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Gold versus stock investment: An econometric analysis

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Abstract

It is important to have a portfolio in investment to diversify the investment to different kinds of instruments. Based on previous research, it is concluded that gold is a good portfolio diversifier, a hedge against stock and safe haven in extreme stock market condition. As an investment instrument, stock is exposed to macroeconomic risks and global stock market risks. In this research, we conduct a comparison between the stock investment and gold investment by using the probit econometric model and data from 1997 to 2011. The final result obtained from the model shows that the gold investment is more advantageous than the stock investment.

Keywords: Gold investment, Probit model, Safe haven, Hedge, Investment portfolio

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1. Introduction

Investment defined as idle money which is put away for future use (Tyson, 2011). There are a lot of investment instruments in which investors could invest their idle cash including stocks, bonds, mutual funds, real estate, foreign currency, or gold. Gold has always been a much trusted investment which offers a good financial return to the investors. There are significant benefits in gold investment that help meet the objectives of the investors. For example when investors invest in gold, they invest in tangible assets, when compared to investment in stock. Figure 1 shows gold price (using weekly price) starting from July 1997 to November 2011.

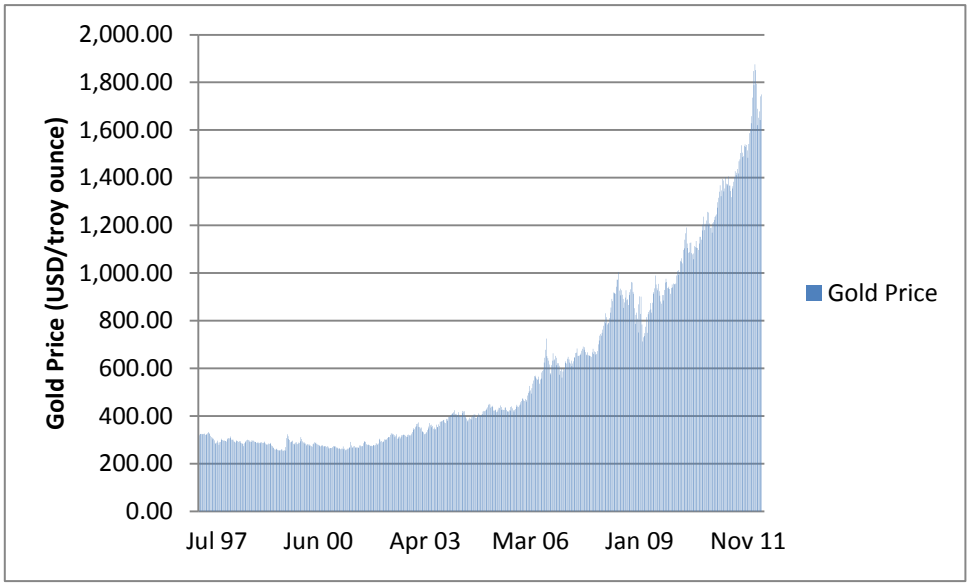

Figure 1. Gold price from July 1997 to November 2011

This figure shows that gold price increases significantly during the last 14 years. Historically, the gold has been considered as safe haven for the investors; "an investment that is quite safe from crisis". Figure 1 clearly shows that there is no significant declining price even during US financial crisis of 2007-2008 and European debt crisis of 2010. Trend of gold price continue hiking, although from investors view it is not assured a positive return for them. Figure 2 shows gold return using same period as in figure 1. From figure 2, it could be seen that there is fluctuative weekly return of gold. Although it moves fluctuatively, investment in gold has less-risk exposure than investment in stock. Figure 3 shows comparison between risk of gold investment and risk of stock investment.

Past studies have revealed that the there is relationship between gold price and stock. In this research we provide comparison between the gold investment and the stock investment with the objective of identifying which one could be considered as better investment alternative, and also to prove whether gold is still a "safe haven" for the investors. The data on weekly price of Indonesian Composite taken from the Econstats database (econstats.com) is used for the economic analysis.

