The Autumn effect in Vietnam's gold market

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ABSTRACT: This paper studies the seasonality in Vietnam's gold market. The gold return is studied for each month and season for the period 2004-2015, the results show that only August's gold return is positive and statistically significant. A similar effect exists in the variance of return, which fluctuates higher than in other months. At the same time, when grouping dummy variables by seasonality, the study finds out that the "Autumn effect" is statistically significant both in gold return and its variance. These abnormalities can be explained by the "Halloween effect" in the stock market, increasing demand for gold jewelry in the wedding season and investor sensitivity due to fewer day hours during this period.

KEYWORDS: Halloween effect, Autumn effect, seasonality, gold.

JEL CLASSIFICATION: G10 . G11 . G14 . G15 . G23 . C32 . G41.

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1. Introduction

Investments in gold have been very active in recent years as the economy was shaken after the global financial crisis which began in 2007 and peaked in 2008. Investors tend to put gold into portfolios due to the fact that gold prices are expected to increase along with inflation and gold is considered as a hedge against inflation risk (Levin & Wright, 2006, Ho Thi Lam , 2015). Accordingly, the high price of gold can be associated with a "fear" trading, i.e. the price of gold increases because investors fear that the performance of the economy or the stock market will be weaker in the future, which may lead to higher expected inflation rates due to the expansionary policies of the central bank. Gold purchase is driven by higher inflation "fear" or a recession that may continue at any time but does not usually occur in the same month of each year (Baur, 2013).

However, if investors know that one of the harshest periods of financial crises often occurs in September and October (such as the collapse of the stock market in October 1987, the Asian financial crisis in October 1997, the global financial crisis in September and October 2008 or the recent upsurge in the Chinese stock market in August), this could lead to the increasing demand for gold during these months as a hedge for investors' assets against risk.

According to Baur & Lucey (2010) and Hood & Malik (2013), when investors believe that gold can be regarded as a hegding tool for the stock market's risks, they can increase gold purchases before investing into stock between November and May - the setting for the Halloween effect or "Sell in May and go away effect" (Bouman & Jacobsen, 2002; Jacobsen & Zhang, 2012). In this case, the demand for gold may rise in the months ahead of the "Halloween effect".

Baur (2013) has another explanation for the seasonality of the gold market that is due to the recurrence of annual cultural events. These events can be festive season, especially wedding season and Christmas season held in many countries around the world, including Vietnam. In Vietnam, the wedding season usually begins in the "Autumn of August", which lasts until the end of the year when the weather is cool. If consumers tend to buy gold in the form of jewelry for weddings or for Christmas, this can set a seasonal pattern of monthly gold price's changes.

Baur (2013) also suggests that the seasonal effect of gold prices is related to the phenomenon of "Winter blues." Demand for gold can be linked to the number of day hours as reported by Kamstra, Kramer & Levi (2003). In fact, Vietnam is located entirely within the tropical belt of the Northern Hemisphere with shorter daylight hours starting in August, so gold may become more

attractive in the autumn months, such as August, September and October because "the color and light of gold can be seen as a substitute for reducing the number of day hours during these months" (Baur, 2013).

Vietnam is one of the largest gold consumers in the world (World Gold Council; 2012, 2015) and a gold importer in the context of the economy in general and the gold market in particular. With Vietnam integrating more into the world economy, together with modern information systems, the domestic price of gold is based on the principle of "interpenetration", while the World price of gold, and Vietnam's gold price also reflects immediately, in the same direction. Therefore, basing on the above explanations together with the expectation that domestic gold prices fluctuate in tandem with the world gold price, the author suggest a hypothesis of the existence of seasonality in Vietnam's gold market due to the demand for gold in special months of August, September and October and demand for gold jewelry during the wedding season and the Christmas season of the year.

2. Literature review

Gold topics have always attracted the attention of researchers, including the role of gold as a hedge against inflation (Chua & Woodward, 1982; Sherman, 1982; Jaffe, 1989; McCown & Zimmerman, 2006; Worthington & Pahlavani, 2007 and Shahbaz, Tahir, Ali & Rehman, 2014), the role of gold in periods of crisis and turmoil in the stock market (Baur & McDermott, 2010; Baur et al., 2010; Miyazaki, Toyoshima & Hamori, 2012) as well as the response of gold return to the change of currency (Capie, Mills & Wood, 2005; Joy, 2011; Reboredo, 2013; Yang & Hamori, 2014). These studies often focus on adverse events that reflect negative market conditions but do not focus on seasonal differences. In addition, events characterized by positive market conditions (eg, wedding season, Christmas season, etc.) or the need for hedging against the future that does not relate to any negative events have not been studied.

