

CHAPTER IV

RESEARCH FINDINGS

A. Research Variables Overviews

1. Dependent and Independent Variable Overview

This following overviews introduce entire variables of study, namely stock returns of JII10 selected companies, Bank Indonesia Interest Rate, Brent Oil Price and Trading Volume of JII10.

TABLE 4.1.

Research Variables

Year	RJII10 (IDR)	BR (%)	CPI (%)	Δ CPI (%)	OIL (USD/Barrel)	VOL (Shares)
2008.1	-4729	8	160,81	-50.73	103,64	472118625
2008.2	-10999	8.5	110,08	3.17	132,32	343169875
2008.3	-22534	9.25	113,25	0.61	97,23	95245375
2008.4	968	9.25	113,86	0.41	39,95	160427375
2009.1	8084	7.75	114,27	-0.17	46,54	106145250
2009.2	14044	7	114,1	2.36	68,61	177619625
2009.3	885	6.5	116,46	0.57	67,65	322601500
2009.4	2946	6.5	117,03	1.16	74,46	133654500
2010.1	4290	6.5	118,19	1.67	78,83	486868125
2010.2	3801	6.5	119,86	3.35	74,76	207625625
2010.3	6283	6.5	123,21	1.96	77,84	344138500
2010.4	-16366	6.5	125,17	0.88	91,45	252219875
2011.1	4750	6.75	126,05	0.45	114,64	677730875
2011.2	1845	6.75	126,5	2.39	113,83	125484500
2011.3	9355	6.75	128,89	1.02	112,83	124974500

2011.4	4545	6.75	129,91	1.14	107,87	48354000
2012.1	-6575	5.75	131,05	1.18	125,45	139745500
2012.2	11850	5.75	132,23	2.22	95,16	152572000
2012.3	910	5.75	134,45	1.04	112,86	126886000
2012.4	870	5.75	135,49	N/A	109,49	219636000

Source: Data Analysis Result

Table 4.1 shows the entire variables in this study monthly. It displays RJII10 that had both positive and negative denomination. Means, this portfolio consists of risk in line with the Islamic principle of investment that derived from prophetic tradition:

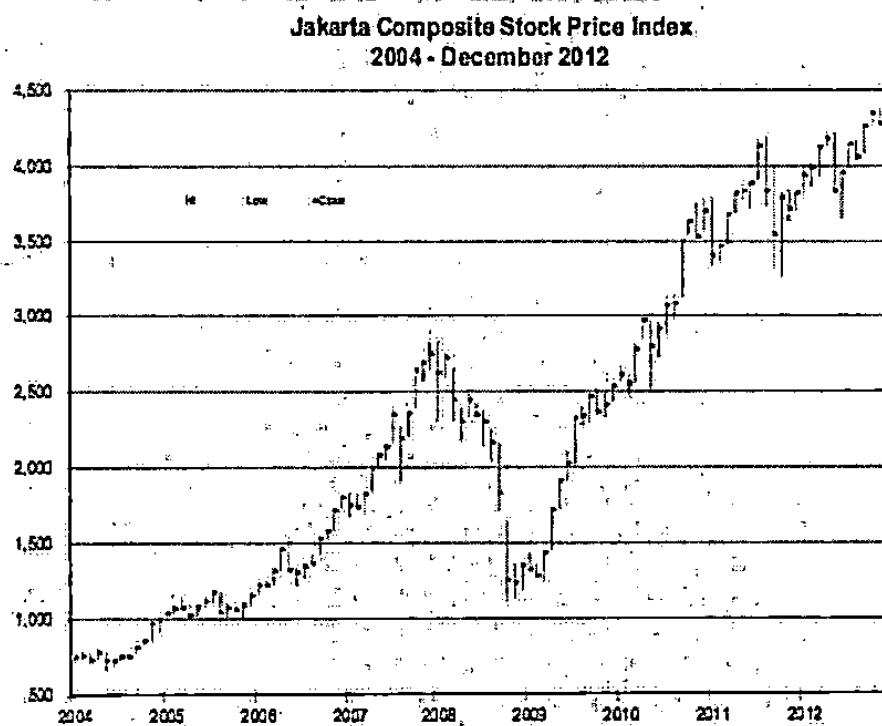
Al-kharaj bi adh-dhaman (The right of income comes from liabilities)

(Narrated from Abu Daud, Tirmidy, An-Nasai', Ibnu Majah and Ahmad)

In 2008, RJII10 experience negative denomination from Q1 until Q3 and reversal in the end of year. The other RJII10 negative denomination shown in Q4 year 2010 and Q1 year 2012. The rest of data had positive denomination afterwards. Bank Indonesia had relatively highest rate in year 2008 in range 8 – 9.25 % and experienced its lowest rate in year 2012 at 5.75 %. A concave trend occurred in CPI data which was high in the beginning at 160.81 % in Q1 year 2008 and experienced declining trend afterwards; In addition, negative CPI growth is occurring during the research period. The decreasing in CPI growth also occurred in Q1 year 2008 and Q1 year 2009 which were 50.73% and 0.17% respectively. Crude oil price had relatively increasing trend from Q1 year 2008 – Q4 year 2012. It had the lowest price in Q4

year 2008 which was 39.95 USD/Barrel and had the highest price in 132.32 USD/Barrel. Meanwhile, JII10 trading volume had relatively declining trend from Q1 year 2008 to Q4 year 2012. In Q1 year 2011 it had the highest volume in 677.730.875 Shares while, in Q4 year 2011 had the lowest volume in 48.354.000 Shares.

