The Effect of Macroeconomic Variables and Covid-19 Crisis on Jakarta Composite Index (JCI)

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Abstract. The capital market is an important element for the development of the Indonesian economy to support sustainable development. Jakarta Composite Index (JCI) is one of the indexes in the capital market that is often used by investors in determining their investment. In this study, the author will examine specifically the macroeconomic influences, namely inflation, interest rates, exchange rates, and the dummy of the health crisis due to the Covid-19 pandemic on the JCI. The data used in this study are data for the 2011 to 2021 quarters which were obtained from the official website of the Indonesia Stock Exchange and CEIC. This study uses the ARDL model to test the test limit to show a stable long-term relationship between macroeconomics and the JCI. This study shows that interest rates and the Covid-19 crisis have a significant positive effect, the exchange rate has a significant negative effect, and inflation has no significant effect on the JCI in the long-term coefficient. For the short-term coefficient (ECM)-ARDL, interest rates, and exchange rates have no significant effect, while inflation significantly affects the JCI.

Keywords: JCI, Inflation, Exchange Rate, Interest Rate, Covid-19.

1 Introduction

Accompanied by the increasingly advanced economic development and the experiencing rapid growth, the capital market has a significant role in Indonesia's economic development to support national development. The capital market has two functions as a means of business funding for companies and as media for the public to invest in financial instruments [1]. The funds obtained by the company will be used for business development, expansion, and additional working capital. Investment in the capital market is an alternative for society to improve its economy. Public ownership of stocks in the capital market is supposed to provide benefits through the distribution of dividends by the company as well as an increase in stock prices (capital gain). Access to information that gets open and faster makes the capital market gain investors in Indonesia. It can be seen from the increasing number of investors in 2021, which increased by

ICONIC-RS 2022, March 31-April 01, DKI Jakarta, Indonesia

DOI 10.4108/eai.31-3-2022.2321009

89.58 percent to 7.3 million Single Investor Identification (SID) and is dominated by the Millennial Generation and Gen Z [2].

In the capital market, several indexes use as a benchmark for the market sentiment on decision-making. The Indonesia Stock Exchange classifies the price index of stock into several categories, one of which is the Jakarta Composite Index (JCI) [3]. JCI is one of the indicators that reflects the performance of the whole stock price index on the Indonesia Stock Exchange (IDX) and this index is the most frequently used by investors in decision-making. By looking at the movement of the JCI, increased (bullish) or decreased (bearish), investors can sell, hold, or buy stocks [4]. Investing in the capital market has a high risk, where price movements fluctuate quickly so that the selling price can decline at any time. For this reason, proper analysis is needed before investing in the capital market. In the Figure 1, Jakarta Composite Index (JCI) experienced high fluctuates as seen in the candle stick from 2011 to 2021. From 2011 to 2021, JCI has a bullish trend in the long term, and in the short term, JCI has corrected several times. In 2020, from the first quarter to the third quarter, JCI has a market crash which caused a deep decline in stock prices due to the Covid-19 pandemic.

The Covid-19 pandemic has had an impact on economic and financial systems throughout the world, including Indonesia. The increasing number of Covid-19 cases and the high fatality rate since March 2020 caused panic among the public, government, and the business world. The government has implemented preventive policies like Large-Scale Social Restrictions since April 2020 and the Enforcement of Community Activity Restrictions since January 2021, which caused an economic recession. Tightening regulations in various sectors cause uncertainty and risk in running a business so that companies experience losses. Revinka [5], stated that the pandemic had a significant negative impact on the decline in the values of the company listed on the Indonesia Stock Exchange. The decline in company values led to a decrease in the number of investments in the capital market which can see from the decline in the JCI reaching 34.50% from its closing position at the end of 2019 JCI reached lows at the level of 3937 in March. Research conducted by Ftiti et al., stated that the Covid-19 pandemic harmed the Shanghai Market Index by increasing volatility and decreasing liquidity in the stock market [6].

Fig. 1. JCI data from 2011 to 2021.

A side Covid-19 pandemic, fluctuations in changes in macroeconomic variables can have a direct impact on stock prices. The Composite Stock Price Index (JCI) adjusts more quickly to changes

in macroeconomic variables than the company's performance. When macroeconomic changes occur, investors will react quickly by taking the positive and negative impacts on the company's performance in the next few years [7]. The ability of investors to make decisions when investing is highly efficient, so the profits are maximized. Therefore, investors need to consider several macroeconomic indicators to make the right choice [8]. According to Ullah et al., [9] several indicators of macroeconomic variables that need to be considered before deciding to invest in the capital market are inflation, interest rates, and exchange rates.

