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The Relationship between the Oil Price, Gold Price, and the Stock Market in Malaysia during the Covid-19 Pandemic

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Abstract

Due to the negative impact of the COVID-19 pandemic on the worldwide financial and economic sectors, investors have been opting for safer, low-risk assets like gold and crude oil during periods of instability. This study aims to investigate the relationship between the stock market, gold price, and crude oil price using the quantile regression method. The study focused on examining the parameters of the stock price index within deciles 0.1-0.9, based on daily data from March 18th, 2020, to March 30th, 2022. The findings indicated that the relationship between gold prices and the stock market was generally insignificant during the COVID-19 pandemic. However, a negative and significant correlation between crude oil prices and the stock market was observed in deciles 0.6, 0.7, 0.8, and 0.9. Hence, the impact of these variables on the returns of the stock market should be taken into account by investors and policymakers.

Keywords: Quantile regression; Oil price; Gold price; Covid-19; Stock market

1. Introduction

The Covid 19 pandemic, which broke out in December 2019, has significant implications for the global economy. Malaysia is particularly vulnerable to the virus, and the official outbreak of Covid-19 in Malaysia began on 18 March 2020. Measures taken to combat the virus, including quarantine and mobility restrictions, have led to a global financial and economic crisis, resulting in an economic downturn.

The pandemic COVID -19 had a significant impact on the stock market, whose ups and downs were closely monitored. It also provided an opportunity to study the impact of the outbreak on various economic variables and financial markets. The fear and uncertainty associated with the disease affected a large number of people and investors around the world, which indirectly impacted financial markets worldwide. Several studies have examined this impact, including those by Liu et al. (2020), and Al-Awadhi et al. (2020).

Financial markets, including the stock market, have been the subject of increased scrutiny following the severe impact of the COVID -19 pandemic. The outbreak of the virus has caused negative reactions in the stock markets of many countries and led to fluctuations in various macroeconomic variables. Several studies have been conducted to examine the impact of the pandemic on financial markets and the results indicate a negative impact (Narayan et al., 2020; Mishra et al., 2020; Sikiru and Salisu, 2021).

One of the tangible consequences of the pandemic is the decline in the value of the global stock market, which began in February 2020 when the rate of COVID -19 infections

increased significantly. Indeed, health-related news has a significant and negative impact on stock returns, suggesting that returns tend to decline when more information about health issues is sought after the pandemic outbreak.

As the primary source of energy worldwide, crude oil has a significant impact on macroeconomic factors such as economic growth, inflation and stock market fundamentals in several countries (Aguilera and Radetzki, 2017; Ansari and Sensarma, 2019). Due to the COVID -19 pandemic, isolation efforts have led to a decline in oil demand, resulting in a significant drop in oil prices. As a result, crude oil prices have fallen to historically low levels of less than $20 per barrel, which has not been seen since the beginning of the 21st century. According to Shehzad et al. (2021), the COVID -19 pandemic and the resulting closures have affected oil prices more than the stock market.

Examining the correlation between oil and stocks in countries that are net importers of oil is essential, particularly in light of the decline in oil prices resulting from the worldwide economic slowdown caused by COVID-19. However, current research by Narayan (2020) on COVID-19 has mainly focused on analysing the impacts of oil markets on different economic factors. Betarelli Junior et al. (2021) suggest that the price of crude oil is subject to sudden fluctuations and unpredictability in the market due to the influence of international and climate-related factors.

In Malaysia, the mining sector recorded a sharper decline of 20.0% in Q2 2020 (Q1 2020: -2.0%). Oil and gas production was impacted by a sharp decline in demand due to the MCO as well as maintenance work in East Malaysia. Growth was also impacted by lower production in the other mining segment due to constraints during the MCO period.

Gold plays a crucial role in finance as it fulfils three main functions: as money, as a shop of value and as a financial instrument. Because of its intrinsic value, gold can be used for trading purposes and serves as a widely accepted currency. This financial ability of gold makes it a valuable tool to hedge against the risks of inflation. In addition, gold has a non-credit function as a shop of value, useful for financial and monetary purposes in modern economies. Despite its usefulness, several countries still do not recognise gold as a standard means of payment to support their exchange rates.

The literature emphasises the importance of analysing gold as a safe investment instrument, mainly because of the evidence suggesting that gold serves as a safe haven in prolonged periods of crisis. This fact makes gold an important resource for financiers, national investors and governments, as it is seen as a major power that plays a major role all over the world (Wang and Zhang, 2021). According to current literature, investors tend to include gold in their portfolios because it is considered a safe investment. (Atri et al, 2021)

On the contrary, gold is a generally sought-after investment that attracts investors regardless of market conditions. Investors often include gold in their portfolios to effectively diversify, as a safe haven in uncertain times or as a hedging instrument. The motivation for choosing gold for hedging purposes lies in its low volatility and its ability to preserve assets during inflation and protect investments during financial crises/uncertain times.