In term of RJII10 it experienced relatively negative sentiment during year 2008 which were -4729 in Q1, -10999 in Q2, -22534 in Q3 and 968 in Q4. It was influenced by the general trend in Indonesia and International capital market after the US financial crisis in 2008.



Source: Indonesia Exchange Annual Report 2012

CHART. 4.1

Jakarta Composite Index Movement from 2004-2012

Chart. 4.1 captured the JKSE index from year 2004-2008. The US 2008 financial crisis had relatively strong negative impacts to the world capital market. It caused the world financial and macroeconomic links turbulence. Financial market turbulence was occurred due to the toxic asset from US financial market. Which were owned by relatively most of international investor in the international capital market and financial institutions. Therefore, the market and default risks are spread in those international capital markets. In December 2008 JKSE index was closed in 1.355,4 or decreased for about 50% from 2.627,3 in the early 2008 due to the world financial liquidity crisis, risk aversion sentiment, flight to quality effect and foreign capital outflow. Fortunately, Indonesian capital market experienced relatively fast recovery after 2008 crisis. The increasing trend was occurred from year 2009 to 2012, while macroeconomic links turbulence impacts Indonesia export capacity. It caused Indonesian national income and real economic recession and relates to the global real economic recession that caused to the global liquidity crisis and global consumption in commodity market declined.

According to Kuniati, Cadarajat and Yanifitri (2008) Indonesia had relatively low diversification on exports destination country compared with Singapore, United States and China as the biggest exports destination country. Therefore, Indonesian economy had sensitive responses to those countries' economic recession.

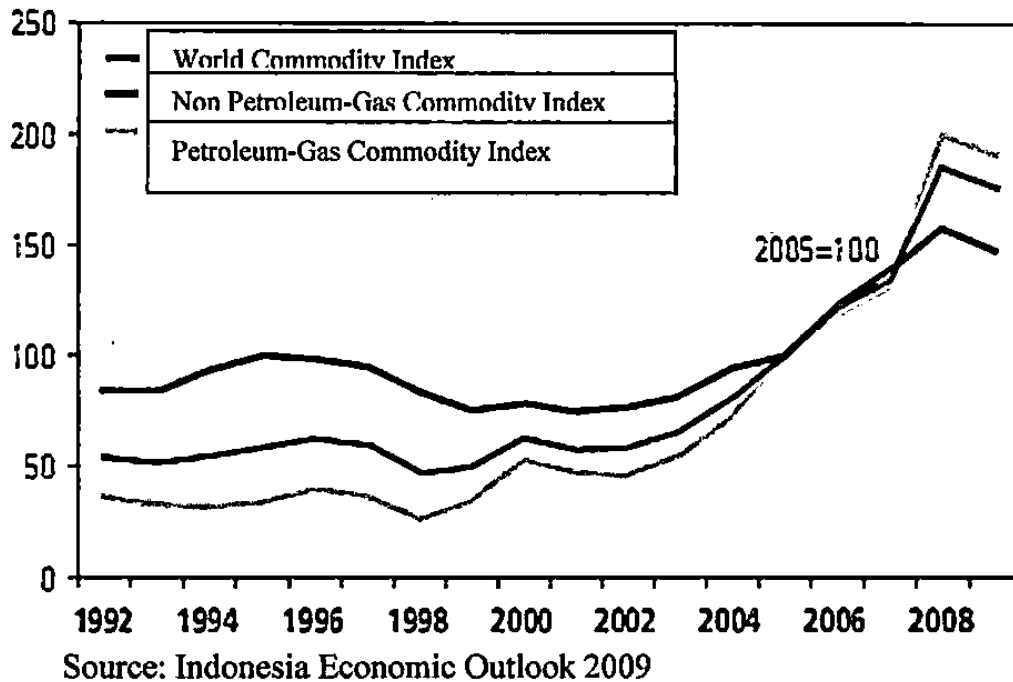


CHART. 4.2

Commodities Price Movement year 1992-2008

Chart. 4.2 captures the commodities price movement from year 1992 to 2008. The red line represents Non-Petroleum and Gas commodity, the yellow line represents Petroleum and Gas commodity while the blue line represents the global commodity price index. The three lines altogether were experienced the falling price index starting from the early 2008 to the end of 2008. The US 2008 financial crisis caused the US and EU international trade activities were decreased. This economic recession stimulated the unemployment and the fall in commodities price.

In term of monetary instrument and inflation Indonesia had relatively stable

... from year 2008 to 2012, particularly in term of interest rate benchmark

Unlike US monetary authority (the FED), Bank Indonesia was imposed relatively prudent monetary policy. Bank Indonesia (BI) determined relatively high interest rate for commercial banks loan, beside BI regulated prudent banking system. The US toxic asset effect was prevented by BI regulation No. 7/2/PBI/2005 about commercial banks asset valuation and BI regulation No. 7/37/PBI/2005 about commercial banks on net open position. Therefore, Indonesian capital market able to recover from 2008 financial crisis faster. Meanwhile, in term of Costumer Price Index (CPI) or inflation rate, Indonesia relatively experienced normal rate of CPI and inflation. Starting from year 2008 to 2012 Indonesia CPI growth had no significant change.

1. Research Findings

a. Descriptive Statistics

Descriptive statistics becomes a set of whole descriptive coefficient concluded the variables in a study. It represents the entire population or sample in the study and explains data central tendency and dispersion measurement. *Eviews7* is used as the econometric tool to analyze the data.

