

**Analysis of Oil Price Volatility and Stock Price Fluctuations in an
Emerging Market: Evidence from Indonesia**

A Thesis

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Degree in Economics Department



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AN ANALYSIS OF OIL PRICE VOLATILITY AND STOCK PRICE
FLUCTUATIONS IN AN EMERGING MARKET: EVIDENCE FROM
INDONESIA 2011-2015

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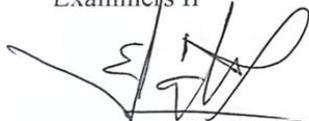
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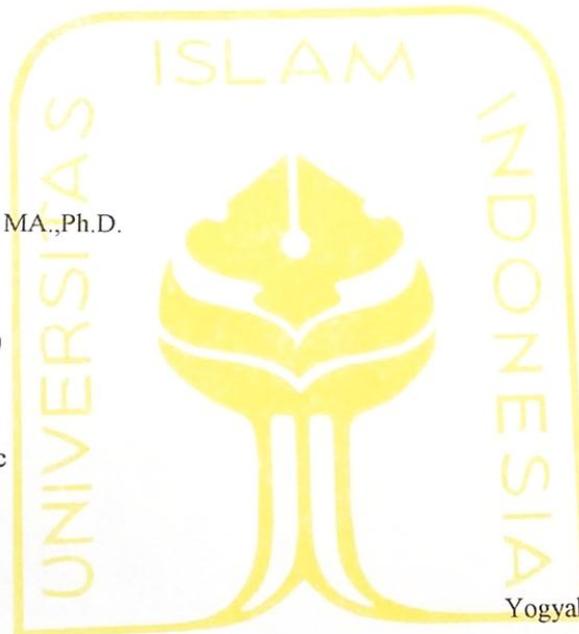


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DECLARATION OF AUTHENTICITY

Hereby I declare the originality of the thesis; I have not presented someone else's work to obtain my university degree, nor have I presented someone else's words, ideas or expressions without any of the acknowledgments. All quotations are cited and listed in the bibliography of the thesis. If in the future this statement is proven to be false, I am willing to accept any sanction complying with the determined regulation or its consequence.

Yogyakarta, March 8th, 2018

Author,


Artha Widyatama Rama Davis

MOTTOS

“Allah does not burden a soul beyond that it can bear”

(Quran, 2:286)

“Everything has changed and yet, I am more me than I’ve ever been”

(Iain Thomas)

Go for it. No matter how it ends, it was an experience”

(Unknown)

“Sometimes the best thing you can do is not think, not wonder, not
imagine, not obsess. Just breathe, and have faith that everything will
work out for the best”

(Unknown)

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ ACKNOWLEDGEMENT

Assalamu 'alaikum Warahmatullahi Wabarakatuh.

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I would like to thank everyone who has participated in making this thesis a success. Hopefully, this will be the starting point of initiating other studies. Through this occasion, I would like to address my appreciation and regards to:

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LIST OF TABLES

Table 4.1 Stationarity Test in Level Test.....	60
Table 4.2 Stationarity Test in 1st Different.....	60
Table 4.3 Optimum Lag Test.....	61
Table 4.4 Granger Causality Test.....	63
Table 4.5 Cointegration Test.....	66
Table 4.6 Long – term Result.....	68
Table 4.7 Short – term Result.....	71
Table 4.8 Result of Variance Decomposition.....	83

LIST OF FIGURES

Figure 1.1 Stock Price.....	7
Figure 4.1 Growth of Stock Price in IDX.....	49
Figure 4.2 Inflation Rate in Indonesia.....	51
Figure 4.3 Exchange Rate in Indonesia.....	53
Figure 4.4 Interest Rate in Indonesia	54
Figure 4.5 World Oil Price.....	56
Figure 4.6 Production Index in Indonesia.....	57
Figure 4.7 World Oil Production.....	58
Figure 4.8 Analysis Result Impulse – Response.....	79

LIST OF APPENDICES

Appendix 1: Datas of Stock Price, Inflation, Exchange Rate, Interest Rate, Production Index, World Oil Price, World Oil Production per month in Indonesia in 2000 – 2015

Appendix 2: Time Series Test Using E-views

Contents

DECLARATION OF AUTHENTICITY.....	Error! Bookmark not defined.
MOTTOS	v
ACKNOWLEDGEMENT	vi
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF APPENDICES	xi
ABSTRACT.....	xv
CHAPTER I.....	1
INTRODUCTION	1
1.1 Background	1
1.2 Problem Formulation.....	7
1.3 Problem Limitation.....	7
1.4 Research Objectives	7
1.5 Research Contribution	8
1.6 Systematic of Writing.....	9
CHAPTER II.....	10
LITERATURE REVIEW & THEORETICAL FRAMEWORK.....	10
2.2 Theoretical Framework	10
2.2.1 Stock.....	10
2.2.2 Stock Price Index.....	11
2.2.3 Stock Price	13
2.2.4 Stock Market Price.....	15
2.2.5 Factors that affect stocks	16
2.2.6 Influence of Inflation Rate on Stock Price Index	18
2.2.7 Effect of Exchange Rate on Stock Price Index	19
2.2.8 Effect of Interest Rate on Stock Price Index	20
2.2.9 Effect of Oil Price Against Stock Price Index.....	22
2.3 Literature Review	23
2.4 Framework for Thinking	27
2.5 Hypothesis	28
CHAPTER III	29

RESEARCH METHOD.....	29
3.1 Type of Study	29
3.2 Data Collection Method	29
3.3 Research Variable.....	30
3.3.1 Dependent Variable	30
3.3.2 Independent Variable.....	30
3.4 Analysis Technique	32
3.4.1 Vector Autoregression (VAR).....	32
3.4.3 Granger Causality	35
3.4.4 Optimum Lag Test.....	35
3.4.5 Cointegration Test	36
3.4.6 VECM Estimation	37
3.4.7 Model Stability Test	39
3.4.8 Impulse Response Function.....	40
3.4.9 Forecast Error Decomposition Variance (FEDV)	40
CHAPTER IV	43
DATA ANALYSIS DISCUSSIONS	43
4.1 Description of Research Data	43
4.1.1 The Development of Stock Price Index in Indonesia.....	43
4.1.2 The Development of Inflation in Indonesia	44
4.1.3 The Development of Exchange Rate in Indonesia.....	46
4.1.4 The Development of Interest Rate in Indonesia.....	47
4.1.5 The Development of Oil Price Indonesia.....	48
4.1.6 The Development of Production Index in Indonesia	50
4.1.7 The Development of World Oil Production in Indonesia	51
4.2 The Result of Analysis	52
4.2.1 Stationarity Test	52
4.2.2 Optimum Lag Test	54
4.2.3 Granger Causality Test.....	55
4.2.4 Cointegration Test	58
4.2.5 VECM test.....	59
4.2.5.1 Long-term Analysis.....	60

4.2.5.2 Short-term Analysis	62
4.2.5.3 Economy Analysis Interpretation.....	65
4.2.6 Analysis Impulse – Response.....	67
4.1.7 Analysis Variance Decomposition	71
CHAPTER V.....	73
CONCLUSION	73
5.1 Conclusion	73
5.2 Implication.....	74

ABSTRACT

The study aims to examine the effects of oil price, inflation, exchange rate, interest rate, production index, oil production on stock price index in Indonesia in the period of 2000 – 2015. The empirical analysis commence by analyzing the time series property of data. The Johansen VAR-based co-integration technique was applied to examine the long run relationship between oil price, inflation, exchange rate, interest rate, production index, oil production and stock price index and found the long run relationship does exist. The vector error correction model was performed to check the short run dynamics and found that the short run dynamics are influenced by the estimated long run equilibrium. Granger causality was done and found that oil price affect stock price index.

This research uses secondary data from BPS, Investing.com. Sample Data used is monthly data from January 2000 to December 2015. The result of the research shows that Inflation, Interest Rate, World Oil Price, Production Index and Oil Production give positive and significant impact in the long term and the Exchange rate shows Negative impact. While in the short term variable Stock, Inflation, Exchange rate, Interest rate, World Oil Price, Production Index, and Oil Production indicate Positive effect on first lag.

Keywords : Stock, Exchange Rate, Inflation, Interest Rate, Oil Production, World Oil Price, Production Index

CHAPTER I

INTRODUCTION

1.1 Background

Governments that are building countries around the world need resources to develop their country. One of these sources can come from the capital market. The capital market is one of the effective means of accelerating the development of a country. This is because the capital market is a means to mobilize funds from the community to be channeled to various industrial sectors. Investment funds from the capital market can provide benefits for the company because it will get a source of funding to do business development company. The investor can own a portion of the company's share of ownership and will benefit from it. The profit in question is the profit in the form of dividends or capital gains.

The capital market is one of the sub-sectors that play an important role in moving the wheels of a country's economy. Therefore, the capital market becomes one of the economic indicators of a country. There are two main functions of the capital market, first, as a source of financing for business entities. Companies that need funds can obtain funds from the capital markets that can be used for business development and additional corporate capital and so forth. Secondly, as a means of investing for the public, such as stocks, bonds, and other financial instruments. The public can use the capital market to invest in such financial instruments in accordance with the choice of profits and risks. The capital market as one place of financial business activity will receive direct and indirect impact if there are

changes in other business activities, such as changes in world oil prices, changes in gold prices and changes in the exchange rate of a currency.

According to Ang (1997), the capital market is an indicator of the economic progress of a country and support the economy of the country concerned. The capital market has an important role for the economy of a country because the capital markets perform two functions, first as a means for business financing or as a means for companies to obtain funds from the investors or investors Husnan (2004). Funds obtained from the capital market can be used for business development, expansion, additional working capital and others. Thus, the public may place the funds it owns in accordance with the profit and risk characteristics of each of the above financial instruments.

According to Emmanuel and Sunday (2012), the stock market is a common feature of a modern economy and is well known for performing functions that promote economic growth and development. The market is an economic institution that promotes efficiency in capital formation and allocation. This allows the government and industry to increase long-term capital.

Stock Price on the Indonesia Stock Exchange is not always stagnant, there is a time when the price increases and there is a time when the stock price declines. According to Haroon and Jabeen (2013), a stock exchange is an organized institution in which the securities of a joint-stock company are traded freely and the price is determined by the strength of demand and supply.

In Indonesia, investors who are interested to invest in capital market can invest in Indonesia Stock Exchange (IDX). BEI in supporting its business activities always provide information to the public about stock price movements, either through print or electronic media. One of the information submitted is the movement of a composite stock price index (composite stock price index or abbreviated JCI is a combination of all shares listed on Indonesia Stock Exchange). Therefore, that investors can recognize the condition of the market, whether it is passionate or lethargic through the movement of the composite stock price index. Many economic factors affect the capital market. According to Blanchard (2006), macroeconomic factors affecting capital markets are among others, the global economy, world energy prices, the political stability of a country, etc. Meanwhile, according to Samsul (2008) factors affecting the capital market, among others: foreign exchange rates, international economic conditions and the economic cycle of a country.

On the other hand, fluctuations in stock prices can occur due to fundamental factors, psychological factors of investment and external factors. According to Alwi (2003), several macro factors that influence IDX investment activity include government announcements are a change of interest rate, inflation, exchange rate and various regulation and economic deregulation issued by the government. The high rate of inflation can lead to rising factor prices and also followed by a decrease in people's purchasing power.

When the exchange rate of the rupiah against the US dollar weakens and when other investments are also less promising, investors tend to invest dollars into the form of currency dollars. By hoping that when the dollar rises again, the investor will sell in the form of dollars and get a profit from the difference of the currency. Fluctuations in currency exchange rates may also affect the export trade in imports of goods and services related to issuers. As well as when the exchange rate weakened then followed by an increase in the cost of production factors are expensive. These conditions will ultimately affect capital market activity, and will further result in declining capital market performance.

High-interest rates are a negative signal to stock prices. Increased interest rates will lead to an increase in interest rates on the investment of a stock. In addition, increased interest rates may also cause investors to withdraw their investments in stocks and transfer them to investments in the form of savings and deposits.

In addition to BI interest rates, energy also holds an important role in the Indonesian economy. This is motivated that in Indonesia Stock Exchange, the value of capitalization of mining companies listed in IHS reach 13.9% (www.idx.co.id). In addition, based on data of Indonesia Stock Exchange (IDX) per 17 September 2016, trading transactions dominated by the mining sector about 39.7%. This resulted in an increase in oil prices will encourage the rise of mining company stock prices. This will certainly encourage the increase of IHSG.

Research conducted by Kilian and Park (2007) shows that world oil prices have a significant impact on the movement of the stock market index. Many previous theories and studies reveal that the movement of the Stock Price Index is influenced by several factors. Factors from outside the country (External) such as changes in world oil prices, world gold prices to foreign markets. Whereas, the factors of the internal come from currency fluctuations, inflation, interest rates, social and political conditions, the money supply and so on. From the previous research, there are differences in terms of conclusions from each study on inflation variables, rupiah exchange rate and interest rates that result in different conclusions. The research of Yusup (2012) proves that inflation does not have a significant impact on JCI. The same thing can be obtained from the research in 2002 showing that inflation does not significantly affect the JCI.

Research conducted by Avonti and Prawoto (2004) succeeded in proving that the rupiah exchange rate had a significant effect on the composite stock price index. The research conducted by Wicaksono (2010) confirms previous research on the exchange rate that proves that the rupiah exchange rate has no significant effect on the stock price index.

Research conducted Wicaksono (2010) managed to prove that the interest rate significant effect on the composite stock price index. However, research conducted by Kewal (2012) proves that the interest rate does not significantly affect the stock price. Research conducted by Nugroho (2011)

proved that the industrial production index positively affects the stock price index.

