IMPACT OF FEDERAL FUND RATE, AMERICA INFLATION RATE, AND NEW YORK STOCK EXCHANGE COMPOSITE INDEX ON RETURN OF GOLD PRICE

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ABSTRACT

Gold has evolved from time to time in both its benefits and shape. In the world of the economy, gold has gained a vital role as a tool for transactions from coins to banknotes but as time went on it began to diminish its role in the economy since the end of the Bretton Wood Agreement. The price of gold was initially stable, and then started to move up and down. The volatility caused many economists to begin to find out what factors are causing the movement of gold prices. Unfortunately it is still not clear what factors affect the gold price. Many factors such as stock market, inflation, currency and even random walks have been tested to find factors that affect the gold price movement. The objectives of this study were to measure and to evaluate how big the effect of variables that are America Inflation Rate (AIR), Federal (FED) fund rate, New York Stock Exchange (NYSE) composite index and the previous return of gold price on return of gold prices.This research used descriptive analysis, goodness of fit tests and multiple regression models. The data used was monthly data from January 2008 to December 2018. The result shows that previous return of gold price has significant effect, NYSE has marginally significant effect and two last variables; FED fund rate and AIR had no significant effect on the return of the gold price.

Keywords: Gold Price, Fed Fund Rate, America inflation, NYSE composite Index, Previous Return of Gold

INTRODUCTION

Gold is a precious metal in the world that is used as a financial asset and property. The history of gold as a transaction tool has begun a long time ago especially at Croesus King era around 560 BC ago in Lydia (now known as Turkey) who ordered to make the first gold coin. In 1297, gold price was set by Great Britain at 0.89 pounds per ounce and added by around 1 pound each century. In 1718, London market price started giving a gold price per ounce in pound sterling then changed into US dollars in 1950. The use of gold coin has begun to reduce because of business development and fiat money is gold coin replacement. In 1800s many countries started to print its money then followed by America in the 1900s. At first, fiat money must be guaranteed by the amount of gold that the country has and because of this, it limited country to print money more than the amount of gold that country own. This era is known as gold standard. In 1944, World War 2 allied country gathered in Bretton Woods in order to make a new international monetary system that aims to create a trade stability without a trade war between nations after World War 2. It was done by linking US dollar to gold, and country that was member of IMF would maintain a fixed exchange rate against the US dollar, which, in turn, is pegged at the gold price, set at $ 35 per ounce. The arrangement is known as Bretton Woods agreement. (Ghizoni, S,2013).

On August 15, 1971, Richard Nixon, the 37th President of the United States did a unilateral cancellation of the direct international convertibility of the United States dollar to gold and it became the end of Bretton Woods agreement and gold standard. This event is known as Nixon Shock. Gold price that remained stable during Bretton Woods agreement started moving and fluctuating. For example, gold price increased by 110% in only two years in period of 1971 – 1973 compared to gold price during Bretton Woods agreement that only increased by 21% in 27 years. Since that, economists started observing gold price and study how the gold price was related to variables such as interest rates, stock index, GDP ,other macroeconomic variables and even a superpower country like America. Because of its difficulty to determine what factors influence and how big the effect on the gold price. Researcher take several variables from America data that are easy to get from news or information such as American inflation, fed fund rates, NYSE composite index and gold return itself to be tested. The scope of paper only focuses on that four variables with limited time frame from 2008 until 2018. The objective to see how big the effect of variables on the return of gold price through multiple regression models to see its significant or not significant effect.

LITERATURE REVIEW

Many studies have been done to know what variable that impact gold price. Some studies are:
1. According to Smith (2002), in order to find relationship between the gold price and stock exchange used data between 1991 and 2001 from 18 stock exchanges from many countries such as United Kingdom, Germany, Japan etc. In conclusion that a weak and negative relationship between gold prices and stock exchange in short run
2. According to (Al-Ameer, Hammad, Ismai & Hamdan, 2018), there is strong and high negative correlation between gold and stock exchange in non-financial crisis condition.
3. According to Tufail and Batool (2013), gold price has positive relation with inflation on short run.
4. According to Naser (2017), using US inflation data from April 1968 until June 2016, gold can be used as an inflation hedge on short run.
5. According to Abdullah & Jaffri, (2015), gold price and real interest rate are inversely related as revealed through the Gibson's paradox.
6. According to Shankari & Manimaran (2015), there is a weak form efficiency in gold price movement.

RESEARCH METHOD

This study analyzes the impact of independent variables on dependent variable. The independent variables are American inflation, fed fund rates, NYSE composite index and previous return of gold. Dependent variable is return of gold price.

Return of gold price is the difference between the change in the price of gold t-1 and the price of gold t. In this research, the gold return data is monthly return of average price of gold and measured in percentage unit (%). Efficient Market Hypothesis is a market that fully reflected the available information (Fama, 1970) and because of its independent price, the theory is associated with "random walk" that describe a fluctuation of price where price movement changes because of a random behaviour. A good previous information will affect the behaviour of people to buy more gold.