Table 4.3¹ defines the descriptive statistics of all variable with regards to change unselected macroeconomic variables and JII10 stock returns. It defines that first: Stock Returns of 10 selected JII companies (RJII10) Mean, Median, Maximum and Minimum value are 626.1667, 1994.500, 14044.00 and -22534.00 respectively;

¹ See the appendix 2.f

secondly, Bank Indonesia Interest Rate (BIR) Mean, Median, Maximum and Minimum value are 6.933333, 6.500000, 9.500000 and 5.750000 respectively; thirdly, Costumer Price Index (CPI) Mean, Median, Maximum and Minimum value are 125.8040, 124.6000, 164.0100 and 110.0800 respectively; fourthly, Crude Brent Oil Price (OIL) Mean, Median, Maximum and Minimum value are 92.15300, 95.84000, 132.7200 and 39.95000 respectively; fifthly, Trading Volume (VOL) Mean, Median, Maximum and Minimum value are 297.458.417,3, 185.302.250, 1.111.937.250 and 48.354.000 respectively.

The result also explains that all variables in this study exhibit positive mean. In term of Skewness BIR, CPI and Trading Volume are positively skewed which are 0.979300, 1.483741 and 1.586559 respectively. Meanwhile, RJI10 and Oil Price are negatively skewed they are -0.998150 and -0.409904 respectively.

The relationships that need to be observed between stock returns and macroeconomic variables are derived from this following equation.

$$RJI10_{it} = \beta_0 + \beta_{1t}CPI_{it} + \beta_{2t}BIR_{it} + \beta_{3t}OIL_{it} + \beta_{4t}VOL_{it} + e_t$$

Where RJI10 is stock returns on 10 selected companies in Jakarta Islamic Index, CPI is costumer price index , BIR is Bank Indonesia Interest Rate, OIL is Brent Crude Oil Price, VOL is trading volume of 10 selected companies in Jakarta Islamic Index, β_0 is

b. Unit Root Test

Eviews7 is used in this study. It conducted the unit root test as the first test to build the proper econometric model for JII10 stock returns *VAR* forecasting. Unit root test is conducted by observing the value of *Akaike Information Criterion* (AIC) and *Schwarz Criterion* (SC) through the *Augmented Dickey-Fuller* (ADF-test) in level and first difference level. ADF-test is used to examine the stationary and lag length of the four variables in this study in level and first difference. This study observes the lowest value of AIC and SC to be the proper lag for *VAR* estimation and forecasting.

Table 4.4² shows the results of lag length determination on the basis of *Akaike Information Criterion*(AIC) and *Schwarz Criterion*(SC) value. It shows that RJII10 and VOL are in lag 4. It defined the lowest value of AIC and SC among the other lag length (1 until 5) which is in lag 4. RJII10 lag (4) AIC and SC are 20.863 and 21.12 respectively; meanwhile OIL lag (4) AIC and SC are 41.36 and 41.61 respectively; Meanwhile, BIO, OIL and CPI are match their minimum AIC and SC in lag 5. Finally, this study conclude lag 5 as the proper lag length to be used in *VAR* estimation and forecasting.

² See appendix 2.g

Beside manual lag length determination an automatic lag length determination is also used in this study to strengthen lag length determination. Table 4.5³ shows the result of automatic lag length determination by *Eviews7*. It shows that based on the value of *Final prediction error* (FPE) and *Akaike Information Criterion* (AIC) which is 12.28991099 and -6.935609 respectively. Meanwhile, *Schwarz Criterion* and *Hannan-Quinn Information Criterion* match in lag 1 which is -5.109307 and -5.780806 respectively. Automatic *Eviews7* lag length determines lag 5 as proper lag length in *VAR* estimation and forecast based on *FPE* and AIC value.

Table. 4.6⁴ consists the result of stationary test in determined lag 5 in "level". It describes that Brent Crude Oil (OIL) variable had no stationary criteria because, its p-value is higher than $\alpha = 5\%$ or 0.05 which is 0.1922. Meanwhile, Bank Indonesia Interest Rate also had no stationary criteria because of its p-value. BIR p-value is 0.4455, it is higher than $\alpha = 0.05$. The rest variables are have stationary criteria in 95% confidence level. Base on the mentioned explanation, further *cointegration-degrees'* test is conducted to overcome the stationary problems.

Table. 4.7⁵ Consists of stationary test in determined lag 5 in first difference (*integrated-degrees'* test). It defines that p-value of all variables passed the stationary test. All variables tested in *integrated-degrees'* test. The p-value of all variables are 0.0000 and are lower than $\alpha = 0.05$. Therefore, Stock returns, oil price, bank

³ See appendix 2.h

⁴ See appendix 2.i

⁵ See appendix 2.j

Indonesia interest rate, costumer price index and trading volume have stationary criteria.

Because the stationary test is conducted in the first difference/integrated-degrees test, therefore, the relationships need to be examined among JII10 stock returns and macroeconomic variables that will be conducted in *VAR* estimation and forecasting on their first difference. It defined in the following equation:

$$DRJII10_{it} = \beta_0 + \beta_{1t}DCPI_{it} + \beta_{2t}DBIR_{it} + \beta_{3t}DOIL_{it} + \beta_{4t}DVOL_{it} + e_t$$

Where D is the first difference, JII10 is stock returns on 10 selected companies in Jakarta Islamic Index, CPI is costumer price index, BIR is Bank Indonesia Interest Rate, OIL is Brent Crude Oil Price, VOL is trading volume of 10 selected companies in Jakarta Islamic Index, β_0 is the intercept, $\beta_1, \beta_2, \beta_3, \beta_4$ are the coefficient of macroeconomic variables and e_t is the error term.

c. Johansen - Juselius Cointegration Test

Cointegration is a combination of linear relationship from every non-stationary variable in this study. Those variables must be integrated at order the similar degree. The integrating variables define similar stochastic trend and long-term similar movement. Johanses – Juselius test is conducted after the two previous tests and results this following table:

Table. 4.8⁶ and 4.9⁷ display the result of Johansen – Juselius Cointegration Test based on the likelihood ratio test consists of first trace statistics and second maximum Eigen value statistics. Table. 4.8 shows the results of trace statistics at 5 months lag length and the MacKinnon-Haug-Michelis p-values are 0.0000 and $0.0001 < \alpha = 0.05$; therefore we reject H_0 and accept H_a or the model is significant. In other word, there is cointegration between JII10 stock returns and selected macroeconomic variables for period 1/2008 to 12/2012.

