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The Influence of Macroeconomic Factors on the Volatility of Composite Price Stock Index: A Study on the Indonesia Stock Exchange

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Abstract: *Composite stock price index volatility has experienced ups and downs in the last period due to internal and external factors of several companies. It has an impact on the national economic level and decreased investment climate. This research aims to determine the effect of macroeconomic factors on the volatility of the composite stock price index in the Indonesia stock exchange period 2013-2017. The research method used is purposive sampling with a total data of 300 samples. Multiple regression analysis at the 5% significance level through the application of the view program plus several forms of testing to produce an appropriate recommendation. The results showed that the factors of economic growth, the exchange rate and the price of gold significantly influenced the volatility of the composite stock price index, while the inflation factor did not significantly influence the volatility of the composite stock price index.*

Keywords: Economic Growth, Inflation, Exchange Rates, Gold Prices, Composite Stock Price Index

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Introduction

The movement of composite stock price indexes in several companies in Indonesia is relatively volatile each year. It can be caused by changes in macroeconomic elements and the price level of precious metals (gold). A change in the level of the composite stock price index shows the economic stretch that is carried out by investors in investing their capital. However, according to economists, the movement of the JCI could be influenced by various factors; both internal and external (Jogiyanto [1]). Internal factors can be influenced by events that occur within the country that include several macro variables, such as: economic growth, inflation and the exchange rate. While interest rates and prices for precious metals (gold) tend to come from external factors in the national economy. The following is a graph of the volatility of the composite stock price index of several companies in the Indonesian stock exchange during the study period:

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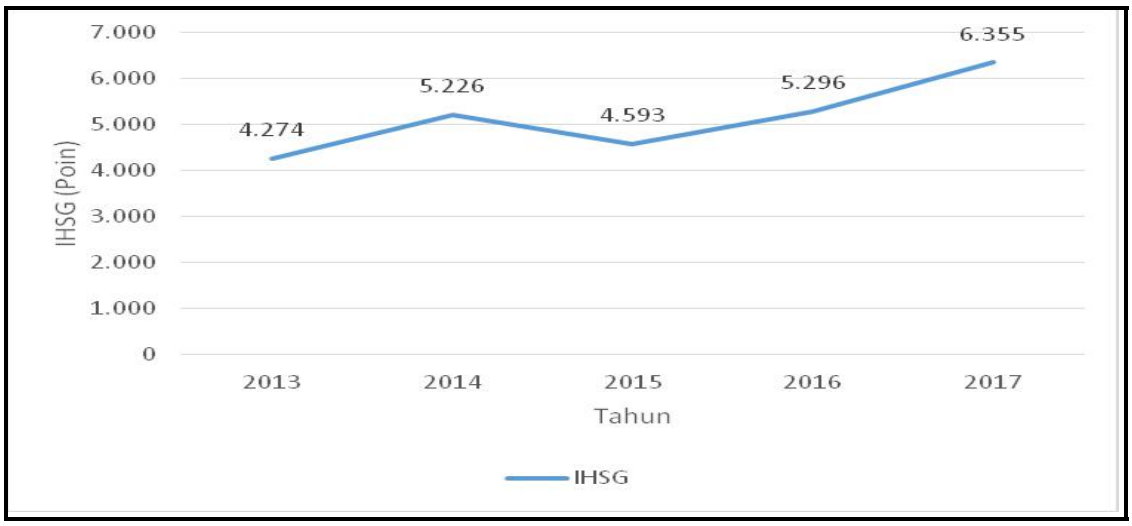

Source: *Yahoo Finance* (2019) (data processed)

Graph 1. IHSG Volatility for the 2013-2017 Period

depiction of the movement of the composite stock price index based on graph 1 shows the existence of changes in the level of JCI volatility which tends to fluctuate each year. This condition shows that the trend of the JCI value movement is not stable which could have been caused by several macroeconomic factors. Variables which are a problem regarding the influence of internal and external factors from the development of the volatility of the composite stock price index on companies listed in the Indonesia stock exchange during the study period will be explained in detail along with trends in movements and problems. The following variables will be trending topics for each problem that arises in this research.

