GOLD: HEDGE, SAFE HAVEN OR DIVERSIFIER

FOR INDONESIAN CAPITAL MARKET

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Abstract

This study scrunitize whether gold can act as hedge, diversifier and safe haven in Indonesian Capital Market. Data employed in this study are monthly Jakarta Composite Index and monthly international gold spot price during January 1999 to September 2013. Using Generalized Autocorrelation Conditional Heteroscedasticity (GARCH), the results show that gold can not act as hedge and diversifier in Indonesian Capital Market because both instruments have comovement. Furthermore, gold can not act as robust safe haven in Indonesian Capital Market. These findings suggest that it is better to investors whose already hold Indonesian stocks as their portfolio to exclude gold as their part of portfolio and divert their portfolio to other instrument with risk free characteristic such as Indonesia sovereign debt and Indonesia sovereign Sukuk during financial market crash.

Keywords: Gold, JCI, Hedge, Safe Haven, Diversifier
JEL Classifications : G1, G10, G11, G15.

Background

Gold is one of the crops or the most valuable commodity in the world. Most people are familiar with these crops. Gold has been known since antiquity BC and used as a tool of selling and buying. Over the last few years, the gold that use as a financial asset acquired a reputation as a safe haven in times of financial turmoil. The study on gold as a safe haven pioneered by research of Capie et al. (2005) that attempts to examine whether gold can be a safe haven for US Dollar. Hillier et al. (2006) did the study that began to evolve into realm

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of capital markets. The study of Hillier et al. (2006) examines the role of gold and commodities on the stock market and found that in the period of 1976-2004, gold has little correlations with S&P500 Index. But an academic study in depth about gold as a safe haven in the capital market began to flare after Baur and Lucey (2010) introduced the concept of gold as safe haven.

Baur and Lucey (2010) defined safe haven as an asset that has no correlation or negative correlation with other asset or portfolio when the market conditions are fluctuate. Diversifier defined by Baur and Lucey (2010) as an asset that has positive correlation (but not a perfect correlated) with the other asset or portfolio. Similar to hedge, diversifier does not have a special character to reduce the risk in extreme market because correlation is only required for all periods in the average. According to Baur and Lucey (2010) hedge is defined as asset that has no correlation or negative correlation with other asset and portfolio. Hedge asset has no special characteristic which can reduce losses when the market is fluctuate and stressful, so that it can occur when the market is fluctuate, an asset has positive correlation with the other asset and in normal market it has negative correlation with other asset.

The study of gold as a safe haven in the Indonesian capital market by adopting concept introduced by Baur and Lucey (2010) is still relatively rare. Therefore, the study aims to prove the gold as hedge, a safe haven or diversifier to the Indonesian stock exchange by adopting a concept introduced by Baur and Lucey (2010). The price of gold that were examined in this study is the spot price of gold in the international market as a reference for gold futures-products, which is one of futures-products traded by futures-products company in Indonesia. When it discovered that gold can be a hedge in Indonesian stock exchange, investors can use this instrument to secure the investment portfolio in Indonesia stock exchange at all times. Meanwhile, when it is discovered that gold can be a safe haven in times shares are listed in Indonesia stock exchange experiencing a drastic decline in price, investors can secure the investment value with opening the buying contract of futures-gold. Furthermore, when it is discovered that gold can be a diversifier for Indonesia stock exchange, investors can use the instrument as one instrument among asset classes in the investment portfolio.

