# Determinants JCI of the Indonesian Stock Exchange (Comparison of IHSG Projection of OLS Method and ARIMA and GARCH Methods for the Period 2015-2023)

## Reza Relita[1], Sri Hasnawati[2], Irham Lihan[3]

[1,2,3] Master of Management, Faculty of Economics and Business, University of Lampung, Indonesia

**ABSTRACT:** This study aims to examine the effect of interest rate, exchange rate, inflation, gross domestic product and LQ-45 index variables on the movement of the Composite Stock Price Index using the ordinary least square method. Comparison in predicting the movement of the stock price index through three models, and then compared with the projection results with OLS, ARIMA and GARCH methods. This research was conducted using monthly data on JCI, interest rates, exchange rates, inflation, gross domestic product and the LQ-45 index for the period May 2015 - December 2023. From the results it can be concluded that interest rates have a significant negative effect on JCI, exchange rates have a significant negative effect on JCI, inflation has a significant negative effect on the value of JCI, gross domestic product has a significant negative effect on JCI and the LQ-45 index has a positive effect on JCI. The results of the comparison of JCI projections with 3 models showed that the OLS model offers more accurate results and has the lowest MAPE value in predicting stock price movements.

**KEYWORDS:** Composite Stock Price Index, Interest Rate, Exchange Rate, Inflation, Gross Domestic Product, LQ-45 Index, OLS, ARIMA, GARCH

## I.  INTRODUCTION

The Indonesian government and the Indonesia Stock Exchange (IDX) have launched the "Aku Investor Saham" campaign to encourage public participation in the capital market. Easy access to online investment through securities companies is expected to increase the number of investors in Indonesia, which currently stands at 11 million. However, investment in the capital market has risks that are affected by the country's economic conditions.

The Jakarta Composite Index (JCI) is an important indicator that reflects the movement of stock prices on the Indonesia Stock Exchange. The Jakarta Composite Index (JCI) is an index that measures the movement of stocks in the capital market and is a record of changes and movements of stocks from the time they first circulate until a certain time (Sunariyah, 2006). The Composite Stock Price Index is released by the Indonesia Stock Exchange (IDX). The total number of issuers listed on the Indonesia Stock Exchange to date (2023) is 892 issuers. The JCI is a summary of the development of stock prices listed on the IDX. The JCI can be used as a mirror of the Indonesian economy because its movements are influenced by various factors, including changes in interest rates, inflation, exchange rates, gross domestic product and the liquid 45 index, the state of the global economy, the level of world energy prices, political stability and investor behavior (Blanchard, 2006). The following is the movement of JCI from 2010 to 2023:
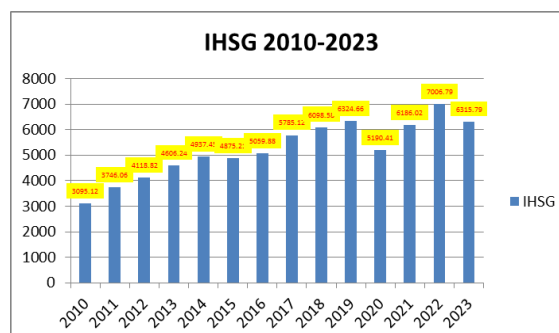
**Determinants JCI of the Indonesian Stock Exchange (Comparison of IHSG Projection of OLS Method and ARIMA and GARCH Methods for the Period 2015-2023)**

The JCI tended to increase from 2010 to 2023, although it experienced some significant declines due to external factors such as the US economic recovery which caused the US Dollar to appreciate against all world currencies, including Indonesia, the COVID-19 pandemic, and rising interest rates. The movement of the JCI not only reflects the development of the company, but also the overall economic condition of the country.

Some of the macroeconomic factors that are thought to affect the JCI are the inflation rate, interest rate, exchange rate, Gross Domestic Product (GDP), and the LQ-45 index. Each of these factors has a different impact on the JCI. For example, an increase in interest rates tends to have a negative impact on the JCI, while positive GDP growth can push up the JCI.

Previous studies on the effect of macroeconomic factors on the JCI show mixed and not always consistent results. This shows the complexity of the relationship between macroeconomic variables and stock market movements. Therefore, further studies are needed using the right model to explain the relationship more accurately and relevant to the phenomena that occur in the Indonesian capital market.

Movements in the capital market are influenced by the activities of investors who invest in the capital market. For an investor, it is very necessary to know the current or future investment movements to prepare the right strategy in order to get maximum profit. Investment movements can be seen in the value of the composite stock price index (JCI). However, the average investor cannot read the movement of the increase and decrease in the JCI correctly, as a result many investors actually experience losses because they are wrong in interpreting the JCI. Therefore, investors need a prediction tool that can help in making investment decisions.

