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by Oliver Ross

The Influence of Interest Rates, Exchange Rates, and Money Supply on Jakarta Composite Index (JCI)

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ABSTRACT

This study aimed to examine the influence of interest rates, exchange rates, and money supply on the composite stock-price index in Indonesia Stock Exchange (IDX) during the period between January 2016 and December 2020. This research used a multiple-linear regression analysis on time-series data and then the data was processed using the SPSS software version 25. The results reveal that among three independent variables in this study, two variables have no significant influence. These variables are interest rates and exchange rates, that partially have a positive but not significant influence on JCI. Meanwhile, the variable of money supply has a positive and significant influence on JCI.

Keywords: Interest Rates, Exchange Rates, Money Supply, JCI

1. INTRODUCTION

Several researchers have studied about the effect of macroeconomic variables on the Composite Stock-Index from year to year, and found different results, which also included the Jakarta Composite Index (JCI). The macroeconomic aspects, which are believed to influence the movements of stock market, are reflected in monetary economic indicators (Sarwono, 2003) [1].
Boediono (2014: 76) [2] stated that interest rate is the price of using investment funds. According to Brigham and Houston (2010) [3], low interest-rate can reduce the cost of capital for businesses, which in turn encourages corporate investment and will increase consumer and market spending. Interest rate also affects people's desire to invest in banks.
Exchange rate reflects the balance of supply and demand for both domestic and foreign currencies. Exchange rate is defined as a comparison of the value between two different currencies (Triyono, 2008) [4]. The exchange rate applied in Indonesia is the value of one unit of Rupiah which is converted to one unit of USD (Adiningsih, 1998) [5].
Regarding the vital role of monetary indicators in the economy, it is important to pay attention to the changes in money supply. Money supply affects the JCI, because if the amount of money in circulation is high, the stock price will tend to fall. This will increase the sale of shares in circulation so that there will be no inflation in the country.
The three factors which influence the JCI, will be examined to find a new evidence from Indonesia Stock Exchange (IDX). After this introduction section, this article will continue with related works, research method and data, result and discussion, and conclusion.

2. RELATED WORK

This study refers to two theories, namely *The Efficient Market Hypothesis* (EMH) by Eugene Fama (1970) [6], assuming that stock prices in the market must combine all available information from the past, present, as well as information from the company itself. An efficient market always reflects all available information so that investors cannot predict stock prices by looking at historical data, because the market is the main factor causing price changes, which is in form of new information emerging in the market. This study focused on the semi-strong form of Efficient-Market Hypothesis (EMH), because this hypothesis mentions that the information, which is available for public, reflects the current prices. The semi-strong form of EMH is used to determine the relationship direction between stock returns and macroeconomic factors, because the economic factors are assumed to be fully reflected in the stock prices.
The second theory is *The Arbitrage-Pricing Theory* (APT), which was developed by Ross (1976) [7]. APT is another way besides CAPM to relate the macroeconomic variables to stock-market returns. According to Ross, the main influence on stock returns is several economic factors, such as: (1) Unanticipated shifts in the risk premium; (2) Expected changes industrial-production level; (3) Unanticipated inflation; and (4) Unanticipated movements of the stock-market interest-rate.
Interest rates are believed to influence the stock prices in stock market. When the interest rates are very high, the stock prices may decline. So, the opportunity to invest in stock market is no longer attractive to investors. Ajaz et al. (2017) [8] obtained the results from their research, that

interest rates negatively and significantly affect stock prices. Such effect also strengthens the long-term relationship between interest rates and stock prices. Hashim et al. (2018) [9] used a linear-regression test in the Malaysian Stock Market, proving that when the interest rates increase, there is a negative and insignificant influence on stock prices. Subsequent research was conducted by Singh (2016) [10] using the Johansen test, VECM, and Granger causality-test.

Johansen test shows that interest rates positively but insignificantly influence stock prices, while in the VECM and Granger causality-tests, it is said that interest rates are one of the factors for changes in stock prices. According to Wahyudi et al. (2017) [11] who researched Southeast Asian countries, the results revealed that interest rates negatively and significantly impact the stock prices in Thailand, while in Singapore, Malaysia, Indonesia, and Philippines, it was found that interest rates positively and significantly affect the stock-price index.