The fact that makes oil and gas business activity in this country continues to increase every year, it is estimated that the amount of oil dredged from the stomach of the earth in various parts of Indonesia reaches 915.798 barrel/day. The vicissitudes of oil prices and production at any given time may affect some of the stock prices listed on the Indonesia Stock Exchange. Here is the Stock price of 2000-2013.

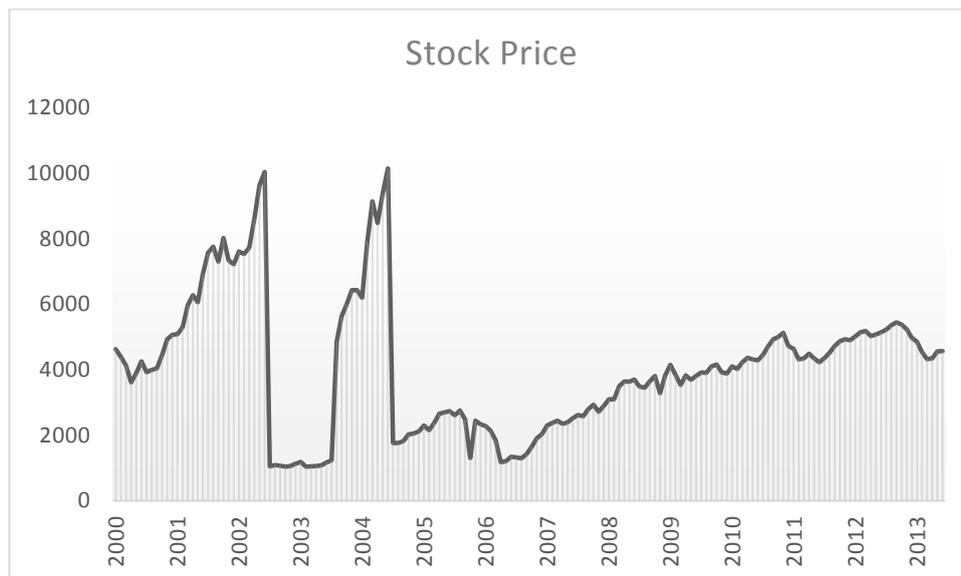


Figure 1.1 Stock Prices 2000-2013

Source: Investing (Processed)

On the graph shows that the volatility of stock prices from 2000 to 2013. The highest stock price occurred in 2002 also in 2004, and the lowest stock price was in 2003. Based on the above background researchers interested in conducting research on the factors that affect stock prices. The study is titled “**Analysis of Oil**

Price Volatility and Stock Price Fluctuations in an Emerging Market: Evidence from Indonesia”

1.2 Problem Formulation

Based on the above background can be formulated several problems to conduct research, namely:

1. How does the Exchange Rate affect stock price in Indonesia?
2. How does the Rate of Inflation affect stock price in Indonesia?
3. How does the Interest Rate affect stock price in Indonesia?
4. How does Oil Productions affect stock price in Indonesia?
5. How does Production Index affect stock price in Indonesia?
6. How does World Oil Price affect stock price in Indonesia?

1.3 Problem Limitation

This research focused on the oil price volatility and stock price fluctuations in Indonesia. The limitation of this research is using four variables having impact on the oil price volatility and stock price fluctuations, which are the exchange rate, rate of inflation, interest rate, and oil production.

1.4 Research Objectives

To answer the problem formulation, the researcher has determined the research objectives as follows:

1. To Analyze the effect of Exchange Rate variable on oil price volatility and stock price fluctuations in Indonesia.

2. To Analyze the effect of Rate of Inflation variable on oil price volatility and stock price fluctuations in Indonesia.
3. To Analyze the influence of Interest rate variable on oil price volatility and stock price fluctuations in Indonesia.
4. To Analyze the effect of Oil Productions variable on oil price volatility and stock price fluctuations in Indonesia.

1.5 Research Contribution

1. For Researcher

As one of the requirements to get a bachelor degree at the Faculty of Economics of Islamic University of Indonesia, and also increase the knowledge and experience of the writer in order to develop the knowledge gained during the lectures at the Faculty of Economics, Economics Department of Islamic University of Indonesia, in addition the author can compare about theory and practice occurs in the field.

2. For the Related Agency

This research is expected to provide information and additional insight for the parties related to the economic problems, thus expected to determine the policy appropriately.

3. For the World of Science

This research can be used as a thought contribution or comparative study for students or parties doing similar research. In addition, in order to improve skills, broaden the insights that will shape the students' mental as a stock to enter the work field.

1.6 Systematic of Writing

Writing this thesis presented in five chapters, namely: introduction, literature review, research methods, results and discussion, and cover.

Chapter I Introduction

The chapter I explain about the background of the study and also explain about why the researcher is interested to conduct a research about oil price volatility, stock price in emerging market: evidence in Indonesia.

Chapter II Literature Review

The researcher discussed about theory, literature review, and hypotheses..

Chapter III Research Method

The chapter III explains about data collection and data analysis..

Chapter IV Findings and Discussions

Describe the description of the object of research, data analysis and discussion of results and analysis.

Chapter V Conclusion and Recommendation

CHAPTER II

LITERATURE REVIEW & THEORETICAL FRAMEWORK

2.2 Theoretical Framework

2.2.1 Stock

Stocks are one of the most favored capital market instruments for investors providing an attractive rate of return. Shares can be defined as a sign of one or one-sided capital (the business enterprise) in a company or limited liability company. By including such capital, the party has claimed for corporate earnings, claims on company assets, and is entitled to attend general shareholder meetings (GMS). The stock is one type of investment that promises profits for investors. Shares acquired through purchases or otherwise, which grants the shareholder the right to dividends and others in accordance with the investments in the enterprise.

According to Rahardjo (2006) stock is securities that are instruments of proof of ownership or participation of an individual or institution within a company. Whereas in general terms, shares are evidence of equity participation in a shareholding in a company. Based on the understanding of the experts above it can be concluded the stock is a proof of sign of ownership of a company in which listed nominal value, company name, and followed with the rights and obligations described to each holder.

2.2.2 Stock Price Index

According to Sunaryah (2001: 126), that the stock price index is a statistical stock that measures changes in the economy or in the financial market and is usually expressed in terms of percentage of a base year or prior month. This index is called the stock price index because in this stock price index contains historical information about the picture of stock price movements in the past and provide a description of stock prices at a certain time or in a certain period. The stock price indices also illustrate a condition or condition of changes that occur in stocks.

At the time of stock price index can be used as one barometer that can show economic health in a country and serve as a statistical basis for the condition of a market. At the investor usually in viewing the condition of the stock that became the investment goal always see the stock price index as a benchmark in making decisions. At the election of the market price index does not depend on a theory but more dependent on its empirical results. If there is an increase in the stock price index that means the stock market in good condition. But if the stock price does not change then the stock market in stable condition. Meanwhile, if the stock price index decreased it can be ascertained if the stock market conditions are experiencing a decline. The types of stock indexes are listed on the Indonesia Stock Exchange

1. Individual Index

Using price index of each share to its basic price or Index of each share listed on BEI

2. Sectoral Stock Price Index

Use all the shares included in each sector, such as the financial sector, mining, and others. In IDX, the sectoral index is divided into nine sectors, namely: agriculture, mining, industry, industry, consumption, infrastructure property, finance, trade and services, manufacturing.

3. Composite Stock Price Index (JCI)

The composite stock price index (JCI) is a joint stock price development of all participants of the transaction in the overall exchange in Indonesia. JCI is one of the stock market indices used by the Indonesia Stock Exchange. First introduced on April 1, 1983, as an indicator of stock price movements in the Stock Exchange. Here will focus on IHSG related to macroeconomic effect.

4. LQ45 Index

The index consists of 45 stock options with reference to two variables namely liquidity of trade and market capitalist. Every 6 months there are new shares that enter into the LQ45

5. Jakarta Islamic Index (JII)

JII is an index consisting of 30 stocks accommodating sharia investment in Islam or index based on Islamic Shari'a. In other words, in this index are included stocks that meet the investment criteria in Islamic Shari'a. Shares that enter the sharia

index criteria of Islam are listed companies whose business activities are not contrary to sharia.

6. Main Board Index and Development Board

That is the stock price index that is specifically based on stock groups listed on the BEI is the main board group and development board.

7. Compass Index 100

That is a stock price index result of a cooperation of Indonesia Stock Exchange with the compass.

2.2.3 Stock Price

The stock price is the closing price of the stock market during the observation period for each type of stock being sampled and its movements are constantly observed by investors. According to Darmadji and Fakhrudin (2006) stock price is the price that occurs in the stock at a certain time. Stock prices may change up or down in a matter of time so quickly. Stock prices may change in a matter of minutes or even change in seconds. This is possible because it depends on the demand and supply between the stock buyer and the stock seller.

According to Jogiyanto (2010) stock prices that occur in the stock market at a given moment determined by market participants and determined by the demand and supply of shares concerned in the capital market. According to Widioatmojo (1996), share price can be divided into 8 (eight):

1. Nominal Prices

The price listed in the stock certificates stipulated by the issuer to assess each share issued. The magnitude of the nominal price gives the importance of the stock because the minimum dividend is usually set based on the nominal value.

2. Price Prime

This price is the price at which the stock price is listed on the stock exchange. Stock prices on the primary market are usually set by underwriters and issuers. Thus it will be known how the stock price of the issuer will be sold to the public usually to determine the initial price.

3. Market Price

If the initial price is the selling price of the emission agreement to the investor, then the market price is the selling price of one investor with another investor. This price occurs after the stock is listed on the stock. Transactions here no longer involve issuers and underwriters of this price are referred to as prices in the secondary market and this price really represents the price of the issuing company because, in transactions in the secondary market, there is little investor price negotiation with the issuing company. The daily price announced in newspapers or other media is the market price.

4. Opening Price

The opening price is the price demanded by the seller or the buyer at the time the opening hour is opened. It could happen at the commencement of the day that the nurse has been a transaction on a stock, and the price as requested by the seller and the buyer. In such circumstances, the bookkeeping price can be the market

price, and vice versa the market price may also be the opening price. But that is not always the case.

5. Closing Price

The closing price is the price demanded by the seller or the buyer at the end of the exchange day. In such circumstances, it could happen at the end of stock exchange day suddenly happen a transaction on a stock, because there is an agreement between seller and buyer. If this happens then the closing price has become the market price. However, this price remains the closing price on the day of the exchange.

6. Highest Price

The highest price of a stock is the highest price that occurs on the exchange day. This price may occur transactions on a stock more than once not at the same price.

7. Lowest Price

The lowest price of a stock is the lowest price that occurs on the exchange day. This price may occur if there is a transaction on a stock more than once not at the same price. In other words, the lowest price is the opposite of the highest price.

8. Average Price

The average price is the average of the highest and lowest prices.

2.2.4 Stock Market Price

Understanding of the capital market in general is a place the meeting between demand and supply of long-term financial instruments, generally more than one year (Samsul,2006). In fact, a capital market is more

similar to some other markets, when the number of requests is greater than with the number of offers, then it is certain the price will be higher. Conversely, if the number of requests is smaller compared to the number of offers, then the price will fall or become cheap.

According to Darmadji and Fakhruddin (2006), the capital market is a market for various long-term financial instruments traded, either in the form of debt, equity (shares), derivative instruments (options), or other instruments. The capital market is a means of funding for companies and other institutions (eg government) and means for investing activities. Thus, the capital market facilitates various facilities and infrastructure of buying and selling activities and other related activities. Financial instruments traded in the capital market are long-term instruments (more than one year) such as stock, bond, warrant, mutual fund, and various derivative instruments such as options.

According to the Capital Market Law no. 8 of 1995, the capital market is an activity concerned with the public offering and securities trading, public companies relating to the securities it publishes, as well as institutions and professions relating to securities (Samsul, 2006). The definition of securities listed in this sense includes all types of marketable securities capital. Currently, securities issued and traded in the Indonesian capital market are shares, preferred stock, bonds, convertible bonds, rights and warrants.

2.2.5 Factors affecting stocks

There are several factors that can influence the fluctuation of the stock price in a capital market, this happened because stock price can influence by an

external factor from the company and internal factor of a company. Internal factors are come from within the company. Information obtained from the company's internal condition in the form of financial information, non-financial information.

According to Brigham and Houston (2010) stock prices are influenced by several key factors:

1. Internal Factors
 - a. Announcements on sales production marketing such as advertising, contract details, price changes, new product withdrawals, production reports, security reports, and sales reports.
 - b. Announcement of funding, such as announcements relating to equity and debt.
 - c. The announcement of the management board of directors announcements such as change and change of director, management, and organizational structure.
 - d. The acquisition announcement is verified like an investment merger statement, equity investment, take-over report by acquisition and acquisition, investment report and more.
 - e. Investment announcements such as expansion of other factories and research development plants.
 - f. Labor announcements, such as new negotiations, new contracts, strikes and more.

g. The announcement of the company's financial statements, such as profit before the end of the year fiscal and after the end of year earnings per share (EPS), dividend per share (DPS), Price Earnings Ratio, Net profit margin, return on assets (ROA) and others.

2. External Factors

a. Government announcements such as changes in savings rates and foreign exchange rate deposits, inflation, as well as various economic regulations and regulations issued by the government.

b. Legal announcements such as claims against the company or against its manager and the company's demands on its manager.

c. The announcement of the securities industry, such as insider trading annual reports, volume or stock trading price restrictions or trading delays.

