IMPACT OF MACROECONOMIC VARIABLES AND USA QUANTITATIVE EASING TO CAPITAL MARKET: EVIDENCE OF INDONESIA STOCK EXCHANGE (IDX) IN JANUARY 2005 – FEBRUARY 2013.

By

Elisabeth Lukas

THESIS

Submitted to

KDI School of Public Policy and Management

in partial fulfillment of the requirements

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MASTER OF DEVELOPMENT POLICY

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Professor Jinsoo LEE, Supervisor

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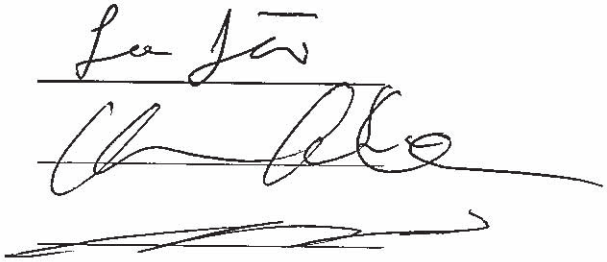

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ABSTRACT

Impact of Macroeconomic Variables and US Quantitative Easing to Capital Market: Evidence of Indonesia Stock Exchange (IDX) in January 2005 – February 2013.

By

Elisabeth Lukas

How stock price moves in Indonesian capital market has been an interest of either domestic or foreign investors since stock market in Indonesia has developed. Theoretically, stock price movement, which is shown with stock rate of return, is influenced by domestic and foreign factors. This research gives complementary contribution to this theory by studying empirical impact of certain domestic macroeconomic variables, like Ted Spread, Real Exchange Rate, and Inflation Rate, and also USA Quantitative Easing (QE) as foreign factors to stock rate of return in Indonesia since recently, there are only few studies related QE to stock price in Indonesia. By using Ordinary Least Square (OLS) method and monthly data in Indonesia from January 2005 – February 2013, this research proves that before and after QE period, Ted Spread is negative, but not significant in affecting stock rate of return in Indonesia. While, Real Exchange Rate and Inflation Rate are negative and significant in affecting Stock Rate of Return in Indonesia. In addition, during QE period, this research proves that three periods of QE, which are QE1, QE2, and QE3

are positive and significant in affecting Stock Rate of Return in Indonesia.

Keywords: Stock rate of return, Ted spread, Real Exchange Rate, Inflation rate, Quantitative easing.

Dedicated to my Father and Mother

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CHAPTER I

INTRODUCTION

I.1. Background of this Research

How stock price in Indonesia moves has been an interest for both domestic and foreign investors. This interest has been triggered by development of capital market in Indonesia as shown by number of market capitalization [1], which has increased from 2,249,999,872 USD in 1989 into 396,772,107,424 USD in 2012 (World Bank 2013) as we can see in figure 1.1 below.

Figure 1.1. Market Capitalization in Indonesia, 1989 - 2012.
Source: World Bank 2013

Specifically, condition of stock market or 'bull and bear market' can be seen with

[1] Market capitalization means outstanding shares times share's price of companies listed in Indonesia's stock exchange (IDX). However, it excludes mutual fund, or other investment companies (World Bank 2013).

stock rate of return (ROR) as the proxy of difference between stocks prices of one period from previous period (Hwang 2013). An increase of stock's price or 'bull market' will increase investor's rate of return, which can be resulted from capital gain. On contrast, a decrease of stock's price or 'bear market' will decrease investor's rate of return or it may cause capital loss for investors. Stock rate of return is a return to the stock holder per amount of money invested (Defina 1991). On the other side, stock price is a signal of profitability, economy condition, and chance of employment (Defina 1991). This theory can be strengthened by an efficient market theory, which says that stock price reflects all information in the market. This will be shown with the random walk movement that shows the random stock prices fluctuation.

Theoretically, investors and analysts tend to predict stock price through changes of some macroeconomic variables, like inflation or central bank rate. According to some previous empirical studies, there are several macroeconomics variables affecting stock rate of return, like interest rate, inflation rate, money supply growth, Ted spread etc (Chen 2008, and Hwang et.al. 2013). Those previous researches have shown various results upon relationship of macroeconomic variables to stock rate of return. According to those previous researches, some variables are significant; while, in another research some of those variables are not significant. In addition, besides local macroeconomic variables, according to several equity analysts, Quantitative Easing (QE) has significant impact to stock price in Indonesia and stock market has responded positively to this expansive monetary policy. It is shown by the increase of stock rate of return in some emerging stock markets, including in Indonesia. Quantitative Easing (QE) is the unconventional monetary policy that is implemented by the Federal Reserve that aims to stimulate economic activities and economic

growth. At the same time, this policy has a purpose to achieve targeted unemployment rate and inflation rate in USA.

From these phenomena, this research takes an idea to prove with econometrics tools the impact of Quantitative Easing (QE), as well as certain local macroeconomic variables to Stock Rate of Return (ROR) in Indonesia, that is divided into two periods; those are before QE period, and after QE period.

I.2. Purpose of Study

Purpose of this study is to see impact of macroeconomic variables, which are ted spread, real exchange rate, and inflation rate to stock rate of return in Indonesia. In addition, this study aims to know how the impact of external shock from the Federal Reserve, by including one monetary policy that is newly implemented by the Federal Reserve, which is Quantitative Easing (QE1, QE2, and QE3) to stock market in Indonesia, that is reflected with stock rate of return (ROR). Therefore, this study will add literature study regarding impact of local macroeconomic variables and USA quantitative easing (QE) to stock rate of return (ROR) in Indonesia.

I.3. Research Questions

There are two research questions of this research as follows. First, what are the impacts of Ted spread (TED), real exchange rate (RER), and inflation rate (INF) on stock rate of return (ROR) in Indonesia before and after quantitative easing (QE)? Second, what is the impact of quantitative easing policy from the Federal Reserve (QE1, QE2, and QE3) on stock rate of return (ROR) in Indonesia?

I.4. Significance of Study

There are several things that make this research different from previous studies. First of all, this research intends to examine the impact of Quantitative Easing (QE) implemented by the U.S. Federal Reserve since November 2008 on the stock rate of return (ROR) in Indonesia. As far as I know, there are few previous researches related to this issue, especially in the context of Indonesia. Second, this research extends the sample period to February 2013, which is not covered by previous studies. Third, this research uses Ted spread (TED) as the interest rate variable that indicates credit risk in Indonesia, which is not widely used in the analysis of Indonesian stock market.

I.5. Hypotheses

There are four hypotheses for this research. First, Ted Spread (TED) has negative relationship with stock rate of return. I expect that the increase in Ted spread (TED) with higher credit risk will lead to decrease in stock rate of return (ROR) in Indonesia. Second, real exchange rate (RER) has negative relationship with stock rate of return in Indonesia (ROR). It means that an increase (depreciation) of real exchange rate (RER) will decrease stock rate of return in Indonesia (ROR). We expect that depreciation of Indonesian rupiah against US dollar will decrease Indonesian stock market return because depreciation of exchange rate mainly leads to increase in the cost of imported goods and the increase in the cost of imported goods results in lower profitability of import companies (Kuwornu 2011). In this way, as imported companies re predominant in Indonesian stock market, we expect that stock rate of return (ROR) will be lower. Third, inflation rate (INF) has negative relationship with real exchange rate in Indonesia (ROR). It means that an increase in inflation (INF)

rate will decrease rate of return in Indonesia (ROR). Fourth, Quantitative Easing (QE) has positive relationship with Stock Rate of Return (ROR). As a small open economy, Indonesia is influenced by monetary policy of a big open economy, such as USA (Pilbeam 2006). As more foreign funds will flow into Indonesia with QE, I expect that QE will result in higher stock rate of return in Indonesia (ROR).

To test those hypotheses, we will use the monthly data retrieved from Bloomberg Professional Service from January 2005 – February 2013.

I.6. Organization of this Research

The structure of this research will be, in Chapter I, this study will cover introduction, purpose of research, and hypothesis. In Chapter II, this research will show the empirical studies that have been conducted by previous researchers and theoretical background as well. In Chapter III, this research will explain model, data, variables used, and methodology that will be used. In Chapter IV, this research will present the output result, interpretation, and analysis. In Chapter V, this research will provide conclusion, some policy recommendations, and suggestion for further studies.

CHAPTER II

LITERATURE REVIEW AND THEORY

II.1. Empirical Studies

How macro variables gives impact stock rate of return has been learned by some researchers previously. Therefore, we can refer to those researches. For example, the research that has been done by Rapach, Wohar, and Rangvid (2005) used set of macroeconomic variables, those were inflation rate, money stocks, various interest rates (money market rate, three month treasury bill rate, long term government bond yield), term spread, industrial production, and unemployment rate of 12 industrialized countries (Belgium, Canada, Denmark, France, Germany, Italy, Japan, Netherland, Norway, Sweden, the UK, and the US) in order to see whether the predictability patterns of those macroeconomic variables to stock return happen in all those countries, or just in some or few countries during the period of **1970 – 1990.** The model used in this research is:

$$^{yk}_{t+1} = \alpha + \beta\ z_t + \gamma\ yt + u^k_{t+1} \quad \text{.....} \quad (2.1)$$

Where y_t = real return to holding stocks from period t-1 to period t, $^{k}_{t+1}$ = real return to holding stocks from period t to t+k, z is a macro variables that are believed have potential **prediction capability** to future real returns, and u^k_{t+1} is a disturbance term. This research shows that interest rate is a variable that gives significant impact to stock rate of return. Moreover, in most of those 12 industrialized countries, interest rates are generally more consistent and reliable predictors of stock returns than some

other macro variables. Meanwhile, inflation has impact that is limited to few numbers of countries only (especially the Netherlands and the US).

