

The Effect of Macroeconomic Variables and United States Economic Crisis on LQ 45 Index in Indonesia Stock Exchange

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Abstract

This study aims to determine the effect of macroeconomic variables (inflation, economic growth, interest rates, exchange rates) and United States economic crisis both simultaneously and partially to the LQ 45 Index on the Indonesia Stock Exchange. The sample in this study uses the LQ 45 Stock Price Index data in the period 2007 to 2018 with monthly data. The type of data used in this study is secondary data. Data analysis in this study uses multiple linear regression analysis. The results of this study indicate that simultaneously macroeconomic variables (inflation, economic growth, interest rates, exchange rates) and the United States economic crisis significantly influence the LQ 45 Index. Partially the results of this study indicate that inflation does not significantly influence the LQ 45 Index. Economic growth has a positive and significant effect on the LQ 45 Index. Interest rates negatively and significantly affect the LQ 45 Index. The exchange rate has a positive and significant effect on the LQ 45 Index. The United States economic crisis has a negative and significant influence on the LQ 45 Index.

Keywords: *macroeconomic variables, United States economic crisis, LQ 45 Index*

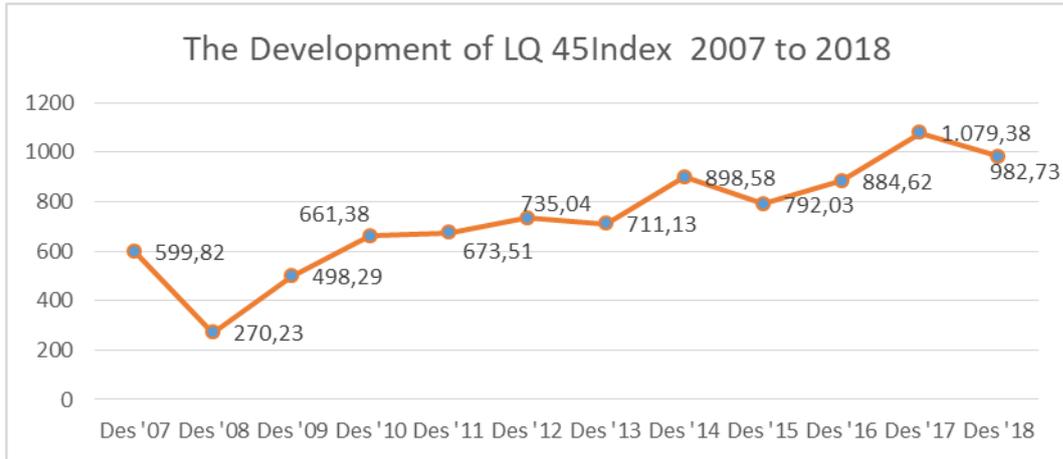
Introduction

One of the objective of investment is to earn profits in the future. Investing can be done in several ways, namely in the form of investment *real asset* and investment through *financial asset*. One of the investment alternative form of *financial asset* that can be done is by investing in the capital market. Martalena and Malinda (2011) stated that the capital market is a market for sharing of financial instruments that can be traded, either bonds, stocks, mutual funds, derivatives and other instruments. With the development of capital markets, the investment alternatives are no longer limited to real assets and deposits in the banking system, but investors can invest their funds in the capital market, either in the form of stocks, bonds, and securities (financial assets) others.

According to Director of Development at the Indonesian Stock Exchange Nicky Hogan one quite profitable investments in the caapital market is to invest in stocks. Further explained when viewed from the Growth Composite Stock Price Index (GCSPI), the Indonesian capital market growth in the last 20 years (1998 -2018) was quite good. GCSPI value at the end of December 1998 around 398.04 points and at the end of December 2018 GCSPI has touched the 6190 level. It means, in the last 20 years GCSPI has been increased to 15 times or grown about 1,400%.

Information related to stock market performance is often summed up in a stock market index or stock price index (Tandelilin, 2010), Stock market index is an indicator that describes the movement of stock prices. By knowing the position of the index, investors can determine decision to be taken against the shares they own, either sold, purchased or retain the stock. The number of the indices listed on the Indonesia Stock Exchange are 22 types of stock index by CSPI (Composite Stock Price Index) as a component of the index calculation on all the shares listed on the stock. From the various existing index, one of the index that the most frequently used as an indicator of stock movement in Indonesia is LQ 45.

