

Macroeconomics and Jakarta Composite Index

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Keywords: Jakarta Composite Index (JCI), Macroeconomics, Dow Jones Index, BI 7 Days Rate, The Fed Rate, Exchange Rate, World Oil Prices

Abstract: This study was conducted to determine the effect of macroeconomic variables on the Jakarta Composite Index (JCI). By using time series data from 2016-2018, multiple regression analysis with the least square model is used to prove the influence of dow jones index (DJIA), BI 7 days rate, fed rate, exchange rate, inflation and world oil prices against the Jakarta Composite Index. After going through the data stationary test and classic assumption test, the results of the study prove that there is no significant effect both simultaneously and partially between macroeconomic variables on the Jakarta Composite Index (JCI) on the Indonesia Stock Exchange (IDX).

1 INTRODUCTION

As a developing country, Indonesia has enormous potential in the growth of investment, especially in financial assets. This potential is evidenced by the growth of the Jakarta Composite Index (JCI) in the last 10 years which reached 200%. JCI is the weighted average price of all shares of companies listed on the Indonesia Stock Exchange. The increase in JCI will be an indicator of the improving investment climate of Indonesia's financial securities. The JCI price increase also followed by the growth of market capitalization originating from foreign investment and domestic investment. At the end of 2018, market capitalization in Indonesia reached almost 7,000 trillion rupiah, an increase of 7 times compared to the previous 10 years. Even though in 2019, domestic market capitalization in Indonesia has reached 50% compared to foreign market capitalization, but the composition of foreign investment in the country continues to increase, thereby reducing the composition of domestic investment. The investment growth is an opportunity that foreign and domestic investors can use in investing in the Indonesian capital market.

An increase in market capitalization will certainly increase demand and supply of shares in Indonesia. Although fundamental financial performance factors play an important role in the investor's consideration of investment policies, macroeconomic factors and competition in developing countries' stock exchanges

can also influence the flow of funds and thus affect JCI price levels. It cannot be denied that investors are eagerly always trying to find information related to macroeconomics which will be a consideration of investment policies. (Barakat et al., 2016) (Barakat, Elgazzar and Hanafy, 2016) explain that macroeconomic variables can explain and have an important role in market fluctuations. News about the increase in the domestic interest rate (BI 7 days rate), the foreign interest rate (the fed rate), the development of the Dow Jones index price, the rupiah exchange rate against the USD, inflation, and even the development of world oil prices has always been highlights in financial media. And this is also supported by the opinions of several experts from securities companies (Paramitra Alfa Sekuritas, 2018) (Artha Sekuritas, 2019) (OSO Sekuritas, 2019) (Bina Artha Sekuritas, 2019), and also by the Indonesian Stock Exchange representatives (Wintoro, 2014). Some studies that support the influence of the macro economy on the stock index that are (Samadi et al., 2012) (Vejjagic and Zarafat, 2013), (Sudarsana and Candraningrat, 2014), and (Barakat et al., 2016).

Whereas some studies have found that macroeconomics factors do not contribute to stock index price. (Wijayaningsih et al., 2016) found that the fed rate had no significant effect on JCI. (Salameh and Alzubi, 2018). found that the Stock Exchange in the United Arab Emirates was influenced by the Stock Exchange in the UK, but not by the stock exchange in the USA. (Ullah et al., 2014) found

that in the long run the exchange rate and interest rate have a significant effect while inflation has no effect on the stock market. Likewise with research (Asmara and Asmara, 2018) which found that there was no relationship between inflation and JCI. (Sir, 2012) found that there is a causality relationship between macroeconomic variables on stock returns. This study will prove whether these macroeconomics number really affect investor behavior that will significantly change JCI prices.

2 RESEARCH PROBLEM

The problem in this study is the value of JCI which continues to increase with a significant increase over the past 10 years reaching 200%. By ignoring the fundamental factors, this study focuses more on macroeconomic variables that have been trusted and have been proven by various studies to affect stock indexes.