Forecasting methods can be used as a predictive tool to assist investors in making investment decisions. Forecasting can help investors to estimate future stock price movements. Forecasting is not always accurate, but it is still important to do because investment contains an element of uncertainty. This uncertainty can affect the value of the investment, while the methods that can be used for prediction are OLS, ARIMA and GARCH.

## II. LITERATURE REVIEW

### A. Interest rates

Interest rates are the most important macroeconomic variable in investment decision making. According to Jones (2013), interest rates are inversely related to stock prices, if interest rates increase, then stock prices will decrease, and vice versa.

Interest rates are known to have a negative influence on stock prices, meaning that the higher the interest rate, the lower the stock price tends to be, which results in a decrease in the composite stock price index. This is supported by research by Paryudi (2021) which states that the SBI interest rate has a negative effect on the JCI. This can be explained that when the SBI interest rate increases, the stock price will decrease because it has an impact on the allocation of investor investment funds, so investors tend to divert their investments from the capital market (stocks) to other sectors such as bonds or deposits which have less risk than investing in stocks. So that investors will sell their shares and then will keep their funds in the bank. Simultaneous share sales will have an impact on a significant price decline.

H1: Interest rates have a negative effect on JCI

### B. Exchange Rate

The exchange rate is the value of a currency against another country's currency. Currency exchange rates are closely related to investment activities. Any change in the exchange rate will have an impact on the stock price index. When related to stock investment activities, depreciation in the domestic currency exchange rate will reduce the value of stock returns received by investors. This situation will be followed by a sell-off of stocks and result in a decline in stock prices. Depreciation of the domestic currency exchange rate will also increase returns on foreign stocks, this encourages investors to move their funds from domestic stocks to foreign stocks and will reduce domestic stock prices (Astungkoro, 2010).

Kurniawati (2015) argues that the amount of costs incurred and obtained in the process of stock or securities transactions in the capital market can affect the dollar/rupiah exchange rate. From the importer side, assuming that the company imports raw materials or financing in the form of United States Dollars (USD), the depreciation of the dollar/rupiah exchange rate will cause the company's expenses to increase (Robiyanto 2018). This can have an impact on lower company revenues and stock returns (Saputra and Santoso 2017).

The effect of the rupiah exchange rate variable on JCI shows negative and significant results. This indicates that the relationship between the rupiah exchange rate and stock prices is in the opposite direction, meaning that the stronger the rupiah exchange rate against the US $ (rupiah appreciates) it will increase stock prices, and vice versa. The results obtained are consistent with theory, where the strengthening of the rupiah against the US $ is a positive signal for an economy experiencing

inflation (Tandelilin, 2001). The strengthening of the rupiah against the US $ will reduce production costs, especially the cost of importing raw materials and will be followed by a decrease in the prevailing interest rate, this will have a positive impact on company profits which ultimately increases earnings per share (EPS).

Previous research conducted by Putra and Robiyanto (2019) stated that the dollar / rupiah exchange rate has a significant negative impact on company stock returns. The results of this study are also supported by (ESLI SILALAHI, 2021) and Rizki (2021) which state that the exchange rate has a negative and significant effect on stock returns.

H2: The exchange rate of the rupiah against the dollar has a negative effect on JCI

### C. The Inflation

The inflation rate is the general increase in the direction of goods prevailing in an economy. The inflation rate (percentage increase in price increases) differs from one period to another, and also differs from one country to another (Sadono, 2002).Inflation has a significant negative impact on the Jakarta Composite Index (JCI). When inflation increases, people's purchasing power decreases, which means that people have less money to buy goods and services. This indirectly reduces the profitability of the company, as sales decrease. As a result, the company's share price also decreases, so the Jakarta Composite Index (JCI) also decreases.

High inflation can cause investors to wait and choose to see the policies taken by the government in overcoming the inflation problem, and then take the next step of investing. This will have an impact on stock prices in the capital market that have decreased, so that the Composite Stock Price Index (JCI) has decreased. In addition, inflation can also increase the company's production costs, so that the company's profitability decreases. Thus, it can be concluded that inflation has a significant negative effect on the JCI.

Previous studies have shown that inflation has a negative effect on JCI, as stated by Manurung (2016) which states that the inflation variable has a negative and significant effect on JCI.

This is also supported by previous research conducted by Tandelilin (2010) and Ningsih (2018) which states that inflation has a negative and significant effect on the composite stock price index.