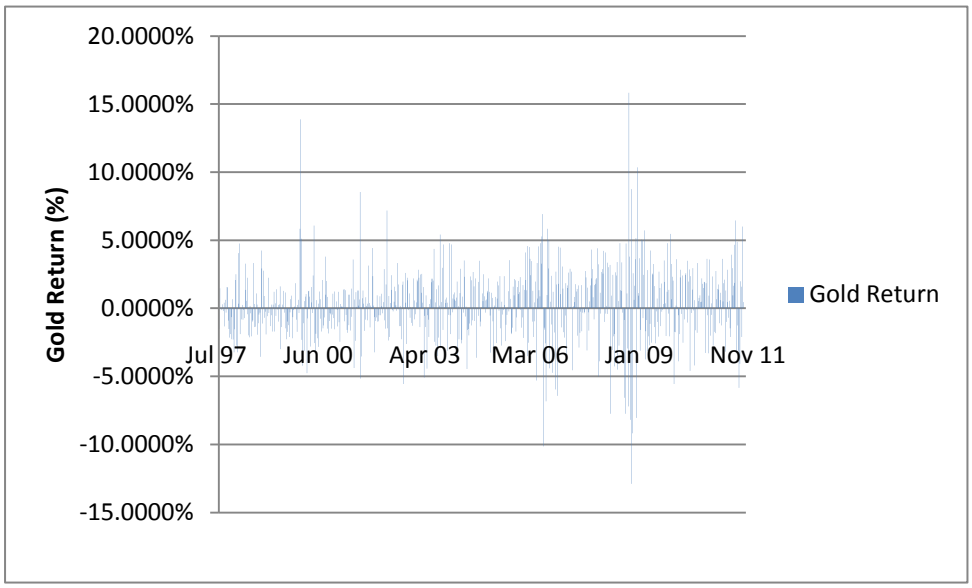

Figure 2. Gold return from July 1997 to November 2011

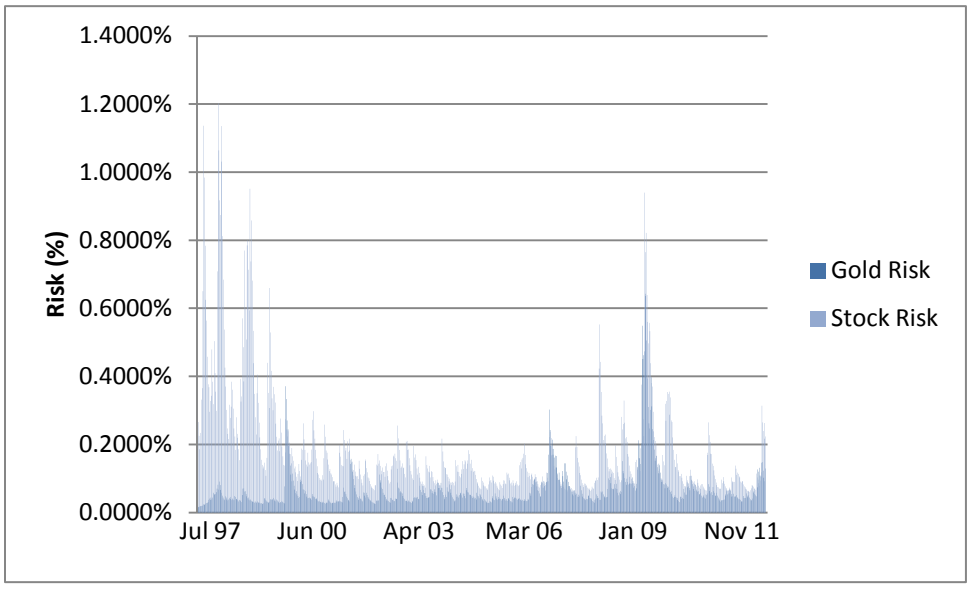

Figure 3. Risk comparison between gold investment and stock investment

2. Literature review

Portfolio is a common terminology in investment. Basically portfolio concept suggests the investors to divide their investment in many investment instruments to minimize the risk of large losses. Regarding the gold investment many studies suggested it as one of the best investment instruments for diversification. Chua et al. (1990) and Jaffe (1989) analyzed benefits of investment diversification in gold. Jaffe (1989) also concluded that gold gives an advantage in investment diversification.

According to Sumner et al. (2010) diversification is important across different global markets as well as within various classes of assets and "for at least some investors, an investment in gold has been seen as a good hedge or safe haven against stock market movements" (p. 107). These results are consistent with the findings of another study conducted by Lawrence (2003). From the results of this study which was based on quarterly data for the period of 1975-2001, he found a lack of correlation between the return on a variety of financial assets and gold, and linked this lack of the correlation to the fact that the return from stocks and bonds correlate with macroeconomic variable, but gold return does not. Finally he concluded that gold is a good portfolio diversifier. Findings from other studies show that gold is a safe haven and a hedge against stocks in extreme market conditions for very short periods.

Beside correlation between stocks and bonds with macroeconomic variables, stocks and bonds also exposed to global risk. Several studies have investigated the impact of risk and return from global market/regional market to domestic market and vice versa (Balasubramanyan and Premaratne, 2004; Eun and Shim, 1989; Hamao et al., 1990; Mukherjee and Mishra, 2008; Mulyadi and Anwar, 2010). They concluded that there is impact of risk and return especially from dominant markets to smaller/emerging markets, although there is also impact from emerging markets to dominant markets in the world.