While seasonality in stock return has been extensively studied (Bouman et al., 2002; Jacobsen et al., 2012; Hong & Yu, 2009; Schwert & William, 2003), studies of the seasonality of gold or silver is relatively rare (Ball, Torous & Tschoegl, 1982; Ma, 1986; Lucey & Tully, 2006). Lucey et al. (2006) analyzed the day-to-day seasonality of the return and the variance of gold and silver and found evidence of the effects of day hours. In particular, research on the seasonality of the gold return for lower frequencies such as months or quarters is not focused on by research except in Baur (2013) for the world gold market.

In order to provide evidence of the seasonality of Vietnam's gold market, which has not been done in previous studies, the author focuses on testing the hypothesis that gold return is positive in a particular period of the year which may be explained by increasing demand for gold jewelry (according to World Gold Council report, demand for jewelry gold of Vietnam in the second quarter of 2015 increased by 22% over the same period of previous year and up to 31% over the same period in the third quarter of 2014) and the demand for gold investment as a hedging tool for future adverse events.

3. Data and methodology

3.1. Data

The study uses the daily return data for gold, which is calculated by changing the price from time t-1 to time t. In which, the gold price is the selling price of SJC gold in VND/tael, the data is provided by Vietstock Joint Stock Company.

The World price of gold and the VN-Index price index were collected from the World Gold Council (www.gold.org) and Phu Toan Investment Joint Stock Company respectively, so as to represent the control variables in the model of gold price's fluctuation in Vietnam.

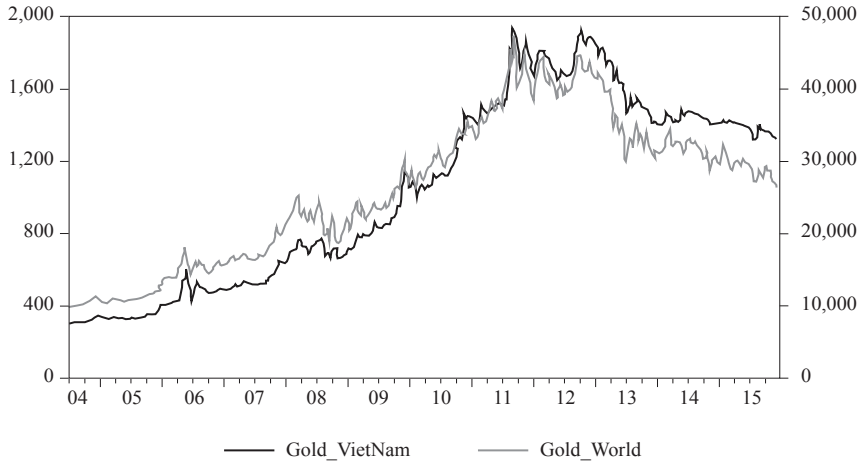
The sample consists of data of more than 11 years from 18 June 2004 until 7 December 2015, with the total of 2991 return observations per day for each data series. Table 1 presents descriptive statistics for return strings and Figure 1 shows domestic and world gold price's fluctuation for 2004-2015.

Table 1: Descriptive statistics

	Gold_VietNam	Gold_World	VNI-Index
Mean (×100)	0.0538	0.0408	0.0386
Max	7.1429	7.0809	4.8487
Min	-10.5042	-9.1501	-5.8717
Standard deviation	0.8877	1.2042	1.5026
Skewness	-0.2438	-0.3005	-0.0499
Kurtosis	20.7486	7.7428	4.4025

The statistics described in Table 1 show the similarity between returns in domestic and international gold. The daily average returns of domestic and the world

Figure 1: Domestic and world gold prices for 2004-2015



gold are positive, however, the volatility of the world's gold market (with the standard deviation of 1.2) is 0.88 higher than the figure of the domestic's gold market. During the study period, the stock market has a positive daily average return and fluctuates stronger than the gold market with a standard deviation of approximately 1.5.