LQ 45 Index is an index that contains 45 the most liquid stocks listed companies to cover 70% of capitalization and value of transactions in the Indonesian stock market. Beside high liquidity, the development of LQ 45 index was also quite good, as presented in the following graph:



Source: Data from the Financial Services Authority (Capital Market Statistics 2018)

Figure 1 The Development of LQ Index

Based on picture 1, it is known in the period 2007 to 2018 the development of LQ 45 index tend to be volatile. At the end of 2008, LQ 45 index touch the number of 270.23, but rebound with a value of 982.73 at the end of 2018. Along with the development of good and sufficient liquidity and large value of capitalization, often LQ 45 index is used as a means of objective by the financial analysis, investment managers and investors as a reference in view the price movements of stocks actively traded on the Indonesia stock Exchange.

The movement of stock prices in the capital market does not happen by itself, but is influenced by various factors. One theory regarding the factors that affect stock return is *Arbitrage Pricing Theory* (Ross, 1976). *Arbitrage Pricing Theory* is based on the view that the expected return on a security is affected by several risk factors that indicate the economy in general and not the special characteristics of the company. Risks in the theory represented in macroeconomic factors. Based on research conducted by Chen, et al (1986), Siegel (1991), Narayan and Narayan (2012), Bhargava (2014) which states that the macro-economic variables have a significant influence on stock prices. It is also stated by Tandelilin (2010,341) that one of the factors that affect stock prices are macroeconomic variables, fluctuations in the capital markets associated with changes in various macroeconomic variables. Samsul (2015) also explained that the changes in the macroeconomic variables have a different impact on a stock price. Based on the theory and the study it can be concluded that there is a strong relationship between stock prices and macroeconomic performance, thus the high and low LQ 45 index is affected by changes in macroeconomic variables.

The Indonesian government annually determines the basic assumptions of macroeconomic indicators used are: inflation, economic growth, interest rates, exchange rates, oil prices and oil lifting. But in the study, these authors only examined four macroeconomic variables, namely inflation, economic growth, interest rates, and exchange rate on the LQ 45 index. The following is data on the growth LQ 45 index and macroeconomic variables Indonesia in 2016-2018.

Table 1 Growth LQ 45 Index and Macroeconomic Variables Indonesia in 2016-2018

Year	LQ 45 Index	%	Inflation	%	Economic Growth	Interest Rates	%	Exchange Rate	%
2016	884,62		3,02%		5,02%	4,75%		13.485	
2017	1.079,38	22,02%	3,71%	22,85%	5,07%	4,25%	-10,53%	13.624	1,03%
2018	982,73	-8,95%	3,13%	-15,63%	5,17%	6,00%	41,18%	14.569	6,94%

Source : Data compiled from www.idx.co.id and Indonesian Bank

Based on Table 1 shows the growth of LQ 45 index in the last 3 years, which in 2017 LQ 45 index experienced steady growth which is about 22.02%, but experienced a negative growth of 8.95% in 2018. Meanwhile, inflation in 2017 has increased by 22.85% and decreased in 2018 amounted to 15.63%. The first of

macroeconomic variables used in this research is inflation. Tandelilin (2010:342) states that inflation is a situation where the rising prices sharply (absolute) which lasts continuously for long periods of time. The high inflation or even uncontrolled can cause a decline in purchasing power. Dornbusch, R; Fischer (2008) expressed in terms of the company, the increase in inflation can reduce the level of income of the company. One of the factors that led to the decline in revenue is due to increases in the prices of goods that have direct impact on the increase in operating costs. Based on these, the inflation may reduce profits of a company and lead to the securities in the stock market into a commodity that is not interesting. Thus of these explanations can be concluded that inflation is negatively related to LQ 45 index, but based on table 1 conditions that occur on the contrary, in 2017 the rise in inflation followed by a rise of LQ 45 index.

The second macroeconomic variables is economic growth. Gross domestic product is a measure of the total production of goods and services a country, rapid GDP growth is an indication of economic growth (Tandelilin, 2010). Economic growth encourage in consumer purchasing power against the products of the company thereby increasing the profitability of the company that also enhance the company's stock price. Thus, economic growth has positive influence on LQ 45 index, but based on Table 1 above in accordance with the existing theory in 2017 increased by 5.07% economic growth LQ 45 index increased by 22.02%, but in 2018 a different condition occurs when the economic growth increased by 5.17% LQ 45 index declined by 8.95%.