A research by Purnomo (2012) examined long run and short run relationship between domestic and foreign factors affecting Indonesian Stock Exchange by using monthly data from period January 2001 – December 2011. This research constructs two models, first is to see the impact of domestic macroeconomic variables, those were Industrial Production Index (IPI), Consumer Price Index (CPI), Money Supply (M2), Short Term Risk (POLRATE), Long Term Risk (RISK), and exchange rate of Indonesian Rupiah (ER) to Indonesian stock market (JCI / Jakarta Composite Index). Second, is to see the relationship between Indonesian stock market (JCI) with stock market index of five neighboring countries, those are Singapore, Malaysia, Thailand, Vietnam, and Philippines; along with US and Japanese stock market. The methodology used in this research is Autoregressive Distributed Lag (ARDL) for long run co integration test, and Error Correction Model (ECM) for short term relationship test. The result from long run co integration showed that there is long term relationship between those six macroeconomic variables with stock market in Indonesia (JCI). Moreover, those variables are also significant in affecting JCI. In addition, the result for short term relationship by using Error Correction Method (ECM) showed that the coefficient of adjustment in the disequilibrium caused by those six macroeconomic variables will come to the equilibrium of stock price (JCI) with significant speed of adjustment 7.5 percent of the monthly Indonesian stock price. The other methodology that is used to see the relationship between Indonesian stock market with several foreign stock markets mentioned above is Johansenn-Juselius method for co integration.

Based on these models and methods, there is long run relationship between stock market in Indonesia and stock market in other countries, like Singapore, Malaysia, Thailand, Vietnam, and Philippine. But there was no relationship between Indonesian stock market with US and Japanese stock market. Besides that, the summary from the variables used in this study can be seen in the table 2.1. below.

Table 2.1. Research Result of Purnomo (2012)

Variables Name	Output
Industrial Production Index (IPI)	negative, not significant
Consumer Price Index (CPI)	negative, significant
Money Supply (M2)	positive, not significant
Short Term Risk (POLRATE)	negative, significant
Long Term Risk (RISK)	negative, significant
exchange rate of Indonesian Rupiah (ER)	negative significant

Study by Chen (2008) tried to investigate whether macroeconomic variables, like term spread (the difference between 3-month Treasury Bill Rate and 10-year Treasury Constant Maturity Rate), inflation rates, industrial production, unemployment rates, federal funds rate, nominal effective exchange rates, and federal government debts could predict recessions in US stock market. The dependent variable in this study is Standard&Poor's S&P 500 price index. According to the result of this study, term spread, inflation rates, and unemployment rates are positively associated with future recession in stock market. While, industrial production growth is negatively associated with future recession in stock market. And exchange rate does not have significant predictive power to recession.

Another study has been done by Manurung, Pardede, and Sitorus (2013). The aim of this study is to analyze interrelationship between Jakarta Composite Index (JCI), and macroeconomic indicators, global stock market, and commodities prices. This study uses ten variables; those are Gross Domestic Product (GDP), Consumer Price Index, Interest Rate, Dow Jones Index, Nikkei Index, Hang Seng Index, Coal Index, Crude Palm Oil Index, Gold Index, Oil, and Real Exchange Rate. Besides that, this study contained monthly time period from November 2000 to December 2012. The methodology used in this study was VECM Model. According to this study, the macroeconomic variables, LCPI, and LGDP are significant and important in determining JCI. On the other hand, the price fluctuation of commodities, like Gold, Oil, CPO and coal are not significant in affecting JCI. However, performance of global stock market, like Dow Jones, Nikkei, and Hang-Seng are significant in determining JCI.

In addition, Wong, Khan, and Du (2005) made a research in order to see long-term and short-term equilibrium relationships of several major indices in Singapore and United States with selected macroeconomic variables, those are money supply (M1 and M2) and interest rate. The interest rates used in this study are 1-month saving deposit rate for Singapore, and 1-month checkable deposit rates for US. This study uses time series analysis that includes co-integration, Johansen multivariate co-integrated system, fractional co-integration, and Granger Causality. This study examined data from January 1982 – December 2002, which are divided into three sub periods. First, before 1982 – 1986 that is before 1987 equity crisis. Second, 1987 – 1996 that is before Asian financial crisis. Third, 1997 – 2002 that is during and after Asian financial crisis. According to this study, before Asian financial crisis, there is

long term relationship between interest rate and money supply with stock price in Singapore, but this relationship has weakened after Asian financial crisis. The same case happened in US stock market as well where interest rate and money supply had co integration with stock price before 1987, but has weakened after 1987.

Besides that, Kumar and Puja (2012) investigated the impact of macroeconomic fundamentals by using Indian data. This study used 5 variables; those were industrial production index, wholesale price index, money supply, treasury bills rates, and exchange rate during 18 years period from 1994: 04 – 2011: 06. The methodology used in this study was Johansen's co integration test, and vector error correction model. The aim of this study is to investigate short run and long run relationship of those variables to stock price in India. The stock price indices investigated in this study is Bombay Stock Exchange (BSE) Sensex. According to this study, there is long run equilibrium relationship between stock price indices (SPI) and those five macroeconomic variables. Besides that, this study shows positive sign and statistically significant for variable industrial production index (IIP), and money supply (MS). While, for variable wholesale price index, there is negative, and statistically significant. On contrast, there is variables exchange rate (EXR) showed positive sign and treasury bills rate (TBR) showed negative sign, but those variables are insignificant.

Another study has been done by Hwang et.al.(2013) in order to see co-movement of stock market in US and some emerging countries. The data used in this research is daily data from January 2nd, 2006 to December 31st, 2010. The stock return is calculated from S&P 500 index, and other indices of 10 countries, those are Brazil, Russia, India, China, South Korea, Thailand, Philippines, Taiwan, South Africa, and

Malaysia. Methodology used in this study is dynamic multivariate EGARCH model. According to this study, there is spillover effect from US Stock market to those emerging countries, except to Brazil. Besides that, this research identified some exogenous variables which determined the dynamic conditional correlations of stock return. Those exogenous variables which are used in this research are US CDS spread (USCDS) and US TED spread (US TED). CDS spread measures sovereign risk; while, TED spread measures liquidity and credit risk. According to this research, CDS spread is insignificant for South Africa and Taiwan, but it is significant for Korea. For US TED spread, this research showed that US TED spread was significant for Korea and Philippines.

According to Kim et al. (2012), there is contagion effect between financial market in US and in emerging countries. Besides that, there are several channels, through which this contagion effect happened, like TED Spread, CDS Premium, Equity Returns (it used S&P 500 daily return index), VIX Index as a measure of financial stability in US, Libor-Overnight index swap (OIS) spread, Foreign Capital, . This research utilizes data from April 2nd, 2007 to August 31st, 2009 of five emerging Asian countries; those are Indonesia, Korea, the Philippines, Thailand, and Taiwan. Results of this research can be shown in table 2.2. below:

Table 2.2. Research Result of Kim et al. (2012)

Variables	Indonesia	Korea	Philippines	Thailand	Taiwan
Equity Returns	Significant	Significant	Significant	Significant	Significant
Foreign	Significant	Significant	Significant	Significant	Significant

Capital					
Libor-Ois Spread	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant
CDS Premium	Significant, negative sign	Insignificant	Significant, negative sign	Insignificant	Insignificant
Ted Spread	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant

A study by Montes, and Tiberti (2012) is to analyze the role of inflation targeting, credibility of central bank, role of macroeconomic fundamental variables to stock market performance in Brazil by using Ordinary Least Square (OLS), generalized method of moments (GMM) and a GMM methodology. The period covered in this study is monthly series from December 2001 – September 2010. In this study, macro variables that are used as independent variables are Country risk (EMBI), Real Interest Rate (REAL), Exchange Rate (EXCH), Economic Growth (GROWTH), Value of companies listed at Bovespa (VC_BOV), Dow Jones (DOW_JONES), S&P500 (SP_500), and the dependent variable is IBOVESPA (Index of Stock Market in Brazil). Results of this study show statistical significance of all those variables in affecting index of stock market in Brazil. And the sign is aligned with hypothesis, where EMBI, REAL, has negative, impact to IBOVESPA. While, VC_BOV, DOW_JONES, and SP_500 have positive impact to IBOVESPA.

II.2. Theories about Stock Rate of Return

We develop hypothesis in chapter one from some foundation of theories that will be explained in sub chapters below.

II.2.1. Ted Spread (TED) and Stock Rate of Return (ROR)

According to hypothesis in chapter I, Ted Spread (TED) rate has negative relationship with Stock Rate of Return (ROR) in Indonesia. It means that an increase in money market rate will decrease stock of return in Indonesia. According to (Cheung et al. 2010), an increase of Ted spread means worse liquidity or fear of worse economic condition in capital market. Therefore, it will decrease stock rate of return. In addition, according to Westrupp, Giovanneti, and Bueno (2012), this is a risk factor that captures additional cost of financial agents in order to get funding and this is a sign of crisis.

