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Analysis of Determinants of Stock Transaction Volume and Its Effect on the LQ45 Stock Price Index on IDX 2010-2020 Period

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Abstract
The LQ45 stock index is a stock index that concerns investors in monitoring the development of company performance that is included in the LQ45 index calculation. Several factors that can cause the movement of the LQ45 stock index include BI interest rates, exchange rates, and global stock exchanges such as the Shanghai Composite Index. The study was conducted to determine the effect of the BI interest rate, dollar exchange rate, yuan exchange rate and the Shanghai Composite Index (SSE) on the LQ45 stock index. The study was conducted using 121 samples consisting of monthly data for all variables from 2010 to 2020. Data analysis was performed using multiple linear regression analysis techniques. The results show the BI interest rate, dollar exchange rate, yuan exchange rate and Shanghai Composite index simultaneously have a significant effect on the LQ45 stock index. BI interest rate and yuan exchange rate partially have a significant effect on the LQ45 stock index. The dollar exchange rate and Shanghai Composite index have no significant effect on the LQ45 stock index. The BI interest rate, dollar exchange rate, yuan exchange rate and Shanghai Composite index simultaneously affect volume of transactions. Partially, BI interest rate, dollar exchange rate, yuan exchange rate have a significant effect on transaction volume, while Shanghai Composite index has no significant effect on transaction volume. Simultaneously, BI interest rate, dollar exchange rate, yuan exchange rate, and Shanghai Composite index have a significant effect on the LQ45 stock index with transaction volume as an intervening variable.

Keywords: LQ45 Index, BI Interest Rate, Dollar Exchange Rate, Yuan Exchange Rate, SSE Index, Transaction Volume

1. Introduction

The stock market is a place for trade long-term instruments. Long-term instruments such as bonds, stocks, mutual funds, as well as derivative and other instruments. One of the long-term instruments that attract investors

is stocks. Capital gains and dividends are benefit from stock investing. However, stock investing also a high risk level of investment, so there are many factors to become attention for stock investing, one of them is through the stock price index.

There are many stocks index in Indonesia Stock Exchange such as LQ45, JII, Kompas 100 and others. The LQ45 index is a concern of investors in stock investment. The index consists of 45 company stocks. The LQ45 stock price index covers at least 75% of the capitalization and transaction value of stock on the IDX. The LQ45 index describes the fluctuations in actively traded stocks and is able to influence stock market conditions. This is because the LQ45 stock price index has a high level of liquidity and is supported by the company's good financial condition. The LQ45 index will move up if the movement of stock prices in general increases. Likewise, the LQ45 stock price index will move down if the stock price movement, in general, has decreased. The increase and decrease in stock prices are reflected in the size of the trading volume of stock. The volume of stock transactions describes the activity of buying and selling stock at one time. This can have an influence on the stock price index, include LQ45 stock price index.

In addition, several macroeconomic factors can influence stock investment activities. According to Zulaikha (2013), economic conditions and macroeconomic variables are factors that have an effect and cause stock prices and its returns have change continously. Investors will see economy condition of the Indonesia through macroeconomic factors. There are many macroeconomic factors such as inflation, interest rates, and exchange rates.

The BI interest rate is a monetary policy instruments based on a Bank Indonesia. The value of interest rates can influence on country's economy. The movement of interest rates is volatile. It depends by monetary policy in order to maintain economic stability.

The exchange rate is a value of exchange in trade between countries. Exchange rates is also means "investing" by investor. According by Murtini & Septivanie (2016), fluctuations in the dollar and yuan exchange rates can influence the movement of the stock price index. Another study by Haryogo (2013) shows the exchange rate moves have opposite direction and is not significant with the stock price index. If the exchange rates depreciates, but is predicted that in the future the foreign currency will appreciate, then investors want to move their investment into exchange rates investment with the hope that when the rupiah depreciates, capital gains will be obtained. Another factor that has an influence on the Indonesian capital market is the global economy. Research by Kabigting and Hapitan (2013) shows there is an increasing integration of stock markets between developing countries Indonesia and China. Research by Tita and Stella (2009) also found the SSE index has a significant effect on the stock price index on the IDX.

In addition, capital market movements can be affected by world conditions. According to the OECD, the Covid-19 pandemic affected the third largest economic and social sphere in the 21st century after the 9/11 terror attacks and the 2008 global financial crisis. The Covid-19 pandemic is predicted to create a global recession in 2020 and have a bigger impact than the financial crisis. Global events that occurred in 2008 according to the IMF (2020). This can have an impact on the investment in Indonesia. Based on the phenomena and the differences in the results of the research, the writer needs to study further and conduct research with the title "Analysis of the Determinants of Stock Transaction Volume and Its Effect on the LQ45 Stock Price Index on the IDX 2010-2020 Period.

2. Literature Review and Hypothesis Development

2.1 LQ45 Stock Price Index

The LQ45 stock price index is an index that has a membership of 45 public companies. The LQ45 index is a stock price index with high liquidity and has a large market capitalization and passes the selection based on criteria according to Tandelilin (2010). The LQ45 Index began on February 1, 1997, primarily measuring liquidity in terms of the value of transactions on the regular market. Then there was an increase in the liquidity

measure of the LQ45 stock price index which starting in January 2005, its number of trading days and the number of stock transactions.

Criteria for issuers in the LQ45 stock price index:

- Listed on the Indonesia Stock Exchange for a minimum period of 3 months
- Issuer activity in the regular market is measured by the value and volume of transactions
- Total trading days on the regular market
- Market capitalization in a certain period
- Financial scope and future development of a company

The Indonesia Stock Exchange reviews the performance of company included in the LQ45 stock index. The IDX conducts an evaluation once in a quarter of the order movement of company in the LQ45 index. Change of company in the LQ45 index is carried out once in a period of one semester in early February and August.

