

# The Effect of Changes in Gold and Nickel Prices on Stock Return of Mining Sector Company

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## ABSTRACT

The purpose of this study was to examine the effect of changes in gold and nickel prices on stock returns with the Jakarta Composite Index (JCI) as a control variable. This study wants to see whether changes in gold and nickel commodity prices on the world market caused by market sentiment can affect the stock returns that investors will get. The object of this research is a mining company in the metal and mineral sub-sector, which produces these two products (gold and nickel). The data used is quarterly data, with a research period from June 2018 to July 2021. After the data passes the classical assumption test, this data is retested level of influence by using panel data with twice the test model. Afterwards testing, the results of this study indicate that changes in gold prices do not have a positive effect on mining companies. This is because mining companies in Indonesia do not all produce gold. In contrast, nickel prices can consistently affect mining company stock returns. This is because nickel products are the largest contributor to sales in Indonesia. Gold and nickel are commodities that are very sensitive to market sentiment, so mining companies must be careful so that their stock returns remain attractive in the eyes of investors.

**Keywords:** Gold; Nickel; JCI; Stock Returns; Mining.

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## 1. Introduction

The COVID-19 pandemic has had a major impact on global financial markets. Due to this turmoil, global financial markets have suffered heavy losses and the kind of profound changes not seen since the 2008 financial crisis (Cembalest, 2020). Assessing the interconnectedness of financial markets during this outbreak has been a tremendous challenge for researchers and policy makers as it helps them analyze the behavior of the markets facing this major event, prepare plans and strategies to minimize the financial impact of the COVID-19 outbreak, and make informed and reasoned decisions about global portfolio diversification opportunities (Benlagha & Omari, 2021).

The COVID-19 pandemic has caused uncertainty in the stock market, especially in Indonesia, which affects the stock returns that will be given because one of way to calculate returns is to look at the magnitude of changes in the company's stock price (*capital gain*). The mining sector is one of the choices in investing, both direct and indirect investment. Investors who want to invest through the capital market in the mining sector must pay attention to the movement of the

mining sector's stock price index (Anisa & Darmawan, 2018). On a fundamental perspective, it must be realized that the mining sector is currently one of the main sectors that drive the wheels of the Indonesian economy (Putra & Widaningsih, 2016). One of the factors that influence fluctuations is market sentiment.

Gold is one of the commodities that was affected because of the market sentiment in the past 7 years, the price of gold suddenly soared and recorded its highest value on February 20, 2020 in the commodity market until it reached its peak on August 7, 2020 (Bloombergbusiness, 2020). This increase in gold prices is getting higher every day until almost a year later the gold price decreases as of July 10, 2021, the price per one gram of gold touches USD \$ 1,808.55 or if converted to the rupiah exchange rate, its value is equivalent to Rp. 882,000.00 (investing.com, 2021). Gold is regularly considered a *safe-haven* asset during periods of turmoil (Benlagha & Omari, 2021). Gold has a long and unique history as a financial asset over the last 6000 years. Recently there is a development research agency that assessing whether gold acts as a Safe Haven for investors in times of severe market stress (He Zhen, et al., 2018).

Besides gold, there is nickel which occupies a strategic position in the economy in Indonesia. Nickel is the most profitable commodity because it is the main material for the manufacture of lithium batteries, especially considering the higher production demand for electric vehicles (Rahayu & Sugianto, 2020). When the regulation regarding the ban on the export of nickel raw ore was passed, the price of nickel commodities was decreased significantly. The European Union sued Indonesia to the WTO regarding the ban on nickel ore exports (Rahayu & Sugianto, 2020). This event caused nickel prices to be decreased on March 2020, namely at \$11,470, the price of nickel commodities again showed an increase to reach \$18,750 on July 9, 2021 (investing.com, 2021).

Changes in commodity prices, one of which is gold, have an effect on stock returns. The effect given by changes in gold prices on stock market returns is determined by the large proportion of gold mining produced (Johnson & Soenen, 2009). Meanwhile research from Ibrahim (2012) stated that the relationship between gold prices tends to be negatively correlated with stock market returns. The results of the Irandoust research (2017) showed that the stock price index and the metal price index (nickel) are not causally related, so changes in metal prices cannot predict the stock market in Europe. Charissa's research (2021) stated that world nickel prices affect stock returns of mining companies in Indonesia. The results of this study are different from Prastyo & Sertiartiti (2018) that world nickel prices have a negative effect on stock returns for mining indexes on JCI.