The next macroeconomic variables used in this research is the interest rate. The interest rate is a price to be paid on the borrowed funds, in terms of interest rate investors are investment profits earned, but for companies the size of the capital costs to be incurred by the company when using loans from investors. According to Brigham and Houston (2014) higher interest rates will affect the present value of cash flows of the company, which resulted in the opportunity to undertake investment activities become unattractive to be taken, so that the value of the company will decrease that also cause a decline in stock price. It can be concluded that the interest rate has a negative relationship to LQ 45 index. The data from the table 1 is same with that theory, when the high interest rates in 2017 declined by 10.53% LQ 45 index increased by 22.02% and when the high interest rates increased by 41.18% LQ 45 index declined by 8.95%.

The last of macroeconomic variables used in this research is the exchange rate of rupiah against the US Dollar. The exchange rate is the price of a currency against other currencies. Sawaldjo (2004:212) explain the definition of the exchange rate is a price at which a country's currency is exchanged for another country's currency. According to Dornbusch, R; Fischer (2008:46) increase in the exchange rate currency in the country called on foreign currency appreciation, while the decline in the exchange rate is called the depreciation of the domestic currency. According to Granger, et.al (1998) theoretically direction of the relationship between the exchange rate and the stock price can be positive or negative, this can be explained by traditional approaches and models of portfolio balance.

In the traditional approach of exchange rate changes affecting the competitiveness of a company, because of exchange rate movements affect the value of the future payments of a company, especially for transacting using foreign currencies. This approach suggests that the relationship between exchange rates and stock prices is positive. The positive relationship occurs because of the effects of exchange rate fluctuations that affect the company's revenue and operating costs, which in turn causes a change in its stock price. While the portfolio balance approach states that there is a negative relationship between stock prices and exchange rates. This approach assumes the shares are part of the wealth that can affect the behavior of the exchange rate through the law of demand for money, an increase in demand for domestic currency causes domestic exchange rate appreciation because it would attract capital into the domestic market which led to rising stock prices. Based on both the theory that the exchange rate against the US dollar amount can be positive or negative effect on LQ 45. The data in Table 1 show that whereas in 2017 the increase in the exchange rate of 1.03% followed by a rise of 22.02 LQ 45 Index %, but the increase in the exchange rate amounted to 6.94% in 2018 LQ 45 Index decreased by 8.95%.

Beside of macroeconomic variables, control variables are also used in this research. Samsul (2015:210) explains there are several factors that can affect the performance of the stock one of which is an international

economic conditions. One of the countries with the largest and most influential economy in the world is the United States. In mid-2007 The United States was affected an economic crisis, the economic crisis caused by the breakdown of property loans that ended in March 2009. Various empirical studies on the effect of macroeconomic to the stock price had a lot to do, but unlike the previous study authors wanted to add the economic crisis other countries on the price of LQ 45 index. Therefore, the author added the US economic crisis in view of its influence on the LQ 45 index.

Based on research that has been done before, the result of research that is different in every country. Talla (2013) find research that inflation and the exchange rate has a negative and significant impact on stock prices, while the interest rate has a negative correlation to the stock price, but not significant. Alihasanzadeh and Mehran Kianvand (2012) find results that gross domestic product growth and significant positive effect on stock prices, while the exchange rate, significant negative effect on stock prices. Kewal (2012) find results that level inflation, interest rate and growth GDP not have influence that significant to stock price, while exchange rate rupiah take effect negative and significant to Composite Stock Price Index (CSPI).

Based on the above phenomenon, the author is very keen to conduct research entitle the effect of macroeconomic variables and the US economic crisis on LQ 45 index in the Indonesia Stock Exchange.

Methods

This research is a quantitative study about the influence of macroeconomic variables (inflation, economic growth, interest rates, exchange rates) and economic crisis towards LQ 45 index. The population in this research is the Stock Price Index LQ 45, with the sample that is used Stock Price Index LQ 45 within the period of 2007 to 2018 in the form of monthly data. The analysis technique used is multiple linear regression analysis.

