

What Causes Future Gold Price Volatility in Indonesia?

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ABSTRACT

The purpose of this study is to determine the factors that influence the future volatility of gold commodities in Indonesia. Methods of quantitative research as well as secondary data are utilized in this study. The years 2011 to 2018 are used in this study example. On the official website, there is a total of 32 data collected quarterly. SPSS version 24 is the software that is being utilized. The findings, the exchange rate is the only factor that has impact on future gold commodities. Other factors, including as the consumer price index and the stock market index, have no such impact. Research can be used to determine the reasons of price volatility from macroeconomic influences on future gold commodities.

INTRODUCTION

The commodity market plays a significant role in preserving the economic stability of the country and offers numerous advantages to investors, corporate players, the community, and the overall economy. Commodity markets have experienced turbulence since the mid-2000s. Prices peaked in 2010–2011 and again in 2007–2008 (during the global economic crisis), and the market also experienced a surge in returns or volatility returns. Additionally, a significant amount of investment capital has poured into the commodity futures market as a result of the sudden increase in popularity of commodities investments. The "financialization" of commodity markets is a process that has generated a lot of discussion (Cheng & Xiong, 2014).

Price determination in the commodity market continues to be quite volatile along with developments (Bolandifar & Chen, 2020). As a result of the tremendous supply and demand uncertainties, potential political unrest around the world, and ongoing financial problems, commodity prices are currently seeing rising price variations. The viability of production both now and in the future, as well as the investment choices made by governments and businesses, are frequently impacted by price swings. When data from one of the key events

in the economic market are released, volatility may rise if fresh information emerges that differs from market expectations (Dewi, 2019).

In the context of commodity pricing, macroeconomic considerations become crucial, particularly during periods of severe price fluctuations. Since the influence of uncertainty on the global economy has been demonstrated, the macroeconomic effect that produces volatility in commodity prices is a subject that will never cease to be investigated (Joets et al. 2015). The influence of macroeconomic indicators, such as the Consumer Price Index, Industrial Production Index, Money Supply, Stock Market Index, Exchange Rate, Consumer Confidence Index, and Composite Economic Leading Indicator, on the future volatility of commodities (Mo, et al, 2018). Additionally, commodity prices are frequently suspected as a reference for businesses involved with these commodities (Dewi, et al, 2021a).

The impact of macroeconomic factors on the gold futures market will persist. Where commodities futures continue to fluctuate, gold will also continue to fluctuate and adapt to the changing times. Despite continuing swings, commodity markets continue to attract investors' interest. Therefore, the issue posed by this study is: What factors influence commodity futures for gold in Indonesia? With the aid of this study, investors are able to identify the macroeconomic elements that contribute to the volatility of gold futures and to accurately estimate and hedge against price fluctuations.

LITERATURE REVIEW

Commodity Future Gold

After commodities got financialized, their behavior became atypical. The fluctuating character of commodity prices has also experienced substantial modifications. Commodity prices have risen significantly, and their fluctuating nature has also undergone considerable transformations (Basak, 2016). Predicting fluctuations in commodity prices is crucial for exporting and importing nations as well as numerous businesses (Ornelas & Mauad, 2017). Futures contracts for commodities are agreements to buy or sell raw materials or commodities at a future date and price.

Impact of the Consumer Price Index on Gold Futures

According to Celasun et al. (2012), oil price shocks have a statistically significant effect, but they have no long-term economic impact on the inflation rate. According to Bhardwaj et al. (2015), commodities prices are associated with inflation and rise simultaneously, but the correlation between stock and bond prices and inflation is diminishing. According to Chiang et al. (2015), oil price risk is highly associated to the inflation rate and numerous macroeconomic factors analyzed, such as stock market volatility, industrial production and GDP growth rates, as well as unemployment rate fluctuations.

H₁: The consumer price index influences commodity future gold.

Impact of the Exchange Rates on Gold Futures

Chen et al. (2014) found that exchange rates and commodity prices always share information content; or it may be stated that the factors that have an effect on predicting the exchange rate will also have an effect on commodity prices. Shang et al. (2016) evaluated the macroeconomic drivers and the rate of return of commodities by investigating asset prices periodically and discovered that the risk of the real exchange rate can influence the rate of return of commodity futures.