2.2 Interest Rate

The Bank Indonesia interest rate [BI Rate] is a policy interest rate that reflects the monetary policy stance or stance set by Bank Indonesia and announced to the public. At 2016, BI set the BI Rate as the interest rate policy in Indonesia. On 19 August 2016, BI increased its strength of monetary operations, Bank Indonesia implemented the BI 7-Day (Reverse) Repo Rate policy.

Interest rates is included in macroeconomic factors. The interest rate is percentage of the interest which is determined by Bank Indonesia. The percentage of interest rates is adjusted with economic conditions to maintain economic stability in Indonesia. So that interest rates becomes attention of investors.

According to Cahyono in Raharjo (2010), an increase of percentage of interest can reduce company income. This has an impact on increasing interest costs and decrease company profits. The decline in profit has a negative effect on investors, so that investors will shift their investment into the form of deposits. Therefore, changes in interest rates can affect the LQ45 stock price index.

2.3 Dollar Exchange Rate

The exchange rate is the value of the domestic currency needed to be equal in value with one unit of foreign currency according to Sukirno (2007). Each country generally has a different currency. In trade transactions between countries, the exchange rate is very important. Trade between Indonesia and other countries is influenced by the exchange rate of the rupiah and the value of other countries. So that the exchange rate has an influence on the economy in Indonesia.

The depreciation of the rupiah resulted in an increase in the value of the company's cost of capital. This increase has an impact on decreasing company profits, and has an influence on investors' interest to invest capital in stocks. The relationship between exchange rate fluctuations and investor interest in stocks is in accordance with the results of research by Hapzi (2017) which states that the exchange rate (USD / IDR) moves in a significant opposite direction to the JCI. Another study according to Agustina and Fitry (2014), there is no significant influence between exchange rates and stock price index movements.

2.4 Yuan Exchange Rate

Based on Central Statistics Agency (2019), imports of goods from China have a percentage of 29.08% or the same value as US $ 67.2 billion. In addition, China also the second largest investment in Indonesia. Trade and investment between countries causes the effect of the yuan exchange rate to the value of the rupiah currency.

Exchange rate able to attracts investors. Investors have profit when the selling value greater than the purchase value. Investments of exchange rates have an impact on stock investment in the capital market. When the value of the rupiah strengthens against a foreign currency, investors will move their funds from stocks to investing in foreign currencies. But, if the rupiah depreciates, investors will sell foreign currency and invest it to stock. Hastina's research (2018) also found that exchange rate movements were unidirectional and significantly affected stock price movements. Research by Anisa and Ari (2018) states that there is no significant effect of exchange rates on the stock price index. This is in line with research by Jaka (2015), where the IDX 30 and JII stock price index movements are not influenced by the yuan exchange rate.

2.5 Shanghai Stock Exchange

The Shanghai Stock Exchange (SSE) is a stock market from China. According to the 2017 China Index fact book, SSE is one of the five largest stock markets in the world based on its market capitalization value of US\$ 3.5 trillion per year in February 2016, and its also the second largest stock market in Asia. Shanghai Stock Exchange was founded on November 26, 1990 with operations starting on December 19, 1990 under the supervision of the China Securities Regulatory Commission (CSRS). Most of the companies listed on the SSE are state-owned companies that have an influence on China's economic growth.

International trade has brought economies integration of countries in the world. The capital market is a reference for the country's economy, and have a relationship due to trade between countries. Other countries investment into domestic capital market is the beginning of the integration of the capital market between countries. Based on research by Kabigting and Hapitan (2013), capital markets in developing countries, Indonesia and China, are increasingly integrated. According to Fikri's research (2012), the China HangSeng index has a movement that is in line with the JCI and is significant. Other research results by Dionysia et al. (2014) stated that the Chinese stock index (SSE) had a significant influence on the JCI.

2.6 The Effect of Stock Transaction Volume on the LQ45 Index

In stock investing, various kinds of stock information is important. Some of the information includes speculation, such as the price and volume of transactions and rate of return on stocks according to Pratama (2015). Investors' reviews are mainly carried out on the volume of stock transactions to facilitate transactions of stock. The volume of stock transactions includes the total transactions that have been carried out at an issuer of stock at a certain time on the stock exchange.

Ong's research (2011: 101) in Haosana (2012) includes trading volume is information in stock transactions in the form of trading activities during a session. Transaction volume provides an overview of the level of stock liquidity. The greater volume of stock transactions indicates high transaction activity in a stock. But, when the volume of stock transactions decrease, it indicates low transaction activity in a stock.

In addition, according to Aliwu (2013) trading volume has an effect on the rate of return of company stock with a directly proportional relationship if the volume of traded stock increases, the increase also occurs in stock returns. This is reinforced by the results of research by Fikri (2012), the volume of stock trading has a unidirectional movement and has a significant effect on the composite stock price index. However, according to research by Faizatul, et al. (2017) found no significant effect of transaction volume on the composite stock price index.

