

**GOLD AS SAFE HAVEN OR SPECULATIVE
INVESTMENT**

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Resumo

O ouro é considerado um investimento seguro porque em tempos de turbulência económica mantém o seu valor. Para fazermos um bom investimento em ouro, temos que saber quais os factores relevantes que afectam o seu valor. Neste estudo, analiso os retornos das cotações do ouro e da prata bem como as de seis ETFs baseados no ouro, e de cinco ETFs baseados na prata. É analisada a forma como o retorno do S&P 500, VIX, de retorno da taxa de câmbio do dólar americano, da taxa de juro, da taxa de inflação e de retorno do petróleo bruto podem afectar do ouro e da prata retornos, no período entre Janeiro de 2000 e Dezembro de 2013.

Os resultados empíricos obtidos permitem concluir que retorno do dólar americano permite explicar o retorno do ouro e da prata, mais especificamente quando o retorno do dólar americano aprecia, os retornos de ouro e da prata depreciam, e vice-versa. O retorno do S&P 500, VIX, taxa de juro e taxa de inflação não afectam os retornos do ouro e da prata. O retorno do petróleo bruto não tem nenhuma relação com o retorno de ouro, mas parecem afectar o retorno de prata. Embora de forma fraca que taxa de inflação é parece explicar para o retorno de ETFs baseados na prata. Os baixos R-quadrado parecem ser explicados pelo fato de os coeficientes variarem ao longo do tempo.

Palavras-Chave: *Investimento em ouro; Prata; Exchange-Traded Funds; Regressão; Factores macroeconómicos;*

Classificação JEL: *G11, C10*

Abstract

Gold is considered a safe investment options, because in times of turbulence keep its value. To make a good investment in gold we need to determine the relevant factors that affect the price of gold. In study this I analyse the returns of gold, silver and returns of six gold ETFs and five silver ETFs. I analyse whether the return of S&P 500, VIX, return of US dollar exchange rate, interest rate, inflation rate and return of crude oil are factors affect gold and silver returns in the period from January 2000 to December 2013.

The empirical results find that return of US dollar explains the gold and silver returns, more specifically when return of US dollar appreciates, the gold and silver returns depreciate and vice versa. The return of S&P 500, VIX, interest rate and inflation do not affect the returns of gold and silver. The return of crude oil has no relationship with return of gold, however it has a weak affect the return of silver. The variation of inflation rate allows us to explain changes of returns of silver ETFs. The low R-squared values are explained by the fact that coefficients vary over a long time.

Keywords: *Gold investment; Silver; Exchange-Traded Fund; Regression; Macroeconomic factors;*

JEL Classification: *G11, C10.*

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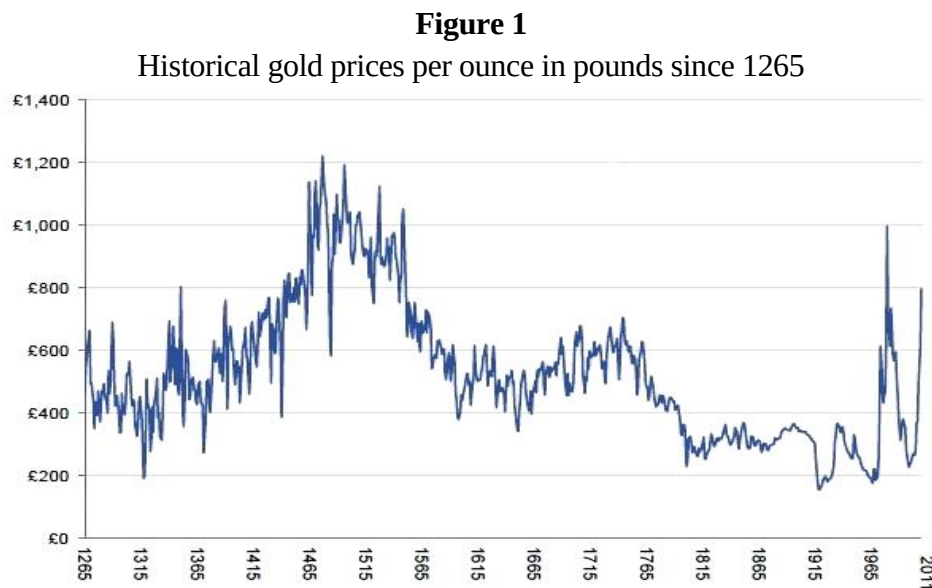
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1. Introduction

