

## The return response on gold and crude oil during global geopolitical issues

**Azarya Putra Ari**

Corresponding author:  
[putrapolio27@gmail.com](mailto:putrapolio27@gmail.com)  
Sam Ratulangi University  
Indonesia

**Jordy Siwu**

Sam Ratulangi University  
Indonesia

**Merlyn Sari Sambur**

Sam Ratulangi University  
Indonesia

**Sisilia Kristiana Kawulur**

Sam Ratulangi University  
Indonesia

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### ABSTRACT

The geopolitical issues together with the COVID-19 pandemic in earlier of 2022 triggered instability in the world economy. The objective of this study is to analyze the correlation and response of the returns of firms in the energy sector to changes in gold and crude oil prices. The observed data is drawn over the period June 2021 to June 2022 on the monthly basis for 68 listed firms in the energy sector, gold prices, and crude oil prices. This study finds that the changes in gold returns tend not to affect the changes in returns of firms in the energy sector. Reversely, the changes in returns of crude oil significantly affect the changes in returns of firms in the energy sector.

Keywords: returns; gold; crude oil; geopolitics

JEL Classification: F13; G12; G15

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### 1. Introduction

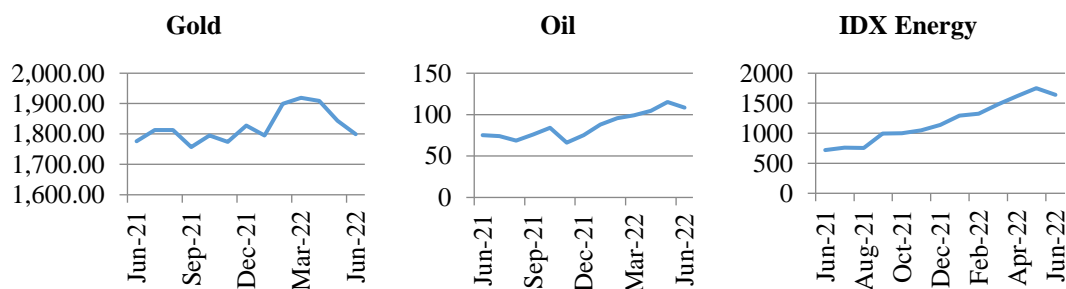
Since the start of the COVID-19 pandemic in 2020, market conditions in Indonesia have become unstable, including obtaining returns by investors (Novilia et al., 2022). Gerung et al. (2022), Tanod et al. (2022), and Pagora et al. (2023) report that one of the triggers for the instability of the capital market since the pandemic is commodities. Commodities are products or goods that can be exchanged for profit or other goods of equal value. Apart from daily needs, these commodities also include various metal commodities, such as gold, silver, aluminum, and energy, such as crude oil, coal, gasoline, and natural gas.

In earlier of 2022, the escalation of geopolitical conditions also triggered instability in the world economy

(including Indonesia) which resulted in increasing global inflation (Bakrie et al., 2022; Khaliq, 2022; Sandra & Kim, 2022). Ghazani and Jafari (2021) report that gold tends to have a stable price compared to oil prices if there are developments in world economic events such as cryptocurrencies. This study suspects that extraordinary events such as the continuation of the COVID-19 pandemic accompanied by world geopolitical changes tend to cause fluctuations in gold and crude oil prices. The changes in gold and crude oil tend to cause the capital market also fluctuate especially in the energy sector (Tanod et al., 2022). Figure 1 illustrates the price movements for gold, crude oil and the energy from June 2021 to June 2022. Movements in world gold prices tend to decrease when pandemics and geopolitical

issues occur. Conversely, the trend of rising crude oil prices was accompanied by rising market prices for the energy sector. This study aims to analyze the response of

returns of the energy sector during global geopolitical issues while the COVID-19 pandemic is still ongoing.