Figure 1.
WORLD PRICE MOVEMENT COMPARISON WITH COMPOSITE STOCK
PRICE INDEX (IHSG)
PERIOD OF JANUARY 1999 – SEPTEMBER 2013
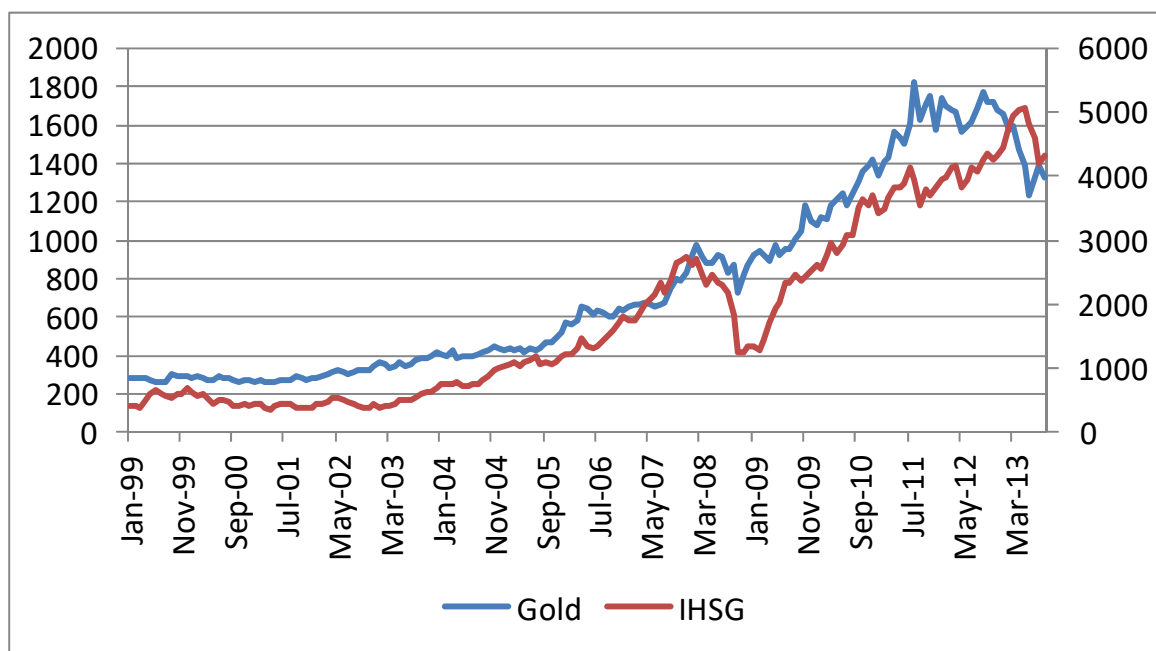
Information: LHS is World Gold Prices
                     RHS is Stock Price Index
Sources :Capital Market Statistics, Meta Trader, Bloomberg and World Gold Council, be
processed.

Literature Review

Three characteristics of risk assets

Baur and Lucey (2010) divided assets in 3 (three) characteristic of asset risk:

a. Hedge

Hedge is defined as assets that are not correlated or negatively correlated with other asset or portfolio. Hedge asset does not have a specific characteristic which can reduce the losses when the market volatile and stressful so that it can occur in time the market is volatile, the asset has positive correlation with other asset and in the normal market it has negative correlation with other asset.

b. Diversifier

Diversifier is defined as an asset that has positive correlation (but not perfect correlated) with other asset or portfolio. Similar to hedge, diversifier does not have a specific

character to reduce the risk in extreme market because correlation is only required for all periods in the average.

c. Safe Haven

Safe haven is defined as asset that has no correlation or negative correlation with other asset or portfolio when the market is in volatility condition. Characteristic feature of this asset is the absence of correlation with other asset or portfolio in extreme market condition. This feature does not impose the correlation should be positive or negative in average, but its only no correlation or negative correlation in the certain period. So that in the normal market condition or bullish, the condition could be positive or negative. If the safe haven asset correlated with other asset or portfolio in the extreme market, it shall provide compensation for losses for investor, because safe haven asset increase when other assets depreciate.

Gold

Gold is a chemical element in the periodic table that has the symbol Au (Latin: Aurum) and atomic number is 79. It is a transmission of metal (trivalent and univalent) that soft, shiny, yellow, heavy, 'malleable', and 'ductile'. Gold does not react with other chemicals but is attacked by chlorine, fluorine and aqua regia. This metal is widely available in the gold nuggets or dust on the rocks, in alluvial deposit and is one of the coinage metals. The ISO Code is XAU. Gold melted into liquid form at a temperature of about 1000 degrees Celsius (source: http://mineral.galleries.com).