The volatility of gold price as depicted in Figure 1 shows the continuous rise of gold price in the period before 2012. The gold price has changed from about VND7.5 million/tael in mid-2004 to approximately 48 million VND/tael in Quarter III of 2012. Contrary to the mainstream trend of the previous period, in the period from the end of 2012 until now, the general trend of gold price is down, up to December 7th of 2015, the selling price of gold SJC has decreased to 33.2 million VND/tael. In addition to the impact of world gold prices, domestic gold price volatility recently reduced due to the domestic demand as investors are more cautious with information on gold management policy of the State Bank of Vietnam (SBV). For example, in November 25th of 2012, banks must close positions, stop mobilizing gold loans under Decree 24/2012/ND-CP and the trading session thereafter witnessed a continuing reduction of gold price. The difference between domestic gold price and world gold price is also high in this period, sometimes up to 6 million VND/tael as this is the time when the new legal framework comes into effect. During this period, gold trading floor and gold trading on the account are not allowed to operate, the government has the monopoly in import and production of gold bars. The SBV does not allow any institution to import gold, smuggling is strictly controlled. These restrictions

on the freedom of gold trading lead to a fairly significant difference between the two markets in the above period.

Table 2 shows the average daily return, the max, min and standard deviation return, as well as the skewness and kurtosis of the gold return distribution for each month during the study period. The results show that the average return of gold is positive in January, March, March, July, September, October, and November, with the highest return falling in November (0.16) and August (0.12). The monthly average return can be calculated by multiplying the daily average return with the average number of trading days per month, averaging of 21 days. The highest standard deviation in June and followed by May and August. September shows the low standard deviations correlation despite the fact that average return is positive and high. Finally, the deviation of gold return distribution is highest positive in January (1.82) and September (1.5) and highest negative in June (-3.05) and March (-0.9).

Seasonal statistics show that the daily average return of gold is maximum and positive in the Autumn (0.07), while the strongest fluctuations in summer are expressed in standard deviations (1.03). In all four seasons of the year, the gold return distribution deviates positively in Autumn and Winter, and negatively in other seasons.

Thus, the highest of gold return falls in November, August, and Autumn, together with the highest standard deviation in June and followed by May and August, with the strongest fluctuations in the Summer. The early assumptions have supported part of the hypothesis of seasonality in the return and the variance of gold.

3.2. Methodology

To model and verify seasonality in Vietnam's gold market, the study was conducted in two phases. The author, in the first phase, examines the gold return; and then does the regression estimation on the variance of return in the second phase.

Return analysis

The foundation of econometric analysis for seasonal effects is a regression model with dummy variables for each month of the year together with control variables associated with particular economic and financial conditions. Following the study of Baur (2013) the author sets up the regression model:

$$r_{G,t} = \beta_1 D_{Jan,t} + ... + \beta_{12} D_{Dec,t} + \gamma X_t + e_t \quad (1)$$

Where: r_G is the daily gold return, D is the dummy variable that receives the value of 1 with the dates of the particular month and zero in the other case, X is the set of control variables. The error of the model is shown by e. The estimated parameters are β_i with i = 1, ..., 12 and γ. The estimated model does not include a constant for all months in the model. As a consistency test, the constant is included and each month of 12 months is excluded in 12 separate regressions, the results is reported in a similar way. As the variance of gold return is not constant as indicated in the data description, therefore, the error of the regression equation (1) is modeled by an asymmetric GARCH model. The characteristics of the asymmetric GARCH model are detailed in the next analysis of variance.

Vietnam is a gold importer (the price taker) and is the largest gold consumer in the world, so the fluctuations in the world's gold market have a significant impact on domestic gold price volatility. While Lucey et al. (2006) and Baur (2013) report that there is a seasonal occurrence in the world gold price, the author puts the world gold price on the model to control the effect of this variable on seasonality in Vietnam's gold market.

Including stock return in the model is expected to capture a part of the real economic activity - that is, domestic demand. Therefore, if the stock return is positive, there may be a positive impact on demand for gold. However, it can also be a negative impact if the investment needs in the stock market and gold market are interchangeable. Moreover, several previous studies (Baur et al., 2010; Hood et al., 2013) suggest that returns of gold and stock market are influenced by each other. So, the author puts the control variable, stock return, into the model to help accurately identify the seasonality in the gold market.