II.2.2. Real Exchange Rate and Stock Rate of Return

According to second hypothesis, real exchange rate (RER) has negative relationship with stock rate of return in Indonesia (ROR). It means that an increase (depreciation) of real exchange rate (RER) will decrease stock rate of return in Indonesia (ROR).

Based on economic theory, depreciation of RER of IDR (Indonesian Rupiah) will create lower expectation of rate of return for foreign investors who are going to convert the money from IDR to USD. This depreciation of IDR will decrease demand of foreign investors for stocks in Indonesia, and simultaneously, it will decrease stock price and stock rate of return (ROR). According to Manurung, Pardede, and Sitorus (2013), exchange rate will give impact to stock price either positively or negatively. It depends on the type of the company. For importing company, depreciation of local exchange rate will give negative impact to stock price. On the other hand, depreciation of local exchange rate will give positive impact to stock price.

II.2.3. Inflation Rate and Stock Rate of Return

According to third hypothesis, inflation rate (INF) has negative relationship with real exchange rate in Indonesia (ROR). It means that an increase in inflation (INF) rate will decrease rate of return in Indonesia (ROR). The theory behind this hypothesis can be seen from two sides. First, from company's side, when inflation will make firm less profitable (Defina 1991). It is because inflation will be a burden for company that will increase cost and decrease after-tax profitability. Second, from consumer's side when inflation, will decrease purchasing power of investors to investment products, including to stocks and at the same time inflation will decrease investment growth (Beetsma and Giuliodori 2012). Therefore, demand o f stocks will decrease as well.

II.2.4. Quantitative Easing and Stock Rate of Return

According to fifth hypothesis, Quantitative Easing (QE) has positive relationship with Stock Rate of Return (ROR). It means that an increase Quantitative Easing (QE) will increase Stock Rate of Return in Indonesia (ROR). Based on Abarca (2012), QE gives impact to increase in liquidity, which supports an increase of stock market across emerging markets. This condition shows confidence in stock market in those emerging countries. To summarize, QE is able to give impact to stock market through this structure below:

QE → foreign liquidity ↑ → capital inflow to Indonesia ↑ → demand on stock ↑ → stock price ↑ → stock rate of return ↑.

CHAPTER III

DATA AND METHODOLOGY

III.1. Model and Data

From some empirical studies that have been done by previous researchers, I adopt some variables in order to see impact of macroeconomic variables to stock rate of return (ROR) in Indonesia. Data that will be used in this study is monthly data from January 2005 – February 2013. The reason behind the choosing of this period is because early 2005 was still period of housing bubble. It can be shown by figure 3.1 below that in early Q1 2005, US house price index increased into 323.88 from 277.94 in Q1 2004. Moreover, house price index reached its peaked in Q1 2007 that was 378.05. However, at the same time, 2005 was a start of housing market bursting. This bursting of housing bubble happened when there was correction of house price that has made house price and value lower than mortgage loan rate. It can be seen in Q1 2006, where house price index (HPI YoY %) started to decrease into 10.44% from 11.2% in Q4 2005. In contrast, Fed rate at the same period in Q1 2006 increased into 4.75% from 4.25% in Q4 2005.

This lower house price and higher interest rate have caused people in US unable to pay their mortgage loan. Therefore, it was starting to turn into subprime mortgage crisis in 2008 that has become global financial crisis in 2008 and has made The Fed implement quantitative easing as one of the unconventional monetary policy to support financial institutions in USA which were in collapse (Labonte 2013).

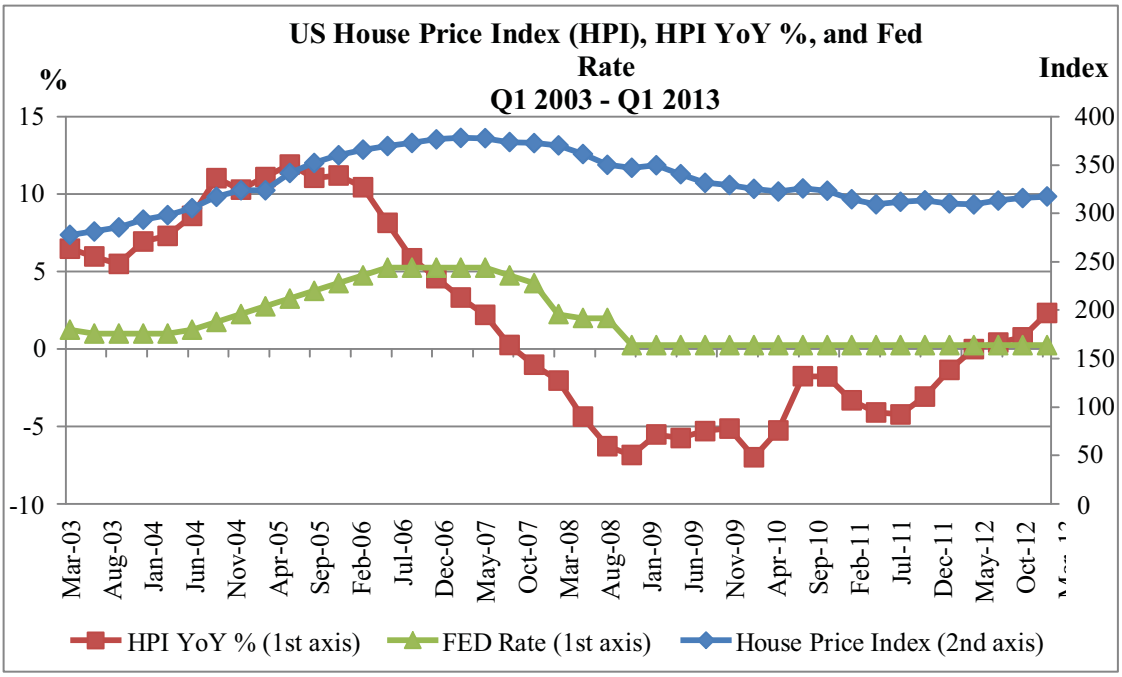

Figure 3.1. US House Price Index (HPI), HPI YoY %, and Fed Rate Q1 2003 - Q1 2013
Source: Bloomberg Professional Service, Federal Reserve Housing Agency, and Federal Reserve

We will examine a model in this research in order to see the impact of macroeconomic variables and quantitative easing (QE) to capital market in Indonesia that is reflected by stock rate of return (ROR) that will be divided into two periods. First, before quantitative easing (QE), that is from January 2005 – November 2008. Second, during quantitative easing (QE) period, that is from December 2008 – February 2013.

From the explanation above, the model that will be examined in this research is:

$$ROR_t = \alpha + \beta_1 L.12TED_t + \beta_2 RER_t + \beta_3 INF_t + \beta_4 QE1_t + \beta_5 QE2 + \beta_6 QE3 + \varepsilon_t \quad (3.1)$$

Where:

Table 3.1. Description of Variables Used in this Research

Variable Names	Description	Source
ROR	Rate of Return of Stock in Indonesia Stock Exchange (Jakarta Composite Index / JCI). (YoY)	Bloomberg Professional Service
TED	Ted Spread (difference between 1 year JIBOR and 1 year T-Bills Rate / SBI[2] Rate). In this model, we are going to use 12 months lag of Ted Spread (L12.TED)	Bloomberg Professional Service
RER	Percentage Change of Real Exchange Rate in Indonesia (IDR/USD). (YoY).	International Financial Statistics
INF	Inflation Rate (YoY)	Bloomberg Professional Service
QE1	Dummy variable, where value 1 is for the period of Quantitative Easing 1 by the Federal Reserve from December 2008 – March 2010	The Federal Reserve
QE2	Dummy variable, where value 1 is for the period of Quantitative Easing 2 by the Federal Reserve from November, 2010 – June 2011	The Federal Reserve
QE3	Dummy variable, where value 1 is for the period of Quantitative Easing 2 by the Federal Reserve from September 2012 – February 2013	The Federal Reserve

[2] SBI stands for *Sertifikat Bank Indonesia* / Certificate of Bank Indonesia

In addition, we can see summary statistic of the variables that we use in this research from table 3.2 and 3.3 below, which is divided into those two periods.

Table 3.2. Summary Statistics of Data from January 2005 – October 2008

Variables	Number of Observations	Mean	Standard Deviation	Min	Max
ROR (Stock Rate of Return)	46	34.08376	24.07647	-52.4604	73.76353
TED (Ted Spread)	46	0.850885	0.8711488	-1.10333	2.62122
RER (Real Exchange Rate)	46	-5.73728	5.746326	-20.14213	2.875362
INF (Inflation Rate)	46	10.04826	4.142861	5.26	18.39

Table 3.3. Summary Statistics of Data from November 2008 – February 2013

Variables	Number of Observations	Mean	Standard Deviation	Min	Max
ROR (Stock Rate of Return)	51	23.29057	36.69884	-52.77361	98.29488
TED (Ted Spread)	51	0.7323686	0.959151	-2.43	2.77
RER (Real Exchange Rate)	51	-2.781144	10.27284	-23.44801	19.51492
INF (Inflation Rate)	51	5.040392	1.775489	2.41	11.06

III.1.1. Jakarta Composite Index (JCI) and Stock Rate of Return (ROR)

Jakarta Composite Index (JCI) is a weighted index of stock price in Indonesia that includes all stocks listed in Indonesian Stock Exchange (IDX). IDX has to ensure that JCI reflects fair market price. Therefore, IDX has the right to add or eliminate one or several listed companies to calculate JCI (IDX 2014). On the other hand, Stock Rate of Return (ROR) is percentage of JCI's changes (ΔJCI_t) (Hwang et.al 2013). From table 3.2. and 3.3. above, the average of stock rate of return (ROR) in Indonesia between January 2005 – October 2008 and November 2008 – February 2013 was 34.08% and 23.29% respectively.