Several empirical research proves that exchange rates, inflation, and interest rates on stock price movements indicate different results. Ilahi et al., [10] state that exchange rates, inflation, and interest rates do not affect stock returns, Ullah et al., [9] found that interest rates and exchange rates hurt stock prices, Santos et al., [11] found that interest rates have negative effects, while exchange rates and inflation do not affect stock prices, Krisna dan Wirawati, [12] found that the exchange rate and inflation have positive effects, while interest rates did not affect the increase in stock prices. Based on theories and research results that are still debated about the impact of macroeconomic variables on inflation, interest rates, and exchange rates on stock price movements. Therefore, this research is supposed to provide comprehensive results that can give an evident description of the influence of macroeconomic variables and an analysis of the impact of the Covid-19 pandemic, which makes it different from previous research.

2 Literature Review

2.1 JCI

Jakarta Composite Index (JCI) was first launched on April 1, 1983, as an indicator of stock price movements listed on the stock exchange, and the base day for calculating the index was on August 10, 1982 [13]. Jakarta Composite Index covers the movement of all common shares and preferred shares listed on the Indonesian Stock Exchange. The index calculation uses a weighted average methodology based on the number of shares listed on the stock market. The basic formula for calculating the index is:

$$Index = \frac{Value\ of\ Market\ Basket\ in\ the\ Given}{Value\ of\ Market\ Basket\ in\ the\ Base} \times 100 \quad (1)$$

Jakarta Composite Index is one of the most sought-after indexes by investors because it reflects the overall movement of stockson the IDX. Movements in the stock market are closely related to the company's return or income. When the company's return increase, the stock price will increase which can affect the behavior of investors to buy, sell or hold their stocks [14].

2.2 Inflation

According to Sukirno [15], inflation is an increase in the price of items or commodities in the economic system. The inflation rate differs from one period to another and from one country to another. Inflation also has an impact on the decline of the local currency against foreign currencies. One indicator used to measure inflation is the Consumer Price Index (CPI). CPI is an index that measures the price consumed by households [16].

The relationship between inflation and Jakarta Composite Index stated by Apergis & Eleftheriou [17], inflation leads to lowerprice stability which causes uncertainty in investment. Rising inflation can lead to higher risk because it will affect the increase in production materials that increase the company's production costs as well, this uncertainty resulted in non-optimal investment which resulted in a decline in stock prices. Meanwhile, according to Kewal [18], if inflation is still relatively light, it will not affect the JCI. But, if inflation exceeds the low category, BI will respond by raising interest rates to control inflation, which will affect the allocation of investors to switch to bonds or deposits.

2.3 Interest Rate

According to Mishkin [19], the interest rate is the fee lent or the price paid for borrowed funds and is usually explained as a percentage every year. According to Keynes's theory, interest rates are prices that occur in markets and investments. According to the Neo Classics, interest rates are an important factor for the ups and downs of an investment, and interest rates have a negative relationship with investment because when interest rates increase, they will reduce investment levels [20].

The relationship between interest rates and the Jakarta Composite Index (JCI) is where the interest rate increases, the investment level will decrease, and otherwise. Astuti et al., [7] state that the interest rate is a factor that affects the performance of the capital market. An increase in interest rates will have a direct impact on the stock sector, investors will withdraw the investment and will shift to the banking sector which has less risk but stable return. In addition, interest rates also had negative effects on the company because one of the sources of capital financing is debt. When interest rates increase, the rate of return on the debt will increase too and reduce company returns.

2.4 Exchange Rate

The exchange rate is the amount of money needed or the number of rupiahs needed to obtain one foreign currency [8]. Exchange rates are divided into two types, such as nominal exchange rates and real exchange rates. The nominal exchange rate is the price of a currency exchanged for another country’s currency, while the real exchange rate is the price of an item or service that has been transacted between countries.

The relationship between the exchange rate and the value of the Jakarta Composite Index is the exchange rate of the rupiah against the US dollar hurts the index of stock price movements. When the rupiah depreciates, it will have a direct impact on the increase in production costs of companies that relies on imports for feedstocks in their business activities, in addition, the rupiah depreciation will increase the company’s foreign debt which has a direct impact on the decline in company profits. However, the exchange rate can have a positive effect if the sector or company is an exporter when there is de’reciation Ih will increase the selling value of goods/services so that profits increase [21]. Fluctuating exchange rates cause uncertainty and risk for companies. The company will increase production costs when the exchange rate has corrected so that it will affect the company’s fundamentals. Investors will also sell their shares because of the rate of decline when there is a depression [22]. However, Haider [23] and Krisna & Wirawati [12] state that the exchange rate has a significant positive effect.

