The correlation of gold, exchange rate, and stock market on Covid-19 pandemic period

Alfi Syahri, Robiyanto Robiyanto

Department of Management, Faculty of Economics and Business, Satya Wacana Christian University, Jl. Diponegoro No. 52-60, Salatiga, 50711, Indonesia

Abstract

This study aims to analyze the correlation of gold, exchange rate, and CSPI on COVID-19 pandemic periods by testing the effect of gold exchange prices and exchange rate on CSPI and stock volatility. Also, by considering the dynamic correlation of dynamic correlations between CSPI with gold and CSPI with exchange rates. The data was collected from secondary data in the form of JCI daily data, gold prices, and exchange rate during the COVID-19 pandemic period from January 2020 to June 2020. Further, the data was analyzed by using a GARCH method to examine the effect of changes in gold and USD prices for CSPI and stock volatility. Hence, DCC-GARCH method was used to see the dynamic correlation between CSPI with gold and IHSG with exchange rate. The result showed that changes of gold prices has significant effect of on stock price volatility, the presence of a positive dynamic correlation between CSPI and gold, and a negative dynamic correlation between CSPI and exchange rates. This research can be used as a reference for investors for their investments by looking at the relationship between the CSPI, gold, and the exchange rate.

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1. Introduction

Capital market has two main functions namely a source of funding for a business entity and an investment medium for investors in various instruments, for instance, stock, bonds, mutual funds, etc. Among those instruments, stocks are the most frequently traded instrument because they are considered as the easiest trading instrument and high returns. The development of the stocks listed on the Indonesia Stock Exchange can be seen through the Composite Stock Price Index (CSPI) (Sari, 2019).

Before investing the stock, the investors will conduct a stock selection by utilizing the stock rate volatility statistics to calculate the profit and loss potentials. The stock rate volatility can affect the uncertainty risk which brings a positive or negative impact on the investors’ interest in their investment (Handayani, Muharam, & Mawardi, 2018). However, many investors are still interested in high volatility stocks. Although the investors have to deal with the high risks, they still get an opportunity for getting high profits.

Many factors influence the stock rate volatility so that stock investment also has several risks. However, the gold price and the USD exchange rate are macroeconomic factors that affect stock price volatility. Gold is one of the most important commodities traded internationally (Singh & Sharma, 2018). According to Husnul, Hidayat, & Sulaimyati, (2017), gold is used as an alternative investment because it tends to be risk-free and not affected by inflationary pressure. Gold is one of the precious metals that considered as a safe asset to be stored in the long-run period because it has good durability (Robiyanto, Wahyudi, & Pangestuti, 2017). It also can be an effective diversification tool within the portfolio to reduce the risks (Tuna, 2019).

Research about the relation of gold price and the stock price had been conducted by Hlupo (2017) using the Granger causality test. The results are the price of gold and the performance of the ZSE Industrial Index stock have an insignificant relationship. Furthermore, Billah & Hartomo (2018) stated that the dynamic correlation of gold prices and the sharia stocks in Indonesia shows that there is a negative correlation between gold prices and sharia stocks. Hence, Tuna (2019) also investigated the correlation between precious metals and the sharia stocks market using the Pedroni Panel Cointegration Analysis method which found a relationship between the gold precious metals and the sharia stocks market. Moreover, by using the Panel Vector Autoregression method, Padungsaksawasdi (2019) discovered the relationship of gold and stock prices which was demonstrated through the relationship between gold market investor sentiment and stock price investor sentiment.

Besides gold, another variable that has a relationship with stock prices is the exchange rate of USD/IDR. The dynamic relationship between exchange rate and stock prices is a topic that attracts many researchers in the economy field, especially capital markets. It is because the exchange rate and stock prices play a role in influencing the economy of a country and this relationship is often used to conduct a fundamental analysis for looking at the movement of stock prices and exchange rates in the future (Syakhroza & Endri, 2012). Research conducted in India by Jayashanker & Rath (2017), research in several eastern European countries by Živkov, Njege, & Pavloviæ (2016), and the research conducted in Indonesia by Pamungkas & Darmawan (2018) showed a relationship between exchange rates and stock prices.

Several studies that discuss the correlation between stock prices with exchange rates and the correlation between stock prices with gold prices, mostly use a static approach as in research that had been conducted by Gumilang, Hidayat, & Goretti (2014); Husnul et al. (2017); Pamungkas & Darmawan (2018); Putri (2015). Their research examined the composite stock price index using the multiple linear regression method. In addition, Hlupo (2017) and Mukhuti (2018) also examine the dynamic correlation between the stock market and
gold prices using multiple linear regression methods. But in reality, the stock market has dynamic movements. Therefore, this study will use a different method, namely Dynamic Conditional Correlation-Generalized Autoregressive Conditional Heteroscedasticity (DCC-GARCH) to be able to see the dynamic correlations between the variables in this study. The DCC-GARCH method is used because it has been proven to be predicted in a sequence for various covariant matrix (Robiyanto et al., 2017). Besides the DCC-GARCH method, this study also uses the GARCH method to determine the effect of changes in gold prices and changes in the exchange rate of the Dollar against the Rupiah on stock returns and stock volatility.