2.2.6 Influence of Inflation Rate on Stock Price Index

Inflation is a macroeconomic variable that describes the increase in prices of goods and services in a certain period. One of the triggers for rising inflation rate during 2013 at 8.38% is the rise in fuel prices that cause prices to rise. This figure was the highest since the crisis last year 2008. Inflation tends to increase the production cost of the company so that the profit margin from the company becomes lower. The continued impact of this is to make stock prices in the stock fall. If this is experienced by many companies in the capital market, the performance of Stock Price Index will also decrease. Influence of inflation on the performance of the stock price index is not only seen the influence directly but also must be seen as the indirect influence. Indirect influence in this

case that inflation will affect the high-interest rates and further interest rates will affect the performance of IHSB. Inflation is a condition in which the price of goods and services has risen in price over time and the increase occurs equally. Inflation has a positive influence on the Stock Price Index. If inflation rises the Stock Price Index will rise, this positive correlation is based on the assumption that inflation is due to excess demand for available goods supplied. In these circumstances, the company may charge the cost increase to the consumer with a larger proportion so that the company's profits increase. Thus, it will increase the company's ability to pay dividends and will provide a positive assessment of stock prices Kuncoro (1998: 46).

2.2.7 Effect of Exchange Rate on Stock Price Index

The Exchange Rate is the ratio between a currency unit with a number of other currencies that can be converted at any given time or a simpler understanding is the price of a country's currency against the price of another currency unit. Mankiw (2006), explaining the exchange rate between the two countries is the price level agreed upon by the two countries to trade each other.

The Rupiah exchange rate so far is relatively lower against the United States currency. The declining exchange rate of the Rupiah against the US Dollar will have an impact on the improvement of raw materials and equipment needed by the company and will affect the stock price in Indonesia stock exchange. The effect of exchange to the stock price is negative, if the Dollar strengthens against the Rupiah then it is likely that

investors will tend to shift their investments in the form of US Dollar currency compared to investing in stocks and vice versa. On the other hand, when Rupiah against the Dollar depreciates does not always have a negative impact, there are some positive impacts that occur. The impact of Rupiah depreciates, exports will increase. Increased purchases of domestic products will certainly increase the benefits of some Indonesian exporters, such as furniture and textile exporters. This condition is very logical because if the domestic product sold with reference to the Rupiah, of course, the importer will buy it by converting Dollars to Rupiah and will get a lot of goods than when the Rupiah appreciated. In addition to high export, the impact is very pronounced with the weakening of the rupiah is the price of imported goods more expensive. Rising prices of imported goods will make people switch to local products at a more affordable price. This situation makes importers decreased turnover. However, at the same time, local product traders get a profit.

2.2.8 Effect of Interest Rate on Stock Price Index

BI rate is the policy rate reflecting the stance of monetary policy stipulated by the Indonesian bank and announced to the public. BI rate is announced by the Board of Governors of Bank Indonesia every monthly. Board of Governors Meeting and implemented on monetary operations conducted by Bank Indonesia through liquidity management in the money market to achieve the operational targets of monetary policy. The operational targets of monetary policy are reflected in the development of the Overnight Interbank Money Market Rate (PUAB O/N). The movement

in the interbank money market rate is expected to be followed by developments in deposit rates, and in turn bank lending rates. Taking into account other factors in the economy, Bank Indonesia will generally raise the BI rate if future inflation is predicted to exceed the predetermined target, whereas Bank Indonesia will lower the BI rate if future inflation is predicted to fall below predetermined targets (Siamat, 2001).

Bank Indonesia, is the authority to set interest rate known as BI Rate. The interest rate is set as a reference to the interest rates on loans and deposits. Banks in Indonesia should see the BI rate as the basis for determining loan interest and deposit interest. But the BI Rate is not pushy. This means that if BI sets its interest rate of 7.5% then the Bank may set its loan interest and savings equal to or higher than the BI Rate. The increase in interest rates, investors will have another alternative to double their money without having to bother in the stock market. This will cause the demand for shares to decrease, and in a certain period cause the movement of JCI to be down. If BI lowered interest rates, which then responded by banks in general which also lowered interest rates including, interest on the loan. If interest rates fall, that means financing provided by the bank will be very attractive to entrepreneurs. An increase in interest rates would cut corporate earnings. This happens in two ways. The increase in interest rates will increase the interest expense of the issuer so that the profit can be cut. In addition, when interest rates are high, production costs will increase and product prices will be more expensive so consumers may postpone their

purchases and keep their funds in the bank. As a result, the company's sales decreased. The drop in company sales and earnings will weigh on stocks. Changes in monetary policy will affect the capital market through changes in consumption and investment spending. A decrease in the interest rate will encourage consumption and investment expenditures which will further increase stock prices. Based on the explanation it can be concluded that interest rates have a negative effect on stocks (Cahyono, 2000).

2.2.9 Effect of Oil Price Against Stock Price Index

Oil is one of the energy sources needed by human beings in various aspects of life. Since 2000 it has been seen that oil prices are experiencing upheaval. The next three years prices continue to rise along with declining reserve capacity. The number of factors causing this turmoil:

- a) Perceptions of the current low oil reserve capacity.
- b) The second is the rising demand and on the other hand, there is concern over the inability of the producer countries to increase production.
- c) The utility level of refineries in some countries and the decline of gasoline inventories in the United States also contributed to the rising position of oil prices. (Republika Online, Tuesday 28 June 2005).

Currently, crude oil prices are measured from the spot price of the world oil market, generally used as a standard is West Texas Intermediate or Brent. Crude oil traded in West Texas Intermediate (WTI) is high-quality crude oil. Crude oil is the lightweight type and has low sulfur content. This type of oil is very suitable to be used as fuel, this causes the oil price is used

as a benchmark for oil price trading. OPEC oil prices are mixed oil prices from OPEC countries, such as Algeria, Indonesia, Nigeria, Saudi Arabia, Dubai, Venezuela, and Mexico. OPEC uses this price to oversee the world oil market. OPEC oil prices are lower because oil from some OPEC member countries has high enough sulfur content making it more difficult to use as fuel.

The rise in oil prices, in general, will push up the stock price of the mining sector. So that world oil prices have a positive effect on JCI. This is because the increase in oil prices will trigger a general rise in mining prices. This will certainly result in mining companies having the potential to increase their profits. The rise of mining stock prices will boost the mining sector's JCI.

2.3 Literature Review

Avonti and Prawoto (2004) analyzed the effect of Rupiah Exchange Rate / US \$ and the Interest Rate of BI against Composite Stock Price Index in Indonesia Stock Exchange. The method used is multiple linear regression. Data were obtained from 2000 to December 2003. Based on the results found Rupiah and Interest Rates effect on Composite Stock Price Index. When interest rates fall then investors will prefer to invest shares. The exchange rate also influences stock price volatility. Depreciation of the domestic currency will increase export volume. If international market demand is elastic it will increase the cash flow of domestic companies, which then increase the stock price. (Avonti, Prawoto, 2004).

Nugroho (2011) analyzed the effect of changes in World Oil Prices, World Gold Price Industry Production, Interest Rate to JCI. The data used is quantitative secondary data consisting of monthly data of all variables. The analytical method used is multiple analysis. Simultaneous results found that simultaneously variable macroeconomy that includes world oil prices, industrial production of world gold prices, interest rates have a significant influence on JCI. This study shows that world oil prices, industrial production of world gold prices, interest rates give a significant impact on the movement of stock exchange index with 95% confidence level.

Yau (2010) examined the dynamic relationship between capital stock, GDP, employment, and oil price by using structural VECM impulse response and variance decomposition analysis. The study found that oil price has adverse effects on capital stock, GDP, and employment. Unemployment, GDP, domestic investment, and capital stock reached their lowest value before recovering in 2010. However, the oil price was found to have a detrimental effect on the price level and a negative effect on money supply, thus exacerbating unemployment.

Papaetrou (2001) employs a multivariate VAR model on monthly data relating to the period, 1989-1999, to explore the dynamic relationship between the variables, oil prices, economic activity and employment in Greece. The study show that oil price shocks affect stock markets negatively. This study shows that in very intolerant to change in oil prices and volatility. Because the economy is heavily depend on oil and has not yet developed alternative energy-saving technologies

Cheng, H-F, Gutierrez, M., Mahajan, A., Shachmurove, Y. And Shahrokhi, M. (2007) found that oil prices have a negative association with the stock exchange of Malaysia. For this purpose, they have utilized the data from 1980 to 2001 and applied Johansen co-integration test and vector error correction model. Results have shown that there is short-run relationship between fluctuation in oil price and stock exchange of Malaysia.

Ghorbel and Younes (2008) examined that oil prices have a short run association with the stock exchange of India. For this purpose, they have utilized the data from 1981 to 2001 and applied the classical regression model, best linear unbiased estimates (BLUE). Results have shown that there is a short-run relationship between fluctuation in oil price and stock exchange of India.

Al-Fayoumi, N. A., Khamees, B.A., & Al-Thunneibat,A.A. (2009) a found that oil prices have negative association with the stock exchange of Nigeria. For this purpose, they have utilized the data from 1985 to 2008 and applied the Augmented Dickey Fuller Unit Root Test, Johansen co-integration test. Results have shown that there is short run relationship between fluctuation in oil price and stock exchange of Nigeria and there is no relationship in the long run.

Amano, R.A., & Van Norden,S (1998) observed that oil prices have negative association with the stock exchange of Japan. For this purpose, they have utilized the data from 1995 to 2005 and applied the pertain Zivot-Andrews Unit Root Test, F-Bound Co-integration, Toda and Yakama to Causality test. Results have shown that there is short run relationship between fluctuations in oil price and stock exchange of Japan.

Chen, J., Hong, H., & Stein, J.C. (2002) viewed that oil prices have a negative association with the stock exchange of Brazil, Russia, India, and China. For this purpose, they have utilized data from 1989 to 2008 and applied the Unit Root Test, Co-integration, and Granger Causality Test. Results have shown that there is short-run relationship between fluctuations in oil price and stock exchange of Brazil, Russia, India, and China.

Jimenez Rodriguez, R., & Sanchez, M. (2005) found that oil prices have a negative association with the stock exchange of USA. For this purpose, they have utilized the data from 1986 to 2006 and applied Johansen Co-integration test and vector error correction model. Results have shown that there is short-run relationship between fluctuation in oil price and stock exchange of USA.

Hamilton (2008) examined that oil prices have negative association with the stock exchange of UK. For this purpose, they have utilized the data from 1991 to 2012 and applied the Pearson correlation and ANOVA method. Results have shown that there is short run relationship between fluctuation in oil price and stock exchange of UK.

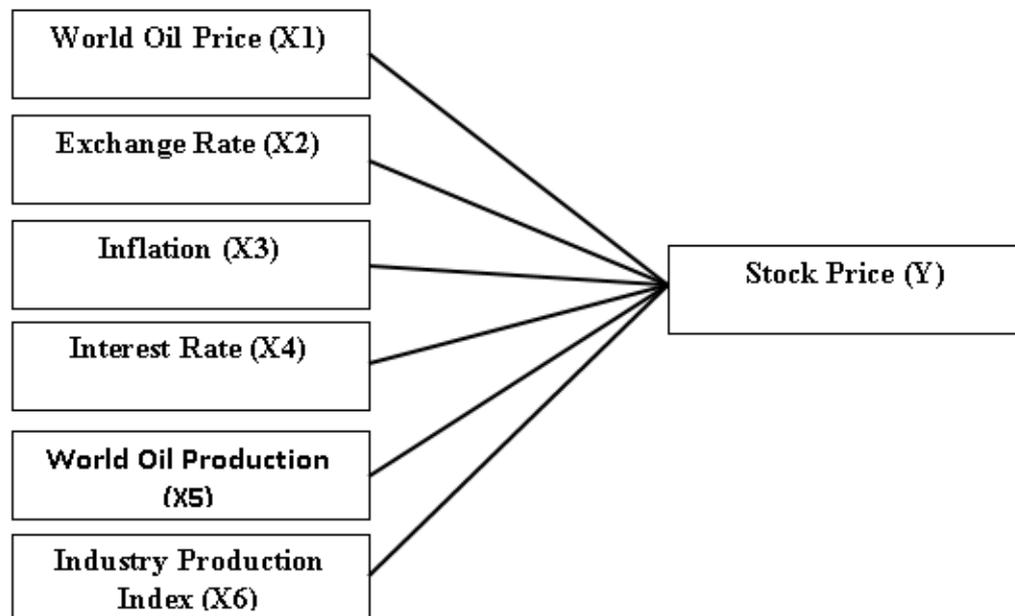
Berument et.al. (2008) investigated the effects of macroeconomics policy shock on total unemployment in Turkey and measured the differential responses of unemployment in economic sectors from January 1988 to April 2004. The study employed a VAR model with recursive order. The findings show that a relationship exists between income shock and unemployment in all economic activity groups during the initial periods, except for unemployment in the sectors of mining, manufacturing, construction, wholesale/retail trade, transportation,

finance, and insurance. Price shock is positively correlated with unemployment in the long term except of mining and community services. Interest rate shocks do not show any significant relationship with unemployment.

Tunah (2010) used Johansson co-integration and Granger causality to examine the cause of unemployment in Turkey. The results reveal that a relationship exists between GDP, inflation, exchange rate, and unemployment for the long term. In the short term, only real GDP and inflation Granger caused unemployment.

2.4 Framework for Thinking

The framework of this research can be explained through the following picture:



2.5 Hypothesis

A hypothesis is a temporary assumption of a problem and that needs to be tested for truth. Hypothesis in this research are:

1. World Oil Price has a positive impact on Stock price in Indonesia.
2. Exchange rate has a negative impact on Stock price in Indonesia.
3. Inflation has a positive impact on Stock price in Indonesia.
4. Interest rate has a negative impact on Stock price in Indonesia.
5. World Oil Production has a positive impact on Stock price in Indonesia.
6. Industry Production Index has a positive impact on Stock price in Indonesia

CHAPTER III

RESEARCH METHOD

3.1 Type of Study

Type of study, which used by researcher is quantitative research. This research uses a quantitative method by way of generating numerical data or data that can be transformed into usable statistics. The type of data in this research is secondary data, the researcher reuses information as secondary data because it is easier and less expensive to collect the data. Secondary data is data obtained directly from the source, such as a quote from the books, literature, scientific journals, as well as data sources published by several agencies, which have relevance to the theme of research. Data needed for this research are:

- a) World oil price data 2000 – 2015
- b) Exchange rate data 2000 – 2015
- c) Inflation data 2000 – 2015
- d) Interest rate data 2000 – 2015
- e) World oil production data 2000 – 2015
- f) Industry production index data 2000 – 2015

3.2 Data Collection Method

Method of collecting data used in this research is the study of the literature. It is an attempt to obtain data by studying and analyzing the literature books and processed data. The collections of data in this study are intended to

obtain materials that are relevant and accurate. The data used are secondary data by using a data collection method in studies of original documents from the BPS as well as other library resources related with the research.