H3: Inflation has a negative effect on JCI

### D. Gross Domestic Product (GDP)

The capital market reflects what happens in the macro economy because the value of an investment is determined by the expected cash flow and the required rate of return on the investment, and both factors are strongly influenced by changes in the macroeconomic environment (Tandelilin, 2010). The macroeconomic variables used in this study are inflation, interest rates, exchange rates, gross domestic product and the LQ-45 index.

Gross Domestic Product (GDP) is the total income generated from all goods and services within a country, including the income of foreigners working within the country. According to Tandelin, gross domestic product is a measure of a country's total production of goods and services. Rapid GDP growth is an indication of economic growth. If economic growth improves, then people's purchasing power will also increase, and this is an opportunity for companies to increase their sales. With the increase in company sales, the company's profits will also increase. If the company's profits increase, it will affect investors in choosing the company's shares and investing there. From there, it will also indirectly affect the stock price movement. Increasing GDP will have a positive effect on consumer income because it can increase demand for company products, this will provide high optimism and also spur market sentiment so that it has a positive influence on the equity market.

The increase in revenue will affect the productivity of the company and its performance in the capital market. This will encourage investors to invest which then has an impact on the capital market. So with an increase in GDP, it will cause consumer demand to increase and result in sales going up so that the company's performance will increase. This will increase the stock price. Research conducted by Prasetyanto (2016) and (Fatmawati & Astuti, 2021) revealed that GDP has a positive effect on the composite stock price index. Research conducted by Hismendi, et al (2013) also revealed that Gross Domestic Product has a positive influence on the composite stock price index.

H4: Gross domestic product has a positive effect on JCI

### E. The LQ-45 Index

The LQ-45 Index aims to complement the Composite Stock Price Index (CSPI). In addition, this index can be an objective and reliable tool for financial analysts, investment managers, investors, and capital market observers in analyzing stock price movements on the Indonesia Stock Exchange. The movement of the JCI can also be influenced by the LQ-45 stock price index because the LQ-45 index is a combination of stock prices with large capitalization. The LQ45 index is one of the main stock

indices on the Indonesia Stock Exchange (IDX) which consists of 45 selected stocks with high liquidity. This index is selected based on certain criteria such as market capitalization, trading frequency, and transaction value. The main purpose of the formation of the LQ45 Index is to measure the performance of the Indonesian capital market which reflects the performance of 45 selected stocks with high liquidity (Bisnis.com, 2023).

Wisya Intan Sari (2019) examined the LQ45 index has a significant positive effect on JCI. This means that if the LQ45 index rises, the JCI will also rise, and vice versa. These results indicate that the LQ45 Index has a significant positive effect on the JCI, so it can be used as an important indicator for investors and financial analysts to monitor the performance of the Indonesian stock market.

H5: The LQ-45 Index has a positive effect on the JCI.

### F. Composite Stock Price Index Projection Model

Prediction using the Ordinary Least Squares (OLS) method is an effective strategy in forecasting the value of the dependent variable based on the value of the independent variable. The OLS method has several assumptions that must be met, such as assumptions about normality of errors and homoscedasticity (constant error variance). If these assumptions are not met, then the resulting regression results may be inaccurate or even wrong. However, if these assumptions are met, OLS can provide very accurate forecasting results.

Prediction using the Autoregressive Integrated Moving Average (ARIMA) method is an effective strategy in short-term forecasting. ARIMA is a combination of autoregressive (AR) and moving average (MA) methods, which recursively determine the most appropriate model for the data being analyzed. ARIMA is used to determine a good statistical relationship between the variable to be forecast and the historical value of the variable. Research that uses ARIMA to forecast can provide accurate forecasting results. In addition, ARIMA is suitable for short-term forecasting as it can produce accurate forecasts using past and present values of the dependent variable.

Autoregressive Conditional Heteroscedasticity (ARCH) and Generalized Autoregressive Conditional Heteroscedasticity (GARCH). Prediction using ARCH and GARCH methods is an effective strategy in dealing with heteroscedasticity. ARCH and GARCH are used to measure and deal with non-constant volatility in time series data. ARCH-GARCH method is very useful in forecasting the rupiah exchange rate, stock price index, and national inflation rate. Research using the ARCH-GARCH method shows that the most appropriate model can be obtained by conducting heteroscedasticity testing using the ARCH-LM test. Testing with the GARCH model to predict can provide accurate forecasting results with a Mean Absolute Percentage Error (MAPE) value.

