# Impact of Macroeconomic Movements on Changes in Stock Returns

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**A B S T R A K**

*Dalam konteks ekonomi makro, dampak inflasi akan dirasakan oleh semua perusahaan dalam industri tersebut. Kondisi ini akan mempengaruhi kinerja pasar modal karena banyak perusahaan yang tidak dapat beroperasi secara optimal. Akibatnya, pasar modal menghadapi ketidakpastian yang tinggi. Masalah ketepatan waktu dalam membeli atau menjual saham seringkali membuat investor mengalami kerugian dalam berinvestasi. Kondisi ini menunjukkan bahwa perlu adanya kajian akademis yang mampu memprediksi faktor-faktor yang mempengaruhi return saham. Penelitian ini bertujuan untuk menguji pengaruh inflasi, nilai tukar, dan suku bunga terhadap return saham. Penelitian ini menggunakan pendekatan kuantitatif dengan paradigma kausal. Populasi dalam penelitian ini adalah data ekonomi makro dan return saham Indeks Harga Saham Gabungan (IHSG) periode 2009–2020. Analisis data menggunakan regresi dengan uji asumsi klasik yang telah dilakukan sebelumnya yaitu uji normalitas, autokorelasi, multikolinearitas, heteroskedastisitas, dan linieritas. Program uji data yang digunakan adalah eviews-10. Hasil temuan mengungkapkan bahwa makroekonomi mempengaruhi return saham secara simultan; inflasi berpengaruh negatif terhadap return saham; suku bunga dan nilai tukar berpengaruh positif terhadap return saham. Hasil penelitian ini menunjukkan kesesuaian dengan Arbitration Pricing Theory (APT) yang menyatakan bahwa harga aset dapat diprediksi dengan melihat faktor makroekonomi.*

**A B S T R A C T**

In the macroeconomic context, the impact of inflation will be felt by all companies in the industry. This condition will affect the performance of the capital market because many companies cannot operate optimally. As a result, the capital market faces high uncertainty. The problem of timeliness in buying or selling shares often makes investors experience losses in investing. This condition indicates that there is a need for an academic study that is able to predict the factors that influence stock returns. This study aims to examine the effects of inflation, exchange rates, and interest rates on stock returns. This study uses a quantitative approach with a causal paradigm. The population in this study is macroeconomic data and stock returns of the Composite Stock Price Index (JCI) during the 2009–2020 period. Data analysis used regression with the classical assumption tests previously carried out, namely normality, autocorrelation, multicollinearity, heteroscedasticity, and linearity tests. The data test program used is eviews-10. The findings revealed that macroeconomics affect stock returns simultaneously; inflation has a negative effect on stock returns; interest rates and exchange rates have a positive effect on stock returns. The results of this study indicate a conformity with the Arbitration Pricing Theory (APT), which states that asset pricing can be predicted by examining macroeconomic factors.

## 1. INTRODUCTION

APT is an asset pricing model based on the idea that the return on an asset can be predicted using the relationship that exists between the same asset and risk factors in general. The APT theory is an "undeniable" theory, indicating that there is a macroeconomic influence on stock returns (Siregar, 2019; Vardari et al., 2016). However, after the researchers conducted further research, there was an interesting pattern of macroeconomic influence on stock returns in developed countries compared with stock returns in emerging market countries (Ayuba et al., 2018; Muslim et al., 2021). The APT theory, which explains that there is a macroeconomic effect on stock returns, In general, the results of research investigating the

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relationship between macroeconomic variables and the stock market in emerging market countries tend to be mixed.

Macroeconomic factors that affect stock returns are Macroeconomic factors stem from broad economic problems, one of which is inflation. Inflation has a big impact on the national economy. High inflation will push the price of building materials to become more expensive, causing high production costs that must be borne by the company (Bhattarai, 2018; Sudarsono & Sudiyatno, 2016). The decline in purchasing power and high production costs will indirectly affect capital market conditions. In the macroeconomic context, the impact of inflation will be felt by all companies in the industry (Giri & Joshi, 2017; Jefferis & Okeahalam, 2000). This condition will affect the performance of the capital market because many companies cannot operate optimally. As a result, the capital market faces high uncertainty. Rational investors will try to get the maximum expected return with a minimum level of risk. Return is usually directly proportional to risk, namely the higher the level of risk faced, the higher the return from the investment, and vice versa (Forson & Janrattanagul, 2014; Gay Jr., 2008; Gupta & Reid, 2013).