Trace test implies the existence of two cointegrating vectors among variables at the $\alpha = 0.05$ where the results conducted by Maximum Eigen value test. Table. 4.9 confirms the existence of cointegrating at $\alpha = 0.05$. The MacKinnon-Haug-Michelis p-values are 0.0000 and $0.0002 < \alpha = 0.05$. Therefore we reject H_0 and accept H_a or the model is significant. In other word, it proves evidence on the existence of long term relationship between macroeconomics variables and JII10 stock returns.

d. **Granger Causality Test**

According to Hasan, Jinnah and Javed (2009), Johansen – Juselius cointegration test does not account for data structural breaks. Therefore, Granger

Table. 4.10⁸ proves evidence on the presence of unidirectional causality from BIR, CPI and OIL to JII10 stock returns at $\alpha = 0.05$ and bilateral causality from BIR and OIL to JII10 stock returns at $\alpha = 0.1$; In addition, no Granger Cause is found in trading volume (VOL) and JII10 stock returns.

The probability of BIR to RJII10, CPI to RJII10, OIL to RJII10 and VOL to RJII10 are 0.00142, 0.00021, 0.09752 and 0.23466 respectively. $0.00142 < \alpha = 0.05$, $0.09752 < \alpha = 0.1$ and $0.23466 > \alpha = 0.1$. In 95% confidence level, we reject H_0 and accept H_a for Granger Cause BIR and CPI to RJII10. Meanwhile in 90% confidence level, we reject H_0 and accept H_a for Granger Cause of OIL to RJII10; and in the similar confidence level 90% we accept H_0 and reject H_a for VOL to RJII10.

In 80% confidence level $\alpha = 0.1$ the bilateral causality is found from BIR and OIL to RJII10. The probability of Granger Cause of RJII10 to BIR is $0.00563 < 0.1$ it rejects H_0 and accepts H_a . The probability of Granger Cause RJII10 to OIL is $0.004 < 0.1$ and it rejects H_0 and accepts H_a which meaning that RJII10 had bilateral causality with BIR and OIL in 80% confidence level.

Therefore investor is suggested to be more cautious in investment decision making. The causal relationship among variables defines market movement on the basis of fundamental and real economic activities. Meanwhile the insignificant

⁸ See appendix 2.m

causality among Trading Volume and JII10 stock returns indicates market sentiments which are not reflected from its trading volume.

e. *Vector Autoregressive VAR(5) Estimation and Model*

The previous stationary test defines that all variables are stationary in the first difference. Therefore they are changed into their first difference form.

TABLE. 4.2

Vector Autoregressive VAR(5) Estimation Result

No.	Variable	T-table	T-test	F-table	F-test	α	Exp.
1.	<i>BIR(2)</i>	1.29831	< (-1.5196)	-	-	0.2	significant
2.	<i>CPI(1)</i>	0.67943	< (-0.77675)	-	-	0.25	significant
3.	<i>CPI(4)</i>	0.67943	< 1.20440	-	-	0.25	significant
4.	<i>OIL(1)</i>	1.29871	< 1.51223	-	-	0.2	significant
5.	<i>OIL(2)</i>	2.00850	< 3.75372	-	-	0.05	significant
6.	<i>OIL(3)</i>	2.00850	< 2.38566	-	-	0.05	significant
7.	<i>F-test</i>	-	-	2.40	< 5.907268	0.05	significant

Source: Data Analysis Result

Where t-table value of 0.002 is 3.26141, t-table value of 0.01 is 2.67779, t-table value of 0.02 is 2.40327, t-table value of 0.05 is 2.00850, t-table value of 0.1 is 1.67591, t-table of 0.2 is 1.29871 and t-table value of 0.5 is 0.67943.

Table. 4.2 provides result of *Vector Autoregressive VAR(5)* estimation. It defines that Bank Indonesia Interest Rate coefficient is -0.183035 which means that it had negative influence to JII10 stock returns. In other words, if Bank Indonesia

coefficient is 2.017676 that means it had positive influence to JII10 stock returns and Brent Oil Price coefficient is -1.52054; it implies negative influence of Brent Oil Price to JII10 stock returns. The following explanations give detail *VAR (5)* estimation results on partial (t-test) and general (f-test).