The trends in economic growth indicate changes in the level of economic growth which is fluctuates. This condition shows that the problems can be seen as long-term macro-level problems. The Economic growth is one of the important indicators in analyzing economic development in a country. Economic growth can be defined as a development of activities in the economy which causes goods & services to be produced in the community to increase (Sukirno [2]). According to analysts the increase in *Gross Domestic Product* (GDP) is a positive signal for investment and vice versa (Kewal [3]). An increase in GDP has a positive influence on people's purchasing power. Hence it will be able to increase demand for products. An increase in demand for the company's products will have an impact on increasing company profits which can ultimately increase share prices.

While the inflation trend that occurred during this research period has increased and decreased every year. Inflation causes fluctuations in the price changes of a product as a whole in the community which can impact on the weak purchasing power of the product. Inadequate allocation of resources will result in low levels of economic growth that can affect the distribution of income and production factors of national production.

The movement of the Indonesian rupiahs against the American dollar (USD) is also expected to have an effect on the composite stock price index. Depreciation of the value of the rupiah against the dollar will result in increased prices for imported goods. It has an impact on rising production costs resulting in a decrease in corporate profits in the use of imported goods as raw material for production. Declining corporate profits result in reduced investor interest to invest. It will affect the movement of the composite stock price index. Gold price fluctuations from year to year and the small risk level is estimated to affect the movement of the composite stock price index. This has led investors to consider shifting their investments to gold rather than capital market investments. The low interest in investing in the capital market as well as selling actions by investors will result in a decline in the price of the joint stock on the stock exchange.

Several research is used as a reference in the development of this research by analyzing macroeconomic conditions and gold prices that affect the stock price index. The results of previous studies indicate that there is a *research gap* between the researchers. The value of Gross Domestic Product (GDP) which measures a country's income can be used as an indicator of economic growth influencing the stock index. Several research results conducted by economists indicate that GDP has a significant effect on the volatility of the stock price index (Pujoalwanto [4]). While the results of research conducted by (Kewal [3]) show the opposite, that the value of GDP does not significantly influence the movement of stock price indexes.

If the selling price of a product is fixed, then of course it will increase production costs which have an impact on profit decline. Symptoms of profit decline will be responded negatively by investors, resulting in a decline in share prices due to the company's inability to produce optimal dividends. This is consistent with research conducted by (Komariah et al [5]) stating that inflation has a significant effect on JCI volatility. Research conducted by (Amin and Herawati [6]) revealed that the rupiah exchange rate had a significant effect on the JCI movement.

The intent and purpose of this research are to analyze the movement of macroeconomic factors characterized by fluctuations in economic growth, inflation, exchange rates and gold prices in influencing the volatility of the composite stock price index both simultaneously and partially (each variable) during research period.

Methods

Type of research is conducted using descriptive and verification methods, where each factor will be used as a reference as a variable in influencing other variables. Descriptive research aims to obtain a description or description of certain characteristics of a subject that is being considered in research activities (Nuryaman and Christina [7]). While the verification method known as the causal method aims to find the source of the cause of the problem being studied (Sekaran and Roger [8]).

Operational Research

Variables The dependent variable according to (Sugiyono [9]) is a variable that is affected or which is due to the independent variables. In this case the dependent variable is the Composite Stock Price Index (CSPI). JCI illustrates a series of historical information regarding the movement of the combined stock price of all shares, up to a certain date. Usually the stock price movements are presented every day, based on the closing price of the exchange on that day. The index is presented for a certain period, in this case reflects a value that serves as a measurement of the performance of a joint stock on the stock exchange (Sunariyah [10]). (Samsul [11]) states that stock prices expressed in index numbers are used for analytical purposes and to avoid the negative impact of using share prices in rupiah. The method of calculating the Composite Stock Price Index requires the amount of market capitalization and the number of basic values, then multiplied by 100.

The independent variable according to (Sugiyono [9]) is the variable that influences or is the cause of changes in the emergence of the dependent variable. The independent variables used in this study include: Economic Growth, Inflation, Exchange Rates and Gold Prices.