The rupiah exchange rate is an economic phenomenon that will have an impact on economic activities on a domestic and global scale. The depreciation of the rupiah against the US dollar causes most companies to be unable to pay their loans to banks (Jefferis & Okeahalam, 2000; Khan et al., 2015; Khoury, 2015). One of the policies taken by the government to reduce fluctuations in the exchange rate was by increasing interest rates through Bank Indonesia Certificates (SBI) and Money Market Securities (SBPU). As an investor, there is a number of important pieces of information that must be considered related to stock prices, which are very volatile (Ozlen & Ergun, 2012; Rahman et al., 2009; ystein Gjerdea, 1999). This greatly affects investors' decisions in making wise decisions in choosing and managing good and correct stocks. Accurate stock valuation can minimize risk while helping investors get profits (Prasetioningsih et al., 2018; Shafana, 2014; Sudarsono & Sudiyatno, 2016). The interest rate is one of the attractions for investors to invest. According to the theory of interest rates, the classical theory states that investment depends on the interest rate. The high interest rate makes the desire to invest small. The lower the interest rate, the more entrepreneurs will invest (Alagidede, 2009; Bhattarai, 2018). Conceptually, stock returns are one of the factors that encourage investors to invest and are a reward for the courage of investors to take risks for their investments. A stock return is defined as income earned during the investment period per a number of funds invested in shares (Ayuba et al., 2018; Khan et al., 2015; Sudarsono & Sudiyatno, 2016).

Various previous studies, state that the stock market, are referred to as a barometer of the Indian economy; it is an indicator of the country's economic condition. Previous study investigates the relationship between Indian stock returns and macroeconomic variables, namely India's interest rate and the interest rate (Nikita et al., 2017). Quarterly data is collected for the period January 2000 to December 2015 for all macroeconomic variables. Data analysis used a regression model. The variables were tested for stationarity, serial correlation, heteroscedasticity, and normality. Base on other study found that relationships between stock returns and macroeconomic variables are well documented for the United States and other major economies (Gay Jr., 2008). The relationship between stock market index prices and macroeconomic variables are exchange rates and oil prices for Brazil, Russia, India, and China (BRIC) using the Box-Jenkins ARIMA model. Although no significant relationship was found between the respective exchange rates and oil prices on the stock market index prices of the two BRIC countries. In addition, no significant relationship was found between current and past stock market returns, indicating that the markets of Brazil, Russia, India, and China exhibit weak forms of market efficiency.

Previous study investigates whether economic variables have explanatory power for stock returns in South Asian stock markets (Khan et al., 2015). This article examines the effect of local, regional, and global economic variable choices in explaining equity returns; most previous studies examining this issue have tended to focus only on local and/or global factors. Important factors are identified by filtering macroeconomic variables into their main components. The results of vector autoregression show that the South Asian market under study is inefficient. Both local and regional factors can directly and indirectly explain Bangladesh, Pakistan, and Sri Lanka stock returns, while lagging returns from the Pakistan stock market and world economic activity can explain Indian stock returns. Other study attempts to develop a multi-index CAPM for nine European car companies (Khoury, 2015). This study find that S&P, exchange rates, platinum, and, to a lesser extent, exports are significantly positively related to stock returns, while unemployment and aluminum are negatively related. In summary, this paper finds that the multi-index approach is better than the single-index approach in predicting stock price movements in the European automotive industry.

However, since economic theory does not state which factors and the number of factors should be used in the analysis, many possible combinations of factors are left open to future research. On the basis of theory and various previous studies, the focus of this research is to examine the effects of inflation, exchange

rates, and interest rates on stock returns in Indonesia during the 2009–2020 Period. This is very important because it shows the relevance of APT theory to the Indonesian context.