Overall, a review on the literature reveals that gold investment gives an advantage as a reliable instrument for diversification and a safe haven in extreme stock market conditions. In contrary, stock investment is exposed to macroeconomic risks as well as global stock market risks. Therefore, we formulate our hypothesis: "Gold investment is more advantageous than stock investment". In this paper we address this hypothesis by employing an econometric analysis.

3. Data and research methodology

Data used in this research are weekly price of gold (per troy ounce) and closing price of Indonesia Composite from July 4, 1997 to November 4, 2011. Both data are taken from Econstats database (econstats.com). Weekly return calculation of gold and stock has been done by using the following formula:

$$R_t = (P_t - P_{t-1})/P_{t-1} \quad (1)$$

Where R_t is return in week-t, P_t is price in week-t, and P_{t-1} is price in week t-1.

To test the proposed hypothesis we use the following probit econometric model:

$$I_g = \beta_1 + \beta_2 R_s \quad (2)$$

$$I_s = \beta_1 + \beta_2 R_g \quad (3)$$

Where I_g and I_s is utility index of increase in gold return and stock return using dummy variable, respectively (1 if return is higher than previous week, 0 otherwise). R_s and R_g is weekly return of stock and gold, respectively. To calculate the probability, we use the following equation:

$$P_g = P(Y_g = 1 | R_s) = P(I_g^* \le I_g) = P(Z_g \le \beta_1 + \beta_2 R_s) = F(\beta_1 + \beta_2 R_s) \quad (4)$$

$$F(I_g) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{I_i} e^{-z^2/2} dz = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\beta_1 + \beta_2 R_s} e^{-z^2/2} dz \quad (5)$$

$$P_s = P(Y_s = 1 | R_g) = P(I_s^* \le I_s) = P(Z_s \le \beta_1 + \beta_2 R_g) = F(\beta_1 + \beta_2 R_g) \quad (6)$$

$$F(I_s) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{I_i} e^{-z^2/2} dz = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\beta_1 + \beta_2 R_g} e^{-z^2/2} dz \quad (7)$$

4. Analysis and discussion

The first test is conducted by using the second equation. Using dummy variable of increase in gold return and stock return, we found out that gold return is significant in 5% with lag 3. While using the third equation, gold return is significant in 5% with lag 2. Summary of testing result is shown in Table 1.

After having the coefficient in Table 1, in order to test increase probability of gold and stock return we assume R_s and R_g are between -5% to 5%. Summary of probability is presented in Table 2. The second row indicates how probability of the increase in gold return is impacted by the stock return, while in the third row we can see how probability of the increase in stock return is impacted by the gold return.

Table 1. Summary of testing result

	β_1	β_2
Second equation	0.0220 (0.4775)	2.1819** (2.0068)
Third equation	-0.0183 (-0.3947)	-4.5721** (-2.4658)

** significant in 5%, number in parentheses is Z-Statistic.

Table 2. The probability of increase in stock/gold return

	-5%	-4%	-3%	-2%	-1%	0%	1%	2%	3%	4%	5%
I_g	53.59%	52.79%	51.60%	50.80%	50.00%	49.20%	48.40%	47.21%	46.41%	45.62%	44.83%
I_s	41.68%	43.64%	45.22%	47.21%	48.80%	50.80%	52.39%	54.38%	56.36%	57.93%	59.87%

From table 2 we can see how the higher probability of gold return is increasing while the stock return is decreasing. Under assumption of 5% stock return there is only 44.83% probability that gold return will increase, while in -5% stock return we have greater probability (53.59%). In case of increase in the probability of stock return, the higher gold return the higher its probability to increase. It can be concluded that when stock investment results in negative return, then the probability of increase in gold return becomes higher (more than 49.20% probability).

At the meanwhile in the positive gold return, the increase in the probability of stock return is higher compared to the negative gold return. This shows that in the negative stock return, there is a higher probability to have higher gold return than the previous week. While in the positive gold return there is higher probability to have higher stock return than the previous week. This result supports the previous findings that gold has advantages for diversification and also is a safe haven for investors and a hedge to stock. Therefore, the conducted analysis in this research confirms our proposed hypothesis that gold investment is more advantageous than stock investment.

5. Conclusion

The result from this study showed that the gold investment is quite safe for the investors and could be categorized as safe haven. This conclusion is also supported by the previous research that identified gold as a good portfolio diversifier and a hedge against stocks as well as a safe haven in extreme stock market conditions. When stock investors in loss, gold return tends to increase. While when gold return increases, it gives linear impact to the stock return.

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