Table 1. Operationalization of Research Variables

No.	Variable	Concept	Indicator	Scale
1	IHSG	JCI illustrates a series of historical information about the price of a company's joint stock until a certain time. Usually the stock price movements are presented every day based on the closing price of the exchange on that day. The index is presented for a certain period, in this case reflects the value that serves as a	*Closing Price* IHSG listed on the yahoo finance website	Nominal

		measurement of the performance of a joint stock on the stock exchange.		
2	Economic Growth	growth is the development of economic activities that cause goods & services produced in a society to increase so that the prosperity of the community increases.	The value of economic growth listed on the Bank Indonesia website	Ratio
3	Inflation	Inflation is a process of increasing prices in general and continuously (continuously) in the long run. Inflation is considered to occur if the price increase process takes place continuously and influence each other.	The inflation value listed on the Bank Indonesia website	Ratio
4	Exchange	Rate is an exchange rate of foreign currencies against other countries' currencies.	$\frac{Kurs\ Beli + Kurs\ Jual}{2}$	Ratio
5	Price of Gold	Gold as one of the commodities that can be useful as an investment option because the price is relatively up so that it brings profits. The difference between the purchase price and the selling price is almost the same as the capital gain in stock investment.	The price of gold listed on the price-gold.org website	Nominal

Data Analysis and Hypothesis Testing

data analysis uses the type of descriptive data analysis. According to (Sugiyono [9]) descriptive statistical analysis method is a statistic used in analyzing through describing data that has been collected as it is without intending to make general conclusions (generalizations).

1. **Multiple Regression Analysis**

Linear regression analysis is used to analyze the effect of the independent variables on the dependent variable simultaneously. This analysis is intended to determine whether there is an influence of independent variables (economic growth, inflation, exchange rates and gold prices) on the dependent variable (composite stock price index). The model of multiple linear regression equation is as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where: Y = Dependent Variable
X = Independent Variable
α = Constant Value
β = Regression Coefficient of

2. **Hypothesis Testing**

Coefficient of determination (*adjusted R square*) measures how much the model's ability to explain variations for the dependent variable. Value ranges from, if the *adjusted R square is* 0-1small, it means that the ability of free vajriabel in explaining the variation of the dependent variable is very limited; Model compatibility is said to be good if the value of r^2 approaches the number 1. The limit of the coefficient of determination is $0 \leq r2 \leq 1$. A value close to number 1 means that independent variable provides almost all information needed to explain variation in dependent variable.

Simultaneous hypothesis testing (F test) is carried out in order to produce meaning from the results of the regression model. If the value of F_{count} larger than F_{table} or a significant level of less than 5% then it indicates that $H_{0\ is}$ rejected and Ha accepted. This means that the independent variable has a significant effect on the dependent variable simultaneously.

Partial hypothesis testing (t test) was carried out to analyze the effect of the independent variables X_1, X_2, X_3 and X_4 on the dependent variable Y partially (respectively). If the value of t is greater than t table or a significant level $t < \alpha = 5\%$, then this shows that $H_{0\ is}$ rejected and Ha accepted which has the meaning that the independent variables have a significant influence on the dependent variable partially.

Results and Discussions

Multiple regression analysis aims to determine whether or not the influence of two or more independent variables (X) on the dependent variable (Y).

Table 2. Multiple Regression Analysis

Dependent Variable: Y				
Method: Least Squares				
Date: 19/02/20 Time: 08:01				
Sample: 2013 2017				
Included observations: 60				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	**9.822269**	**1.007321**	**9.750883**	**0.0000**
X1	**-0.033305**	**7.694306**	**-3.865024**	**0.0489**
X2	**9.832964**	**5.504754**	**1.786268**	**0.0778**
X3	**8.232211**	**7.916074**	**3.785680**	**0.0002**
X4	**-0.016159**	**0.004004**	**-4.035547**	**0.0001**

Form multiple regression equation as follows:

Y = 9.822269 - 0.033305 (X1) + 9.832964 (X2) + 8.232211 (X3) - 0.016159 (X4)

The equation can be interpreted as follows:

a = 9,822269 meaning: if the variable Economic Growth (X1), Inflation (X2), Exchange Rate (X3) and Gold Price (X4) are zero (0) , then the Joint Stock Price Index (Y) variable has a constant value of 9.822269 indicating that the regression line will intersect the Y axis at point 9.822269.

b1 = -0.033305 meaning, the regression coefficient for Economic growth (X1) is 0.033305 and is negative; every time a decline in economic growth and other variables are assumed to be constant, it is predicted to reduce the composite stock price index by 0.033305.

b2 = 9,832964 meaning, the regression coefficient for inflation (X2) is 9,832964 and is positive; every time a change in inflation occurs and other variables are assumed to be constant, it is predicted to increase the composite stock price index by 9,832964.

b3 = 8.232211 meaning, the regression coefficient for the exchange rate (X3) is 8.232211 and is positive; every change in the exchange rate and other variables is assumed to be constant, it is predicted to increase the composite stock price index by 8.232211.

b4 = -0.016159 meaning, the regression coefficient value for the gold price (X4) is 0.016159 and is negative; every change in the exchange rate and other variables is assumed to be constant, it is predicted to reduce the composite stock price index by 0.016159.