2.7 Thinking Framework

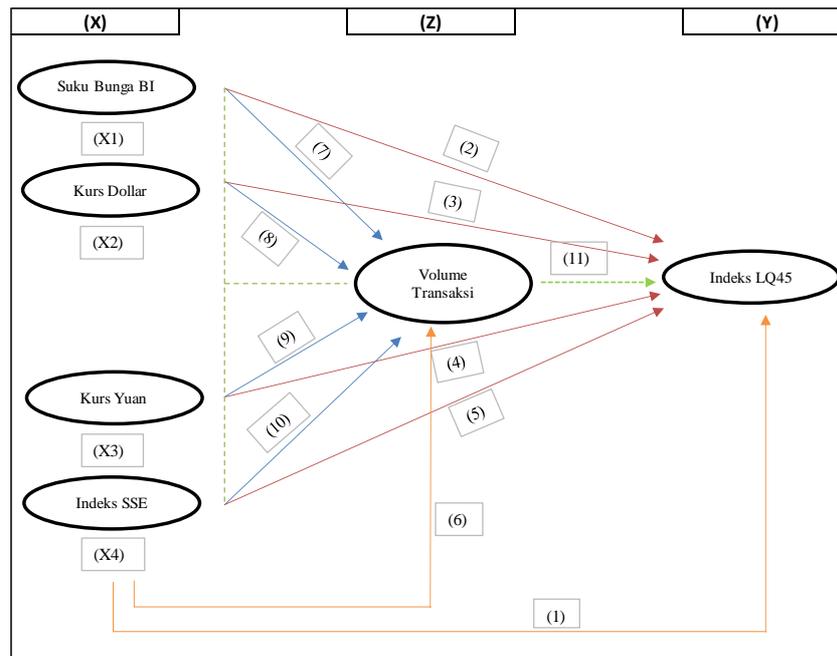The mindset in this study is presented in the following figure:

Figure 2.1: Thinking Framework

Based on the picture of the framework above, the research hypothesis is:

H1: *It is suspected that there is an effect of the BI interest rate, dollar exchange rate, yuan exchange rate, SSE index simultaneously on the LQ45 index.*

H2: *It is suspected that there is an effect of the BI interest rate on the LQ45 index.*

H3: *It is suspected that there is an effect of the dollar exchange rate on the LQ45 index.*

H4: *It is suspected that there is an effect of the yuan exchange rate on the LQ45 index.*

H5: *It is suspected that there is an effect of the SSE index on the LQ45 index.*

H6: *It is suspected that there are simultaneous effects of the BI interest rate, dollar exchange rate, yuan exchange rate, and SSE index on transaction volume.*

H7: *It is suspected that there is an effect of BI interest rates on transaction volume.*

H8: *It is suspected that there is an effect of the dollar exchange rate on the volume of transactions.*

H9: *It is suspected that there is an effect of the yuan exchange rate on the volume of transactions.*

H10: *It is suspected that there is an effect of the SSE index on transaction volume.*

H11: *It is suspected that there are simultaneous effects of the BI interest rate, dollar exchange rate, yuan exchange rate, and SSE index on the LQ45 index through transaction volume as variable intervening.*

3. Research Methods

In this study, the data were taken from previously documented data (secondary data) with time series form. Population in this study were all data on the BI interest rate, dollar exchange rate, yuan exchange rate, SSE index, transaction volume and the LQ45 stock price index. The sample in this study is a saturated sample where all the variable time series data are sampled in the study. The sample of monthly data is 121 samples from June 2010 to June 2020.

Sources of data received from Bank Indonesia publications in the form of BI interest rates, dollar exchange rates and yuan exchange rates, the yahoo finance website includes SSE index data, and the LQ45 stock price index, OJK publications in the form of stock transaction volume from the period of June 2010 to June 2020. The data testing in this research includes the classic normality assumption test, the classic multicollinearity assumption test, the heteroscedasticity classic assumption test and the autocorrelation classic assumption test. The data analysis technique was analyzed using multiple linear regression. Hypothesis testing is done by using the F test

and t test with a significance level of 5%. For the statistical analysis this paper relies on software PC e-views version 9.0.

Table 3.1: Operational Definition of Variables

Variable Names	Measures	
Stock Index LQ45	Value of LQ45 Stock Index from June 2010 - June 2020	——
Transaction Volume	Value of Stocks Transaction Volume from June 2010 - June 2020	——
Interest Rates BI	BI Interest Rates from June 2010 - June 2020	——
Dollar Exchange Rate	(Buy Rate + Sell Rate)/ 2	——
Yuan Exchange Rate	(Buy Rate + Sell Rate)/ 2	——
Stock Index SSE	Value of Stock Index SSE from June 2010 - June 2020	——

4. Results

4.1 Descriptive Statisic

Descriptive statistical calculations are presented in the following table:

	LQ45	**SBI**	**DOLLARS**	**YUAN**	**SSE**	**VOLUME**
Mean	831,9854	0.0605	11988.44	1846.23	2782.6	156,5873
Median	838,005	0.06	13092.53	1965,371	2849,884	127.8619
Maximum	1105.76	0.0775	15867.43	2260,694	4611,744	415,074
Minimum	566.1	0.0425	8225,743	1316,732	1979,206	55.61621
Std. Dev	130.9448	0.010757	2168,386	300,076	516.2383	78.40965
Skewness	-0.034132	-0.014923	-0.376115	-0.6158	0.62714	1.247453
Kurtosis	1.956765	1,819787	1.623717	1,835697	3,97448	3.874635
Jarque-Bera	5.464993	6.96897	12.30003	14.36219	12,61416	34,94773
Probability	0.065057	0.03067	0.002133	0.000761	0.001823	0.000000
Sum	99838.25	7.26	1438613	221547.6	333912	18790.48
Sum Sq. Dev.	2040437	0.01377	5.60E + 08	10715425	31713737	731620.8