The role of gold in the economy is very important as most of the foreign exchange reserves of the developed countries is in the form of gold. So that, every movement of the gold prices will affect the amount of foreign exchange reserves to the countries which have their reserves in form of gold. As gold has an important role in the economy as well as for investment then there are a variety of ways to invest in gold. According to (Demidova-Menzel and Heidorn 2007) gold investment can be done in several ways::

1. Gold investment in physical form (jewelry, bullion, coins)
2. Buying Gold Pool Account (nowadays often called gold ETF/Exchange Traded Products)
3. Buying futures-investment
4. Buying gold backed securities, such as Xetra Gold
5. Investment in gold mining companies.

At the present time, investors buy gold to hedge and safe haven against market volatility. Gold market remains liquid during the financial crisis even when other financial market experienced a liquidity shortage. Gold is a metal that is highly liquid, traded 24 hours a day and has a large denomination with small spread (Tully and Lucey 2007). This reflects the depth and breadth of gold market that make it attractive to the investors.

Stock Price Index

Stock price index is a value that is used to measure the performance of stocks listed on a stock exchange. Stock price index issued by the concerned stock exchange and some were issued by private institution such as, financial media, financial institution, etc. (Ang, 1997).

Stock price index is a main indicator which is show stock price movements. Stock price index is the number of stock price that is compiled to result a trend. And it shows a company's performance, corporate performance and companies listed on the stock exchange. Stock price index is a summary of simultaneous and complex impacts on the affected factors. Even, the stock price index can be used as a barometer that shows the economic health of a country and is premised upon statistical analysis of last market conditions. In the stock transaction, the investors use the stock price index in view of market conditions that will be used to make decision.

An increase in stock price index shows the market is aroused; when the market price index unchanged, it indicates a stable market situation; and when the stock price index decreases, it means market conditions are sluggish.

Composite Stock Price Index (IHSG) in Indonesian Stock Exchange

As an indicator for stock price movements that listed in Indonesian Stock Exchange (formerly Jakarta Stock Exchange and Surabaya Stock Exchange), IHSG first time introduced on April 1st 1983. Meanwhile, on August 10th 1982 was the day for counting at 100. The formula used to calculate IHSG is the Paasche formula as follow (Ang 1997):

$$IHSG = \frac{\sum (P_S \times S_S)}{\sum (P_{base} \times S_S)}$$

Where :

IHSG = Composite Stock Price Index

Ps   = Stock Price

Ss   = Outstanding Shares

Pbase = Base price of stock

IHSG (Composite Stock Price Index) has obtained registration approval from the Directorat General of copyrights, patent and trademarks, the Department of Justice Republic of Indonesia. Certificate of approval granted on March 24th, 1999 with the number 019525 for IHSG. This index is continuously displayed through display wall in the market floor and spread to data vendor through the data feed.

Previous Studies

Few studies have attempted to explain the potential gold as hedge and safe haven for capital market investment. Jaffe (1989) did pioneering research of the potential of gold as a hedge. melakukan penelitian yang mempelopori potensi emas sebagai pelindung nilai. Jaffe (1989) used the data from the year 1971-1987for its research. The data used was the gold prices in international market, stock prices of the gold mining companies and index S&P500 as a proxy US stock market. Jaffe (1989) concluded that gold is hardly correlated with the stock market movements but the stocks of gold mining companies are positively correlated with the stock market in the US.

Capie et al. (2005) searched gold as a hedge for US currency. Meanwhile, Hillier et al. (2006) researched the role of gold and commodity against stock market on the period 1976-2004. In this research, Hillier et al. (2006) found that gold has low correlation with S&P500. In the research, Capie et al. (2005) used the gold price data and Pound sterling exchange rate against US Dollar, and US Dollar against Yen Japan; started on January 8th, 1971 to February 20th, 2004. By using GARCH analysis, the results showed that gold is a hedge for US Dollar. Gold becomes a hedge as it is easy continuously traded and cannot be produced by authorities who also produce currency. Meanwhile, Hillier et al. (2006) found that gold has low correlation with S&P500.