Research on the dynamic correlation of stock prices in ASEAN countries and the exchange rate was also carried out when Donald Trump was elected as a President of the United States by Stefan & Robiyanto (2019). Robiyanto (2018a) also conducted research on the dynamic correlation of ASEAN countries’ stock prices with world oil prices. In contrast, this study will use daily data on the stock prices in Indonesia during the COVID-19 pandemic period due to the impact of the economic crisis caused by the pandemic in the world, especially Indonesia. Further, aside from the dynamic correlation of the CSPI with the USD/IDR exchange rate, this study will also look at the dynamic correlation between the CSPI with the gold price in the middle of the COVID-19 pandemic. It will also examine the effect of changes in gold prices and changes in exchange rates on the CSPI and volatility in stock prices.

This study aims to find out how the dynamic correlation of stock prices (CSPI) with gold prices and the dynamic correlation of stock prices (CSPI) with the exchange rate of Dollar to Rupiah (USD/IDR), and also investigate the effect of gold prices and exchange rates on IHSG and stock price volatility. Eventually, this research can be used as a benchmark and reference for investors and financial analysts in making decisions by looking at the dynamic correlation of CSPI with the price of gold, CSPI correlation with the exchange rate of the Dollar against the Rupiah (USD/IDR), also by looking at the effect of changes in gold prices and changes the exchange rate against the CSPI and the volatility of stock prices in dynamic market conditions such as the COVID-19 pandemic period.

2. Hypotheses Development

The performance of a capital market can be illustrated through the supply and demand mechanism of stock trading activities. By using a composite stock price index, the movement of stocks listed on the Indonesia Stock Exchange can be observed (Putri, 2015), whether the market is in a bullish or bearish condition. The calculation of the composite stock price index was carried out using closing stock prices in each sector in the Indonesia Stock Exchange. Therefore, CSPI illustrates the activity and trends of the capital market because it covers the movement of stock prices as a whole (Aditya, Sinaga, & Maulana, 2018) so that the CSPI can be used as a benchmark for investors to invest.

The ups and downs of stock prices is a movement in stock price called volatility. Volatility is a statistical measure for changes in the price of a security or commodity over a certain period (Robiyanto et al., 2017). The risk of a stock can also be reflected from the volatility of the stock price. If the volatility is high, there is an opportunity for loss and large profits in the short term because the stock price is difficult to be predicted. In contrast, if the volatility of the stock price is low, the stock price tends not to change frequently. Thus, investors can use the stock rate volatility to find out the opportunities for profit and loss from the stock before purchasing.

Gold is one of the precious metals which is the most important commodity in the world that can attract investors’ interest and trade internationally (Singh & Sharma, 2018). According to Natalie & Artigas (2010) gold has two roles as a hedging
tactic against inflation and as a long-term strategic asset. Therefore, gold price fluctuations become a concern for policymakers, investors, financial institutions, central banks, and the wider community (Kumar, 2014).

The price of gold which increases from year to year and tends to be minimal risk can affect the movement of the CSPI. It caused by the market investor that will consider for moving their investment into gold commodities (Gumilang et al., 2014), the risk is relatively lower and gives better results (Gulo, Subiyantoro, & Tubing, 2017). Previous research conducted by Gumilang et al. (2014); Robiyanto et al. (2017); Gulo et al. (2017); Robiyanto (2018b); Shabbir, Kousar, & Batool, (2020) stated that gold price has positive effects on CSPI returns. Therefore, it can be concluded as the following hypothesis.

\[ H_1: \text{gold price changes have positive effects on the CSPI returns.} \]

Choosing gold for investment is believed to be profitable because the price tends to increase. Gold is also included as a very liquid investment form because it can be accepted in many countries (Surbakti, Achsani, & Maulana, 2016). Baur & Lucey (2010) stated that gold can be used as a hedge fund on stock and a safe haven from the extreme stock market condition because of the negative correlation with stock movement.

Previous studies by Kumar (2014); Choudhry, Hassan, & Shabi, (2015); Surbakti et al. (2016); Chkili (2016); Robiyanto et al. (2017) stated that there is a negative correlation between gold price changes with stock volatility. Based on the explanation above, the hypothesis can be formulated as follows.

\[ H_2: \text{gold price changes have negative effects on stock volatility prices.} \]

The exchange rate is the price of a particular foreign currency in the domestic currency unit (Yuswandy, 2013). Exchange rates can change frequently due to changes in supply and demand on the foreign exchange market. According to Faraga, Chabachib, & Muharam, (2012), the exchange rate changes of the domestic currency against foreign currency (USD/IDR) will harm the capital market. The reason is if the foreign currency exchange rates increased or appreciated, the exchange value of the domestic currency will depreciate. Hence, the price of imported raw materials and all imported products will increase and the company’s production costs will also increase. Therefore, changes in exchange rates will affect the competitiveness of companies that will have an impact on the stock price and the product produced by the company (Yunita & Robiyanto, 2018).

