

ANALYSIS OF STOCK PRICE INDEX VOLATILITY IN INDONESIA USING MACROECONOMIC VARIABLES AND GLOBAL ECONOMIC UNCERTAINTY INDEX

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Abstract: *Stock price changes within a certain period can be observed in the volatility of the stock price index. Changes in stock prices can be influenced by a country's macroeconomic conditions and global economic conditions. Macroeconomic factors include interest rates, inflation, exchange rates, and economic growth, while global economic uncertainty is observed using the Global Economic Policy Uncertainty (GEPU) index. This study examines the effect of macroeconomic variables and the GEPU index on the volatility of the stock price index on the Indonesia Stock Exchange (IDX). A descriptive analysis method was used using time series data between Q1 2016 and Q4 2021. The results indicate that the interest rate has a negative and significant effect on the volatility of the stock price index. In contrast, the value of each GEPU index and exchange rate have a positive and significant effect on stock price index volatility. However, inflation and economic growth have a positive relationship and do not significantly affect the volatility of the stock price index.*

Keywords: *global economic policy uncertainty, macroeconomics, stock price index volatility*

Abstrak: *Harga saham yang mengalami perubahan dalam rentang waktu tertentu dapat diamati pada terjadinya volatilitas indeks harga saham. Perubahan harga saham dapat dipengaruhi oleh kondisi makroekonomi suatu negara dan kondisi ketidakpastian ekonomi global. Faktor makroekonomi terdiri dari tingkat suku bunga, inflasi, nilai tukar, dan pertumbuhan ekonomi, sedangkan ketidakpastian ekonomi global diamati menggunakan indeks Global Economic Policy Uncertainty (GEPU). Penelitian ini bertujuan untuk menguji pengaruh variabel makroekonomi terhadap volatilitas indeks harga saham di Bursa Efek Indonesia (BEI) serta untuk menguji pengaruh ketidakpastian ekonomi terhadap volatilitas indeks harga saham di BEI. Metode analisis deskriptif digunakan dalam penelitian ini dengan memanfaatkan data time series dalam rentang waktu antara kuartal I 2016 hingga kuartal IV 2021. Hasil penelitian ini menunjukkan bahwa secara parsial tingkat suku bunga memiliki pengaruh negatif dan signifikan terhadap volatilitas indeks harga saham, sedangkan masing-masing nilai tukar dan ketidakpastian ekonomi global secara parsial memiliki pengaruh positif dan signifikan terhadap volatilitas indeks harga saham. Namun,*

masing-masing variabel inflasi dan pertumbuhan ekonomi secara parsial memiliki hubungan positif dan tidak berpengaruh signifikan terhadap volatilitas indeks harga saham.

Kata Kunci: ketidakpastian ekonomi global, makroekonomi, volatilitas indeks harga saham

INTRODUCTION

The stock price is the main determinant for investors who want to invest in the stock market. Over time, stock prices in the capital market can change, either increasing or decreasing, causing fluctuations in stock prices. Changes in the rise and fall of stock prices that occur at certain times can be measured using a statistical approach, namely, the volatility of stock prices. The high and low volatility of the stock price index is related to stock risk, so it can impact investors' decisions to invest their wealth in a stock portfolio. Hugida (2011) states that increases and decreases in stock prices can cause volatility, which reflects the risks investors face. Kartika (2016) states that the size of the risks investors face can affect investors' interest in investing. Investors interested in forming their investment portfolios can observe stock price movements on the Indonesia Stock Exchange (IDX). The Composite Stock Price Index (IHSG) reported by the IDX reflects activities in the capital market, which can be used as an indicator to serve as a reference for capital market activities (Isyyatin, 2021). Changes in the stock price index can occasionally occur with varying magnitudes of changes (Han & Lesmond, 2009). The magnitude of changes in the stock price index can be measured using the volatility of the stock price index. Many previous studies were interested in making stock price index volatility the object of research by selecting the factors that cause stock price index volatility.

Research observing the stock price index volatility has been related to economic activity. Changes in several macroeconomic factors can cause increases and decrease in the stock price index, which is observed by measuring the volatility of the stock price index (Khalid & Khan, 2017; Setiawan, 2020; Sutrisno, 2020; Handika et al., 2021). Macroeconomic factors are claimed to influence the occurrence of stock market volatility and provide helpful information in estimating the volatility of the stock price index to assist investors in managing their portfolios by enabling the correct forecast of stock price movements. The information and insights that investors have about economic conditions in predicting the volatility of the stock price index support the decision-making process so that these investors can achieve their investment goals.