In Indonesia in the last 2 years (2016-2018), the pattern of JCI change is very much in accordance with the changing pattern of macroeconomic variables. JCI in the last two years has increased by 30% where there has been a decline in interest rates by 17%, a decrease in inflation by 24%, a decline in the exchange rate by 4.5%, an increase in DJIA by 42%, an increase in world oil prices by 81%, and an increase The Fed's interest is 995%.

So, the research problem that we want to prove in this research is "Are there significant influences between macroeconomic factors on the Jakarta Composite Index (JCI)?"

3 LITERATURE REVIEW

3.1 Macroeconomic Variables

Research that links macroeconomic variables to stock returns begins to be enlivened by (Fama and Schwert, 1977) and (Fama, 1981). By using inflation as the main macroeconomic variable that is most influential so that it causes a stock anomalous return. After that, more and more studies using other macroeconomic variables are used in predicting stock prices, stock returns, and also stock index prices.

Macroeconomic variables used in this study are:

- Dow Jones Industrial Average (DJIA) The DJIA is the index used to determine the weighted average of the 30 largest companies in the United States which was founded by The Wall Street

Journal. This index is used as a measure of the performance of the largest companies in America that will determine the condition of the USA economy.

- BI & Days Rate The 7 days BI rate is the reference interest rate of banks in Indonesia, which has been determined by Bank Indonesia as the central bank. 7 days showing a period of 7 days used Bank Indonesia s to evaluate monetary policy in setting the benchmark interest rate.
- The Federal Reserve Rate (The Fed Rate) The Fed Rate is the interest rate at which depository institutions (banks and credit unions) lend reserve balances to other depository institutions overnight, on an uncollateralized basis (wikipedia).
- The exchange rate of the rupiah against the dollar An exchange rate is an agreement known as a currency exchange rate for payments now or later, between two currencies of each country or region (wikipedia).
- Inflation Inflation is an increase in the prices of goods in general and continuously. Inflation data in Indonesia is obtained from the publication of Bank Indonesia as the central bank in Indonesia.
- Oil Prices oil price is the price of petroleum that uses the West Texas Intermediate (WTI) standard. WTI is a world standard of petroleum produced from North America which is in great demand, especially in the USA and China.

3.2 Jakarta Composite Index

The Jakarta Composite Index is the average daily stock of all shares listed on the Indonesia Stock Exchange. JCI is seen as the most commonly used general index in Indonesia as a measurement of the average performance of all shares.

4 METHODOLOGY

4.1 Population and Sample

The population and sample in this research are Jakarta Composite Index (JCI) in Indonesia Stock Exchange. Secondary data used is from 2016 - 2018 so the overall data is 36 (n = 36).

4.2 Data Analysis

Data were analyzed using multiple regression analysis using software EViews. The multiple

regression equation from the study is as follows:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + e \quad (1)$$

Where,

- Y = Jakarta Composite Index
- X_1 = Dow Jones Index (DJIA)
- X_2 = BI 7 Days Rate
- X_3 = The Federal Reserve Rate
- X_4 = Exchange Rate (IDR to USD)
- X_5 = Inflation
- X_6 = Oil Price
- a = constanta
- $b_1, b_2, b_3, b_4, b_5, b_6$ = The Federal Reserve Rate
- e = error

Before the multiple regression testing is carried out, each variable is subjected to data stationarity testing to determine whether or not there is a trend pattern on time series data. This is done to avoid spurious regression in research.

After that, classical assumptions were tested on the data, namely multicollinearity and normality so that best linear unbiased estimator (BLUE) requirements were fulfilled in the regression with the least squares model.

Furthermore, the F test is used to determine the simultaneous effect between all macroeconomic variables on JCI. Likewise, with the t test, it is used to determine the partial effect of each macroeconomic variable on JCI. The hypothesis is accepted if the significance value < 0.05 .