2.5 Covid-19

According to the World Health Organization (WHO), Coronavirus disease (Covid-19) is an infectious disease caused by the SARS-CoV-2 virus. This virus can spread through the mouth, and nose in small particles when they cough, speak, or breath. There have been 227 countries also more than 404 million confirmed positive Covid-19 so far. In Indonesia, in February 2022, the number of confirmed Covid-19 cases reached 4.8 million, 4.3 million recovered, and 145 thousand people died. Based on these problems and the directives of the WHO, Indonesia implemented Large-Scale Social Restrictions, which have been written in government regulation Number 21/2020 on March 31, and these social restrictions make a direct impact on economic activity in Indonesia [24]

The Covid-19 crisis caused the Jakarta Composite Index (JCI) to drop quite drastically. All of these cases are unpredictable and not easy to control. On March 13, 2020, trading had to suspend for the first time since 2008 due to the Covid-19 Pandemic. Before the first positive confirmation of Covid-19 in Indonesia, the JCI was at the 5516 level (February, 28) and continued to depreciate to reach the 3967 level (Mar, 23). In this Covid-19 crisis, the government's role is too crucial because its policies are expected to reduce the negative impact of this pandemic [25].

3 Methodology

From the time series data obtained, the data is processed and analyzed using the Autoregressive Distributed Lag (ARDL) method, this method is used by Pesaran dan Shin [26] using a cointegration approach. This technique is used to determine the short-term and long-term relationship of the variables being studied and prevent spurious regression. This method has several advantages over other methods which it can use with small sample size, and the estimation results are not biased in the long term. With this method, it's hoped that it will be able to provide a more comprehensive description than previous research. Data analysis in this research used statistical software STATA 16. In this research, several tests were carried out like Stationarity Test, Bound Test, Optimum Lag Test, ARCH Test, Heteroscedasticity Test, Normality Test, Multicollinearity Test, and Autocorrelation Test as a condition for data and model validation [27].

The Jakarta Composite Index and Exchange Rate variables transformed into the form of the natural logarithm (Ln). A natural logarithm will reduce the error value of the regression equation, which is used to reduce problems in the post-estimation test as a requirement of the ARDL method [28]. The following is the equation of the research estimation model used following the research variables, such:

$$\Delta LNJCI_t = \alpha_0 + \sum_{i=1}^{\mu} \beta\Delta \quad INT_{t-i} + \sum_{i=0}^{q} \delta\Delta \,\mathrm{LNEXR}_{t-i} + \sum_{i=0}^{r} \gamma\Delta_{\mathrm{INF}_{t-i}} + \sum_{i=0}^{s} \sigma\Delta_{\mathrm{C19}_{t-i}} + \lambda_0 \mathrm{INT}_{t-p} + \lambda_1 LEXR_{t-p} + \lambda_2 \mathrm{INF}_{t-p} + \lambda_3 INF_{t-p} + \lambda_4 LC19_{t-p} + \mu_t \quad (2)$$

4 Result and Discussion

4.1 Data Stationarity Test

The first stage in this research is the Stationarity Test on the data, this is useful to find out whether the variables under study have unit roots or not. A variable can be said to have no unit root if the probability value of the test results is less than the alpha (α) 5%.The test uses the Augment Dickey-Fuller (ADF) test with the results obtained like the Dickey-Fuller Augment Test Table (ADF).

Table 1. Augment Dickey-Fuller (ADF) test.

ADF test for unit root		
Variable	*Level I(0)*	*First Difference l (1)*
ln_JCI	0.2554	0,0000
INF	0.3032	0,0008
INT	0.9121	0,0000
ln_EXR	0.3934	0,0000

In the table of stationary test results, the JCI variables, inflation, exchange rates, and interest rates are not stable at level I(0). Meanwhile, at the first difference or level I(1), all variables are stable at a significance level of 0.01. These results follow the requirements of using ARDL, where the variables studied have a stationarity level in the first difference, and the variable stationarity level does not have a second difference. Because if there is, the variables cannot use later on.

4.2 Cointegration Test

A cointegration test was conducted to see whether or not a long-term relationship between the variables used in the ARDL method. The approach to determine cointegration in this study is the Limit Test Cointegration approach. The results of this limit test will focus more on the F-statistical value [29]. If the F-statistical test exceeds the critical value limit test, it means the variable has a long-term relationship, and if the F-statistical test is smaller than the critical value limit test, it means the variable has no effect or long-term cointegration with the results obtained through the cointegration test as shown in the Limit Test Cointegration Test Table.

Based on the results of the *Bounds Test*, the ARDL method in the table (2, 4, 4, 2) shows that the *F-statistic* value of the model is 10,453,which is greater than the value of the upper bound at the 1% level. This proves that the four variables in this study, such as the JCI, exchange rate, inflation, and interest rates have long-term cointegration, or the four variables move together in the long term.

Table 2. Bounds test.

	Value	K
F-statistics	10,453	3
Critical Values Bounds Test		
Significance	I(0)	I(1)

10%	2,72	3,77
5%	3,3	4,35
2,5%	3,69	4,89
1%	4,29	5,61

4.3 Normality Test

The normality test used in this study is the Shapiro-Wilk W test with 42 observations. But, because there were dummy observations, it became 37. The normality test was conducted to determine whether the variables used were normally distributed or not.The normality test is normally distributed if the probability value exceeds alpha (α) 5%, known if the p-value (0.94693) is bigger than alpha (α) 5%. From the estimation results, it is concluded that all variables are normally distributed.