The coefficient of determination test is used to measure how much the model's ability to explain the variation of independent variables on the dependent variable.

Table 3. Determination Coefficient

Dependent Variable: Y			
Method: Least Squares			
Date: 2/19/20 Time: 08:01			
Sample: 2013 2017			
Included observations: 60			
R-squared	**0.523233**	**Mean dependent var**	**451.0946**
Adjusted R-squared	**0.505354**	**SD dependent var**	**85.34106**
SE of regression	**60,02130**	**Akaike info criterion**	**11.07372**
Sum squared resid	**288204.5**	**Schwarz criterion**	**11.18948**
Log likelihood	**-461.0964**	**Hannan-Quinn criter.**	**11.12026**
F-statistic	**29.26556**	**Durbin-Watson stat**	**0.277206**
Prob (F-statistic)	**0.000000**		

The coefficient of determination shows that the *Adjusted R-squared value* of 0.523233 means that the variability of the dependent variable is the composite stock price index can be explained by the independent variables of economic growth, inflation, the exchange rate and the gold price of 52.32%, while the remaining 47.68% is explained by other variables outside the research model.

F statistical test (F test) shows the F value $_{calculated}$ of 29.26556 and greater than the F $_{table}$ of 2.76. The significance value of 0.00000 <0.05, so that according to the hypothesis testing criteria that reject Ha and accept Ho, it means that simultaneously economic growth, inflation, exchange rates and gold prices significantly influence the composite stock price index.

While for t-test statistics that show how much influence the economic growth, inflation, exchange rates and gold prices, individually in explaining the variable stock price index. The following is an explanation of each variable on the results of the t test:

a. The significance value of the Economic growth variable is 0.0489 <0.05 (significance level). The result of comparison between $t_{arithmetic}$ of -3.865024 while t_{table} -2.00 means $t_{arithmetic} < t_{table}$ that is -3.865024 > -2.00. It can be concluded that Ho is rejected and Ha is accepted, meaning that partially the economic growth

variable has a negative effect on the composite stock price index.

b. The significance value of the inflation variable is 0.0778> 0.05 (significance level). The result of comparison between $t_{arithmetic\ is}$ 1.786268 while t_{table} 2.00 means $t_{arithmetic} < t_{table}$ that is 1.786268 < 2.00. It can be concluded that Ho is accepted and Ha is rejected, meaning that partially the inflation variable has no negative effect on the composite stock price index.

c. The significance value of the exchange rate variable is 0.0002 <0.05 (significance level). The results of the comparison between $t_{arithmetic}$ amounted to 3,785680 while t_{table} 2.00 means $t_{count} > t_{table}$ is 3,785680 > 2.00. It can be concluded that Ho is rejected and Ha is accepted, meaning that partially the exchange rate variable has a positive effect on the composite stock price index.

d. The significance value of the gold price variable is 0.001 <0.05 (significance level). The result of comparison between t arithmetic of -4.035547 while t_{table} 2.00 means $t_{arithmetic} > t_{table}$ that is -4.035547 > 2.00. It can be concluded that Ho is rejected and Ha is accepted, meaning that partially the gold price variable has a negative effect on the composite stock price index.

Conclusions

Based on the results of research and analysis that has been proven empirically, only three variables show positive or negative and significant influence on the composite stock price index. There are economic growth, the exchange rate and the price of gold. While the inflation variable does not show the effect on the composite stock price index. When the exchange rate is high, investors should not invest in the capital market, this is done to anticipate the tendency of falling stock prices. As long as there is no macroeconomic turmoil that can increase surges in the BI *Rate* (BI *Rate* normal and stable), investors can invest in shares, because the company's performance still shows good category. For company management who want to carry out export and import policies, it is better to first examine the factors that influence the size of the company's burden that can cause changes in the BI *Rate* and exchange rate, so as to attract investors in investing their capital.

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