3.3 Research Variable

This research contains of independent variable and dependent variable. Dependent variable in this research is Stock price of Indonesia, and the independent variables are world oil production, exchange rate, inflation, interest rate, world oil production and industry production index that can be defined as follows:

3.3.1 Dependent Variable

Dependent variable is a variable of which magnitude is influenced by other variables. This study used stock price as a dependent variable. Stock prices obtained directly from www.investing.com the data used is monthly from January 2000 to December 2015.

3.3.2 Independent Variable

The independent variable is the variable that can affect another variable. Independent variables used in this study are:

- a. World Oil Price (X1)

World oil prices are measured by world spot market prices, in general, the standard used is West Texas Intermediate. Monthly data released by Investing.com expressed in million Dollars.

b. Exchange Rate (X2)

The exchange rate is the sum of a given currency to earn another currency. The exchange rate is determined by various rules, both exchange rates and the rules themselves may change. Exchange rate data released by the Central Bureau of Statistics of Indonesia in thousand Rupiahs.

c. Inflation (X3)

Inflation is a sustained increase in the general price level of goods and services in an economy over a period of time. Inflation data released by the Central Bureau of Statistics of Indonesia in percent (%).

d. Interest Rate (X4)

The interest rate is the amount charged, expressed as a percentage of principal, by a lender to a borrower for the use of assets. Interest rate data released by the Central Bureau of Statistics of Indonesia in percent (%).

e. World Oil Production (X5)

World oil production is the number of fossil fuels that are the raw material for fuel oil, gasoline, and many chemical products - is an important source of energy because oil has a significant percentage in meeting world energy consumption. The data used in this research are taken from data released by the IFS in million barrel.

f. Industry Production Index (X6)

Industrial production index (IPI) is a statistical instrument used to monitor the monthly trends in Indonesia industrial activity. If we refer to the traditional

classification of economic activities in three sectors, the IPI concerns the so-called secondary sector: factories, construction sites, mines, and quarries. The data used in this research are taken from data released by the Central Bureau of Statistics of Indonesia.

3.4 Analysis Technique

Processing of secondary data that have been collected from various sources is uses some statistical program packages, such as Microsoft Excel 2013 and EViews. In processing data activities, the researcher used Microsoft Excel 2013 to create tables and analysis. Meanwhile, on the processing regression time series, the researcher uses program package EViews.

3.4.1 Vector Autoregression (VAR)

The econometric model often used in macroeconomic and stochastic macroeconomics analysis is Vector Auto Regression (VAR). VAR is a system of equations, which shows each variable as a function of the constants and lag values of the variable itself and the lag value of another variable that exists in the system. The explanatory variable in the VAR includes the lag value of all the dependent variables in the VAR system requiring retry identification to achieve the equation through the interpretation of the equation.

VAR with the p and n order of non-free variable in period t can be modeled as follows:

$$Y_t = A_0 + A_1 Y_{t-1} + A_2 Y_{t-2} \dots + A_p Y_{t-p} + \varepsilon_t$$

Where :

Y_t = The vector of the dependent variable ($Y_{1,t}, Y_{2,t}, Y_{3,t}$)

A_0 = Intercepted vectors (n x 1)

A_1 = Parameter size matrix (n x 1)

ε_t = Residual vector

The assumption that must be met in the VAR analysis is that all variables are not stationary, all the rest are white noise, i.e. having zero mean, constant variation and among non-free variables, there is no correlation. Test stationary of data can be done through testing the presence or absence of root units in variables with Augmented Dickey-Fuller (ADF) test. The existence of the root unit will produce a spurious regression equation.

The detection of co-integration can be done by Johansson or Engel - Granger method. If the variables are not co-integrated, then a standard VAR can be applied which results will be identical to the OLS, after ensuring that the variable is stationary to the same degree (order). If the test proves there is a co-integration vector, then EMC can be applied to the single equation or VECM for system equation.

3.4.2 Data Stationarity Test

One important concept that must be remembered in the analysis using time series data is the condition of data that is stationary or non-stationary. If estimation is done using non-stationary data it will give false regression result or called spurious regression (Gujarati, 2003). Having the understanding that the regression results of one time series variable on one or more other time series variables tends to produce a conclusion of the estimation results that can be shown with characteristics such as obtaining a very high R^2 result (greater than

0.9) but in reality the relationship between variables it has no meaning or meaningless. Gujarati also said that if $R^2 > d$ (Durbin Watson Statistic), then this condition is a good rule of thumb to suspect that the estimation result is likely to be nonsense/spurious regression.

If a time series data is stationary data then the behavioral study for that data can only be done for a certain period of time (Gujarati, 2003). In other words that every part of the time series data is a separate part of each other. As a consequence of the condition, it is not possible to make a generalization estimate at different time periods. Gujarati states that the stochastic process is said to be stationary if the mean and variance are constant over a period of time, and are judged by different covariance between two time periods depending on the lag between two time periods independent of the actual time at which the covariance is calculated. It could also be said to be stationary time series data, if the average variance and auto covariance in various lag numbers show similarity when measured at various points of measurement.

There are several methods that can be used to test stationarity. The two most commonly used methods are to use Dickey-Fuller augmented test method where the lag is added to the variable. While the method of testing Philip - Peron using non - parametric statistical methods so as to overcome the problem of serial correlation without adding lag. Testing Philip - Peron, then H_n is contains a root unit that indicates the condition is not stationary.

3.4.3 Granger Causality

Granger causality test is used to evaluate forecasting ability from the one-time series variable in the previous period to other time series variables in the current period. The null hypothesis tested states that there is no causality between variables whereas the alternative hypothesis states that there is a causality relationship between the variables. To reject or accept the null hypothesis, it can see the value of probability compared with the level of trust, in this study using a critical value of 5 percent. If the probability value is greater than 5 percent then the null hypothesis is rejected which means there is a causality relationship between the variables tested.

3.4.4 Optimum Lag Test

The lag test is used to determine the optimum lag length to be used for further analysis. The optimum lag test is an important step that must be done in using VECM model. For the first step in this test is to form a VAR equation to obtain optimum lag and stability of the new VAR can be formed its VECM equation. The criteria information for determining the appropriate lag length is to use the selection of Final Prediction Error (FPE) model criteria, Akaike Information Criteria (AIC), Schwarz Criteria (SC), and Hannan-Quinn (HQ). In the lag selection test through these criteria, candidate lag will be obtained on each criterion that refers to the optimal lag. In Eviews 9 gives an asterisk on the smallest AIC and SC values.

3.4.5 Co-integration Test

One of the assumptions to be met in VARs is that all non-free variables are stationary (Enders, 2004). If the data is not stationary, co-integration test is required. Co-integration test step by applying Johanson method, which consists of several stages, namely:

1. Test the order of integration of all variables. Data needs to be plotted to observe whether or not there is a linear trend. It is recommended not to mix variables with different orders.
2. Estimate the model and establish the model condition. Model conditions can be done in the following three forms:
 - a. All constants are zero ($\mathbf{A}_0 = \mathbf{0}$)
 - b. Value \mathbf{A}_0 be appointed
 - c. Value \mathbf{A}_0 is a constant on the co-integration vector
3. Analyze to get the normalized co-integration vector and the adjustment coefficient.
4. Calculates error correction factors to help identify the model structural.

In Eviews 9 an equation is categorized co-integrated if the trace statistic value is greater than the critical value of 5 percent. From the co-integration test, we can determine the exact number of equations to estimate the VECM.

To test co-integration constraints, Johansson defines two matrices α and β dimension (n \times r) where r is a device of, so:

$$\pi = \alpha \beta$$

Where:

α = the weight matrix of each co-integration vector present in n VAR equations α also can be regarded as a matrix of a speed of adjustment parameters (Enders, 2004).

β = co-integration parameter matrix

The hypothesis of the Johansen method is as follows (Enders, 2004):

$H_0: r = 0$ $H_1: 0 < r < g$

$H_0: r = 0$ $H_1: 0 < r < g$

$H_0: r = 0$ $H_1: 0 < r < g$

$H_0: r = g-1$ $H_1: r = g$

The first test mentions the null hypothesis in the absence of a co-integration vector. If this hypothesis fails to be rejected, it can be concluded that no co-integration vector and test has been completed. But if the hypothesis is rejected, then the test will be done continuously and so on until the value of r will increase until the hypothesis fails to be rejected.

3.4.6 VECM Estimation

Vector Error Correction Model (VECM) is a special method of VAR, which is useful for seeing the long-term equilibrium relationship of co-integrated equations. The trick is to restrict several variables of an equation. If the variables used are co-integrated, then there is a long-term balance of these variables, of course, in the short-run relationship there is an imbalance.

In other words, this method is a way to see the influence of another variable in the long run.

VECM Equation models

$$\Delta Y_t = \omega_1 + \lambda_1 e_{t-1} + \sum \gamma_{1i} \Delta Y_{t-i} + \sum \omega_{1i} \Delta X_{1t-i} + \sum \beta_{1i} \Delta X_{2t-i} + \sum \alpha_{1i} \Delta X_{3t-i} + \sum \theta_{1i} \Delta X_{4t-i} + \sum \xi_{1i} \Delta X_{5t-i} + \sum \epsilon_{1i} \Delta X_{6t-i} + \varepsilon_{1t}$$

$$\Delta X_{1t} = \omega_2 + \lambda_2 e_{t-1} + \sum \gamma_{2i} \Delta Y_{t-i} + \sum \omega_{2i} \Delta X_{1t-i} + \sum \beta_{2i} \Delta X_{2t-i} + \sum \alpha_{2i} \Delta X_{3t-i} + \sum \theta_{2i} \Delta X_{4t-i} + \sum \xi_{2i} \Delta X_{5t-i} + \sum \epsilon_{2i} \Delta X_{6t-i} + \varepsilon_{1t}$$

$$\Delta X_{2t} = \omega_3 + \lambda_3 e_{t-1} + \sum \gamma_{3i} \Delta Y_{t-i} + \sum \omega_{3i} \Delta X_{1t-i} + \sum \beta_{3i} \Delta X_{2t-i} + \sum \alpha_{3i} \Delta X_{3t-i} + \sum \theta_{3i} \Delta X_{4t-i} + \sum \xi_{3i} \Delta X_{5t-i} + \sum \epsilon_{3i} \Delta X_{6t-i} + \varepsilon_{1t}$$

$$\Delta X_{3t} = \omega_4 + \lambda_4 e_{t-1} + \sum \gamma_{4i} \Delta Y_{t-i} + \sum \omega_{4i} \Delta X_{1t-i} + \sum \beta_{4i} \Delta X_{2t-i} + \sum \alpha_{4i} \Delta X_{3t-i} + \sum \theta_{4i} \Delta X_{4t-i} + \sum \xi_{4i} \Delta X_{5t-i} + \sum \epsilon_{4i} \Delta X_{6t-i} + \varepsilon_{1t}$$

$$\Delta X_{4t} = \omega_5 + \lambda_5 e_{t-1} + \sum \gamma_{5i} \Delta Y_{t-i} + \sum \omega_{5i} \Delta X_{1t-i} + \sum \beta_{5i} \Delta X_{2t-i} + \sum \alpha_{5i} \Delta X_{3t-i} + \sum \theta_{5i} \Delta X_{4t-i} + \sum \xi_{5i} \Delta X_{5t-i} + \sum \epsilon_{5i} \Delta X_{6t-i} + \varepsilon_{1t}$$

$$\Delta X_{5t} = \omega_6 + \lambda_6 e_{t-1} + \sum \gamma_{6i} \Delta Y_{t-i} + \sum \omega_{6i} \Delta X_{1t-i} + \sum \beta_{6i} \Delta X_{2t-i} + \sum \alpha_{6i} \Delta X_{3t-i} + \sum \theta_{6i} \Delta X_{4t-i} + \sum \xi_{6i} \Delta X_{5t-i} + \sum \epsilon_{6i} \Delta X_{6t-i} + \varepsilon_{1t}$$

$$\Delta X_{6t} = \omega_7 + \lambda_7 e_{t-1} + \sum \gamma_{7i} \Delta Y_{t-i} + \sum \omega_{7i} \Delta X_{1t-i} + \sum \beta_{7i} \Delta X_{2t-i} + \sum \alpha_{7i} \Delta X_{3t-i} + \sum \theta_{7i} \Delta X_{4t-i} + \sum \xi_{7i} \Delta X_{5t-i} + \sum \epsilon_{7i} \Delta X_{6t-i} + \varepsilon_{1t}$$

Where :

ΔY : Variable of Stock Price

ΔX_1 : Variable of World Oil Price

ΔX_2 : Variable of Exchange Rate

ΔX_3 : Variable of Inflation

ΔX_4 : Variable of Interest Rate

ΔX_5 : Variable of World Oil Production

ΔX_6 : Variable of Production Index

- \mathbb{Q} : Intercept
 λe_{t-1} : Coefficient to Ect
 γ : Coefficient of lag variable Y
 ω : Coefficient of lag variable X_1
 β : Coefficient of lag variable X_2
 α : Coefficient of lag variable X_3
 θ : Coefficient of lag variable X_4
 ξ : Coefficient of lag variable X_5
 ϵ : Coefficient of lag variable X_6

3.4.7 Model Stability Test

Stability test is used to see whether the model used is stable or not. Estimates must have high validity so that their results can be trusted. These results can be trusted if the model used has stability. If the VAR model used is not stable, the estimation result using the VAR model does not have a high degree of validity. Stability can be interpreted as the result of estimation is near zero if the model is extended the time period. A model is said to have high validity if its root inverse characteristic has a modulus less than one or all within the circle. If the modulus is less than one or is in a circle, then the model is quite stable. On the contrary, if the modulus is worth one or more, or the modulus is mostly outside the circle then it is certain that the model is less stable. If the VAR has a low level of stability or all of its root inverse characteristics are outside the circle unit, the result of the VAR model estimate is doubtful.