### III. METHODOLOGY

The data used in this study are quantitative data, namely data that has been measured on a numerical scale (numbers). Quantitative data in this study is in the form of time series data, namely data that has been arranged according to time on a particular variable. This study uses secondary data, namely data that has been collected by data collection institutions and that has been published to the data user community. The data in this study are monthly time series data with a period of May 2015 to December 2023. Monthly data used because of changes in variables such as the Composite Stock Price Index (JCI), Exchange Rate, Interest Rate (Bi Rate), Inflation, Gross Domestic Product (GDP) and the LQ-45 IndexThe analysis technique that will be used in this study is descriptive and quantitative analysis in testing the hypothesis, first tested using the Ordinary Least Square (OLS) model, the OLS test is carried out because it has only one direction of causality, namely from the four selected variables to the JCI. While the reverse direction is assumed not to occur. The data collected was then processed using Minitab and Eviews programs. Then the causality relationship can be mathematically written as follows

$$IHSG = \beta_0 + \beta_1 DEP + \beta_2 KURS + \beta_3 INF + \beta_4 PDB + \beta_5 INDX + e$$

Description:

$\beta$ = Parameter of the model whose magnitude will be estimated (Assumption of Gauss Markov Theorem)

DEP = Interest Rate

KURS = Currency exchange rate

INF = Inflation

GDP = Gross Domestic Product

INDX = LQ-45 Index

e = Represents other variables that affect the JCI outside the variables selected in the study.

**Determinants JCI of the Indonesian Stock Exchange (Comparison of IHSG Projection of OLS Method and ARIMA and GARCH Methods for the Period 2015-2023)**

**IV. RESULT AND DISCUSSION**

*A. Descriptive Statistics*

**Table 1. Descriptive Statistics**

|  | IHSG | SUKU BUNGA | KURS | INFLASI | PDB | IDX LQ45 |
|---|---|---|---|---|---|---|
| **Mean** | 5247.80 | 5.65 | 12590.34 | 4.28 | 2382227. | 846.13 |
| **Median** | 5216.18 | 5.75 | 13358.71 | 3.91 | 2394392. | 869.44 |
| **Max** | 7228.91 | 7.75 | 15867.43 | 8.79 | 3139591. | 1105.76 |
| **Min** | 2549.03 | 3.50 | 8532.00 | 1.32 | 1619950. | 496.03 |
| **Std.Dev** | 1146.09 | 1.30 | 2231.51 | 1.83 | 408068. | 1146.09 |

The maximum value of the composite stock price index of 7228.91 occurred in 2022 which indicates that in that year there was an increase caused by factors of improving the Indonesian economy, characterized by moderate economic growth and controlled inflation, causing an increase in the JCI. Then the minimum JCI value of 2549.03 occurred in 2010 which indicates that in that year there was the lowest decline in the period 2010-2023 caused by the monetary policy crisis that occurred in 2010 causing a decline in the value of shares. Bank Indonesia raised the benchmark interest rate (BI Rate) in July 2010, which caused a decline in stock value.

The maximum value of the interest rate of 7.75 occurred in 2014, which indicates that in that year there was an increase due to the global economic crisis that occurred in 2014 which caused an increase in interest rates. Then it is known that the minimum value of the interest rate of 3.50 occurred in 2021, which indicates that in that year there was the lowest decline in the period 2010-2023, which was caused by conducive monetary policies, such as lower interest rates, which could increase access to loans and investment, which in turn could increase the value of shares. In 2021, Bank Indonesia lowered its benchmark interest rate (BI Rate) which led to a decline in interest rates.

The maximum value of the exchange rate is 15867.43 in 2022 which indicates that in that year there was an increase in foreign investment, especially from other developing countries, which also contributed to increasing the value of shares. Then it is known that the minimum value of the exchange rate of 8532.00 occurred in 2011 which indicates that in that year there was the lowest decline in the period 2010-2023, which was caused by the global economic crisis that occurred in 2011 causing an increase in interest rates and a decrease in the exchange rate. This crisis led to a decline in global demand and increased economic uncertainty, which in turn led to a decline in the exchange rate.

The maximum value of inflation of 8.79 occurred in 2013, indicating that in that year the highest increase in inflation for the period 2010-2023 occurred due to an increase in the price of energy commodities, such as electricity, water, gas and fuel. This increase was caused by electricity tariff adjustments made by the government throughout 2013. Then it is known that the minimum value of 1.32 occurred in 2021 which shows that in that year there was the lowest decline in the 2010-2023 period, due to the Covid-19 pandemic which was still high in Indonesia in 2021 causing disrupted capital market performance. This condition causes a decrease in investment value.

