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The effect of NIKKEI and crude oil on market indices during COVID-19 in Indonesia

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ABSTRACT

Several world economic indicators that are interrelated and affected by the COVID-19 pandemic are IHSG, NIKKEI, and the world oil price. The sample of this study is taken from 9 June 2020 to 7 June 2021 in objective to analyze the impact of oil price and NIKKEI on IHSG. This study finds that increasing in oil prices and the NIKKEI have significant positive impact on the IHSG on the Indonesia Stock Exchange. This study indicates that the COVID-19 pandemic does not always result for negative impact on world economy. Moreover, the movement of the market index tends to be responded positively by investors which indicate optimism about economic growth in Indonesia.

Keywords: IHSG; oil price; NIKKEI; COVID-19
JEL Classification: F62; G01; G11

1. Introduction

Generally, investors tend to consider economic stability in making investment decisions, especially in the stock market. This consideration is carried out by investors to maintain the target return of the investment portfolio that has been prepared. Global economic conditions have experienced significant shocks due to the COVID-19 pandemic. Several world economic indicators that are interrelated and affected by the pandemic are the composite stock price index (IHSG), NIKKEI, and the world oil index.

The previous evidence of Haryanto (2020) and Putranto (2021) are also report that Covid-19 has unfavorable impact on the IHSG. In addition, Anggraeni (2022), Gerung et al. (2022), Indrisuari et al. (2022), Mamesah et al. (2022), and Rengkung et al. (2022) report that world economic factors such as the NIKKEI and the world oil index had a relative impact on IHSG movements during the pandemic. This study aims to determine the effect of the world oil index and NIKKEI on the IHSG during the COVID-19 pandemic.

2. Literature review

2.1. The NIKKEI and IHSG

Some empirical evidence shows that there is a relative impact of the NIKKEI on the IHSG. Prahesti and Paramita (2020) find that national economic stability from January 2009 to December 2019 tended to cause NIKKEI to have no significant effect on the IHSG. Similarly, the exact condition is also found by Joventus, et al. (2019) from January 2016 to December 2017, and Adnyana et al. (2022) during the

period 2012 to 2020. Gerung et al. (2022) find that NIKKEI significantly influences the IHSG movement in the period June 2021 to May 2022 which is caused by the COVID-19 pandemic. Rengkung et al. (2022) find that the IHSG has a significant and unidirectional relationship with NIKKEI in the period March 3, 2020, to March 3, 2021. These results are supported by Mamesah et al. (2022) who find that IHSG has a unidirectional relationship with NIKKEI in the period 19 November 2021 to 31 May 2022.

H1: NIKKEI is significant on IHSG

2.2. The oil price and IHSG

Some empirical evidence shows that there is a relative impact of crude oil on the IHSG. Basit (2020) reports that world oil is a positive significant impact on the IHSG in the period 2016 to 2019. Anggraeni (2022) finds that crude oil had a positive and significant impact on the IHSG in the period 2019 to 2021. A similar result is also found by Indrisuari et al. (2022) from March 2019 to October 2021 where crude oil prices have a positive and significant influence on the IHSG. In addition, Mahendra et al. (2022) find that between 2000 and 2019, crude oil prices had a negative and significant effect on the IHSG. Reversely, Purnama et al. (2021) find that the price of crude oil in the period from July to December 2020 had no significant effect on the IHSG. Consistently, Faraga et al. (2012), and Suyono et al. (2022) also find the same result where crude oil had no significant effect on the IHSG.

H2: Oil price is significant on IHSG

3. Research method

The data from this study are the IHSG, crude oil price, and NIKKEI, which are drawn from Yahoo Finance. The sample is taken from 9 June 2020 to 7 June 2021 period so it has 218 observation data. Based on the data, the variables of this study are measured using the rate of return (current price minus previous price divided by previous price). In order to test the hypothesis, the study conducts multiple linear regressions at a significance level of 5% with the following mathematical equation.

$$R_{IHSG} = \alpha + R_{Oil} + R_{NIKKEI} + \varepsilon$$

To obtain fit regression results or the best linear unbiased estimation (BLUE), the classic assumption test procedures are carried out which consists of a normality test, autocorrelation test, multicollinearity test, and heteroscedasticity test (Park test).

4. Result and discussion

Table 1 presents descriptive statistics of the returns of oil, NIKKEI, and IHSG. The results show that oil has highest return than NIKKEI or IHSG. The results are confirmed by the skewness that oil has better performance. The standard deviation also shows that IHSG has highest value which means its return is more volatile.

