



# The Effect of Macroeconomic Indicators, Crude Oil Prices, and the Dow Jones Index on the Jakarta Composite Index

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## Abstract

*This research aims to analyze the influence of macroeconomic factors, such as Exchange Rate, BI Rate, Inflation, Gross Domestic Product, Crude Oil Price, and Dow Jones Industrial Average Index (DJIA) on the Jakarta Composite Index (JCI) for the 2014-2018 period. The analytical method used is the Error Correction Model (ECM) with a significant level of 5% with E-views 10 software. The results of partial research show that in the short and long term, the Exchange Rate and Oil Price significantly negatively affect the JCI and BI Rate in the short term and have a significant negative relationship with the JCI, inflation, and Gross Domestic Product a negative and insignificant relationship with the JCI and the Dow Jones Index in the short and long term has a significant positive relationship with the JCI. The simultaneous research results show that the Exchange Rate, BI Rate, Inflation, Gross Domestic Product, Oil Price, and the DJIA simultaneously significantly influence the dependent variable, namely JCI. According to the Islamic review, activities related to Exchange Rate, BI Rate, Inflation, GDP, Crude Oil Prices, the Dow Jones Index, and the JCI are allowed. However, they must comply with Islamic law and regulations.*

**Keywords:** Jakarta Composite Index (JCI), Macroeconomic Factors, Crude Oil Price, DJIA

## Abstrak

Penelitian ini bertujuan untuk menganalisis pengaruh faktor makroekonomi, seperti Nilai Tukar, BI Rate, Inflasi, Produk Domestik Bruto, Harga Minyak, dan Indeks *Dow Jones Industrial Average (DJIA)* terhadap IHSG periode 2014-2018. Metode analisis yang digunakan adalah *Error Correction Model (ECM)* dengan tingkat signifikan 5% dengan *software E-views 10*. Hasil penelitian secara parsial menunjukkan bahwa dalam jangka pendek maupun panjang Nilai Tukar dan Harga Minyak memiliki pengaruh negatif signifikan terhadap IHSG, BI Rate dalam jangka pendek berkorelasi negatif signifikan terhadap IHSG, Inflasi dan Produk Domestik Bruto berpengaruh negatif tidak signifikan terhadap IHSG dan Indeks *Dow Jones* dalam jangka pendek dan panjang berkorelasi positif signifikan terhadap IHSG. Hasil penelitian simultan menunjukkan Nilai Tukar, BI Rate, Inflasi, Produk Domestik Bruto, Harga Minyak, dan *Dow Jones Index* secara simultan berpengaruh signifikan terhadap IHSG.

**Kata Kunci:** IHSG, Faktor Makroekonomi, Harga Minyak Mentah, DJIA

## 1. Introduction

In a capital market, various parties, especially companies, sell stocks and bonds to increase capital or strengthen company finances (Febriawan & Santosa, 2018; Fahmi, 2014). The capital market or stock exchange is a medium for investment, meeting investors and users of funds (companies going public/issuers) (Umam & Sutanto, 2017), and a place for securities trading between investors/traders. The capital market is very dynamic, and JCI fluctuations as a performance benchmark are affected by the factors that influence it. Murhadi (2009) said that several macroeconomic variables/indicators influence stock price movements, such as Gross Domestic Product (GDP), Interest Rates, Inflation, Exchange Rates, Oil Prices and Commodity Prices, Hedging, Business Cycle/Business Cycle, and others (Santosa & Puspitasari, 2019).

Tandelilin (2010) mentions a strong relationship between stock prices and macroeconomic fundamentals and shows that changes in stock prices always occur before or after changes in economic indicators. The two reasons underlying these changes are. First, the stock price that is formed is a reflection of investors' expectations of earnings, dividends, and interest rates that occur. The formed share price reflects investors' expectations of future macroeconomic conditions, not just current conditions. Second, the performance of the capital market will react to changes in macroeconomic fundamentals, such as



inflation, exchange rates, gross domestic product, and world gold prices. Research has shown that fundamental macroeconomic factors influence investment decisions in several countries (Joslin & Konchitchki, 2018).

Suteja and Gunardi (2016) also explain that the global economy has an influence. Economic dependence largely determines the sensitivity to macroeconomics; the greater the economic dependence, the greater the impact caused by macroeconomic changes. As a country with an open economy, Indonesia cannot escape the global economic conditions.

