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# The influence of the crude oil and the gold on energy sector returns

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## ABSTRACT

Oil and gold are the most essential commodities in the business world. During the Covid-19 pandemic, the price of gold tended to be stable and the price of crude oil, on the other hand, tended to increase. The objective of this study is to analyze the effect of crude oil returns and gold returns on the returns of firms especially in the energy sector during 8 June 2020 to 4 June 2021. This study finds that only crude oil returns significantly and positively impact the returns of the firms in the energy sector.

Keywords: returns; energy; gold; crude oil; Covid-19
JEL Classification: D53; D81; G11



## 1. Introduction

Petroleum is a non-renewable natural resource. This natural resource is located on the earth and formed through the process of deposition of fossils over millions of years. Petroleum is formed naturally which consists of deposits of hydrocarbons and other organic matter. The crude oil produced from petroleum is a global commodity that is traded in markets around the world, both as spot oil and through derivative contracts. Many countries view the crude oil as the single most important commodity in the world because it is currently the main source of energy production that supports the national economy (Ma'arif, 2014; Yazid et al., 2020).

On the other hand, gold is a soft and malleable noble metal which is usually used as a jewelry or valuable material. In addition, gold is a popular and trusted investment instrument from time to time. Usually, gold is able to protect one's wealth from unstable economic conditions or inflation. When there is a decrease in the value of money, this investment instrument tends to increase in value. Empirically, the tendency for a stable gold price amidst a weakening economic situation makes this asset a safe investment alternative (Evamelia & Panjaitan, 2019; Yuliana & Robiyanto, 2021). Both oil and gold are factors that tend to be related to the energy sector, especially during the Covid-19 pandemic which started in 2019. Figure 1 shows the trend of movement in oil prices and gold prices throughout the observation period of this study.

The Contrarian: Finance, Accounting, and Business Research
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pp. 35-40

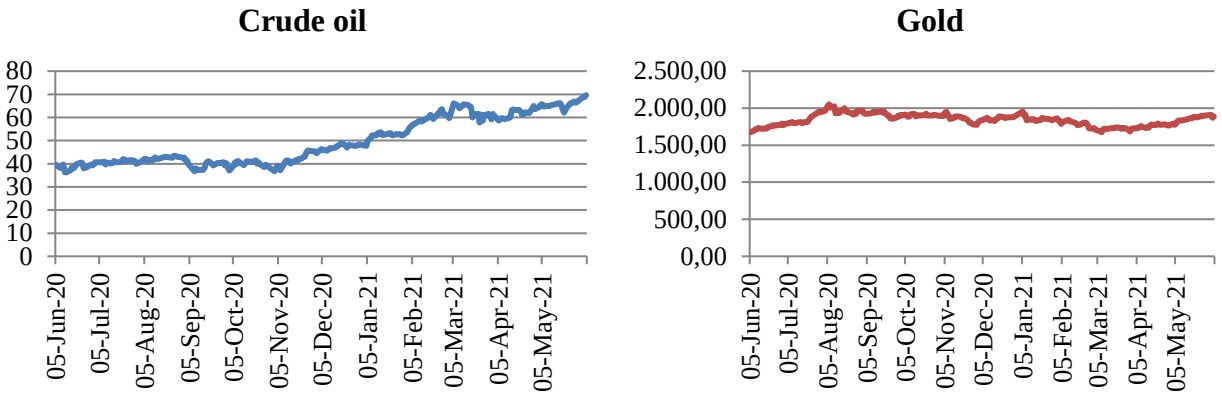


**Figure 1. Trends in crude oil price and gold price**

Figure 1 shows that the trend in world oil prices has continuously increased until early June 2021. The trend in crude oil prices indicates an increase in demand from various parts of the world, resulting in a significant increase in prices. On the other hand, the trend for gold prices has decreased until April 2021 and will begin to increase in May 2021. The objective of this study is to examine the effect of crude oil and gold returns on firm returns, especially in the energy sector.