The maximum value of GDP of 3126294 billion occurred in 2023, which indicates that in that year economic growth was in a better condition for the 2010-2023 period, the driving factor is that increased foreign investment can increase capital flows to Indonesia, which causes an increase in GDP, a decrease in interest rates, which in turn can increase the value of shares. In 2023, Bank Indonesia lowered the benchmark interest rate (BI Rate), which led to an increase in GDP, high political stability, especially after a successful general election, also contributed to increasing investor confidence and strengthening GDP. Then it is known that the minimum value of 1619950 billion occurred in 2010 which shows that in that year Bank Indonesia raised the benchmark interest rate (BI Rate), which caused a decrease in the value of GRDP.

The maximum value of the LQ45 index of 1105.76 occurred in 2019, which indicates that in that year there was an increase due to factors increasing the Indonesian economy, which was characterized by conducive economic growth, strengthening the rupiah exchange rate which caused the increase in LQ45. A stable and fast-growing economy can increase investor confidence and strengthen stock values, which in turn can increase stock values. Then the minimum value of LQ45 of 496.03 occurred in 2010, which shows that in that year there was the lowest decline in the period 2010-2023, which was caused by global economic

**Determinants JCI of the Indonesian Stock Exchange (Comparison of IHSG Projection of OLS Method and ARIMA and GARCH Methods for the Period 2015-2023)**

conditions that were still unstable and investor concerns about a slowdown in the world economy could affect stock indices in Indonesia, including the LQ45 index.

### B. Regression Model

The result of multiple regression processing on Eviews Software are presented in the table below:

**Table 2. Regression Model**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 0.250134 | 0.065111 | 3.841638 | 0.0002 |
| SUKU | -0.071059 | 0.022938 | -3.097828 | 0.0026 |
| KURS | -0.010584 | 0.003345 | -3.164139 | 0.0021 |
| D(INFLASI) | -0.223877 | 0.036228 | -6.179612 | 0.0000 |
| D(PDB) | -12.43303 | 2.706280 | -4.594141 | 0.0000 |
| D(INDEKS) | 0.694070 | 0.025116 | 27.63428 | 0.0000 |

Each regression coefficient shows that the probability is smaller than the significance level of 5%, all coefficients in this study are significant (real and not equal to zero). The constant value of 0.25 means that if all independent variables namely interest rates, exchange rates, inflation, GDP and the LQ-45 index are assumed to be constant, then the composite stock price index increases by 0.0025.

The interest rate coefficient (X1) of -0.07 is real that when interest rates increase by 1% it will result in a decrease in the JCI by 0.0007.

The exchange rate coefficient (X2) of -0.01 is real that when the exchange rate rises 1% it will result in a decrease in the JCI by 0.0001.

The inflation coefficient (X3) of -0.22 is real that when inflation rises 1% it will result in a decrease in the JCI by 0.0022.

The GDP coefficient (X4) -12.47 is real that when GDP rises 1% it will result in a decrease in the JCI by 0.1247.

The LQ-45 index coefficient (X5) of 0.69 is real that when the LQ-45 index rises 1% it will result in an increase in the JCI of 0.0069.

### C. Projection Comparison between OLS, GARCH and ARIMA

A comparison of projections between OLS, GARCH, and ARIMA models will be conducted to determine which model is most effective in projecting the JCI.The results of the projection comparison between OLS, ARIMA and GARCH models, using JCI data in this study, which can provide the most accurate and stable projection results will be selected as the most effective model in projecting. The results of this comparison can also help investors and market analysts to make more informed decisions in stock investment. Thus, it can be concluded that the comparison of projections between OLS, ARIMA and GARCH models is very important in predicting the value of JCI and other variables, so the comparison results are as follows:

**Table 3. Comparison Results of JCI Projections in 2024 with OLS, ARIMA and GARCH methods**

| Indeks | Mean Actual | Mean Proyeksi | | |
|---|---|---|---|---|
| | | OLS | ARIMA | GARCH |
| IHSG | 7309.76 | 7405.66 | 2575.42 | 7104.63 |
| Std. Deviasi | | 2.54% | 64.73% | 3.29% |
| MAPE | | 2.39% | 65.21% | 4.36% |

Based on the comparison, it can be seen that the OLS (Ordinary Least Squares) method performs better in projecting the JCI. OLS managed to provide a more accurate projection for JCI. This accuracy can be seen from the OLS projection value which is closer to the actual value than the ARIMA and GARCH methods. The OLS method has a deviation of 2.54% which indicates the uncertainty or variability of the OLS model predictions. This value is relatively low, indicating that the OLS model provides stable predictions and does not fluctuate too much, and the MAPE value of 2.39% indicates that the OLS model provides very accurate predictions with relatively small errors. This value indicates that the OLS model can predict the JCI value with a low error rate.