3.4.8 Impulse Response Function

The response impulse can be interpreted as a response of an endogenous variable when other endogenous variables are in shock or in impulse. The function response impulse traces the effect of a shock or surprises deviation standard on innovation on the value of endogenous variables present and future. A surprise that occurs in one variable will directly affect the variable and also on another endogenous variable through a dynamic structure (Enders, 2004).

3.4.9 Forecast Error Decomposition Variance (FEDV)

Forecast Error Variance of Decomposition (FEVD) or decomposition analysis of various forecasting errors is used to see the contribution of the diversity of an endogenous variable to other endogenous shocks for some time to come (Enders, 2004). If coefficient A_0 and A_1 known and variability X_{t+1} want to be foreseen, while the observed condition is X_t , then the variability of a period is $X_{t+1} = A_0 + A_1 X_t + e_{t+1}$ and expectations conditions from $e_t X_{1+j} = A_0 + A$

CHAPTER IV

DATA ANALYSIS DISCUSSIONS

4.1 Description of Research Data

4.1.1 The Development of Stock Price Index in Indonesia

If the price index moves up, indicating the average stock price has risen in price. Conversely, if the price index drops, indicates the average stock price experienced a correction or decline in prices. A stock price index is used to see the performance of all stock prices on the Stock Exchange Indonesia (BEI). So that investors can see the development of stock prices at any time as a calculation

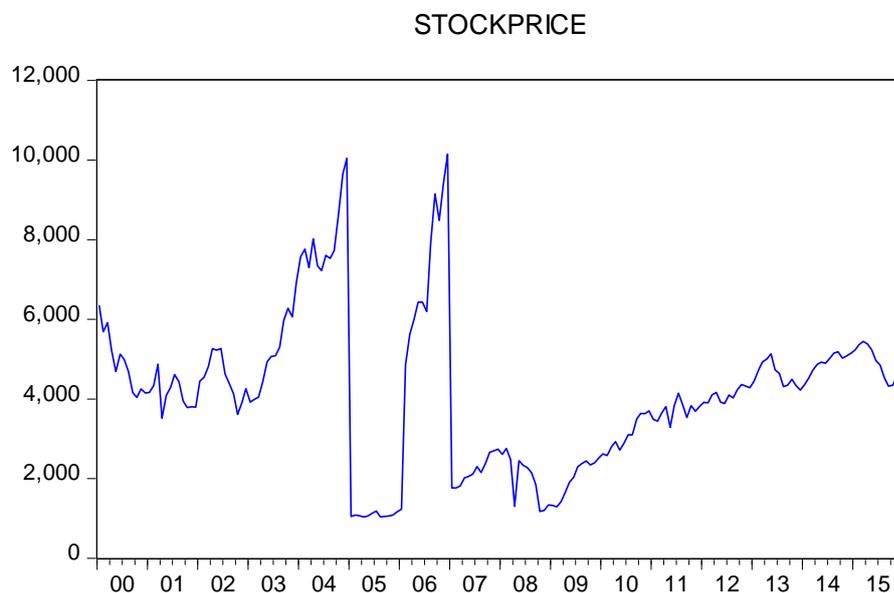


Figure 4.1 Growth of Stock Price in IDX

Source : BI and Investing.com

The development of shares in Indonesia has increased and decreased. From January 2000 to mid-2003 experience decline, if the stock declines then the stock market are in a bad season but at the end of 2004, the stock market experienced a very large shocks shares dropped dramatically due to experience levels considerable losses. Until the end of 2006 stocks increased significantly due to obtaining a large profit rate. Stock price index did not give a positive return in 2013. By the end of 2015 December, the index closed at 4569.4 many things that rocked the stock market, such as the weakening global economy, low prices of oil and other commodities, Fed interest rate hikes, and global factors, which heats up.

4.1.2 The Development of Inflation in Indonesia

The steady improvement in economic growth since 2000 has been accompanied by unstable inflation. Increased economic growth coupled with rising inflation rate can cause the economy to quickly overheat. The higher rate of inflation, the higher level of certainty in the economy. Therefore, the government should be able to suppress inflation rate in order not to disturb economic stability.

The global economic crisis that occurred in 2008 gave a considerable effect, especially on economic growth. Government policies that restrict imports change the pattern of consumption of people who tend to choose a member of goods in the country that are cheaper than the outside goods. This resulted in a high amount of demand which then price increases can't be contained again.

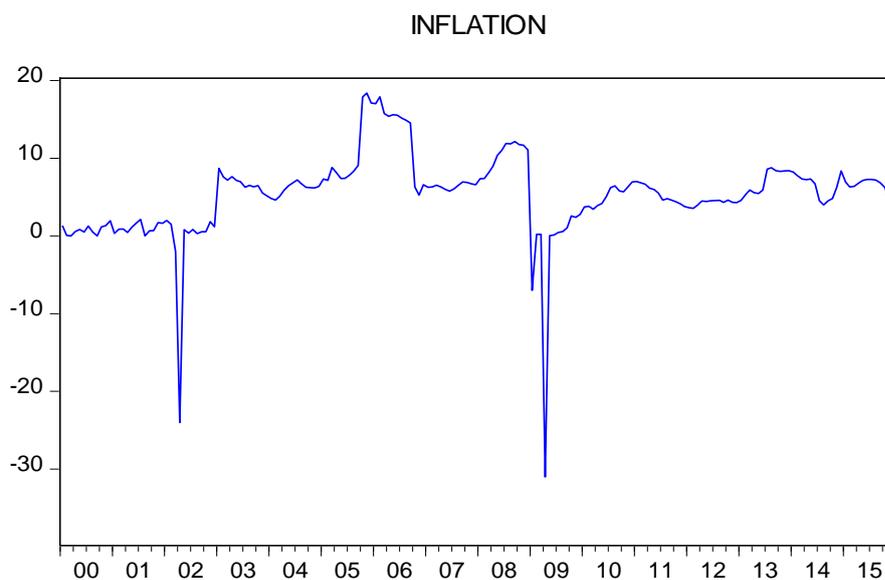


Figure 4.2 Inflation Rate in Indonesia

Source : BPS and BI

From the graph, it can be seen that inflation in several times reached a fairly high point, i.e. in October 2005 -September 2006. There are several things that cause why in those years the inflation is quite high. In the period of July 2009, the value of inflation began to be under control. The decline in inflationary pressures is not free from the positive contribution of monetary and fiscal policy implementation, as well as other policy measures in order to reduce the impact of the global crisis and high government interest. The government tries to balance price increases, improve public income levels, and strengthen coordination between Bank Indonesia and other Governments through the Inflation Control Team (ICT), to harmonize various measures in the effort to control the main sources of inflationary pressure in July 2009 inflation figures show good numbers. The lowest figure since the crisis in 2008. By the end of 2015 inflation begins to steady. This is due to the stable exchange rate development,

the availability of sufficient materials, as well as the increase in the price of goods controlled by the government at a minimum.

4.1.3 The Development of Exchange Rate in Indonesia

A stable exchange rate is one of the goals of Indonesia's monetary authority. From 1970 to 2007, Indonesia has established three fixed exchange rate systems (1970 - 1978). The exchange rate system is under control (1978 - July 1971), and the free-floating exchange system (14 August 1997).

During the period of the fixed exchange rate, Bank Indonesia has actively intervened in the foreign exchange market to maintain the stability of the exchange rate. The overvalued exchange rate prompted the government to devalue the rupiah 2 times (17 April, 23 August 1971 and 15 November 1978). Devaluation aims to maintain the competitiveness of export products in the international market).

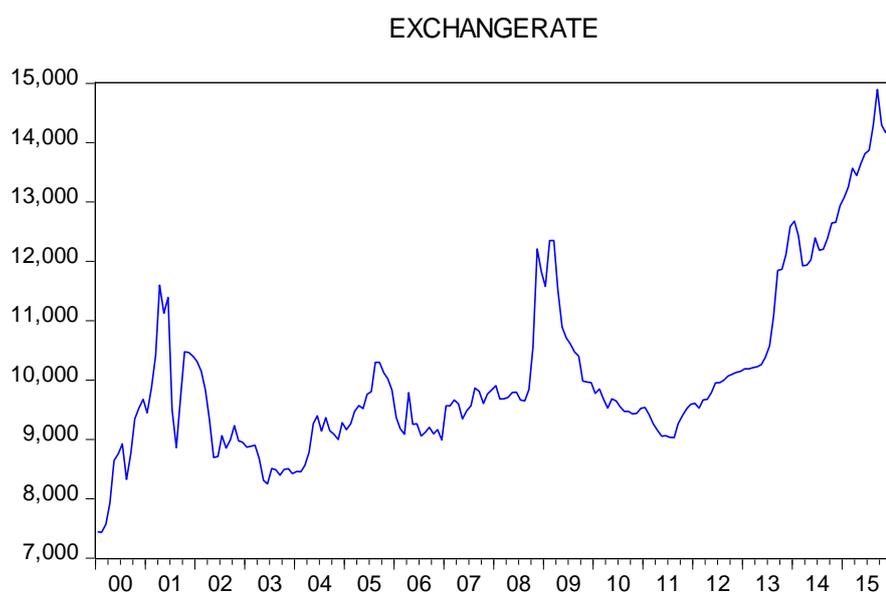


Figure 4.3 Exchange Rate Charts in Indonesia

Source : BI and IMF

In the range of 2000 to 2001, the rate tends to show a significant increase. The economies of European countries have become increasingly influential in domestic exchange rates. The low-interest rate becomes the support for the exchange rate in the range of Rp 9000 - 9500/Dollar. Problems occur in times of crisis. In the middle of 2009, the rupiah weakened, causing the selling price abroad to be expensive. After the crisis stops from 2009 to 2011 continues to appreciate. In general, Indonesia suffered only temporary repercussions from the crisis and to the destruction of the Indonesian economy. While in 2015 the exchange rate weakened against the dollar to the range of 14,000/\$. This increase is the highest increase during 2015.

4.1.4 The Development of Interest Rate in Indonesia

An increase in interest rates can increase the company's expenses. This increase has the potential to encourage investors to transfer funds to the money market so that investment in the stock market down so that it can lead to falling stock prices. Interest rates that exist in banks - banks as a place to save and borrow money will certainly refer to Bank Indonesia. This means that the interest rate becomes a reference down then the existing banks in Indonesia will adjust to remain competitive with other.

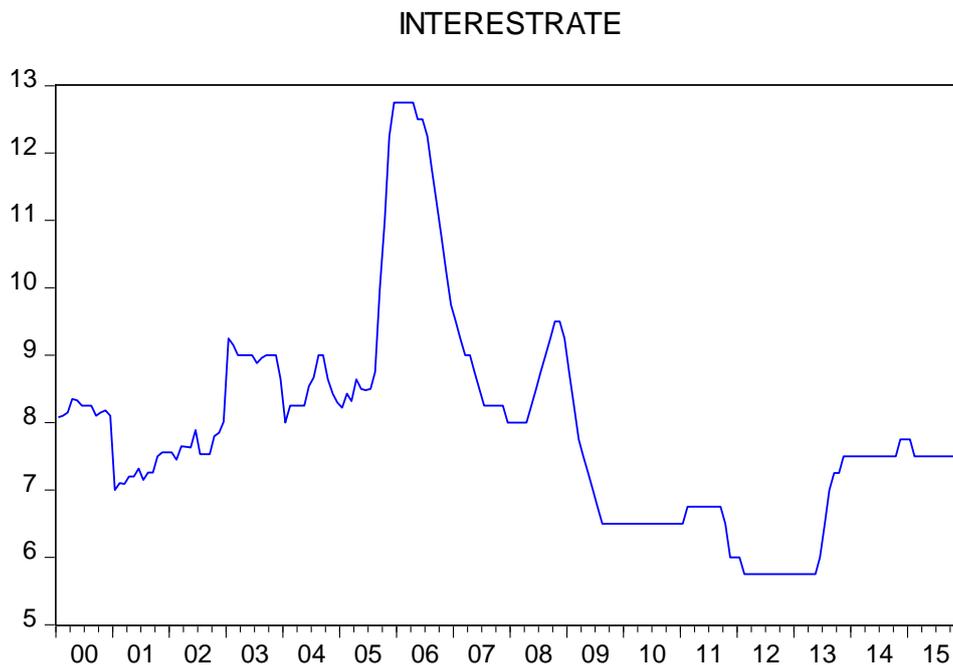


Figure 4.4 Interest Rate in Indonesia

Source : BPS and BI

In November 2005, the BI rate increased to 12.75%. The figure is the highest number of interest rate increases during 2015. If high-interest rates will actually worsen the banking and the economy. Under such crisis conditions, high-interest rates will inconvenience banking activities. In November 2009 interest rates declined to 6.00% that was the smallest figure, thanks to the government's hard work, bringing the interest rate down. Interest rates in Indonesia are still increasing and decreasing by 2015 the interest rate will be around 7.5%.