Table 3. Shapiro-Wilk W test.

Shapiro-Wilk W test for Normal Data					
Variable	bs	W	V	z	Prob>z
res	37	0.987 58	0.462	-1.616	0.94693

4.4 Multicoloniarity Test

A multicollinearity test was used to test if there is a correlation between the independent variables used. Based on the data multicollinearity test in the independent variables, it is found that the VIF (Variance Inflation Factor) value for all variables is below 10, and 1/VIF for each variable.

4.5 Heteroscedasticity Test

The heteroscedasticity test used in this study was the *Breusch-Pagan* test. This test aims to see whether the regression model has inequality of variance from the residuals from one observation to another. If the variable of one residual observation is different from the other, it is called heteroscedasticity, and if the same is called homoscedasticity. Based on the test that executes, the calculation results concluded that the p-value of 0.9815 is greater than the alpha value (α) 5%.

Table 4. Breusch-Pagan test.

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity	
chi2(1)	0.00
Prob > chi2	0.9815

4.6 Autocorrelation Test

The auto correlation test in this study is the LM Breusch-Godfrey test. This test is to decide if there is a relationship between observations at different times. From this test, which obtained a p-value of 0.0956, which is greater than alpha (α) 5%, it can be concluded that there is no auto correlation between the variables studied.

Table 5. Breusch-Godfrey test.

Breusch-Godfrey LM test for autocorrelation			
lags(*p*)	chi2	df	Prob > chi2
3	6.355	3	0.0956

4.7 Long-Run Estimated

In the ARDL regression test, the results will indicate long-term and short-term. In the long term, investors will respond quickly to changes in macroeconomic variables that directly affect the company's performance. According to Petrusheva and Jordanoski [30], in the long-term, investors tend to use fundamental analysis for investment purposes, where investors will consider the company's performance, including sentiment, as well as parts of detailed financial statements including assets, income, expenses, and make an annual comparative analysis. In using financial performance data from financial statements comprehensively and how macroeconomics affects company performance, investors will create decisions to buy, sell or hold their stocks. Investors in the long term believe that the stock market price will match the book value in the long term, but the market takes a long time, more than a year to understand the news and information to make the proper judgment. In conclusion, if a company's fundamentals are great, it will have an impact on increasing stock prices in a company.

Investors in the short term are usually called traders who tend to do technical analysis in making decisions. Traders usually refer to past statistics such as stock prices, stock volumes, and stock patterns to fore cast stock prices to build profitable momentum for buying and selling stocks. Investors in the short term have a trading goal, where they can sell shares at relatively high prices in less than one year. A trader can also sell his stocks on the same day they buy. While investors in the long-term focus on the fundamentals and prospects of the company, investors in the short term focus more on the right time to obtain capital gains in a short time.

The following is a statistical test using STATA 16 software using the ARDL model in this study. This study aims to determine the long-term and short-term relationship. The independent variable, in this case, is the macroeconomic variable and the dummy of theCovid-19 crisis on the Jakarta Composite Index (JCI).

Tabel 6. Long-Term Coefficient (ARDL).

Variable	coefficient	Standard error	t	P>|t|
INT	- 7,436348	1.899077	-3.92	0.001 ***
ln_EXR	0,3872507	1.899077	3.03	0.007***
INF	2,166976	1.089212	1.99	0.060*

C19	-0,09741	.0369172	-2.64	0.016**
Constanta	4,330	1.491.795	5.17	0.000***

Description ***p<0.01, **p<0.05, *p<0.10

a. Long-Term Coefficient of Interest Rates on the JCI

The results of the long-term analysis show that interest rates have a significant negative effect on the Jakarta Composite Index (JCI) on the Indonesia Stock Exchange by -0.0743627. This indicates that if there is a 1% increase in interest rates, the JCI level will decrease by 7.436348%. From the company's perspective, an increase in loan interest rates will impact the increasing rate of return that companies will pay to banks. If the interest of borrowing costs increases, the profit earned by the company decreases and causes fewer dividends to be distributed to shareholders. After reducing dividends, the decline in company profits also results in a decrease in retained earnings, which will be used for expansion or business improvement for the company's sustainability. With the reduced dividends to be paid to shareholders and reduced capital from retained earnings, it will be followed by a decrease in stock prices [31].