After considering the seasonal effect on gold return by month, the study continues to investigate seasonal effects (Spring, Summer, Autumn, Winter) on Vietnam's gold market to link analysis with the theories of "Halloween effect" and "Sell in May and go away effect" (Bouman et al., 2002). Accordingly, the authors group the monthly dummy variables into seasonal dummy variables and re-evaluate equation (1) with the error following the asymmetric GARCH model as shown above.

According to Vietnam's lunar calendar, January, February, March is Spring; April, May, June is Summer; July, August, and September are Autumn; and October, November, and December are Winter. Astronomically, there are four important days in both Eastern and Western calendar, including the Vernal Equinox (March 20 or March 21, depending on the year), Summer Solstice (June 20 or June 21), Autumnal Equinox (September 22 or September) and Winter Solstice (December 21 or December 22) - the days are considered mid-season. In

Table 2: Daily gold return by month and season

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean (×100)	0.1182	-0.0299	0.0647	0.0232	-0.0158	0.0176	0.1171	0.0692	0.0143	0.1625	0.1182	-0.0299
Max	3.3333	2.2222	7.1429	5.2250	4.6948	3.7657	6.2651	5.5127	3.3071	4.4953	3.3333	2.2222
Min	-5.4105	-3.9051	-7.4074	-5.9603	-10.5042	-3.2258	-5.5848	-2.4652	-2.5714	-5.4545	-5.4105	-3.9051
Standard deviation	0.7995	0.6418	0.9882	1.1304	1.1325	0.7215	1.0703	0.7998	0.7315	0.9463	0.7995	0.6418
Skewness	-0.6949	-0.9027	0.2106	-0.1030	-3.0556	0.3587	0.5583	1.5073	-0.2071	0.2459	-0.6949	-0.9027
Kurtosis	15.0611	11.3986	29.4601	12.5064	36.2423	10.9657	13.6285	12.5649	6.1850	11.2530	15.0611	11.3986

	Autumn	Winter	Spring	Summer
Mean	0.0738	0.0592	0.0501	0.0167
Max	6.2651	4.4953	7.1429	5.2250
Min	-5.5848	-5.4545	-7.4074	-10.5042
Standard deviation	0.9057	0.8241	0.8305	1.0299
Skewness	0.6745	0.3063	-0.1838	-1.3837
Kurtosis	13.1119	12.5062	25.9612	25.2732

addition, according to the Chinese calendar, Autumn starts from around August 7th until ends in the November 7th. Based on this information, the author divides 12 months of the year into four seasons: Autumn (August to October), Winter (November to January), Spring (February to April) and Summer (May to July) according to the solar calendar.

Analysis of variance

The unconditional standard deviation of gold return presented in Table 2 shows that the variance is higher in June and August and which are in Summer and Autumn. This shows that the variance of gold return is not constant over time, however, seasonal effects in variance are not clear.

This section provides modeling and seasonal analysis in the variance of gold return. Figure 2 shows the conditional variance estimation based on the asymmetric GARCH model as introduced by Glosten, Jagannathan & Runkle (1993). Model is written as follow:

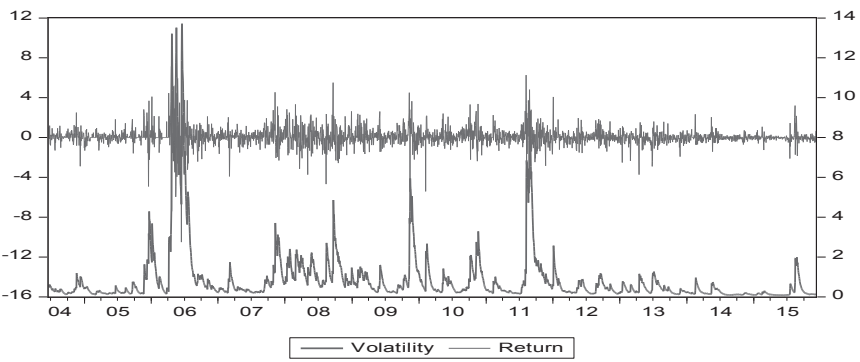
$$h_t = c + \alpha_1 e^2_{t-1} + \alpha_2 e^2_{t-1} I(e_{t-1}<0) + \tau h_{t-1} \quad (2)$$

Where: h_t is the conditional dynamic variable of gold return. The α_2 parameter captures the asymmetric effect and determines whether there is a different impact between positive and negative shocks.

