

Dynamic Movement of Indonesian Stock Exchanges: Analysis of Global Stock Exchanges and Macroeconomic Variables

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Abstract: This study aims to study the effect of global markets and macroeconomics on joint stock price movements. This research was conducted at the Indonesia Stock Exchange with the period 2014-2018. The model used in this study uses the VAR / VECM method with the results of the DJIA Variable there is a significant influence on the movement of the CSPI, this means that an increase in the Dow Jones index will have an effect on increasing the value of the CSPI. Significantly, there was no influence between the NIKKEI225 variable on the movement of the CSPI because t-statistics were greater than t-tables at the coefficient level. The results of the STI index influence, the value of t-statistics in the short term the effect of the STI shows that the STI has a significant effect on the CSPI, this is indicated by t-statistics smaller than the t-table. Inflation research results, in the short term, there is a significant influence between inflation variables on the movement of the CSPI. BiRate has a significant influence on the CSPI with the t-statistic value in the short term is smaller than the t-table, meaning that in the short term the BiRate increase of 1% will affect the movement of the Composite Stock Price Index (CSPI). The t-statistic value in the short term variable USD / IDR exchange rate has a positive effect on the movement of the CSPI. This means that an increase in the exchange rate (IDR / USD) will have an effect on increasing the value of the CSPI and conversely a decrease in the exchange rate (IDR / USD) will have an effect of reducing the value of the CSPI.

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I. INTRODUCTION

In Indonesia, an index that is often considered by investors when investing in the Stock Exchange is the Composite Stock Price Index (CSPI). An investor can see the market condition whether you are excited or lethargic. These different market conditions certainly require a different strategy from investors in investing. Many factors affect the stock index, including changes in central bank interest rates, the state of the global economy, the level of world energy prices, political stability of a country, and the behavior of investors themselves (Endri, 2019.)

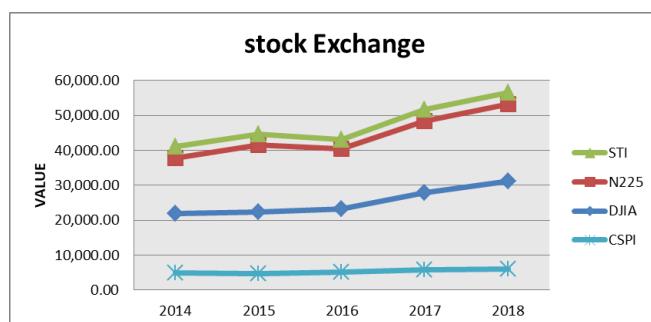


Figure 1: Global Stock Exchange

The development of CSPI in recent years has increased significantly. JCI is a reflection of the Indonesian economy. For the United States, the proper index used as a proxy is the Dow Jones index chosen as a variable in this study, because

this is the oldest stock index in the United States and is a representation of the performance of the most important industries in the United States (Robiyanto et al., 2019). The Dow Jones index, which moves up, indicates the economic performance is in a good position, will move the Indonesian economy through exports and capital inflows, both direct investment and through the capital market (Hasan & Zaman, 2017). And for Japan itself, the stock index used as a proxy is the Nikkei 225 index. The Nikkei 225 index was chosen in this research variable because besides this calculation index has been done since 1950, this index is also a competing index often used in Japan as a benchmark for the performance of the stock market. The STI index is the largest combination of companies in the Singapore stock market and countries that have close relations with Indonesia and between Singapore and Indonesia are ASEAN members who have economic agreements, namely AFTA and MEA as trade economic agreements in Southeast Asia. The Straits Times Index (STI) is the average share price on the Singapore capital market. Indonesia and Singapore are ASEAN member countries that have economic agreements, namely AFTA, where AFTA is a free trade economic agreement in the Southeast Asian region. This causes the economies of the two countries to have a strong relationship. The economic relationship can be seen from the capital markets in each country, where Indonesian investors are free to invest their funds in the Indonesian Capital Market.