1. *VAR (5)* Partial t-test Result

The partial t-test examination is conducted to observe the significant influence of the independent variables to dependent variable individually. The *VAR(5)* estimation result describe these following partial t-test:

a. *VAR(5)* Bank Indonesia Interest Rate Partial t-test Result

The *VAR(5)* estimation result defines that Bank Indonesia interest rate (BIR) t-statistics is -0.20575 in lag 1, -1.51916 in lag 2, 0.69250 in lag 3 -0.38520 in lag 4 and 0.75762 in lag 5 with the degree of freedom (df) $55-4-1=50$ in 80% confidence level ($\alpha = 0.2$). In addition, the t-table of t-test is 1.29837. Therefore, t-statistics in lag 2 -1.51916 greater than t-table 1.29831 which means that we reject H_0 and accept H_a or the model is significant.⁹

b. *VAR (5)* Costumer Price Index Partial t-test Result

The *VAR (5)* estimation result defines that Costumer Price Index (CPI) t-statistics is -0.77675 in lag 1, -0.52777 in lag 2, 0.39442 in lag 3 1.20440 in

⁹ See appendix n

lag 4 and 0.05521 in lag 5 with the degree of freedom (df) $55-4-1=50$ in 75% confidence level ($\alpha = 0.25$). In addition, the t-table of t-test is 0.67943. Therefore, t-statistics in lag 1 is -0.77675 and lag 4 is 1.20440 greater than t-table 0.67943, those mean that we reject H_0 and accept H_a or the the model is significant.¹⁰

c. *VAR (5)* Brent Oil Price Partial t-test Result

The *VAR (5)* estimation result defines that Brent Oil Price (OIL) t-statistics is -1.51223 in lag 1, 3.75372 in lag 2, 2.38566 in lag 3 0.16079 in lag 4 and 0.79339 in lag 5 with degree of freedom (df) $55-4-1=50$ in 95% confidence level ($\alpha = 0.05$). The t-table of t-test is 2.00850. Therefore, t-statistics in lag 3 2.38566 and lag 2 3.75372 greter than t-table 2.00850 which means that we reject H_0 and accept H_a or the the model is significant.¹¹ With the degree of freedom (df) $55-4-1=50$ in 80% confidence level ($\alpha = 0.2$), where the t-table of t-test is 1.29871 and t-statistics in lag 1 is 1.51223 greater than t-table 1.29871, means that we reject H_0 and accept H_a or the the model is significant.¹²

2. *VAR (5)* Simultaneous f-test Result

The simultaneous f-test examination is conducted to observe the significant

simultaneously. The

VAR (5) estimation result describes that *VAR (5)* f-statistics is 5.907268 with the degree of freedom (df) (4), (55-4-1) is equal to 4,50 in 95% confidence level ($\alpha = 0.05$). In addition, the f-table of f-test is 2.40, therefore, *VAR (5)* f-statistics is 5.907268 greater than t-table 2.56. It means that we have to reject H_0 and accept H_a or the the model is simultaneously significant.¹³

3. Economic Analysis on *VAR (5)* Estimation Result

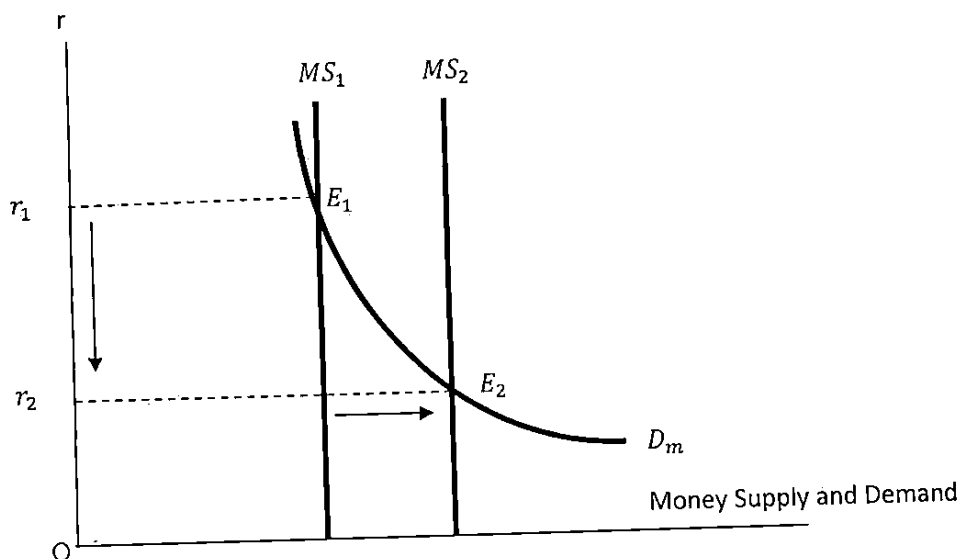
The *VAR (5)* estimation result can be summarized in the following description. Bank Indonesia Interest Rate had negative influence to JII10 stock returns. It is indicated by the negative coefficient in the *VAR (5)* estimation result -0.183035 and confirmed the hypothesis of this study. Similarly to the interest rate the international oil price which had negative influence to JII10 stock returns. It is indicated by the negative coefficient in the *VAR (5)* estimation result -1.520541 and confirmed the hypothesis of this study as well. The costumer price index (CPI) had positive influence to JII10 stock returns, which is indicated by the positive coefficient in the *VAR (5)* estimation result 2.017676 and contradicted the hypothesis of this study.

4. The Influence of Bank Indonesia Interest Rate to JII10 Stock Returns

Bank Indonesia interest as the proxy of interest rate is indicated to had

value of money which stated that 1 dollar today worth more than 1 dollar tomorrow. It is concluded that Indonesian economy is relatively close to interest rate system and used it as the main engine of the economy. This theory argued that money owner expects interest rate as compensation on their money.

The increasing in interest rate will stimulate people to take their money out from stock market to be deposited in saving, deposit account or to other debts based securities such as bond or *sukuk*. This capital outflow will decrease stock exchange capitalization in certain level. Finally, it can be concluded that Indonesian stock exchange has negative relationship with interest rate and confirm the hypothesis of this study. In order to avoid significant negative impact to Indonesia stock exchange the ministry of finance and Bank Indonesia has to be careful in determining its interest rate. The interest rate must be in appropriate point with regards to macro and microeconomic condition.