Baur and Lucey (2010) did the similar research with Hillier et al. (2006) Hillier et al. (2006) with the development in asset such as shares, bonds, and gold. Baur and Lucey (2010) use the data of closing spot price of gold in the US, stock index data MSCI and bond index data for the period of 10 years MSCI (period of November 30th 1995 to November 30th 2005). Analytical technique used is the technique of using regression with dummy

variables for market conditions and analysis techniques GARCH. Baur and Lucey (2010) found that gold is safe haven for the stock in the limited time but gold is not safe haven for bonds in any market. Gold can be a safe haven when market conditions are very volatile and will be detrimental if stored for long period.

In Asia, the research about gold as safe haven did by Ibrahim and Baharom (2012) with examination the potential of gold in Malaysia (Kuala Lumpur Stock Exchange). The research use gold price data in local market named Kijang Emas in the period August 2001 to March 2010. Using GARCH and EGARCH, found the result that gold can be a hedge and safe haven for Malaysian Capital Market, only in the period of August 2001 to November 2005. In the high volatile condition which is represented by this period, correlation between gold and stock market are stronger. This occurs because stock markets are continuously volatile; it is about in time of crisis subprime mortgage. This research concluded that gold is more suitable as a diversifier asset than safe haven.

The difference of this research with the previously, is the object and time of research. Furthermore, the research divided period of extreme bearish with using quintiles and deciles. First group of quintiles and deciles are group with a decrease in the stock price index spread in a month.

Formulation of Hypothesis

Empirically, an asset seen as hedge if an asset has no correlation or negative correlation with the underlying asset in the average Joy 2011). The main difference between the hedge and safe haven is the time period. Hedge functions occur in long term, haven functions only occur in the extreme condition Baur and Lucey 2010; Baur and McDermott 2012). Empirically, gold as an instrument of hedging proved by Jaffe (1989); Beckmann and Czudaj (2012); Faubert (2012); Dee et al. (2013). The result of Morales (2009) research is also show that precious metals market is not affected by movements in the stock market so that is can be a hedge. Therefore, formulated the following hypotheses:

H1   : Gold can be a hedge for Indonesian Capital Market

Coudert and Raymond-Feingold (2011) stated that the function of the asset can be seen as a safe haven in time of economic and financial volatile. In that time, asset prices are risky to fell simultaneously. Losses that realized on the market will create a shortage of liquidity in other markets, and can trigger massive sales of existed risky assets. So that, the

investor will flock invade assets deemed safe like T-Bill and T-Bond, gold and even other commodities. Along with the transfer of funds towards higher quality assets, the price of safer assets will increase. The research of Miyazaki et al. (2012) proved that in time of financial market crash, gold become a safe haven. Even, the research of Jubinski and Lipton (2013) concluded gold is tendency to have a positive correlation with the volatile in the stock market, and supporting the idea that gold can act as a safe haven. Therefore, the following hypotheses:

H2   : Gold can be a safe haven for Indonesian Capital Market

Baur and Lucey (2010) defined diversifier as asset that has positive correlation (but not perfect correlated) with other assets or portfolio. The research that found gold can be a diversifier is Ibrahim and Baharom (2012) which is conducted a study on gold's roles in Malaysian Capital Market (Kuala Lumpur Stock Exchange). Generally, this research concluded gold is a diversifier asset comparing to safe haven in Malaysia Capital Market. If in Malaysia found that gold can be a diversifier, it also can found in Indonesia. Therefore, formulated the following hypotheses:

H3   : Gold can be a diversifier for Indonesia Capital Market

Research Methods

Data and Periods of Research

Data used in this research is data of monthly closing gold price in International market and composite stock price index (IHSG) on monthly closing in Indonesia Stock Exchange. The data in the International market price of gold was obtained from Bloomberg and Meta Trader. Meanwhile, the IHSG data is obtained from Capital Market Statistics which is published by OJK (Financial Services Authority).