Economic conditions are observed not only in a country's macroeconomic aspects but also in the global economy. Global conditions can affect the stock market conditions of countries, including Indonesia. The economic conditions of developed countries experiencing turmoil and uncertainty can have an effect spillover in other countries that have economic relations with these developed countries through trade and financial channels. The turmoil arising from economic uncertainty results in fluctuations in the stock market (Zhenghui & Junhao, 2020).). In addition, rapid technological developments encourage globalization of global economic conditions to trigger an extensive dissemination of information from developed countries to stock markets in developing countries. The impact of uncertain and difficult to

predict changes in world economic conditions results in economic uncertainty faced by countries with economic links with other countries (Ghani et al., 2022). Global economic issues have had an impact resulting in the emergence of world uncertainties that must be faced by many countries in the world (Ahrori & Lucik, 2017). Seeing how the consequences of world economic uncertainty can affect economic activity and the stock market in a country opens the possibility of research observing the effect of global economic uncertainty on economic conditions and the stock market in Indonesia.

Baker et al. (2016) developed an index that can quantify economic uncertainty to observe the degree of severity of uncertainty about economic conditions, namely the *Economic Policy Uncertainty* (EPU) index. The EPU index is obtained by measuring the frequency of articles from leading newspapers that contain matters related to economic uncertainty. Therefore, economic uncertainty needs to be addressed appropriately because it has a crucial impact on investment decisions for investors who want to achieve their investment goals and spending by governments, businesses, and companies (Al-Thaqeb & Algharabali, 2019). Furthermore, the index of economic uncertainty can change at any given time, thus leading to changes in stock market conditions. Therefore, not only economic uncertainty in certain countries but research is also carried out to develop indexes *Global Economic Policy Uncertainty* (GEPU), which measures economic uncertainty in a global scope. The economic conditions of countries affected by global economic uncertainty can also affect stock market conditions due to the dynamic nature of stock market behavior in dealing with changes brought about by world factors. Therefore, it is necessary to observe the impact of world economic uncertainty, which can be observed using an index *Global Economic Policy Uncertainty* (GEPU) concerning stock price index volatility in Indonesia.

Research that has been conducted to observe the volatility of the stock price index shows different results from various types of stock markets, countries, macroeconomic variables, and periods are objects of observation (Prempeh, 2016; Wallin, 2020; Otajah, 2020; Ghani et al., 2022). Therefore, this research was conducted as an extension of research by Handika (2021) and by Setiawan (2020) which observed macroeconomic conditions on stock market conditions, which can be seen in the JCI. As previously explained, the occurrence of globalization in the economic aspects faced by Indonesia does not rule out the possibility of having an impact in the form of shocks that can affect stock market conditions in Indonesia. This topic is observed for its effect on the volatility of the stock price index in this study. Observations on the effects of macroeconomic conditions and global economic uncertainty are developments from previous research, thereby showing renewal towards research on stock market conditions in Indonesia. On global economic uncertainty, this research examines the measurement of economic policy uncertainty shocks on the stock market in Indonesia, and this will contribute to a better understanding of the stability of the stock market in Indonesia. Therefore, through this research, it is hoped to contribute to research on the stock market by examining the effect of the macroeconomic variables used in this study and the impact of global economic uncertainty on the volatility of the stock price index on the IDX.

Changes that occur in economic activity need to be addressed appropriately by several stakeholders, such as investors, academics, the government, regulators, policymakers, and practitioners in the stock market. This encourages stakeholders to make adjustments to volatile stock market conditions. Stakeholders are required to have knowledge and insight in order to be able to make policies that can maintain conducive stock market conditions so that they can accommodate investors who want to invest their wealth in the stock market. In addition, knowledge and insights related to the volatility of stock price indexes can be utilized to produce the best investment decisions for investors, providing a competitive advantage in the form of better information.