## 2. Literature review

### *2.1. Crude oil price and return in capital market*

Fadah et al. (2017) find that in the period 2011 to 2015, oil prices have a negative and significant effect on the basic and chemical industry sectors, the various industrial sectors, the property and real estate sectors, as well as the infrastructure, utilities and transportation sectors. Safitri and Robiyanto (2020) prove that world oil prices have a weak and negative relationship with the sector index on the Indonesia Stock Exchange from January 2017 to June 2020. In contrast, Salim et al. (2018) prove that crude oil prices have a positive and significant effect on stock returns on the Indonesia Stock Exchange for the 2008 to 2016 period. Basit (2020) finds that oil prices have a positive and significant impact on the composite stock index in Indonesia in the period from 2016 to 2019. In the period 2 March 2020 to 31 March 2021, Agustin and Hartono (2021) prove that world oil prices have a significant effect and positive on the stock return of the property sector in Indonesia. Asrif'ah and Wahyudin (2021) prove that in the long term world oil prices have significant effects on shares in the agricultural sector, basic and chemical industry sectors, and the various industrial sectors, however in the short term world oil prices have significant effects on shares in the agricultural sector, various sectors industry, and the financial sector. However, Utha (2015) shows that oil prices are not significant in determining the movement of the composite stock index in Indonesia, especially in the period from 2010 to 2014. Similarly, Kaligis and Soejono (2020) also prove that oil prices have an insignificant effect on indices of consumer goods from 2008 to 2018. Based on previous evidence, the hypothesis of this study is written as follows.

*Ha1: Crude oil price significant on return*

### *2.2. Gold price and return in capital market*

Yunita et al. (2018) find that gold prices have a positive and significant effect on mining stock returns in the period from

2011 to 2017. Ali et al. (2019) find that gold prices have a positive and significant effect on mining sector stock prices in the period from 2016 to 2018. Asrif'ah and Wahyudin (2021) prove that in the period June 2019 to November 2020, gold prices have a significant effect on stocks in the basic industrial sector and chemicals, the various industrial sectors, the property sector, and the financial sector in the long term, while in the short term, the gold prices have a significant effect on all sectors stock prices except the agricultural sector. Agustin and Hartono (2021) prove that in the period March 2, 2020, to March 31, 2021, gold prices have a significant and positive effect on stock returns. Pebriani and Suselo (2022) show that the price of gold has a positive and significant effect on the share price of the construction sector in the period 2019 to 2021. On the other hand, Utha (2015) proves that gold prices are insignificant in determining the movement of the composite stock index in the period 2010 to 2014. Pratama (2016) finds that gold prices do not significantly affect stock prices in mining sector companies from 2010 to 2014. Fadah et al. (2017) prove that gold prices do not significantly affect the basic industrial and chemical sectors, the various industrial sectors, the property and real estate sector, as well as the infrastructure, utilities, and transportation sectors. Basit (2020) finds that gold prices do not significantly affect market returns in the period 2016 to 2019. Prasetyo et al. (2022) find that gold prices have no effect on Islamic stock returns in Indonesia during the 2017 to 2020 period. Based on empirical evidence, the hypothesis of this study is written as follows.

*Ha2: Gold price significant on return*

## 3. Research method

This study uses secondary data and multiple regressions for hypothesis testing. The data used are daily returns of world oil, daily returns of gold, and daily stock returns of firms listed in the energy sector, which are Elnusa Tbk (ELSA) and Medco Energi Internasional Tbk (MEDC). The daily return is calculated by dividing the difference between the current and previous prices with the previous price. The data source for this study is Yahoo Finance (https://finance.yahoo.com) with an observation period of 8 June 2020 to 4 June 2021. The equation model of this study is noted as follows.

$$R=\alpha+\beta.Oil+\beta.Gold+\varepsilon \quad (1)$$

R is stock returns, β.Oil is returns of world oil, β.Gold is returns of gold, and ε is residual error. The cut-off or the levels of significance for hypothesis testing are 1%, 5%, and 10%.

## 4. Result and discussion

Table 1 presents descriptive statistics of world oil prices, gold prices, and energy sector returns. The results of the analysis show that gold returns have a lower mean, while oil returns and energy sector returns have the same mean. These results also confirm Figure 1 which shows gold returns that had experienced a decline in value.