“Gold is a dense, soft, shiny metal and the most malleable and ductile metal known.”
- Spall, Jonathan (2009)

Gold has played an important role in political events as well as in the world economy, because it is used as: jewellery, currency, an industrial input and as money base. Individuals held gold as in form of jewellery, bars or coins, governments and central banks around the world held gold as monetary reserve assets and small bars as insurance against currency devaluation.¹



Source: Bank of England Goldman Sachs global ECS research

Like no other precious metal, gold has a fascinating history that began around 5,000 years ago. Historically gold has been seen as more attractive investment than stocks and bonds or other assets classes, not only for the positive returns but also as safe haven in time of difficulty.

On Figure 1, we see that in deep 1265 price of gold was very volatile. Later, over period 1500 - 1965 gold had a bear market, as a consequence price declined by almost 80%. However, in the 1970s the gold price began to rise and created a bull market for investors and a possibility to freely trade on the markets. In middle of 2007 of the beginning financial crisis the nominal price of the gold has risen by 42%.

¹ Silver & Gold, Energy and Environmental Profile of the U.S. *Department of Energy*, available online at <http://energy.gov/sites/prod/files/2013/11/f4/gold-silver.pdf>

Shafiee and Topal (2009) point out that over 2007 the price of gold moved in the same manner as in 1978. However the price of gold is still turbulent. It has ups and downs from time to time due to the economic conditions, political uncertainties and condition on financial markets. Thus it is very important for investors to know the current price of gold. In order to take advantages on when to buy gold at a lower price and sell at higher price. Therefore, we need to analyze the relevant factors that may have an effect on gold price in order to determine appropriate time when investors can make investment in gold.

In this study analyze the effect of return of S&P 500, VIX (volatility), return of US dollar exchange rate, inflation rate, interest rate, and return of crude oil on returns of gold and silver, returns of silver ETFs and gold ETFs. The analysis will use method of Ordinary Least Squares with data over period from January 2000 to December 2013.

This paper consists of following sections: Section 2 makes a brief literature review about investing in gold and gold Exchange-Traded Funds. In Section 3, describes the demand by categories: jewellery and investments, and gold supply. Section 4 describes the data and methodology used in the study. Section 5 provides the empirical findings: structural breaks for gold and silver prices, descriptive statistics for returns of gold, silver, returns of six gold ETFs and five silver ETFs. Moreover, section shows the regression analysis, to determine which variables have an effect on returns of gold, silver and returns of gold ETFs, silver ETFs and rolling window estimation to see how the gold variables change over time.

2. Literature Review

2.1 Investing in Gold

Goodboy (2013) argues that in recent years gold and silver have been the favourite precious metals of most investors. Moreover, they are the most enduring form of currency and investment in the world. They serve as a medium of monetary exchange and store of value. Despite their differences and similarities as a commodity, investors prefer to own gold than silver. The reason is that silver is used mostly for industrial purposes, whereas gold is used for investment and jewellery.² Singh and Nadda (2013) note that an investor has various investment options: mutual funds, stock markets, hedge funds, gold and commodities.

² North, G. 2011. The Gold Wars. *The Tea Party Economists*, available at <http://www.garynorth.com/GoldWars.pdf>.

However, higher risks provide the possibility of higher return. One of the reasons people still prefer to invest in gold than stock market is because of the safe and growth characteristics. They also found that gold has been one of the best performing asset classes. Greenwood and Steiner (2011) state that from 2000 to 2010 gold increased in value by a cumulative 398%. Furthermore, over the same period, gold outperformed emerging markets, bonds, Treasury bills, commodities, oil and platinum.

Traditionally, gold investment can be made in few different ways: physical gold, gold Exchange-Traded Funds (ETFs), gold mutual funds and other form of gold investments through buying gold certificates or through gold accounts.³ According to the World Gold Council physical gold is one of the most direct ways of investing in gold, and it can be done by buying: gold bullions, coins and jewellery.