4.2 Classical Assumption Testing
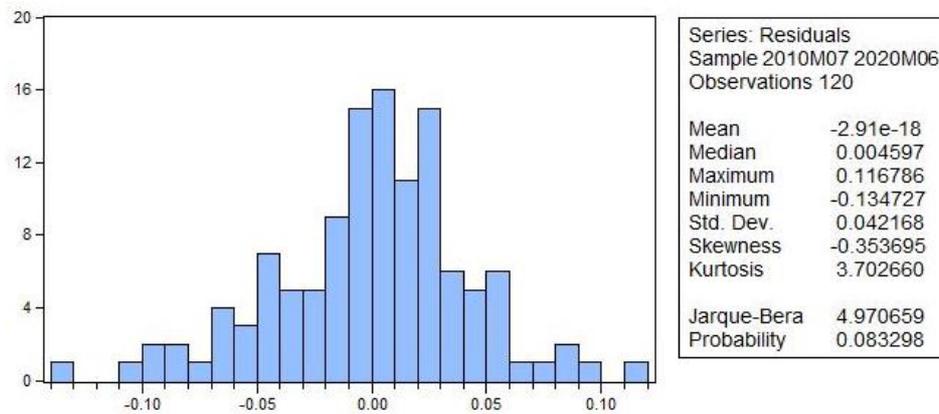
4.2.1 Test of Normality

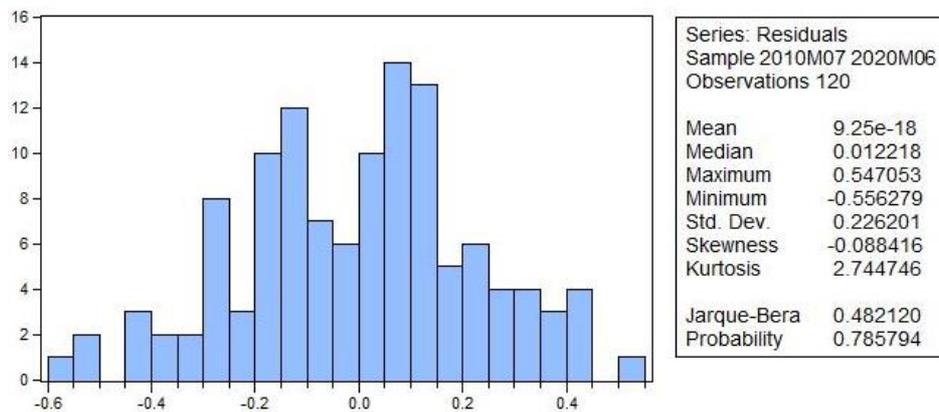Figure 4.1: Normality Test Results of Equation 1

Figure 4.2: Normality Test Results of Equation 2

The probability value of the normality test results in equations 1 and 2 are 0.08 and 0.78. Based on the hypothesis test, both values exceed the significance level (0.05) where according to the hypothesis test, Ho is accepted and Ha is rejected. So data (residual) are normally distributed.

4.2.2 Test of Multicollinearity

Table 4.2 Multicollinearity Test Results for Equation 1

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	1.73E-05	1.047281	NA
D(X1_SBI)	0.015274	1.032281	1.020675
D(X2_DOLLAR)	0.069066	2.630550	2.574408
D(X3_YUAN)	0.101733	2.542208	2.473444
D(X4_SSE)	0.004621	1.056393	1.055463

Table 4.5 Multicollinearity Test Results for Equation 2

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.000462	1.047281	NA
D(X1_SBI)	0.408458	1.032281	1.020675
D(X2_DOLLAR)	1.846909	2.630550	2.574408
D(X3_YUAN)	2.720468	2.542208	2.473444
D(X4_SSE)	0.123566	1.056393	1.055463

The value of centered variance inflation factor in the multicollinearity test in equations 1 and 2 each shows lower than 10. So that multicollinearity is not found.

4.2.3 Test of Heteroscedasticity

Table 4.3: Heteroscedasticity Test Results of Equation 1

Heteroskedasticity Test: Harvey

F-statistic	1.886660	Prob. F(4,115)	0.1175
Obs*R-squared	7.389812	Prob. Chi-Square(4)	0.1167
Scaled explained SS	7.207407	Prob. Chi-Square(4)	0.1253

Table 4.6 Heteroscedasticity Test Results for Equation 2

Heteroskedasticity Test: Harvey

F-statistic	2.073730	Prob. F(4,115)	0.0887
Obs*R-squared	8.073247	Prob. Chi-Square(4)	0.0889
Scaled explained SS	7.719744	Prob. Chi-Square(4)	0.1024

The prob-chi square value of the heteroscedasticity test results in equations 1 and 2 are 0.1167 and 0.0889 which is exceed the significance level (0.05). It indicates that Ho is accepted and Ha is rejected. So that the regression model is free from heteroscedasticity.

4.2.3 Test of Autocorrelation

Table 4.4 Autocorrelation Test Results for Equation 1

F-statistic	0.256241	Prob. F(2,113)	0.7744
Obs*R-squared	0.541772	Prob. Chi-Square(2)	0.7627

Table 4.7 Autocorrelation Test Results for Equation 2

F-statistic	2.116325	Prob. F(2,114)	0.1252
Obs*R-squared	4.331719	Prob. Chi-Square(2)	0.1147

The prob-chi square value of the autocorrelation test results in equations 1 and 2 are 0.7627 and 0.1147. Based on the hypothesis test, the prob-chi square exceed the significance level (0.05) which indicates that Ho is accepted and Ha is rejected. So that, autocorrelation is not found.