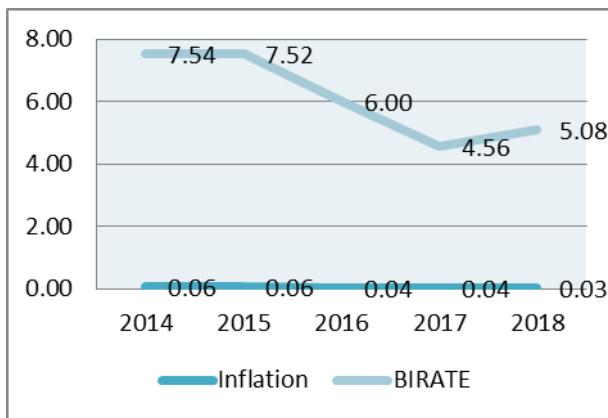


Figure 2: Macroeconomic Indicators

Research on the effect of inflation conducted by Oseni and Nwosa (2011) found that inflation had a positive influence on the CSPI. In contrast to Samadi et al., (2012), it was found that inflation had a negative effect because the inflation rate

would increase the discount rate so that the future cash flow would ultimately cause share prices to be lower. Inflation itself can be defined as a process of increasing the price-price process prevailing in an economy. In Indonesia, the interest rate policy is directly controlled by Bank Indonesia through BIRATE. BIRATE is the central bank's response to future inflationary pressures in order to remain on the set targets. Changes in BIRATE itself triggered a shift in shares in Indonesia (Endri, 2009). USD / IDR exchange rate or exchange rate is the price of a currency against other currencies. Exchange rates play an important role in the economy. Exchange rates are used in business activities carried out by individuals, companies and countries. The weakening of a country's currency exchange rate will have a negative influence on the economy and capital markets. Meanwhile, an increase in interest rates can increase the burden of the company (issuer) which can further reduce stock price.

II. LITERATURE REVIEW

2.1 Effect of DJIA on the Movement of the Composite Stock Price Index (CSPI)

The DJIA index moves up, which means that the economic performance of the United States in general is in a good position. With good economic conditions, it will drive the Indonesian economy through export activities as well as capital inflows of direct investment and foreign capital markets (Ahlquist, 2006). Capital inflows entering the capital market will certainly have an influence on changes in the JCI (Sagita, 2017). The multinational companies above are indicators of the DJIA movement so that the decline and increase in the United States economy is reflected in the DJIA movement.

This research was conducted by Sudarsana and Candraningrat (2014), and Ernayani (2015), stating that the Dow Jones Index has a positive effect on the Composite Stock Price Index (CSPI). The influence of indexes on the United States exchanges on the movement of world stock indexes is very large. This happens because the United States has so far become the center of the world economy. As the Dow Jones Index increases, the Composite Stock Price Index (CSPI) also increases.

2.2 Effect of Nikkei 225 Index on CSPI Movement

Companies listed on N225 are large companies that have operated globally, including in Indonesia. With the rise in the N225 Index, the performance of the Japanese economy has improved. Japanese economic growth can encourage economic growth in Indonesia through export activities and capital inflows both direct investment and through the capital market. Based on research by Sakthivel et al., (2012), it was found that the Nikkei index had a negative effect on the movement of the CSPI. Albert (2013) showed that simultaneously global stock index variables (Nasdaq, Taiex, Nikkei and Kospi) had an influence on the CSPI. The results of research from Rizwan and Khan (2007) showed that the Nikkei 225 Index had a positive effect on the CSPI. From this description, the hypothesis that can be built is the Nikkei 225 Index, which has a positive effect on the movement of the JCI.

2.3 Effect of Straits Times Index (STI) on the CSPI Movement.

Economic growth in Singapore will have a direct or indirect impact on the stock price indexes of countries in ASEAN including the CSPI through 100 companies listed on the STI as a gauge to gauge stock price movements that have a market capitalization value.

2.4 Influence of Inflation Rate on CSPI Movement

Inflation affects stock prices in two ways, directly or indirectly. An increase in inflation is a negative signal for investors in the capital market because an increase in inflation will increase the company's production costs. Directly, inflation causes a decrease in profitability and purchasing power of money while inflation indirectly influences through changes in interest rates.

Inflation has a positive relationship with the composite stock price index. This is caused if inflation or the price of goods rises continuously, it will affect the country's economy, including stock prices. high inflation will result in decreased purchasing power and can cause recession (Masoud, 2013). This will cause a country's capital market index to fall. a similar opinion was expressed by Shahbaz et al., (2008) that for investors it is very important to reduce inflation because inflation is a negative signal in the capital market. Similar findings are listed in the research

of Hosseini et al., (2011) and Izedonmi & Abdullahi (2011) which conclude that inflation has a negative effect on the movement of the Composite Stock Price Index (CSPI).