**Figure 1. Gold, crude oil, and energy indexes**

## 2. Literature review

### 2.1. Capital pricing asset model

Fama and French (2004) explain that the capital asset pricing model (CAPM) provides a risk measurement concept and can explain the relationship between expected return and risk. According to Fama and French (2004), CAPM provides several implications, which are: (1) returns have a linear relationship with the beta; (2) beta premium is always positive; and (3) assets that are not related to the market have returns equal to risk-free rate while beta premium is the difference between returns and risk-free rates.

According to Perold (2004), the CAPM implies that investors will ask for a higher return when they have a high-risk investment. Perold (2004) explains that non-risk assets tend to have lower returns. Moreover, Perold (2004) also explains that the implications of the CAPM are: (1) the return of an asset is independent of its stand-alone risk; (2) the beta is a risk that cannot be diversified; and (3) return is independent from the growth rate of future cash flows.

### 2.2. The relationship between gold and stock return

Utama and Puryandani (2020) prove that gold prices do not have a significant effect on stock returns from firms listed on the Sri Kehati index over the period January to December 2018. Sri Kehati is indicator for the firms that concern about sustainable business, environment, and also actively improve the social and corporate governance. Generally, Kumar and Robiyanto (2021) find that in the period 2019 to 2020, the gold price positively and significantly affected the market prices in the Shanghai Stock Exchange and Bombay Stock Exchange. Moreover, Arisandhi and Robiyanto (2022) also prove that gold has positive correlation with stock price in ASEAN-5 in period March 2020 until August 2021. In period March 11, 2020, to December 31, 2020, Zakiyah and Windasari (2022) find that gold plays as safe haven (which indicate for negative correlation or uncorrelation) for returns of LQ-45 (the most liquid stocks) and Jakarta Islamic Index. Tanod et al. (2022) find that gold insignificantly impact the energy sector' returns during 8 June 2020 to 4 June 2021.

*H1: Gold has significant relationship with stock return*

### 2.3. The relationship between crude oil and stock return

Stefan and Robiyanto (2019) find that crude oil prices can have a negative effect or do not affect returns. Reversely, Putra and Robiyanto (2019) find that crude oil had a significant positive effect on returns during the period from 2011 to 2017. Potto and Robiyanto (2021) find that changes in oil prices had a significant positive impact on stock prices for the period from January 2020 to June 2020. Tanod et al. (2022) find that only crude oil returns significantly and positively impact the returns of firms in the energy sector from 8 June 2020 to 4 June 2021. The other evidence, Yudianto et al. (2018) find that price changes in crude oil would not have a significant impact on returns for all sectors in the period July 2009 to December 2017. Moreover, Audy et al. (2022) also find that world oil prices have an insignificant effect on the stock return of the BUMN-20 Index from July 2016 to June 2021.

*H2: Crude oil has significant relationship with stock return*

### 3. Research method

This study observes listed firms in the energy sector, gold, and crude oil from June 2021 to June 2022 on the Indonesia Stock Exchange and Yahoo Finance. During this period, the data collected on a monthly basis included the closing prices of 68 listed firms in the energy sector, gold prices, and crude oil prices. Based on the data taken, the returns of firms in energy sector (ENERGY), gold (GOLD), and crude oil (OIL) are calculated with the following formula.

$$R_t = \frac{P_t - P_{t-1}}{P_{t-1}} \quad (1)$$

In order to test the hypothesis, this study uses correlation analysis with the following formula.

$$r = \frac{\sum(x-\bar{x})(y-\bar{y})}{\sqrt{\sum(x-\bar{x})^2 \sum(y-\bar{y})^2}} \quad (2)$$

Additionally, this study also uses the CAPM concept to determine the response of stock returns to changes in gold prices and crude oil prices. Based on the CAPM concept, the beta will be used as an indicator basis where if the value is equal to or more than 1 it is considered to have a high response while vice versa it is considered to have a low response. The beta based on CAPM is calculated by the following formula.

$$\frac{\sum_{i=1}^n X_i Y_i - \frac{(\sum_{i=1}^n X_i)(\sum_{i=1}^n Y_i)}{n}}{\sum_{i=1}^n X_i^2 - \frac{(\sum_{i=1}^n X_i)^2}{n}} \quad (3)$$