The theoretical construction of the link between the crude oil market and the gold market is based on a long-standing relationship between the crude oil market and the gold market, and the gold price and the oil price - both of which have a global impact on a country's overall macroeconomic fundamentals (Soytas et al., 2009; Narayan et al., 2010; Gil-Alana et al., 2017; Bedoui et al., 2019). In this context, the theoretical relevance of gold's role as a good hedge against oil price risk is straightforward.

The impact of the COVID -19 pandemic on markets was manifold, affecting oil, gold and stock markets in different ways. Oil prices, for example, experienced significant fluctuations during the pandemic, which directly affected the economies of countries and companies. The profitability and cash flow of companies were directly affected by fluctuations in oil prices. (Gulfen and Vedet, 2022)

Therefore, the objective of this study is to analyse the correlation between oil, gold and stock market returns in Malaysia. The study focuses on examining the impact of volatility of oil and gold on KLSE index during the global health crisis. In this way, the study is expected to provide valuable insights to investors seeking to optimise their returns during such global crises.

2. Data and Methodology

Data

The impact of gold and oil prices on the stock markets of different countries may vary during the COVID -19 pandemic. To explore this issue further, this study will examine how gold and oil prices affect the Malaysian stock market, especially in the context of the pandemic. Figure 1 illustrates the daily number of COVID -19 cases in Malaysia from February 2020 to March 2022, adopted from the World Health Organisation (WHO).

This study analysed the daily prices of gold, OPEC crude oil (based on the US dollar) and the Bursa Saham Malaysia total stock index from 18 March 2020 to 30 March 2022. The data for oil, gold and the stock index were obtained from the investing.com website, resulting in 425 observations for each time series. To synchronise the data, observations for oil and gold were removed on official holidays when the Malaysian stock market was closed. Figure 2-4 shows the changes in oil and gold prices and the Malaysian stock market over a two-year period following the emergence of the coronavirus in Malaysia.

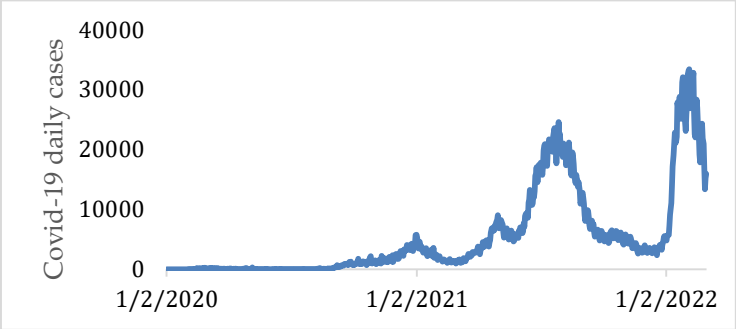

Figure 1: The change of Malaysia covid-19 daily cases from February 2020 until March 2022