2.5 The Effect of Birate on the Movement of the Composite Stock Price Index (CSPI).

The interest rate is an attraction for investors to invest, if interest rates tend to increase continuously will encourage investors to move funds from the capital market to banks, so that stock prices will decline or vice versa. So the relationship between Bank Indonesia Interest Rates and stock prices has a negative relationship. If interest rates fall, investors tend to prefer investment by buying shares so that demand for shares will increase and will encourage an increase in share prices. This is in line with the results of research from Wongbangpo (2002), Peiro (2015) and others.

2.6 Influence of Rupiah Exchange Rate on United States Dollar (Exchange Rate) on CSPI Movement

The exchange rate is an indicator of a country's economic stability and prayer one that affects stock market activity. If the demand for the rupiah exchange rate is relatively less than the supply of Rupiah, this Rupiah exchange rate will depreciate and / or vice versa. For investors, the depreciation of the rupiah against the dollar indicates that the outlook for the Indonesian economy is declining. Sichoongwe (2016). (2006) states that fluctuations in the rupiah exchange rate against foreign currencies can have an impact on individual stock prices and CSPI. Robiyanto et al., (2019) also suggested that the increase in the rupiah exchange rate had a positive effect on overall stock prices in the short term. In line with this, Endri (2009) stated that the exchange rate has a positive effect on the overall stock price in the short term.

III. RESEARCH METHODS

3.1. Variable Definition, Data Types and Sources

The research variable is the dependent variable (Y) is a variable that is influenced by the independent / independent variable (X) of the 2014-2018 data research period with a monthly secondary numerical or numerical data scale of 58 months.

3.2. Data Analysis Method

The data used in this study in the form of quantitative data is data measured on a numerical scale or numerical monthly secondary data referring to information collected or obtained through the internet media, document tracking or publication of information recorded at BI and Bank Indonesia during the research period of the month January 2014 to 2018 as in the table below. Besides using quantitative methods, this study also uses VAR / VECM (Vector Error Correction Model). VAR Vector Autoregression or VAR is a time series method that is often used in research, especially in economics. The data used is secondary data (time series) in the form of monthly

data obtained from data from Bank Indonesia (BI) and Indonesian economic reports and other sources related to the discussion of the problem in this study. However, due to the limited data available, the researchers used monthly data (time series) from the 2007: 01-2014: 06 period.

In general the VAR model with n endogenous variables is shown by the following equation: $Y_{nt} = \beta_0 + \beta_1 Y_{1t-i} + Y_{nt} = \beta_0 + \beta_1 Y_{2t-i} + \dots + \eta_{1n} Y_{nt-1} + \epsilon_{nt}$ (6) Parameters and have dimensions $N \times r$, (N : number of variables and r : degree of cointegration). The degree of cointegration shows how long the long-term relationship between variables y_t of the model.

Table 1. Definition of Variables, Types and Sources of Secondary Data

| Variable | Indicator | Scale | Data source |
|------------------|---|----------------|-------------------|
| Y CSPI | Composite Stock Price Index at the end of the month | Base Points | IDX * |
| X1 DJIA | Dow Jones Industrial Average at the end of the month | Decimal points | Bank Indonesia ** |
| X2 N225 | Nikkei 225 month end period | Decimal points | Bank Indonesia ** |
| X3 STI | Straits Times Index month end period | Base Points | Bank Indonesia ** |
| X4 Inflation | Inflation rate at the end of the month | Base Points | Yahoo Finance *** |
| X5 BiRate | Bank Indonesia Interest Rates at the end of the month | Base Points | Yahoo Finance *** |
| X6 Exchange rate | Middle rate at the end of the month | Base Points | Yahoo Finance *** |

Sources: Data processed (2019)

* www.idx.co.id ** www.bi.go.id *** www.yahoo.finance.com

IV. RESULTS AND DISCUSSION

4.1. Stationary Test

Stationarity testing is done by unit root test (unit root test) using the Augmented Dickey Fuller test (ADF) based on a comparison between the ADF

probability value with a significance level of 5%. If the ADF probability value is $<5\%$, then H_0 is rejected, it means that the residual data is stationary and if the reverse residual data is not stationary.