The Period of research used in this study is January 1999 to September 2013. Period have been due to the availability of data, and it is covered some market crash like Dot Com Bubble Burst which occurred in March 2000 and worsened by September 11, 2001 attack, the Chinese Correction on February 2007, and Global financial crisis in 2008. Furthermore, in this period there were significant movements on the price of gold, started from level $200 per troy ounce in the year of 2000 to nearly $2000 per troy ounce on 2011.

Definition of Operational Variables

Followings are the definition of operational variables in this research :

1. Gold return, measured by the ratio measurement scale, calculated with the formula of:

$$R_{Gold,t} = \left[\frac{Gold_t - Gold_{t-1}}{Gold_{t-1}} \right]$$

Where :

GOLD$_t$ = The closing spot price of gold on the month t

GOLD$_{t-1}$ = The closing spot price of gold on the month t – 1

1. Market Return, is market return of Indonesian Stock Exchange. Measured by ratio measurement scale. Return in Indonesian Stock exchange is calculated with the following formula:

$$R_{m,t} = \left[\frac{IHSG_t - IHSG_{t-1}}{IHSG_{t-1}} \right]$$

Where :

IHSG$_t$ = The closing IHSG on the month t

IHSG$_{t-1}$ = The closing IHSG on the month t – 1

Data Analysis Technique

Data analysis technique is done by using Generalized Autoregressive Conditional Heteroskedasticity (GARCH) which is developed by Bollerslev (1986). GARCH model is the development of ARCH models that are based on the principles of parsimony or choose a simple model that will ensure the variance is always positive.

GARCH models used for gold equation is :

Return GOLD = β_1 *Return* IHSG$_t$ + ε_t

With :

$\varepsilon_t = \Phi_t \varepsilon_{t-1} + ... + \Phi_t \varepsilon_{t-p} + \eta_t$

$\eta_t = \sigma_t \epsilon_t$

$\sigma^2_t = \alpha_0 + \alpha_1 \eta^2_{t-1} + .. + \alpha_p \eta^2_{t-p} + \beta_1 \sigma^2_{t-1} + ... + \beta_q \sigma^2_{t-q}$

and ϵ_t is *independent and identical distributed* N(0,1) and it is not depending on the past condition of η_{t-p}.

GARCH analysis is done in 2 steps: first, was using the existed data to examine gold to be   a hedge or diversifier in Indonesian Capital Market; second step is done by using the data include quintile and decile to examine gold as safe haven.

Diagnostic test like ADF (Augmented Dickey Fuller) test used to examine the data stationary and Jarque-Berra test to examine residual normality.

Hypotheses Testing

Hypotheses 1 is accepted when the value of the regression coefficient t GARCH towards IHSG is not significant or negative affected significantly.

Hypotheses 2 is accepted when the value of the regression coefficient t GARCH towards IHSG is not significant or negative affected significantly on quintile and decile

Hypotheses 3 is accepted when the value of the regression coefficient t GARCH towards IHSG not significant but positive.

Result Research and Discussion

Residual Normality Test Result

A model is good if the residual is normally distributed. Assumption of normality in the residuals is tested using the Jarque-Berra (JB) test:

$$JB = n \ ((S^2/6) + (K-3)^2/24)$$

Where :

S   : Skewness

K   : Kurtosis

Null hypotheses of JB test is normally distributed residuals. Decision can be made using JB statistic, besides, the test can be done using its probabilities. If the probability is above 5%, then the assumption of normality cannot be rejected.

The value of JB statistics for hedge/diversifier equation is 4,8238 with its probability value is 0,0896.

The value of JB statistics for safe haven equation on quintile is 0,8277 with the probability 0,9865, and for safe haven equation on decile is 0,8277 with the probability 0,6611.

This case shows that all residuals in equation has a normal distribution because JB statistics is not significant at 5% level of confidence. The result of residual normality test can be seen in the following table:

Table 1. Residual Normality Test Result

Information	Hedge/Diversifier	Safe Haven	
		Quintile	Decile
JB Statistics	4.8238	0.8277	0.8277
Probability	0.0896	0.9865	0.6611

Resource : Capital Market Statistic, Meta Trader, Bloomberg be processed.