4.1.5 The Development of Oil Price Indonesia

One of the energy sources people need in various aspects of life is petroleum. Since 2000 it has been seen that oil prices are experiencing upheaval. The next three years prices continue to rise along with declining reserve capacity. The effects of rising oil prices are among others on the

fiscal, monetary, household consumption, and most importantly the industrial sectors. For the industrial sector, rising oil prices will have an impact on prices and output due to increased fuel costs, increased raw materials and transportation and distribution costs. One of the industries hardest hit by the rise in world oil prices is the domestic and large-scale manufacturing industries. In 2007, the manufacturing sector did not increase significantly, this is a turbulent oil impact, and this will still be felt this year because of its high price.

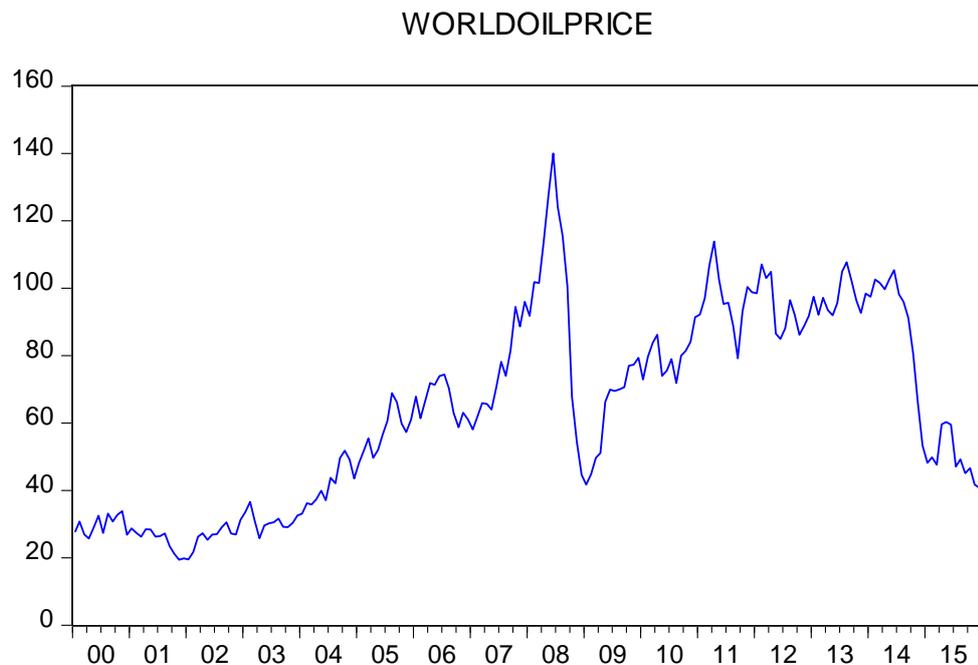


Figure 4.5 World Oil Price

Source : Investing.com

In June 2008 oil price range of 140.00, this price is the highest price from July 2005 until April 2016. The high price of oil makes consumer choose to replace with other fuel like gas, wood etc. However, the longer the price of oil even declines. The decline in oil prices in November 2014 caused the company to cut capital expenditure amid high production costs, thereby

jeopardizing recovery in the oil and gas industry in the long term. The low price of oil causes the company difficulty to raise investment funds. In Indonesia, the oil and gas industry still has high endurance amid the low world oil prices.

4.1.6 The Development of Production Index in Indonesia

The industrial sector is one of the backbones of the Indonesian economy, given the industry's contribution to GDP of 23.61 percent in 2012. Large and Medium Industry (IBS) survey results are used to calculate monthly production indices. Index figures are used to see the growth rate of the industry, especially the manufacturing sector.

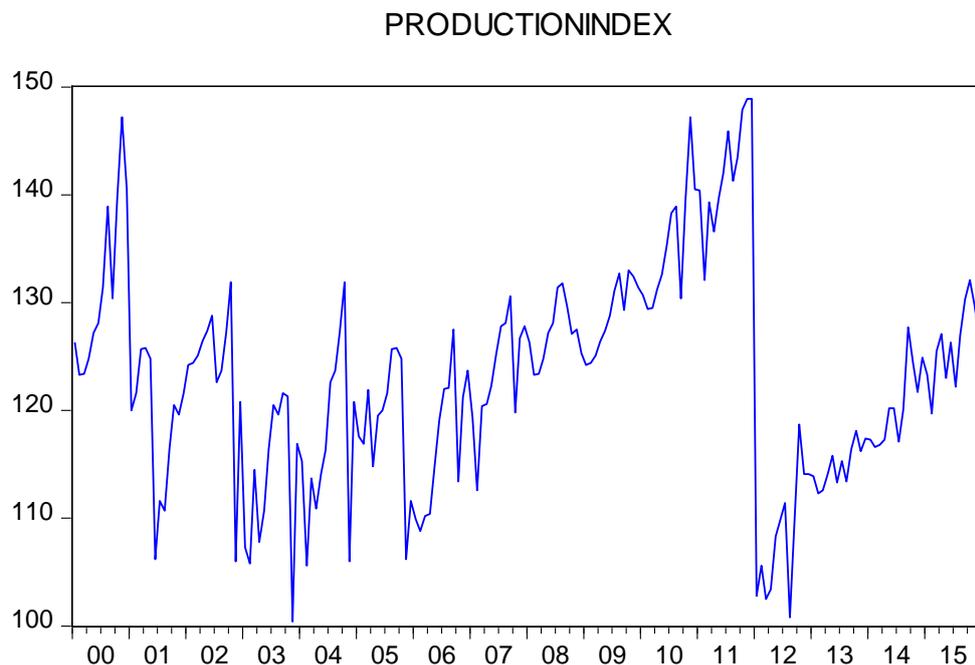


Figure 4.6 Production Index in Indonesia

Source : BPS

Central Bureau of Statistics released a report, the growth of production of large and medium manufacturing industries. The growth of industrial production increases every year. From 2005 to 2011 industrial production

continued to increase. The increase or decrease in high industrial production can be influenced by factors such as climate, if the weather is good production growth will also be good otherwise if climate bad weather or erratic can be the main factor causing decreasing agricultural productivity. Among other things, the drought is rather long and many damaged irrigation and resulted in approximately three million hectares of rice fields are not irrigated properly.

4.1.7 The Development of World Oil Production in Indonesia

World crude oil becomes one of the mining products that become the driving factor in the world economy. Industries around the world still rely on fuel oil, which is a processed product of crude oil as a raw material of production factors. Due to the growing economic growth in developing countries such as the ASEAN region, the demand for crude oil continues to increase. The movement of world crude oil prices will affect the stock price index of the mining sector.

Indonesia is an exporter and importer of crude oil and oil products, including fuel oil. Oil production in Indonesia is currently showing a decrease so that it is necessary to import petroleum to meet domestic demand for oil.

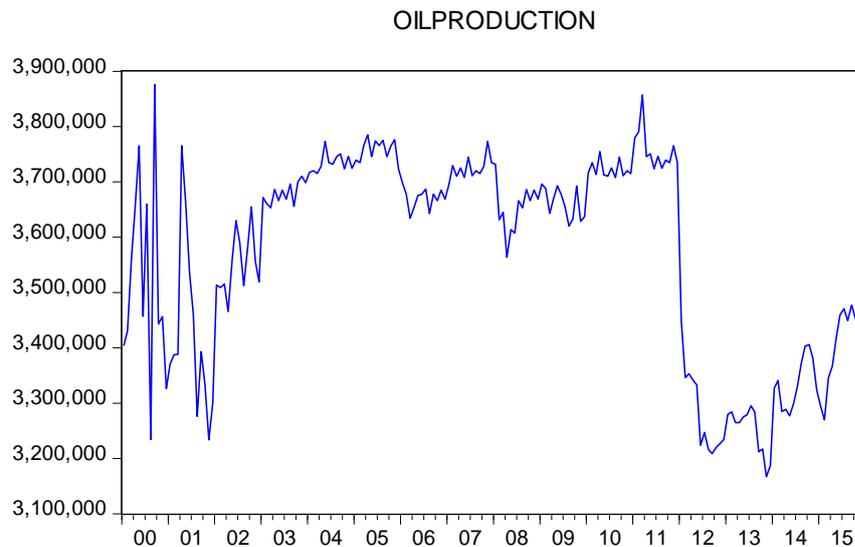


Figure 4.7 World Oil Production

Source: Investing.com and IMF

The ups and downs of oil prices and production at any given time may affect some of the stock prices listed on the Indonesia Stock Exchange. The drastic drop in world oil prices to 36.56 will certainly affect various sectors of oil and gas including mining sector investment sector.

4.2 The Result of Analysis

4.2.1 Stationarity Test

A stationary test is the most important step in analyzing time series data to see whether or not the root unit is contained among variables, so that the relationship between variables in the equation becomes valid. This stationarity test is performed on all-time series data variables that will be used in VAR analysis.

Unit root test in this research model is based on Augmented Dickey-Fuller (ADF) test at the level. To determine that a series has a root unit or not, it is necessary to compare the t-statistic value of the ADF with the ADF table. If the

absolute value of t-statistics in the ADF test is smaller than the critical value of the ADF in the table with a certain significant level, then the time series data is not stationary.

Research using data that is not stationers will produce spurious regression, that is regression that describes relationship between two or more variables that seem statistically significant but in fact not, so it can lead to misleading in research on an economic phenomenon that is happening. Therefore, unit root testing of all variables is continued by unit root test at the first difference level.

Test results at the first difference level can be seen in the Table 4.1 below:

Table 4.1
Stationarity Test in Level

Variabel	ADF Value	Critical Value ($\alpha=5\%$)	Prob	Conclusion
LogStock	-3.375725	-3.433525	0.0577	Not Stationary
INF	-3.242016	-3.433778	0.0795	Not Stationary
LOGExchange	-0.785735	-2.876515	0.8205	Not Stationary
Interestrata	-2.115507	-2.876595	0.2389	Not Stationary
LOGOilPrice	-2.032772	-2.876595	0.2727	Not Stationary
LOGIPI	-0.011006	-1.942508	0.6778	Not Stationary
LOGOilProduction	-2.599333	-3.433651	0.2812	Not Stationary

(Source: Processed by Eviews)

Table 4.2
Stationarity Test in 1st Different

Variabel	ADF Value	Critical Value ($\alpha=5\%$)	Prob	Conclusion
LogStock	-14,14532	-2,876595	0.0000	Stationary
INF	-15,68567	-2,876677	0.0000	Stationary
LOGExchange	-11,67248	-2,876595	0.0000	Stationary
Interestrata	-7,782084	-2,876595	0.0000	Stationary
LOGOilPrice	-10,70263	-2,876595	0.0000	Stationary
LOGIPI	-18,33315	-2,876595	0.0000	Stationary
LOGOilProduction	-22,5853	-2,876595	0.0000	Stationary

(Source: Processed by Eviews)

Unit root testing at the first difference level indicates that all data is stationary. This can be seen from the absolute value of ADF statistic greater than McKinnon Critical Value at a critical value of 1%, 5%, 10%. Thus it can be explained that all variables to be estimated in this research have stationed at the same degree that is a degree of integration one (I).

4.2.2 Optimum Lag Test

Before forming a VAR model it is necessary to determine the optimum lag length, since the exogenous variable used is none other than the endogenous variable's endogenous lag, to determine the optimum lag used by the Schwarz Information Criteria (SC) value criterion. The optimum lag length obtained from Eviews results based on SC criteria is 2, as shown in the following table:

Table 4.3
Optimum Lag Test

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-2171.391	NA	35.10764	23.42356	23.54496	23.47275
1	-926.7581	2382.200	9.17e-05	10.56729	11.53848*	10.96086
2	-845.1628	150.0301	6.47e-05*	10.21680*	12.03779	10.95474*
3	-811.2944	59.72484	7.65e-05	10.37951	13.05029	11.46181
4	-769.2907	70.90942*	8.34e-05	10.45474	13.97531	11.88141
5	-741.3627	45.04526	0.000106	10.68132	15.05169	12.45236
6	-706.2150	54.04428	0.000126	10.83027	16.05043	12.94568

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

(Source: Processed by Eviews)

In determining the optimal lag using these information criteria, we select the criteria that have the final prediction error correction (FPE) or the number of AIC, SIC, the smallest HQ among the various lags submitted. From the results of data processing in Table 4.3, it can be seen that in the length lag test there are the most star signs are on lag 2 and SC on lag 1. This election is based on Reimers (1992) in the study team on co-integration and causality relationship analysis and dynamic relationship between Foreign capital flows, Exchange rate changes and JCI movement in Indonesia capital market, finds that SC runs well in optimal lag on the optimal lag determination of Granger causality test. So the optimal lag recommended in the Granger causality test is lag 2.

4.2.3 Granger Causality Test

Testing with Granger's Causality is intended only to test the relationship between variables and not to estimate the model. In this research, Granger causality test is used to see the direction of the relationship among Stock Price, Inflation, World Oil Production, Interest Rate, Exchange Rate, Production Index, World Oil Price variables in lag 2.

In the Granger causality test shows the probability value $F\text{-statistic} < \alpha = 10\%, 5\%, 1\%$ then there is influence relationship. If the reverse probability $F\text{-statistic} > \alpha = 10\%, 5\%, 1\%$ then there is no influence relationship.