Table 2. Result Stationary Test

| Variable | Unit Root test | ADF test Statistic | Test critical values | | | Probability |
|-----------|----------------|--------------------|----------------------|------------|------------|-------------|
| | | | 1% level | 5% level | 10% level | |
| CSPI | Stationary | 0,07701 | -3,546,099 | -2,911,730 | -2,593,551 | 0,8602 |
| DJIA | Stationary | 0,4100 | -3,546,099 | -2,911,730 | -2,593,551 | 0,7701 |
| NIKKEI | Stationary | 0,4705 | -3,555,023 | -2,915,522 | -2,595,565 | 0,4100 |
| STI | Stationary | 0,2227 | -3,546,099 | -2,911,730 | -2,593,551 | 0,4705 |
| Inflation | Stationary | 0,6310 | -3,546,099 | -2,911,730 | -2,593,551 | 0,2227 |

| | | | | | | |
|----------------------|------------|--------|------------|------------|------------|--------|
| BiRate Exchange Rate | Stationary | 0,6316 | -3,555,023 | -2,915,522 | -2,595,565 | 0,6310 |
| | | 0,8602 | -3,546,099 | -2,911,730 | -2,593,551 | 0,6316 |

4.2. Determination of Lag Length

In carrying out the VAR and VECM approaches, the selection of the amount of Lag is used to know the length of the period of influence of a variable on its past variable as well as on other endogenous variables. Optimum lag is a way to choose how large the amount of Lag that can be used in

research. Determination of the Lag length is also useful to eliminate the autocorrelation problem in the VAR model. The criteria used in determining Lag length are Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SC) and Hannan-Quinn Criterion (HQ).

Table 3. Optimum Lag test results

| Lag | LogL | LR | FPE | AIC | SC | HQ |
|-----|-----------|-----------|-----------|-----------|-----------|-----------|
| 0 | -1963.388 | NA | 1.17e+23 | 72.97734 | 73.23518 | 73.07678 |
| 1 | -1643.636 | 544.7637 | 5.22e+18 | 62.94947 | 65.01212* | 63.74495 |
| 2 | -1602.380 | 59.59095 | 7.61e+18 | 63.23631 | 67.10378 | 64.72784 |
| 3 | -1562.684 | 47.04773 | 1.37e+19 | 63.58088 | 69.25317 | 65.76846 |
| 4 | -1482.403 | 74.33437 | 7.33e+18 | 62.42232 | 69.89943 | 65.30595 |
| 5 | -1415.984 | 44.27919 | 1.10e+19 | 61.77718 | 71.05911 | 65.35686 |
| 6 | -1222.476 | 78.83646* | 4.51e+17* | 56.42505* | 67.51179 | 60.70077* |

Based on the table, it can be seen that according to the LR, FPE, AIC, SC, and HQ criteria that the length of Lag lies in Lag 6 because all three criteria show the same results, the length of the chosen Lag is Lag 6. This is reflected in the Akaike Information Correction (AIC), Schwarz Information Correction (SC), and Hannan-Quinn Information Criterion (HQ), where the lowest value is at Lag 6.

4.4. VAR Stability Testing

Tests carried out by VAR Stability Condition Check in the form of Roots of Characteristic Polynomial. The following results are based on AR Root Table results.

Table 5. VAR Stability Test Results

| Root | Modulus |
|----------------------|----------|
| 0.974706 | 0.974706 |
| 0.941174 - 0.125585i | 0.949515 |
| 0.941174 + 0.125585i | 0.949515 |
| 0.824106 - 0.312318i | 0.881302 |
| 0.824106 + 0.312318i | 0.881302 |
| -0.548770 | 0.548770 |
| 0.456427 | 0.456427 |

| | |
|-----------------------|----------|
| 0.102768 - 0.430258i | 0.442361 |
| 0.102768 + 0.430258i | 0.442361 |
| 0.306197 - 0.260073i | 0.401739 |
| 0.306197 + 0.260073i | 0.401739 |
| -0.211921 - 0.232414i | 0.314526 |
| -0.211921 + 0.232414i | 0.314526 |
| -0.055425 | 0.055425 |

Based on the table above, it can be seen that the characteristic or modulus values all indicate less than one, so it can be concluded that the data is stable.