Besides that, we can see movement of JCI and ROR in figure 3.2. below. This figure shows general increase of JCI from IDR 1,045.435 in January 2005 into IDR 4,795.789 in February 2013. However, a deep decline of ROR happened in November 2008, that was -53.82%. It happened because of Subprime Mortgage Crises in USA at that time of which the impact came to stock market in Indonesia as well. In contrast, the highest stock rate or return (ROR) happened in February 2010 that was 98.30% after subprime mortgage crisis in 2008 - 2009.

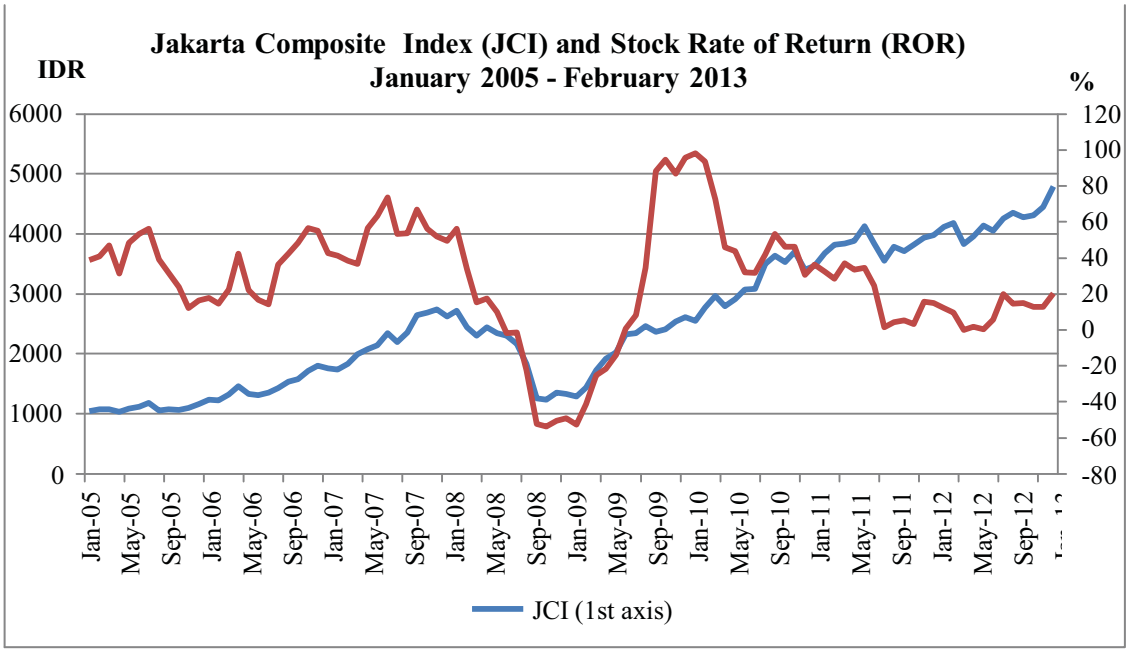

Figure 3.2. JCI and ROR, January 2005 – February 2013.
Source: Bloomberg Professional Service

III.1.2. Ted Spread (TED)

The interest rate that will be used in this research is Ted Spread (TED). It can be used as the measure of the world's economic health and the liquidity in banking system. In addition, it is a measure of how much central bank spends to borrow money and commercial banks do (Rice, 2013). According to Brunnermeier (2008), Ted spread is able to show the condition of liquidity crisis. In other words, Ted spread

is a measure of liquidity in market and credit risk of a country. Ted Spread is calculated from difference between 3-months LIBOR (London Interbank Offer Rate) and 3-months T-Bills rate. However, in this research for Indonesia, based on the complete set availability of data, Ted spread can be calculated from difference between 1-year JIBOR (Jakarta Interbank Offered Rate) and 1-year government bonds. An increase of Ted spread means higher cost of borrowing among banks because they believe that there is higher risk in lending money to other banks. Therefore, liquidity in banking system will be lower as well. When it happens, the economic condition is near to drop. Thus, people would be reluctant to invest their money in stock market since they believe that stock market is riskier and will be faltered. As the consequence, people will tend to buy risk free assets instead of stock. As the result, stock price will decrease and stock rate of return will decrease as well. In addition, an increase of Ted spread will cause lower number of credit that indicates economic contraction.

On the other side, a decrease of Ted spread means lower credit risk among banks. Therefore, there will be higher liquidity as well since cost of borrowing is low. This condition is a sign of good economic condition and economic expansion. As the result, people will tend to invest their money in stock market since they believe that they will earn higher return by investing in stock market.

This research will use lag 12 months of Ted Spread (TED) since we make assumption that lag previous 12 months of TED of will give impact to current ROR. From figure 3.3 below, we can see movement between Ted Spread (TED) and Stock Rate of Return (ROR). In general, this figure shows us opposite movement of Ted Spread (TED) and Stock Rate of Return (ROR), that we can see in January 2005 when lag 12

of Ted Spread (TED) was 0.63% nd Stock Rate of Return (ROR) was 38.85%. But when lag 12 of TED increased in March 2008 into 1.26%, ROR decreased into 33.67%.

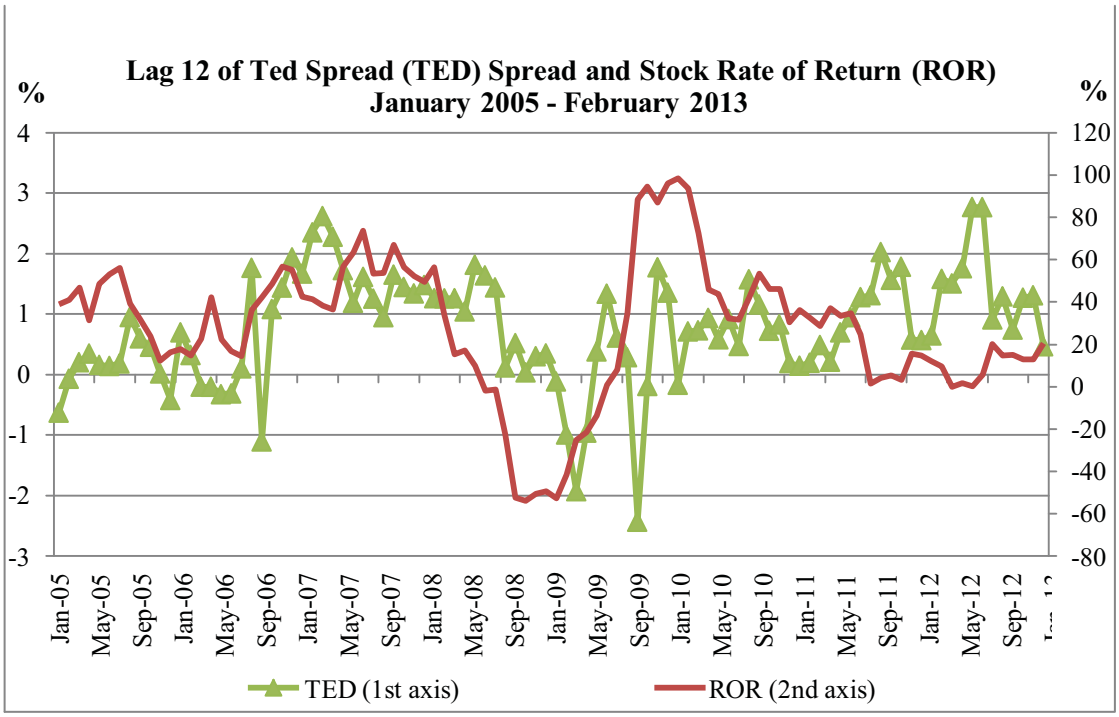

Figure 3.3. Ted Spread (TED) and Stock Rate of Return (ROR) January 2005 – February 2013.
Source: Bloomberg Professional Service 2014

III.1.3. Real Exchange Rate (RER)

Real exchange rate (RER) is a nominal exchange rate adjusted with price level. Specifically, the relationship between nominal exchange rate and real exchange rate can be shown with this mathematical function (Batiz 1994):

———……(3.2)

Where RER is real exchange rate, NER is nominal exchange rate, P* is price level in foreign country (CPI USA), and P is price level in domestic country (CPI Indonesia).

Regarding exchange rate system in Indonesia, this is a system to determine the value or price of Indonesian Rupiah (IDR) to foreign currency, in this term, the foreign currency is USD. The purpose of exchange rate system in Indonesia is to support trade balance, balance of payment, and monetary policy in Indonesia. Principally, there are three exchange rate regimes in Indonesia. First, fixed exchange rate system from 1973 – March 1983. Second, managed floating exchange rate system from March 1983 – 14 August 1997. Third, free floating exchange rate system from 14 August 1997 until present (Lukas 2009).