The exchange rate is one of the macroeconomic factors that can affect stock returns. The reason is that the depreciation of the domestic currency on foreign currencies will increase the amount of Rupiah which is used to pay the foreign debt and it will also increase the price of imported raw materials (Robiyanto et al., 2019). Further, it will affect the reduction of the company’s stock price and stock returns.

Changes in exchange rates are predicted to influence the stock returns. Previously, some research that had been conducted by Yogaswari, Nugroho, & Astuti, (2012); Patel (2012); Husnul et al. (2017); Wahyudi, Asdar, & Nohong, (2017); Aditya et al. (2018); Yunita & Robiyanto (2018) stated that exchange rate changes have negative impacts on CSPI returns. Therefore, it can be concluded as the following hypothesis.

\[ H_3: \text{exchange rate changes have negative impacts on CSPI returns.} \]

The exchange rate can also affect the stock volatility. Changes in exchange rates will have an impact on price stability, corporate profitability, and stability of a country (Olweny & Omondi, 2011). Asih & Akbar (2016) asserted that the attractive-
ness of the stock market will decrease due to the negative effects of the depreciation of Rupiah to Dollar. It is caused by the movement of the investors to the money market. Finally, it will provide greater profits and ultimately will reduce the stock price index.

Previous studies by Katti (2014); Asih & Akbar (2016); Arfaoui & Ben Rejeb (2017); Fadhyla & Rikumahu (2018) found that there is a negative correlation between exchange rates with stock volatility. According to the explanation above, the hypothesis can be formulated as follows.

\[
H_0: \text{the changes in the exchange rate have negative impacts on stock volatility.}
\]

3. Method, Data, and Analysis

This research conducted using secondary data collected from www.finance.yahoo.com. The data consisted of IHSG daily data from Indonesia Stock Exchange, the price of the gold, and exchange rate from dollar to rupiah (USD/IDR) during COVID-19 between January 1th and June 30th, 2020. The dependent variable in this research is CSPI stock returns and stock volatility, while the independent variable is the changes of gold price and exchange rate from dollar to rupiah.

The calculation of CSPI Returns can be calculated using Eq. (1).

\[
\Delta IHSG_t = \frac{IHSG_t - IHSG_{t-1}}{IHSG_{t-1}}
\]

Where, \(\Delta IHSG_t\) = CSPI returns on the day t; \(IHSG_t\) = CSPI on the day t; \(IHSG_{t-1}\) = CSPI on the day t-1

The changes in gold price within the dollar currency can be calculated using Eq. (2).

\[
\Delta GOLDUSD_t = \frac{GOLDUSD_t - GOLDUSD_{t-1}}{GOLDUSD_{t-1}}
\]

Where, \(\Delta GOLDUSD_t\) = the changes of gold price within dollar currency on the day t; \(GOLDUSD_t\) = gold price on the day t; \(GOLDUSD_{t-1}\) = gold price on the day t-1

The changes of exchange rate from dollar to rupiah (USD/IDR) can be calculated using Eq. (3).

\[
\Delta USDIDR_t = \frac{USDIDR_t - USDIDR_{t-1}}{USDIDR_{t-1}}
\]

Where, \(\Delta USDIDR_t\) = the changes of USD/IDR exchange rate on the day t; \(USDIDR_t\) = USD/IDR exchange rate on the day t; \(USDIDR_{t-1}\) = USD/IDR exchange rate on the day t-1

Stock volatility means the ups and downs of stock rate. Stock volatility in this study was proxied using Conditional Variance which can be calculated using Generalized Autoregressive Conditional Heteroskedasticity (GARCH). In order to analyze the dynamic relationship, this study used Dynamic Conditional Correlation-Generalized Autoregressive Conditional Heteroscedasticity (DCC-GARCH) approach. Moreover, this research also used GARCH model approach to find out the effect of gold price changes and (USD/IDR) exchange rate toward stock and stock volatility returns. GARCH model can be written as Eq. (4) and (5).

\[
R_t = \alpha + \beta_1 GOLD_t + \beta_2 USD_t + \sigma_t^2 + \varepsilon_t
\]

(4)

\[
\varepsilon_t = \phi_1 \varepsilon_{t-1} + \cdots + \phi_q \varepsilon_{t-q} + \eta_t
\]

(5)

Where, \(R_t\) = stock returns / stock volatility; \(GOLD_t\) = the changes of gold price; \(USD_t\) = the change of (USD/IDR) exchange rate; \(\varepsilon_t\) = error standard; \(\sigma_t^2\) = conditional variance; \(\alpha\) = previous period of volatility (ARCH model component); \(\lambda \sigma_{t-1}^2\) = previous period of volatility (GARCH model component)
4. Results

Descriptive statistics

Descriptive statistics is used to find out the mean, maximum, minimum, and deviation standard of a data. Descriptive statistics in this study can be seen on the Table 1 and Table 2.