Furthermore, Bodie et al. (2014) summarized several macroeconomic factors that influence investment in a country, including economic growth, inflation, interest rates, exchange rates, and global economic conditions. Observation of changes in macroeconomic indicators is believed to assist investors in making investment decisions in the capital market (Jones, 2014). Seeing the movement of JCI, which has fluctuated over the last few years, driven by the condition of share ownership which is dominated by foreign investors and conditions regarding the relationship between the capital market and macroeconomic factors as well as expert opinion, of course, logically this shows that the JCI movement may not be purely speculative (Santosa & Santoso, 2019).

The background above guides this study to analyze the factors that influence the JCI index, and what is studied are exchange rates, interest rates (SBI), inflation, gross domestic product (GDP), world oil prices, and the Dow Jones index. This study offers the contribution of macro-risk information to the Indonesian equity market index, which can be used as a reference for investment decisions.

## 2. Literature Review and Hypothesis

The stock price index is the main indicator investors can use to determine market movements. By looking at the market index numbers, investors can find out whether today's market movements are higher or lower than yesterday's and can also compare market conditions in this period compared to the last period because stock indexes fluctuate following macroeconomic information both nationally and globally (O'Hara, 2009; Sudirman, 2015).

In the world of capital markets, an index of equities and bonds is an imaginary portfolio that measures changes in the price of a market or part of that market. When the stock index moves up, the prices of most of the stocks measured by the index move up. Conversely, most index constituent stocks move down when the stock index moves down (Santosa, 2019). By looking at the movement of the equity index, investors know the general price performance of the stocks they own. In addition, investors also know stock market conditions in general if there is a change in policy from within or outside the country. Aside from being a measure of stock prices, currently, stock indexes are increasingly popular to be used as a reference for investment products, such as mutual funds and Exchange Traded Funds (ETF).

### Research Hypothesis

#### *Effect of Exchange Rate on JCI*

Arbitrage Pricing Theory assumes that every investor can increase his portfolio return without increasing risk. By looking at the weakening Rupiah exchange rate, investors will sell their shares on the capital market and wait until the Rupiah exchange rate strengthens again to minimize risk. Thus it can be concluded that the Rupiah exchange rate negatively influences JCI (Syarofi, 2014).

According to research by Wijayaningsih et al. (2016), the IDR-USD exchange rate has a negative or inverse effect on the Composite Stock Price Index IDX. This means that when the USD appreciates, and the IDR depreciates, the Jakarta Composite Index on the IDX rises, and vice versa. When the USD depreciates, and the rupiah appreciates, the IDX Stock Price Index decreases. This condition is because if the value of the US dollar is high or the rupiah weakens, investors will be more interested in investing in US dollars than investing in securities which are long-term investments.

This finding also aligns with research conducted by Wahyudi et al. (2017). An increase in foreign exchange rates (in this case, the USD) gave negative sentiment to the domestic stock market. This



condition caused a movement of funds from the stock exchange to the foreign exchange market because speculators considered it more profitable to speculate overseas. Similar research has been conducted by Karisma (2017), Yuanisa (2013), Husnul et.al (2017), and Witjaksono (2010). Based on the description above, the following hypothesis is made:

H1: Exchange Rate has a negative and significant effect on JCI

### ***The influence of the BI Rate on JCI***

The higher the BI Rate, makes public interest in saving higher, but the lower the public's desire to invest, which will result in a general decline in stock prices which can be seen in the Jakarta Composite Index on the IDX (Wijayaningsih et al., 2016). In addition, this is also supported by Tandelilin (2010) that changes in interest rates will affect stock prices in reverse with ceteris paribus (when interest rates increase, stock prices will decrease in ceteris paribus, i.e., do not see changes in the FED Rate and IDR Exchange).

Listriono and Elva (2015) state that the BI Rate significantly negatively affects JCI. This finding proves that an increase in the BI Rate can increase the company's burden to fulfill obligations to the Bank so that it can reduce company profits. Eventually, the Jakarta Composite Index will decrease because investors are not interested in investing in the capital market. This increase also has the potential to encourage investors to divert their funds to the money market or savings or time deposits.