## 2. METHODS

The writer uses an associative descriptive approach because of the variables that will be examined in relation to it, and the aim is to present a structured, factual, and accurate description of the facts and the relationship between the variables studied. A descriptive approach will be used to identify the factors that influence stock returns in the country on the basis of per capita income during crisis and normal times. The population in this study are inflation, interest rates, exchange rates, and JCI stock returns during the 2009-2020 period. The sampling technique used in this study is a saturated sample, which means that all populations are used as research samples. Data analysis used regression with the classical assumption tests previously carried out, namely normality, autocorrelation, multicollinearity, heteroscedasticity, and linearity tests. The data test program used is eviews-10.

## 3. RESULTS AND DISCUSSIONS

**Results**
**Classic Assumption Test**



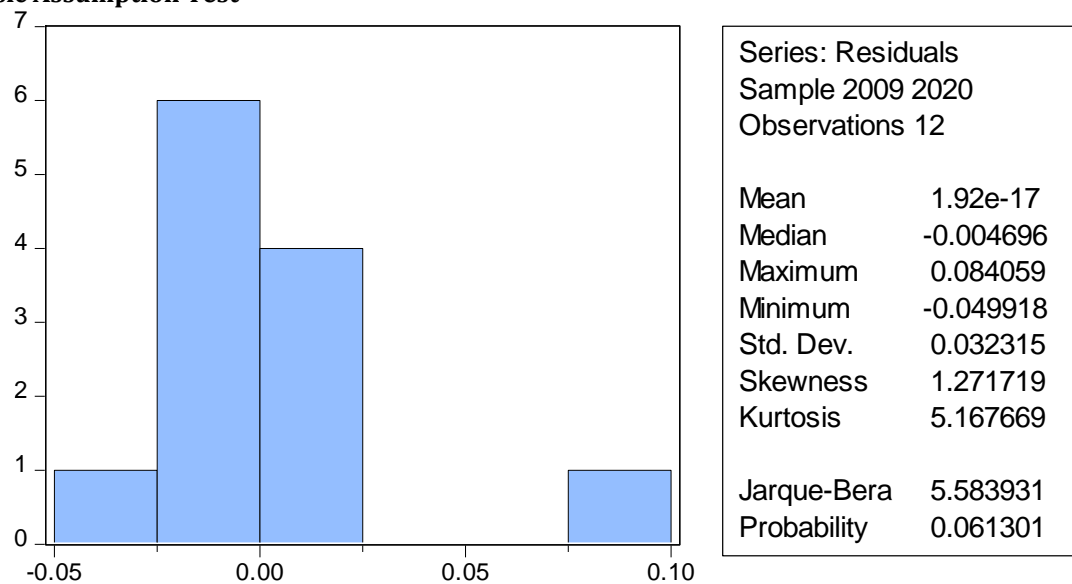| Series: Residuals |  |
| --- | --- |
| Sample 2009 2020 |  |
| Observations 12 |  |
| Mean | 1.92e-17 |
| Median | -0.004696 |
| Maximum | 0.084059 |
| Minimum | -0.049918 |
| Std. Dev. | 0.032315 |
| Skewness | 1.271719 |
| Kurtosis | 5.167669 |
| Jarque-Bera | 5.583931 |
| Probability | 0.061301 |

**Figure 1.** Normality Test

Base on Figure 1, the decision whether the residuals are normally distributed or not is simple by comparing the calculated JB (Jarque-Bera) probability value with an alpha level of 0.05 (5%). When Prob. JB count greater than 0.05, it can be concluded that the residuals are normally distributed and vice versa, if the value is smaller then there is not enough evidence to state that the residuals are normally distributed. Prob value. JB count 5.5583931 > 0.05 so it can be concluded that the residuals are normally distributed, which means that the classical assumptions about normality have been met. Heteroscedasticity test result is show in Table 1.

**Table 1**. Heteroscedasticity Result

| F-statistics | 0.6513 | Prob. F( 3,8) | 0.6041 |
| --- | --- | --- | --- |
| Obs *R-squared | 2.3557 | Prob. Chi -Square( 3) | 0.5019 |
| Scaled explained SS | 2.2557 | Prob. Chi -Square( 3) | 0.5211 |

Base on Table 1, the decision whether or not heteroscedasticity occurs in the linear regression model is by looking at the Prob value. F-statistic (F count). If the value of Prob. The calculated F is greater than the alpha level of 0.05 (5%) then H0 is accepted which means there is no heteroscedasticity, whereas if the Prob value. F count is smaller than the alpha level of 0.05 (5%) then H0 is rejected, which means there is heteroscedasticity. Prob value. The calculated F of 0.6041 is greater than the alpha level of 0.05 (5%) so

that, based on the hypothesis test, H0 is accepted, which means that there is no heteroscedasticity. Multicollinearity result is show in Table 2.