The relations among countries, especially in the economic field, are unavoidable at this time and the USD exchange-rate has become a benchmark for currencies in almost all countries. According to Akhtar et al. (2017) [12], in the long-term period, exchange rate positively and significantly influences stock prices. Supporting the research of Akhtar et al., Al-Azizah (2018) [13] conducted research and obtained the conclusions that exchange rate positively and significantly affects JCI, meaning that an increase in exchange rate will result an increase in JCI.

Utomo et al. (2019) [14] in their research in Indonesia, obtained the results that in short-term and long-term, exchange rate negatively affects the stock-market performance. Mangala and Rani (2015) [15] found that exchange rate negatively and significantly affects stock prices. However, the research conducted by Omodero and Mlanga (2019) [16] obtained different results, namely exchange rate that has no significant effect on the share-price index in Nigeria.

Capital market is a media for companies to seek additional capital and is also a source of funds that the government hopes can increase the pace of the country's economy, whereas money supply becomes one among the factors affecting the capital market condition. According to Otorima and Kesuma (2016) [17], a decrease in the money supply negatively affects JCI in IDX.

Asmy et al. (2009) [18] also found that money supply negatively affects stock prices in Malaysian Stock Exchange. In contrast, different results were found by Asmara and Suarjaya (2018) [19], which stated that money supply positively and significantly affects the JCI in IDX. Etale and Eze (2019) [20] also found that money supply positively and significantly affects stock-index in Nigerian Stock Exchange (NSE).

Based on these findings, the hypotheses were developed as follows:

H_1: There is an influence of interest rates on JCI
H_2: There is an influence of exchange rates on JCI
H_3: There is an influence of money supply on JCI

3. RESEARCH METHOD AND DATA

This research is descriptive research, because the researcher tried to test the empirical truth of a hypothesis, namely the truth about the relationship between two or more research variables without any manipulation of the existing variables (Aritonang, 2007: 84) [21]. In addition, this study used a quantitative method from time-series data, namely the data that was arranged according to the time on a certain variable.

In this research, time-series data was used in form of secondary data obtained from an institution that published the data. Meanwhile, the composite stock-price index data is in form of closing-price at the end of the month during the 2016-2020 period acquired from the IDX official-website (www.idx.co.id). The interest-rate data was used in form of the reference interest-rate per month during the 2016-2020 period acquired from the official website of Bank of Indonesia (BI) (www.bi.go.id). The exchange-rate data was used in form of the comparison between Rupiah and US Dollar at the end of the month obtained from the official website of BI (www.bi.go.id) and trade statistics (www.statistik.kemendag.go.id). The data of money supply used is the amount of M1 (currency and demand deposits) plus quasi-money and securities other than shares per month published by Bank of Indonesia during the 2016-2020 period, and the data was also acquired from the official website of BI (www.bi.go.id).

This study used a purposive-sampling technique in taking research samples with the characteristics of sampling period during the years of 2016 - 2020. The data was processed using the Statistical Package for Social Science (SPSS) software version 25. The classical-assumption tests carried-out in this study consist of normality, multicollinearity, heteroscedasticity, and autocorrelation tests, plus other tests which are the coefficient-of-determination test (R^2), F test, and t-test.

The model that was tested in this research is as follow:

$$JCI = \alpha + \beta_1 IR + \beta_2 ER + \beta_3 MS + \varepsilon$$

Whereas: IR is interest rates; ER is exchange rates; MS is money supply

4. RESULTS AND DISCUSSIONS

According to the results of classical-assumption tests, the normality test obtained the p-value of 0.200. This value is greater than 0.05, thus the data in the equation model in this research is normally-distributed.