### 4. Result and discussion

Table 1 presents descriptive statistics for returns from ENERGY, GOLD, and OIL. The mean of ENERGY shows a fairly high value and is equivalent to the return from OIL. These results indicate a simultaneous increase between ENERGY and OIL. Conversely, GOLD has a small mean indicating that gold prices tend to be more stable and do not fluctuate more. These results are confirmed by the standard deviation indicating that GOLD is less volatile in the market compared to ENERGY and OIL. The skewness shows that ENERGY and GOLD tend to be dominated by low returns compared to OIL which has better returns. The kurtosis value indicates that ENERGY and OIL have a leptokurtic shape while GOLD has a platykurtic shape.

**Table 1. Descriptive statistics**

N=816	ENERGY	GOLD	OIL
Mean	0.037	0.001	0.037
Std. Deviation	0.205	0.027	0.105
Skewness	2.286	0.514	-0.968
Kurtosis	11.979	-0.550	0.217

Table 2 shows the results of the correlation test between ENERGY, GOLD, and OIL. The test results show that the relationship between GOLD and ENERGY is not significant at the level of 10%, 5%, and 1%, so this study rejects H1. The result of this study is inconsistent with the findings of Kumar and Robiyanto (2021), Arisandhi and Robiyanto (2022), and Zakiyah and Windasari (2022). In contrast, the finding of this study is consistent with those of Utama and Puryandani (2020), and Tanod et al. (2022). This condition indicates that geopolitical issues tend not to affect the relationship between the market movements of GOLD and ENERGY.

Furthermore, this study finds that OIL and ENERGY have a positive and significant relationship at the 5% level so that H2 can be accepted. The correlation value for 0.084 also indicates low relationship between OIL and ENERGY. This finding is still consistent with the findings of Putra and Robiyanto (2019), Potto and Robiyanto (2021), and Tanod et al. (2022). In contrast, the findings of this study are inconsistent with the findings of Yudianto et al. (2018), Stefan and Robiyanto (2019), and Audy et al. (2022). The finding indicates that geopolitical issues tend to influence the relationship between the OIL and ENERGY markets.

**Table 2. Correlations matrix**

N = 816	ENERGY	GOLD	OIL
ENERGY	1	0.003	0.084**
GOLD	0.003	1	0.141***
OIL	0.084**	0.141***	1

\*, \*\*, \*\*\* are significant at 10%, 5%, and 1%

Table 3 presents the results of the regression test which aims to detect the response of ENERGY to changes in GOLD. The test results confirmed the results of the correlation test where GOLD is not significant at the 10%, 5%, and 1% significance levels. In addition, the beta of GOLD is 0.025 indicating a low response

from ENERGY. These results also confirm that geopolitical issues have no effect on the relationship between ENERGY and GOLD.

**Table 3. Returns of energy sector and gold**

	Coefficients	t	Sig.
Constant	0.037	5.176	0.000
GOLD	0.025	0.092	0.927

Dependent variable: Energy

Table 4 presents the results of the regression test which determine the response of ENERGY to changes in OIL. The test results also confirmed the results of the correlation test where OIL is significant at 5%. In addition, the beta of OIL is 0.165 indicating a low response from ENERGY. These results also confirm that geopolitical issues have low effect on the relationship between ENERGY and OIL.

**Table 4. Returns of energy sector and oil**

	Coefficients	t	Sig.
Constant	0.031	4.117	0.000
OIL	0.165	2.411	0.016

Dependent variable: Energy

## 5. Conclusion

The escalation of geopolitical conditions together with the COVID-19 pandemic in earlier of 2022 triggered instability in the world economy. This study finds that the changes in gold returns tend not to affect the changes in returns of firms in the energy sector. This study also finds that changes in returns of crude oil significantly affect the changes in returns of firms in the energy sector. Those findings imply that returns in the energy sector have little volatility for any changes in crude oil returns. Conversely, returns from the energy sector do not really respond to changes in returns from gold.

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