5 RESULTS

5.1 Data Stationarity

Data stationarity is tested using a unit root test at various levels until it reaches stationary. The probability of the unit root test can be seen in the table below:

At level 0, all time series data on each variable forms a trend pattern with a probability value > 0.05 . Therefore, stationary testing is carried out at level 1st difference. Based on the table above the data at the 1st difference is stationary with all probability values in each variable ≤ 0.05 . Furthermore, multiple regression analysis is done using the 1st difference data.

Table 1: Unit Root Test

Variable	Level	1 st difference
Jakarta Composite Index (JCI)	0.4476	0.0004
Dow Jones Index (DJIA)	0.4490	0.0004
BI 7 Days Rate	0.0609	0.0008
The Fed Rate	0.9997	0.0002
Exchange Rate	0.7247	0.0000
Inflation	0.1724	0.0000
Oil Price	0.2295	0.0023

5.2 Classical Assumption Test

Classical assumption test is done so that the multiple regression equation model satisfies the best linear unbiased estimator (BLUE).

5.2.1 Multicollinearity

Multicollinearity is used to determine the correlation between independent variables.

Table 2: Multicollinearity Test

Variable	Centered Variance Inflation Factor (VIF)
Dow Jones Index (DJIA)	1.310733
BI 7 Days Rate	1.250585
The Fed Rate	1.133625
Exchange Rate	1.308130
Inflation	1.180933
Oil Price	1.457788

Based on the table above, there is no correlation between the independent variables with the centered VIF value < 10 . This means that each independent variable in the study has no resemblance so that it is suitable to be used as an economic macro variable that can affect Jakarta Composite Index (JCI).

5.2.2 Normality

The normality test aims to test whether in the regression model, the residual confounding variable has a normal distribution.

The data in this study are normal with a Jarque Beta > 0.05 probability value, which is 0.643257.

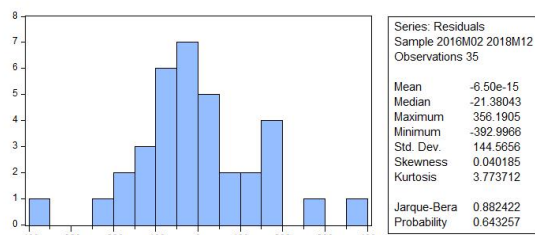


Figure 1: Jarque Beta Normality Test

5.3 Hypothesis Test

5.3.1 Simultaneous Effect

The value of F and its probability that determines the influence all macroeconomic variable on the Jakarta Composite Index can be seen in the table below:

Table 3: Simultaneous Effect

F-statistic	Probability
0.79	0.585318

The calculated H^{456} F value is 0.79, smaller than the F table value of 2.42. In addition, the probability F value > 0.05 , which is 0.58. Based on the statistical analysis, the decision was that there was no significant simultaneous effect between the DJIA, the BI 7 days rate, the Fed rate, the rupiah exchange rate, inflation and world oil prices against the Jakarta Composite Index (JCI).

5.3.2 Partial Effect

The value of t and its probability that determines the influence of each macroeconomic variable on the Jakarta Composite Index can be seen in the table below:

Table 4: Partial Effect.

	t-statistic	Probability
Dow Jones Index (DJIA)	1.122180	0.2713
BI 7 Days Rate	-0.882821	0.3848
The Fed Rate	1.648327	0.1105
Exchange Rate	0.508940	0.6148
Inflation	0.426376	0.6731
Oil Price	-0.898726	0.3765

The t value of statistics for each variable does not exceed t table, which is 2.03. Likewise, the probability value of each variable is more than 0.05. This means that none of the macroeconomics variables have a partial effect on JCI.

5.3.3 Contribution of Macroeconomic Variables to JCI

The contribution of Dow Jones Index (DJIA), BI 7 days rate, fed rate, exchange rate, inflation and world oil prices against the JCI are 0.1447 or 14.47%. With no significant influence between all macroeconomic variables on JCI it is reasonable that macroeconomic contributions are 14.47%. The rest, 85.53% is influenced by other variables outside of this study.