Many empirical studies have examined the relationship between the COVID-19 pandemic and the stock market. For example, So et al. (2001) used dynamic financial networks based on stock return correlations to examine the connectivity between financial networks in Hong Kong during the COVID-19 extraordinary event. They found that network connectivity in financial networks increased during the outbreak. Similarly, Zhang et al. (2020) found that the pandemic had an important impact on global financial markets. In particular, they point out that the interrelationships between global stock markets show distinctly different patterns during the pandemic period.

The questions that become the main points of this research are as follows: first, is there a relationship between gold prices and stock returns in the mining sector? second, is there a relationship between nickel prices and stock returns in the mining sector. The purpose of this study is to contribute to the literature on the relationship between the price of gold, nickel and stock returns in the mining sector.

## **2. Literature Review and Hypothesis Development**

### *2.1 Literature Review*

#### 2.1.1 Behavioral Finance

As time goes by, new theories emerged, especially in the financial sector because a number of experts felt that there were some oddities made by investors but could not be explained by existing financial theories. According to Ritter (2003), behavioral finance is a modern financial behavior that based on the psychology of investors and be able to show that the human decision-making process is influenced by several cognitive illusions. These illusions are divided into two groups, namely illusions caused by the heuristic decision-making process and illusions rooted in the adoption of mental frames which are grouped in prospect theory (Waweru, et al., 2008).

#### 2.1.2 Stock Return

There are two main sources of investment return components that will be received by investors, first is yield and second is capital gain (loss). If the income obtained is based on periodic cash flows, it is called yield. Usually the size of the yield in an investment is determined by the amount of dividends distributed by a company. Capital gain (loss) is the result of the difference (can be an increase or decrease) in the price of a stock or other securities (Tandelilin, 2012). Stock return can be calculated as follows (Jogiyanto, 1998).

$$\text{Stock Return} = \frac{P_t - P_{t-1}}{P_{t-1}} \quad (1)$$

#### 2.1.3 Price Gold

Gold has some industrial uses (limited) as a commodity and there is a demand for it in jewelry, some researchers argue that gold also has a monetary role, similar to currency. In a previous study, Jaffe (1989) showed the diversification advantage obtained when gold is included in the traditional portfolio. In terms of dynamics of gold and currencies suggest that gold can act as a hedge against inflation and hence, provide protection against dollar devaluation (Ciner, et al, 2012).

$$\text{Gold Return} = \frac{P_t - P_{t-1}}{P_{t-1}} \quad (2)$$

#### 2.1.4 Nickel Price

Nickel is widely used as a metal mixing material in various metal industries. There are several potential nickel points in Indonesia, which are spread over areas in Papua, Maluku, Sulawesi, and Kalimantan (Winzenried & Kamarudin, 2018). The great benefits of nickel, such as being

able to use it as a material for making rechargeable batteries, making countries competes to export their nickel minerals (Trihusodo, 2020).

$$\text{Nickel Return} = \frac{P_t - P_{t-1}}{P_{t-1}} \quad (3)$$

### 2.1.5 Jakarta Composite Index (JCI)

JCI (IHSG) is an indicator that can be used as a guide in seeing price movements in stocks. The index can be used as an indicator of market trends, to see whether the movement of the index describes market conditions that are active or sluggish (Darmadji, 2011).

## 2.2 Hypothetical Development

### 2.2.1 Changes in gold prices have a positive effect on stock returns

Important events in other countries can affect the value of this commodity, especially if a country is experiencing a crisis (Kamdema, Essomba, & Berinyuy, 2020). The crisis can trigger the impact of stock returns caused by turmoil to changes in commodity prices, especially gold (Kang, Ratti, & Vespignani, 2020). For countries that are still developing, the volatility that occurs in the stock market is usually affected by fluctuations in commodity prices. From some of the descriptions above, it can be concluded that the hypothesis of this research is as follows.

H<sub>1</sub>: Changes in gold prices have a positive effect on stock returns

### 2.2.2 Changes in nickel prices have a positive effect on stock returns

Research conducted by Irandoust, (2017) states that commodities are not significantly related to stock returns. This insignificant result was motivated by the low proportion of metal commodities owned by Europe. The greater the proportion of commodities produced by a country, will affect its market return (Johnson & Soenen, 2009). When the world's demand for nickel minerals is getting bigger, and starting in 2020 Indonesia has started exporting processed nickel ore which has a higher selling value, this will automatically increase the company's revenue. On the other side, this will have an impact on the company's profits which indirectly affect the stock returns given by the mining sector company to its investors. Thus, it can be concluded that the hypothesis of this research is as follows.