From the investor's point of view, an increase in interest rates will affect the psychology of investors about the investments they invest in, so it will affect stock prices. High-interest rates are a negative signal to stock prices, which can cause investors to withdraw their investments in the stock market and move them to bonds or deposits. When interest rates are high, that means investingin the banking sector is much more profitable than in the stock market because the rate of return is much higher than in the stock market. Weston and Brigham [32] suggest that interest rates have a high effect on stock prices. When high-interest rates will slow down the economy, an increase in interest costs will reduce company profits and cause investors to sell shares and transfer funds to the bond market. These results approve with the research of Khan [33], Sharkas [34] and Amarkhil et al., [35] which state that interest rates have a significant negative effect on stock indexes.

b. Long-Term Coefficient of Exchange Rate against JCI

The results of the long-term analysis show that the Exchange Rate has a significant positive effect on the Jakarta Composite Index (JCI) on the Indonesia Stock Exchange at 0.3872507. It means, that if there is a 1% depreciation of the exchange rate, it will raisethe JCI level by 0.3872507%. Currently, there are 773 issuers listed on the Indonesia Stock Exchange, 13 in the oil and gas sector, and 760 non-oil and gas issuers. Issuers in the non-oil and gas sector have a market capitalization of more than 99% of the total issuers. The depreciation of the rupiah will make export goods cheaper and increase sales for companies that are exporters. During the research period, the value of non-oil and gas exports always run into surplus or positive and tended to increase from 2018 to 2021 [36]. An increase in sales will increase the company's profitability and increase paying dividends to shareholders. Issuers that have high profitability have an attraction for investors so it will increase stock prices.

A study conducted by Amelia [37] found that the exchange rate has a positive effect on non-oil exports in Indonesia. Ranto [38] said that net non-oil exports have an effect on the Jakarta Composite Index on the IDX. The depreciation of the rupiah currencyincreases sales of non-oil exports and increase competitiveness among companies [39]. increased

sales will have an impact on increasing profits, so it will increase Earning per Share (EPS). This is supported by research conducted by, Astuti [7], and Amarkhil et al., [35] which state that the exchange rate has a significant positive effect on the Jakarta Composite Index.

c. Long-Term Coefficient of Inflation on the JCI

The results of the long-term analysis show that the inflation rate has a significant positive effect. This indicates that if there isa 1% increase in inflation, the JCI level will increase by 2.166976%. According to Jayanti et al., [40] there is a positive correlation between inflation and stock prices. This opinion is based on the fact that inflation is demand-pull inflation which causes excess demand for the supply of the available goods. Where this condition from the company's perspective will be exploited by imposing increased costs to consumers with a larger proportion so that company profits increase and will increase the company's ability to pay dividends so that it can provide a positive assessment of stock prices [41].

In terms of investors or the public, inflation will make people save their money in the form of shares. The increase in inflationcauses prices to increase, where people tend to save and save money in the form of shares in the hope that the real value of money does not decrease. This result is supported by previous research by, and Khan [42] which states that inflation has a significant positive effect on the Composite Stock Price Index.

d. Long-Term Coefficient of the Covid-19 Crisis on JCI

The results of the long-term analysis show that the Covid-19 crisis has a significant negative effect. Where there is a difference between conditions before the crisis and conditions during the Covid-19 crisis of -0.0973197. In research, it is confirmed thatpanic by investors can lead to panic selling resulting in low liquidation, which will cause a fairly deep decline in stock index prices. Another study showed that confirmed cases of Covid-19, market uncertainty, and investor panic sentiment hurt stock indexes in Asian countries, one of which was Indonesia. Positive cases of Covid-19 that continue to increase are one of the causes of the market crash on the Indonesia Stock Exchange. The increasing number of cases has caused the government to limit economic activities by implementing the PSBB policy. With this tightening, it has negative impacts on the company such as a decrease in the amount of production, a decrease in the number of requests, and the cessation of company operations. The effect of the declining productivity of this company will havea direct impact on stock prices on the IDX. A survey conducted by the Ministry of Manpower [43] stated that 88% of companies in Indonesia experienced losses.

From the investor's perspective, considering the economic uncertainty and high risk in the global capital market, investors tend to store their wealth in safer assets and avoid high-risk investment instruments. In this condition, investors who have assets in the formof shares will choose to sell their shares and place their funds in other investments with lower risk such as gold and bonds. This condition also has a direct impact on the decline in stock prices on the IDX. This research is also in line with research conducted by, Revinka [5] which stated that the Covid-19 crisis had a significant positive effect on the Composite Stock Price Index on the IDX.

4.8 Short-Term Cointegration Relationship (ECM-ARDL)

From the ARDL test results, short-term results will be obtained Error Correction Mechanism (ECM-ARDL). The results of this test explain the short-term relationship between the independent variables, namely loan interest rates, exchange rates, and inflation, while the Covid-19 crisis variable is not included in the short-term results because this variableis exogenous which cannot be logarithmic to the dependent variable, namely the Stock Price Index. Combined. Seen in **Table 7**.

Table7. Short-Term Coefficient of ECM-(ARDL).