To analyze the seasonality in the variance of gold return, the author adopts a two-step approach in which the regression estimation of ht is obtained from step 1 on the dummy variable follows the equation:

$$\hat{h}_t = \delta_1 D_{autumn} + \delta_2 D_{winter} + \delta_3 D_{spring} + \delta_4 D_{summer} + \nu_t \quad (3)$$

Figure 2: Return and return volatility of gold in the period 2004-2015



Finally, for the purpose of answering the question of whether periods of high or low volatility (clustered, grouped) are seasonal, the author estimates the regression model based on equation (2) for 1%, 5%, 10%, 50%, 90%, 95% and 99% percentile points.

4. Results

4.1. Results of return analysis

Table 3 presents the estimation results of gold return by month dummy variables with no control variables ($\gamma = 0$), and with control variables to be the world's gold return (GWR), and with stock return (VNI), respectively in the models 1, 2 and 3.

The results show that the world gold price has a strong positive impact on domestic gold price, which supports the "interpenetration" feature between the domestic gold market and the global gold market. The study does not find statistical evidence of the impact of stock return on the average daily return of Vietnam's gold. Thus, it is likely that that gold can be a hedge against unpredictable changes in the domestic stock market.

Table 3: Regression results with month dummy variables and control variables

	Model 1		Model 2		Model 3	
	Coefficient	t-Stat.	Coefficient	t-Stat.	Coefficient	t-Stat.
Jan	0.0826**	2.0810	0.0219	0.7231	0.0805**	2.0083
Feb	0.0940***	2.6849	0.0283	1.3442	0.0939***	2.6736
Mar	-0.0567*	-1.8630	-0.0232	-0.6731	-0.0553*	-1.7919
Apr	0.0420	1.0952	0.0190	0.6868	0.0421	1.0987
May	-0.0119	-0.2938	-0.0125	-0.4045	-0.0119	-0.2917
Jun	0.0460	1.0789	0.0351	1.1365	0.0461	1.0746
Jul	-0.0033	-0.0850	0.0139	0.4328	-0.0032	-0.0828
Aug	0.0916**	2.2873	0.0626**	2.0747	0.0915**	2.2638
Sep	0.0495	1.2510	0.0387	1.0687	0.0497	1.2497
Oct	0.0145	0.2890	0.0197	0.4821	0.0144	0.2874
Nov	0.0340	1.0469	0.0692***	4.1384	0.0344	1.0487
Dec	-0.0247	-0.5798	-0.0236	-0.8068	-0.0248	-0.5827
GWR			0.2448***	51.8130		
VNI					0.0034	0.5170

*Note: *, ** and *** represent signiticance levels of 10%, 5% and 1%, respectively.*

The regression results of the dummy variables were statistically significant. Specifically, daily average return of gold is positive and statistically significant in August in all models. In addition, January and February also showed positive and significant return of gold when controlling the impact of return on the stock market, but no statistical evidence of these months was found in model 2, so many the possibility of positive return in these month is due to the impact of the world's gold market. When controlling the impact of world gold prices on the seasonality of Vietnam's gold market, the domestic gold return was statistically significant in November, but there was no evidence to support the seasonality of the month in the two models 1 and 3 when controlling the variable of the stock return. Hence, there are signs that "Halloween effect" existing in Vietnam's stock market.

The above results indicate that the August effect is maintained in both unconditional and conditional contexts in Vietnam's gold market. In addition, the winter months are also supposed to have a positive effect on domestic gold return, although these effects can be linked with real economy activity or external influences.

Table 4: Seasonal variance estimation results

	Coefficient	t-Stat.	Prob.
Average return equation			
Autumn	0.0517	1.9591	0.0501
Winter	0.0218	1.0547	0.2916
Spring	0.0172	0.7792	0.4358
Summer	0.0103	0.4339	0.6644
Variance equation			
Constant	0.0082	16.9631	0.0000
ARCH	0.1299	27.7341	0.0000
Asym. ARCH	-0.0624	-12.2951	0.0000
GARCH	0.8976	424.6113	0.0000

Model

$$r_{G,t} = \beta_1 D_{autumn} + ... + \beta_4 D_{summer} + e_t$$

$$e_t = z_t \sqrt{h_t}$$

$$h_t = c + \alpha_1 e_{t-1}^2 + \alpha_2 e_{t-1}^2 I(e_{t-1}<0) + \tau h_{t-1}$$

The study examines the difference in gold price's changes by the four seasons: Autumn, Winter, Spring, and Summer, in connection with the "Halloween effect" and "Sell in May and go away effect". The estimated results presented in Table 4 indicate that only the estimated coefficients of the dummy variable Autumn are positive and are statistically significant in all seasons. Alternative estimates, such as those with control variables or excluding dummy variables Auntum and estimation with a constant reach similar results.