Following are the multiple regression equations that explain the effect of macroeconomics on JCI:

$$JCI = 4.64 + 0.07DJIA - 94.53BI7DaysRate + 495.03TheFedRate + 0.06ExchangeRate + 41.54Inflation - 6.9OilPrice \quad (2)$$

Based on the regression equation above it is known that the variable domestic interest rate (BI 7 Days Rate) and oil prices, have a negative relationship while other macroeconomic variables have a positive relationship. If the Indonesian government increases the benchmark interest rate, JCI will decline even though the decline is not significant. Likewise, with world oil prices. The increase in world oil will add to the average operational burden of public companies in Indonesia, especially manufacturing companies so that it will reduce the company's stock price even though the decline is not significant.

6 DISCUSSION

The results prove that surprisingly macroeconomic factors do not have a significant influence on JCI. During this time, every financial media and even investment managers from securities companies always make a fuss if macroeconomic changes occur that could affect investors' decisions. This research proves the opposite.

The Dow Jones Index is often seen as a barometer of world market performance consisting of 30 companies. When market experts say the market is going up or down, it illustrates that DJIA is experiencing fluctuations. The stock price of the 30 best companies in America is a reference to the state of the world economy. The rising price of Dow Jones provides information that the world economy is improving which should affect the economies of other countries including Indonesia. The rising price of DJIA has often been responded positively by domestic investors related to the hope of future economic conditions. If economic conditions improve, stock prices will also experience

an increase. But, in fact, DJIA did not significantly influence JCI. This might be due to the lack of direct connection between these 30 companies and companies in Indonesia. Dow Jones has also been criticized as no longer a reflection of market prices in the world economy.

BI 7-days rate does not contribute to JCI because the offered interest rate is not too competitive so investors tend not to mind the fluctuation in the BI 7 Day Rate. The 7 days BI rate in Indonesia, which were around 4-6% in the past two years, did not provide an incentive for investors to moved their funds to financial institutions that provide less risk.

The Federal Reserve Rate has no effect on the JCI, this can be caused by the average company incorporated in the Indonesia Stock Exchange which is represented through the JCI is a company that operates almost entirely in Indonesian territory and is not directly related to The Federal Reserve Rate. From the investor side, it might be preferable to invest in Indonesia despite the opportunity to increase profits with promising interest rates in America. Exchange rate risk will be an additional consideration for investors in transferring funds from Indonesia.

Changes in the exchange rate of the rupiah against the dollar also did not contribute to fluctuations in the value of the JCI. Investors who invest in the Indonesia Stock Exchange usually have their own preferences on the choice of industrial sectors that are of interest so that even if there are significant changes to the exchange rate it will not affect investor interest in investing. In addition, in terms of companies in general, they have carried out exchange rate risk management so that it does not affect the company's financial performance. Likewise, inflation is not the main focus of investors in investing which is supported by research (Ullah et al., 2014) and (Asmara and Asmara, 2018) and (Geetha et al., 2011).

Oil Price should be a consideration because it can affect production costs but not the entire company is in the manufacturing production sector. Of the 600 companies listed on Indonesia Stock Exchange, only about 23% are manufacturing companies. JCI is a combination of all sectors in the Exchange, because on the average there is no effect of oil price on the value of the JCI.

Based on the results it is known that overall macro factors do not affect the JCI, assuming that the round of funds that occur in the capital market already has its own investment preferences by each investor.

7 RESEARCH DEFICIENCY

Due to limitations in data collection, this study uses short-term time frames, from 2016 to 2018. Future research is expected to use a span of 10 years so that it can see changes in macroeconomic strength towards JCI from year to year and add a comparison of the influence of fundamental and macroeconomic factors on JCI.

8 CONCLUSIONS

The results of this study prove that although the JCI change pattern follows the changing pattern of macroeconomic variables, but after it has been proven by a series of statistical tests, none of the macroeconomic variables affect JCI in the short run. This might be caused by investors in Indonesia pay more attention to the fundamental factors which are the company's financial performance. In addition, stock indices in a country do have a tendency to increase due to developments in a country's Stock Exchange.

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