Variable	coefficient	Standard error	t	P>|t|
INT	3,88569	3,258231	1.19	0,247
ln EXR	-1,546025	0,3400996	-4.55	0,000 ***
INF	1,782501	0,9681676	1.84	0,080 *

Description ***p<0.01, **p<0.05, *p<0.10

a. Coefficient of Short-Term Interest Rates on the JCI
The results of the short-term analysis show that interest rates have a significant positive effect on the Jakarta Composite Index (JCI) The reason for the ineffectiveness of loan interest rates on the JCI is that investors in Indonesia tend to be happy to trade (traders/speculators) so that investors tend to take profit in the hope of obtaining high enough capital gains in the capital market. The tendency of short-term investors according to Petrusheva and Jordanoski [30] does not consider the company's fundamentals but rather wait for the right momentum from technical analysis in trading. The results of this study are from research conducted by Kewal [18] and Divine et al [44] [40] which state that interest rates do not affect the Composite Stock Price Index.

b. Short-Term Coefficient of Exchange Rate against JCI
The results of the short-term analysis show that the exchange rate has a significant negative effect on the Jakarta Composite Index (JCI). This is by the condition where when there is a short-term depreciation, outside investors will take profit to get profit from selling shares on the IDX because the dollar value is higher than the rupiah value so that the rate of return obtained by foreign investors will increase. High volatility also affects foreign retail investors (foreign traders) with high volatility causing uncertainty in profits for foreign traders so that foreign investors will reduce their stock portfolio in Indonesia. Foreign traders will move their shares to countries with more stable volatility. Currently, foreign ownership of shares in Indonesia is 41.58% (Oct 2021). This study is in line with research conducted by Kewal [18] which states that the exchange rate has a significant negative effect on the Composite Stock Price Index.

c. Short-Term Coefficient of Inflation on the JCI
The results of the short-term analysis show that inflation has a significant positive effect. Investors tend to make purchases inthe short term because mild inflation provides positive sentiment for economic growth. In addition, traders will speculate that inflation will

benefit by increasing company profits in conditions of demand-pull inflation. By taking advantage of this condition, traders will seek to profit from capital gains from the shares purchased. This result is supported by previous research by Listriono & Nuraina [8] which states that inflation has a significant positive effect on the Composite Stock Price Index.

5 Conclusions and Recommendations

Based on the discussion and results that have been described previously regarding the effect of macroeconomic variables and the Covid-19 crisis on the JCI on the Indonesia Stock Exchange for the period 2011-2021, the conclusion that can be drawn is that theexchange rate becomes the variable that has the most significant positive effect in the long term, where when the depreciation of the rupiah will encourage an increase in the value of exports of goods in Indonesia so that it can increase the company's fundamentals. Interest rates are the variable that has the second negative significant effect on the JCI movement. The inflation variable has the third positive significant effect on the JCI movement in the long term according to the theoretical assumption which states that interest rateshave a significant negative effect. The Covid-19 pandemic has a significant negative effect in the long term where the more uncontrolled the pandemic is, it will cause economic activity to be paralyzed which has a direct impact on stock price movements. The exchange rate in the short-term coefficient has a significant negative effect on the JCI, where when there is depreciation, it will encourage foreign investors to sell because of short-term profits. Inflation has a significant positive effect in the short term, while interest rates inthe short-term coefficient do not have a significant effect because domestic investors tend to be happy to conduct stock transactions inthe short-term (speculators), so investors often take profit-taking in the hope of obtaining short term capital gains without interest rate.

Based on the discussion and results that have been described previously regarding the effect of macroeconomic variables and the Covid-19 crisis on the JCI on the Indonesia Stock Exchange for the period 2011-2021, the suggestions that can be given are:

1. The government should continue to maintain exchange rate stability and inflation, as well as continue to provide low-interest rates and improve the handling of the Covid-19 crisis to be able to encourage the increase in the real sector to increase stock price movements.
2. Investors must pay attention to macroeconomic changes before investing in the stock market because macroeconomic movements have an impact on the performance of the stock market itself so that it can affect the rate of return on investment.
3. IDX should be more responsive and firm in making policies related to domestic and foreign issues to create a conducive investment climate.

References

[1] Otoritas Jasa Keuangan, Pasar modal [internet]. Otoritas Jasa Keungan; 2020. Available from: https://www.ojk.go.id/sustainable-finance/id/tentang/Pages/Pasar-Modal.aspx#:~:text=Pasar%20modal%20memiliki%20peran%20penting,untuk%20berinvestasi%20pada%20%20nstrument%20keuangan.

[2] Indonesia Central Securities Depository. Statistik pasar modal Indonesia September 2021 [internet]. Indonesia Central Securities Depository; 2021 September. Available from: https://www.ksei.co.id/files/Statistik_Publik_-_September_2021.pdf.