Numerous studies have examined the status of gold as investments: Feldman (2010) argues that an investor has a few ways to use gold as part of his investment strategy: potential “safe haven” during political or economic uncertainty also supports (Baur and Lucey (2010), Baur and McDermott (2010), Hood and Farooq (2013) and Harmston (1998)), hedge against the US dollar devaluation also pointed (Reboredo (2013)), portfolio diversification over both long and short-term horizons and hedge against inflation also provides (Worthington and Pahlavani (2006), Blose (2010)). While Brier (2012) argues that gold is purely speculative investment what makes big swings in price of gold.

Baur and Lucey (2010) examine “hedge” and “safe haven” assets, i.e. assets that are uncorrelated or negatively correlate with the other types of asset classes. Therefore, gold is referred as “safe haven” during negative market events that give opportunity investors protect their wealth.

Baur and McDermott (2010) examine gold as strong “safe haven” for most developing markets during market turmoil. During the stock market crash in 1987, gold showed a strong “safe haven” for the major Eurozone market, but not "safe haven" for Asian and Australian emerging markets. They also pointed out ability gold be “safe haven” for stocks but not for bonds.

³ Why buy Gold? *Trustable gold*, available at <http://www.trustablegold.com/gold-investment/>

Beckmen and Czudaj (2012) discuss gold investments as hedge against inflation in a long-run for the USA and United Kingdom economies. Reboredo (2013) and Hood and Farooq (2013) describe investment in gold as a strong “safe haven” for oil market movements and as a hedge against movements of US dollar.

The World Gold Council argues that gold also plays strategic diversification investment role. The investment allocation on gold depends on the level of risk. Small allocation adds diversification benefit to the portfolio with a low level of risk (1%-3%). Helmersson, Kang and Scold (2008) conclude that by including gold to the portfolio, it could improve an investor performance by increasing return or minimize in risks. That makes it more attractive especially in times of recession. Shafiee and Topal (2010) and McCown and Zimmerman (2006) describe gold investment as an insurance against stock market losses.

Baur (2013) pointed out that over the historical period from 1980 to 2010 gold prices showed significant positive returns especially in the months between September and November according to the season anomaly called the “autumn effect”. The extreme periods of gold prices for investors occurred: Stock markets crashed (October, 1987), Asian Financial Crises (October, 1997), Global Financial Crises (September and October, 2008).

2.2 Investing in Gold ETFs

According to the World Gold Council, gold Exchange-Traded Funds (ETFs) were launched in the early part of 21st century and emerged as a better gold investment for portfolio diversification. Gold ETFs are open-ended mutual funds, whose securities listed and traded on the stock exchange based on the price of metal. The upside of gold ETFs is that they are traded like stocks and move as spot futures.⁴

The world’s largest gold Exchange-Traded Fund is SPDR Gold Shares ETF (GLD), founded in 2004. The SPDR was developed to track the gold price and as an alternative to owning physical gold. SPDR is listed on the New York Stock Exchange (NYSE), but also traded in: Japan (TYO), Hong Kong (SEHK) and Singapore (SGX) an average of 24 million shares on a daily basis representing 2.4 million ounces of gold.⁵

⁴ Pierce, E. 2012. Buying Silver vs. Gold as an Investment – What is better? *Money Crasher*.

⁵ Drakoln, N. 2010. Gold Futures vs. Gold ETFs: Understanding the Differences and Opportunities, *CME Group, Chicago Board of Trade*.

There are many others successful gold ETFs traded in the USA (see Table 1).

Table 1
List of gold ETFs traded in the USA

Symbol	Name	Price	Assets *	Avg. Vol	YTD
GLD	SPDR Gold Trust	\$128.11	\$34,400,48	8,000,982	+10.33%
IAU	iShares Gold Trust	\$12.88	\$7,066,312	4,459,049	+10.27%
SGOL	ETFS Physical Swiss Gold Shares	\$130.57	\$1,144,746	46,984	+10.32%
DGP	PowerShares DB Gold Double Long ETN	\$30.37	\$187,988	159,559	+21.00%
DGL	PowerShares DB Gold Fund	\$44.62	\$180,400	55,823	+10.56%
UGL	ProShares Ultra Gold	\$49.89	\$152,100	78,867	+20.92%
GLL	ProShares UltraShort Gold	\$84.02	\$103,231	119,856	-18.84%
DZZ	PowerShares DB Gold Double Short ETN	\$6.19	\$71,938	430,482	-19.51%
AGOL	ETFS Physical Asian Gold Shares	\$132.00	\$59,522	478	+12.56%