**Table 2.** Multicollinearity Result

| Variable | Coefficient Variance | Uncentered VIF | Centered VIF |
|----------|---------------------|----------------|--------------|
| C | 0.0161 | 135.3813 | NA |
| X1 | 0.0002 | 38.02624 | 3.5379 |
| X2 | 4.08E-05 | 49.31967 | 1.3998 |
| X3 | 0.0004 | 119.2480 | 3.3286 |

Base on Table 2, the results of the multicollinearity test can be seen in the Centered VIF column table. The VIF value for all variables is not greater than 10. Because the VIF value of the two variables is not greater than 10 or 5 (many books require no more than 10, but there are also those that require no more than 5), it can be said there is no multicollinearity in the two independent variables. Based on the classical assumptions of linear regression with OLS, a good linear regression model is one that is free from multicollinearity. Thus, the above model is free from multicollinearity. Then for linearity result is show in Table 3.

**Table 3.** Linearity Result

|  | Value | df | Probability |
|--|-------|----|-------------|
| t-statistics | 0.0481 | 7 | 0.9630 |
| F-statistics | 0.0023 | (1.7) | 0.9630 |
| Likelihood Ratio | 0.0040 | 1 | 0.9498 |
| **F-test summary:** | | | |
|  | **Sum of Sq.** | **df** | **Mean Squares** |
| SSR test | 3.79E-06 | 1 | 3.79E-06 |
| Restricted SSR | 0.0115 | 8 | 0.001436 |
| Unrestricted SSR | 0.0115 | 7 | 0.001640 |
| **LR test summary:** | | | |
|  | **Value** | | |
| Restricted LogL | 24.6815 | | |
| Unrestricted LogL | 24.6835 | | |

Base on Table 3, if the value of Prob. F count is greater than the alpha level of 0.05 (5%) then the regression model meets the assumption of linearity and vice versa, if the value of Prob. F count is less than 0.05 then the model does not meet the assumption of linearity. Prob value. The calculated F can be seen in the F-statistic row of the Probability column. In this case, the value is 0.9630 which is greater than 0.05, so it can be concluded that the regression model has met the assumption of linearity. Autocorrelation result is show in Table 4.

**Table 4.** Autocorrelation Result

| F-statistics | 0.6037 | Prob. F( 2.6) | 0.5769 |
|--------------|--------|---------------|--------|
| Obs *R-squared | 2.0103 | Prob. Chi -Square( 2) | 0.3660 |

Base on Table 4, prob value. F(2.6) of 0.5769 can also be referred to as the calculated F probability value. Prob value. The calculated F is greater than the alpha level of 0.05 (5%) so that, based on the hypothesis test, H0 is accepted, which means that there is no autocorrelation. On the other hand, if the value of Prob. If F count is less than 0.05, it can be concluded that there is an autocorrelation. The result is show in Table 5.

**Hypothesis Testing**
**Table 5.** T-test Result

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|----------|-------------|------------|-------------|-------|
| C | -0.052794 | 0.127275 | -0.414798 | 0.0002 |
| X1 | -0.003058 | 0.013998 | -0.218448 | 0.0325 |
| X2 | 0.005072 | 0.006389 | 0.793746 | 0.0002 |

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| X3 | 0.000640 | 0.019333 | 0.033092 | 0.0744 |

Based on Table 5, it shows that inflation has a negative effect on stock returns, which means that the lower the inflation, the higher the stock returns. The exchange rate has a positive effect on stock returns, which means that the higher the exchange rate, the higher the stock returns. Interest rates also show a positive effect on stock returns, which means that the higher the interest rate, the higher the stock return. The result of F test is show in Table 6.