Results and Discussion

Based on the results of multiple linear regression analysis was used to test the influence and direction of the relationship of independent variables of inflation, economic growth, interest rates, and exchange rate on the LQ 45 index in the Indonesia Stock Exchange obtained results as shown in Table 2 below :

Table 2 Results of Multiple Linear Regression Analysis

Model	unstandardized		standardized	t	Sig.
	Coefficients		Coefficients		
	B	Std. error	Beta		
1 (Constant)	-8.061	1.424		-5.662	,000
Inflation	1,076	1.056	,067	1,019	,310
Economic growth	25,200	3.262	,584	7.726	,000
Interest Rate	-7.480	1,826	-,298	-4.096	,000
Exchange rate	1,470	0.133	,841	11.027	,000
Crisis	-0.307	0.055	-,330	5,548	,000
R2				0.715	
adjusted R2				0.704	
F-Count				66.651	
F sig				0,000	

Source: SPSS Statistics 21.0 Processed in 2019

From the table above can be specified multiple regression equation as follows:

$$LQ\ 45 = \beta_0 + \beta_1\ Inf + \beta_2\ EG + \beta_3\ Interest + \beta_4\ Exchange + \beta_5\ Crisis + e$$

$$LQ\ 45 = -8,061 + 1,076\ Inf + 25,200\ EG - 7,480\ Interest + 1,470\ Exchange - 0,307\ Crisis$$

With:

LQ 45	= Stock Price Index LQ 45
Inf	= Inflation
EG	= Economic Growth
Interest	= The interest rate
Exchange	= Exchange Rate
Crisis	= Dummy economic crisis in period t (0 or 1)
B_0	= Constant regression
$B_1, \beta_2, \beta_3, \beta_4, \beta_5$	= Coefficient of regression
e	= Error Disruptors

From equation model formed multiple regression shows that the value of the constant is generated is equal to -8.368, The results showed that when it was assumed there was no change inflation, economic growth, interest rates, exchange rates and variable control of the economic crisis, then change LQ 45 index in the Indonesia Stock Exchange decreased by a constant that is -8.368, Based on the multiple regression model formed from Table 2 above, it appears that the inflation coefficient is positive for 1.076. These results suggest that the higher inflation will push up LQ 45 index amounted to 1,076 units, assuming other variables held constant. Based on Table 9 model formed multiple regression showed coefficient is positive for economic growth 25,200. The resulting coefficient values indicate that the increase economic growth will push LQ 45 index at 25,200 units, assuming other variables held constant.

From model regression formed based on Table 2, it appears that the interest rate coefficients are negative for -7.480. These results indicate that an increase in interest rates will cause a decrease in LQ 45 as -7.480 unit assuming other variables held constant. In accordance with the formation of model regression shows that the coefficient of the exchange rate is positive for 1,470. These results suggest that the increase in the exchange rate will lead to an increase in LQ 45 as many as 1,470 units, assuming other variables held constant. Coefficient value of the economic crisis from model regression formed negative sign for 0.307. These results suggest that if the US economic crisis will decreased LQ 45 index 0.307 units, assuming other variables held constant.

Feasibility Test

Based on Table 2 above, it is known F count equal 66.651 Thus F count > F table (66.651 > 2.282) then H_0 accepted and rejected, meaning that inflation, economic growth, interest rates, exchange rates, and the economic crisis jointly significant effect on LQ 45 index.

On stages of testing the F-statistic is based on Table 2 obtained sig 0.000. At the stage of data processing used an error rate of 0.05. The results obtained showed that the value of sig 0.000 < alpha of 0.05 then the decision is H_0 refused and H_a is received so that it can be concluded that inflation, economic growth, interest rates, exchange rates, and the economic crisis jointly significant effect on the LQ 45 index in The Indonesia Stock Exchange.

Ghozali (2009) stated that the R^2 value close to unity means independent variables provide almost all the information needed to predict the variation of the dependent variable. Based on the test results in Table 2 above was obtained R^2 0.715, meaning that 71.5% predictive LQ 45 can be explained by the five independent variables (inflation, economic growth, interest rates, exchange rates, and the economic crisis), while 28.5% others are other variables that are not used in this study.

However Ghozali (2009) stated that the fundamental weakness of the use of the coefficient of determination is biased against the number of independent variables included in the model. Each additional one independent variable, then R^2 will certainly increase regardless whether these variables significantly influence the dependent variable. Therefore, many researchers advocate for the use of Adjusted R^2 value when evaluating which best regression model. Unlike R^2 , adjusted R^2 value can go up or down when the

independent variable is added to the model. From the results of adjusted R^2 values were also obtained a value of 0.704 then it can be concluded that predictive LQ 45 index can be explained by five independent variables (inflation, economic growth, interest rates, exchange rates, and the economic crisis) that is equal to 70.4%, while the remaining 29.6% is influenced by other variables not used in this research.