* Assets in thousands of the US Dollars. Assets and Average Volume as of 22/10/2013

Source: ETF database

On Table 1, we can see the list of major gold ETFs currently traded in the USA. By column we describe: symbol, name and price, assets in US dollars, average volume and yield to returns. Mallika and Sulphrey (2013) point out that, typically, 1 gram of the gold price is equal to each unit of the ETF. Moreover, there is another Quantum gold ETF, where each unit equal to $\frac{1}{2}$ a gram of gold.

Many studies pointed out the beneficial characteristics of investing in gold ETFs. Carty (2001), Gallagher and Segara (2005) and Nedeljkovic (2005) describe risk diversification, cost efficiency and safe characteristics, whereas Prashanta and Suhitra (2010), Singh and Nadda (2013) note that gold ETFs offer investors the benefits of lower taxes and zero storage costs. Nedeljkovic (2005) also describes gold ETFs as highly liquid investments with no credit risk. They are simple an accessible option to the investors. Wang, Hussain and Adnan (2010) argue that gold ETFs are highly valuable investments and extremely successful of basket securities. They offer investors to trade the portfolio easily and quickly with no high transaction costs. Agyei-Amapomah, Gounopoulosb and Mazouz (2014) note that gold ETFs

are more liquid than investment in physical gold through buying: gold bullion, jewellery or bars and coins (see Table 2).

Table 2
Comparison of gold ETFs with physical gold

	Gold ETF	Jewellery	Bank
How Gold is held	Electronic form	Physical (Bar /Coin /Jewellery)	Physical (Bar/Coin)
Transparency	Very high	Very low	High
Impurity risk	Nil	High	Nil
Wealth tax	No	Yes	Yes
Quantity to Buy/Sell)	Minimum is ½ or 1 gram according to the fund	Available in standard denomination	Available in standard denomination
Resale	At Secondary Market Prices	Conditional and economical	Banks do not buy back
Convince buying/selling	More convenient as held in electronic form under demat account	Less convenient, as gold needs to be physically moved	Less convenient, as gold needs to be physically moved
Buying Premium above gold price	Likely to be less	Likely to be more	Likely to be more
Security of Assets	Fund house take responsibility	Investor are responsible	Investor are responsible
Bid Ask Spread	Very low	Very high	Can't sell back
Risk of Theft	No	Yes	Yes
Long Term Capital Gains Tax	After 1 year	Only after 3 years	Only after 3 years

Source: Gold Exchange Traded Fund – Equity Bulls

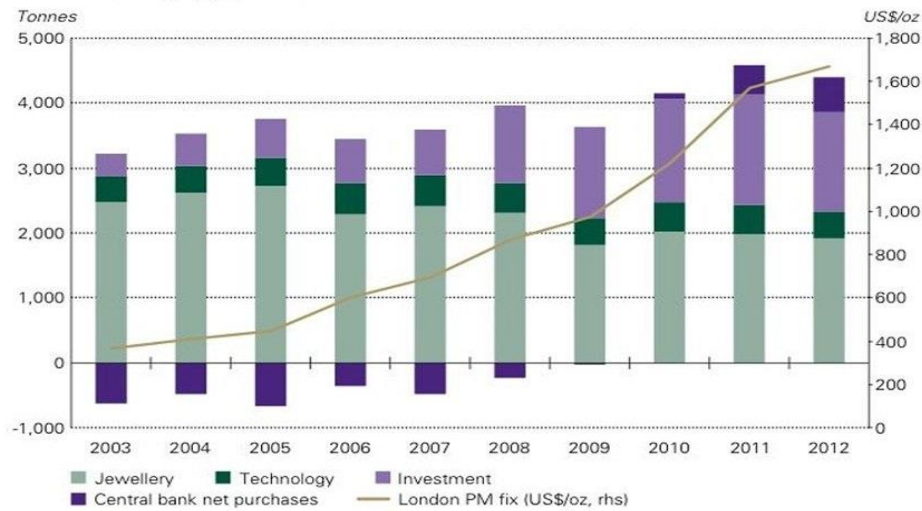
Table 2 shows gold ETFs compared with investments in physical gold. By columns, we describe: gold ETFs, jewellery and bank investments in gold. By rows, we have main investment parameters.

