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

A RESEARCH JOURNAL

Presented as Partial Fulfillment of the Requirements to Obtain the Bachelor Degree in Economics Department

By:

ArthaWidyatama Rama Davis

Student Number: 14313363

DEPARTMENT OF ECONOMICS

INTERNATIONAL PROGRAM

FACULTY OF ECONOMICS

UNIVERSITAS ISLAM INDONESIA

2018

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

Artha Widyatama Rama Davis
Faculty of Economics of Universitas Islam Indonesia
Arthawidyatama27@gmail.com

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

Analisis Ketidakpastian Harga Minyak dan Turun Naiknya Harga Saham di Pasar Berkembang: Bukti dari Indonesia

Artha Widyatama Rama Davis
Faculty of Economics of Universitas Islam Indonesia
Arthawidyatama27@gmail.com

ABSTRAK

Penelitian ini bertujuan untuk menguji pengaruh harga minyak, inflasi, nilai tukar, suku bunga, indeks produksi, produksi minyak pada indeks harga saham di Indonesia pada periode 2000 - 2015. Analisis empiris dimulai dengan menganalisis properti time series data . Teknik ko-integrasi berbasis VAN Johansen diterapkan untuk menguji hubungan jangka panjang antara harga minyak, inflasi, nilai tukar, suku bunga, indeks produksi, produksi minyak dan indeks harga saham dan menemukan hubungan jangka panjang ada. Model koreksi kesalahan vektor dilakukan untuk memeriksa dinamika jangka pendek dan menemukan bahwa dinamika jangka pendek dipengaruhi oleh perkiraan ekuilibrium jangka panjang. Kausalitas Granger dilakukan dan menemukan bahwa harga minyak mempengaruhi indeks harga saham.

Penelitian ini menggunakan data sekunder dari BPS, Investing.com. Sampel Data yang digunakan adalah data bulanan dari Januari 2000 hingga Desember 2015. Hasil penelitian menunjukkan bahwa Inflasi, Suku Bunga, Harga Minyak Dunia, Indeks Produksi dan Produksi Minyak memberikan dampak positif dan signifikan dalam jangka panjang dan nilai tukar menunjukkan dampak Negatif. . Sedangkan dalam variabel jangka pendek Saham, Inflasi, Kurs, Suku Bunga, Harga Minyak Dunia, Indeks Produksi, dan Produksi Minyak menunjukkan efek Positif pada lag pertama.

Kata Kunci: Saham, Nilai Tukar, Inflasi, Suku Bunga, Produksi Minyak, Harga Minyak Dunia, Indeks Produksi

INTRODUCTION

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.

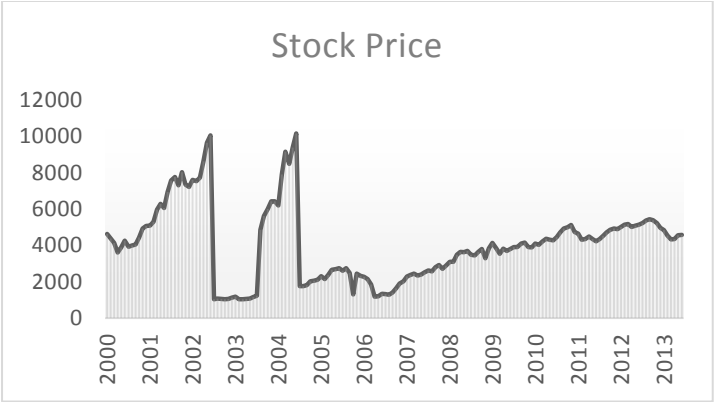


Figure 1.1Stock Prices 2000-2013

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.

THEORETICAL FRAMEWORK

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.

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.

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 IHSG. 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).

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.

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).

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.

LITERATUR 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 the very intolerant to change in oil prices and volatility of Greece. The economy of Greece heavily depended on oil and if 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.

RESEARCH METHODOLOGY

Type of Research

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 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.

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.