Wahyudi et al. (2017) stated in their research that the BI Rate had a significant negative effect on the JCI and in his research explained that if an increase in the deposit rate can provide a higher level of interest income than the expected return when making stock transactions, then investors will tend to divert their investment by depositing funds in a bank rather than making risky transactions, and vice versa. In another study conducted by Maurina et al. (2015), Yuanisa (2013), Listrino & Nuraina (2015), and Sumardi & Ula (2017). Based on the description above, the following hypothesis is made:

H2: BI Rate has a negative and significant effect on JCI

### ***Effect of Inflation on JCI***

Prasetyanto (2016) concluded that inflation significantly negatively affected JCI. The high inflation rate affects other economic activities, such as investment and stock prices. A higher inflation rate means that the level of stock prices in a company has decreased; therefore, high inflation will reduce consumption because the price of goods has increased. High inflation will have an impact on rising prices in general, and this will have an impact on increasing the company's cost of capital so that companies will experience investment competition, which means that there is a tendency for investors to invest in the money market and of course can result in share prices in the capital market experiencing a significant decline.

Wahyudi et al. (2017) show that inflation growth in Indonesia is followed by a decline in stock prices on the Indonesia Stock Exchange because changes in inflation that tend to increase will impact the rising prices of goods and services. An increase in the price of goods and services will result in an increase in the cost of production by the company. On the other hand, inflation growth will reduce the real income level of people who earn a fixed income, thereby reducing people's purchasing power. It can be explained that fluctuations in inflation will create uncertainty in stock business activities, making investors afraid to face risks, especially when inflation increases.

Nofiatin (2013) states that a negative long-term balanced relationship exists between JCI and inflation (the higher the inflation, the lower the JCI). If prices increase, people's purchasing power will decrease, and interest in investing will also decrease. As a result, stock prices will decrease, and the Stock Price Index will also decrease. Based on the description above, the following hypothesis is made:

H3: Inflation has a negative and significant effect on JCI

### ***Effect of GDP on JCI***

Prasetyanto (2016) found that Gross Domestic Product has a significant positive effect on JCI. This finding is because GDP growth indicates economic growth in a country. If economic growth improves,



people's purchasing power will also increase, and this is an opportunity for companies to increase their sales revenue. With increasing company sales, the company's opportunity to earn profits will also increase so that the company's performance becomes better, which will affect capital formation. The increase in revenue will affect the company's productivity and performance in the capital market. This condition will encourage investors to invest, impacting the capital market and increasing the share price. An increase in the company's share price due to increased GDP will encourage an increase in JCI on the IDX.

Kusuma and Ida Bagus (2016) also held the same opinion in their research, stating that GDP growth reflects economic growth. Improved economic growth will increase people's purchasing power. Economic growth also has an impact on the company. Companies can increase their profits from increased sales. High profits attract investors to invest their capital in various companies in the capital market and buy shares of these companies, increasing the Jakarta Composite Index in the capital market. Increased GDP growth, which impacts increasing economic growth in a country, impacts people's purchasing power, which is increasing, and the attractiveness of investors to invest in the capital market is increasing. Based on the description above, the following hypothesis is made:

H4: Gross Domestic Product has a positive and significant effect on JCI

#### ***Effect of Oil Prices on JCI***

The significant negative effect of the crude oil variable on the Jakarta Composite Index (JCI) for the 2008-2016 period. Investors can use crude oil as a consideration in making investment decisions. If crude oil declines, investors will have more opportunities to invest in the capital market (Karisma, 2017). World oil prices have a negative and significant impact on JCI. The increase in world oil prices will cause an increase in other necessities because oil is one of the vital needs. Rising prices of production goods will cause companies to experience increased production costs (Khan et al., 2019). This finding will certainly greatly affect the performance and profits of the company. Investors will sell their shares when the company's performance and profits show unfavorable results and will certainly affect stock prices and also the combined stock price index (Gumilang et al., 2014)

In a study by Hossein et al. (2011), in the long term, crude oil prices have a positive effect on the SSE Index (Shanghai Stock Exchange) and a negative effect on the BSE Index (Bombay Stock Exchange). A negative long-run relationship between the BSE (Bombay Stock Exchange) and oil prices is expected because India is one of the largest oil importers and uses crude oil much less efficiently. Hence, oil price risk has a large negative effect on the stock market.

H5: Oil prices have a positive and significant effect on JCI

#### ***Effect of the Dow Jones Index on JCI***

The results of Witjaksono's research (2010) show that of the two main exchanges in the world that tested their influence on JCI, the result was that the Dow Jones Index had the greatest influence on JCI. This finding is motivated by the United States being Indonesia's main export destination. So changes in US economic conditions reflected in the Dow Jones Index will impact the Indonesian economy through JCI.