4.3. Cointegration Test

After determining the Optimum Lag Length and stability testing, the next thing to do is to do the Cointegration Test. Cointegration Test is a test conducted to determine the existence of a long-term relationship, i.e. whether or not there is a similarity in the movement and stability of the relationship between the variables studied. In this research, Johansen Cointegration Test is used to see the presence or absence of cointegration

Table 4. Johansen's Cointegration Test

| Hypothesized | Trace | | Max-Eigen | |
|--------------|-----------|--------|-----------|----------|
| No. of CE(s) | Statistic | Prob.* | Statistic | Prob.* |
| None * | 129.857 | 6 | 0.0269 | 41.49231 |
| At most 1 | 88.3652 | 8 | 0.1447 | 32.14415 |
| At most 2 | 56.2211 | 2 | 0.3691 | 20.42332 |
| At most 3 | 35.7978 | 0.4066 | 15.27972 | 0.7258 |
| At most 4 | 20.5180 | 9 | 0.3884 | 10.49553 |
| At most 5 | 10.0225 | 5 | 0.279 | 8.336514 |
| At most 6 | 1.68604 | 0.1941 | 1.68604 | 0.1941 |

Based on table 4 of the cointegration test results above, it can be seen that the variables above have a trace statistic and Maxigen value that is greater than the critical value. And among the six variables, each has 1 cointegration at the level Based on table 4.5 of the cointegration test results above, it can be seen that the variables above have a trace statistic and Maxigen value that is greater than the critical value. And among the six variables, each has 1 cointegration at a significance level of 5%. Namely in None * so that it can be concluded that between variables have a long-term or cointegrated relationship. An alternative hypothesis which states that cointegration is rejected.

4.5. Granger Causality Test

The point is whether one variable has a significant causal relationship with another variable, because each variable has the opportunity to become an endogenous variable or an exogenous variable. In this test, researchers used the Pairwise Granger Causality Test and used a 5% level. The initial hypothesis (H_0) tested was the absence of a causal relationship, While the alternative hypothesis (H_1) is a causal relationship between variables. To reject or accept H_0 , we need to look at the probability value of the Granger test results. If the probability value is smaller than the real level used (in this study the real level used is 5 percent), then H_0 is rejected.

Table 6. Granger Causality Test Results

| Null Hypothesis: | Obs | F-Statistic | Prob. |
|-----------------------------|-----|-------------|--------|
| Y does not Granger Cause X1 | 58 | 4.47433 | 0.016 |
| X1 does not Granger Cause Y | | 1.71717 | 0.1894 |
| Y does not Granger Cause X6 | 58 | 10.6852 | 0.0001 |
| X6 does not Granger Cause Y | | 0.87582 | 0.4225 |

From the results obtained, it is known that those who have a causality relationship are those who have a probability value that is smaller than alpha 0.05, so that later H_0 is rejected which means that a variable will affect other variables. Following are the results of granger causality testing.

- a. CSPI return rate on the DJIA variable is less than 5% level, so that the conclusion H_0 is rejected. This means that there is a causal relationship between the BiRate variable and the DJIA variable, in other words, the CSPI granger cause X1 variable. On the other hand, the probability value of the DJIA variable on the CSPI variable is more than 5%, then H_0 is accepted, or in other words there is no causal relationship between the DJIA variable and the CSPI, it is known that there is only a one-way relationship between the DJIA variable and the CSPI variable.
- b. CSPI returns to the USD / IDR variable rate less than the 5% level, so that the conclusion H_0 is rejected. it means that there is a causal relationship between the CSPI variable against the USD / IDR exchange rate variable in other words Y IHSG variable granger cause X1 USD / IDR exchange rate. On the other hand, the probability value of the USD / IDR Exchange Rate to the IHSG variable is more than 5%, then H_0 is accepted, or in other words there is no causal relationship between the USD / IDR Exchange Rate variable with the CSPI known that there is only a one-way relationship of the USD / IDR Exchange Rate variable. IDR

4.6. Estimation VAR/VEM

Based on the cointegration test, the right model to analyze the relationship between DJIA, Nikkei, STI, Inflation, BiRate and Exchange variables on e. IHSG is VECM. The optimal lag length or optimal lag is 2

Table 7. VAR / VECM Estimation Results

| Long-term | | |
|--------------|-------------|-------------|
| variable | Coefficient | t-statistic |
| X1DJIA(-1) | 1 | |
| X2NIKKEI(-1) | 1.683117 | [2.35220] |
| X3STI(-1) | -7.047094 | [-1.27062] |
| X4INFI(-1) | 140325.5 | [3.27178] |
| X5BIRATE(-1) | 3589.518 | [4.19752] |
| X6KURS(-1) | -11.13984 | [-3.94695] |
| YIHSG(-1) | -16.15471 | [-5.03555] |

| t-table | | | |
|-------------|--------|---------|---------|
| Probability | 1% | 5% | 10% |
| Nilai | 2.6087 | 1,97580 | 1.65501 |
| T-Tabel | 8 | | |

