

Macroeconomic Factor Impact on the Stock Returns: An Empirical Study on the Indonesia LQ45 Stocks

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ABSTRACT

The stock price is affected by various macroeconomic factors such as the global market index, money supply, interest rate, inflation rate, and oil price. This paper presents a study on these macroeconomic factors on the return of stocks that are listed as the most liquid stocks in the Indonesia Stock Exchanges (IDX). The data used in this study is the stock that is included consistently in 45 most liquid stocks (LQ45) from 2009 up to 2019. On the stock returns, partial tests have shown that the global market index, interest rate, and inflation rate have a positive impact, and the oil price has negative effects. On the other hand, the money supply has a negligible impact on the stock returns. Simultaneous regression tests have shown, however, all of the macroeconomic factors have significant effects on the LQ45 stock returns, with a determination level of 27%.

Keywords: CAPM, APT, macroeconomics, IDX, LQ45.

1. INTRODUCTION

Indonesia Stock Exchanges (IDX) is an emerging market with significant growth in the last decades. From 2009 to 2019, the market size increased from 2,711 trillion to 7,217 trillion, and the total number of investors increased from 300 thousand to 2.4 million. This growth is the highest in Southeast Asian countries.

In IDX, the most 45 liquid stocks are listed in LQ45. This list is updated every six months by taking into account the trading activities and company reports. Thus, from year to year, companies listed in LQ45 can be different depending on the company's performance. Though LQ45 member is just about 6.7% of the total number of issuers, the market size is quite significant (64% of total market size). Figure 1 shows that the LQ45 index has grown significantly (almost 300%) over the last decade. It shows that the LQ45 market is an attractive market for investors.

Since the introduction of the Arbitrage Pricing Theory (APT) by Roll in 1976 [1], a lot of works have been reported on the impacts of macroeconomic factors on the stock returns, included global market, money supply, interest rate, inflation rate, and oil price [2]–[8].

The APT can be considered the extension of classical capital asset pricing theory introduced by Sharpe in 1964 [9]. Instead of considering just market risk as to the only investment risk, the APT considered various

macroeconomic factors as additional risks. Though many works have been done, no conclusive results have been reached what the impacts of various macroeconomic factors on the stock returns, especially in Indonesia [2], [10].

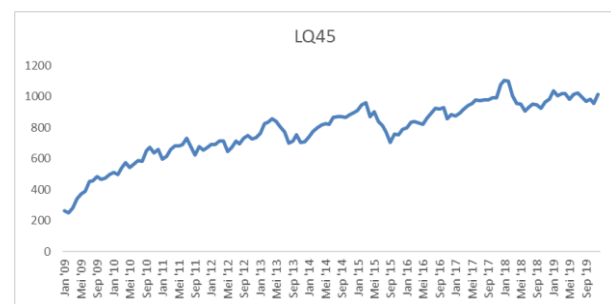


Figure 1 The growth of the LQ45 index

This paper presents a study on the impact of macroeconomic factors on the stock performance in Indonesia Stock Exchange (IDX). The considered stocks are the ones listed in LQ45 (45 most liquid stocks). The stock performance is measured by monthly stock returns. The studied macroeconomic factors are the global index, money supply, interest rate, inflation rate, and oil price. Based on the data for the period of 2009-2019, the partial tests have shown that the global index, interest rate, and inflation rate have a positive impact, and the oil price has

negative effects on the stock returns. On the other hand, money supply negligible impacts. Simultaneous tests have shown that all macroeconomic factors have significant effects on the stock returns, with a level of determination of more than 27%.

The first significant theory on the capital asset pricing model (CAPM) is the one introduced by Sharpe [9] and Lintner [11]. The theory has shown that the net stock return is proportional to the market risk if the diversification can be done perfectly. No other risks have an impact on the stock return if the diversification is perfect. Though many critiques have been published to this classical CAPM theory [12]–[15], this theory is the most common theory in many business schools.

The second significant theory on capital asset pricing is the one that is called the arbitrage pricing theory (APT). This theory is introduced by Ross in 1976 [1]. In this theory, it is shown that asset prices are influenced by various macroeconomic factors. Thus, macroeconomic risks are considered the risks that must be considered in asset pricing instead of just market risk, as in classical CAPM.

The third significant work on capital asset pricing is the one introduced by Fama in 1992 [16]. In this theory, instead of just market risk, additional factors such as stock size and price are considered additional stock returns determinants. This theory is commonly called the multifactor theory. This theory can be considered the extension of the classical CAPM by adding some factors to consider the imperfectness of diversification.