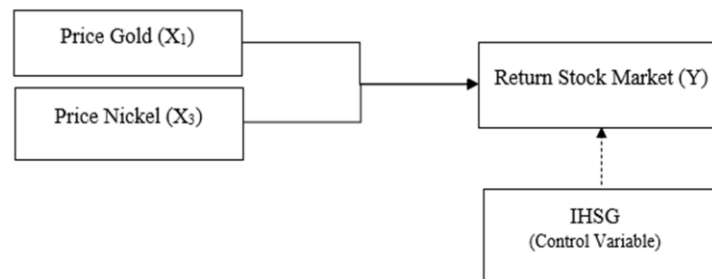
H<sub>2</sub>: Changes in nickel prices have a positive effect on stock returns

## 3. Research Methodology

### 3.1 Research Design

This study tested the hypothesis by using secondary data. The data is quarterly data taken from the period July 2018 to June 2021. The object of this research is the mining sector company. So that the dependent variable used in this study is stock returns from the mining sector. The independent variable in this study is the change in the weekly selling price of gold and nickel commodities. Then the control variable of this research is JCI (IHSG).

Figure 1. Research Design



### 3.2 Population Targets, Samples, and Data Sources

#### 3.2.1 Population

The population is a general area consisting of objects or subjects that become certain numbers and characteristics determined by researchers to be studied and then drawn conclusions (Sugiyono, 2008). The population of this study used the mining sector companies on the IDX as many as 46 mining companies.

#### 3.2.2 Sample

The sample is part of the population to be studied, (Suliyanto, 2017). The sampling technique used purposive sampling method with the following criteria: 1) Mining sector companies listed or listed on the IDX as issuers until 2021. 2) Stocks and issuers are actively traded every month during the period of July 2018 to June 2021. 3) Publishing and always presenting financial reports during the observation period, namely July 2018 to June 2021.

#### 3.2.3 Data Sources

The source of data in this study is secondary data, namely data that has been collected by other parties (Suliyanto, 2017). And the data sources used are from [www.idx.co.id](http://www.idx.co.id), [www.investing.com](http://www.investing.com), [www.bi.go.id](http://www.bi.go.id). Data collection techniques perform research data searches related to the variables being studied.

#### 3.2.4 Data Analysis

##### 3.2.4.1 Descriptive Statistics

Sugiyono and Susanto (2017) stated that descriptive statistical analysis in which the resulting data will be presented in various forms, either tables or graphs. Descriptive statistical analysis is used to make it easier for researchers to read the characteristics of respondents briefly through

percentages, amounts, and averages.

### 3.2.4.2 Uji Asumsi Klasik

The ideal panel data regression analysis meets the BLUE criteria (Best Linear Unbiased Estimator) (Gujarati, 2012). Classical assumption test consists of normality test, multicollinearity test, heteroscedasticity test and autocorrelation test.

### 3.2.4.3 Panel Data Regression Model

Panel data which is a combination of two data, namely time series (for certain years) and cross section (for certain companies) which is able to provide more data so that it will produce a greater and more efficient degree of freedom (Gujarati, 2012). . Linear regression of panel data consists of three models, namely common effect, fixed effect and random effect . To choose which model best fits the data, the Chow test, Housman test, Lagrange Multiplier test will be carried out (Sriyana, 2014).

$$RS_{it} = \beta_0 + \beta_1GLD_{it} + \beta_2NKL_{it} + \beta_3IHSG_{it} + \varepsilon_{it} \tag{4}$$

## 4. Results

### 4.1 Descriptive Statistics

This study consists of three kinds of variables, namely independent variables, dependent variables, and control variables. The independent variables used in this study are changes in gold prices and changes in nickel prices. The dependent variable uses stock returns, and the control variable uses changes in the JCI (IHSG) value.

Table 1. Descriptive Statistics

	<b>RS</b>	<b>GLD</b>	<b>NKL</b>	<b>IHSG</b>
Mean	0.080338	0.025534	0.030431	0.008538
Median	0.000000	0.038215	0.045556	0.011111
Maximum	1.744681	0.132373	0.349901	0.227725
Minimum	-0.481212	-0.113269	-0.183775	-0.279624
Std. Dev.	0.333700	0.067228	0.169776	0.109224

From the test results, it is concluded how consistent the influence of the independent variable on the control variable is and whether the presence of a control variable (JCI/IHSG) can strengthen or weaken the influence exerted by the independent variable (changes in gold and nickel prices) on the control variable (stock returns).