According to table 3.2. and 3.3 average of real exchange rate between January 2005 – October 2008 and November 2008 – February 2013 was -5.74% and -2.43% respectively. Besides that, figure 3.4 shows the movement of nominal, real exchange rate (RER), and stock rate of return (ROR) in Indonesia from January 2005 – February 2013. In this figure, we can see that there was a great depreciation of IDR/USD during the period of October 2008 – February 2009 since it was the time of global crises that was started in USA.

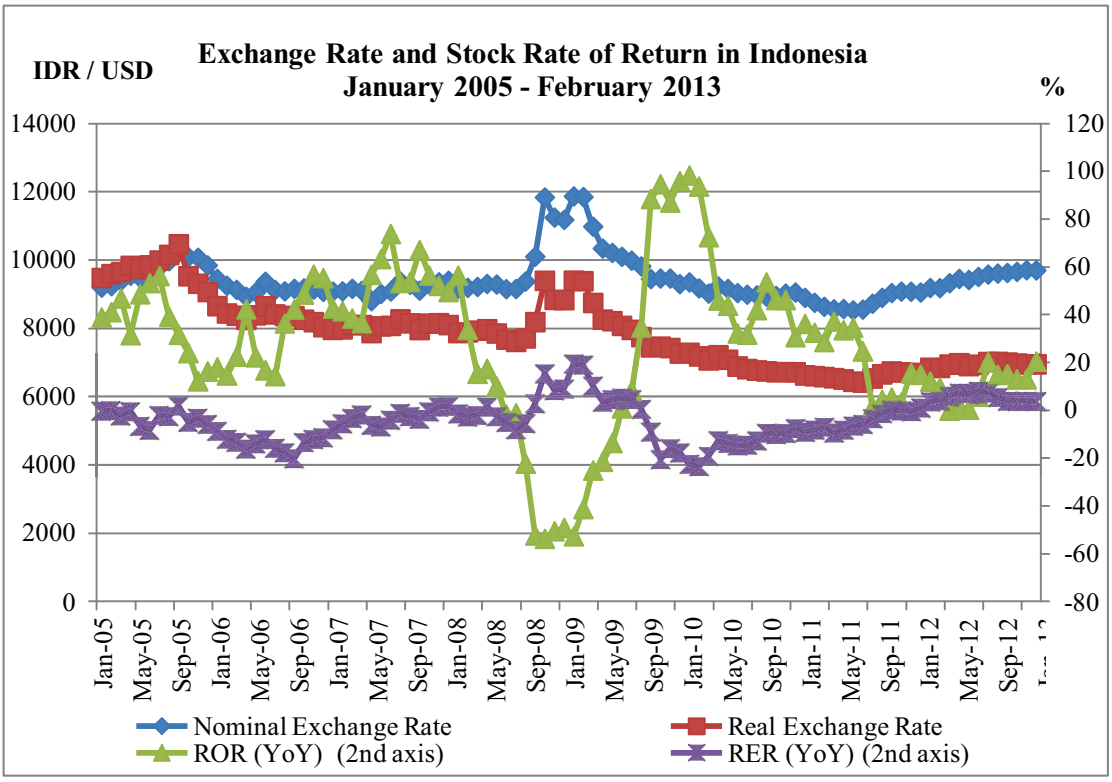

Figure 3.4. Nominal Exchange Rate, Real Exchange Rate, RER (YoY %), and Stock Rate of Return (ROR) in Indonesia
Source: International Financial Statistics (IFS) 2013, and Bloomberg Professional Service 2013

Moreover, when we see the movement of Stock Rate of Return (ROR) and of Real Exchange Rate during this global financial crisis period 2008 - 2009, there was negative Stock Rate of Return (ROR) when real exchange rate (RER) depreciated. Even though, within November 2008 – February 2013, the highest depreciation of real exchange rate was 19.52% in November 2009, but the most contrast declining relationship is shown by the sharp depreciation for about 15.40% of Real Exchange Rate (RER) in November 2008 into IDR9, 391.53 / USD, and at the same time, Stock Rate of Return (ROR) declined into -53.82%. This great depression happened in 2008, when global financial crisis happened in US, and the contagion effect came to Indonesia, that has made IDR currency depreciated and stock price went down deeply.

III.1.4. Inflation Rate (INF)

Inflation rate is the level of price increase in general. Inflation (INF) is calculated by calculating the difference year on year of CPI (Consumer Price Index). CPI is the index price of group of consumer goods and services, which are consumed within certain period of time (Statistics Indonesia 2014). In Indonesia, since 2004, CPI was calculated with base year 2002 that covers 45 cities (2002 = 100). Then, since June 2008, CPI used base year 2007 from 66 cities (2007= 100).

Figure 3.5. reports the movement of INF, ROR, and CPI in Indonesia. During January 2005 – October 2008, average of inflation rate was 10.05%. While, during November 2008 – February 2013, inflation rate was 5.12% in average. In addition, from figure 3.5. we can see that from January 2005 – February, CPI has an increasing trend from 94.7596 in January 2005 into 165.983 in February 2013. While, inflation rate was various during that period. In terms of Inflation Rate (INF) and Stock Rate of Return (ROR), they have contrary movement with coefficient of correlation -0.27. It means that when Inflation Rate increases, ROR will decrease. Furthermore, this negative relationship will be tested furthermore with econometric method that will be explained in chapter IV.

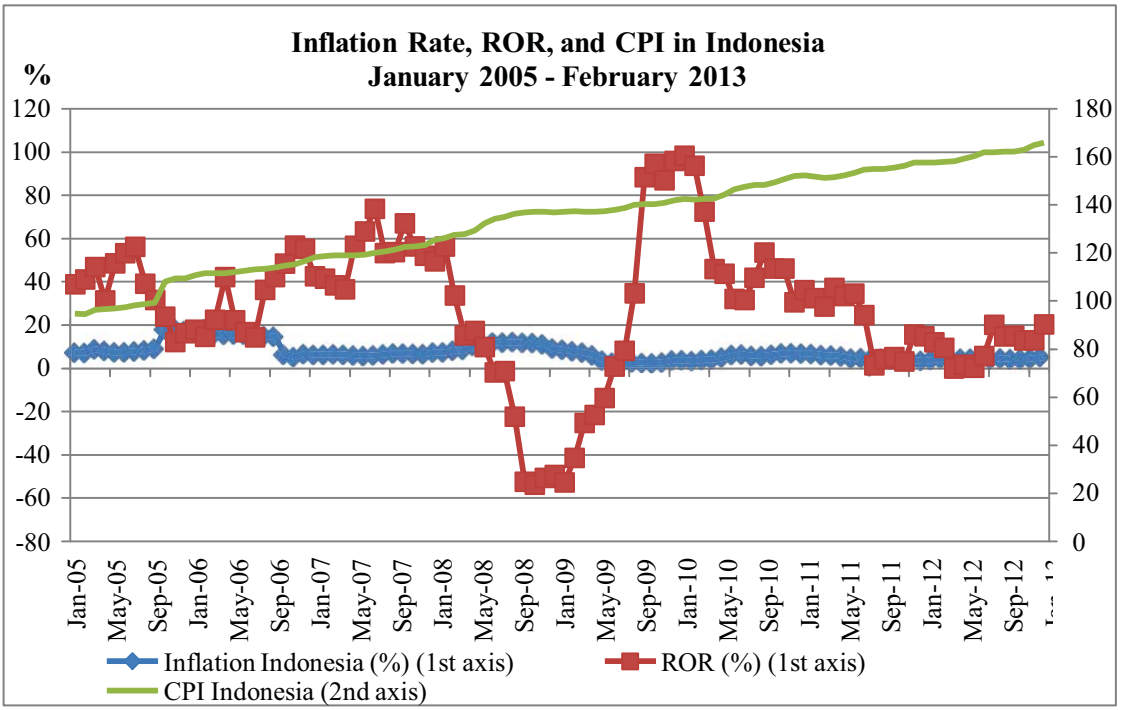

Figure 3.5. Inflation Rate, ROR, and CPI in Indonesia
Source: Bloomberg Professional Service 2013

III.1.5. Quantitative Easing (QE)

Quantitative Easing (QE) is an unconventional monetary policy implemented by The Federal Reserve by buying assets of financial institutions in order to stimulate economic growth. The difference between QE and other conventional monetary policy is, QE does not give much impact to interest rate. QE itself has been implemented under the name QE1, QE2, and QE3. QE 1 was implemented in November 2008 – March 2010. Referring to Labonte (2013), we can summarize total purchase spent by QE in table 3.4 below

Table 3.4. USA Quantitative Easing

QE Period	Total Assets Bought by the Fed
QE1 (November 25th, 2008 – March 2010)	300 billion USD of US Treasury securities 175 billion USD of US agency debt 1.25 trillion of MBS (Mortgage Backed Securities)
QE2 (November 2010 – June 2011)	600 billion USD of US Treasury Securities for eight months
QE3 (September 2012 – February 2013)	September 13th, 2012 = 40 billion USD of MBS (Mortgage Backed Securities) per month December 12th, 2012 = additional 45 billion USD of MBS (Mortgage Backed Securities) per month

Source: The Federal Reserve, Labonte (2013)

III.2. Methodology

In order to prove our hypotheses and theoretical background, we are going to use econometric methodology in this research. The econometric methodology that we will use in this research is Ordinary Least Square (OLS) since we would like to see the impact of macroeconomic variables and quantitative easing to stock rate of return in Indonesia. This methodology is also the methodology used by Rapach, Wohar, and Rangvid (2005).