Table 1 shows that the mean of CSPI is -0.0019 and the deviation standard of CSPI is 0.0213. Meanwhile, the mean of gold variable is 0.0009 and its deviation standard is 0.0164. Then, the mean of USD variable is 0.0011 and its deviation standard is 0.0147.

Table 2 illustrates the mean of stock volatility is 1.0001 and the deviation standard of stock volatility is 0.2079. While, the mean of gold variable is 0.0009 and its deviation standard is 0.0164. The mean of USD variable is 0.0011 and the deviation standard of gold variable is 0.0147. The deviation standard on the Table 1 and 2 reports that stock has the highest risk among gold and USD.

| Variable       | N   | Minimum | Maximum | Mean   | Dev. Std. |
|----------------|-----|---------|---------|--------|-----------|
| CSPI Return    | 116 | -0.0657 | 0.1019  | -0.0019| 0.0213    |
| Gold           | 116 | -0.0462 | 0.0764  | 0.0009 | 0.0164    |
| USD            | 116 | -0.0379 | 0.0468  | 0.0011 | 0.0147    |

| Variable       | N   | Minimum | Maximum | Mean   | Dev. Std. |
|----------------|-----|---------|---------|--------|-----------|
| Stock Volatility| 116 | 0.5638  | 1.9432  | 1.0001 | 0.2079    |
| Gold           | 116 | -0.0462 | 0.0764  | 0.0009 | 0.0164    |
| USD            | 116 | -0.0379 | 0.0468  | 0.0011 | 0.0147    |

Table 3. The result of the Augmented Dickey-Fuller test

| Variable       | Augmented Dickey-Fuller | Probability | Result      |
|----------------|-------------------------|-------------|-------------|
| CSPI Returns   | -9.6620                 | 0.0000      | Stationary  |
| Gold           | -9.7960                 | 0.0000      | Stationary  |
| USD            | -14.2116                | 0.0000      | Stationary  |

Table 4. The result of GARCH Analysis (1,1) the impact of gold and USD toward CSPI

| Independent Variable | Coefficient | Error Standard | Z-Statistics | Probability |
|----------------------|-------------|----------------|--------------|-------------|
| C                    | -0.0009     | 0.0013         | -0.9185      | 0.4724      |
| Gold                 | 0.0745      | 0.1041         | 0.7158       | 0.4741      |
| USD/IDR              | -0.0741     | 0.1094         | -0.6770      | 0.4984      |

Variance Equation

| RESID (-1)^2        | 0.2986      | 0.1088         | 2.7438       | 0.0061      |
| GARCH (-1)          | 0.7131      | 0.0967         | 7.3736       | 0.0000      |
The result of Stationary Data Test

Stationary test in this research used the Augmented Dickey-Fuller test with 0.01 significance value. The result of the test can be seen on Table 3.

Table 3 reveals that CSPI variable, Gold, and USD are stationary. Then, those variables are tested using GARCH Analysis.

The result of GARCH (1,1) Analysis

The result of GARCH analysis (1,1) can be seen on Table 4 and Table 5.

Table 5. The result of GARCH Analysis (1,1) The Impact of gold and USD toward stock volatility

| Independent Variable | Coefficient | Error Standard | Z-Statistics | Probability |
|----------------------|-------------|----------------|--------------|-------------|
| C                    | 0.9963      | 0.0001         | 5876.664     | 0.0000      |
| Gold                 | -0.6684     | 0.9089         | -0.7353      | 0.4621      |
| USD/IDR              | 1.3754      | 0.6414         | 2.1442       | 0.0320      |

Variance Equation

| RESID (-1)^2         | -0.0697     | 0.0088         | -7.8928      | 0.0000      |
| GARCH (-1)           | 1.0930      | 0.0157         | 69.4994      | 0.0000      |

Dynamic correlation between CSPI and the price of the gold to the various time

Figure 1 shows the result of dynamic correlation analysis between CSPI and gold using DCC GARCH. The result indicates the value of DCC CSPI and gold during the research period is -0.1960 until 0.9532. The highest DCC value is 0.9532 in the early March 2020. Meanwhile, the lowest DCC value is -0.1960 in the early June 2020. It can be seen in the Table 7 that the mean value of DCC is 0.0764 which means that the dynamic correlation between CSPI and Gold is positive and week.
The correlation of gold, exchange rate, and stock market on Covid-19 pandemic period
Alfi Syahri, Robiyanto Robiyanto

Dynamic correlation between CSPI and USD/IDR exchange rate to the various time

Figure 2. Dynamic correlation CSPI-USD/IDR

Figure 2 illustrates the result of dynamic correlation analysis between CSPI and USD/IDR exchange rate using DCC GARCH. The result reveals that DCC value between CSPI and USD/IDR exchange rate is -0.8206 until 0.3047. The highest DCC is 0.3047 in early March 2020 while the lowest DCC value is at the end of March 2020. Based on Table 7, the mean value of DCC is -0.100, thus the dynamic correlation between CSPI and USD/IDR is negative and weak.