### 4.2 Classical Assumption Test

#### 4.2.1 Normality Test

If the data distribution is normal or close to normal, the resulting regression model will be good. Normality test using Eviews Histogram Normality Test

Table 2. Normality Test Results

<b>Probability Value</b>	<b>Model 1</b> 0,257165	<b>Model 2</b> 0,792371
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The data can be said to be normal if the results of the normality test have a probability value greater than 0.05. Based on Table 2, for model 2 (without involving control variables) the data is normally distributed or  $0.25 > 0.05$ . Testing of model 2 involves the control variable of JCI normally distributed or  $0.79 > 0.05$ .

#### 4.2.2 Multicollinearity Test

Figure 3. Model 2 Multicollinearity Test  
Figure 2. Model 1 Multicollinearity Test

Variance Inflation Factors  
Date: 08/19/21 Time: 09:07  
Sample: 1 120  
Included observations: 120

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.000916	1.156719	NA
GLD	0.184802	1.195374	1.043287
NKL	0.028977	1.077159	1.043287

Failure to estimate is usually influenced by the relationship between data is linear, this must be avoided. The following are the results of the multicollinearity test with Variance Inflation Factors conducted using Eviews.

Based on Figures 2 & 3, if the VIF value is  $< 10$ , then there is no multicollinearity problem. After that, the VIF value of the two test models is also smaller than 10 so it can be concluded that the data does not occur multicollinearity.

#### 4.2.3 Autocorrelation Test

Autocorrelation is the most important thing when testing time series data, so that the data you have must avoid autocorrelation symptoms. Based on Table 3, the value of Prob.chi square (Obs\*R-squared)  $> 0.05$  means that there is no autocorrelation problem in the data. Both test models use the Breusch-Godfrey Serial Correlation LM Test which is greater than 0.05 so it can be concluded that there is no autocorrelation in the two models.

Table 5. Autocorrelation Test Results

	Model 1	Model 2
Chi-Square Probability Value (Obs*R-squared)	0,203693	0,9693

#### 4.2.4 Heteroscedasticity Test

In order to produce a good regression equation, the data must pass the heteroscedasticity test. Based on Table 4, the value of Prob.chi square (Obs\*R-squared) of both test models is greater than 0.05 so it can be concluded that there is no heteroscedasticity.

Table 6. Heteroscedasticity Test Results

	Model 1	Model 2
Chi-Square Probability Value (Obs*R-squared)	0.2984	0,3114

#### 4.4 Panel Data Regression Analysis

After the data has passed the classical assumption test, regression testing is carried out. In this study, four tests were conducted to see the consistency of the effect given by the independent variable on the control variable. The following are the results of the regression testing carried out

$$RS_{it} = 0,0811 + 0,8605 GLD_{it} + 0,0278 NKL_{it} + 0,0001 IHS_{it} + \varepsilon_{it} \quad (5)$$

Furthermore, model 1 without control variables was tested for the simultaneous significance of Prob (F-statistics) of  $0.000210 < 0.05$ , so that the GLD & NKL variables simultaneously had an effect on RS. This is also the same as model 2 with a Prob value (F-statistic) of  $0.000210 < 0.05$ , so that the GLD, NKL, & JCI (IHS) variables simultaneously affect RS. Model 1 without Partial Significance test control variables (individuals). The GLD Prob value is  $0.4870 > 0.05$  so that it rejects  $H_{a1}$  i.e. GLD has no effect on RS. The prob value of NKL is  $0.0001 > 0.05$  so that it accepts  $H_{a2}$ , that is, NKL affects the hospital. Model 2 uses the JCI (IHS) control variable, the GLD Prob value is  $0.8605 > 0.05$  so that it rejects  $H_{a1}$ , namely GLD has an effect on RS. The prob value of NKL is  $0.0278 > 0.05$  so that it accepts  $H_{a2}$ , that is, NKL affects the hospital. The prob value of the JCI (IHS) is  $0.000 > 0.05$  so that it affects the RS.

## 5. Discussions

The results of this study support the research of Ibrahim (2012) that the relationship between gold prices tends to be negatively correlated with stock returns of mining companies. The next finding is that nickel prices have a positive effect on stock returns of mining companies. This is in line with research from Irandoust (2017) which shows that the stock price index and the metal price index (nickel) are not causally related, so changes in metal prices cannot predict the stock market in Europe.

## 6. Conclusion

This study aims to examine changes in the gold price which affect return and nickel mining company. Based on test results and discussion of data that has been described, it can be deduced as follows: First. Variable changes in gold prices do not significantly affect the stock return of mining companies. The influence given is negative. Second. Variable changes in the price of nickel also significantly affect stock returns from mining companies. Influence exerted by the nickel price change is positive so the higher price of nickel product sales, stock returns earned by investors are also getting bigger. In addition, Indonesia is currently the star in the nickel mining industry so investors who hold shares in the mining company can feel secure when investing in this company.



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