The estimated VECM results in table 4.6 note that the STI variable, and the USD / IDR exchange rate have a significant effect on the JCI in the long run. However, the yields of NIKKEI 225, inflation and BiRate in the long run do not significantly influence the CSPI, i.e. :

- a. DJIA index has a significant effect on the movement of CSPI in the short term in lag 1, this is shown in the table above. While
- b. Effect of NIKKEI225 on the movement of Composite Stock Price Index (CSPI) T-statistic value in the short term influence of NIKKEI225 with t-statistic more than $\alpha = 5\%$, then there is no significant effect between NIKKEI225 variables.
- c. The influence of STI on the movement of the Composite Stock Price Index (CSPI) shows that there is a significant influence. Same thing in lag 3 with coefficient -1,83288 because it is smaller than t-table then the value has a significant effect..
- d. Influence of Inflation on the movement of the Composite Stock Price Index (CSPI)

The t-statistic value in the short term influence of inflation shows that inflation has no significant effect on the CSPI. But the t-statistic value in the long run between Inflation and CSPI is more than the t-table value $\alpha = 5\%$, then there is a long-term

relationship, meaning that in the long run 1% inflation increases will affect the movement of the Composite Stock Price Index (CSPI).

Effect of BiRate on the movement of the Composite Stock Price Index (CSPI). The effect of BitRate on lag 1, shows that BitRate has a significant effect on the CSPI with t-statistics in the short term. But the t-statistic value in the long run between Inflation and CSPI is more than the t-table value $\alpha = 5\%$. Then there is no long-term relationship, meaning that in the long run the 1% increase in BiRate will affect the movement of the Composite Stock Price Index (CSPI).

Effect of the USD / IDR Exchange Rate on the movement of the Composite Stock Price Index (CSPI).

The t-statistic value in the long run of the USD / IDR exchange rate variable with the USD / IDR exchange rate variable that has a t-statistic smaller than the t-table with a 5% level, then shows no effect between the USD / IDR KURS variable on the CSPI variable.

4.7. Impulse Response Function dan Variance (IRF)

The vertical axis in the IRF analysis illustrates the standard deviation used to measure how much response a variable will give. While the horizontal axis describes the period (years) and the response given to a variable shock. If the response line is on a horizontal axis 0.00 then the shock will have a positive effect. Vice versa, if the response line is above the horizontal axis 0.00 then the shock will cause a negative effect.

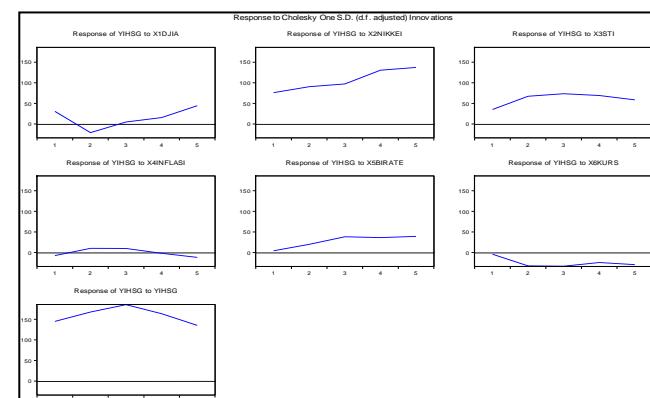


Figure 4: Impulse Response Function and Variance test results

Based on the analysis of the picture above, it can be seen that the IRF test results show the CSPI response to shocks from the values of the DJIA, NIKKEI, STI, Inflation, BiRate and Exchange rates variables. The following description from the picture above:

1. IRF analysis result in Figure 4.1 shows the response of the CSPI movement variable in the presence of fluctuation in the DJIA index variable fluctuation to the JCI movement. The blue line on the graph shows the DJIA response variable moving from the bottom up. In the first period it is in the number (436.8203) right on the number 31 line which means the shock is positive. However, in the second period the movement declined drastically which is negative -21 line with a nominal -40.67175.
2. The results of the analysis of the variable NIKKEI225 on the graph above show the movement of the CSPI due to shock in the fluctuation of the NIKKEI225 index. The blue line on the graph shows the response of the JCI movement towards the NIKKEI225 variable standing between the 0.00 lines. In the first period parallel to the number 76 line with a percentage of 0.00258%, the number continues to go along the period until the fifth period is at line 137, causing a positive shock.
3. CSPI response received on STI shocks is not responding, said to cause positive shocks. That is because the blue line fluctuates above the 0.00 line. Ie in the first period outlined 35 (positive) with the number 101.3117, the thing is fluctuating over time until the last period is on the line 59 (positive) with the number 99.52898.
4. CSPI response received to inflation shocks is not responding, said not to respond because according to the IRF graph the inflation response line to shock that occurs in the CSPI is stagnant below the horizontal line. The IRF chart also shows the CSPI response to inflation from the beginning of the period to the end of the negative period outlined (-8) at the beginning of the period until the end of the fluctuating period to 0,000686.
5. The results of the BiRate variable analysis in the graph above show the response of the CSPI received to the BiRate shock. The blue line in the graph above shows the response of the

CSPI movement from BiRate continues to move above the 0.00 line more precisely on the line number 4 can be called having a positive response with the number 0.213374 in the first period, and continues to move up until the final period the location of the line is parallel at 39 with the number 0.327727.

6. CSPI response received against USD / IDR exchange rate shocks is not responding, said not to respond because according to the IRF graph the USD / IDR exchange rate response line to the shock that occurs on the CSPI tends to lead from the bottom to the horizontal line (0.00). The IRF graph also shows the CSPI response to the USD / IDR exchange rate from the beginning of the period to the end of the negative period stagnating with the -4 line with a figure of -117,4082 until the last period outlined -29 with a figure of -90.7799.

4.8. Analysis of Variance Decomposition (VD)

Variance Decomposition aims to measure the amount of contribution or composition of influence of each independent variable on the dependent variable.

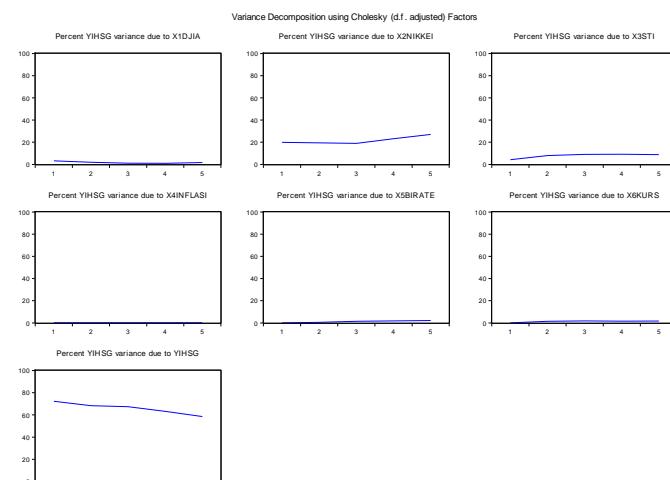


Figure 5: Variance Decomposition test results

- a. From the results of data processing in graph 4.2, it is seen that the variable that has a major contribution to the DJIA index is the variable itself. With the largest contribution in the first period of 100%. This contribution had occurred in the first period of 3,230,842%, although the contribution had a trend, but in the fourth period there was a decrease of 0.939190% and this contribution formed another increase in the fifth period of 1.64030%.

- b. While the contribution of the NIKKEI 225 variable to the CSPI movement had a standard influence contribution in the first and second periods that was balanced by 19.93140% and 19.44663%. the contribution had dropped in the third period with a rate of 18.93703%. But it can rise again in the fifth period of 27.02851%
- c. The contribution of STI variables in the first period was small compared to the next period was 4.262949%. but the contribution trend could rise in the next period by 8.008572%, until the trend continued to rise until the fifth period of 9.12124%.
- d. The contribution of the inflation variable to the movement of the CSPI which in theory is often triggered by the inflation variable prices of goods. Therefore, in the first period the position was 0.194722%. But the trend could go up a second time in a row in the second period only 0.218417% stable not much different in the third period with a figure of 0.207186%. On the contrary it fell again in the fifth period until it was 0.181770%.
- e. On the contrary, the BiRate variable with a contribution to the movement of the JCI in the first period which was very small amounted to 0.0062812, the trend was still stagnant in the second period of 0.567873%. then the contribution can still advance the nail in the fifth period of 2.151230%.
- f. The same was experienced by the variable USD / IDR exchange rate on the movement of the JCI which had a very small contribution in the first period was 0.63515%, but over time the contribution could rise in the fifth period by 1.657588%.
- g. The contribution of the IHSG variable which affected itself by having a contribution for the first period was 72.25376. Over the course of the period it is seen that contributions occur fluctuatively until the last period of 58.52636%.