If a country is involved in international economic trade, its national economic growth will be influenced by directly related international economic activities. Theoretically, the progress of the United States economy will positively impact the Indonesian economy, making the Indonesian capital market more lively and increasing JCI. Thus, the Dow Jones Index positively affects JCI (Syarofi, 2014). Yuanisa (2013) research is also in line with some of the studies above that the Dow Jones Index has a positive and significant effect on changes in JCI.

H6: The Dow Jones Index has a positive and significant effect on JCI

### **3. Data and Method**

#### **Population and Sample**

The population is a generalization area of objects or subjects with certain quantities and characteristics. (Sugiyono, 2014). The population in this study is the composite stock price index (JCI) on the Indonesia Stock Exchange (IDX) from 2014-2018. The sample is part of the number and characteristics possessed



by the population. (Sugiyono, 2014). The sampling technique in this study was purposive sampling (conditional sampling), namely the sampling technique with certain criteria adapted to the needs of this research. The sample selection criteria in this study are as follows:

1. Jakarta Composite Index (JCI) Monthly from 2014 to 2018.
2. The Jakarta Composite Index (JCI) is the closing price of trading on the 2014-2018 Indonesia Stock Exchange (IDX).

Based on the following criteria, 60 Jakarta Composite Index (JCI) data were obtained in 2014-2018, which can be used as samples.

### **Measurement Scale**

As for measuring the variables in this study, the following measurements can be used:

**Table 1. Variable Definitions and Measurement Scales**

No.	Measurement Variable	Scale
1	Jakarta Composite Index	Ratio
2	Exchange Rate USD – IDR	Ratio
3	BI Rate (7 Days Repo Rate)	Ratio
4	Inflation Consumer Price Index	Ratio
5	GDP Gross Domestic Product	Ratio
6	Crude Oil Price	Ratio
7	Dow Jones Industrial Index	Ratio

### **Analysis Method**

This study will use descriptive statistical methods and ECM (Error Correction Model) analysis. The error Correction Model is used to determine the short-term and long-term effects of the dependent variable on the independent variable. Besides determining the effect of economic models in the short and long term, the ECM model also has been used to overcome non-stationary data and spurious regression problems (Santosa & Hidayat, 2014).

### **Cointegration Test**

To proceed to the next stage, use the Error Correction Model. The residual model must be stationary at the level. To calculate the ADF value, first form a cointegration regression equation with the ordinary least squares (OLS) method (Widarjono, 2009). After all, variables are declared stationary, and a cointegration test is performed. The cointegration test was conducted to determine whether there is a long-term relationship between the independent and dependent variables. The first thing to do is to model a long-run regression equation. The long-term model equations used in this model are:

$$JCI_t = \beta_0 + \beta_1 KURSt + \beta_2 BIR_t + \beta_3 INF_t + \beta_4 GDP_t + \beta_5 OIL_t + \beta_6 DJIA_t + e \quad (1)$$

Where:

$\beta_0$  = Constant;  $\beta_i$  = Long-term coefficient; JCI = Jakarta Composite Index; KURS = Exchange Rate  
 BIR = BI Rate; INF = Inflation; GDP = Gross Domestic Product; OIL = Crude Oil Price; DJIA =  
 Dow Jones Industrial Average; t = Time Period; e = Error Term

The residual-based test method was used to test the cointegration between the variables in this study. This method is carried out using the ADF statistical test by looking at whether the cointegration regression residuals are stationary. If the ADF value is less than the critical value, then the equation model above can be cointegrated. Conversely, if the ADF value exceeds the critical value, the equation model is not cointegrated.

### **Error Correction Model (ECM)**

This time series data study uses the Error Correction Model (ECM) approach. ECM is a model used to correct the regression equation for individually non-stationary variables so that they return to their



equilibrium values in the long run, with the main condition being a cointegration relationship between the constituent variables (Ajija et al., 2011). The use of the ECM model is carried out by using the residuals of the cointegrated equations. The residual is used as an error correction or ECT (Error Correction Term), which affects the short-term equation. The equation can be written as follows:

$$D(JCI)t = \alpha_0 + \alpha_1 D(KURS)t + \alpha_2 D(BIR)t + \alpha_3 D(INF)t + \alpha_4 D(GDP)t + \alpha_5 D(OIL)t + \alpha_6 D(DJIA)t + ECT(-1)t + et \quad (2)$$

Where:

D(JCI)=JCI Change; D(EXCHANGE)=Exchange Rate Change; D(BIR)=Change in BI Rate; D(INF)= Change in Inflation; D(GDP)=Change in Gross Domestic Product; D(OIL)=Crude Oil Price Change; D(DJIA)=Dow Jones Industrial Average Change;  $\alpha_0$ =Constant;  $\alpha_1, \alpha_2, \dots, \alpha_6$ =ECM coefficient (short term); ECT(-1)=Error Correction Term (ECT), which represents the actual adjustment for the balance condition when an unbalance condition occurs; e=Error Term; t = period.