Inflation is an increase in the overall level of prices (Mankiw, 2009). In this research, America Inflation data used is monthly data and measured in percentage unit (%). High inflation rates indicate that investment risk is quite risky because high inflation will reduce the rate of return for investors that lead people to exchange its wealth to types of securities that can maintain its value such as houses or gold. (BPFE, 2011). It means positive relationship occurs that increase on inflation will increase gold price.

Federal Fund Rate is the overnight interest rate at which banks lend to one another (Mankiw, 2009). The FED fund rate is regulated by The Federal Open Market Committee (FOMC) that is a group within The FED that makes monetary policy consisting of 12 members. In this research, Fed fund rate data used is monthly data and measured in percentage unit (%). According to Suharto (2013), an increase in interest rates will result in a decline in the price of gold and vice versa. As a result of rising interest rates, investors will prefer to invest their money in the money market or instruments such as savings and deposits rather than invest in gold that has higher risk. Thus, interest rates have a negative relationship with the gold price.

The New York Stock Exchange (NYSE) is the leading stock exchange in the world that trade with almost 1.46 billion shares traded each day (Advfn.com, 2019). A composite index is a collection of equities, securities, or indexes that are averaged together to represent overall market or sector performance (Tardi, 2019). In this research, The Composite Index data used is monthly return of New York Stock Exchange Composite Index, measured in percentage unit (%). As a substitute product of gold, stocks gives another option for investors gain better return as a result investors shift their property to more profitable investments. It means negative relationship occurs that increase on stocks will decrease the gold price.

The sample data is in period of January 2008 – December 2018. Linear multiple regression analysis was used to analyze the variable. There were two test that has been done such as the classic analysis test and goodness of fit test.

The classic analysis test is needed to be done because it explain either the data can be used or not for research to avoid misleading information and a statistical requirement for linear multiple regression analysis based on ordinary least square. It consists of multicollinearity, autocorrelation, heteroscedastic and normality. Multicollinearity aims to test whether there is a high correlation among independent variables in a regression model (Ghozali, 2012). Autocorrelation aims to test whether in the regression model there is a correlation between the error of the intruder in the t-period and the intruder in the t-1 period (before) (Ghozali, 2012). Heteroscedasticity aims to test whether in the regression model there is an unequal variance from the residuals of an observation to another observation (Ghozali, 2013). Normality aims to test the independent and dependent variable data on regression whether it has normal distribution or abnormal distribution (Ghozali, 2013).

Goodness of fit test is used to assess the accuracy of the sample regression function in estimating the actual value. It consists of F-Test, T-Test and the coefficient of determination. According to Ghozali (2013), F-Test basically shows whether all independent variables in the regression model have a joint influence on the dependent variable. According to Ghozali (2012), T-test is used to test how far the influence of the independent variables used in explaining the dependent variable. The coefficient of determination (R^2) is a tool to measure how far the model's ability to explain the variation of the dependent variable (Ghozali, 2012).

RESULT AND DISCUSSION

The tables below will show results of the classic analysis test that are:

1. **Multicollinearity Test**

$Coefficients^a$		
	Collinearity Statistics	
	Tolerance	VIF
US Inflation	0,712	1,405
Fed Fund Rate	0,736	1,360
New York Stock Exchange	0,927	1,078
Return of Gold Price t-1	1,000	1,000

Dependent Variable Gold Price

It can be seen that each independent variable has tolerance value more than 0.01 and VIF value less than 10 means that each independent variable is not explained by other independent variables and does not correlate with each other.

2. **Autocorrelation Test**

Model Summary[b]

R	R Square	Adjusted R Square	Std. Error of Estimate	Durbin-Watson
,245[a]	,060	,030	,03713	2,030

a. Predictors: (Contant), Return of Gold Price t-1, US Inflation, Return of NYSE, Fed Fund Rate

b. Dependent Variable: Return of gold price t

The test show no positive or negative autocorrelation because the value of d (2.030) is within the interval of du (1.7786) and $4 - du$ (4 - 1.7786 = 2.2214) so the result is $1.7786 < 2.030 < 2.2214$