Source: Sukirno (2006)

GRAPH. 4.7.8

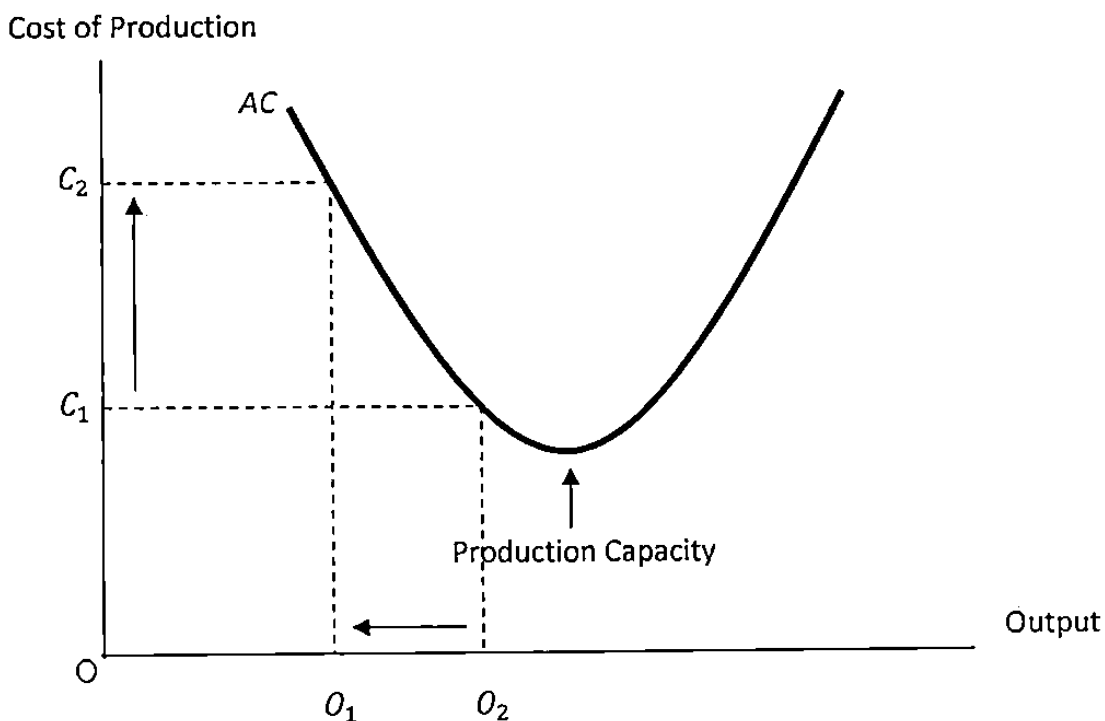
Interest Rate and Money Supply-Demand

Keynes theory on money and interest rate defines that interest rate is determined by the demand and supply of money and explains that there are three motives of people to hold money, namely precautionary motive, speculation motive and transaction motive. Sukirno (2006) Graph. 4.3 defines how interest rate relates to supply and demand of money, where, MS_1 is assumed to be the basis point of money supply; MS_2 is the new money supply point; D_m is the basis point of money demand; r_1 and r_2 represent interest rate on money in 1st and 2nd period of time and E_1 while, E_2 represent the equilibrium point of money supply-demand and the interest rate. It explains that when the decreasing of interest rate from r_1 to r_2 occurred the decreasing of supply and demand of money will adjusted from MS_1 to MS_2 . In other word, interest rate has negative relationship with money supply and demand.

5. The Influence of Brent Oil Price to JIII10 Stock Returns

Brent oil price as the proxy of production factor is indicated to have negative relationship with stock returns. It confirms the cost of production theory where the cost of production must be minimized in order to get higher rate of returns. Indonesia as an importing oil country will be relatively sensitive to international oil price

of production. When this condition is occurred, automatically it will reduces the capacity of Indonesian industry in generating higher income. Eventually, this condition confirms the study hypothesis. With regard to this circumstances, in order to minimize the negative impact of international oil price increase, the Indonesian industry must be able maximize their efficiency.



Source: Sukirno (2006)