The chronology of important events related to COVID-19 can be read on Table 6. It affects the correlation between CSPI and gold, CSPI and USD/IDR. COVID-19 is a global pandemic which makes the virus becomes global attention. In contrast, Stefan & Robiyanto (2019) stated that monumental events do not affect dynamic correlation. The study from Putri (2015); Billah & Hartomo (2018) did not link the monumental events to the dynamic correlation. This is in line with Robiyanto (2018a) and Chen et al. (2018) that dynamic correlation can be affected by the important event which is happening.

5. Discussion

According to the developed hypothesis, all of the hypotheses are rejected. The analysis indicates that the changes of gold price and USD/IDR exchange rate do not affect to the CSPI and stock volatility. However, there is a significant positive effect of the changes of the gold price toward stock volatility. It is the effect of the crisis period during COVID-19 pandemic which makes people worry about their investment. It is supported by the findings of the stock volatility model in this study. The gold commodity proves that the higher gold returns the more volatility increase on the CSPI. There is an indicator that stock investors in the Indonesia Stock Exchange are skeptical responding to the changes in the gold price which makes them hesitate to invest gold. Electronic and printed media which mention that gold is the safest asset during the pandemic play an important role in the people’s confusion. The result of this study was supported by oleh Choudhry et al. (2015); Ingalhalli & Reddy (2016); Raza et al. (2016) studies which explain that the changes in gold price takes positive effect to stock volatility.

Dynamic correlation happens between CSPI and gold, and CSPI and USD/IDR exchange rate is weak with different correlation condition. Considering the mean value of dynamic correlation on Table 7, correlation between CSPI and gold is positive yet weak. Therefore, gold cannot be categorized as a safe investment asset during the COVID-19 economic crisis. By contrast, Kumar (2014) pointed out that there are variative, positive, even negative dynamic correlations between stock and gold in the crisis period in India so that gold becomes a good portfolio diversification in India. Chkili (2016) and Tuna (2019) asserted that there is a low negative correlation between the stock market and gold so that gold can become a safe haven and effective portfolio diversification when there is an extreme stock movement on a crisis period. The result is in line with Choudhry et al. (2015) the disappearance of gold as a safe haven during the global economic crisis makes gold is not worth it to minimize the risk of the portfolio during the crisis period.

The dynamic correlation of CSPI and USD/IDR exchange rate is negative and weak correlation,
Events | Time
---|---
China has identified the virus as a new virus with 2019-nCoV as the previous name. | January 2020
Washington confirms the first case in the US. | January 2020
WHO sets COVID-19 as Public Health Emergencies of International Concern (PHEIC). | January 2020
The first COVID-19 death case outside China mainland. | January 2020
Chinese tourist passes away in Paris, the first Corona death case in Europe. | January 2020
COVID-19 death rate in China is 908 cases, and the total of positive case is 40,171 people. | January 2020
The China-USA heats up after the Chinese Foreign Ministry accuses the US government of reacting inappropriately to the outbreak and spreading fear by imposing travel restrictions. | February 2020
Japan, Egypt, Israel, Italy, South Korea confirm COVID-19 case in their countries. | February 2020
A lot of countries include Indonesia confirm the first COVID-19 case in their countries. | February 2020
Italy reports that there are 4,825 death cases among 53,578 positive cases. | February 2020
USA reports 124,000 positive cases and 2,000 death cases. | February 2020
WHO declares the new coronavirus as a pandemic. | February 2020
Donald Trump signs an agreement about giving 2 trillion dollars to help workers, business, and health workers that affected by COVID-19. | March 2020
China reopens Wuhan after 76 days lockdown. | March 2020
Donald Trump stops the funding for WHO temporarily. | March 2020
USA passes one million COVID-19 cases. | March 2020
Trump and his government announce that federal government sends 11 billion dollars to some countries to expand the examination potency of corona virus. | April 2020
The data which collected by Johns Hopkins University reports that there are 100,000 corona virus death cases in the USA. | May 2020
Wuhan, China confirms that there is no new case after doing COVID-19 test to 9.9 million of its citizens. | June 2020
WHO plans to give 2 billion COVID-19 vaccine doses to the people around the world. | June 2020
USA passes 2 million COVID-19 cases. | June 2020

Source: Al Jazeera and News Agencies (2020); CNN Editorial Research (2020).
The correlation of gold, exchange rate, and stock market on Covid-19 pandemic period
Alfi Syahri, Robiyanto Robiyanto

This research is a multivariate study on the relationship of CSPI, gold, and exchange rate that used the daily data during the period of COVID-19 pandemic from January 2020 to June 2020. Further research is recommended to use the beginning period of COVID-19 pandemic to the end of the COVID-19 pandemic, so that it can obtain more findings in details about the correlation of CSPI, gold, and exchange rate on the period of COVID-19 pandemic. This research may be beneficial as a reference for the investors to observe the gold variable and exchange rate in investing in the stock market during COVID-19. It should be considered since the gold variable and exchange rate have a correlation toward CSPI, also the changes in gold price bring significant effect to the stock volatility.