**Table 6.** F . test Result

| | | | |
|---|---|---|---|
| R-squared | 0.915861 | Mean dependent var | 1122.825 |
| Adjusted R-squared | 0.874441 | SD dependent var | 442.4966 |
| SE of regression | 0.037893 | Akaike info criterion | 37.46913 |
| Sum squared resid | 0.011487 | Schwarz criterion | 13.85278 |
| Likelihood logs | -24.68148 | Hannan-Quinn criter . | 13.06757 |
| F-statistics | 18.55386 | Durbin-Watson stat | 2.049920 |
| Prob(F-statistic) | 0.000084 | | |

Based on the Prob (F-statistics) as shows in Table 6 reveal that a value of 0.00084 smaller than 0.05, meaning that simultaneously macroeconomic variable affect stock prices. Meanwhile, this research model contributes to changes in stock prices by 91%, only 9% is in other variables.

**Discussion**

Comparison with various previous studies shows the pattern in emerging market countries showing the inconsistency of macroeconomic effects on stock returns. The inflation variable that has an influence on stock returns is found in previous research of (Bhattarai, 2018; Shafana, 2014; Ugur & Ramazan, 2005). Meanwhile, the results of previous study show that inflation has no effect on stock returns (Muradoglu et al., 2000).

A study conducted by previous study in Kenya, Nigeria and Tunisia found that inflation has a positive impact on stock returns (Alagidede, 2009). Other study conducted an analysis in China, which found inflation to have a long-term positive effect on market returns (Riantani & Tambunan, 2013). The analysis findings show that inflation has a positive effect on stock returns. Research related to inflation has also been carried out by many previous researchers, such as previous study conducting research on the effect of inflation on stock returns, the results show that there is a long-term positive effect (Hosseini et al., 2011). Other study in Pakistan conducted a separate study on the effect, which found that inflation has a negative impact on stock prices (Mahmood et al., 2014). Similar with other study who conducted research in Malaysia showed that there was a positive influence between inflation and stock returns (Ugur & Ramazan, 2005). This research is complemented by research in Malaysia which shows that there is a long-term effect between inflation and stock returns (Thamrin & Sembel, 2020).

The results of previous study have conducted work in India finding that inflation has an impact on stock returns in the long run (Giri & Joshi, 2017). Research conducted in Nigeria reveals that inflation has a negative effect on stock returns (Ayuba et al., 2018). This pattern shows that the majority of research in emerging market countries shows that inflation has an influence on stock returns. Macroeconomic factors, such as interest rates also have an influence on stock returns (Jefferis & Okeahalam, 2000; Okech & Mugambi, 2016). The results of this study indicate that interest rates consistently have an influence on stock returns in emerging market countries.

Interest rates have a big impact on investors to invest their capital, interest rates have an influence on stock returns. Previous study in Japan, showed that interest rates had a long-term effect on stock returns (Mukherjee, 1995). A study in Greece, the results showed that interest rates had an effect on stock returns (Muradoglu et al., 2000). Other study conducted research in the United States and Japan, the results showed that interest rates had a negative effect on stock returns (Humpe & Macmillan, 2009). Other study also conducted research in Indonesia, Malaysia, the Philippines, Singapore and Thailand (Sharma., 2002). The results showed that interest rates had a negative long-term effect on stock returns, except for Indonesia and Malaysia, which had a positive effect. Previous study conducted research in Turkey, the results showed that interest rates had an effect on stock returns (Ozlen & Ergun, 2012). Interest rates have a negative effect on stock returns. The research results show that interest rates have a negative effect on stock returns (Gupta & Reid, 2013; Riantani & Tambunan, 2013). Other study conducted research in Thailand, showed that interest rates had an effect on stock returns (Forson & Janrattanagul, 2014).

The implications of this research provide an overview related to the impact of macroeconomic movements on changes in stock returns. This research will be useful in the economic field. This research is still very limited, one of the limitations of this research lies in the limited research subjects. Therefore, it is hoped that future research will be able to deepen and broaden the scope of research related to the impact of macroeconomic movements on changes in stock returns.

## 4. CONCLUSION

The results of the study indicate that there is conformity with the APT theory that macroeconomics has an influence on stock returns. This result is carried out by comparison test showing that there are different patterns, especially in developed countries that have a consistent tendency, while emerging market countries have a tendency of inconsistency.

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