THEORETICAL REVIEW

Stock Price Index Volatility

Stock prices are the main determinant for investors' investment decisions in the stock market because investors primarily focus on stock prices when they decide to invest in stocks. Stock prices can fluctuate daily, depending on various internal factors related to the company's financial performance and external factors related to the economic conditions of a country and the global economy. Investors who reason need to understand the factors that determine stock prices to make optimal investment decisions (Basit & Haryono, 2021). Investors will like high volatility because there are more opportunities for considerable swings in a relatively short period. Meanwhile, an investor's *buy-and-hold* long-term often prefers low volatility with a steady incremental gain over time. Calculating stock price index volatility can be done using an estimation approach *high-close*, which is defined as a calculation considering the highest and lowest prices. This approach was chosen because the observation of stock prices can move extremes, either up or down, so they are considered more representative for calculating stock price volatility. So, extreme values, namely the minimum and maximum values, are used to estimate constants over a certain time interval. These extreme values provide more detail of movement throughout the period, so such an estimator is much more efficient than an estimation approach *close-close* (Parkinson, 1980).

Interest Rates

The interest rate is the percentage value of remuneration by the party receiving the loan in a certain amount to the party providing the loan. Interest rates are one of the most widely used macroeconomic factors in influencing stock prices, where there is an inverse relationship between interest rates and stock prices, as this follows economic theory (Hasan & Zaman, 2017). Stock prices are determined by expected future earnings. Monetary policy shocks will affect stock prices directly through the discount rate but also indirectly through their impact on the risks faced by a company (Alshogeahri, 2011). The interest rate serves as a function of income and significantly helps in the mobilization of financial resources and ensures efficient utilization of resources to bring about economic development (Osoro & Ogeto, 2014).

Inflation

The inflation rate is an increase in product prices in a country in general which is generally followed by a decrease in the purchasing power of people in a country. Symptoms of inflation can be seen in the increased prices of goods simultaneously. Increasing production costs that exceed rising prices can cause a company's profitability to decline. Increased inflation can decrease the purchasing power of the rupiah (Sartika, 2017). Rising prices can cause investors to refrain from investing in stocks. According to Jains et al. (2022), inflation can be divided into two types, namely *demand-to-pull inflation* and *cost-push inflation*. When there is a general increase in demand for goods, it consequently causes prices to increase and results in a certain level of increase in exports in the economy, which is referred to as *demand-pull inflation*. Conversely, an increase in production costs causes *cost-push inflation*, which makes the company pass the increased cost on to the customer by charging more. An indicator that can be used to measure a country's inflation is the percentage measurement *Customer Price Index* (CPIs). The use of CPI in calculating the inflation rate is because CPI can measure changes in average prices in certain periods (Khalid & Khan, 2017).

Exchange Value

The foreign exchange rate variable is the price or purchasing power of the domestic currency in the form of foreign currency. Currency exchange rates are the amount of money that must be exchanged to obtain a particular country's currency. Currency exchange rates are unstable and can change continuously. Changes in exchange rates have a significant influence on the current account balance or other macroeconomic variables (Handika, 2017). A country's currency can experience appreciation or depreciation Towards other currencies, showing prospects that shape investors' perceptions of investing. According to Khalid and Khan (2017), investors with a risk-averse principle will certainly avoid risks, sell their shares, and wait for economic conditions to improve.

Economic Growth

Economic growth is an addition to the aspect of a country's economic capacity in the production of goods and services. Economic growth shows the development of activities in a country's economy that can lead to an increase in goods and services produced by the people of a country. Economic growth can stimulate anticipated cash flow increases, thereby driving increased returns on the stock market. Economic growth shows reduced effects of periods of recession (Kirui et al., 2014). A country's economic growth can be seen from the *gross Domestic Product* (GDP) value, which is reported regularly. GDP measurement is able to show the state of a country's overall economic health. The long-term effect of healthy economic growth is increased company performance in terms of increased profits and increased stock market returns. This results in long-term growth, while the short-term effect is market trends that cannot be predicted even in times of positive economic growth (Beck et al., 2006).

Global Economic Uncertainty

Economic uncertainty can be observed in global aspects, which include uncertainties that may affect the world's economy. In their research, Baker et al. (2016) created an index that can quantify a global economic uncertainty called an index *Global Economic Policy Uncertainty* (GEPU). The GEPU index can be created by analyzing information sourced from news, policies, markets, and economic indicators. Aggregating these factors into a new index using three-part averages: the level of newspaper coverage of economic uncertainty regarding policy, how much of the provisions in the federal tax code are due to expire soon, and disagreement among economic forecasters. The GEPU index is based on various indicators of economic policy uncertainty, such as the frequency of references to policy uncertainty in newspapers. This index closely corresponds to events broadly associated with periods of extreme policy uncertainty. The GEPU index can predict market volatility and the potential economic recession. Any new information related to the stock market can affect the higher volatility. The volatile stock market condition requires policymakers to produce policies that provide a conducive situation for investors. New policies resulting in uncertain conditions can increase uncertainty in stock prices and company business fluctuations (Sumiyati et al., 2022).