3. Demand and supply of gold

Dorgan (2013) argues that gold and silver depend more on the supply and demand situation than others commodities or asset classes. However, gold reacts slowly, whereas silver and crude oil reacting faster on demand and supply situation. Lampinen (2007) and Greenwood and Steiner (2011) argue that gold is used for: physical purposes (jewellery, electronics),

investor purposes (both government and private) and also industrial applications (including dental and medical uses). The World Gold Council separates total gold demand into few categories: jewellery demand, investment demand, technological demand and demand of central banks.

Figure 2
Gold demand by category (tonnes) and price of gold



Source: LBMA, Thomson Reuters GFMS, World Gold Council

On Figure 2, shows annual gold demand by categories during the period 2003-2012. The growing demand came from: jewellery and investment. Following Baur and McDermott (2010) the largest component of gold demand is jewellery, determined by consumers spending power.

3.1 Jewellery demand

Gold as jewellery has been used for a very long time, over five thousands of years. The largest world customers of gold jewellery in 2012 were: China with customer demand of 800 tonnes, followed by India with 720 tonnes and the United States, with 128 tonnes.⁶

Chilkoti and Crabtree (2013) argue that in India gold is viewed as a charming national quirk driven by elaborate weddings and religious offerings. During the Hindi festivals, Diwali religious holidays gold purchasing power increases very fast with further pressure on external

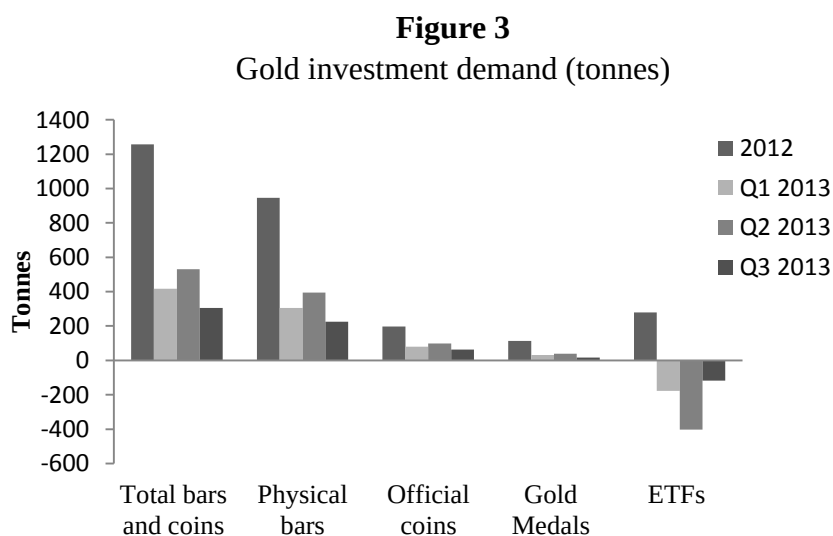
⁶ Supply and demand of gold: Jewellery, available at <http://goldratefortoday.org/demand-gold-jewelry>

financing. According to the World Gold Council, both India and China generates almost 56% of total annual jewellery demand in 2012, higher by 8% compared to 2011. Far Eastern markets generated a low demand, while Russia which was fourth largest jewellery market in 2012 has a growth tendency in demand. Customer jewellery demand increased by 20% with value of \$183.9 billion and reached to 3,757 tonnes during the first three quarters 2013. The most growth in demand came from Turkey and Middle East region.

Greenwood and Steiner (2011) pointed out that the biggest effect on gold jewellery was the period of worldwide recession 2008-2009. Demand on jewellery shrank by 9% in 2008 and 20% in 2009. Moreover, that time demonstrated negative impact on spending in the USA and western markets.