Hypothesis testing

Hypothesis 1

Hipotesis in the first test phase based on Table 2 aims to demonstrate empirically the effects of inflation as measured by the rate of inflation to LQ 45 index gained sig at 0.310. In this test phase error rate is used for 1%, 5% and 10%. The results obtained show that the sig of $0.310 > 0.1$ alpha, that it can be concluded that inflation as measured by the rate of inflation does not significantly affect the LQ 45 index in the Indonesia Stock Exchange, it can be assume to be the first hypothesis rejected.

Hypothesis 2

The second hipotesis testing based on Table 2 which aims to demonstrate empirically the effect of economic growth as measured by the rate of economic growth towards LQ 45 Index. Based on obtained data sig value of 0.000. The results obtained show that the value of sig $0.000 < \alpha 0.01$ then the decision is accepted. Then it can be concluded that the economic growth as measured by the rate of economic growth effect positively and significant towards LQ 45 index in the Indonesia Stock Exchange, it can be assumed second hypothesis is accepted.

Hypothesis 3

The third hypothesis which states SBI interest rate is negatively and significant effect towards LQ 45 index in the Indonesia Stock Exchange is acceptable. This is because the value of the probability of testing has been done obtain the results of 0.000. These results show that the value of sig $0.000 < \alpha$ of 0.01. It can be concluded that the level of interest rates as measured by the SBI interest rate is negative and significant effect towards LQ 45 index in the Indonesia Stock Exchange.

Hypothesis 4

Table 2 shows the rate coefficient 1.470 with a probability value 0.000. These results indicate that the value of sig $0.000 < \alpha 0.01$ then the decision is accepted, it can be concluded that the exchange rate as measured by the rupiah per US dollar affect positively and significantly related to LQ 45 index in the Indonesia Stock Exchange , it can be assumed the fourth hypothesis is accepted.

Hypothesis 5

Based on the test results to the fifth hipotesis which aims to demonstrate empirically the effect of the control variables of economic crisis towards LQ 45 Index. Based on Table 2 the test results shows the value of the probability value 0.000. The results obtained show that the value of sig $0.000 < \alpha 0.01$ then the decision is accepted. It can be concluded that the US economic crisis effect negatively and significant on LQ 45 index in the Indonesia Stock Exchange.

The Effect of Inflation on LQ 45 index in the Indonesia Stock Exchange

Based on the results of hypothesis testing found that inflation variable has no effect on LQ 45 index in the Indonesia Stock Exchange (BEI). Thus the inflation tends to be accompanied by price increases do not affect the profitability of companies that include into LQ 45 Index. This may be due to the rate of inflation in Indonesia within the range of the research period (2007 to 2018) is still in the category of mild inflation at an average below 10% a year, despite the increase in production costs for companies that include in LQ 45 Index, the company can still maintain profitability of the company by making efficiency and increase selling

prices in line with cost increases production, thus the value of the company's shares remain intact and are not affected by inflation.

The results obtained in this research are consistent with Kewal (2012) which found that inflation is not shown to affect the stock index. This occurs because the capital market is still an attractive place for investors if the inflation rate is still below 10 percent. Different results obtained Talla (2013), Thobarry (2009), Gan, C., et al (2006) and Menike (2003) who find results that inflation negatively affected by stock prices, the negative effect occurs because of an increase in inflation causes a decrease in purchasing power that may affect the company's stock price.

The Effect of Economic Growth Toward LQ 45 Index in the Indonesia Stock Exchange

Based on the results of hypothesis testing found that the variables of economic growth and a significant positive effect on LQ 45 index in the Indonesia Stock Exchange (BEI). The results show that economic growth has a positive impact on stock prices of companies listed in the LQ 45 to lead to an increase in LQ 45 itself. One of the factors that promote economic growth is an increase in consumption, the increase in private consumption will automatically increase the demand for the company's products. There is an increasing demand for the company's products in the company the opportunity to benefit also increased, it positively effect on the company's stock price. The increase in stock prices that causes LQ 45 index also increased.

The results of this research are consistent with research Hasanzadeh and Kianvand (2012) which found that economic growth is positive and significant impact on the stock price index. The results of this research are also consistent with the Arbitrage Pricing Theory stating macroeconomic variables have a systematic influence on the stock market return. This shows that economic growth increases the purchasing power of people to make the consumption of goods and services thereby increasing profits which then affect the stock price of the company itself, then economic growth as one of the macroeconomic variables have an influence on the LQ 45 Index.

Although based on the existing theories and some previous studies show that economic growth has a positive effect on stock prices, but the different results of studies obtained Thobarry (2009) who find the result that economic growth does not affect the stock price index as investors prefer other investment sources rather than invest by buying shares.