III.2.1. Stationary Test

The first step that we take before we do regression of the data and analyze it is stationary test of data. This test needs to be done in order to avoid spurious regression, where the model has high R^2, and statistically significant, but it does not have economic meaning. The stationary test can be done by testing a unit root test with ADF (Augmented Dickey Fuller) test. The hypothesis used for this test is:

Ho: There is unit root (data is not stationer)

Ha: There is no unit root (data is stationer).

Result summary of stationary test for each variable can be seen in tables below.

Table 3.5. Summary of Stationary Test

Variables	At Level
ROR (Stock Rate of Return)	Stationer
TED (Ted Spread)	Stationer
RER (Real Exchange Rate)	Stationer
INF (Inflation Rate)	Stationer

According to stationary test that is shown from tables above, we can conclude that all variables, those are ROR, TED, RER, and INF are stationer at level.

III.2.2. Serial Correlation Test

In time series data, we need to check serial correlation test since it might happen when the error term is serially correlated, which means error term in period t is correlated with error term in period t-1. Impact of serial correlation will affect efficiency of the model and it may lead to assume that estimation parameter is more precise that it is. Serial correlation test can be done with Durbin-Watson Statistic, which can be written in formula below:

————————……(3.3)

Where, T is number of time periods, ε is error term, and t is time indicator. And for serial correlation test, we can use hypothesis below:

Ho: there is no serial correlation

Ha: there is serial correlation

After we do regression of two periods, those are before quantitative easing and after quantitative easing; we find that there is serial correlation as reported in table 3.6. After we compare DW-stat 0.4205746 with DW-crit from K = 3, N=45 that we see in table , we can conclude that Ho is rejected, so that there is serial correlation. Therefore, we are going to regress the model with robustness in order to eliminate the serial correlation problem (Newest and West 1987).

Table 3.6. Summary of Serial Correlation Test

Durbin Watson d-statistic before QE Period (4 , 46)	0.4205746
Durbin Watson d-statistic before QE Period (7 , 52)	0.9288041

In addition, for regression model after QE period, table 3.6 also reports that there is serial correlation as well, when we compare DW-stat = 0.9288041 with DW-crit from K = 3, N = 50. Therefore, we are going to use robustness in the next regression model after QE that will be shown in chapter IV.

III.2.3. Multicollinearity Test

Multicollinearity needs to be tested in this research when we use time series data since multicollinearity is a violation in linear time series where there is correlation among the independent variables. This condition can be indicated through

several conditions. First, insignificant coefficient, but R^2 is high and F test is significant. Second, unexpected changes in sign of coefficient. Besides that, multicollinearity is able to cause higher variance. Higher variance will lead to higher confidence interval and standard error. Therefore, it may cause incorrect interpretation of coefficient.

For the regression model, we can check multicollinearity by using VIF (Variance Inflation Sector). VIF is calculated from formula below:

——…….(3.3)

Multicollinearity test for period of before QE and after QE is reported in table 3.7.

Table 3.7. Summary of Multicollinearity Test

Variable	Before QE Period		After QE Period	
	VIF	1/VIF	VIF	1/VIF
QE1	-	-	1.88	0.532813
QE2	-	-	1.55	0.643282
QE3	-	-	1.27	0.788702
INF	1.69	0.590105	1.52	0.659396
TED	1.44	0.694849	1.62	0.616448
RER	1.27	0.788863	1.5	0.667451

We can use rule of thumb, that if VIF > 10, we will conclude that there is multicollinearity. However, multicollinearity test results in table 3.7 above show no variables with multicollinearity since there is no variable with VIF > 10. Therefore, we can conclude that multicollinearity does not exist in this regression model.

III.2.4. Heteroscedasticity Test

In linear regression model, we assume that variance of error is constant in all observations time or homoscedastic. However, heterocesdacity is the condition where that assumption is not fulfilled. In order to test heteroscedasticity, we can use hypothesis below:

Ho: variance of error is homoscedastic / constant variance

Ha: variance of error is heterocedastic / non-constant variance

For this research, we can omit heterocedasticity test since we will use model with robustness that can eliminate heterocedasticity problem as well (Newey and West 1987).

CHAPTER IV EMPIRICAL RESULT

AND ANALYSIS

IV.1. Model and Regression Result

After conducting stationary test, our model remains the same with the model (3.1) that we have developed in chapter III, as written below:

$ROR_t = \alpha + \beta_1 L12.TED_t + \beta_2 RER_t + \beta_3 INF_t + \beta_4 QE1_t + \beta_5 QE2 + \beta_6 QE3 + \varepsilon_t$…….(4.1)

However, as explained in previous chapter, we are going to analyze the econometric result into two periods. Firstly, before quantitative easing (QE) period, that is from January 2005 – October 2008. Secondly, after quantitative easing (QE) period, that is from November 2008 – February 2013. Moreover, according to the serial correlation test result in chapter, we are going to regress the model with robust. Finally, results of the regression before and after QE period is shown in table 4.1 below in summary.

Table 4.1. Summary of Regression Result of the Model before QE Period (January 2005 – October 2008) and after QE Period (November 2008 – February 2013)

Dependent variable	**ROR**					
Independent Variable	**TED, RER, INF, QE1, QE2, QE3**					
Variables	**Before QE Period**			**After QE Period**		
ROR	**Coef**	**P>|t|**	**R-Squared**	**Coef**	**P>|t|**	**R-Squared**
TED	-3.020299	0.229	0.4652	-1.044852	0.642	0.9121
RER	-1.55837	0.024		-	0.000	

Dependent variable	ROR					
Independent Variable	TED, RER, INF, QE1, QE2, QE3					
Variables	Before QE Period			After QE Period		
ROR	Coef	P>|t|	R-Squared	Coef	P>|t|	R-Squared
				2.923141		
INF	-4.765542	0.000		-6.132262	0.000	
QE1	-	-		8.303715	0.093	
QE2	-	-		10.35788	0.077	
QE3	-	-		18.12952	0.003	
Constant	75.5983	0.000		40.74329	0.000	

IV.2. Economic Analysis of the Result

Based on regression result in table 4.1, we can substitute to the regression model into equation 4.1 below:

$ROR_t = 75.5983 – 3.020299\ TED_t – 1.55837\ RER_t - 4.765542\ INF_t + \varepsilon_t$ ……...(4.1)

And based on regression result in table 4.2, we can substitute to the regression model into equation 4.2 below:

$ROR_t = 40.74329 – 1.044852\ L12.TED_t – 2.923141\ RER_t - 6.132262\ INF_t +$

$8.303715\ QE1_t + 10.35788\ QE2 + 18.12952\ QE3 + \varepsilon_t$ ……(4.2)

To summarize hypothesis developed in this model and the regression result before & after QE period, we can read in table 4.2 below.

Table 4.2. Comparison between Regression Result and Hypothesis

Variables	Before QE	Hypothesis	After QE	Hypothesis
L.12 TED	Negative, not significant	Negative, significant	Negative, not significant	Negative, significant
RER	Negative, significant	Positive or negative, significant	Negative, significant	Positive or negative, significant
INF	Negative, significant	Negative, significant	Negative, significant	Negative, significant
QE1	-	-	Positive, significant	Positive, significant
QE2	-	-	Positive, significant	Positive, significant
QE3	-	-	Positive, significant	Positive, significant

The coefficient of variations (R^2) before QE period is 46.52%. It indicates that 46.52% variations in the dependent variable are explained by the variations in independent variables that we use in this model. While, coefficient of variations (R^2) after QE period is 91.21%. This number is much higher than coefficient of variations before QE period and it implies that 91.21% of variations in dependent variable are explained with independent variables that we use in this model.

IV.2.1. Ted Spread (TED) and Stock Rate of Return (ROR)

From the econometric result above, before and after QE period, lag 12 months of Ted Spread (TED) is 'negative' in affecting Stock Rate of Return (ROR) in Indonesia, but it is 'not statistically significant' with coefficient – 3.020299 and – 1.044852 respectively. This result implies that credit risk is not a significant indicator of stock rate of return (ROR) in Indonesia.

IV.2.2. Real Exchange Rate (RER) and Stock Rate of Return (ROR)

According to the regression result, before and after QE period, Real Exchange Rate (RER) is 'negative and significant' in affecting Stock Rate of Return (ROR) in Indonesia with coefficient –1.55837 before QE period, and –2.923141 after QE period. This coefficient indicates that before QE period, 1% depreciation of RER will decrease ROR 1.56%, with assumption other variables are constant. And, after QE period, the result is not really different that 1% depreciation of RER will decrease ROR 2.92%, with assumption other variables are constant. The effect after QE period is slightly higher than before QE period. In addition, compared to variable Ted Spread (TED), RER is more significant in affecting ROR. This condition might happen since depreciation has led foreign investors to decrease total volume of shares in Indonesia Stock Exchange (IDX) as we can see in figure 4.1 below. For example, in January 2008, when RER depreciated 1.75%, total volume of shares bought by foreign investors (JASXFIBV) was 3,785.08 million shares. On the other hand, when RER appreciated -10.02% JASXFIBV was increased into 7,103.122 million shares in November 2010. Even though coefficient correlation of these two variables does not show negative relationship, but, based on our regression model, it shows 'negative and significant' relationship.