The Error Correction Model approach determines short-term and long-term dynamic movements for time series data. Meanwhile, a cointegration approach is used to identify a long-term relationship between the dependent and independent variables. Using the ECM model can assist researchers in solving spurious regression problems and non-stationary time series data (Ajija et al., 2011).

## 4. Results

### Data Description

The results of descriptive statistics in this study are shown in Table 2 with the characteristics of the sample used in this study, including the number of 60 samples (N), the sample average (mean), the maximum value (max), the minimum value (min), and the standard deviation for each variable. The number of observations on the Jakarta Composite Index on the Indonesia Stock Exchange for 2014 - 2018 in this study is 60 data.

**Table 2. Descriptive Analysis Results**

Research Variables	N	Mean	Max	Min	Std. Dev.
KURS	60	13237.45	15178.87	11427.05	856.3157
BIR	60	6.137500	7.750000	4.250000	1.346232
INF	60	4.667833	8.360000	2.790000	1.691152
GDP	60	5.010500	5.170000	4.780000	0.115794
OIL	60	786245.9	1251177.	410805.6	220155.8
DJIA	60	19862.28	26458.31	15698.85	3283.773
JCI	60	5351.252	6605.631	4223.908	582.4152

Source: Processed Data (2020)

### Error Correction Model Estimation

#### Data Stationarity Test

Before testing data using ECM (Error Correction Model), what needs to be done first is to determine whether the variables used are stationary. This is done to avoid spurious regression, making statistical tests for each coefficient invalid and difficult to use as a guideline. In addition, if the data to be used is stationary. OLS regression can be used, but if it is not stationary, the data needs to be seen for its stationarity through a degree of integration test. And then, data that is not stationary at the level can be cointegrated, so it is necessary to do a cointegration test. If the data has been cointegrated, then ECM testing can be done.

We used a unit root test to determine whether the time series data was stationary. At this stage, a unit root test was carried out using the Augmented Dickey-Fuller (ADF-Test) method with the help of EViews 10 software. The stationary test results are as follows:



Table 3. Unit Root Test

Variable	Unit Root Test			
	Level		1 <sup>st</sup> Difference	
	ADF	Prob	ADF	Prob
JCI	-1.204116	0.6672	-6.564203	0.0000
KURS	-0.880160	0.7878	-6.770985	0.0000
BIR	-1.034305	0.7354	-5.727008	0.0000
INF	-2.128724	0.2345	-6.000492	0.0000
GDP	-1.153884	0.6885	-7.486702	0.0000
OIL	-2.361167	0.1571	-5.339928	0.0000
DJIA	-0.935275	0.7701	-6.924711	0.0000

Source: Processed Data (2020)

The unit root test results in Table 3 show that all variables are not stationary at the level, marked by a Prob value  $> \alpha$ , where  $\alpha = 5\%$ . This finding indicates that all variables at the level have a unit root. A degree of integration test is then carried out To prove whether the data is stationary at the 1st Difference level. Table 3 shows that all variables have a probability value below 0.05, indicating  $< \alpha$ . So it was concluded that all variables were stationary at the 1st Difference level.

### Cointegration Test

The cointegration test is carried out to detect the stability of the long-term relationship between variables. If there is cointegration among the dependent variables, it means that there is a long-term relationship between these variables. Cointegration test results are obtained by forming a residual, which is obtained by regressing the independent variables on the dependent OLS. The residual must be stationary at levels to be said to have cointegration. The results of long-term regression processing, the results are shown in Table 4 as follows:

Table 4. Long-run Regression Estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8947.675	1758.887	5.087124	0.0000
KURS	-0.379846	0.051144	-7.427002	0.0000
BIR	5.447688	36.41570	0.149597	0.8817
INF	-27.78741	24.01077	-1.157290	0.2523
GDP	-525.6129	333.6503	-1.575340	0.1211
OIL	-0.000566	0.000186	-3.048519	0.0036
DJIA	0.231927	0.018217	12.73129	0.0000
R-squared	0.919567	Prob(F-statistic)		0.000000
Adjusted R-squared	0.910461			

Source: Processed Data (2020)

Table 4 presents long-term regression estimates, the Exchange Rate variable has a significant negative effect on JCI, the Oil Price variable has a significant negative effect on JCI, and the Dow Jones Index variable has a significant positive effect on JCI. These three variables are said to be significant because all three have a probability value that is smaller than  $\alpha = 5\%$ .