Table 4.4
Granger Causality Test

Pairwise Granger Causality Tests

Date: 12/23/17 Time: 15:54

Sample: 2000M01 2015M12

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
LOG_PRODUCTIONINDEX does not Granger Cause LOG_STOCKPRICE	191	2.17147	0.1423
LOG_STOCKPRICE does not Granger Cause LOG_PRODUCTIONINDEX		0.26448	0.6077
LOG_OILPRODUCT does not Granger Cause LOG_STOCKPRICE	191	1.30088	0.2555
LOG_STOCKPRICE does not Granger Cause LOG_OILPRODUCT		0.31957	0.5725
LOG_OILPRICE does not Granger Cause LOG_STOCKPRICE	191	0.20724	0.6495
LOG_STOCKPRICE does not Granger Cause LOG_OILPRICE		0.67787	0.4114
LOG_EXCHANGE does not Granger Cause LOG_STOCKPRICE	191	0.11731	0.7324
LOG_STOCKPRICE does not Granger Cause LOG_EXCHANGE		0.42735	0.5141
INTERESTRATE does not Granger Cause LOG_STOCKPRICE	191	0.71840	0.3977
LOG_STOCKPRICE does not Granger Cause INTERESTRATE		8.38899	0.0042
INFLATION does not Granger Cause LOG_STOCKPRICE	191	0.15931	0.6902
LOG_STOCKPRICE does not Granger Cause INFLATION		0.50708	0.4773
LOG_OILPRODUCT does not Granger Cause LOG_PRODUCTIONINDEX	191	1.66979	0.1979
LOG_PRODUCTIONINDEX does not Granger Cause LOG_OILPRODUCT		2.32817	0.1287
LOG_OILPRICE does not Granger Cause LOG_PRODUCTIONINDEX	191	0.36604	0.5459
LOG_PRODUCTIONINDEX does not Granger Cause LOG_OILPRICE		0.28448	0.5944
LOG_EXCHANGE does not Granger Cause LOG_PRODUCTIONINDEX	191	0.00610	0.9378
LOG_PRODUCTIONINDEX does not Granger Cause LOG_EXCHANGE		0.11455	0.7354
INTERESTRATE does not Granger Cause LOG_PRODUCTIONINDEX	191	0.39077	0.5327
LOG_PRODUCTIONINDEX does not Granger Cause INTERESTRATE		0.89701	0.3448
INFLATION does not Granger Cause LOG_PRODUCTIONINDEX	191	1.24914	0.2651
LOG_PRODUCTIONINDEX does not Granger Cause INFLATION		1.07424	0.3013

LOG_OILPRICE does not Granger Cause LOG_OILPRODUCT	191	0.82912	0.3637
LOG_OILPRODUCT does not Granger Cause LOG_OILPRICE		3.69455	0.0561
LOG_EXCHANGE does not Granger Cause LOG_OILPRODUCT	191	4.80869	0.0295
LOG_OILPRODUCT does not Granger Cause LOG_EXCHANGE		7.20890	0.0079
INTERESTRATE does not Granger Cause LOG_OILPRODUCT	191	3.21168	0.0747
LOG_OILPRODUCT does not Granger Cause INTERESTRATE		0.03569	0.8504
INFLATION does not Granger Cause LOG_OILPRODUCT	191	0.04528	0.8317
LOG_OILPRODUCT does not Granger Cause INFLATION		0.73147	0.3935
LOG_EXCHANGE does not Granger Cause LOG_OILPRICE	191	1.65079	0.2004
LOG_OILPRICE does not Granger Cause LOG_EXCHANGE		0.58793	0.4442
INTERESTRATE does not Granger Cause LOG_OILPRICE	191	0.62701	0.4295
LOG_OILPRICE does not Granger Cause INTERESTRATE		0.39229	0.5319
INFLATION does not Granger Cause LOG_OILPRICE	191	3.15827	0.0772
LOG_OILPRICE does not Granger Cause INFLATION		8.38210	0.0042
INTERESTRATE does not Granger Cause LOG_EXCHANGE	191	0.50638	0.4776
LOG_EXCHANGE does not Granger Cause INTERESTRATE		0.02233	0.8814
INFLATION does not Granger Cause LOG_EXCHANGE	191	1.78501	0.1832
LOG_EXCHANGE does not Granger Cause INFLATION		0.39037	0.5329
INFLATION does not Granger Cause INTERESTRATE	191	7.89555	0.0055
INTERESTRATE does not Granger Cause INFLATION		7.79480	0.0058

(Processed by Eviews)

From the results of data processing in Table 4.4 it can be seen that in the Granger Causality test that has a causality relationship is that has a probability value smaller than the alpha 0.05 , therefore H_0 will be rejected which means a variable will affect other variables.

Based on Table 4.4 there are variables that affect other variables. World Oil Production has a probability of 0.0079 smaller than alpha 0.05, thus rejecting

Ho which means World Oil Production affect the exchange rate. The Exchange Rate has a probability of 0.0295 less than alpha 0.05, thus rejecting Ho, which means Exchange Rate affects oil production. Stock Price has a probability of 0.0042 smaller than alpha 0.05, thus rejecting Ho, which means Stock Price affects the Interest Rate. World Oil Price has a probability of 0.0042 smaller than alpha 0.05, thus rejecting Ho, which means World Oil Price affects inflation. Inflation has a probability of 0.0055 smaller than alpha 0.05, thus rejecting Ho, which means Inflation affects the interest rate. Interest Rate has a probability of 0.0058 is smaller than alpha 0.05, thus rejecting Ho which means the Interest Rate affects inflation.

4.2.4 Cointegration Test

All variables used in this study stationer on the same degree of first difference. Therefore, the co-integration test can be performed through the Johansen co-integration test using the optimum lag 1. Table 4.5 shows the results of the test Johansson co-integration used to determine the number of co-integration equations contained in the system. If the trace statistic value is greater than the critical value, then the equation is co-integrated. Thus Ho is not co-integrated with H1 is co-integrated. If the trace statistic value is greater than the critical value, then reject H_0 or accept H_1 , which means co-integration, occurs. The results of co-integration test data analysis are shown in the following table.

Table 4.5
Cointegration Test

Unrestricted Cointegration Rank Test (Trace)

Hypothesized	Trace	0.05
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No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.337445	161.5954	125.6154	0.0001
At most 1	0.157109	83.38151	95.75366	0.2607
At most 2	0.099252	50.90719	69.81889	0.5979
At most 3	0.066501	31.04660	47.85613	0.6640
At most 4	0.050786	17.97162	29.79707	0.5682
At most 5	0.026989	8.068561	15.49471	0.4581
At most 6	0.014993	2.870194	3.841466	0.0902

Trace test indicates 1 cointegratingeqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.337445	78.21387	46.23142	0.0000
At most 1	0.157109	32.47432	40.07757	0.2777
At most 2	0.099252	19.86058	33.87687	0.7662
At most 3	0.066501	13.07498	27.58434	0.8808
At most 4	0.050786	9.903055	21.13162	0.7537
At most 5	0.026989	5.198367	14.26460	0.7166
At most 6	0.014993	2.870194	3.841466	0.0902

Max-eigenvalue test indicates 1 cointegratingeqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

(Processed by Eviews)

From Johansenn, Co-integration test result shows there is 1 co-integration

equation ($r = 1$) that is when Trace statistic value is bigger than its critical value.

Thus the model used in this research is Vector Error Correction Model (VECM).

4.2.5 VECM test

Vector Error Correction Model is an econometric analysis that can be used to determine a short-term behavior of a variable over the long term, due to the permanent shock (Kostov and Lingard, 2000). In the VECM method to see whether there is a long-term or short-term relationship by looking at the comparative t-statistical value of the estimate to the t-table value. If the t-statistic is greater than the t-table value, then it can be said that there is a long or short-

term relationship. The existence of long-term or short-term relationship shows that the independent variables affect the dependent (Santosa, 2013).

4.2.5.1 Long-term Analysis

Table 4.6
Long-term result

CointegratingEq:	CointEq1
LOG_STOCKPRICE(-1)	1.000000
LOG_PRODUCTIONINDEX(-1)	-3.207704 (1.42941) [-2.24407]
LOG_OILPRODUCT(-1)	9.959964 (2.50653) [3.97361]
LOG_OILPRICE(-1)	1.457447 (0.24208) [6.02053]
LOG_EXCHANGE(-1)	1.148479 (0.78876) [1.45605]
INTERESTRATE(-1)	0.330497 (0.09229) [3.58093]
INFLATION(-1)	-0.238515 (0.03265) [-7.30552]
C	-160.8517

(Source : Processed by Eviews)

Based on the Table 4.6 above, can take a equation as :

$$\begin{aligned} \text{LOG_STOCKPRICE} = & +160.8517 + 3.207704 \text{LOG_PRODUCTIONINDEX} \\ & (-2.24407) \\ & -9.959964 \text{LOG_OILPRODUCT} - 1.457447 \text{LOG_OILPRICE} \\ & (3.97361) \quad (6.02053) \\ & -1.148479 \text{LOG_EXCHANGE} - 0.330497 \text{INTERESTRATE} \\ & (1.45605) \quad (3.58093) \\ & +0.238515 \text{INFLATION} \\ & (-7.30552) \end{aligned}$$

1. World Oil Price

Variable World Oil Price have positive and significant influence in long-term because of t-statistic value equal to $6.02053 > T$ table equal to 1.65371 ($\alpha = 5\%$) hence world oil production variable accept H_0 and reject H_1 , meaning world oil production variable has the positive effect to the stock price.

2. Production Index

Variable Production index has positive and insignificant effect in long-term because t-statistic value equal to $-2.24407 > T$ table equal to 1.65371 ($\alpha = 5\%$) hence variable production index accept H_0 and Resist H_1 , meaning world oil production variable have a positive effect to Stock Price.

3. Oil Production

Variable Oil Production has positive and significant influence in long-term because a t-statistic value is $3.97361 > T$ table equal to 1.65371 ($\alpha = 5\%$) hence oil production variable accept H_0 and reject H_1 , it means that world oil production variable has a positive effect on Stock Price.

4. Interest Rate

Interest rate variable has positive and significant influence in long-term because of t-statistic value equal to $3.58093 > T$ table equal to 1.65371 ($\alpha = 5\%$) hence interest rate variable accepts H_0 and Resist H_1 , meaning interest rate variable have a positive effect to Stock Price.

5. Inflation

Inflation variable has positive and significant influence in long-term because t-statistic value equal to $-7.30552 > T$ table equal to 1.65371 ($\alpha = 5\%$) then interest rate variable accept H_0 and reject H_1 , it means inflation variable has a positive effect to Stock Price.

6. Exchange Rate

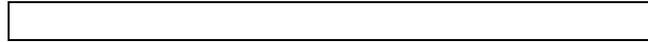
The exchange rate variable has negative impact in the long term since the t-statistic value is $1.45605 < T$ table of 1.65371 ($\alpha = 5\%$), the exchange rate variable receives H_1 and rejects H_0 , meaning that the exchange rate variable does not effect on Stock Price.

4.2.5.2 Short-term Analysis

Table 4.7
Short-term result

Error Correction:	D(LOG_STOCKPRICE)
CointEq1	-0.079889 (0.02843) [-2.80955]
D(LOG_STOCKPRICE(-1))	0.007521 (0.07456) [0.10087]
D(LOG_STOCKPRICE(-2))	-0.010623 (0.07393) [-0.14369]
D(LOG_PRODUCTIONINDEX(-1))	-0.669400 (0.34314) [-1.95082]
D(LOG_PRODUCTIONINDEX(-2))	0.541268 (0.34727) [1.55862]

D(LOG_OILPRODUCT(-1))	0.565036 (0.85348) [0.66204]
D(LOG_OILPRODUCT(-2))	0.164666 (0.82445) [0.19973]
D(LOG_OILPRICE(-1))	0.514016 (0.20532) [2.50349]
D(LOG_OILPRICE(-2))	0.233471 (0.21764) [1.07273]
D(LOG_EXCHANGE(-1))	-0.423226 (0.60899) [-0.69496]
D(LOG_EXCHANGE(-2))	-0.157416 (0.60157) [-0.26168]
D(INTERESTRATE(-1))	-0.062309 (0.08337) [-0.74741]
D(INTERESTRATE(-2))	0.105502 (0.08441) [1.24985]
D(INFLATION(-1))	-0.015743 (0.00617) [-2.55123]
D(INFLATION(-2))	-0.008970 (0.00505) [-1.77685]
C	-8.91E-05 (0.01820) [-0.00490]
<hr/>	
R-squared	0.125144
Adj. R-squared	0.049289
Sum sq. resids	10.54838
S.E. equation	0.246928
F-statistic	1.649786
Log likelihood	4.526297
Akaike AIC	0.121415
Schwarz SC	0.395848
Mean dependent	-0.001367
S.D. dependent	0.253248
<hr/>	



From the result of estimation of VECM test in Table 4.7 it can be seen that the relationship between Stock Price, Inflation, Exchange rate, Oil Price, Oil production, Production Index, it can be concluded that by observing t-statistic of each coefficient, Stock Price, Inflation, Exchange rate, Oil Price, Oil production, Production Index can be seen below:

1. STOCK PRICE in first lag have positive and not significant effect on short-term because T-statistic 0.10087.
2. WORLD OIL PRICE in the first lag has a positive and significant effect in the short term because T-statistics 2.50349.
3. PRODUCTION INDEX in the first lag has a negative and not significant effect in the short term because T-statistics -1.95082.
4. OIL PRODUCTION in the first lag has positive and not significant effect in the short term because T-statistic 0.66204.
5. INTEREST RATE in the first lag has a negative effect in the short term because T-statistics -0.74741.
6. INFLATION in the first lag have negative effect and significant in the short term because T-statistic -2.55123.
7. EXCHANGE RATE in the first lag has negative effect in the short term because of T-statistics -0.69496.

4.2.5.3 Economy Analysis Interpretation

Inflation (INF) in the long run has a positive influence on the stock price index. As an increase in inflation (INF) will cause an increase in the stock price index. Inflation rate (INF) in the long run has a positive and significant influence when inflation (INF) is high will result in rising prices of goods will usually encourage BI (Bank Indonesia) to raise the interest rate. If the inflation rate (INF) has increased significantly, then the Indonesian bank must control by raising interest rates. High inflation (INF) and bank interest rates will cause the company's operating expenses to become heavier and will affect financial performance. The inflation (INF) value of rupiah currency has decreased from year to year. With the increase in inflation (INF) resulted in the price index will increase as well. The exchange rate of U \$ D (KURS) in the long run negatively affects the stock price index. This informs that the strengthening of dollar exchange rate against rupiah will impact on a strengthening of the composite stock price index (JCI), and also vice versa. This fact is in accordance with the concept that if the dollar strengthens against the rupiah then it is likely that investors will tend to shift their investments in the form of US dollar currency compared to investing in stocks, and vice versa.