Interest Rate Towards Stock Price Index Volatility

Bank Indonesia determines and announces an interest rate policy that reflects a monetary policy. Changes that occur in interest rates can impact investors' attitudes toward managing their stock portfolios and affect stock market conditions in Indonesia. Changes in interest rates affect the volatility of the stock price index in Indonesia. Interest rates can affect interest expense, a liability for companies that use debt as a funding source. This can lead to more significant interest expense, potentially reducing the profit received. An increase in production costs encourages customers to increase spending on the consumption of a product. Rational customers will consider having more control over their spending and are likelier to keep their money in the bank. Rakhil (2018) in his research explains that interest rates can have a negative influence on stock market performance, meaning that when interest rates rise, investors tend to change their investment portfolios in government securities which can affect weak stock market performance which has an impact on reducing the volatility of the stock price index. Astuti et al. (2013) found that *BIrate* determined by Bank Indonesia harms the volatility of the stock price index. Therefore, the first hypothesis in this study is as follows:

H1: The interest rate has a significant negative effect on the volatility of the stock price index

Inflation Towards Stock Price Index Volatility

Inflation in a country's economy impacts stock market conditions in that country. Badullahewage (2018) says that the relationship between inflation and the volatility of the stock price index can occur due to unexpected or expected inflation. In the case of expected inflation, when the demand is more than the supply in the market, the company increases the selling price, which has the potential to increase

the dividend payout by the company, which is followed by an increase in the demand for the shares and thus increases the value of the shares. An increase in the general price level will increase the daily cost of subsistence. Therefore, investors will be encouraged to invest less. Thus, in such a case, the share price will fall. This is a case of unexpected inflation. Therefore, both expected, and unexpected inflation can affect the volatility of the stock price index. Research conducted by Saryal (2007) observed the effect of the inflation rate on the volatility of the stock price index with samples on stock markets in Turkey and Canada. Inflation rate variability, as measured by changes in inflation rates, has a stronger impact on predicting stock market volatility in Turkey than in Canada. This research shows that new information on an efficient stock market can affect stock volatility, where bad information has more influence than good information. Therefore, the second hypothesis in this study is as follows:

H2: Inflation has a significant positive effect on the volatility of the stock price index

Exchange Rate Towards Stock Price Index Volatility

Changes in currency exchange rates can affect the volatility of the stock price index in a country. According to Lakshmanasamy (2021), the relationship between the exchange rate and the volatility of the stock price index can be explained in two theories, namely the goods market or flow-oriented model and the portfolio balance or stock-oriented model. In the goods market model, international competitiveness and the trade balance are affected by exchange rate volatility, thereby affecting domestic real income and output. The domestic stock market reacts to changes in exchange rates. Future income, interest rates, investment decisions, and current consumption are related to the volatility of stock prices and exchange rates. In the stock-oriented model, the exchange rate balances asset supply and demand. Since stocks are a significant component of financial assets and their present value is based on the present value of future cash flows, stock price movements are influenced by expectations of relative currency values. Therefore, the dynamics of shocks to stock prices and exchange rates are interrelated. Research conducted by Ghani et al. (2022) found that foreign currency exchange rates are one of the macroeconomic variables that influence the volatility of the stock price index, where macroeconomic variables contain information useful for predicting stock market volatility. Therefore, the third hypothesis in this study is as follows:

H3: The exchange rate has a significant positive effect on the volatility of the stock price index

Economic Growth Towards Stock Price Index Volatility

Economic growth can be observed by calculating *Gross Domestic Product* (GDP) value changes. According to Subagyo et al. (2018), the value of GDP can represent economic growth because it is used to find out how the resources owned can boost the economy in real terms from one period to another without being influenced by the price factor. GDP can affect changes in stock prices, whereas changes in GDP can impact economic development. GDP is calculated as consumption goods, which shows that the increasing number of consumption goods

can affect economic growth. In addition, the increase in the number of consumer goods also has an impact on increasing the potential for sales turnover by companies which affect the increasing profits received by companies. Profits have increased and are seen as an attractive investment for investors, so the demand for company shares increases the stock price. Stock prices that continue to increase can increase stock volatility. Levine and Zervos (1996) in Omoregie et al. (2016) examined the strong empirical relationship between stock market development and economic growth in a country in the long run. The results of the analysis reveal that there is a strong correlation between stock market conditions as a whole and long-term economic growth. Li et al. (2022) in his research stated that from a macroeconomic perspective on the GDP growth rate to analyze the impact of stock volatility, the results showed that the GDP growth rate had a positive impact on stock volatility. Therefore, the fourth hypothesis in this study is as follows:

H4: Economic growth has a significant positive effect on the volatility of the stock price index

Global Economic Uncertainty Towards Stock Price Indices Volatility

Global economic uncertainty can be represented using an index *Global Economic Policy Uncertainty* (GEPU), which shows the magnitude of the impact of economic uncertainty. Economic uncertainty arises due to unexpected changes in the economic conditions of a country or globally. The impact of economic uncertainty can spread to other countries with economic relations, both through trade and financial channels. Economic uncertainty is related to investment risk, where greater economic uncertainty causes greater risk. Investment risk can affect investors' attitudes and decisions in the stock market. Some investors will transfer their wealth from risky stocks so that many stock-selling activities can affect stock price movements. However, some investors may see an opportunity for profit from risky stocks because the greater the risk, the greater the profit. Investors with different views on risk can influence stock price movements which also affect the volatility of the stock price index. Global economic uncertainty, proxied by the GEPU index, contains information about global economic uncertainty. New information in uncertainty can affect the higher volatility. If new policies are produced under uncertain conditions, this can increase stock price uncertainty and fluctuations in the company's business (Sumiyati et al., 2022). Another study by Liang et al. (2020) uses five economic policy uncertainty indices to estimate oil market volatility using predictive regression with a combined forecasting method. The research shows that the uncertainty of international economic policies and US equity market indices can predict market fluctuations. Therefore, the fifth hypothesis in this study is as follows:

H5: Global economic uncertainty has a significant positive effect on stock price index volatility

RESULTS AND DISCUSSION

Analysis of Regression Model Results

1. Uji Augmented Dickey-Fuller (ADF)

The Augmented Dickey-Fuller (ADF) test was carried out by comparing the ADF Chi-Square values with the degrees of freedom values. If the ADF Chi-Square value is less than the degrees of freedom in the study, which in this study is 0.05, this indicates that the research data is stationary and feasible to be processed at the next research stage. However, if the ADF Chi-Square value is greater than the degrees of freedom, the research data needs to be differentiated or decreased until it reaches the ADF Chi-Square value, which can be less than the degrees of freedom. The results of the unit root test can be seen in Table 1.

Table 1. Augmented Dickey-Fuller (ADF) Test Results

Method	Prob.
ADF - Fisher Chi-Square	0.0004

Source: Processed Data (2023)

Based on Table 1, the prob. of ADF Fisher Chi Square in this study of 0.0004. This shows that the research data is stationary at this level. Therefore, already stationary data does not need to be reduced to the first differentiation. Therefore, the data in this study are feasible because they fulfill the elements of data stationarity.

2. t-test (partial test)

The t-test or partial test was carried out aiming to test whether each variable is independent, which in this study are macroeconomic variables such as interest rates (INT), inflation (INF), exchange rates (FER), and economic growth (ECG), as well as the global economic uncertainty index (GEPU), partially has a significant influence on the dependent variable, namely the volatility of the stock price index (VOL). The results of the t-test of the multiple linear regression model in this study can be seen in Table 2.

Table 2. Test Results t

Model	Unstandardized Coefficient		
	B	T	Say.
(Constant)	0,319485	4,29296	0,0004
Interest Rate (INT)	-2,86079	-2,437621	0,0254**
Inflation (INF)	1,327274	0,740368	0,4686
Exchange Rate (FER)	4,12862	5,168231	0,0001*
Economic Growth (ECG)	0,236006	0,55563	0,5853
Global Economic Policy Uncertainty (GEPU)	0,000359	1,991454	0,0618***

Significance level:

*0,01

**0,05

***0,1

Source: Processed Data (2023)

Based on Table 2, this research is to observe the effect of macroeconomic variables and the global economic uncertainty index in the form of a multiple linear regression model as follows:

$$VOL = 0.319485 - 2.86079 INT + 1.327274 INF + 4.12862 IRON + 0.236006 ECG + 0.000359 GEPU + \varepsilon$$