Overall, the results from Table 4 can be translated as follows:

1. The Exchange Rate has a coefficient value of -0.379846, indicating that every increase in the Exchange Rate change by one unit will cause a decrease in the Jakarta Composite Index (JCI) of -0.379846. With a probability value of  $t < \alpha$ , namely a probability value of 0.0000 at  $\alpha = 0.05$ , it can be said that the Exchange Rate significantly influences the Jakarta Composite Index (JCI) in the long run.



2. The BI Rate has a coefficient value of 5.447688, indicating that each increase in changes in the BI Rate by one unit will cause an increase in the Jakarta Composite Index (JCI) by 5.447688. With a probability value of  $t > \alpha$ , namely a probability value of 0.8817 at  $\alpha = 0.05$ , it can be said that the BI Rate does not significantly affect the Jakarta Composite Index (JCI).
3. Inflation has a coefficient value of -27.78741, indicating that every one-unit increase in inflation changes will cause a decrease in the Jakarta Composite Index (JCI) of -27.78741. With a probability value of  $t > \alpha$ , namely a probability value of 0.2523 at  $\alpha = 0.05$ , it can be said that inflation has no significant effect on JCI in the long run.
4. Gross Domestic Product has a coefficient value of -525.6129 which means that every one unit change in Gross Domestic Product will cause a decrease in the Jakarta Composite Index (JCI) of -525.6129. With a probability value of  $t > \alpha$ , namely a probability value of 0.1211 at  $\alpha = 0.05$ , it can be said that in the long run, the Gross Domestic Product does not significantly affect JCI.
5. The price of oil has a coefficient of -0.000566 which indicates that every increase in the change in oil price by one unit will cause a decrease in the Jakarta Composite Index (JCI) by -0.000566. With a probability value of  $t < \alpha$ , namely a probability value of 0.0036 at  $\alpha = 0.05$ , it can be said that in the long term, oil prices have a significant influence on JCI.
6. The Dow Jones Index has a coefficient value of 0.231927, indicating that every increase in the change in the Dow Jones Index by one unit will cause an increase in the Jakarta Composite Index (JCI) of 0.231927. With a probability value of  $t < \alpha$ , namely a probability value of 0.0000 at  $\alpha = 0.05$ , it can be said that in the long run, the Dow Jones Index significantly influences the JCI.

After carrying out the long-term regression estimation test, the residual formation is then carried out. To be said to have cointegration, the residual must be stationary at the level. From the results of data processing in the EViews 10 program, the results are in Table 5 as follows:

**Table 5. Cointegration Test**

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.319473	0.0010
Test critical values:		
1% level	-3.546099	
5% level	-2.911730	
10% level	-2.593551	

\*MacKinnon (1996) one-sided p-values.

The estimation results of the Augmented Dickey-Fuller (ADF) test showed that the residual is stationary at the level shown in Table 4 and that the t-statistic is significant at a critical value of 5% with a prob of 0.0010. Thus it can be concluded that the regression is cointegrated or has a long-run equilibrium relationship. Besides that, the concern about the occurrence of spurious regression is not proven by the conditions of the results of the data stationarity test and cointegration test. This cointegration test implies that cointegrated changes are in long-run equilibrium and have a long-term relationship.

### **ECM models**

A good and valid ECM model must have a significant ECT. The significant ECT (Error Correction Term) can be seen from the t-statistic value, which is then compared with the t-table, which can also be seen from the probability. The coefficient is significant if the t-statistic value is greater than the t-table. If the ECT probability is smaller  $\alpha$ , the ECT coefficient is significant. The following is the Error Correction Model equation:

In Table 6, it is known that the Prob(F-statistic) value is 0.000000, which is smaller than 0.05 ( $\alpha$ ), and the ECT(-1) value which indicates a negative and significant speed of adjustment, indicates that this ECM model is a valid and significant influence in the short term and long term. The R-squared value is 0.570662 or 57.07%, or in other words, the Exchange Rate variable, BI Rate, Inflation, GDP, Oil Price, and Dow Jones Index in this modeling can explain the Jakarta Composite Index variable of 57.07% than other variables outside the modeling explain the remaining 42.93%.