The mean projection of ARIMA shows that the estimated mean value of JCI is far from its actual value and lower than the OLS model. This may be due to factors such as higher market volatility in the ARIMA model. The ARIMA model has a deviation of

64.73% which is very high compared to the OLS model. This indicates that the ARIMA model predicts larger and unstable fluctuations in the JCI value, and the MAPE value of 65.21% is very high and indicates that the ARIMA model does not provide accurate predictions.

The mean projection of GARCH shows an estimate of the average JCI value that is close to the actual value, and higher than the ARIMA model. The GARCH model has a deviation of 3.29% lower than the ARIMA model but still higher than the OLS model. The GARCH model provides more stable predictions and can handle volatile volatility better, and the MAPE value of 4.36% is lower than the ARIMA model but still higher than the OLS model.

Therefore, it can be concluded that from the comparison of the three models (OLS, ARIMA and GARCH) in projecting the JCI, the OLS model offers stable and accurate predictions with a low MAPE value.

## D. Effect of Interest Rate on JCI

Interest rates have a negative effect, when interest rates rise, fixed income investment instruments such as deposits become more attractive. As a result, some investors tend to divert funds from the stock market to deposits, which can lead to a decline in the JCI. If related to the descriptive data, the average interest rate of 5.65% with a range of 3.5% - 7.5% is enough to make deposits a competitor to the JCI (stock market). When interest rates increase, the return on deposits also tends to increase. With an average interest rate of 5.65% and a range of 3.5% to 7.5%, deposits offer more attractive returns compared to the potential return from stocks in the stock market. Investors tend to shift their funds to deposits due to lower risk and more certain returns. This is because it provides a stable return without having to deal with the volatility of the stock market.

An increase in the BI Rate will be followed by an increase in deposit interest rates, causing investors to tend to divert their funds into deposits with higher income or return and lower risk levels than investing in the stock price index. The increase in interest rates alone causes investors to be reluctant to invest so that demand for shares will decrease and result in a decrease in stock prices so that it impacts the composite stock price indexThe results of this study are supported by research by Novia (2015) which obtained the results of interest rates having a negative effect on JCI and Rini Astuti (2016) which obtained the results of interest rates having a negative and significant effect on JCI.

## E. The effect of US$ Exchange Rate on JCI

The exchange rate has a negative effect, if associated with the descriptive data, the average exchange rate of 12590.34 with a range of 8532.00 - 15867.43 indicates significant volatility, where the lowest exchange rate value (8532.00) may reflect a period where the rupiah is relatively strong, and the highest value (15867.43) indicates a period where the rupiah is very weak. This range is enough to make deposits a competitor to the JCI (stock market).

In situations of high exchange rate volatility, deposits can indeed be an attractive alternative for investors as they offer certainty of return in rupiah, which can be attractive amidst exchange rate uncertainty. Exchange rate fluctuations can affect investment decisions such as when the rupiah weakens (exchange rate rises), some investors may choose to switch to assets. Conversely, when the rupiah strengthens, domestic investments such as stocks can become more attractive. In periods of high volatility, investors often turn to assets that are considered safer such as deposits, and when Bank Indonesia raises interest rates to stabilize the rupiah, deposit rates can become more attractive due to lower risk and more certain returns. The results of this study are supported by research conducted by Silalahi (2021) and Rizki (2021) which state that the exchange rate has a negative and significant effect on stock prices.

## F. Effect of Inflation on JCI

Inflation has a negative effect, if related to the descriptive data, the average inflation of 4.28% with a range of 1.32% - 8.79% is enough to make deposits a competitor to the JCI (stock market). With an average inflation of 4.28%, the attractiveness of deposits relative to JCI depends on the real interest rate, i.e. if the deposit rate is above the inflation rate, deposits can be attractive. Thus deposits can indeed be a serious competitor to the JCI, especially if deposit rates offer positive real returns making them an attractive investment option for investors. Under these conditions, investors tend to shift their funds from the stock market to deposits. When deposit rates increase, this provides an incentive for investors to place their funds in banks, as they can earn higher returns with lower risk compared to investing in the stock market.The results of this study are supported by research conducted by Reina (2023) and Yendi (2021) showing that inflation has a significant negative effect on JCI.