4.3 Hypothesis Testing

Table 4.8 Results of Multiple Linear Regression Analysis of Variable Y

Dependent Variable: Y_LQ45
Method: Least Squares
Date: 03/11/21   Time: 01:36
Sample: 2010M06 2020M06
Included observations: 121

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	502.5785	75.26352	6.677584	0.0000
X1_SBI	-41.47269	8.943748	-4.637060	0.0000
X2_DOLLAR	-0.012262	0.015716	-0.780209	0.4369
X3_YUAN	0.364855	0.108374	3.366623	0.0010
X4_SSE	0.018755	0.016839	1.113790	0.2677

R-squared	0.632166	Mean dependent var		831.3591
Adjusted R-squared	0.619482	S.D. dependent var		130.5799
S.E. of regression	80.54970	Akaike info criterion		11.65607
Sum squared resid	752637.6	Schwarz criterion		11.77160
Log likelihood	-700.1922	Hannan-Quinn criter.		11.70299
F-statistic	49.83988	Durbin-Watson stat		0.314892
Prob(F-statistic)	0.000000			

Table 4.9 Results of Multiple Linear Regression Analysis of Variable Z

Dependent Variable: Z_VOLUME
Method: Least Squares
Date: 03/11/21   Time: 01:41
Sample: 2010M06 2020M06
Included observations: 121

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	79.45035	51.23939	1.550572	0.1237
X1_SBI	-16.78952	6.088902	-2.757397	0.0068
X2_DOLLAR	0.047128	0.010700	4.404718	0.0000
X3_YUAN	-0.233121	0.073781	-3.159633	0.0020
X4_SSE	0.015677	0.011464	1.367503	0.1741

R-squared	0.524311	Mean dependent var		156.9308
Adjusted R-squared	0.507908	S.D. dependent var		78.17364
S.E. of regression	54.83822	Akaike info criterion		10.88710
Sum squared resid	348838.8	Schwarz criterion		11.00262
Log likelihood	-653.6693	Hannan-Quinn criter.		10.93402
F-statistic	31.96424	Durbin-Watson stat		0.629249
Prob(F-statistic)	0.000000			

Table 4.10 Results of Linear Regression Analysis for Variable Z on Variable Y

Dependent Variable: Y_LQ45
Method: Least Squares
Date: 03/11/21   Time: 01:46
Sample: 2010M06 2020M06
Included observations: 121

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	643.5935	18.71785	34.38395	0.0000
Z_VOLUME	1.196486	0.106849	11.19787	0.0000
R-squared	0.513078	Mean dependent var		831.3591
Adjusted R-squared	0.508986	S.D. dependent var		130.5799
S.E. of regression	91.50044	Akaike info criterion		11.88696
Sum squared resid	996307.4	Schwarz criterion		11.93317
Log likelihood	-717.1608	Hannan-Quinn criter.		11.90572
F-statistic	125.3923	Durbin-Watson stat		0.400051
Prob(F-statistic)	0.000000			

Based on the results of hypothesis testing carried out, the following research and discussion results were obtained:

H1   **:** *The Influence of the BI Interest Rate, Dollar Exchange Rate, Yuan Exchange Rate, and SSE Index Simultaneously Against the LQ45 Index*

Based on the regression analysis, the Prob F-Statistic value shows (0.000000) and is below 0.05. The results of hypothesis testing show that Ho is rejected and Ha is accepted, indicating that all independent variables (SBI, dollar exchange rate, yuan exchange rate and SSE index) simultaneously have a significant effect on the LQ45 index variable during the period June 2010 to June 2020.

The coefficient of determination (Adjusted R-squared) based on table 4.8 obtained a value of 0.619 or 61.9%. These results indicate that 61.9% of the total variation in the dependent variable is account for by independent variables, BI interest rate, the dollar exchange rate, the yuan exchange rate and the SSE index, while the remaining 38.1% is account for by other variables.

H2   **:** *The Effect of BI Interest Rates on the LQ45 Stock Index*

SBI, based on the results of hypothesis testing, has a probability value (0.0000) below the significance level (0.05). These results indicate that Ho is rejected and Ha is accepted, shows that the SBI indicator has a significant effect on the LQ45 stock index. The coefficient of SBI (- 41.47269) shows the direction of the SBI movement against the LQ45 stock index. The figure (41.47269) shows 1% increase in BI interest rates and if there is no change in the value of the other independent variables, there will be a decrease of 4147% in the LQ45 stock index.

When the interest rates increase, investors will interest to invest capital in deposit, and it can reduce interest of investing in stocks. In addition, the uncertainty over the movement of the LQ45 stock index due to the influence of the Covid-19 pandemic has made investors tend to shift their investment to safer investments such as deposits and savings. Research by Farikhah and Nurhadi (2019) also states that the BI interest rate has a movement in the opposite direction to the composite stock price index in the 2015-2018 research year. However, according to different research results obtained by Hari Gursida (2018), the effect of the BI interest rate is not significant on the LQ45 index in the 2010-2015 research year.

H3   **:** *The Effect of Dollar Exchange Rate on the LQ45 Stock Index*

The dollar exchange rate, based on the results of hypothesis testing, has probability value (0.4369) over the significance level (0.05). These results indicate that Ho is accepted and Ha is rejected, shows that the dollar exchange rate does not have a significant effect on the LQ45 index. The coefficient of dollar exchange (-0.012262). The negative sign indicates, opposite movement between the dollar exchange rate and the LQ45 stock index. The number (0.012262) shows 1% increase in the dollar exchange rate indicator and if there is no change in the value of the other independent variables, there will be 1.2% decrease in the LQ45 stock index.