References

Aditya, A., Sinaga, B. M., & Maulana, T. A. (2018). Pengaruh indeks bursa luar negeri, indikator makroekonomi dan krisis ekonomi global terhadap indeks harga saham gabungan di Indonesia. *Jurnal Aplikasi Bisnis dan Manajemen*, 4(2), 284–295. https://doi.org/10.17338/jabm.4.2.284

Al Jazeera & News Agencies. (2020). Timeline: How the new coronavirus spread. Retrieved from: Al Jazeera website: https://www.aljazeera.com/news/2020/01/timeline-china-coronavirus-spread-200126061554884.html

Arfaoui, M., & Ben Rejeb, A. (2017). Oil, gold, US dollar and stock market interdependencies: A global analytical insight. *European Journal of Management and Business Economics*, 26(3), 278–293. https://doi.org/10.1108/embe-10-2017-016

Asih, N. W. S., & Akbar, M. (2016). Analisis pengaruh inflasi, suku bunga, nilai tukar (kurs) dan pertumbuhan produk domestik bruto (Pdb) terhadap indeks harga saham gabungan (IHSG) studi kasus pada perusahaan properti yang terdaftar di Bursa Efek Indonesia. *Jurnal Manajemen dan Akuntansi*, 17(1), 43–52. Retrieved from: http://journal.stiei-kayutangi-bjm.ac.id/index.php/jma/article/view/269

Baur, D. G., & Lucey, B. M. (2010). Is gold a hedge or a safe haven? An analysis of stocks, bonds and gold. *Financial Review*, 45(2), 217–229. https://doi.org/10.1111/j.1540-6288.2010.00244.x

Billah, N. A., & Hartomo, D. D. (2018). Korelasi dinamis emas dan saham syariah sebagai lindung nilai dan safe haven pada investasi di Indonesia. *Jurnal Bisnis dan Manajemen*, 18(2), 67–86. https://doi.org/10.20961/jbm.v18i2.26808

Chen, Y., Mantegna, R. N., Pantelous, A. A., & Zuev, K. M. (2018). A dynamic analysis of S&P 500, FTSE 100 and EURO STOXX 50 indices under different exchange rates. *PLoS ONE*, 13(3): e0194067. https://doi.org/10.1371/journal.pone.0194067

Chkili, W. (2016). Dynamic correlations and hedging effectiveness between gold and stock markets: Evidence for BRICS countries. *Research in International Business and Finance*, 38, 22–34. https://doi.org/10.1016/j.ribaf.2016.03.005

Choudhry, T., Hassan, S. S., & Shabi, S. (2015). Relationship between gold and stock markets during the global financial crisis: Evidence from nonlinear causality tests. *International Review of Financial Analysis*, 41, 247–256. https://doi.org/10.1016/j.irfa.2015.03.011

CNN Editorial Research. (2020). Coronavirus outbreak timeline fast facts. Retrieved from: CNN Health website: https://edition.cnn.com/2020/02/06/health/wuhan-coronavirus-timeline-fast-facts/index.html
Fadhyla, N. R., & Rikumahu, B. (2018). Studi mengkaji pengaruh pergerakan nilai tukar Rupiah per US Dollar terhadap volatilitas indeks saham kompas 100 tahun 2012-2016 dengan menggunakan model GARCH. *Jurnal Ilmiah Ilmu Ekonomi*, 7(7), 60–69. Retrieved from: http://eprints.ummi.ac.id/566/

Faraga, F., Chabachib, M., & Muhamar, H. (2012). Analisis pengaruh harga minyak dan harga emas terhadap hubungan timbal-balik kurs dan indeks harga saham gabungan (IHSG) di Bursa Efek Indonesia (BEI) 2000-2013. *Jurnal Bisnis Strategi*, 21(1), 72–94. https://doi.org/10.14710/jbs.21.1.72-94

Gulo, V. I. S., Subiyantoro, H., & Tobing, W. R. L. (2017). Analisis pengaruh variabel makroekonomi dan volume pedagangan saham terhadap indeks harga saham gabungan di Bursa Efek Indonesia: Pendekatan dua model penelitian pengaruh gaya. *Jurnal Eksekutif*, 14(1), 25–50. Retrieved from: https://jurnal.ibmt.ac.id/index.php/jeksekutif/article/view/126

Gumilang, R. C., Hidayat, R. R., & Goretti, M. (2014). Pengaruh variabel makro ekonomi, harga emas dan harga minyak dunia terhadap indeks harga saham gabungan (studi pada Bursa Efek Indonesia periode 2009-2013). *Jurnal Administrasi Bisnis S1 Universitas Brawijaya*, 14(2), 1–9. Retrieved from: http://adminstrasisbisnis.studentjournal.ub.ac.id/index.php/jab/article/view/586