The multiple linear regression model above consists of five independent variables with different significance values. First, the Exchange Rate (FER) has a Sig value. Namely, 0.0001 where the value is less than the significance level of 0.01 so that the exchange rate (FER) partially has a significant effect on the volatility of the stock price index (VOL). Variable *Global Economic Policy Uncertainty* (GEPU) has a value of Sig. Namely, 0.0618, where the value is less than the significance level, namely 0.1. So *global Economic Policy Uncertainty* (GEPU) partially has a significant effect on the volatility of the stock price index (VOL). Third, the interest rate variable (INT) each has a Sig. Namely, 0.0254, where the value is less than 0.05, so the interest rate variable (INT) partially has a significant effect on the volatility of the stock price index (VOL). Fourth, economic growth (ECG) and inflation (INF) variables each have a Sig. Namely, 0.5853 and 0.4686, where both values are more than the significance level of 0.1, so that each variable of economic growth and inflation partially has no significant effect on the volatility of the stock price index (VOL).

3. Test F (Simultaneous Test)

The purpose of the F or simultaneous test in this study is to determine how the independent variable simultaneously influences the dependent variable. The results of the F test can be seen in Table 3.

Table 3. F test results

Model	F	Sig.
1	8,181898	0,000354
R	0,833335	
R Square	0,694447	
Adjusted R Square	0,609571	

Source: Processed Data (2023)

Based on Table 3, the F value in this study is 8.181898 with a Sig. that is 0.000354. This study uses the basis of decision-making, namely the significance level 0.05. Sig. Value The result of this study is less than 0.05, so it can be concluded that macroeconomic variables influence interest rates, inflation, exchange rates, and economic growth, as well as global economic uncertainty simultaneously on stock price index volatility. The value of R Square in this study is 0.694447, which means that 69.4447% of the volatility variable of the stock price index can be explained by the independent variables used in this study. In comparison, the remaining 30.5553% is explained by other variables not observed in this study.

Classic Assumption Test of Research Model

1. Normality Test

The purpose of the data normality test in this study is to discover the possibility of residual values in the regression, normally distributed in the regression model. The normality test results were obtained from the Eviews software in the form of a significant value using the Jarque Bera method. The significance value will be compared with the degrees of freedom. If the significance value is more than 0.05, the data used is normally distributed. The normality test results using the Jarque Bera method in this study can be seen in Table 4 as follows:

Table 4. Normality Test Results

jarque bera	1,060622
Prob.	0,588422

Source: Processed Data (2023)

Based on Table 4, the prob. obtained by the Jarque Bera method, namely 0.588422, where the value is greater than 0.05. It shows that the data in this study were normally distributed.

2. Multicollinearity Test

The purpose of the multicollinearity test in this study is to find out the possibility of a correlation between the independent variables and the dependent variable in a study. A regression model is declared to have no multicollinearity if the tolerance value is greater than 0.10 and the value *Variance Inflation Factor* (VIF) shown in the study is less than 10. The results of the multicollinearity test in this study can be seen in Table 5 as follows:

Table 5. Multicollinearity Test Results

Model	Collinearity Statistics
	VIF
(Constant)	
Quarter Interest	1,325339
Inflation	1,19997
Exchange Value	1,44326
Economic growth	1,371119
Global Economic Uncertainty (GEPU)	1,150556

Source: Processed Data (2023)

Based on Table 5, the VIF value is obtained, used in the multicollinearity test. This can be seen in the interest rate has a VIF value of 1.325339, inflation has a VIF value of 1.19997, the exchange rate has a VIF value of 1.44326, economic growth has a VIF value of 1.371119, and global economic uncertainty has VIF value is 1.150556. Therefore, the results of this study indicate that each independent variable produces a VIF value of less than 10. It indicates that there is no element of multicollinearity in this study.

3. Heteroscedasticity Test

The purpose of the heteroscedasticity test in this study is to discover the possibility of differences in variance from the residuals of one other observation in the research model. Efforts to determine the existence of heteroscedasticity elements were carried out by running White's method using Eviews software. Prob Value Chi Square from the White test, which will be compared with the value of the degrees of freedom in this study, is 0.05. If the Prob. Chi-Square is greater than the degrees of freedom, and this shows that there is no element of heteroscedasticity.