Novita's research (2011) found that the dollar exchange rate had a negative effect on the LQ45 index in 2011. The dollar exchange rate did not have a significant effect on the LQ45 index was influenced by long-term investors in the stock market who expected dividends. The results of research by Sihombing and Rizal (2014) also show that long-term investors in the capital market in Indonesia tend not to pay attention to the rupiah exchange rate against the dollar as a reference for investment. However, different results obtained by Riko Sutriyadi (2019) show that the dollar exchange rate has a unidirectional movement and has a significant effect on the LQ 45 index in the 2011-2016.

H4   **:** *The Effect of the Yuan Exchange Rate on the LQ45 Stock Index*

The yuan exchange rate, from the results of hypothesis testing, has a probability value (0.0010) below the significance level (0.05). These results indicate that Ho is rejected and Ha is accepted, shows that the yuan exchange rate has a significant effect on the LQ45 stock index. The coefficient of yuan exchange rate (0.364855). A positive sign shows the movement of the yuan exchange rate have same direction with the LQ45 stock index. The coefficient value indicates, if there is 1% increase in the yuan exchange rate and there is no change in the value of the other independent variables, then there will be 36.4% increase in the LQ45 stock index.

Novita's research (2011) shows that the yuan exchange rate moves in the same direction with the LQ45 index significantly. In addition, Indonesia is the country with biggest coal export in the world. Based on the total export of Indonesian coal commodities, 33% of which imported by China (the Indonesian Coal Mining Association). With the depreciation of the rupiah against the yuan, Chinese investors are interested in investing in Indonesia so as to increase the LQ45 stock index.

H5   *: The Effect of the SSE Index on the LQ45 Stock Index*

Based on the results of regression analysis, the SSE index has a probability value (0.2677) and its above the significance level (0.05). These results indicate that Ho is accepted and Ha is rejected, shows that the SSE index has no significant effect on the LQ45 index. The coefficient of SSE index (0.018755). A positive sign on the coefficient indicates that the SSE index is moving in the same direction as the LQ45 index. The coefficient value indicates, 1% increase in the SSE index and if the independent variable does not experience a change in value, there is an increase of 1.8% in the LQ45 index variable.

The positive influence is due to China being the country with the second largest investment value in Indonesia and China being Indonesia's export destination country. Different research by David and Santoso (2015) which state that the SSE index has a significant unidirectional movement towards the IHSG in the 2013-2015. Different research are thought to be due to the global economy which is currently unstable due to the Covid-19 pandemic in 2020.

H6   **:** *The Influence of the BI Interest Rate, Dollar Exchange Rate, Yuan Exchange Rate, and SSE Index Simultaneously Against Transaction Volume*

The F-Statistic Prob value (0.000000), the simultaneous test results are below the significance level (0.05). This result shows that Ho is rejected and Ha is accepted, indicating that (SBI, dollar exchange rate, yuan exchange rate and SSE index) simultaneously have a significant effect on transaction volume during the period June 2010 to June 2020.

The coefficient of determination (Adjusted R-squared) based on table 4.9 shows the value of 0.507 or 50.7%. These results indicate that 50.7% of the total variation in the transaction volume is account for by independent variables, the BI interest rate, the dollar exchange rate, the yuan exchange rate and the SSE index, while the remaining 49.3% is account for by other variables.

H7   **:** *The Effect of BI Interest Rates on Transaction Volume*
Based on the results of multiple linear regression analysis in table 4.9, SBI has a probability value (0.0068), this value is below the significance level (0.05), so it can be concluded that the SBI indicator has a significant effect on transaction volume. The SBI indicator coefficient shows the value (- 16.78952). The negative sign shows the direction of movement of the SBI against the transaction volume. The figure (16.78952) shows that if the BI interest rate indicator increases by 1% while the other independent variables are fixed, the transaction volume will decrease by 1678%.

An increase in interest rates can have an effect on stock investment. Investors tend to shift the form of stock investment into savings or time deposit investments. Meanwhile, if the interest rate decreases, this can reduce the company's interest expense and can increase the company's profit, so that by decreasing interest rates, investors tend to invest in stocks which have an impact on the increase in transaction volume. Different research results obtained by Murni (2010) in Enggal (2016) which states that interest rates have a negative effect on transaction volume. Different research results are due to the influence of the Covid-19 pandemic on research data in 2020.

**H8**   **:** *The Effect of Dollar Exchange Rate on Transaction Volume*

In Table 4.9 the results of multiple linear regression analysis, the dollar exchange rate has a probability value of (0.0000). This value is below the level of significance (0.05). The results indicate that the dollar exchange rate has a significant effect on transaction volume. The coefficient on the dollar exchange rate indicator shows a number (0.047128). A positive sign indicates the linier direction between the dollar exchange rate indicator and the volume of transactions. The figure (0.047128) shows that if the dollar exchange rate indicator increases by 1% while the other independent variables are constant, the transaction volume will increase by 4.7%.

The results showed that the dollar exchange rate had a direct effect on the volume of stock transactions. This is thought to be due to the conditions of the Covid-19 pandemic, investors tended to invest long-term in companies in the LQ45 index amid market uncertainty and tended not to pay attention to fluctuations in the IDR / dollar exchange rate. Different research results obtained by Merdekawati (2007) and Pramaditya (2008) in Enggal (2016) which show that the dollar exchange rate has a negative effect on trading volume. Different research results are due to the covid-19 pandemic which has an impact on the world economy in 2020.

H9   **:** *The Effect of the Yuan Exchange Rate on the Transaction Volume*

From the test results of multiple linear regression analysis in Table 4.9, it can be seen that the yuan exchange rate has a probability value of (0.0020), this shows that the probability value is below the significance level (0.05). Based on these results, the yuan exchange rate indicator has a significant effect on the volume of transactions. The coefficient value of the yuan exchange rate indicator is (-0.233121). A negative sign on this value indicates that the yuan exchange rate indicator is not in line with the volume of the transaction. The coefficient value indicates that every 1% increase in the yuan exchange rate while the other independent variables are constant, the transaction volume will decrease by 23.3%.