H₂ : The exchange rates influences commodity future gold

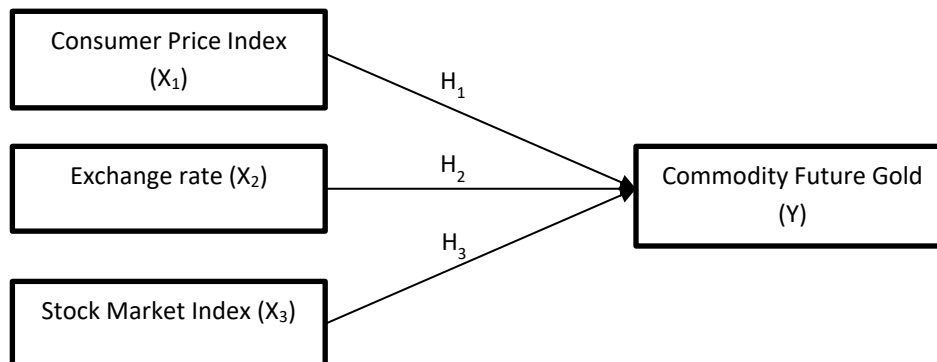


Figure 1. Conceptual Framework

Impact of Stock Market Index on Gold Futures

Through their research on the 2007-2008 financial crisis, Creti et al. (2013) demonstrated the significance of the relationship between commodities and the stock market and the financialization of the commodity market. Rossi (2012) investigates whether equity prices in commodity-exporting nations may anticipate commodity prices. In one and two quarters, he discovered that commodities prices are favorably connected with equity prices, global demand, and lagged interest rates. When Indonesian stock market prices comprise historical data, public and private information, they are referred to as perfect markets (Dewi, et al, 2021b). According to the findings of Shang et al. (2016), the stock market index derived from the S&P 500 index influences the future returns of commodities.

H₃ : The stock market index influences commodity future gold

METHODOLOGY

This study seeks to assess the impact of macroeconomic parameters such as the consumer price index, currency rate, and stock market index on gold futures in Indonesia. This study employs secondary data in the form of historical data extracted from official websites such as those of the Indonesian derivatives exchange, the Indonesian stock exchange, and the Bank of Indonesia. This study makes use of time series data spanning eight years, where data on price swings from macroeconomic variables such as the consumer price index, currency rate, stock market index, and commodity futures gold in Indonesia are recorded.

This study's population consists of all data pertaining to the consumer price index in Indonesia, the exchange rate of the rupiah versus the US dollar, the JCI level in Indonesia, and the price of commodities futures in Indonesia. Through the use of convenience sampling, this study employs temporal data). quarterly series from 2011 to 2018 are utilized.

RESULTS AND FINDINGS

There are 32 samples collected between 2011 and 2018. Fourth quarter 2015 had the lowest value for the dependent variable commodity futures gold. The fall that happened was the result of the Fed's decision to raise interest rates, and it was accompanied by the recovery of the US economy; the Fed did this to foster a more confident investor sentiment in order to accelerate the rate of growth. economy of the United States of America This factor contributed to the collapse in gold futures, as investors grew increasingly interested in placing their funds and investing. In the third quarter of 2012, the value of the dependent variable commodity futures gold reached its peak. This was owing to the Fed's purchase of new long-term assets and the dollar's decline, which increased the attractiveness of investing in the commodity market.

Table 1. Descriptive Statistics

Variabel	N	Min	Max	Mean	Std Deviasi
Consumer Product Index	32	111.37	146.84	128.45	8.60
Exchange rate	32	8,597	14,929	11,987.44	2,031.46
Stock Market Index	32	3,549.03	6,355.65	4,923.11	797.40
Commodity Future Gold	32	1,060.80	1,777.60	1,336.32	182.17

Classic Assumption Test- Result

This regression model has fulfilled the classical assumption test, namely normality, multicollinearity, autocorrelation and heteroscedasticity. Normality test was conducted to test whether all variables in the model were normally distributed. The first test is not all variables are normally distributed, Consumer price index is 0.200, exchange rate is 0.005, stock market index is 0.200, and commodity futures gold is 0.000. Variables can be concluded to be normally distributed when the significance level is greater than 0.05. So it is necessary to perform data transformation on Exchange rate and commodity future gold. Then the second test after data transformation, both variables have shown a significance level greater than 0.05 so that it meets the criteria to accept H_0 and the data is normally distributed.

The multicollinearity test was conducted to test whether there was a correlation between the independent variables in the regression model. In this study, the tolerance value and its opposite variance inflation factor (VIF) with the cutoff value commonly used to indicate the presence of multicollinearity is the

tolerance value <0.10 or the same as $VIF > 10$. Exchange Rate has a tolerance value of 0.375 and a VIF level of 2.670. The Stock Market Index has a tolerance value of 0.386 and a VIF level of 2.593. The Consumer Price Index has a tolerance value of 0.945 and a VIF level of 1.058. From the overall data, it can be concluded that all independent variables do not have multicollinearity in the regression model so that all independent variables can be used in the regression model in this study.

The autocorrelation test aims to test whether in a linear regression model there is a correlation between the confounding error (residual) in period t and the error in period $t-1$ (previous). The results of the Durbin-Watson test are 1,462. With a significance level of 5%, the number of independent variables is 3 ($k=3$) and the number of samples is 32 ($n=32$), then in the Durbin-Watson table the D_U value (upper limit) = 1,650 and the D_L value = 1,244. The Durbin-Watson value is 1.134. From the hypothesis test based on the decision-making table from the Durbin-Watson test, the results obtained are $d_L \leq d \leq d_U$, With no decision, this research can still be continued.

Heteroscedasticity test is a test that aims to test whether in the regression model there is an inequality of variance from the residuals of one observation to another observation. In this study, the author uses scatterplot graph analysis to test whether or not there is heteroscedasticity. In this study, the pattern of dots is spread and does not form a certain shape. So it can be concluded that the regression model does not occur heteroscedasticity.