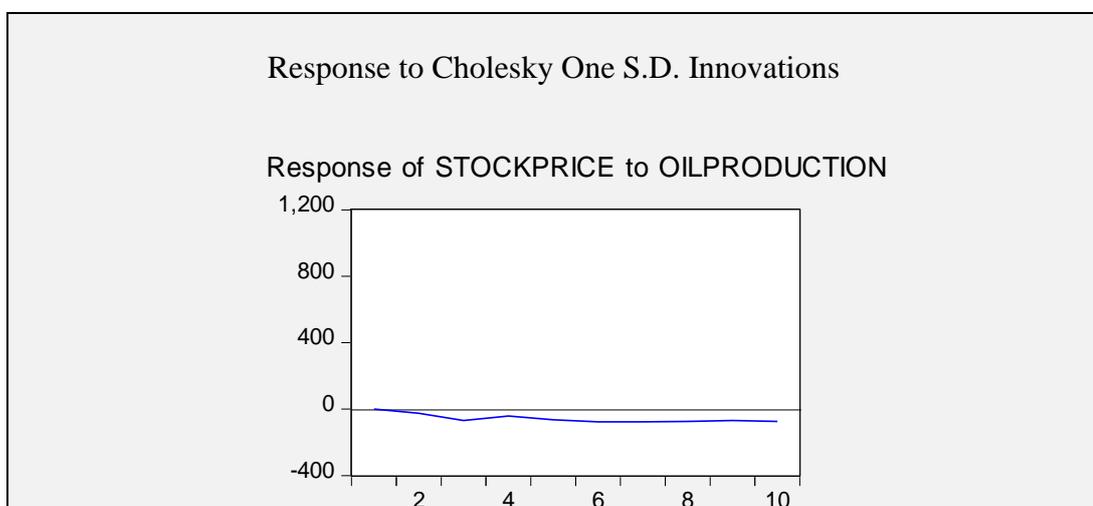
The strengthening of the dollar against the rupiah also affects the issuer companies in general. Companies that have debt in the form of dollars, will experience an increase in expenses as well as foreign exchange losses. This, in turn, has an impact on the decline in corporate profits, so investors become more hesitant to invest in shares of companies that are negatively affected and prefer to invest in dollars or other.

Interest rates in the long term have a positive effect. This is contrary to the majority of theories. Many theories that interest rates have a negative effect on the JCI. Tandelilin (2010: 48) stating that changes in interest rates will affect the stock price upside down, *ceteris paribus*. That means if interest rates increase, then the stock price will go down, and vice versa. In 2008, there was no *ceteris paribus* condition that there was a significant financial crisis in the United States affecting the capital market activity in the country (NYSE, covering DJIA index, NASDAQ, and S & P). Indonesia embraces the global economy and also cooperates with import-export with the US. Many American companies operate in Indonesia, as well as domestic investors. Because of the un-*ceteris paribus* condition, may have caused an investment behavior that is inconsistent with the existing theory. The phenomenon of this deviation is also in line with Dewi (2011) stating that the real interest rate has a significant positive effect on the movement of J (Dewi, 2011)CI. There are various assumptions on these irregularities, perhaps because investors remain skeptical of stock investments as the impact of the financial crisis in the US and Europe, even though deposit rates have fallen. In addition, investors may have

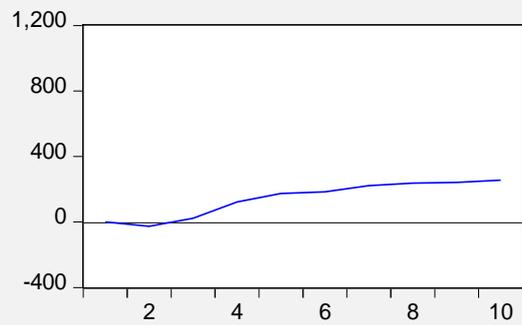
other strong reasons (outside the interest rate factor) when they are not interested in investing in domestic stocks despite the fact that the SBI rate is declining. The investment decision involves the technical and psychological factors of the investor itself, not always the theory is always proven. Then, another reason is that in this period of research, there has never been a *ceteris paribus* situation, allowing for a mismatch of reality with the existing theory. Oil prices, in the long run, have a positive effect because if the world oil price rises, the stock price index also increases. The results of this study explain that oil prices have a positive effect.

Industrial Production Index (IPI) in the long run has a positive and significant effect because if the industry in Indonesia is experiencing a period of growth in a long time it will affect both the stock. As the coal industry rises, coal stocks also rise. Because investors know that coal has a great advantage if it is then the stock of coal also increased.

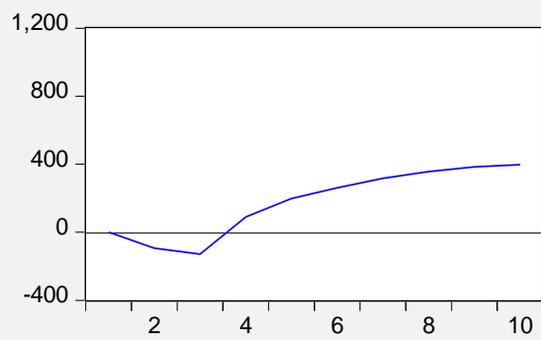
4.2.6 Analysis Impulse – Response



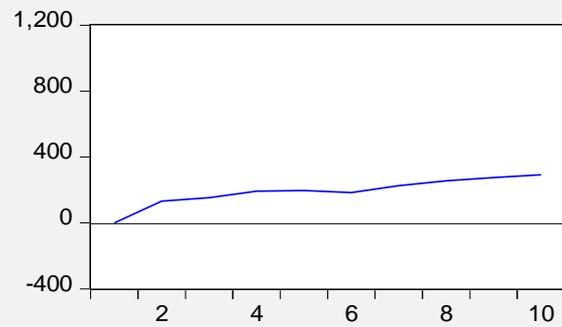
Response of STOCKPRICE to INFLATION



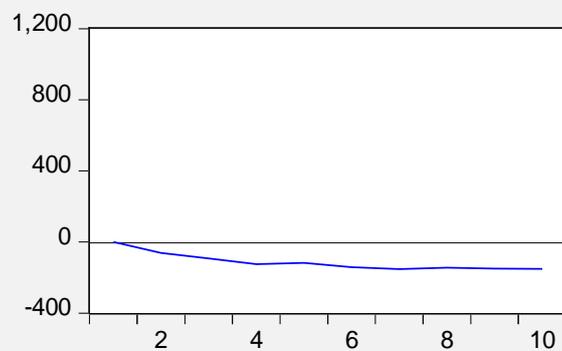
Response of STOCKPRICE to INTERESTRATE



Response of STOCKPRICE to WORLDOILPRICE



Response of STOCKPRICE to EXCHANGERATE



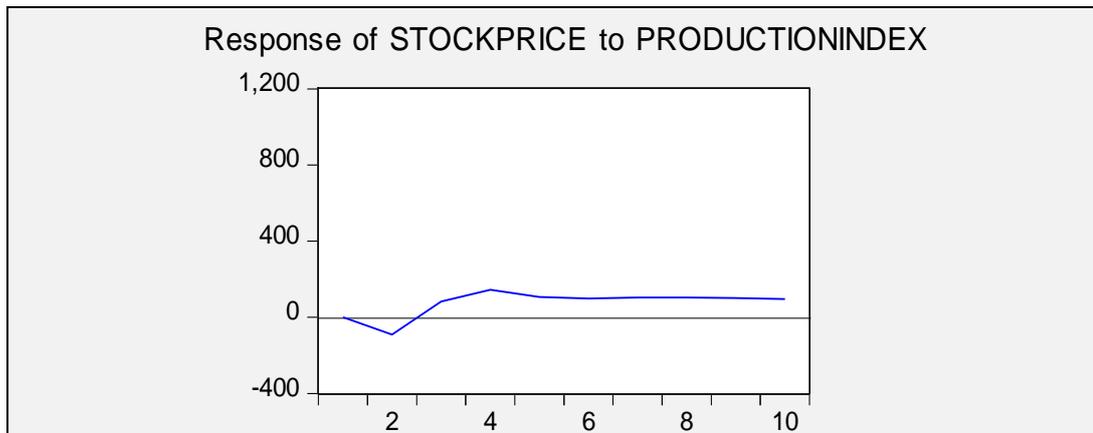


Figure 4.8 Analysis Result Impulse – Response

Source: processed result by Eviews

Impulse-response analysis can use impulse-response (IRF) function. Results plot of IRF can be seen in the picture above. It can be seen that there are 6 IRF plots for the next 10 months, which describes visually the response of a variable arising from the shock/impulse of 1 standard deviation either himself or another variable.

1. Inflation

Stock Price Index has a negative effect from inflation. This means that if there is a negative shock of 1 standard deviation from inflation, Stock Price Index will react negatively. From the analysis using Impulse response it can be seen that inflation gives negative effect to the stock price index only in the initial period until the third period. Furthermore, inflation gives a positive effect.

2. Exchange rate

Stock Price Index has a negative effect from the exchange rate. This means that if there is a negative shock of 1 standard deviation from the exchange rate, Stock Price Index will react negatively. If exchange rate decrease, Stock Price Index will be decreased. From the analysis using Impulse response it can be seen that exchange rate gives negative effect to the stock price index in all period, from the beginning to the end period.

3. Interest rate

Stock Price has a negative effect on interest rate in first until the third period, but in the fourth to the tenth period, the interest rate has a positive effect on the stock price index. This means that if there is a positive shock of 1 standard deviation from the interest rate, Stock Price Index will react positively.

4. Oil prices

Stock Price Index has a positive effect from oil prices. This means that if there is a positive shock of 1 standard deviation of oil prices, Stock Price Index will react positively. From the analysis result using Impulse response can be seen that world oil price give positive effect to stock price index from beginning of period until the end of a period.

5. Oil production

Stock Price Index has a negative effect on Oil production. This means that if there is a negative shock of 1 standard deviation from oil production, Stock Price Index will react negatively. From the analysis result using

Impulse response can be seen that world oil production give negative effect to the stock price index from the beginning of period until the end of a period.

6. Production index

Stock Price Index from the first until the third period has a negative from Production Index, but in the fourth to ten periods has a positive effect on the stock price index. This means that if there is a positive shock of 1 standard deviation from the production index, Stock Price Index will react positively.

4.2.7 Analysis Variance Decomposition

Table 4.8
Result of Variance Decomposition

Period	Variance Decomposition of LOG_STOCK: Perio							
	S.E.	LOG_STO CK	LOG_OILP RODUCT	LOG_IPI	LOG_OILP RICE	LOG_EXC HANGE	INTEREST	INF
1	0.246928	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.345490	97.32158	0.167405	0.432882	1.527249	0.208275	0.244453	0.098153
3	0.415165	95.39304	0.247042	0.508256	2.663187	0.441850	0.181790	0.564840
4	0.470735	93.45817	0.295038	0.448680	3.183892	0.446093	0.272371	1.895759
5	0.516457	91.77274	0.452290	0.421739	3.294751	0.466464	0.580720	3.011298
6	0.557611	89.95814	0.603100	0.422563	3.236931	0.503701	1.117965	4.157602
7	0.596284	88.12449	0.773160	0.413638	3.160514	0.498736	1.814924	5.214539
8	0.632521	86.40733	0.923624	0.404115	3.094627	0.486479	2.609258	6.074568
9	0.667187	84.76724	1.056445	0.396309	3.050783	0.473935	3.423324	6.831964
10	0.700447	83.26501	1.170583	0.388204	3.021193	0.459485	4.204657	7.490867

Source: processed result by Eviews

Based on the results of the above regression, the analysis of Variance Decomposition describes the relative importance of each variable in the VAR due

to Shock. Variance Decomposition is useful for predicting the percentage contribution of variations of each variable due to changes in a particular variable within the VAR system. Of the STOCK PRICE, INF, EXCHANGE RATE, OIL PRODUCTION, OILPRICE, PRODUCTION INDEX, and INTEREST RATE variables most are STOCK PRICE. Therefore, the STOCK PRICE variable explained by itself is above 90%. The other variables are only about 10

CHAPTER V

CONCLUSION

5.1 Conclusion

Based on the results of data analysis on variables Inflation, Exchange rate (USD), Interest rate, World Oil Price, Production Index, Oil Production on Stock Price Index, the following conclusions can be drawn

- 1 The inflation rate has positive and significant effect in the long run, but a negative, no significant effect on first lag in short run.
- 2 The exchange rate has negative and no significant effect in the long run, and negative significant effect on first lag in short run.
- 3 The interest rate has positive and significant effect in the long run, but a negative no significant effect on first lag in short run.
- 4 The world oil price has positive and significant effect in the long run, and positive no significant effect on first lag in short run.
- 5 The industry Production Index has positive and significant effect in the long run, but negative no significant effect on first lag in short run.
6. The world Oil Production has positive and significant effect in the long run, and positive significant effect on first lag in short run.

5.2 Implication

1. Based on the results of research for the investor should pay attention to information about Inflation Variables, Interest rate, World Oil Price, Production Index, Oil Production before starting to invest. Taking into account these variables are expected to help reduce the risks that are not faced.
2. For investors who will invest their investment in the company should be really careful in research to analyze stocks get the benefits as expected. This can be done by using some analytical tools can be used as macroeconomic factors that are proven to affect the stock price index significantly in this study that is Variable Inflation, Oil Price, Oil Production, Interest rate, Production Index.
3. The government should be wise in controlling macroeconomic conditions (including inflation rate and SBI rate) in order for the economy to remain stable and healthy, thereby increasing domestic investment passion.

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