GRAPH. 4.4

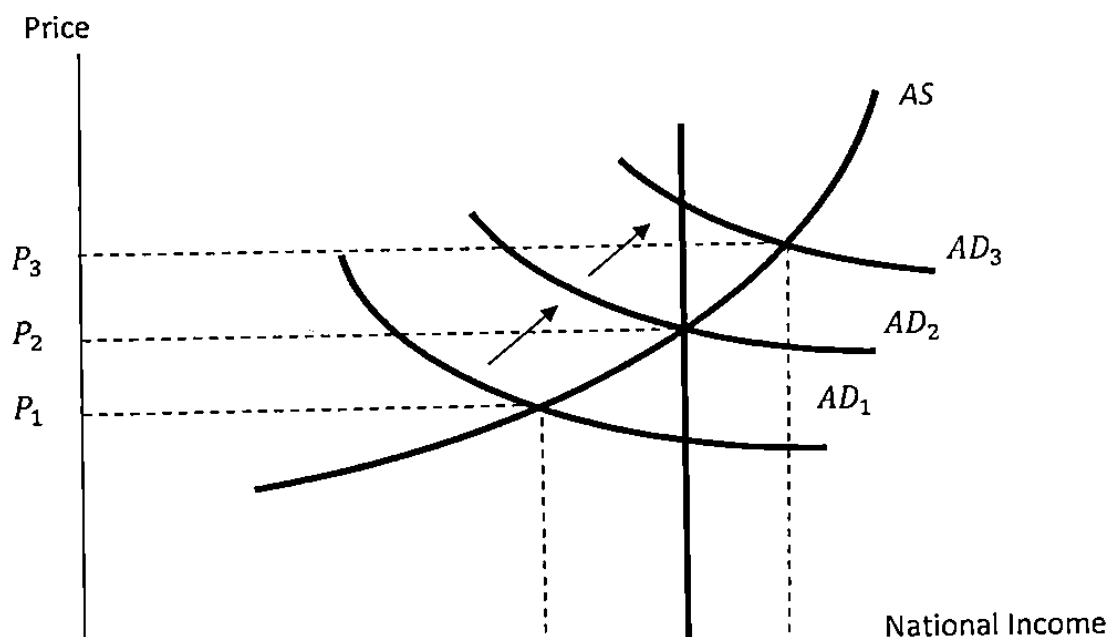
Production Capacity Possibilities

Graph. 4.4 explain how cost of production relates to production output. AC is average cost or Average Variable Cost + Average Fixed Cost; C_1 and C_2 are cost of production in curtained period of time; while, O_1 and O_2 are production output in

production from C_1 to C_2 , the quantity of production output will decrease following the increasing in production cost. To avoid such condition, a company has to increase its efficiency in production activities.

6. The Influence of Inflation to JII10 Stock Returns

Customer price index as the proxy of inflation is indicated to have positive relationship with stock returns and it is contradict the hypothesis of this study, where the inflation have to decrease peoples purchasing power that indirectly reduces people desire to buy some stocks. It can be assumed that Indonesian markets tend to be more reluctant toward inflation and tend to fight the inflation with higher rate of investment. Therefore, it contradicts this study's hypothesis as well.



GRAPH. 4.5
Inflation and National Income

Graph. 4.5 illustrates that the increasing in price P_1 , P_2 to P_3 make the Aggregate Demand shift from AD_1 to AD_3 which mean that demand pulled inflation is occurred. The most interesting phenomena in this study is that stocks exchange investors were indicated to be more optimist against the inflation during 2008-2012. They tend to fight the inflation through their investment in capital markets.

f. Impulse Response and Variance Decomposition Analysis

When the cointegration relationship found among dependent and independent variables. Impulse Response and Variance Decomposition Analysis is conducted. The lag order of *VAR* will be chosen base on the value of SC, AIC and HQ.

Graph. 4.6¹⁴ defines a volatile responses of BIR, CPI and OIL to JII10 stock returns. The horizontal exist represents 10 months period of time, while the vertical exist represents the change of variables due to the presence of shock variables from the independent variables. The 2nd figure defines the change of RJII10 variables in responding the existence of shock variable of BIR. The response of RJII10 to BIR is relatively volatile. The first month of response, BIR shock variable to JII10 stock returns is 0.000000. It becomes negative in the second until fifth month these are

0.065953, -0.088791, -0.160523 and -0.226894 respectively. The positive response is found in the next sixth, seventh and ninth month which are 0.211188, 0.101303 and 0.039193 respectively. Meanwhile in the eighth and tenth month the negative response is found in -0.059110 and -0.019874.

The third figure defines the change of RJI10 variable in response the existence of shock variable of CPI. The response of RJI10 to CPI is relatively less volatile than the second figure. The positive responses are found in the first, third and forth months which are 0.000000, 0.127463 and 0.387729 respectively. Meanwhile the negative responses are found in the second, fifth, sixth, seventh, eighth, ninth and tenth months which are -0.014907, -0.412334, -0.249658, -0.129252, -0.174465, -0.108699 and -0.028179 respectively.

The forth figure defines the change of RJI10 variable in response the existence of shock variable of OIL. The response of RJI10 to OIL is relatively similar to the second figure. The positive responses are found in the first, third, seventh, eighth and ninth months which are 0.000000, 0.110304, 0.006771, 0.065282 and 0.032304 respectively. Meanwhile the negative responses are found in second, forth, fifth, sixth and tenth months which are -0.064028, -0.072311, -0.137933, -0.005304, -0.005304 and -0.023720 respectively.

Table. 4.6¹⁵ defines variable decomposition of DRJII10 which explains how DBIR, DCPI and DOIL influence DRJII10. In the first month, DRJII10 is 100% influenced by itself. Furthermore, the influence of variable DRJII10 to DRJII10 itself is decrease to 35.55% in the tenth month. Table. 4.10 also defines that variable DRJII10 0.00% influenced by DBIR in the first month. And so, the influence of DBIR to DJII10 is increased to 14.73% in the 10th month. The influence of DCPI to DRJII10 also exhibits in table. 4.10 It explains 0.00% DCPI influence to DRJII10 in the first month. It influence is increase to 45.13% in the tenth month. The table also explains the influence of DOIL to DRJII10 in the last DOIL influence 0.00% of DRJII10 in the first period. And increase to 4.57% in the last tenth month.