Table 1. Descriptive statistics

	Oil	NIKKEI	IHSG
Mean	0.0030	0.0011	0.0027
Std. Deviation	0.02476	0.01190	0.03631
Skewness	-0.475	0.086	0.987
Kurtosis	1.927	1.602	3.644
Minimum	-0.08	-0.04	-0.12
Maximum	0.08	0.05	0.19

In the next step, this study tests the classical assumptions to obtain the best linear unbiased estimation (BLUE). The first procedure is the normality test which is used to test the residual error of the regression model whether it is normally distributed or not. The normality test for the residual error of the regression model uses the Kolmogorov-Smirnov (KS) test at a significance level of 5%. Table 2 shows that the Z value of the Kolmogorov-

Smirnov test is 1,283 and is insignificant at the 5% level. These results indicate that the residual error of the regression model is normally distributed.

Table 2. Normality test

Normal Parameters	Mean	0E-7
	Std. Deviation	0.03486578
Most Extreme Differences	Absolute	0.087
	Positive	0.087
	Negative	-0.055
KS-Z		1.283
Asymp. Sig.		0.074

This study detects whether there is autocorrelation in the regression model using the Durbin-Watson test. Table 3 shows that the Durbin-Watson statistical value is 2.178306 and is not significant at the 5% level so it can be concluded that there is no autocorrelation.

Table 3. Durbin-Watson test

D-stat	2.178306
D-lower	1.759698
D-upper	1.796692
Sig.	No

The next step is the multicollinearity test to detect whether there is a significant correlation between the independent variables. Table 4 presents the results of the multicollinearity test using the variance inflation factor (VIF) and the tolerance. The tolerance value for oil and NIKKEI is 0.981 which is above 0.100 or 0.250. Additionally, VIF for oil and NIKKEI is 1.019 or below 5 or 10. The results indicate that there is no multicollinearity effect between the independent variables.

Table 4. Multicollinearity test

	Tolerance	VIF
Oil	0.981	1.019
NIKKEI	0.981	1.019

The final test of the classical assumptions in this study is the heteroscedasticity test which aims to see the distribution of the residual errors. In testing heteroscedasticity, this study uses the Park test with a significance level of 5%. In this test, the dependent variable used is the natural logarithm of the resulting squared residual error. Table 5 shows that all independent variables are insignificant to the dependent variable. These results indicate that the regression model does not experience heteroscedasticity or is called homoscedasticity.

Table 5. Heteroscedasticity test

	Coefficients	t	Sig.
Constant	-8.310	-54.730	0.000
Oil	3.479	0.567	0.572
NIKKEI	5.843	0.457	0.648

Table 6 shows that the correlation (or R) is 0.279 which indicates weak relationship between oil and NIKKEI and the IHSG. In addition, the results of the analysis show that the R-square value is 0.078 which indicates that the IHSG model can be explained by oil and NIKKEI with 7.8% and the rest is explained by other factors not included in the regression model.

Table 6. Model summary

R	0.279
R-squared	0.078
Adjusted R-squared	0.069
Std. error of the estimate	0.03503

Table 7 shows that oil and NIKKEI have a positive and significant influence on the IHSG. Based on these results, H1 is accepted and it is indicated that any increase in oil prices will be followed by an increase in the IHSG. Consistently, the results of this study are consistent with the findings of Basit (2020), Anggraeni (2022), and Indrisuari et al. (2022). This finding also implies that investors responded positively to the increase in oil

prices during the pandemic in determining their investment in the capital market.

This study also finds that NIKKEI had a positive and significant impact on the IHSG. The results of analysis cause H2 to be accepted by this study and indicate that any increase in NIKKEI will be accompanied by an increase in the IHSG during the pandemic. This finding also indicates that there is a positive response from investors to price fluctuations in both markets. Consistently, the findings of this study are consistent with those of Gerung et al. (2022), Rengkung et al. (2022), and Mamesah et al. (2022).

Table 7. Multiple regression

Variable	Coefficients	t	Sig.
Constant	0.001	0.546	0.585
Oil	0.205	2.114	0.036
NIKKEI	0.681	3.376	0.001
F test	9.075*		

Dependent variable is IHSG.
The * is significant at 5%

5. Conclusion

The COVID-19 pandemic has various effects on world markets. This study finds that the increase in oil prices and the increase in NIKKEI result significant positive impact on the IHSG on the Indonesia Stock Exchange. These findings indicate that the COVID-19 pandemic will not absolutely have a negative effect on world economic development. The findings of this study also imply that the movement of the market index in Indonesia tends to be responded positively by investors with increase in oil prices or an increase in the market index in Japan (or NIKKEI). Therefore, the findings also imply that there is optimism by investors about economic growth in Indonesia over developments of world economy.

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