[3] Bursa Efek Indonesia. Indeks saham [internet]. Bursa Efek Indonesia; 2021. Available from: https://www.idx.co.id/produk/indeks/

[4] Asmara WP, Asmara IP. Pengaruh variabel makro ekonomi terhadap indeks harga saham gabungan. E-Jurnal Manajemen Universitas Udayana. 2018;7(3):1397-1425.

[5] Revinka S. Pengaruh pandemi COVID-19 terhadap nilai perusahaan pasa sebelas sektor di Bursa Efek Indonesia (BEI). Jurnal Acitya Ardana. 2021;1(2):145-163.

[6] Fiti Z, Ben Ameur H, Louhichi W. Does non-fundamental news related to COVID-19 matter for stock returns? Evidence from Shanghai stock market. Economic Modelling. 2021;99. Doi: https://doi.org/10.1016/j.econmod.2021.03.003.

[7] Astuti R, Lapian J, Rate P, Van E, Ratulangu. Pengaruh faktor makro ekonomi terhadap Indeks Harga Saham Gabungan (IHSG) di Bursa Efek Indonesia (BEI) periode 2006-2015. Jurnal Berkala Ilmiah Efisiensi. 2016;16(2):399-406.

[8] Listriono K, Nuraina E. Peranan inflasi, BI rate, kurs dollar (USD/IDR) dalam mempengaruhi Indeks Harga Saham Gabungan (IHSG). Jurnal Dinamika Manajemen. 2015;6(1):73-83.

[9] Ullah F, Hussain I, Rauf A. Impacts of macroeconomy on stock market: Evidence from Pakistan. International Journal of Management and Sustainability. 2015;3(3):140-146.

[10] Ilahi I, Ali M, Jamil RA. Impact of macroeconomic variables on stock market returns: A case of Karachi stock exchange. SSRN Electronic Journal. 2015. Doi: 10.2139/ssrn.2583401.

[11] Santos Dos AS, Neto AR, de Araujo EC, de Olibeira L, Abrita MB. Interaction between macroeconomics variables and BOVESPA, the Brazilian stock market's index. Transnational Corporations Review. 2013;5(4):81–95.

[12] Krisna AA, Wirawati NG. Pengaruh inflasi, nilai tukar, suku bunga SBI pada Indeks Harga Saham Gabungan di BEI. E-Jurnal Akuntansi Universitas Udayana. 2013;3(2):421-435.

[13] Bursa Efek Indonesia. Buku Panduan Indeks Harga Saham Bursa Efek Indonesia. Jakarta: Indonesia Stock Exchange; 2010.

[14] Zakaria Z, Aminu A, Pattiasina V. Pengaruh faktor faktor makro ekonomi terhadap IHSG. Jurnal STIE MDP. 2018;5(2):1-8.

[15] Sukirno S. Makroekonomi Teori Pengantar, 3rd Edition. Jakarta: PT. Raja Grafindo Persada; 2016.

[16] Jayanti Y, Pengaruh tingkat inflasi, tingkat suku bunga SBI, nilai tukar Rupiah, Indeks Dow Jones, dan indeks KLSE ierhadap Indeks Harga Saham Gabungan (IHSG): Studi pada Bursa Efek Indonesia periode Januari 2010-Desember 2013. Jurnal Administrasi Bisnis S1 Universitas Brawijaya. 2014;11(1):1-10.

[17] Apergis N, Eleftheriou S. Interest rates, inflation, and stock prices: The case of the Athens Stock Exchange. Journal of Policy Modeling. 2002;24(3):231-236.

[18] Kewal Z. Impact of interest rate, exchange rate, and inflation on stock returns of use 100 index. International Journal of Economics and Research. 2012:142-155.

[19] Mishkin FS. Globalization, macroeconomic performance, and monetary policy. Journal of Money, Credit and Banking. 2009;41(1):187-196.