DATA ANALYSIS DISCUSSIONS

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

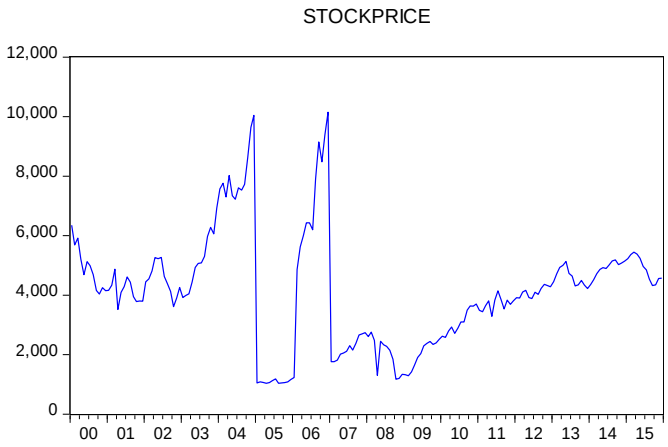


Figure 2 Growth of Stock Price in IDX

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.

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.

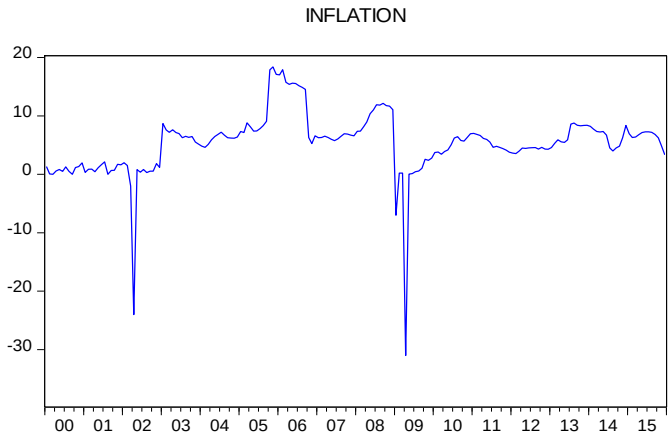


Figure 3 Inflation Rate in Indonesia
Source : BPS and BI

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.

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 (1070 - 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).

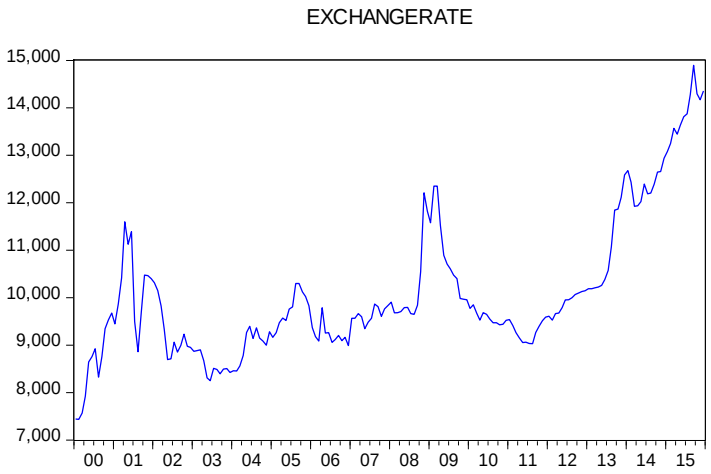


Figure 4 Exchange Rate Charts in Indonesia
Source : BI and IMF

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.

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.

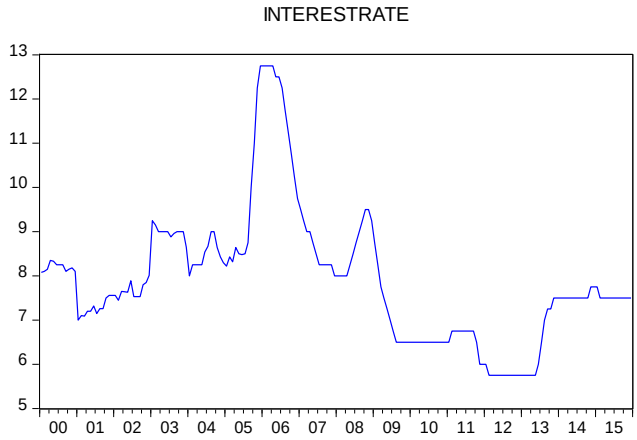


Figure 5 Interest Rate in Indonesia
Source : BPS and BI

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%.