Many works in APT applications in IDX have also been published [17]–[23]. Various studies on macroeconomic factor impacts on the IDX stocks have been reported. In 2015, the effect of the global market

index had been reported [22], [23]. It is shown that the global market performance has a strong impact on the Indonesian stock market performance. The effects of Indonesia's macroeconomic factors such as money supply, inflation rate, and interest rate on the stock returns have also been reported [10] [18]–[20]. The impacts of oil price and gold price on the Indonesian market performance have also been reported [21]. Though a lot of works have been done, the results are still inconclusive. Some works presented results that are opposite to the other works.

This paper is trying to explain the impact of various macroeconomic factors on stock returns, especially for stocks that are consistently listed in Indonesia LQ45. It is hoped that the results can be a stimulus for further research on the impacts of macroeconomic factors on stock returns, especially in Indonesia.

2. METHOD

The data used in this study is secondary data that are obtained from various sources. The stocks that are listed in LQ45 are obtained from the Indonesia Stock Exchanges (IDX). The data of stock returns used in this study is monthly stock returns. We used the data from 2009 to 2019.

Figure 2 shows the rate of change movements of macroeconomic variables that are discussed here. It can be seen that there are common movements among some variables. In this figure, the movement of the LQ45 return has also been included. This figure clearly shows that the LQ45 return consistently moves together with some macroeconomic factors.

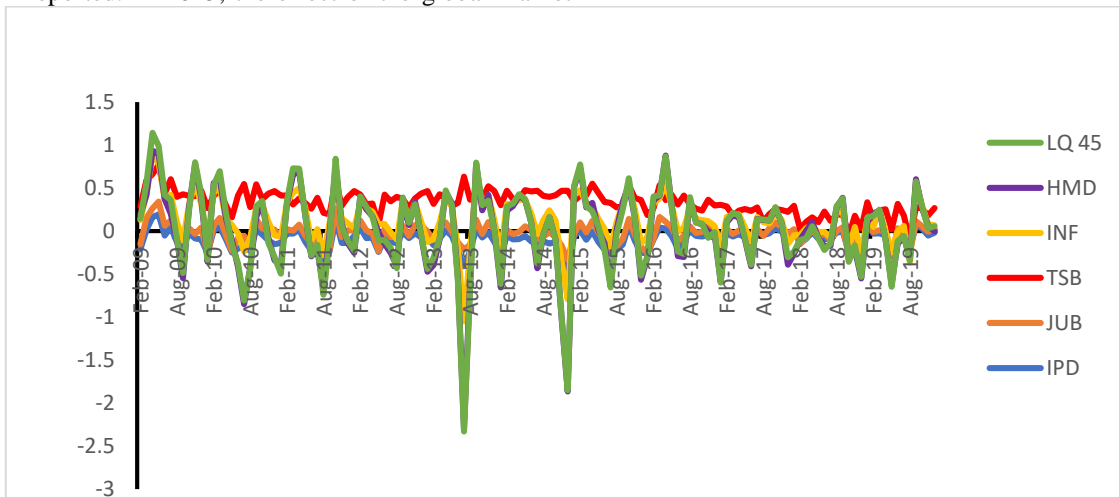


Figure 2. The movement of macroeconomic factors & LQ45

This study used regression analysis for the data, the model is stated below:

$$RLQ45_t = \alpha_t + \beta_1 IPD_t + \beta_2 JUB_t + \beta_3 TSB_t + \beta_4 INF_t + \beta_5 HMD_t + \epsilon_t \quad (1)$$

where:

- RLQ45 = return LQ45
- IPD = global index
- JUB = money supply
- TSB = interest rate
- INF = Inflation rate
- HMD = oil price

As usual, ordinary tests such as residual normality test, stationarity test, and other OLS method test, consisting of multicollinearity, heteroscedasticity, and autocorrelation, are first conducted. Then, each macroeconomic factor is tested individually and simultaneously to check the impact on the stock returns. The determination level of each factor is calculated in this step.

3. RESULTS AND DISCUSSION

3.1 Test Results

Figure 3 shows the result of the normality test. This figure shows that the JB index is 1.33 with a probability of 0.51 that is greater than 0.05. These values indicate that the data used in this study is passed the normality test.

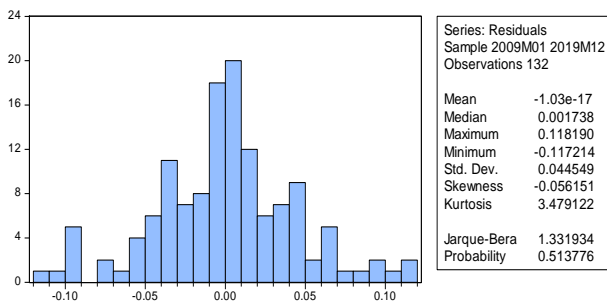


Figure 3. Normality Test

Table 1 shows the result of the stationarity test. It indicates that Augmented Dickey-Fuller (ADF) value is less than 0.05. It can be concluded that the data is stationer.