These findings imply investors purchasing gold in the Autumn as a hedging tool against the crisis risks of the stock market in September and October, as well as large investments in stocks beyond the "Halloween effect". This result also supports the explanation of the increasing demand for wedding jewellery and "winter depression" as mentioned in the introduction.

4.2. The results of the variance analysis of the return

Thus, seasonality is clearly shown in the gold return. To find out whether the conditional fluctuations in the gold market are seasonal, the author performs an analysis of the variance of return.

Table 5 presents the results of estimation of equation (3) for the parameters i. Estimates of the coefficients indicate that the Constant (Autumn) and Summer are positive and Spring is negative, while Winter estimation is not statistically significant. When comparing the magnitude of the estimation coefficients, the positive average return of gold in the Autumn is much greater than in the Summer. This result implies that Autumn (captured by constant) represents the highest variance in the gold return. Conditional results not only confirm and support the unconditional results presented in the data section, but also demonstrate that the Autumn is the season with the highest fluctuation, and the effect has remarkably statistical significance.

To test whether seasonality exists in periods of high volatility and low volatility, the author estimates the percentile regression model based on equation

Table 5: Seasonal regression results in RETURN variance of gold

	Coefficient	t-Stat.	Prob.
Winter	-0.0957	-1.3005	0.1935
Spring	-0.2113	-2.8872	0.0039
Summer	0.2295	3.1637	0.0016
Constant	0.8831	18.3268	0.0000

(2) with 1%, 5 %, 10%, 50%, 90%, 95%, 99% percentiles. The results indicate that "Autumn effect" is statistically significant at both low and high percentiles. This implies that the instability in the gold market usually focuses on the Autumn than any season of the year.

5. Conclusion

The research was conducted to provide empirical evidence of seasonality in Vietnam's gold market. With data collected over a period of more than 11 years (from 18 June 2004 until 07 December 2015), research results show that return of gold is positive and statistically significant in August. Average return in the remaining months is not statistically significant or inconsistent when changing models with different controlled variables. A similar effect exists in the variance of return, i.e., higher volatility than in other months. These results are true even in the existence or absence of conditions when different variables are controlled. At the same time, when grouping dummy variables by seasonality, the study shows that "Autumn Effect" is statistically significant both in return of gold and its variance.

With the seasonal effect, the market does not show its effectiveness. These abnormalities can be explained by different ways. First of all, Vietnam's stock market is becoming more and more integrated into the global stock market, so uncertainties in the global stock market can affect the domestic market and investors are buying gold as a safeguard instrument against risks in the stock market in the months of crisis with negative securities return. Second, the higher demand for jewelry during the wedding season in Vietnam usually starts in the fall and lasts all winter or until other festive seasons such as Christmas. Third, the "winter blues" happens as explained by Baur (2013) when the gold market of Vietnam is linked to the world gold market on the principle of "interpenetration". The fourth reason is perhaps due to the need to invest in gold as a safe asset before investing heavily in the stock market under the "Halloween effect."

Further studies may examine the effects of the weekdays as well as consider whether the "Autumn Effect" and the "August Effect" have long-term or only short-term effects on Vietnam's gold market.

References

Ball, C., Torous, W. & Tschoegl, A. (1982). Gold and the weekend effect. *Journal of Futures Markets.* 2(2), 175-182.

Baur, D. G. (2012). Asymmetric Volatility in the Gold Market. *The Journal of Alternative Investments.* 14(4), 26-38.

Baur, D. G. (2013). The autumn effect of gold. *Research in International Business and Finance.* 27, 1-11.

Baur, D. G. & Lucey, B. M. (2010). Is gold a hedge or a safe haven? An Analysis of Stocks, Bonds and Gold. *The Financial Review.* 45, 217-229.

Baur, D. G. & McDermott, T. K. (2010). Is gold a safe haven? International Evidence. *Journal of Banking and Finance.* 34(8), 1886-1898.