**Table 6. Error Correction Model Regression (Short-Run)**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17.25482	16.70634	1.032831	0.3066
D(KURS)	-0.281566	0.073908	-3.809683	0.0004
D(BIR)	-156.7616	69.35106	-2.260407	0.0281
D(INF)	3.456382	25.43367	0.135898	0.8924
D(GDP)	7.364785	398.7443	1.846994	0.0706
D(OIL)	-0.000513	0.000249	-2.059421	0.0446
D(DJIA)	0.092780	0.025487	3.640239	0.0006
ECT(-1)	-0.566583	0.107067	-5.291847	0.0000
R-squared	0.570662	Prob(F-statistic)		0.000000
Adjusted R-squared	0.511733			

Source: Processed Data (2020)

The short-term equation estimation results show that the Exchange Rate, BI Rate, GDP, and Dow Jones Index variables significantly influence the Jakarta Composite Index (JCI) in the short term. Where the Dow Jones Index has a positive influence on JCI, and the Exchange Rate, BI Rate, Inflation, GDP, and Oil Prices have a negative influence on JCI.

## 5. Discussions

### Effect of Exchange Rate on JCI

Hypothesis one states that the Exchange Rate's negative and significant relationship to JCI is acceptable. In the above research results, the Exchange Rate's probability in the short-term Error Correction Model regression estimation is  $0.0004 < 0.05$  with a coefficient of  $-0.281566$ . Moreover, in the long-term test, the probability of the Exchange Rate is  $0.0000 < 0.05$  with a coefficient value of  $-0.379846$ . So if the Exchange Rate has decreased, then in the short term and long term, the value of JCI has increased. If the demand for the rupiah exchange rate is relatively less than the supply of IDR, the rupiah exchange rate will depreciate and vice versa. For investors, the depreciation of the IDR against the USD indicates that the prospects for the Indonesian economy are bleak. This finding is because the depreciation of the rupiah occurs when the fundamental factors of the Indonesian economy weaken (Santosa, 2019; Sunariyah, 2006). This increases the risk for investors when they want to invest in the Indonesian stock market (Ang, 1997). Investors will, of course, avoid risk, so investors will tend to sell and wait until the economic situation improves. This selling action by investors will drive a decline in the stock price index on the IDX (Santosa & Santoso, 2019; Joesoef, 2007).

### The influence of the BI Rate on JCI

The second hypothesis states that the BI Rate has a negative and significant relationship to the Jakarta Composite Index (JCI), which is acceptable. In the above research results, the BI Rate's probability in the short-term Error Correction Model regression estimation is  $0.0281 < 0.05$  with a coefficient of  $-156.7616$ . So if the BI Rate decreases, then the value of JCI will increase in the short term. The BI Rate is one of the monetary authority's instruments to control inflation and economic growth. If Bank Indonesia announces a BI rate reduction, investors will divert their funds to the capital market to get a better return than keeping their funds in savings (Yanti et al., 2020).

Listriono and Elva (2015) state that the BI Rate significantly negatively affects JCI and proves that an increase in the BI Rate can increase the company's burden to fulfill obligations to the Bank so that it can reduce company profits. Finally, JCI decreases because investors are not interested in investing



in the capital market. This increase also has the potential to encourage investors to divert their funds to the money market or savings or time deposits (Sihombing et al., 2014).

### Effect of Inflation on JCI

The third hypothesis states that inflation negatively and significantly affects the Jakarta Composite Index (JCI), so the hypothesis is rejected. In the above research results, the probability of inflation in the long-term regression estimation is  $0.2523 > 0.05$  and has a coefficient value of  $-27.78741$ . Inflation has a negative but insignificant long-term effect on JCI. The results of this study are supported by the theory put forward by Putong (2013), according to which the market can still accept inflation of less than 10% because the inflation rate is still in the low category. This finding does not affect investors' interest in investing, so it does not significantly affect JCI fluctuations.

If inflation exceeds 10%, the capital market will be disrupted because Bank Indonesia will increase the BI rate, which will cause investors to tend to divert their capital to the banking sector. This result is also based on the assumption that the cause of inflation is Cost Push Inflation. Cost-push inflation occurs due to high production costs caused by the company's inefficiency, the country's exchange rate, increases in raw material prices, labor wages, and decreased production (Santosa & Huda, 2020).