## G. Effect of GDP on JCI

GDP has a negative effect when investors tend to switch from stock market investment (buy stocks) to the consumption sector, with an average GDP of 2382227 with a range of 1619950 inflation of 3.72% to 3139591 inflation of 2.28%, so it is enough for the consumption sector to become a competitor to stock investment (buy). This high inflation, the consumption

**Determinants JCI of the Indonesian Stock Exchange (Comparison of IHSG Projection of OLS Method and ARIMA and GARCH Methods for the Period 2015-2023)**

sector can be a competitor to stock investment because the cost of living increases, when high inflation will increase the cost of living, so people may prefer to place funds in a place that is more stable and provides more certain returns, such as investment in the consumption sector. Research by Afriyanti and Prasetiyo (2021) found that increasing inflation can cause consumer purchasing power to decline drastically. This is due to the increase in prices of goods and services that is not matched by an increase in consumer income. Thus, real purchasing power will decline, which has an impact on company performance and the value of stock prices in the market. Overall, the assertion that GDP has a negative effect on JCI is supported by research showing that high inflation can put pressure on consumers' ability to purchase goods and services, and lead to a decline in consumer spending.

### H. Effect of LQ-45 Index on JCI

The LQ-45 Index is an index consisting of 45 stocks of public companies (PT. Tbk) that have high liquidity on the Indonesia Stock Exchange (IDX). These stocks are selected based on certain criteria and evaluated regularly, and usually represent about 70% of the total market capitalization of the IDX. The analysis shows that the LQ-45 index is highly significant in influencing the JCI. This means that fluctuations in the JCI are highly dependent on fluctuations in the stocks included in the LQ-45 index. This is because LQ-45 stocks are the most actively traded on the IDX, so their movements greatly affect overall market sentiment. Then the companies in the LQ-45 are generally large companies with high market capitalization, so their stock price movements have a significant impact on the overall index.

The results of this study are in line with the findings of Wisya (2019) and Heru (2023), which confirm that the LQ-45 index has a significant influence on the JCI. This is because the LQ-45 index consists of 45 stocks that are selected based on liquidity i.e. stocks that are actively traded and have a high volume of transactions, and market capitalization i.e. these stocks have a large market value. These selection criteria ensure that the LQ-45 index represents a large portion of the market capitalization value on the IDX, which makes it a strong indicator of the overall market.

### CONCLUSIONS AND SUGGESTION

The conclusion of the JCI detterminant of the Indonesia Stock Exchange comparison of JCI projections with the OLS arima and garch models for the 2015-2023 period isInterest rate has a negative and significant influence on JCI, which is in line with the hypothesis. The exchange rate has a negative and significant effect on the JCI on the IDX, this is in accordance with the hypothesis proposed. Inflation has a negative and significant effect on the JCI on the IDX, this is in accordance with the hypothesis proposed. GDP has a negative and significant influence on the JCI on the IDX, this is not in accordance with the hypothesis proposed. Index LQ-45 has a positive and significant influence on JCI on the IDX, this is in accordance with the hypothesis proposed. Comparison of OLS, ARIMA and GARCH model projections of JCI. The OLS model is suitable for prediction because it has the lowest MAPE value.

Suggestions from this researchFor future researchers, it is expected to use international indices represented from each developed country that has a large influence on trading on the Indonesia Stock Exchange which can have an influence on the JCI, such as Hang Seng from Hong Kong, Kospi from South Korea, FTSE from the UK.

### REFERENCES

1) Andrew Liantanu, L. D. 2023. The Effect of Interest Rates, Rupiah Exchange Rates, Inflation, and Gross Domestic Product Growth on the Composite Stock Price Index (JCI) on the Indonesia Stock Exchange for the 2014-2021 Period. eCo-Buss, Vol. 5, No. 3.
2) Box, G. E., & Jenkins, G. M. (1976). Time Series Analysis: Forecasting and Control, Revisided Edition, San Francisco: Holden Day.
3) Darmawan, S., & Haq, M. S. (2022). Analysis of the influence of macroeconomics, global stock indices, world gold prices and world oil prices on the Composite Stock Price Index (JCI). Journal of Economic and Business Research, 95-107.
4) Engle, R. F. (1982). Autoregressive Conditional Heteroscedasticity with Estimates of the Variance of United Kingdom Inflation. Econometrica, Vol. 50, No. 4, pp 987.
5) ESLI SILALAHI, R. S. (2021). THE INFLUENCE OF MACROECONOMIC FACTORS ON THE MOVEMENT OF THE COMPOSITE STOCK PRICE INDEX (IHSG) ON THE INDONESIAN STOCK EXCHANGE FOR THE 2017-2020 PERIOD. JRAK, Vol. 7 No. 2.
6) Fatmawati, E., & Astuti, A. r. (2021). THE EFFECT OF GROSS DOMESTIC PRODUCT GROWTH AND INTEREST RATES ON THE COMPOSITE STOCK PRICE INDEX. Journal of Managerial and Entrepreneurial Perspectives (JPMK), 175-185.