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.

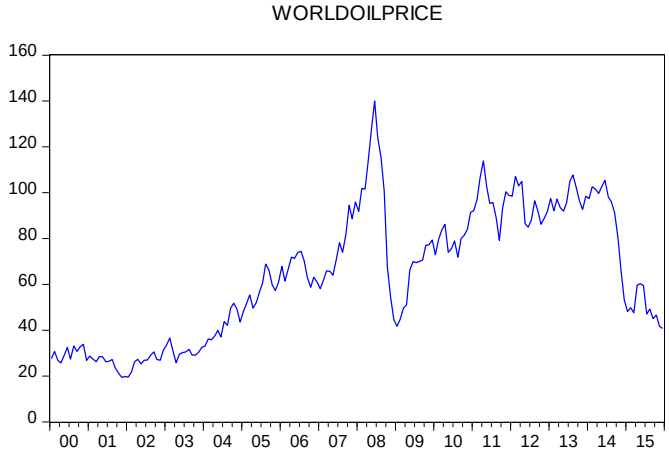


Figure 6 World Oil Price

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.

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.

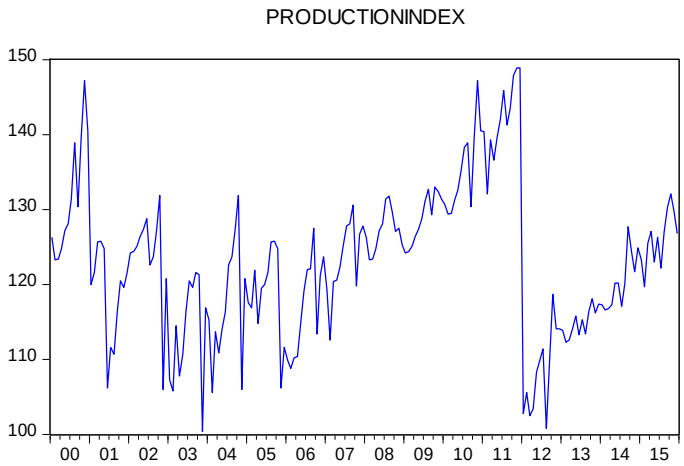


Figure 7 Production Index in Indonesia
Source : BPS

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.

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.

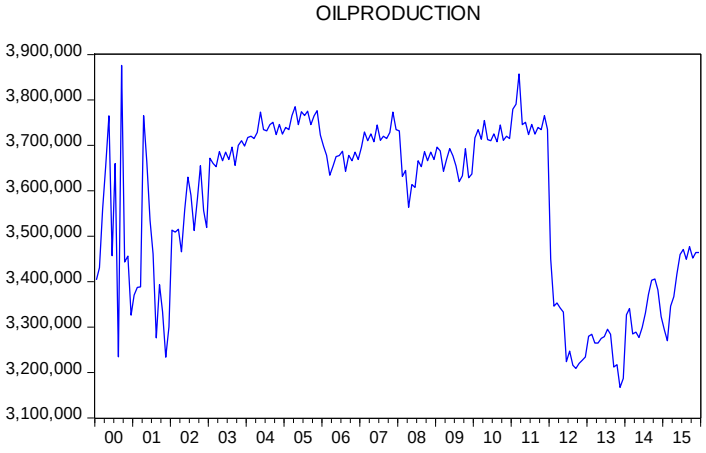


Figure 8 World Oil Production
Source: Investing.com and IMF

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.

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 1 below:

Table 4.1
Stationarity Test in Level

Variabel	ADF Value	Critical Value (α=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
Interestrate	-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 2
Stationarity Test in 1st Different

Variabel	ADF Value	Critical Value (α=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
Interestrate	-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 McKinon 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).

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).