According to the results of multicollinearity test, the interest-rate variable generates a tolerance value of 0.627 with a VIF value of 1.595, while the exchange-rate variable generates a tolerance value of 0.365 with a VIF value of 2.739. In addition, the money-supply variable has a tolerance value of 0.280 with a VIF value of 3.568. The results obtained from each variable meet the requirements

of a model-free from multicollinearity symptoms, because the results of the tolerance value are greater than 0.05 and the VIF value is less than 10.

The result of the heteroscedasticity test using the scatterplot diagram shows that the points are spread above and below or around 0. Thus, the point-spread does not form a certain pattern and the points do not collect. As conclusion, there is no heteroscedasticity problem in this regression model. The autocorrelation test with Durbin-Watson shows the result of 0.101. Because the ideal Durbin-Watson value to be considered as no autocorrelation is between -2 and +2, hence, there is no autocorrelation in this regression model.

Based on the results of hypothesis testing, the coefficient-of-determination test (R^2) obtained the result of 0.037 or 3.7% (see Table 1), which means that the variations of interest rates, exchange rates, and money supply variables can explain the variation of composite-stock-price index (JCI) variable as much as 3.7%, while the rest of 96.3% is explained by other variables out of the scope of this research.

Based on the simultaneous-test (or F-test) result, the p-value is 0.165 (higher than 0.05). So, the independent variables consisting of interest rates, exchange rates, and the money supply have no simultaneous effect on the dependent variable of the Composite Stock Price Index (JCI).

Finally, the interest-rate variable has a p-value of 0.444 (larger than 0.05), this the interest-rate variable does not significantly affect JCI during the 2016 - 2020 period. The exchange-rate variable has a p-value of 0.051 (higher than 0.05), thus the exchange-rate variable does not significantly influence JCI during the 2016 - 2020 period. And the last, the p-value of the money-supply variable is 0.035. This value is less than 0.05, hence the money-supply variable significantly influences JCI during the 2016 - 2020 period.

Table 1 The Results of Hypothesis-Tests

Variable	B	t-stat	p-value
(Constant)	8366.058	4.219	
IR	8137.466	0.770	0.444
ER	-.408	-1.998	0.051
MS	.0000004648	2.167	0.035
F			0.165
R^2	0.037		

Based on Tabel 1, the interest-rate variable positively but not significantly influences the Composite Stock-Price Index (JCI) in IDX during the 2016 - 2020 period. This means that the higher the interest-rate is, the higher the stock price will be. This result is similar to the research results performed by Hashim et al (2018) [9], Omodero (2019) [16], Etale (2019) [20], Otorima and Kesuma (2016) [17], which stated that interest rate does not significantly affect the composite stock-price index.

On the exchange-rate variable, it was found that exchange rate negatively but insignificantly influences JCI in the IDX during the 2016 - 2020 period. So, the increase in USD / IDR exchange-rate will cause a decrease in stock prices.

This result is similar to the research conducted by Ajaz et al (2017) [8], Wahyudi et al (2017) [11], Asmy et al. (2009) [18], and Omodero and Mlanga (2019) [16], stating that exchange rate negatively and significantly affects the stock-price index.

As the result of this research, money supply positively and significantly influences JCI during the 2016 - 2020 period. This means that when the sum of money distributed in the community increases, this will cause an increase in stock prices. The result of this study the same with the research result conducted by Hashim et al (2018) [9], Etale (2019) [20], Asmara & Suarjaya (2018) [19], and Akhtar et al. (2017) [12], stating that money supply positively and significantly influences JCI in the IDX.

Based on the results and discussions above, it can be revealed that Hypothesis 1 and Hypothesis 2 were not accepted, and only Hypothesis 3 succeeded to be proven.

5. CONCLUSIONS

Through this study, it can be seen that not all macro-economic factors can affect stock prices. In the IDX case, only money supply can be used to predict stock index. So, the researchers suggest for companies to focus on the condition of money supply in making decisions so that companies can continue to stabilize stock prices even though the macroeconomic conditions continue to move forward. When the money supply increases, the demand for goods and services will also increase, therefore it will cause company profits to increase, which then affects the stock prices. Investors are advised to focus on the condition of money supply in Indonesia due to making stock-investment decisions so that investors can calculate the expected return more easily.

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