The results showed that the yuan exchange rate had a significant negative effect on transaction volume. It is assumed when the yuan exchange rate increases, investors will tend to invest in the yuan, resulting in a decrease in transaction volume. Conversely, when the IDR / yuan exchange rate decreases, investors tend to sell the yuan currency and move their investment to stock investments, resulting in an increase in transaction volume. In addition, the company's dependence on imported raw materials has made the IDR / yuan exchange rate an important concern for investors. The increase in the yuan exchange rate resulted in an increase in the cost of importing raw materials from China, which could reduce corporate profits. This also make a decrease value in the volume of transactions on the LQ45 stock index.
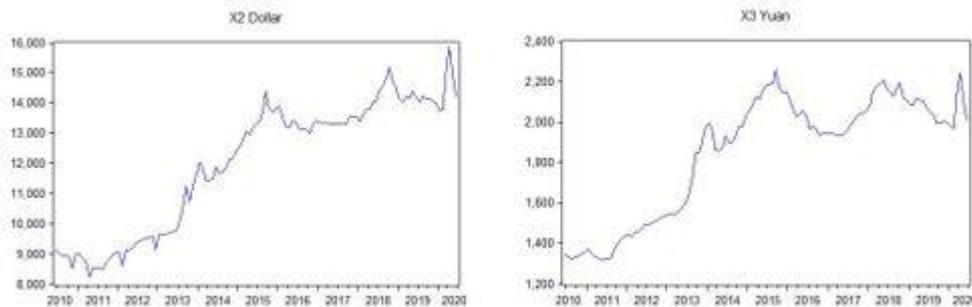
Figure 4.4 Fluctuations in Dollar and Yuan Exchange Rates

Based on the picture above, fluctuations in the dollar exchange rate and the yuan exchange rate have the same fluctuation. This shows that the yuan exchange rate has the same ability to influence the world economy. Based on the results by Merdekawati (2007) and Pramaditya (2008) in Enggal (2016) which shows that exchange rates have a negative effect on trading volume. The correlation of movements between the dollar exchange rate and the yuan exchange rate shows that the yuan exchange rate can also have an influence on transaction volume.

H10 **:** *The Effect of SSE Index on Transaction Volume*

Based on table 4.9 the results of multiple linear regression analysis, it is shown that the Shanghai Stock Exchange index has a probability value of (0.1741). This value is above the significance level (0.05), and it can be concluded that the Shanghai Stock Exchange index does not have a significant effect on transaction volume. The coefficient on the Shanghai Stock Exchange index variable shows a number (0.015677). The positive sign on the coefficient shows the movement of the Shanghai Stock Exchange index in the direction of the transaction volume. The coefficient value indicates that every 1% increase in the Shanghai Stock Exchange index, while the other independent variables are fixed, the transaction volume will increase by 1.56%.

The results showed that the Shanghai Stock Exchange index did not have a significant effect, but have linier movement with the transaction volume. Based on the results by Sudiartha (2017) in Melinda Tety (2018), it shows that there is no effect of the Shanghai Stock Exchange on the composite stock price index. This shows that the relationship between the two countries's capital markets is still low. So that, the movement of the Shanghai Stock Exchange index doesn't have influence on the desire of investors to invest in stocks which is indicated from the volume of stock transactions.

H11 **:** *The Influence of the BI Interest Rate, Dollar Exchange Rate, Yuan Exchange Rate and SSE Index Simultaneously Against LQ45 Index With Transaction Volume As an Intervening Variable*

Based on the results of regression analysis, the transaction volume has a probability value (0.0000) and is below the significance level (0.05). The results of hypothesis testing show that Ho is rejected and Ha is accepted, indicating that the transaction volume has a significant effect on the LQ45 index. The transaction volume coefficient is (1.196486). A positive value shows the movement of transaction volume in the direction of the

LQ45 index. The coefficient value indicates that for every 1% increase in transaction volume, the LQ45 index will increase by 119%.

The results showed that an increase in transaction volume can increase the LQ45 index. The LQ45 index is a large cap index in the capital market. Large cap companies on the LQ45 index attract investors to invest in the LQ45 index. With an increase in the volume of transactions at companies in the LQ45 index, the LQ45 stock price index can increase.

The coefficient of determination (Adjusted R-squared) based on Table 4.10, the value is 0.508 or 50.8%. These results indicate that 50.8% of the total variation in the dependent variable is account for by independent variables, while the remaining 49.2% is account for by other variables.