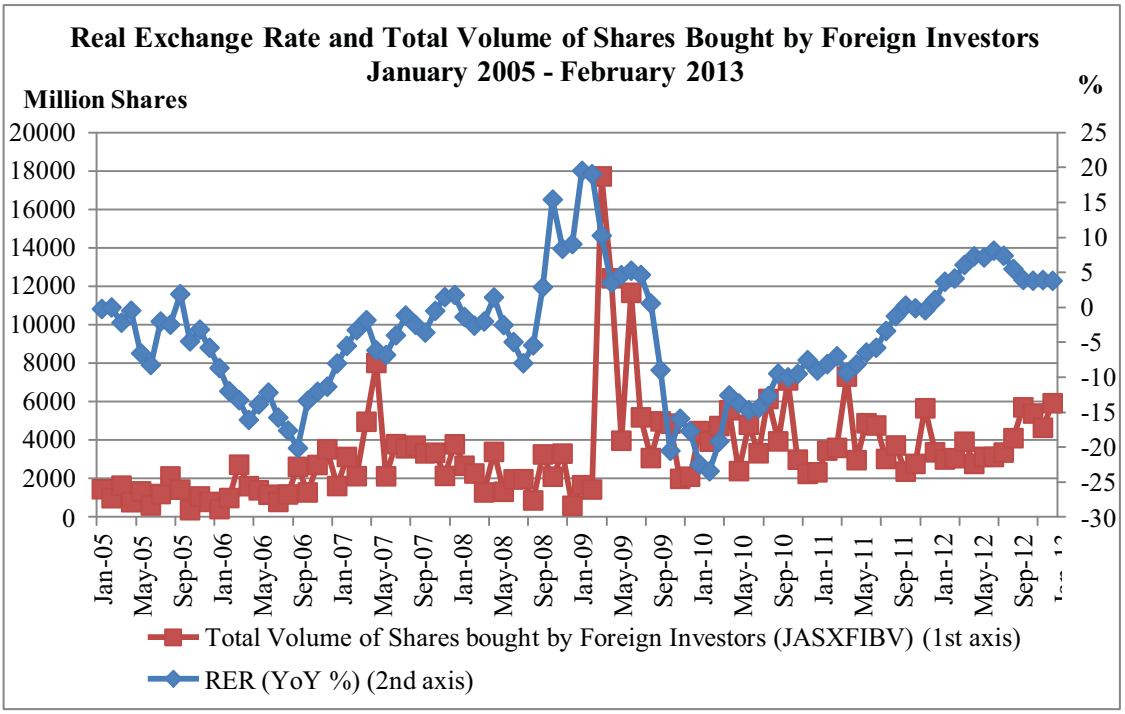

Figure 4.1. Real Exchange Rate (RER) and Total Volume of Shares Bought by Foreign Investors (JASXFIBV)
Source: Indonesia Stock Exchange (IDX) 2014

Foreign purchase is one of important roles to move stock's price in Indonesia since proportion of shares owned by foreign investors in Indonesia is quite high, that is shown with figure 4.2. This figure shows us in 2013, percentage of foreign investor is indeed much higher than local investor with number 62.94% of foreign investor, and 37.06% for local investor. Therefore, those foreign investors will put more attention to fluctuation in foreign exchange market since depreciation of IDR will decrease their return back in USD for example (Montes, and Tiberto 2012).

Figure 4.2. Proportion of Investor's Nationality in Indonesia Stock Exchange (IDX)
Source: Indonesia Central Securities Depository (KSEI)

IV.2.3. Inflation Rate (INF) and Stock Rate of Return (ROR)

According to regression result in equation 4.1 and 4.2, before and after QE period, Inflation rate (INF) is 'negative and significant' in affecting Stock Rate of Return (ROR) in Indonesia, with coefficient - 4.765542 before QE period, and - 6.132262 after QE period. This coefficient implies that before QE period, 1% increase of INF will decrease ROR 4.77%, with assumption other variables are constant. While, after QE period, the effect is quite higher that 1% increase of INF will decrease ROR 6.13%, with assumption other variables are constant.

This result is aligned with our hypothesis. And it might happen since inflation will decrease purchasing power of investors to buy stocks. Therefore, stock price will decrease as well. This condition is supported with figure 4.3. below that shows inflation rate (INF) and total volume of shares bought by domestic investors (JASXDIBV). For example, in November 2005, when inflation rate (INF) YoY % was

18.39%, total volume of shares bought by domestic investors (JASXDIBV) was just 1,071.06 million shares. On contrast, when inflation rate (INF) YoY % was just 7.31% in April 2009, JASXDIBV was 17,711.19 million shares. Moreover, these two relationships calculate correlation coefficient of -0.42. To conclude, it indeed shows negative relationship between inflation rate (INF) and total volume of shares bought by domestic investors (JASXDIBV).

Besides that, another reason that supports inflation rate (INF) has negative relationship with stock rate of return (ROR) is an increase of inflation rate (INF) will decrease net profit of companies.

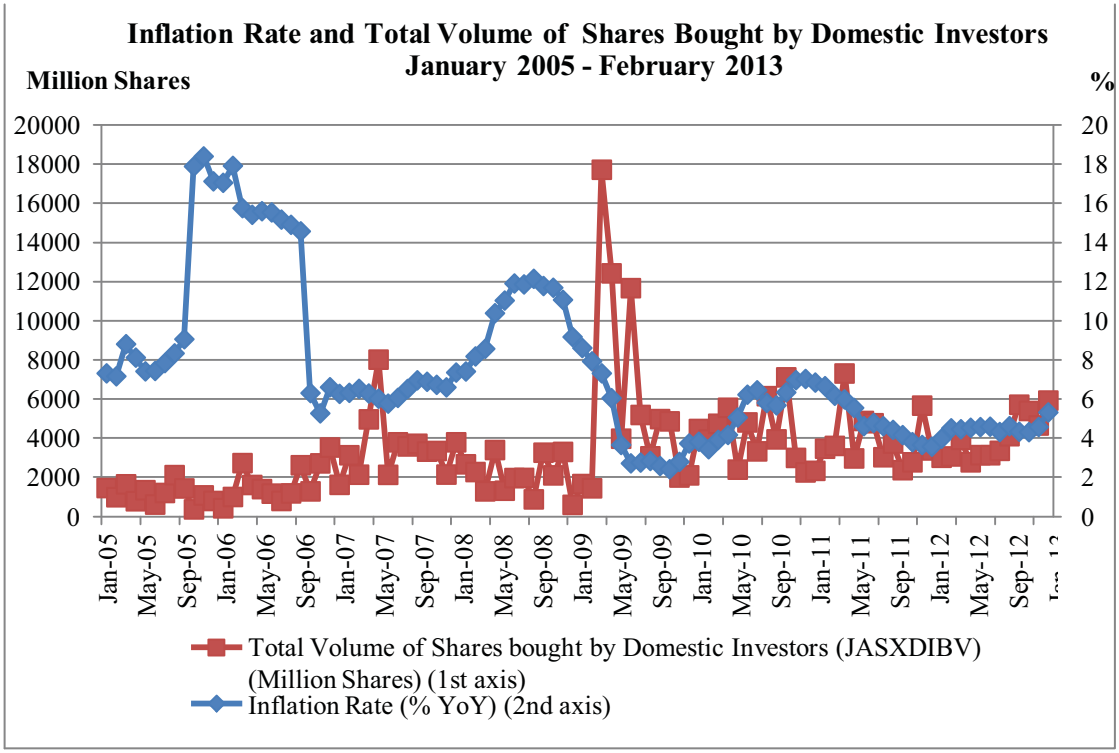

Figure 4.3. Inflation Rate and Total Volume of Shares Bought by Domestic Investors period of January 2005 – February 2013
Source: International Financial Statistics (IFS) and Indonesian Stock Exchange (IDX)

IV.3. Quantitative Easing (QE) and Stock Rate of Return (ROR)

According to regression result in equation table 4.2 QE1 is 'negative, but not statistically significant' in affecting Stock Rate of Return (ROR) in Indonesia with coefficient 8.303715. While, QE2 and QE3 are 'positive and significant' in affecting Stock Rate of Return in Indonesia, with coefficient 10.35788 and 18.12952 respectively. It means that in QE2, period (November 2010 – June 2011), ROR increases by 10.36% in average; with assumption other variables are constant. While in Q3 period (September 2012 – February 2013), ROR increases by 18.13%, with assumption other variables are constant.