3.2 Investment demand

The World Gold Council argues that gold investment had represented as strong growth source in demand, since 2003. However, in 2012 investment demand significantly declined as result of divergence between the retail and institutional investor's behaviour. Greenwood and Steiner (2011) point out that investment demand can be split into retail investments, including the purchase and hoarding of gold bars and coins, medals and Exchange-Traded Funds (ETFs) and similar products. During period from 2001 to 2010, retail investors were responsible for 14% of global gold demand, and ETFs for 6%. Wang, Hussein and Adnan (2010) discuss that demand for gold ETFs showed the higher growth rate than industrial consume or jewellery, in 2009.

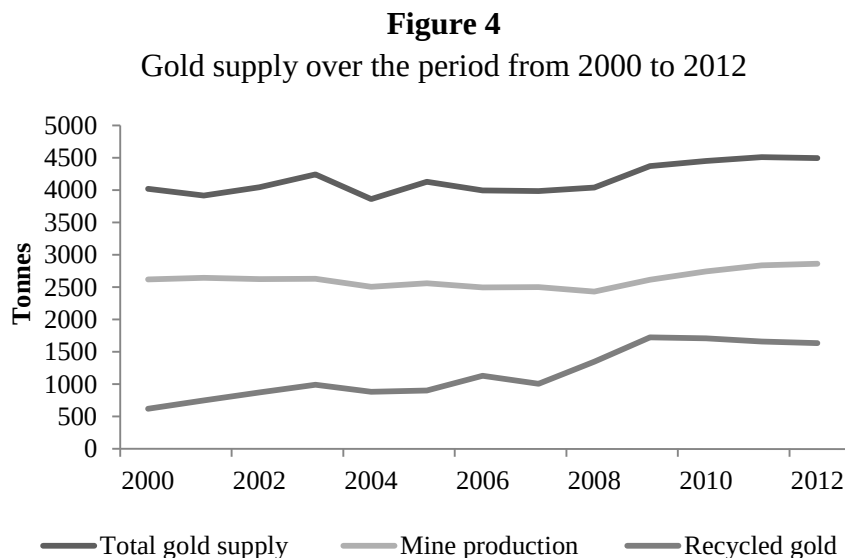


Source: World Gold Council Report

Figure 3 shows gold investment demand during 2012 and first three quarters of 2013. Total gold ETFs demand in 2012 rose by 137.8 tonnes, while during first three quarters of 2013 market saw a big reversal in which demand fell by 697.4 tonnes. The total demand for bars and coins and physical bars continues to growth and tends to be as long term holders argues Dove (2011). According to the World Gold Council, over the first nine months of 2013 big growth in demand for bars and coins were generated in Middle East. The strong performance has been also in Turkey and Egypt, whereas demand in western market and the United States shown fall.

3.3 Supply

Baur and McDermot (2010) note that gold supplies are relatively inelastic, owing to the difficult extraction process and the tedious establishment of new mines. However, gold supply stays relatively stable, while the gold demand is rapidly changing in response to global economic events. According to the World Gold Council, supply coming from gold mine production, recycled gold and central banks sales of gold. In 2012 the largest producers of gold were: China, Australia, the United States, Russia and South Africa. Figure 4 shows that total gold supply has been growing since 2006, reaching a record of 120 million ounces in 2011 or 4,511.85 metric tonnes.⁷



Source: DataStream Thomson Reuters

⁷ James, L. 2012. Gold Supply Crunch is coming? *Chief Metals & Mining Investment Strategist*

However, in 2012 gold supply has been decreased to 4,494.67 metric tonnes. Mine production falls to a 10-years low in 2008, while recycled gold supply shown growth. In 2012, the mine production increased to 2,860 metric tonnes, since 2000, while the recycle gold had declined to 1,633.7 metric tonnes, since 2009. For years, central banks were net sellers of gold. However, in 2009 the first time central banks became the net buyers of gold bullion, since 1988. In 2012 net purchases of gold by central banks around the world was 500 metric tonnes. Greenwood and Steiner (2011) find that during 2002-2010, gold production was responsible for 60% of supply recycled gold for 30% of supply and central bank sales was responsible for 10%.

4. Data and Methodology

In the analysis I use observations from the first day of the month over period of 13 years starting from January 2000 to December 2013. Gold price, silver price and also six gold ETFs and five silver ETFs are as dependent variables and I analyze the effect of several macroeconomic factors such as: currency, stock market, interest rate, inflation rate, crude oil and volatility. Data description can be seen in Table 3. Table 4 describes the features of ETFs sample.