Long-term Analysis

Table 3
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**)**

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 (α = 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 (α = 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 (α = 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 (α = 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 (α = 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 (α = 5%), the exchange rate variable receives H_1 and rejects H_0, meaning that the exchange rate variable does not effect on Stock Price.

Short-term Analysis

Table 4
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]
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

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.

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, buta 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.
1. The world Oil Production has positive and significant effect in the long run, and positive significant effect on first lag in short run.

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.

REFRENCES

Al-Fayoumi, N.A., Khamees, B.A., & Al-Thuneibat, A.A. (2009). Information transmission among stock return indexes: evidence from the Jordania . *Finance and Economics vol.24* , 194-208.

Alwi, Z. I. (2003). *Pasar Modal : Teori dan Aplikasi. Edisi Pertama.* Jakarta: Nasindo Internusa.

Amano,R.A., & Van Norden,S. (1998). Oil Prices and the rise and fall of the US real exchange rate.*Journal of international Money and Finance, Vol,17 (2)* 299-316

Ang,Robert. (1997). *Buku Pintar Pasar Modal Indonesia (The Intelligent Guide to Indonesian Capital Market).* Jakarta: Mediasoft Indonesia.

Avonti, Prawoto. (2004). *Analisis Pengaruh Nilai Tukar Rupiah/US$ dan Tingkat Suku Bunga BI terhadap Indeks Harga Saham Gabungan Di Bursa Efek Indonesia periode 2000-2003.*

Badan Pusat Statistik Republik Indonesia. (2016). *Indeks Produksi Industri Bulanan industri Besar dan Sedang tahun dasar 2010 (Milyar Rupiah).* Http://www.bps.go.id/.

Badan Pusat Statistik Republik Indonesia. *Tingkat Inflasi di Indonesia bulanan.* http://www.bps.go.id/.

Bank Indonesia. (2016). *Data Nilai Tukar Rupiah terhadap US Dollar.* http://www.bi.go.id/.

Bank Indonesia. (2016). *Data Suku Bunga BI Rate.* http://www.bi.go.id/.

Berument,H, Dogan , N., & Tansel, A. (2008). Macroeconomics Policy and Unemployment by Economic Activity. *Discussion Paper* , 3461.

Blanchard, O. (2006). *Macroeconomics 4th edition.* New Jersey: Pearson Prentice Hall.

Brigham and Houston. (2010). *Dasar-Dasar Manajemen Keuangan.* Jakarta: Selemba Empat.

Cahyono, J. (2000). *Menjadi Manajer Investasi Bagi Diri Sendiri.* Jakarta: Gramedia Pustaka Utama.

Chen, J., Hong, H., & Stein, J.C. (2002). Breadth of ownership and stockreturns. *Journal of financial Economics, vol.66 (2)* 171-205

Cheng, H-F, Gutierrez, M., Mahajan,A., Shacmurove, Y. and Shahrokhi, M. (2007). A future global economy to be built by BRICs. *Global Finance Journal,vol.18* 143-156

Darmadji, Tjiptono and Hendy M. Fakhruddin. (2006). *Pasar Modal di Indonesia Pendekatan Tanya Jawab.* Jakarta: Selemba Empat.

Dewi, A. (2011). Penagruh Struktur Modal.Profitabilitas dan Ukuran Oerusahaan Pada Nilai Perusahaan. *E-Jurnal Akuntansi, Vol 4(2)* , 358-372.

Emmanuel and Sunday. (2012). Analisis Kandungan Informasi dan Efek Intra Industri Pengumuman Stock Split yang dilakukan oleh perusahaan bertumbuh dan tidak bertumbuh. *Jurnal Ekonomi dan bisnis Vol 20(1)* , 79-80.

Enders, W. (2004). *Applied Econometrics Time Series, Second Edition.* New York: Jhon Wiley and Sons,.Inc.

Ghorbel,A and Younes,B. (2008). Response of International stock markets to oil price shocks. *Journal of Econometrics, vol 74* , 3-30.

Gujarati, D. (2003). *Ekonometrika Dasar.* Jakarta : Erlangga.

Hamilton, J.D. (2008). Understanding the crude oil prices. *jounal of economics, vol 32* , 1389-1393.