**Table 1. Descriptive statistics**

| | Min | Max | Mean | Std. Dev |
|---|---|---|---|---|
| Crude oil | -0.08 | 0.08 | 0.0027 | 0.02 |
| Gold | -0.05 | 0.03 | 0.0006 | 0.01 |
| Energy | -0.11 | 0.15 | 0.0027 | 0.03 |

This study continues the next procedure, which is to test the distribution of the residual error of the regression model. Table 2 shows the results of the normality test using the Kolmogorov-Smirnov. The Z value of the Kolmogorov-Smirnov test is 1.557 and it is insignificant at the 1% level so it can be concluded that the residual errors of the regression model are normally distributed.

**Table 2. Normality test**

| | | |
|---|---|---|
| Normal Parameters | Mean | 0E-7 |
| | Std. Deviation | 0.033 |
| Most Extreme Differences | Absolute | 0.072 |
| | Positive | 0.072 |
| | Negative | -0.044 |
| Kolmogorov-Smirnov Z | | 1.557 |
| Asymp. Sig. (2-tailed) | | 0.016 |

The Glejser test is used to test the heteroskedasticity of the residual error. Table 3 shows that the significance level of the independent variables for the absolute residual error is above the significance of 1%, 5%, and 10%. These results indicate that the residual error does not experience symptoms of heteroscedasticity or, in other words, the residual error is homoscedasticity.

**Table 3. Heteroskedasticity test**

| | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| Constant | 0.024 | 0.001 | | 23.033 | 0.000 |
| Crude oil | 0.058 | 0.044 | 0.060 | 1.296 | 0.195 |
| Gold | -0.083 | 0.094 | -0.041 | -0.881 | 0.379 |

Dependent variable: Absolute residual error

Table 4 also shows that the Variance Inflation Factor (VIF) of each independent variable has a value below 5 so it can be concluded that there is no multicollinearity effect between the independent variables. In other words, there is no significant correlation between the oil price and the gold price. In addition, the results of the analysis also show that the F value of 3,546 is significant at the 5% level so it can be concluded that the regression model of this study is a fit.

*4.1. Crude oil price and return of energy sector*

Table 4 presents the results of the regression test from this study model. Partially, this study proves that the oil returns (crude oil) have a significantly positive effect on the returns of firms in the energy sector (especially ELSA and MEDC). This result implies that any increase in world oil returns will be accompanied by an increase in returns from the energy sector. Consistently, the findings of this study are still in-line with the findings in Indonesia from Salim et al. (2018), Basit (2020), Agustin and Hartono (2021), and Asrif'ah and Wahyudin (2021).

*4.2. Gold price and return of energy sector*

Table 4 presents the results of the regression test from this study model. Partially, this study proves that gold returns do not significantly affect the returns of companies in the energy sector (especially ELSA and MEDC). This result implies that any increase in gold returns will not be accompanied by an increase in returns from the energy sector. The findings of this study consistently support the findings of Utha (2015), Pratama (2016), Fadah et al. (2017), Basit (2020), and Prasetyo et al. (2022).

**Table 4. Multiple regression test**

| | Unstandardized Coefficients | | t | Collinearity statistics | |
|---|---|---|---|---|---|
| | B | Std. Error | | Tolerance | VIF |
| Constant | 0.002 | 0.002 | 1.418 | | |
| Crude oil | 0.174 | 0.066 | 2.658*** | 0.995 | 1.005 |
| Gold | 0.003 | 0.139 | 0.022 | 0.995 | 1.005 |

Dependent variable: Energy return
R = 0.123
R Square = 0.015
Adjusted R Square = 0.011
Std. Error of the Estimate = 0.03354
F test = 3.546**
*, **, *** are levels of significance at 10%, 5%, and 1% respectively

## 5. Conclusion

Trends in oil and gold prices during the Covid-19 pandemic tend not to have a completely negative impact on returns on the Indonesian capital market. Throughout the observation period, the trend of oil prices tended to increase compared to gold prices which tended to be more stable. This study finds that oil returns have a significant and positive effect on the returns of companies in the energy sector. Empirically, the findings of this study imply that any movement in oil returns will have an impact on energy sector returns on the Indonesian capital market in the period 8 June 2020 to 4 June 2021.

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