Handayani, H., Muhamar, H., Mawardi, W., & Robiyanto, R. (2018). Determinants of the stock price volatilitiy in the Indonesian manufacturing sector. *International Research Journal of Business Studies*, 11(3), 179–193. https://doi.org/10.21632/irjbs.11.3.179-193

Hlupo, P. (2017). The relationship between gold prices and equity market performance: Evidence from the Zimbabwe Stock Exchange. *IRES*, 1, 1–6. Retrieved from: https://pdfs.semanticscholar.org

Husnul, H. M., Hidayat, R. R., & Sulasmiyati, S. (2017). Analisis pengaruh inflasi, kurs (IDR/USD), produk domestik bruto dan harga emas dunia terhadap indeks harga saham gabungan (studi pada Indonesia periode 2008-2016). *Jurnal Administrasi Bisnis*, 53(1), 66–74. Retrieved from: http://adminstrasisbisnis.studentjournal.ub.ac.id/index.php/jab/article/view/2183

Ingahalli, V., G., P. B., & Reddy, Y. V. (2016). A study on dynamic relationship between oil, gold, forex and stock markets in Indian context. *Paradigm*, 20(1), 83–91. https://doi.org/10.1177/0971890716637706

Jayashankar, M., & Rath, B. N. (2017). The dynamic linkage between exchange rate, stock price and interest rate in India. *Studies in Economics and Finance*, 34(3), 383–406. https://doi.org/10.1108/sef-02-2016-0043

Katti, S. W. B. (2014). Analisis faktor makro ekonomi, indeks bursa global, dan kepemilikan saham asing terhadap pergerakan harga saham di Bursa Efek Indonesia. *Jurnal Ekomaks*, 3(1), 92–106. Retrieved from: http://www.unmermadiun.ac.id/ejurnal/index.php/ekomaks/article/view/116

Kumar, D. (2014a). Return and volatility transmission between gold and stock sectors: Application of portfolio management and hedging effectiveness. *IIMB Management Review*, 26(1), 5–16. https://doi.org/10.1016/j.iimb.2013.12.002

Mukhuti, S. (2018). Impact of gold price on stock market return – An econometric analysis of BSE and NSE. *International Journal of Management Studies*, 5(4), 1–16. https://doi.org/10.18843/ijms/v5i4(7)/01

Natalie, D., & Artigas, J. C. (2010). Gold: Inflation hedge and long-term strategic asset. *The Journal of Wealth Management*, 13(2), 69–75. https://doi.org/10.3905/jwm.2010.13.2.069

Olweny, T., & Omondi, K. (2011). The effect of macro-economic factors on stock return volatility in the Nairobi Stock Exchange, Kenya. *Economics and Finance Review*, 1(10), 34–48. Retrieved from: http://www.businessjournalz.org/efr

Padungsaksawasdi, C. (2019). On the dynamic relationship between gold investor sentiment index and stock market: A sectoral analysis. *International Journal of Managerial Finance*, 16(3), 372-392. https://doi.org/10.1108/ijmf-11-2018-0334
The correlation of gold, exchange rate, and stock market on Covid-19 pandemic period
Alfi Syahri, Robiyanto Robiyanto

Pamungkas, B. C., & Darmawan, A. (2018). Pengaruh nilai tukar USD dan bursa ASEAN terhadap indeks harga saham gabungan (IHSG) (studi pada Bursa Efek Indonesia periode 2014–2016). Jurnal Administrasi Bisnis, 60(1), 73–81. Retrieved from: http://administrasibisnis.studentjournal.ub.ac.id/index.php/jab/article/view/2483/2874

Patel, S. (2012). The effect of macroeconomic determinants on the performance of the Indian stock market. NNIMS Management Review, 22, 117–127.

Putri, V. R. (2015). Hubungan dinamis antara nilai tukar rupiah dan inflasi dengan indeks harga saham di BEJ. Journal of Economics, Management and Banking, 1(3), 110–119. http://dx.doi.org/10.35384/jemp.v1i3.41

Raza, N., Jawad Hussain Shahzad, S., Tiwari, A. K., & Shahbaz, M. (2016). Asymmetric impact of gold, oil prices and their volatilities on stock prices of emerging markets. Resources Policy, 49, 290–301. https://doi.org/10.1016/j.resourpol.2016.06.011

Robiyanto, R. (2018a). The dynamic correlation between ASEAN-5 stock markets and world oil prices. Jurnal Keuangan dan Perbankan, 22(2), 198–210. https://doi.org/10.26905/jkdp.v22i2.1688

Robiyanto, R. (2018b). The effect of gold price changes, USD/IDR exchange rate changes and Bank Indonesia (BI) rate on Jakarta Composite Index (JCI)’S return and Jakarta Islamic Index (II)’S return. Jurnal Manajemen dan Kewirausahaan, 20(1), 45–52. https://doi.org/10.9744/jmk.20.1.45-52