Hypothesis test - Result

Table 2. Goodness of Fit

Model	Adj. R Square (R^2)	F	Sig.
Regression	0.656	20.689	0.000

Based on table 2, the results of the coefficient of determination test indicate an adjusted R Square (R^2) of 0.656, as shown in the table above. Therefore, it can be stated that 65.6% of the variation in the dependent variable of Commodity futures gold is explained by the independent variable in this study, while up to 34.4% is explained by independent factors other than the independent variables in this study. According to the findings of the ANOVA test presented previously, the F value is 20,689 and the significance level is 0.000. The H_0 hypothesis is rejected and the H_A hypothesis is adopted with the conclusion that the consumer price index, exchange rate, and stock market index have a simultaneous effect on commodities future gold.

Table 3. Hypothesis Result

Model	Coefficients Beta	t	Sig.
(Constant)	55.178	9.810	0.000
X1	0.132	1.215	0.235
X2	-0.988	-5.738	0.000
X3	0.275	1.620	0.117

Dependent variable: Y

Regression equation based on table 3:

$$Y = 55.178 + 0.132 X_1 - 0.988 X_2 + 0.275 X_3$$

The above regression equation can be read as follows:

1. Constant at 55,178, indicating that if the variable X_1, X_2, X_3 (consumer price index, exchange rate, and stock market index) equals zero, then commodity future gold (Y) equals 55,178.
2. The regression coefficient is 0.132, which indicates that if the consumer price index rises by one unit, the commodity futures index will rise by 0.132, or 13.2%.
3. The regression coefficient is -0.988, which indicates that a one-unit increase in the exchange rate results in a 98.8% fall in the commodities futures index.
4. The regression coefficient is 0.275, which indicates that a one-unit increase in the stock market index will result in a 27.5% increase in the commodity futures index.

Results and Hypothesis t Test is explained as follows:

1. The independent variable consumer price index had no effect on commodity futures gold in Indonesia between 2011 and 2018 based on the findings of a t-test with a significance level of $0.235 > 0.05$.
2. The independent variable exchange rate has an effect on commodity futures gold in Indonesia from 2011 to 2018; the significance level is $0.000 < 0.05$.
3. The independent variable stock market index has no effect on commodity futures gold in Indonesia from 2011 to 2018, according to the findings of the t test, which indicate a significance level of $0.117 > 0.05$.

DISCUSSION

According to the findings, the Consumer price index has little effect on commodities futures. Similar to the index of the stock market, it is concluded that the stock market has no effect on commodity futures. The role of precious metals (particularly gold and silver) is as a safe haven and hedging instrument during economic and macroeconomic turmoil; however, their prices frequently contradict changes in the macroeconomy, as evidenced by the fact that stock market index variables have no effect on gold futures. (Joets et al, 2017). In contrast to macroeconomic variables in China and commodity futures, Ye et al. (2019) conclude that there is a substantial association between macroeconomic variables such as the consumer product index and commodity futures in China. The conclusion is that the exchange rate has an effect on the dependent variable commodities futures. The results of the regression model indicate that a rise in the value of the Rupiah versus the U.S. dollar will cause a decline in the price of gold futures contracts. Mo. et al. (2017) discovered that the real effective exchange rate indicates a negative relationship between the US dollar and commodity volatility. This shows that the rise of the U.S. dollar will lessen the volatility of futures contracts on commodities. The results demonstrate a negative association

between leading economic indicators and the volatility of existing commodity futures in China. Typically, gold goes in the opposite direction of the dollar. Thus, if the US currency appreciates, gold futures will decline because investors using other currencies will find gold to be more expensive. Exogenous factors (external driving factors) such as the trade war between the United States and China also affect the strength or weakness of the US dollar. Where investors are extremely concerned about the effects of a trade war between the second- and third-largest economies in the world after the United States. A weakened dollar could increase the desirability of assets pegged to currencies, such as gold, to buyers using other currencies. This causes investors to choose investing in gold investment instruments, sometimes known as safe-haven investments.

CONCLUSION

In Indonesia, macroeconomic variables such as the consumer price index and the stock market index have little effect on the dependent variable of commodity futures gold. And the exchange rate variable has a very big impact on the stock market index's independent variable. Which indicates that any change in the price of gold on the futures exchange is not driven by both the economic elements of the Indonesian CPI and JCI, but by changes in the exchange rate of the rupiah relative to the US dollar and other factors outside the scope of this study.

Based on the findings, this study can be utilized as a reference for future research on macroeconomic factors affecting commodity futures gold in Indonesia for a more current time period than the one examined in this study. Several other macroeconomic indicators, such as money supply, short-term interest rate, and industrial production, can be the subject of additional investigation.

Investors in the derivatives exchange business might analyze the internal and external factors that influence commodity futures gold in Indonesia. Based on the findings of this study, it was determined that the exchange rate or the exchange rate of the Indonesian rupiah against the U.S. dollar had a considerable impact on future gold commodity prices in Indonesia.

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