Haroon and Jabeen. (2013). Stock Market activity. *Energy Economics, Vol. 7(3)* , 493-504.

Husnan, S. (2004). *Dasar- dasar Teori Portfolio dan Analisis Sekuritas.* Yogyakarta: UOO AMP YKPN.

Jimenes-Rodriguez, R., &Sanchez, M. (2005). Oil Prices shocks and real GDP growth: empirical evidence for some OECD countries. *Applied economics, vol.37(2)* , 201-228.

Jogiyanto. (2010). *Teori Portofolio Dan Analisis Investasi. Edisi Ketujuh.* Yogyakarta: BPFE UGM.

Kewal, Suramaya Suci. (2012). Pengaruh Inflasi, Suku bunga , Kurs, Dan Pertumbuhan PDB terhadap Indeks Harga Saham. *Gabungan jurnal Economics Vol. 8(1)* , 53-64.

Kilian, Lutz and Cheolbeom Park. (2007). The impact of Oil price Shock on the U.S Stock Market. *NATIONAL ECONOMIC REVIEW Vol.50(4)* , 1267-1287.

Kostov and Jhon Lingrad. (2000). *Regime Switching Vector Error Correction Model (VECM).* Analysis of UK Meat.

Kuncoro, Mudrajad1998*Manajemen Keuangan Internasional*YogyakartaBPFE

Mankiw, G. N. (2006). *Teori Makroekonomi,edisi kelima.* Jakarta: Erlangga.

Nugroho. (2011). *Analisis Pengaruh Harga Minyak Dunia,Produksi industri,Harga Emas Dunia,Tingkat Suku Bunga terhadap IHSG.* Yogyakarta: Universitas Mohammadiyah.

Papapetrou, E. (2001). Oil Price Shocks, Stock Market, economic activity and employment in Greece . *Energy Economics,23* , 511-532.

Rahardjo, S. (2006). *Kiat membangun Aset Kekayaan (Panduan Investasi Saham).* Jakarta: PT. Elex Media Komputindo.

Reimers, H. (1992). Impulse Response Analysis of Cointegrated system. *Journal of Economic Dynamics and Control, Vol. 16(1)* , 53-78.

Samsul, Muhammad. (2006). *Pasar Modal dan Manajemen Portofolio.* Jakarta: Penerbit Erlangga.

Santosa. (2003). Integrasi Pasar Modal Kawasan Cina-Asean. *Jurnal Ekonomi Pembangunan Vol. 14(1)* , 78-91.

Siamat, D. (2001). *Manajemen Lembaga Keuangan: Kebijakan Moneter dan Perbankan,Edisi Kelima.* Jakarta: Fakultas Ekonomi Universitas Indonesia.

Sunaryah. (2001). *Pengantar Pengetahuan Pasar Modal.* Yogyakarta: UPD AMP YKPN.

Tandelilin. (2010). Analisis Investasi dan Manajemen Portfolio. Yogyakarta: UGM.

Tunah,H. (2010). The analysis of Unemployment in Turkey : Some Empirical Evidence Using Co-integration test. *European journal of social sciences, 18 (1)* , 19 - 38.

Undang-undang Republik Indonesia Np.8 Tahun 1995 Tentang Pasar Modal. (2017, December 14). Retrieved from http://www.bapepam.go.id

Wicaksono, ardian Agung. (2010). Analisis pengaruh Tingkat Bunga SBI, Harga Emas Dunia, KursRupiah, Indeks Nikkel 225, dan Indeks Dow jones terhadap IHSG periode tahun 2000 - 2009.

Widioatmojo. (1996). *Cara Sehat Investasi Di Pasar Modal.* Jakarta: Elex Media Komputindo.

Yau, R. K. (2010). The Effect of Oil Prices and FDI on Employment,GDP, and Domestic Investment in US before and after Financial . *European Journal of Economics, Finance and Administrative Science (26)* , 1450-2275.

Yusup. (2012). Pengaruh Harga Minyak Dunia dan Variabel Makroekonomi terhadap Indeks Harga Saham.