Dow Jones index has a significance level that is smaller than t table, so it can be stated that there is a significant influence. The results of this study are the same as previous research conducted by Adelima Karnila Faculty of Economics and

Business which states there is a significant positive effect between independent variables on CSPI.

The Nikkei225 index at lag 1 has no significant effect between the NIKKEI225 variable on the CSPI variable because the T-statistic is greater than t-table with t-statistic numbers > t-table with a coefficient level of 5%. While in lag 2, even the same thing in lag 3, both lags can be stated that there is a significant influence with evidence of t-statistics smaller than t-table. In contrast to previous research by Chancharat et al., (2007) with the results of the Nikkei225 variable has an influence on the CSPI and only has a one-way relationship where Nikkei225, STI, KOSPI, FTSE, and ASX affect the CSPI, but not vice versa.

The effect of STI on lag 1, shows that STI has a significant effect on CSPI. In the second lag by showing that there is a significant influence. While in lag 3 because it is smaller than the t-table, the value has a significant effect. This is different from previous research conducted by Adas (2016) and Endri et al., (2019), with the results of the STI variable research partially the T test was declared significant to the CSPI. Yield of STI variable to Nikkei225 variable is less than the level of 5% so the conclusion is rejected. This means that there is a causal relationship between STI and Nikkei variables. The results of the JCI processing with the STI show that STI causes a granger of the CSPI, this is because the probability value is a <5%. Furthermore, the granger causality test shows that the JCI granger against STI. Because of the two-way relationship, the CSPI and STI subsequently used the VAR method. the results of these studies from previous studies with the results that the STI affects the CSPI, this means that investors in Indonesia consider the movement of the STI as a basis for investment decisions..

Influence of inflation on the movement of CSPI in lag 1, shows that inflation has a significant effect on CSPI. This result is not in accordance with the theory of Robiyanto (2019) which sees that an increase in inflation is relatively a negative signal for investors in the capital market. This is due to an increase. inflation will increase company costs, then the profitability of the company will go down. The results of this study on the other hand actually support research conducted by Satiri & Kurniasih (2017) and Endri (2009) which shows that the inflation rate has a positive effect on the CSPI.

The SBI interest rate or often referred to as BiRate in lag 1, shows that BiRate has a significant influence on the CSPI. In the second lag shows that

there is a significant influence. While in lag 3 because t-statistics are smaller than t-tables, the value has a significant effect. When bank interest rates are high, investors tend to be more interested in investing in bank instruments such as savings and deposits, because the rate of return is better and the risk is smaller than investing in capital market instruments.

Dollar exchange rate against Rupiah at lag 1, even at lag 2 with a level of 5% and both lags have t-statistics smaller than t-table. However, this is different from the USD / IDR exchange rate variable which has a t-statistic greater than the t-table with a 5% level. The United States Dollar is a foreign currency used in every international trade. The United States Dollar is a foreign currency used in every international trade. International trade activities such as export-import use US \$, so that the demand for US \$ tends to be high, so fluctuations in the value of US \$ against a country's domestic currency will directly or indirectly affect the economy of a country.

V. CONCLUSION

Based on research that has been conducted with the aim of examining the effect of short-term long-term and Global Stock Exchange and Macroeconomic shocks on the movement of the CSPI on the IDX, using time series data with a Vector Error Correction Model (VECM), the conclusion of the research results this, namely: based on testing with the VECM test shows that the Dow Jones Index can be stated a significant influence. The Nikkei225 index in the long run is significantly no effect between the NIKKEI225 variable on the movement of the CSPI because the T-statistic is greater than the t-table with a coefficient level. The effect of the STI Index, the t-statistic value in the short term shows that the STI has a significant effect on the CSPI movement. Inflation research results, in the short term, Ho is rejected, then there is a significant influence between the inflation variable on the movement of the CSPI. BiRate has a significant effect on the CSPI with a t-statistic value in the short term.

The t-statistic value in the short term variable USD / IDR exchange rate has a positive effect on the CSPI. This means that an increase in the exchange rate (USD / IDR) will have an effect on increasing the value of the CSPI, conversely a decrease in the exchange rate (USD / IDR) will have an effect of reducing the value of the CSPI.

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