Based on the results of the White method in this study, the prob. Chi-Square is 0.2691. When compared with the value of the degrees of freedom in this study, namely 0.05, the value of prob. The Chi-Square obtained is more than the degrees of freedom. This shows that there is no element of heteroscedasticity in this study.

4. Autocorrelation Test

The autocorrelation test in this study aims to determine the possibility of a correlation between disturbing errors in the research model between studies in one period and the previous period. The autocorrelation test in this study can be carried out using the Durbin Watson (DW) method and the Breusch-Godfrey Serial Correlation LM method.

This research resulted in a Durbin Watson (DW) value of 2.083443, which will be compared with the dU value of 1.9018 and (4-dU) of 2.0982. If the Durbin Watson (DW) value shows a comparison that $dU < DW < (4-dU)$, this shows that there is no autocorrelation in this study. In this study, a comparison was obtained, namely $1.9018 < 2.083443 < 2.0982$, so it can be concluded that there was no autocorrelation in this study.

The prob is based on the autocorrelation test performed using the Breusch-Godfrey Serial Correlation LM method. The resulting Chi-Square is 0.4139. When compared with the value of the degrees of freedom in this study, which is 0.05, it means that the prob. Chi-Square is greater than the number of degrees of freedom. Therefore, it can be concluded that there is no autocorrelation in this study.

Interest Rates towards Stock Price Index Volatility

Based on the research conducted, the interest rate affects the volatility of the stock price index, so the decision does not reject H1. The interest rate partially has a significant effect on the volatility of the stock price index in the observation period of this study, and the interest rate has a negative relationship to the volatility of the stock price index. The central bank in a country determines the interest rate for a certain period. According to Alam and Uddin (2009), an increase in the interest rate paid by the bank to depositors causes a transfer of capital from the stock market to the bank. This will have an impact in the form of reduced demand for shares, which will lead to a decrease in share prices. On the other hand, an increase in the interest rate paid by banks to depositors will result in an increase in loan interest rates, which may affect investment in the economy and reduce stock price volatility. So, theoretically, there is an inverse relationship between interest rates and stock price volatility.

Inflation towards Stock Price Index Volatility

Based on the research, inflation affects the volatility of the stock price index, so the decision is to reject H2. Inflation partially does not significantly affect the volatility of the stock price index in the observation period of this study, and inflation has a positive relationship to the volatility of the stock price index. Inflation in Indonesia during the study period was not included in the very high inflation rate category. An inflation rate of less than 10% and no drastic changes in the inflation rate can still be accepted by the market so that changes are considered not to significantly affect stock market conditions (Yunita & Robiyanto, 2018; Sutrisno, 2020). In addition, Kumalasari (2016) revealed that inflation could be caused by pressure on the supply side or cost-push inflation, where its emergence is caused by increased product prices. Companies can try to maintain their business margins when there is an increase in inflation, one of which is by imposing rising costs at prices that must be paid by product consumers. Thus, the company's finances remain solid, allowing companies on the Indonesia Stock Exchange (IDX) to remain flexible in managing their resources which can affect their business performance. This shows that the inflation in this study period did not affect the volatility of the stock price index. Anayochukwu (2012) explains that inflation does not significantly affect stock market volatility. High inflation rates increase the cost of living as well as a shift in the use of resources from investment to consumption. This resulted in a decrease in demand for market instruments and subsequently resulted in a reduction in share trading volume and stock market volatility.

Exchange Rate Towards Stock Price Index Volatility

Based on the research conducted, the exchange rate affects the volatility of the stock price index so that the decision does not reject H3. The exchange rate partially has a significant effect on the volatility of the stock price index in the observation period of this study, and the exchange rate has a positive effect on the volatility of the stock price index. According to Subair and Salihu (2013), exchange rate movements can influence stock price movements. If the local currency depreciates Towards the foreign currency, which in this case is the US dollar, it will increase the return on the origin of the foreign currency. The effect of the exchange rate on the volatility of the stock price index is related to investors' expectations of the country's economy. Suppose the value of a country's currency depreciates Towards the US dollar. In that case, this can create anxiety for investors, causing the perception that a country's economic prospects are not doing well. The weakening of a country's currency Towards the US dollar can be caused by weak fundamentals of the country's economy so that it can reduce the volatility of the country's stock market (Djazuli & Listriyani, 2021). This is caused by a weakening of the value of a country's currency indicating that efforts to obtain US dollars require a lot of the country's currency which has an impact on reducing the purchasing power of shares by investors. In addition, investors also tend to sell shares, causing a positive impact on stock market volatility. Lakshmanasamy (2021) states that an increase in currency exchange rates can increase the stock market's volatility. This is due to globalization

and open market economic policies, and the capital market has become a potential destination for foreign investors to park investments that build exposure to foreign currency. This could be a potential reason behind the positive relationship between exchange rate volatility and stock market return volatility.