Bouman, S. & Jacobsen, B. (2002). The Halloween indicator - sell in May and go away: another puzzle. *American Economic Review.* 92, 1618-1635.

Capie, F., Mills, T. C. & Wood, G. (2005). Gold as a hedge against the dollar. *Journal of International Financial Markets, Institutions and Money.* 15(4), 343-352.

Chua, J. & Woodward, R. S. (1982). Gold as an inflation hedge: a comparative study of six major industrial countries. *Journal of Business Finance & Accounting.* 9, 191-197.

Glosten, L. R., Jagannathan, R. & Runkle, D. E. (1993). On the relation between the expected value and the volatility of the nominal excess return on stocks. *Journal of Finance.* 48(5), 1779-1801.

Hood, M. & Malik, F. (2013). Is gold the best hedge and a safe haven under changing stock market volatility? *Review of Financial Economics.* 22(2), 47-52.

Hong, H. & Yu, J. (2009). Gone fishing: seasonality in trading activity and asset prices. *Journal of Financial Markets.* 12(4), 672-702.

Ho Thi Lam (2015). Vai tro bao hiem rui ro lam phat cua vang o Viet Nam. *Tap chi Cong nghe Ngan hang,* 111, 33-41 (The role of hedging the inflation of gold in Vietnam. *Banking Technology Review,* 111, 33-41).

Jacobsen, B. & Zhang, C. Y. (2012). Are Monthly Seasonals Real? A Three Century Perspective. *Working Paper,* Massey University.

Jaffe, J. F. (1989). Gold and gold stocks as investments for institutional portfolios. *Financial Analysts Journal,* 45.

Joy, M. (2011). Gold and the US dollar, hedge or haven? *Finance Research Letters.* 8, 120-131.

Kamstra, M. J., Kramer, L. A. & Levi, M. D. (2003). Winter blues: a SAD stock market

cycle. *American Economic Review.* 93(1), 324-343.

Levin, E. J. & Wright, R. E. (2006). Short-run and Long-run Determinants of The Price of Gold. *Research study □32, The World Gold Council.*

Lucey, B. M. & Tully, E. (2006). Seasonality, risk and return in daily COMEX gold and silver data 1982-2002. *Applied Financial Economics.* 16, 319-333.

Ma, C. (1986). A further investigation of the day-of-the-week effect in the gold market. *Journal of Futures Markets.* 8, 199-209.

McCown, J. R. & Zimmerman, J. R. (2006). Is gold a zero-beta asset? Analysis of the investment potential of precious metals. *Social Science Research Network Working Paper,* 920396.

Miyazaki, T., Toyoshima, Y. & Hamori, S. (2012). Exploring the dynamic interdependence between gold and other financial markets. *Economics Bulletin.*32(1), 37-50.

Reboredo, J. C. (2013). Is gold a safe haven or a hedge for US dollar? Implications for risk management. *Journal of Banking and Finance.* 37, 2665-2676.

Shahbaz, M., Tahir, M. I., Ali, I. & Rehman, I. U. (2014). Is gold investment a hedge against inflation in Pakistan? A co-integration and causality analysis in the presence of structural breaks. *North American Journal of Economics and Finance.* 28, 190-205.

Sherman, E. J. (1982). Gold: A conservative, prudent diversifier. *Journal of Portfolio Management.* 8, 21-27.

Schwert, G. & William (2003). Anomalies and market efficiency. In: Constantinides, G.M., Harris, M., Stulz, R.M. (Eds.), *Handbook of the Economics of Finance,* 1, 1st ed, 939-974 (Chapter 15).

Yang, L. & Hamori, S. (2014). Gold prices and exchange rates: a time-varying copula analysis. *Applied Financial Economics.* 24(1), 41-50.

World Gold Council (2012). *Gold Demand Trends: Full year 2011,* http://www.gold.org/supply-and-demand/gold-demand-trends/back-issues/gold-demand-trends-q4-and-full-year-2011, 12/2015.

World Gold Council (2015). *Gold Demand Trends: Quarter 3 2015,* http://www.gold.org/supply-and-demand/gold-demand-trends, 12/2015.

Worthington, A. C. & Pahlavani, M. (2007). Gold investment as an inflationary hedge: Cointegration evidence with allowance for endogenous structural breaks. *Applied Financial Economics Letters.* 3, 259-262.