Test Result of Data Stationary

The test of data stationary is using ADF for level 1st order and 2nd order. If the data is not stationary (unit root), it is necessary to test the degree of integration. This test is intended to look at the degree or order differentiation observed to how the data will be stationary.

A complete result can be seen at Table 2. According to Table 2, both of gold variable or IHSG has the value of 1 for the significant ADF test. Therefore, the hypotheses which the data is unit root is rejected. This case shows that the data does not have a unit root and stationary:

Table 2. Data Stationary Test

Information	GOLD	IHSG
Level	-15.047*	-10.541*
1st Order	-10.712*	-15.637*
2nd Order	-9.0152*	-12.364*

Resource : Capital Market Statistic, Meta Trader, Bloomberg be processed.
Information : * significant at 1% at the level of confidence

According to Table 2, it showed that both variables of Gold and IHSG have value of t for significant ADF test. Therefore, the hypotheses which stated that data is unit root has rejected. This shows that data does not have unit root and stationary.

Test Result Gold as Hedge, Safe Haven and Diversifier

Analysis result can be seen in the table 3 as follow:

Table 3. GARCH Analysis Result

Information	Hedge/Diversifier	Safe Haven	
		Quintile	Decile
Coefficient	0.1493	0.0157	0.1949
Z Statistics	3.5323**	0.0782	2.4809*
Probability	0.0004	0.9376	0.0131

Resource : Capital Market Statistic, Meta Trader, Bloomberg be processed.
* significant on the 5% level of confidence
** significant on the 1 % level of confidence

Analysis results that examine whether gold can be a hedge in Indonesian Capital Market showed that IHSG movement is in the direction of gold movements. This is indicated by the value of the coefficient is positive at 1% significance level. This case shows that there is co-movement between IHSG and gold so that gold cannot be a hedge for Indonesian Capital Market. Therefore, the hypotheses 1 that gold can be a hedge in Indonesia capital Market is not proven.

Furthermore, coefficient value which marked a significant positive lead to the conclusion that the gold cannot be a diversifier for Indonesian Capital Market because in fact, gold even has a perfect correlation with Indonesian Capital Market. Therefore, the hypotheses 3 that stated gold can be a diversifier in Indonesian Capital Market is not proven.

The research also found the ability of gold as safe haven in Indonesian Capital Market is relatively not sable. In time of a decline on about 8,5% (quintile in average) in a month, gold can be a safe haven. But in time of a decline bigger, on about 11,5% (decile in average), gold cannot be able to maintain its position as a safe haven. This happens because at this extreme decline occurs co-movement of gold and Indonesian Capital Market as investors preferred to do a sell off. Therefore, the hypotheses 2 which is stated that gold can be a safe haven for Indonesian Capital Market is not proven.

Closing

Conclusion

The purpose of this research is to prove the gold can be a hedge, safe haven or diversifier against Indonesian Stock Exchange. The result showed that gold proved to have the direction and significant movement with IHSG in Indonesian Capital Market (Indonesian Stock Exchange). Therefore, gold cannot be a hedge and diversifier in Indonesian Capital Market. The research also found there are potential gold to be safe haven in Indonesian Capital Market but it is relative, because in time of deeper decline of stock market, the potential will disappear. Even, the movement is in direction between gold and Indonesian Capital Market. Therefore, concluded that gold is not proven as hedge, safe haven or diversifier towards Indonesian Stock Exchange.

Implication and Recommendation

Investors should choose an alternative investment than gold as part of its portfolio when it entered stock listed in Indonesian Stock Exchange as a part of portfolio, because the

gold is not fit for use as a facility of diversification for stocks in Indonesia. Investors also do not need to consider gold as the safest assets to transfer its assets in the event of crash in Indonesia Capital Market. Better investors shift their assets into risk-free of instruments like SUN (Surat Utang Negara/Government securities) or SUKRI (Sukuk Republik Indonesia).

Meanwhile, to the researchers who are interested in doing the research in the same field can add instruments derived from asset classes other than gold to test its potential as a hedge, safe haven or diversifier on similar studies in the future. Beside, the researchers are suggested to examine the stock exchange other than Indonesia Stock Exchange.

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