4.4 Direct and Indirect Effects

Table 4.16: Value of the Coefficient of Determination of Regression Equations

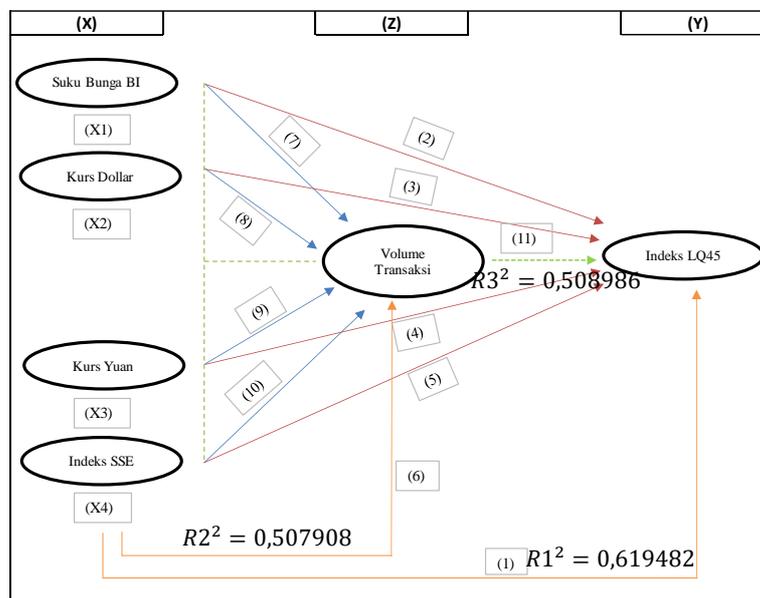| No	Regression Equations	R-Square	Coefficient of Determination
1	$Y = \alpha_1 + \beta_1 * SBI + \beta_2 * DOLLAR + \beta_3 * YUAN + \beta_4 * SSE$	$R1^2$	0.619482
2	$Z = \alpha_2 + \beta_5 * SBI + \beta_6 * DOLLAR + \beta_7 * YUAN + \beta_8 * SSE$	$R2^2$	0.507908
3	$Y = \alpha_3 + \beta_9 * VOLUME$	$R3^2$	0.508986

Figure 4.3: Direct and Indirect Effects

Based on the direct and indirect effect chart, the coefficient of determination correspond to the inequality $[R2^2 + R3^2] > R1^2$. This shows the coefficient of determination of the independent variable BI interest rate (X1), dollar exchange rate (X2), yuan exchange rate (X3), and SSE index (X4) on the dependent variable LQ45 index (Y) through the intervening variable transaction volume (Z) is larger than direct effect without intervening variable, so that the influence of the BI interest rate, dollar exchange rate, yuan exchange rate and SSE index on the LQ45 index variable is mediated by the transaction volume.

5. Conclusions and Suggestions

Conclusions based on hypothesis testing that has been done:

1. Simultaneously, BI interest rate, dollar exchange rate, yuan exchange rate and SSE index have a significant effect on the LQ45 index.
2. Partially BI interest rate has a significant negative effect on the LQ45 index. This is because an increase in interest rates can make investors shift their investment to deposits so that investors' interest in investing in stocks diminishes.
3. Partially the dollar exchange rate has no significant influence and has the opposite direction of movement to the LQ45 index. Because long-term investors expect returns from dividends, so they tend not to pay attention to movements in the dollar exchange rate in investing stocks.
4. Partially yuan exchange rate has a significant effect on unidirectional movements on the LQ45 index. Indonesia, as a global coal exporting country, has become one of the suppliers of China. With the weakening of rupiah exchange rate against yuan, Chinese investors will increase their investment in Indonesia thereby increasing the LQ45 stock index.
5. Partially, SSE index does not have significant effect with unidirectional movements on the LQ45 index. This unidirectional movement is caused by China's economic strength in Asian regional index as well as Chinese investment which has always increased every year in Indonesia. SSE index, which has no significant effect, is thought to be due to world economic conditions which are currently experiencing the effects of the Covid-19 pandemic in 2020.
6. Simultaneously, BI interest rate, dollar exchange rate, yuan exchange rate and SSE index have a significant effect on transaction volume.
7. Partially, BI interest rate has a significant effect with the opposite movement on transaction volume. Because the increase in interest rates increases investor interest in investing in time deposits and reduces interest in stock investment which also has an impact on the volume of stock transactions.
8. Partially the dollar exchange rate has a significant effect on unidirectional movements on transaction volume. This is thought to be a result of the global economic conditions that have been affected by Covid-19 pandemic, so that investors tend to invest long-term in companies in the LQ45 index amid market uncertainty.
9. Partially yuan exchange rate has a significant effect on the direction of movement negatively on transaction volume. This is due to the company's dependence on imports of raw materials, which makes the IDR / Yuan exchange rate an important concern for investors. The increase in the yuan exchange rate resulted in an increase in the cost of importing raw materials from China, thereby reducing company profits which resulted in a decrease in the volume of stock transactions on the LQ45 index.
10. Partially, SSE index does not have a significant effect on unidirectional movements on transaction volume. This unidirectional movement resulted from China becoming the country with the fifth largest capital market capitalization in the world. This has an influence on the movement of the large cap stock index LQ45. So that the increase in SSE index causes an increase in volume of transactions.
11. Transaction volume has a significant effect on the LQ45 index. Based on the coefficient of determination of direct and indirect effects, transaction volume can be an intervening variable between the independent variables (BI interest rate, dollar exchange rate, yuan exchange rate and SSE index) and the dependent variable LQ45 index.

Based on the results of this study, the author's suggestions for further research:

1. Based on the research results, the public (investors) need to pay attention to the pattern of an increase in the dollar exchange rate and a decrease in the yuan exchange rate. This is indicated by the significant effect of the dollar exchange rate with a unidirectional movement and the yuan exchange rate with an opposite movement to the volume of stock transactions. The decline in interest rates is also a concern with its significant impact on transaction volume. So that with a decrease in interest rates, people can allocate more capital in stock investments.
2. Based on the results of this study, further research is suggested to conduct research using other independent variables, because with the independent variables in this study the BI interest rate, dollar exchange rate,

yuan exchange rate and the Shanghai Stock Exchange index can only have an effect of 50.7% on the transaction volume, while 49.3% of the transaction volume is still influenced by other variables.

3. Based on the research results, it is recommended that the government pay attention to movement in transaction volume. The increased transaction volume also shows an increase in the stock price index where the stock price index is a picture of the economy in Indonesia. The government must look at the results of this study to become an indicator of the economy in Indonesia.

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