There are several reasons why QE will lead to an increase of Stock Rate of Return (ROR). Two of them are, first, According to Pardede (2012), excess liquidity in US will be a surge for capital inflow to Indonesia. In addition, for QE3, even though it will give less impact to real economic sector, but it will give more impact to stock market. This condition is then shown by figure 4.4. below, where during QE3, net foreign purchase increases. From this figure, we can see the shocking thing happened in November 2008 when the first time of QE1 was implemented by the Fed, net foreign purchase increased into IDR 6.5 trillion from IDR 2 trillion in January 2005, and it has made YoY % increase of 923.81% in November 2008. Moreover, higher net foreign purchase happened in April 2011, that was in QE2 period, where net foreign purchase at that time was IDR 17.5 trillion and the YoY % was 1049.20%. Besides that, in February 2013, where it was in period of QE3, net purchase achieved around IDR 11 trillion. This net foreign purchase in February 2013 can be the strong reason why QE3 has higher coefficient to stock rate of return (ROR) in Indonesia as explained by Abarca (2012) that capital inflow gives positive impact to stock market.

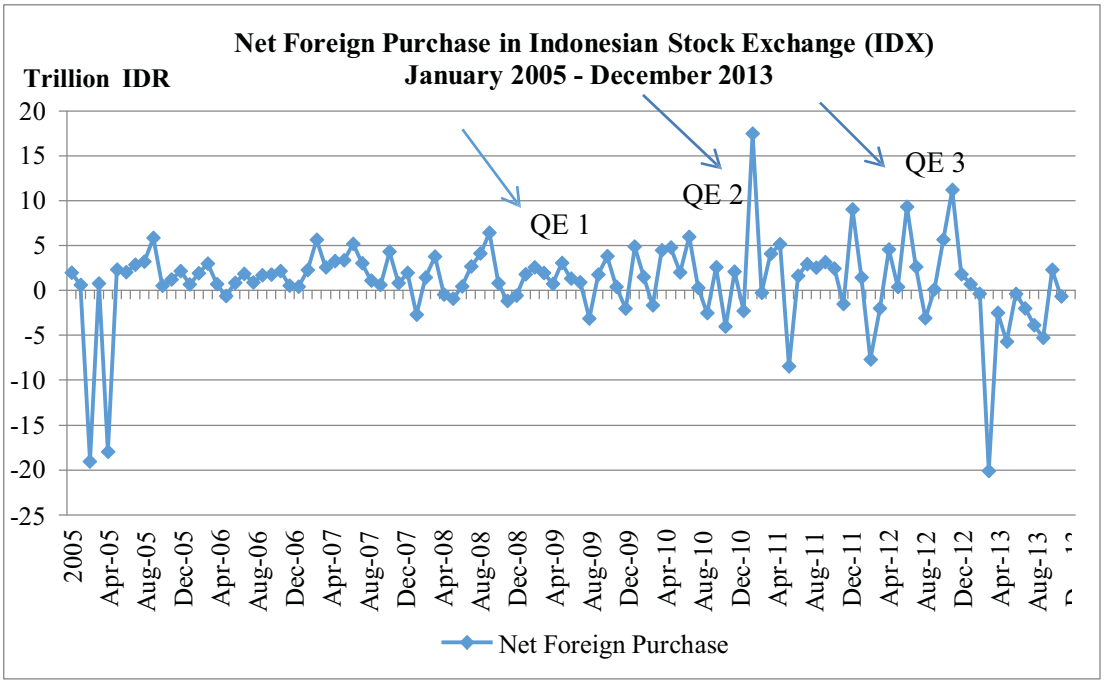

Figure 4.4. Net Foreign Purchase in Indonesia Stock Exchange (IDX) January 2005 – December 2013
Source: Indonesia Stock Exchange (IDX) 2014

Second, QE has made interest rate lower. This lower interest rate will lead to an increase of company's profit since their cost of capital will be lower as well (Matthew 2013). It means that company's debt price has decreased. It is indeed that in QE period, nominal credit interest rate was getting lower as we can see in figure 4.5 In April 2006, nominal credit interest rate was 16.29%; however, during QE 1, interest rate was 14.40% in average. And during Q2, interest rate was 12.67% in average, and in QE3 used in this research, interest rate was 11.58% in average.

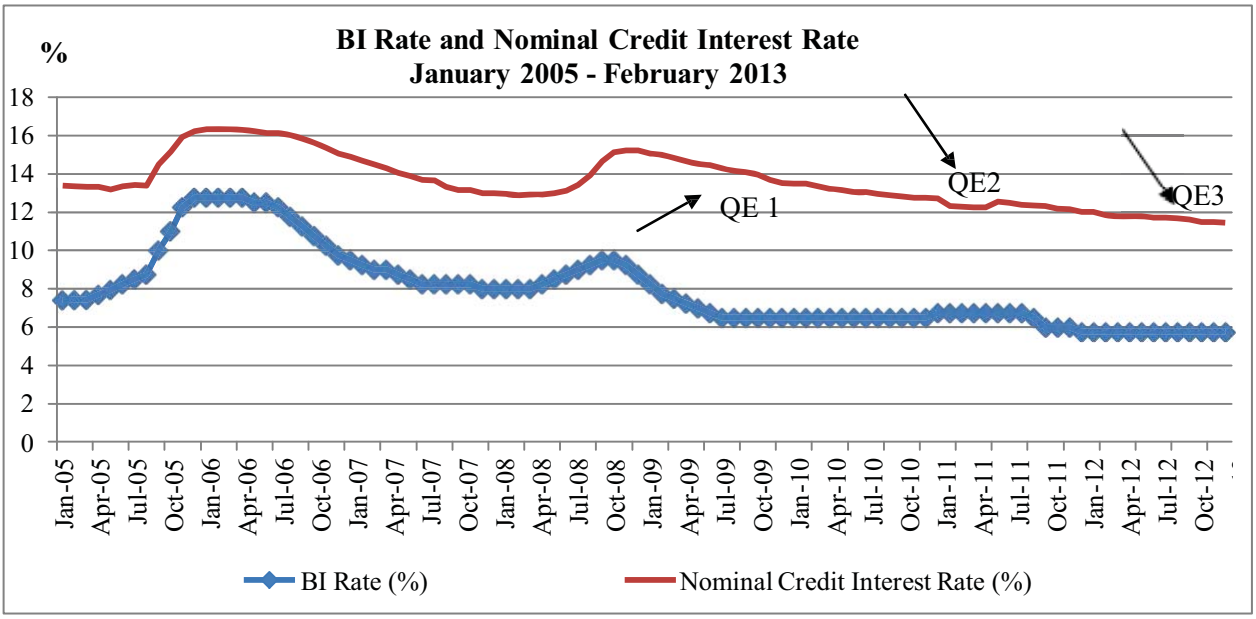

Figure 4.5. BI Rate and Nominal Credit Interest Rate
Source: Bank of Indonesia 2014

CHAPTER V

CONCLUSION

This research examines empirical impact of macroeconomic variables and US quantitative easing (QE) to stock rate of return in Indonesia between before and after QE period. In order to find that empirical result, I analyze monthly data with OLS method (Ordinary Least Square) and separate the regression of model into two periods, those are from January 2005 – October 2008 as the period before QE, and November 2008 – February 2013 as the period after QE. According to the regression result, we can conclude that before and after QE period, 12 months lag of Ted Spread (TED) is 'negative' in affecting Stock Rate of Return (ROR) in Indonesia, but this is 'not statistically significant'. On the other side, Real Exchange Rate (RER) and Inflation Rate (INF) are 'negative and significant' in affecting Stock Rate of Return (ROR) in Indonesia for period before and after QE period. The reason behind this is RER may affect number of total shares bought by foreign investors and INF may lead to decrease total volume of shares bought by domestic investors.

While, for variable Quantitative Easing (QE), that is divided into three QE (QE1, QE2, and QE3), we can find that only QE 2 and QE 3 which are 'positive and significant' in affecting Stock rate of Return (ROR) in Indonesia); while, QE 1 is 'positive as well, but not statistically significant'. In addition, further analysis regarding QE, it affects stock rate of return in Indonesia (RER) through net foreign purchase in Indonesia Stock Exchange (IDX).

From the analysis that I do in this research, we can conclude that in order to create a more stable condition in stock market that is reflected with stock rate of return (ROR), central bank as monetary policy maker may focus on the policy that will affect real exchange rate (RER) and inflation rate (INF). One of the powerful tools that are frequently used to affect real exchange rate and inflation rate is central bank rate or in Indonesia, it is called as BI Rate.

In addition, even though 12 months lag of Ted Spread (TED) does not show significant impact to stock rate of return in Indonesia during these period, it has negative impact to ROR. It is the sign that an increase of credit risk in Indonesia is potential to decrease ROR in Indonesia. Moreover, even though this credit risk comes from banking sector, we should be aware to the possibility of potential linkage between credit crunch in banking sector and stock market.

After conducting the whole process of this research, I find some limitations of this research that can be suggestions for further study. First, this research does not accommodate many other explanatory variables which may have impact to stock rate of return (ROR) in Indonesia. Second, this research uses only Ted Spread (TED) as the indicator of credit risk; while, further study is able to use another variable as indicator of credit risk in Indonesia. Third, further study may see other risks as well other than credit risk and market risk, like sovereign risk, operational risk, and other risks. Even though, based on this research, credit risk does not give significant impact to stock rate of return in Indonesia, it is worth noting that inflation rate, real exchange rate, and USA quantitative easing give significant impact to stock rate of return in Indonesia. It shows that stock market in Indonesia is indeed influenced by internal, as

well as external foreign factors.

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