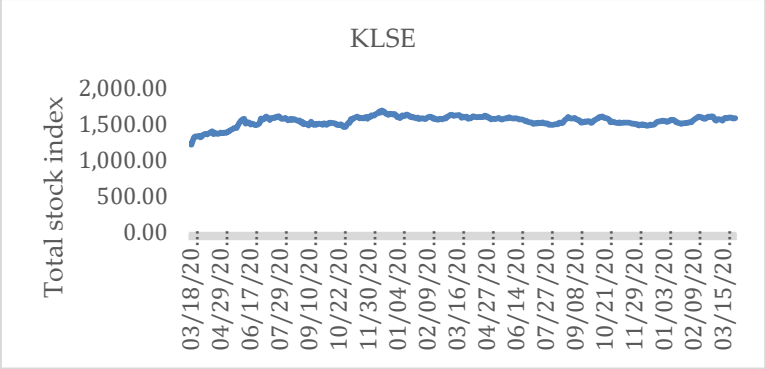

Figure 2: The change of stock market index from February 2020 until March 2022

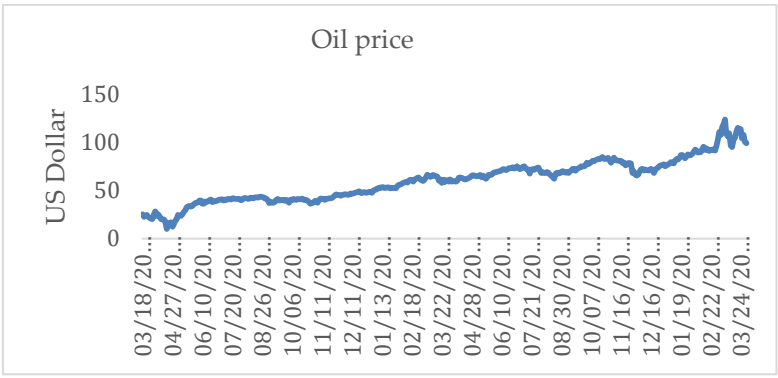

Figure 3: The change of oil prices from February 2020 until March 2022

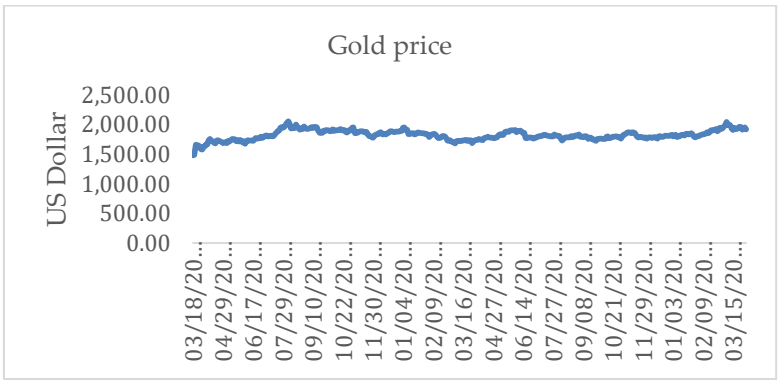

Figure 4: The change of gold prices from February 2020 until March 2022

Prior to the estimation, the stock market index, crude oil and gold price data are transformed into logarithms. This process helps to reduce the skewness of the distribution, which benefits normality.

Methodology

By using quantile regression method in this study, one can estimate and make inferences about conditional quantile functions. The quantile regression method can also be used to cover the entire range of the conditional quantile function, which is particularly useful when the conditional distribution is not homogeneous. This approach is particularly valuable when the assumption of linearity is not valid. Furthermore, the quantile regression method can be used to draw inferences about the co-movement between the stock market and oil returns under different market conditions, e.g. when the market is bearish (lower quantile),

bullish (upper quantile) or normal (middle quantile), as reported in previous studies (Naifar, 2015; Mensi et al., 2014).

The Augment Dickey-Fuller (ADF) test should be performed to ensure that the time series data is stationary. After stationarity of the data is achieved, linear regression can be used to examine the relationship between the KLSE share price and two independent variables, namely the gold price and the oil price. Quantile regression is then used to determine whether gold and oil were safe assets and hedges before and during the pandemic. These safe assets can help investors reduce losses on investments, especially during economic downturns.

The objective of this study is to examine the relationship between gold and crude oil and the Malaysian stock market. The scope of the study focused on the daily return data for the stock market index, crude oil price and gold price during the Covid 19 pandemic. A total of 425 data were collected from the time the government announced the outbreak of the Covid 19 pandemic until the country entered the endemic phase.

Model Specification

The main objective of this study is to analyse the impact of crude oil and gold prices on the Malaysian stock market Index. The model used in this study follows the specifications described in previous literature such as Lee and Zeng (2011), and Tsai (2012):

$$Q_{\tau}(\Delta LSTOCK\_INDEX) = \beta_0(\tau) + \beta_1(\tau) LOP_{i1} + \beta_2(\tau) \Delta LGP_{i2}$$

Where (τ) represent the percentiles or quantiles level for the estimation. $\Delta LSTOCK\_INDEX$ denotes the logarithm of stock market index return, LOP is the logarithm of crude oil price and ΔLGP is the logarithm of gold price return. In order to analyse the study using quantile regression model, the hypothesis is as follows:

H_1 : Crude oil prices significantly impact the KLSE index during the Covid-19 pandemic.
H_2 : The price of gold significantly impacts the KLSE index during the Covid-19 pandemic.

3. Empirical Results

Descriptive Statistics

Table 1 contains some important results. The highest and lowest values of the stock index during the period COVID -19 were 1694.33 and 1220.54, respectively. The skewness of the stock index became negative during the pandemic period, indicating that there were frequent small gains and few extreme losses. The other variables examined in this study were the price of crude oil and the price of gold. The highest and lowest values of the crude oil price during the pandemic period were USD 123.7 per barrel and USD 10.01 per barrel, respectively. For the gold price, the highest and lowest values were 2051.50 USD per 1 troy ounce and 1478.60 USD per 1 troy ounce, respectively.