Economic Growth Towards Stock Price Index Volatility

Based on the research conducted, economic growth does not affect the volatility of the stock price index, so the decision is to reject H4. Partially economic growth has no significant effect on stock price index volatility in the observation period of this study, and economic growth has a positive relationship to stock price index volatility. The results of this study show differences from the results of research conducted by Setiawan (2020), which revealed that economic growth has a positive and significant impact on stock market volatility. Stock market conditions only sometimes accurately reflect economic conditions because the stock market can react very quickly and sharply to events that may have less significant long-term impacts. In addition, the high expectations that have been reflected in stock prices before impacting the economy are another factor that can cause disparities in the market and the economy. As a result, when the economy grows, the market does not jump because investor sentiment already influences stock prices. In addition, economic growth can be used as an indication of an increase in social welfare, where the increase in welfare can stimulate an increase in public consumption of goods and services to encourage the development of investment in the real sector. However, investment development in the real sector was not followed by increased investment in the capital market (Kewal, 2012). The increase in GDP only represents a country's economic growth in general. An increase in GDP does not necessarily affect an increase in per capita income for each individual. In this case, investment in the capital market is not determined by an increase in GDP.

Global Economic Uncertainty Towards Stock Price Indices Volatility

Based on the research conducted, global economic uncertainty affects the volatility of the stock price index so that the decision does not reject H5. Global economic uncertainty has a significant effect on stock price index volatility in the observation period of this study, and GEPU has a positive effect on stock price index volatility. Urakhma and Muharram (2021) stated that uncertain economic situations and conditions impacted stock market conditions. Increasing trade and financial integration makes inter-country markets vulnerable to shocks from crisis uncertainties which can lead to changes in stock prices resulting in increased stock market volatility. The results of this study support the results of research by Liu and Zhang (2015) which predict stock market volatility by analyzing future economic uncertainty indices. The results of his research stated that economic uncertainty resulted in fluctuations and could predict future stock market volatility. Stock prices can decline in response to increased uncertainty, and the effect is greater during periods of high volatility. Li et al. (2020) stated that the rise and fall of the GEPU can cause significant fluctuations in the stock market. GEPU rises, and falls are statistically significant and can result in high stock market volatility. The use of the

GEPU index helps improve prediction accuracy so that it can provide more useful information in predicting stock market volatility.

CLOSING

Two conclusions can be drawn from this research. First, this study shows that several macroeconomic variables, including interest rates and exchange rates, significantly influence the volatility of the stock price index. The interest rate harms the volatility of the stock price index, while the exchange rate positively affects the volatility of the stock price index. However, each of the inflation and economic growth variables has a positive and no significant effect on the volatility of the stock price index. Each change in macroeconomic variables impacts the volatility of the stock price index. The global economic uncertainty index is designed to describe the condition of uncertainty in the economic situation in the form of an index that shows the magnitude of the index explaining the magnitude of uncertainty in the global economy. Second, the results of this study indicate that the global economic uncertainty index has a positive and significant effect on stock price index volatility. The link between the volatility of the stock price index and investment risk caused by large economic uncertainties can lead to large investment risks that can increase the volatility of the stock price index. The uncertainty due to changes in global economic conditions causes fluctuations, making the stock price index unstable. A fluctuating stock price index can increase the volatility of the stock price index.

Suggestions for future research can be made by observing other types of stock markets and the long-term and short-term effects on the volatility of the stock price index. In addition, in future studies, it is recommended to try to observe the volatility of the stock price index using other analytical methods to obtain more accurate results, such as using the Autoregressive Conditional Heteroscedasticity (ARCH) model or the General Autoregressive Conditional Heteroscedasticity (GARCH) model which is also capable of predicting price index volatility Share. This study only observes the effect of macroeconomic variables and the global economic uncertainty index on stock price index volatility, so it is suggested for future research to observe other macroeconomic variables or observe volatility in the type of stock market in one specific industry.

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