[20] Park S. The rationality of negative stock-price responses to strong economic activity. Financial Analysts Journal. 1997;53(5):52-56.
[21] Galih C, Sulistyowati L. Faktor-faktor yang mempengaruhi pergerakan indeks harga saham sektor pertanian periode 2014-2018. Jurnal Agribisnis dan Sosial Ekonomi Pertanian UNPAD. 2020;5(1):15-24.
[22] Maulinda TS. Pengaruh harga minyak dunia, nilai tukar, inflasi, suku bunga SBI, Indeks Dow Jones, dan Indeks Nikkei 225 terhadap indeks sektor pertambangan yang terdaftar di Bursa Efek Indonesia (BEI) periode 2011-2017. Jurnal Ilmu Manajemen (JIM). 2018;6(3)314–322.
[23] Haider SW. Impact of interest rate, inflation rate, exchange rate, and gold prices on Karachi Meezan Index 30. European Journal of Islamic Finance. 2018;(10):1-8.
[24] Liu H, Manzoor A, Wang C, Zhang L, Manzoor Z. The COVID-19 outbreak affected countries' stock markets' response. International Journal of Environmental Research and Public Health. 2020;17(8):1-9.
[25] Raharho S. Pengaruh inflasi, nilai kurs rupiah, dan tingkat suku bunga terhadap harga saham di Bursa Efek Indonesia. Jurnal Ekonomi, Bisnis. 2010:1-16.
[26] Pesaran MH, Shin Y. An autoregressive distributed-lag modelling approach to cointegration analysis. In: Strøm S, editor. Econometrics and economic theory in the 20th century: The Ragnar Frisch Centennial Symposium. Cambridge: Cambridge University Press; 1995. p. 371-413.
[27] Apergis N, Eleftheriou S. Interest rates, inflation, and stock prices: The case of the Athens Stock Exchange. Journal of Policy Modeling. 2002;24(3):231-236.
[28] Junaehi D, Salistia F. Dampak pandemi COVID-19 terhadap pasar modal di Indonesia. Al-Kharaj: Jurnal Ekonomi, Keuangan & Bisnis Syariah. 2020;2(2):109-231.
[29] Yang X, Zhu Y, Cheng TY. How the individual investors took on big data: The effect of panic from the internet stock message boards on stock price crash. Pacific-Basin Finance Journal. 2020;59. Doi: https://doi.org/10.1016/j.pacfin.2019.101245.
[30] Petrusheya N, Jordanoski I. .: Comparative analysis between the fundamental and technical analysis of stocks. Journal of Process Management. New Technologies. 2016;4(2):26-32.
[31] Raatnasari PS, Purnawati NK. Pengaruh profitabilitas, likuiditas, tingkat pertumbuhan perusahaan dan leverage terhadap kebijakan dividen. E-Jurnal Manajemen Universitas Udayana. 2019;8(10): 6179 – 6198.
[32] Brigham EF, Weston JF. Dasar-Dasar Manajemen Keuangan. Jakarta: Erlangga; 1994.
[33] Khan Z, Khan S, Rukh L, Imdadullah K, Rehman W. Impact of interest rate, exchange rate and inflation on stock returns of KSE 100 index. International Journal of Economics and Research. 2012;3(5):142-155.
[34] Sharkas A. Dynamic relations between macroeconomic factors and the Jordanian stock market. Dynamic Relations Between Macroeconomic Factors and the Jordanian Stock Market. 2004;1(1):97-114.
[35] Amarkhil DK, Hussain J, Ayoubi M. Effect of exchange rate on stock return. JournalNX. 2021;7(1):297–310
[36] Halisa NN, Annisa S. Pengaruh COVID-19 terhadap pergerakan Indeks Harga Saham Gabungan (IHSG). Jurnal Ekonomi Kuantitatif Terapan. 2013;6(2):98-105.
[37] Pranama KA, Meydianawathi LG. Variabel-variabel yang mempengaruhi ekspor Nonmigas Indonesia ke Amerika Serikat. Jurnal Ekonomi Kuantitatif Terapan. 2013;6(2):98-105.
[38] Ranto SR. Pengaruh jangka pendek dan jangka panjang variabel makro ekonomi terhadap IHSG Di Bursa Efek Indonesia dengan pendekatan error correction model (ECM). Jurnal Matematika dan Pendidikan Matematika. 2019;6(1):12-24.

[39] Indahwati I. Investasi saham: investasi, spekulasi, atau judi. Equilibrium: Jurnal Ekonomi-Manajemen-Akuntansi, 2020;16(1):22-28.
[40] Jayanti Y, Darminto, Sudjana N. Pengaruh tingkat inflasi, tingkat suku bunga SBI, nilai tukar Rupiah, Indeks Dow Jones, dan Indeks Klse terhadap Indeks Harga Saham Gabungan (IHSG). Jurnal Administrasi Bisnis (JAB). 2014;11(1):1-10.
[41] Atri H, Kouki S, Gallali IM.. The impact of COVID-19 news, panic and media coverage on the oil and gold prices: An ARDL approach. Resources Policy. 2021;72. Doi: https://doi.org/10.1016/j.resourpol.2021.102061
[42] Khan MK. Impact of exchange rate on stock returns in Shenzhen Stock Exchange: Analysis through ARDL approach. International Journal of Economics and Management. 2019;1(2): 15–26.
[43] Kementerian Tenaga Kerja. Survei Kemenaker: 88 persen perusahaan terdampak pandemi COVID-19 [internet]. Kementerian Tenaga Kerja; 2020. Available from: https://kemnaker.go.id/news/detail/survei-kemnaker-88-persen-perusahaan-terdampak-pandemi-covid-19.
[44] Artha DR. Analisis fundamental, teknikal dan makroekonomi. Jurnal Manajemen dan Kewirausahaan. 2014;16(2):175-183.