The Effect of Interest Rate on LQ 45 Index in the Indonesia Stock Exchange

Based on the results of hypothesis testing found that variable interest rates negatively effect and significant on LQ 45 index in the Indonesia Stock Exchange (BEI). The results of this study indicate that any occurrence of rising interest rates will impact on the decline in LQ 45. This happens because of the possibility of a majority of the companies listed in the LQ 45 using capital from the loan. Thus the rise in interest rates become negative signal for the companies listed in LQ 45. For the companies of high interest rates will affect the present value of a company's cash flo, it cause the existing investment opportunities are not attractive anymore. The high interest rates also will increase capital costs to be borne by the company, the increase in these costs will directly affect the profits earned by the company,

The result of this study is in line with a study conducted by Gupta & Modise (2013), Talla (2013), Menike (2003), and Salim (2013), it is found that the level of interest rates negatively effect and significant on the stock price index. This matter in line with the Arbitrage Pricing Theory that state that macro economic variables have a systematic influence on the stock market return, rising interest rates led to an increase in the capital costs to be borne by the company, it cause the negative impact on corporate earnings.

The Effect of Exchange Rates on LQ 45 index in the Indonesia Stock Exchange

Based on the fourth hypothesis testing showed that the variables significantly influence the exchange rate of LQ 45 index in the Indonesia Stock Exchange (BEI), with the direction of a positive relationship. These results show that the increase in exchange rate of US dollar against the rupiah would increase LQ 45. A

positive relationship occurs because of the effects of exchange rate fluctuations that affect revenue and operating costs companies listed in LQ 45. The positive effect of showing that the majority of companies in LQ 45 receive income in foreign currency are greater than its operating costs, due to the company in LQ 45 who receive payments denominated in foreign currencies will have positive benefits from the increase in exchange rate of US dollar against the rupiah.

The results are consistent with the results of Peiró (2016), Thobbarry (2009) found that exchange rate positively impact and significant on the stock price index, but the positive effect was due their shares by foreign investors demand higher as a result of the strengthening of the US dollar exchange rate against Rupiah.

The Effect of the Economic Crisis Towards LQ 45 Index in the Indonesia Stock Exchange

Based on the hypothesis filings found that if the condition of the United States economy was not good, it will negatively effect and significant on LQ 45 index in the Indonesia Stock Exchange (BEI). These results indicate the condition that the US economy has an influence on LQ 45, the condition of the United States economy is not good will negatively affect the LQ 45, this happens because the likely companies listed in the LQ 45 has a transaction directly or indirectly to the counterparty in United States. On the contrary negative influence would occur if the US experienced an economic crisis then automatically request and needs to be reduced, and the goods to the United States will affect the revenue for companies in LQ 45 that conduct transactions with United States country, either directly or indirectly. The results are consistent with Mita Nezky (2013) stating that the economic crisis the United States is negatively effect and significant on the capital market in Indonesia, it happens because the Indonesian capital market is still dominated by foreign capital markets, then in case of shock on stock markets abroad will have negative effects on Indonesia capital markets. Different results obtained by Daryatno and Ramli (2013) stating that the economic crisis did not have a significant effect on stock prices because the orientation of Indonesian exports not dependence on US, but spread to other countries such as the Middle East, Asia, and Africa. Thus Indonesia's exports to the United States do not affect the sales of the companies listed on the exchange.

Conclusion

Based on the analysis and discussion about the influence of macroeconomic variables (inflation, economic growth, interest rates, and exchange rates) and US economic crisis on LQ 45 at the Indonesian Stock Exchange, it can be concluded that simultaneously macroeconomic variables (inflation, economic growth, interest rates, exchange rates) and the US economic crisis significantly influence the LQ 45 Index.

In the partial results of this study indicate that inflation does not significantly affect the LQ 45 Index. Economic growth has a positive and significant effect on LQ 45. The interest rate is negatively effect and significant on LQ 45. The exchange rate effect positively and significantly on LQ 45. US economic crisis give negative and significant impact on the LQ 45.

Based on the presented research, the results of this study can be used by business people both personal and company as a reference in choosing an investment decision in the form of stock purchasing, especially in determining the right time to make stock purchasing by looking at existing macro-economic conditions. In addition, the government can use the results of this study as a consideration in order to make economic policy, particularly in creating a fiscal stimulus to boost stock investment in Indonesian Stock Exchange, it is hoped that investment improvement would boost Indonesian economy.

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