3. **Heteroscedasticity Test**

Scatterplot
Dependent Variable: gldprc
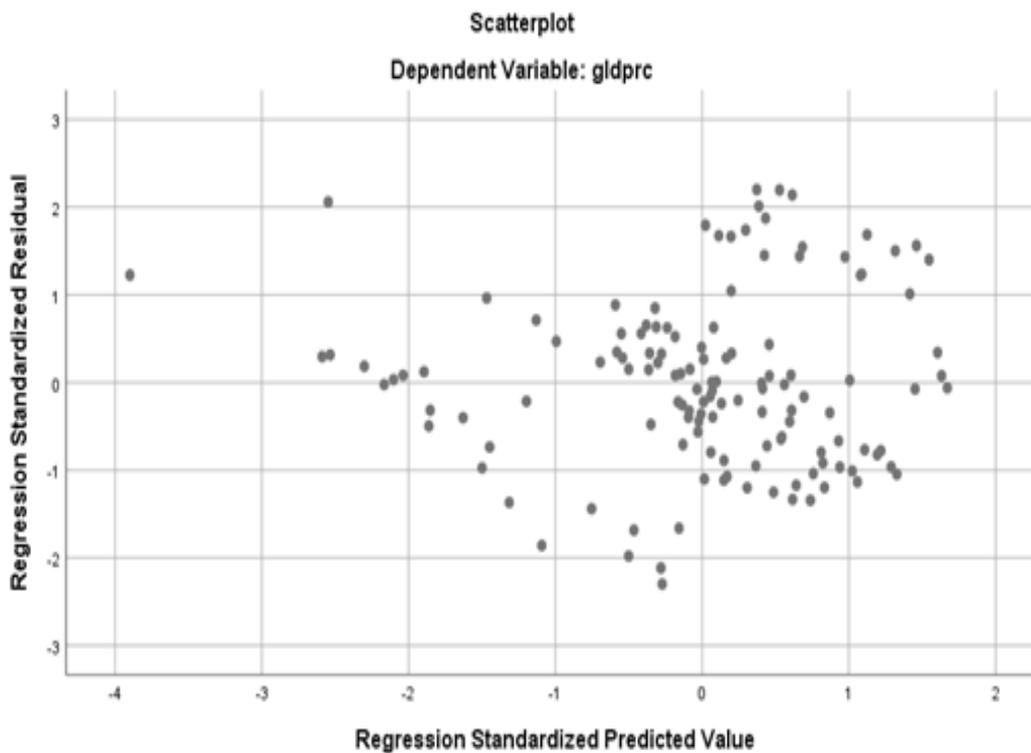
The plot is spread evenly and there are only a few plots that are far. It can be concluded that the regression model for this research is homoscedasticity.

4. Normality Test

Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Gold Price
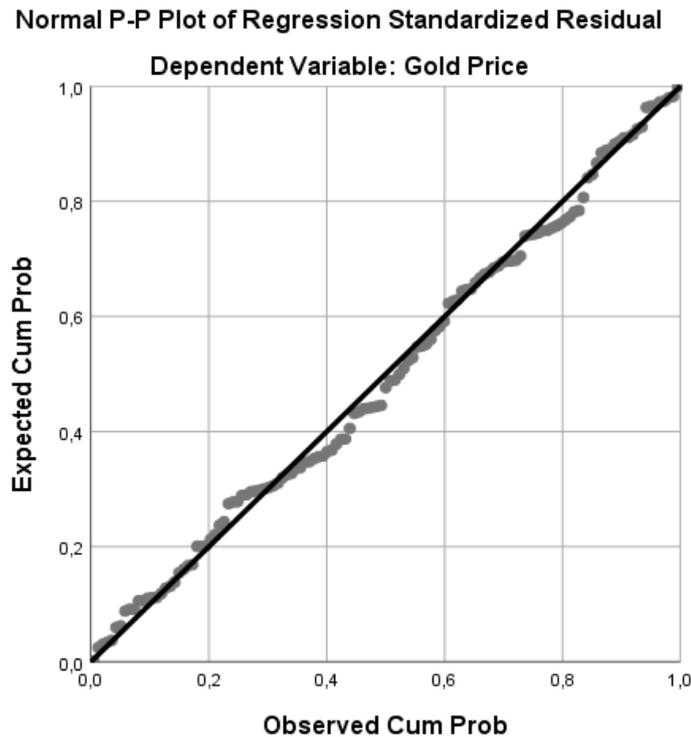
The residual plot is close to the regression line which shows that the data is normal and can be used for drawing conclusions. From the result, the data is fulfilled the standard for linear multiple regression analysis based on ordinary least square.

The tables below will show results of linear multiple regression analysis for each variable that are:

1. US Inflation Statistical Result

	Value	Standard
T	-1,003	1,97897
Sig	0,841	0,05
Coefficient	-0,003	

It shows that the America Inflation rate has no significant impact and negative correlation.

2. Fed Fund Rate Statistical Result

	Value	Standard
T	-0,327	1,97897
Sig	0,372	0,05
Coefficient	-0,002	

The FED fund rate has negative effect but not significant impact.

3. Return of NYSE Composite Index Statistical Result

	Value	Standard
T	-1,425	1,97897
Sig	0,079	0,05
Coefficient	-0,103	

Return of New York stock exchange rate has negative correlation but it has marginally significant impact since the sig value between zero or one toward return of gold price

4.   Return of gold price t-1 Statistical Result

	Value	Standard
T	2,243	1,97897
Sig	0,014	0,05
Coefficient	0,188	

Based on the test that has been done, the return of gold price t-1 has a positive effect with significant impact toward return of gold price.

CONCLUSION

This paper conducts an investigation about the impact of several economic variables over a period of time toward return of gold price. These variables are American inflation, fed fund rates, NYSE composite index and previous gold return. Using monthly data for over ten years from January 2008 – December 2018.

From the results, it shows that only one out of four hypothesis that is supported by the data. The return of the gold price is affected by random walk momentum with trend. One other factor that is NYSE Composite Index Return has a marginally significant effect on the return of the gold price. The study can be used as supported data for investor in deciding when to buy or sell gold by looking at the trend of return of gold price.The limitation of study are the data used in the form of monthly data but the price of gold moves all the time and the variables data used are limited.

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