Variance Decomposition Analysis result explains that variable DCPI is the most capable variable to influence DRJII10 rather than variable DBIR and DOIL. Altogether in the tenth month variance decomposition results are 14.73 for DBIR, 45.13 for DCPI and 4.57% for DOIL. DCPI had the largest percentage influence to DRJII10.

g. *Vector Autoregressive VAR (5) Forecasting*

The research model of this study is used to forecast JII10 stock returns in year

2010. The model used is VAR (5) in the forecasting. The estimation

model result defines these following models to be used in forecasting the stock returns of ten companies listed in stock returns in 2013:

$$\begin{aligned} \text{Model1: } Y_{1t} = & -0.198222 Y_{1t-1} - 0.147897 Y_{1t-2} + 0.001702 Y_{1t-3} - \\ & 0.161570 Y_{1t-4} - 0.032813 Y_{1t-5} - 3.805408 Y_{2t-1} - 4.109641 Y_{2t-2} - \\ & 8.028628 Y_{2t-3} - 8.502750 Y_{2t-4} + 9.540010 Y_{2t-5} - 0.233352 Y_{3t-1} + \\ & 2.547521 Y_{3t-2} + 6.353452 Y_{3t-3} - 11.320398 Y_{3t-4} - 1.124576 Y_{3t-5} - \\ & 0.912396 Y_{4t-1} + 1.474893 Y_{4t-2} - 0.386569 Y_{4t-3} - 0.963839 Y_{4t-4} + \\ & 0.34675 Y_{4t-5} + 18.27901\beta + e \end{aligned}$$

Where, Y_1 is JII10 Stock Returns and t is lag length.

$$\begin{aligned} \text{Model.2: } Y_{2t} = & -0.001013 Y_{1t-1} - 0.005107 Y_{1t-2} + 0.002797 Y_{1t-3} - \\ & 0.001522 Y_{1t-4} + 0.003043 Y_{1t-5} + 0.486316 Y_{2t-1} - 0.308758 Y_{2t-2} + \\ & 0.414746 Y_{2t-3} - 0.103764 Y_{2t-4} + 0.065867 Y_{2t-5} - 0.018810 Y_{3t-1} + \\ & 0.035618 Y_{3t-2} - 0.017599 Y_{3t-3} + 0.020869 Y_{3t-4} + 0.017199 Y_{3t-5} + \\ & 0.033534 Y_{4t-1} - 0.000903 Y_{4t-2} + 0.051210 Y_{4t-3} + 0.001920 Y_{4t-4} + \\ & 0.031954 Y_{4t-5} - 0.183035 \beta + e \end{aligned}$$

Where, Y_2 is Bank Indonesia Interest Rate and t is lag length.

$$\begin{aligned} \text{Model 3: } Y_{3t} = & -0.012244 Y_{1t-1} - 0.005681 Y_{1t-2} + 0.005101 Y_{1t-3} + \\ & 0.015239 Y_{1t-4} + 0.00710 Y_{1t-5} - 0.604481 Y_{2t-1} + 0.491398 Y_{2t-2} - \\ & 0.069416 Y_{2t-3} + 0.190611 Y_{2t-4} - 0.155580 Y_{2t-5} + 0.641313 Y_{3t-1} + \end{aligned}$$

$$\begin{aligned}
& 0.061971 Y_{3t-2} + 0.049398 Y_{3t-3} + 0.08135 Y_{3t-4} - 0.253676 Y_{3t-5} - \\
& 0.073877 Y_{4t-1} - 0.057008 Y_{4t-2} - 0.019537 Y_{4t-3} + 0.060531 Y_{4t-4} - \\
& 0.010833 Y_{4t-5} + 2.017676 \beta + e
\end{aligned}$$

Where, Y_3 is Costumer Price Index and t is lag length.

$$\begin{aligned}
\text{Model.4: } Y_{4t} = & 0.032522 Y_{1t-1} + 0.055130 Y_{1t-2} + 0.042096 Y_{1t-3} + \\
& 0.002776 Y_{1t-4} + 0.013921 Y_{1t-5} + 0.606848 Y_{2t-1} + 0.027602 Y_{2t-2} - \\
& 0.717100 Y_{2t-3} + 0.198953 Y_{2t-4} + 0.474849 Y_{2t-5} + 0.190388 Y_{3t-1} + \\
& 0.206689 Y_{3t-2} - 0.116166 Y_{3t-3} + 0.017250 Y_{3t-4} + 0.015951 Y_{3t-5} - \\
& 0.028992 Y_{4t-1} + 0.089098 Y_{4t-2} - 0.178715 Y_{4t-3} - 0.043540 Y_{4t-4} + \\
& 0.130421 Y_{4t-5} - 1.520541 \beta + e
\end{aligned}$$

Where, Y_4 is JII10 Trading Oil and t is lag length.

TABLE. 5.1
VAR(5) JII10 Stock Returns Forecasting Value year 2013

Forecasting VAR			
Year	RJII10 (IDR)	FRJII10 (IDR)	Year
2012.1	441	99	2013.1
2012.2	173	254	2013.2
2012.3	132	-1	2013.3
2012.4	295	175	2013.4
2012.5	113	-302	2013.5
2012.6	-11	-199	2013.6
2012.7	186	-203	2013.7
2012.8	253	-83	2013.8
2012.9	-66	-17	2013.9
2012.10	93	-90	2013.10
2012.11	192	-84	2013.11
2012.12	-174	-112	2013.12

Source: Data Analysis Result

Table. 5.1 defines the increasing and decreasing of JII10 stock returns. It forecast general negative stock returns in JII10 compared to the previous year 2012. Negative trend is occurred from March until December 2013. The highest depression occurred in May 2013 which is -302. JII10 stock returns is predicted to have positive affect only in January and February 2013 which are 99 and 254 IDR. It forecasted general negative stock returns in JII10 compared to the previous year 2012. This negative sentiment might be caused by the continuous decreasing in Bank Indonesia interest rate and the fluctuating price of oil. But it may not become major influence to

foreign capital, national economic condition, global economic condition and the speculative action of traders existing in the stock markets.

The JII10 negative stocks returns are confirmed by the several phenomena occurred in the Indonesia stock market. In the end of May to June 2013 there is huge foreign capital outflow in Indonesia stock exchange market and potential uncertainty