7) Ganani, A. R., Mandai, S., & Octaviani, D. (2023). DETERMINATION OF THE INFLUENCE OF MACROECONOMIC VARIABLES ON JCI. Trisakti Economic Journal, Vol. 3 No. 1.

8) Grestandhi, J., Susanto, B., & Mahatma, T. (2011). Comparative Analysis of Forecasting Methods of Composite Stock Price Index (JCI) with Ols-Arch/Garch and Arima Methods. Mathematics FMIPA UNY.

9) H.M, J. (2000). Portfolio Theory and Investment Analysis. Yogyakarta: BPFE.

10) Herlina. (2018). THE EFFECT OF BI RATE, INFLATION, EXCHANGE RATE FLUCTUATIONS AND STOCK TRADING VOLUME ON THE COMPOSITE STOCK PRICE INDEX FOR THE PERIOD 2009-2017. JOURNAL OF BUSINESS MANAGEMENT AND ENTREPRENEURSHIP, 25-32.

11) Husnan, S. d. (1994). Basics of Financial Management First Edition. Yogyakarta: UPP AMP YKPN.

12) I Putu Marta Edi Kusuma, I. B. (2016). THE EFFECT OF INFLATION, JUB, DOLLAR EXCHANGE RATE AND GDP GROWTH ON IHSG ON THE INDONESIAN STOCK EXCHANGE. E-Journal of Management Unud, Vol.5, No. 3, 1829-1858.

13) Istinganah, A., & Hartiyah, S. (2021). THE EFFECT OF INFLATION, INTEREST RATES, RUPIAH EXCHANGE RATES, GROSS DOMESTIC PRODUCT AND MONEY SUPPLY ON THE COMPOSITE STOCK PRICE INDEX (IHSG) ON THE INDONESIAN STOCK EXCHANGE (BEI) FOR THE PERIOD 2010 TO 2019. Journal of Economic, Business and Engineering (JEBE), Vol. 2, No. 2.

14) Joni, M., & Nasution, S. H. (2023). The Effect of Bank Indonesia Interest Rate (Bi Rate) and Money Supply on the Jakarta Composite Index (JCI) in Indonesia.

15) Melia Wida Rahmayani, W. R. (2020). THE EFFECT OF SHARE TRADE VOLUME AND LEVERAGE ON SHARE PRICE VOLATILITY (Empris Study on LQ-45 Index Companies Listed on the Indonesia Stock Exchange in 2012-2014). Scientific Journal of Sharia Economics and Finance, Vol. 1, No. 2.

16) Murwaningsari, E. (2008). THE INFLUENCE OF STOCK TRADING VOLUME, DEPOSITS AND EXCHANGE RATES ON IHSG ALONG WITH IHSG PREDICTION (GARCH AND ARIMA MODELS). Indonesian Journal of Economics and Business, Vol. 23, No. 2, 178-195.

17) Paryudi, D. G. (2021). The Effect of Exchange Rate, SBI Interest Rate and Inflation on the Composite Stock Price Index on the Indonesia Stock Exchange. Scientific Journal of Unity Management.

18) Pulungan, D. P., Wahyudi, S., Suharnomo, S., & Muharam, H. (2018). Technical analysis testing in forecasting socially responsible investment index in indonesia stock exchange. Investment Management and Financial Innovations, Vol. 15. No. 4.

19) Ricky Martin Simanullang, R. s. (2023). The Effect of the Global Stock Price Index on the Indonesian Stock Price Index Case Study Before and During the Covid- 19 Period. Journal of IKRATH-ECONOMICS, 2.

20) Rizki, M. (2021). THE IMPACT OF INTEREST RATES, INFLATION, EXCHANGE RATES, AND FOREIGN EXCHANGE RESERVES ON IHSG RETURNS ON THE INDONESIAN STOCK EXCHANGE. Journal of Business Administration Economic & Entrepreneurship, 44.

21) Rode, D., Parikh, S., Friedman, Y., & Kane, J. (1995). An Evolutionary Approach to Technical Trading and Capital Market Efficiency. The Wharton School University of Pennsylvania.

22) Saputri, G. A., Suharsono, A., & Haryono. (2019 ). Value at Risk (VaR) Analysis on Blue Chips Stock Investment with Copula Approach. ITS JOURNAL OF SCIENCE AND ART, Vol. 8. No. 2 pp 2337-3520.

23) Sasono, H., & Said, N. (2023). Analysis of the Effect of Macro Variables on JCI in Indonesia for the Period 2010 to 2021. Journal of Management Research and Research Innovation, Vol. 1 No. 4.

24) Tandelilin, E. (2001). Investment Analysis and Portfolio Management. Yogyakarta: BPFE.