Table 1. Cointegration Eageel-Granger Test

	t-Statistic	Prob
Augmented Dickey-Fuller test Statistic	-11.64320	0.0000
Test critical values		
1% level	-3.480818	
5% level	-2.883579	
10% level	-2.578601	

Source : Data Processed

Table 2 shows the result of the multicollinearity test. This table shows that VIF value less than 10, it can be concluded that no multicollinearity in the independent variables [24].

Table 2. Multicollinearity Test

Variable	Coefficient Variance	Unscented VIF	Centered VIF
IPD	0.003727	4.728256	2.631598
JUB	0.014676	5.879763	1.889612
TSB	0.002710	25.64908	2.648576
INF	0.003026	15.94215	9.705105
HMD	0.003026	11.93765	9.448650
C	0.000208	13.30944	NA

Source : Data Processed

Table 3 shows the result of the heteroscedasticity test. As the probability chi-square value on Obs. *R-squared is greater than 0.05, it can be concluded that there is no heteroscedasticity in the independent variables.

Table 3. Heteroscedasticity Test

F-statistic	1.466746	Prob. F(5.126)	0.2053
Obs*R-squared	7.260370	Prob.Chi-Square(5)	0.2020
Scaled explained SS	8.200115	Prob.Chi-Square(5)	0.1455

Source : Data Processed

The autocorrelation test result is shown in Table 4. Once again, this result indicates that no autocorrelation is found in the data.

Table 4. Autocorrelation Test

F-Statistic	0.663098	Prob. F(2.124)	0.5171
OBS*R-squared	1.396818	Prob.Chi-Square(2)	0.4974

Source : Data Processed

Table 5 shows the results of t-test, F-test, and coefficient of the determination. It can be seen that the global index, interest rate, inflation rate, and oil price have probabilities less than 0.1. These results indicate that the global index, interest rate, inflation rate, and oil price are significantly affecting the stock returns. To the stock returns, the impact of the global index, interest rate, and the inflation rates is positive. The oil price impact is negative. Only money supply has a probability of more than 0.1, and, therefore, this factor can be considered insignificant in determining the stock returns. This table also shows that the calculated F-statistic is 9.401 with a probability of 0.000. This result shows that macroeconomic factors have a significant impact on stock returns. The result of the coefficient determination is 27%. The values are common in common CAPM studies.

Table 5. The t-test, The F test, and The Coefficient of Determination

Variable	Coeff	t-statistic	Prob
C	-0.0216	-1.5003	0.1360
IPD	0.3350	5.4890	0.0000***
JUB	-0.1592	-1.3143	0.1911
TSB	0.2381	4.5740	0.0000***
INF	0.0815	1.6869	0.0941*
HMD	-0.1053	-1.9153	0.0577*
R-Square	0.2727		
F-statistic	9.4013		0.000

Source : Data Processed

The regression analysis gave following model:

$$RLQ45 = -0.022 + 0.335 IPD - 0.159 JUB + 0.238TSB + 0.082INF - 0.105HMD \quad (2)$$

*significant at $\alpha = 10\%$, and **significant at $\alpha = 5\%$, and *** significant at $\alpha = 1\%$

3.2 Discussion

The above results have shown that the global index, interest rate, and inflation rate positively impact stock returns. On the other hand, the oil price has a negative impact on stock returns. Based on the partial test, the money supply has no significant effect. Why money supply has no effect on the stock returns has to be investigated further.

Based on the simultaneous regression test, the result shows that all macroeconomic factors impact the stock returns. The determination level is 27% that is quite high for the asset pricing model. In general, however, we can conclude that the global market performance has a strong impact on the Indonesian market performance.

4. CONCLUSION

The impacts of various macroeconomic factors on the return of stocks listed in LQ45 have been investigated. The stock returns show that the global index, interest rate, and inflation rate have a positive impact on the stock returns, but oil price has a negative effect. Money supply has insignificant impacts. The determination level of the derived model is 27% that is quite high for the asset pricing model.

ACKNOWLEDGMENTS

We thank the ministry of research, technology, and higher education for funding this research. We would also like to thank Universitas Sangga Buana Bandung for allowing the use of campus facilities. we also thank the colleagues at the faculty of economics who encouraged us to write this work

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