Table 1: Descriptive analysis

Parameter	Stock Index	Crude Oil Price (USD)	Gold Price (USD)
Mean	1546.072	59.97675	1819.759
Median	1564.300	61.67000	1810.600
Maximum	1694.330	123.7000	2051.500
Minimum	1220.540	10.01000	1478.600
Std. Dev.	70.90935	21.67773	82.37147
Skewness	-1.440383	0.212474	-0.195472
Kurtosis	6.000098	2.721422	3.865797
Observations	425	425	425

To improve the normality of the distribution of the stock market index data, crude oil price and gold data, a logarithmic transformation was performed. The normality of the data was then tested using the Jarque-Bera statistic. The null hypothesis of the test is that the data are normally distributed. Rejection of the null hypothesis at the 5% significance level means that the data are not normally distributed. Table 2 shows that all variables are not normally distributed as their p-values are less than 0.05. Therefore, the use of quantile regression is more appropriate for analyzing the relationship between the variables.

Table 2: Normality test

	L gold price	L Stock index	L crude oil price
Jarque-Bera statistic	46.19678	469.2868	79.05681
P-value	0.000000	0.000000	0.000000

Unit Root Test

To ensure that a correct regression model is obtained, it is essential to determine whether the variables are stationary or non-stationary. The Augmented Dickey-Fuller (ADF) test is commonly used to confirm the stationarity of the variables before running the regression model. Table 3 presents the results of the ADF test, indicating that the logarithm of the stock index and the logarithm of the gold price are stationary at level, while the logarithm of the crude oil price is stationary at first difference.

Table 3: Unit Root test

	ADF test	
	Form	P-value
L Stock Index	Level	0.0004
L Gold price	Level	0.0001
L Crude oil price	Level	0.1195
	First diff	0.0000

Quantile Regression Analysis

Table 4 presents the results of the quantile regression analysis on the relationship between stock index returns, crude oil price, and gold price returns. The findings indicate that the effect of crude oil price on the total stock market return is negative across all deciles and statistically significant at the 0.6, 0.7, 0.8, and 0.9 deciles. This implies that for every 1%

increase in the logarithm of crude oil price, the return on the Malaysian stock market index decreases by around 0.37% at the 0.6 decile. The coefficients can be interpreted in the same manner as least square regression. In contrast, the results show that there is no significant relationship between gold price returns and the stock market index at any decile. This finding suggests that there is no significant impact of gold price on stock market returns.

Table 4: Results of the quantile regression in the different deciles

Dependent variable: Log stock market return			
Quantile	Constant	Log crude oil price	log gold price return
0.1	-0.01223**	0.00467	-0.109501
0.2	-0.004355	0.000988	-0.073124
0.3	-0.000917	-0.000449	-0.045645
0.4	0.000956	-0.000985	-0.044521
0.5	0.003541	-0.001887	-0.01952
0.6	0.007655**	-0.003688**	-0.023545
0.7	0.008521**	-0.00365**	-0.02809
0.8	0.010144**	-0.003994**	-0.049996
0.9	0.014896**	-0.00563**	-0.047477

** denote significance at 5% level.

4. Conclusion

Fluctuating world oil and gold prices can have a significant impact on various macroeconomic sectors, including the stock index. The outbreak of the Covid 19 pandemic has had a major impact on the global economy and subsequently on oil and gold prices. The main objective of this study is to examine the impact of global crude oil and gold prices on the Malaysia stock market index during the pandemic, using daily prices from 18 March 2020 to 30 March 2022. Quantile regression is used to model the relationship between the overall stock market index as the dependent variable and gold and crude oil prices as the independent variables. The results show a generally insignificant relationship between the gold price and the stock market index during the pandemic, while there is a negative and significant relationship between the crude oil price and the stock market index in deciles 0.6 to 0.9. However, the study acknowledges the limitation of a short data period and points out that the results might be different with a longer period and additional data.

Understanding the changing trends in current oil and gold prices and the impact of the pandemic on economic activity and financial markets can be useful for investors, policymakers and appropriate portfolio selection. Investors can adjust their portfolios in response to the crisis to minimise economic losses and the results can help in developing an effective portfolio strategy. The monetary authority can adjust its monetary policy by lowering interest rates, boosting investor confidence and reducing equity losses in the event of a market decline. In addition, other policies such as tax cuts, social security and provision of soft loans can minimise losses due to Covid-19. The study's findings are not only relevant for oil production and logistics companies, but also for investors in oil-sensitive equities and commodity derivatives.

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