### Effect of GDP on JCI

The fourth hypothesis is rejected, which states that the Gross Domestic Product (GDP) has a significant positive relationship with the Jakarta Composite Index (JCI). In the above study, the probability of GDP in the short-term Error Correction Model regression estimation is  $0.0706 > 0.05$  with a coefficient of  $-7.6347$ . Moreover, in the long-term test, the Gross Domestic Product (GDP) probability is  $0.1211 > 0.05$  with a coefficient value of  $-525.6129$ . GDP has a positive but insignificant effect on JCI in the short and long term. The positive sign on the coefficient means that economic growth positively affects company welfare and people's purchasing power. Investors tend to increase their investment in the stock market because the issuer's financial performance is improving, so JCI is increasing.

### Effect of Oil Prices on JCI

The fifth hypothesis states that oil prices have a significant negative relationship with the Jakarta Composite Index (JCI), which can be accepted. In the above research results, the probability of oil prices in the short-term Error Correction Model regression estimation is  $0.0446 < 0.05$  with a coefficient of  $-0.000513$ . Furthermore, in the long-term test, the probability of the Exchange Rate is  $0.0036 < 0.05$  with a coefficient of  $-0.000566$ . So if oil prices decrease, then in the short term and long term, the value of JCI will also increase. An increase in world oil prices will cause an increase in other necessities because oil is one of the vital needs (Yanti et al., 2019). Rising prices of production goods will cause the company to experience an increase in production costs. This finding will greatly affect the company's performance and profits (Khan et al., 2019). Investors will sell their shares when the company's performance and profits show unfavorable results. This will affect stock prices and the Jakarta Composite Index (Gumilang et al., 2014).

### Effect of the Dow Jones Index on JCI

The sixth hypothesis states that the Dow Jones Index's positive and significant relationship to JCI is acceptable. In the above research results, the Dow Jones Index's probability in the short-term Error Correction Model regression estimation is  $0.0006 < 0.05$  with a coefficient of  $0.092780$ . Moreover, in the long-term test, the probability of the Dow Jones Index is  $0.0000 < 0.05$ , with a coefficient value of  $0.231927$ . If the Dow Jones Index increases, then in the short term and long term, the value of JCI will also increase. The Dow Jones index is the index with the largest capitalization in the world. Therefore, the Dow Jones index movement can affect almost all world stock indexes, including JCI.

The influence of the Dow Jones index on the JCI is expected to be positive because an increase in the Dow Jones index will result in an increase in JCI on the Indonesia Stock Exchange (IDX). This is due to positive sentiment from investors toward world economic conditions (Pratikno, 2009). Witjaksono (2010) shows that of the two main exchanges in the world that tested their influence on JCI, the result



was that the Dow Jones Index had the greatest influence on JCI. This is motivated by the United States being Indonesia's main export destination. So that changes in the economic conditions of the United States, which will be reflected in the Dow Jones Index, will impact the Indonesian economy through JCI (Santosa & Santoso, 2019).

## 6. Conclusion

Based on the results of the analysis and discussion of the research and the hypotheses that have been carried out and tested in this study, it can be concluded that the effect of the independent variables on the Jakarta Composite Index (JCI) is as follows: the results of hypothesis testing one show that the Exchange Rate has a negative and significant relationship to JCI. This result shows that when the exchange rate decreases, in the short term and long term, the JCI value will increase.

The second hypothesis test shows that the BI Rate has a negative and significant relationship to JCI. This finding proves that an increase in the BI Rate can increase the company's burden to fulfill obligations to banks, thereby reducing the company's net profit. JCI will decrease because investors are not interested in investing in the capital market. The results of the third hypothesis show that inflation has a negative and insignificant effect on JCI. According to him, inflation that is less than 10% can still be accepted by the market because the inflation rate is still in the low category; this does not affect investors' interest in investing.

The fourth hypothesis test shows that Gross Domestic Product (GDP) has a negative but insignificant effect on JCI in the short or long term, which states that changes in the GDP variable are negative and do not significantly affect changes in JCI. This finding shows that if GDP changes, the JCI will experience insignificant changes in the opposite direction. Furthermore, the fifth hypothesis test shows that oil prices have a significant negative relationship with JCI. This result is because investors can use oil prices as a material consideration in making investment decisions. If oil prices decrease, investors have more opportunities to invest in the capital market.

Moreover, the sixth hypothesis test shows that the Dow Jones Index has a positive and significant relationship with JCI. These findings show that the NYSE, as the largest capital market in the world, directly influences global market indices, including the IDX. The Dow Jones index indicates the global economy, so its fluctuations directly impact the Indonesian market index.

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