Robiyanto, R., Santoso, M. A., Atahau, A. D. R., & Harjono, H. (2019). The Indonesia stock exchange and its dynamics: An analysis of the effect of macroeconomic variables. Montenegrin Journal of Economics, 15(4), 59–73. https://doi.org/10.14254/1800-5845/2019.15-4.5

Robiyanto, R., Wahyudi, S., & Pangestuti, I. R. D. (2017). The volatility – variability hypotheses testing and hedging effectiveness of precious metals for the Indonesian and Malaysian capital markets. Gadjah Mada International Journal of Business, 19(2), 167–192. https://doi.org/10.22146/gamajb.26260

Sari, W. I. (2019). Analisis pengaruh inflasi, suku bunga SBI, nilai tukar terhadap return LQ 45 dan dampaknya terhadap indeks harga saham gabungan (IHSG) di Bursa Efek Indonesia (BEI). Jurnal SEKURITAS (Saham, Ekonomi, Keuangan, dan Investasi), 3(1), 65. https://doi.org/10.32493/skt.v3i1.3263

Shabbir, A., Kouaar, S., & Batool, S. A. (2020). Impact of gold and oil prices on the stock market in Pakistan. Journal of Economics, Finance and Administrative Science. https://doi.org/10.1108/jefas-04-2019-0053

Singh, N. P., & Sharma, S. (2018). Phase-wise analysis of dynamic relationship among gold, crude oil, US dollar and stock market. Journal of Advances in Management Research, 15(4), 480–499. https://doi.org/10.1108/jamr-12-2017-0124

Stefan, Y. A., & Robiyanto, R. (2019). Korelasi dinamis pasar saham Asean dengan nilai tukar Dollar Amerika Serikat (USD) di Era Donald Trump. Jurnal Ilmu Sosial Dan Humaniora, 8(2), 131–143. http://dx.doi.org/10.23887/jish-undiksha.v8i2.21380

Surbakti, E. H., Achsani, N. A., & Maulana, T. N. A. (2016). The impact of macroeconomic variables on JCI’s stock return volatility in pre and post global economic crisis. International Journal of Scientific and Research Publications, 6(3), 213–220. Retrieved from: www.ijsrp.org

Syakhroza, A., & Endri. (2012). Hubungan kausalitas harga saham dan nilai tukar di negara-negara Asean-5. Jurnal Keuangan dan Perbankan, 14(2), 17–31. Retrieved from: http://journal.perbanas.id/index.php/jkp/article/view/173/46

Tuna, G. (2019). Interaction between precious metals price and Islamic stock markets. International Journal of Islamic and Middle Eastern Finance and Management, 12(1), 96–114. https://doi.org/10.1108/imefm-06-2017-0143
Wahyudi, R. N., Asdar, M., & Nohong, M. (2017). The influence of macroeconomic variables toward Jakarta Composite Index on Indonesia Stock Exchange. *Jurnal Bisnis, Manajemen dan Informatika, 14*(2), 131–148. [http://dx.doi.org/10.26487/jbmi.v14i2.2164](http://dx.doi.org/10.26487/jbmi.v14i2.2164)

Yogaswari, D. D., Nugroho, A. B., & Astuti, N. C. (2012). The effect of macroeconomic variables on stock price volatility: Evidence from Jakarta Composite Index, agriculture, and basic industry sector. *International Proceedings of Economics Development and Research, 46*(18), 96–100. [https://doi.org/10.7763/IPEDR](https://doi.org/10.7763/IPEDR)

Yunita, Y., & Robiyanto, R. (2018). The influence of inflation, BI rate, and exchange rate changes to the financial sector stock price index. *Jurnal Manajemen dan Kewirausahaan, 20*(2), 80–86. [https://doi.org/10.9744/jmk.20.2.80-86](https://doi.org/10.9744/jmk.20.2.80-86)

Yuswandy, Y. (2013). Analisis pengaruh harga minyak dunia, harga emas dunia, nilai tukar Rp terhadap USD, Indeks IHSG terhadap return saham (Studi kasus saham-saham Sinarmas Group). *Working Paper, 1*, 39–61. Retrieved from: [http://www.adlermanurungpress.com/journal/datajournal/Vol 1 No 1/Analisis Pengaruh Harga Minyak Dunia.pdf](http://www.adlermanurungpress.com/journal/datajournal/Vol 1 No 1/Analisis Pengaruh Harga Minyak Dunia.pdf)

Živkov, D., Njegiæ, J., & Pavloviæ, J. (2016). Dynamic correlation between stock returns and exchange rate and its dependence on the conditional volatilities – the case of several eastern European countries. *Bulletin of Economic Research, 68*(S1), 28–41. [https://doi.org/10.1111/boer.12059](https://doi.org/10.1111/boer.12059)