Table 3
Data sources for gold variables

Factors effecting the dependent variables	Independent variables
Currency	US dollar Index
Stock market	S&P 500 price Index
Interest rate	US LIBOR 1 Week
Inflation rate	US CPI Inflation
Crude oil	WTI Cushing US\$/BBL
Volatility	CBOE Gold Volatility Index

Source: DataStream Thomson Routers

For the further calculations I will work with monthly logarithmic rate of return for all gold variables, gold ETFs and silver ETF except interest rate and VIX (volatility). The rate of return is computed in the following way:

$$R_{j,t} = \ln \left[\frac{P_{j,(t+1)}}{P_{j,t}} \right] \quad (1)$$

Where $R_{j,t}$ refers return of variable j at time t and $P_{j,t}$ is the price for variable j at time t , $P_{j,(t+1)}$ is the price for variable j at time $(t+1)$.

Table 4
Exchange –Traded Funds Sample

Panel A: Gold Exchange-Traded Funds						
Ticker Symbol	Short name	Launch date	Leverage	β target	Annual free	Holdings
GLD	SPDR GOLD SHARES	19-Nov-04	Long	1	0.40%	Physical gold
IAU	ISHARES GOLD TRUST	21-Jan-05	Long	1	0.25%	Physical gold
DGL	POWERSHARES DB GOLD FD.	5-Jan-07	Long	1	0.79%	Swaps Futures
GDX	MARKET VECTORS GD.MINERALS ETF	22-May-06	Long	1	0.55%	Stocks
PHAU	ETFS MTL.SEC.S.PHYC.(LON) GOLD U\$	24-Apr-07	Long	1	0.39%	Physical gold
GBS	GOLD BULLION SECS.(LON) ETF	15-Apr-04	Long	1	0.40%	Physical gold
Panel B: Silver Exchange-Traded Funds						
Ticker Symbol	Short name	Launch date	Leverage	β target	Annual free	Holdings
SLV	ISHARES SILVER TRUST	28-Apr-06	Long	1	0.50%	Physical Silver
DBS	POWERSHARES DB.SIL.FD	5-Jan-07	Long	1	0.79%	Swaps, Futures
PHAG	ETFS METAL SECS. PHYSICAL SILVER	1-Apr-07	Long	1	0.49%	Physical Silver
ZSIL	ZKB SILVER ETF	10-May-07	Long	1	0.60%	Physical Silver
SLVR	ETFS CMOD. SECS.SILVER	27-Sep-06	Long	1	0.49%	Futures, Forwards

Table 4 describes the features of our sample of Exchange-Traded Funds. Panel A describes sample of gold ETFs that track the price of gold and Panel B describes sample of silver ETFs that track the price of silver on the London Bullion Market.

The methodology that has been used to achieve the objective of the study is Ordinary Least Square. The Ordinary Least Square (OLS) is statistical technic was used to examine an effect of the several independent variables on the dependent variable. The model is as follow:

$$Y_j = \beta_1 + \beta_2 X_{2j} + \beta_3 X_{3j} + \dots + \beta_n X_{nj} + \varepsilon_j, \text{ for } j = (2, 3 \dots n) \quad (2)$$

Where, Y_j refers to the value of the dependent variable, $X_{(2,3,...n)}$ refers to the values of independent variables that explained by Y_j , β_1 is a constant value and $\beta_{(2,3,...n)}$ are coefficients for independent variables, ε_j is the error term. Standardized beta for an independent variable indicates the expected increase or decrease in the dependent variable, in standard deviation units, given a one standard deviation increase in independent variable with all other independent variables held constant, explained Nathans, Oswald and Nimon (2012). Later I present standardized beta (β^*):

$$\beta_j^* = \beta_j \frac{SD_{X_j}}{SD_Y}, \text{ for } j = (2, 3 \dots n) \quad (3)$$

All statistical calculations have been performed with help of STATA 12.0 version.

5. Empirical Findings

5.1 Structural breaks for Gold and Silver Prices

Figure 5

Price of Gold Bullion on LBM over the period from January 2000 to December 2013

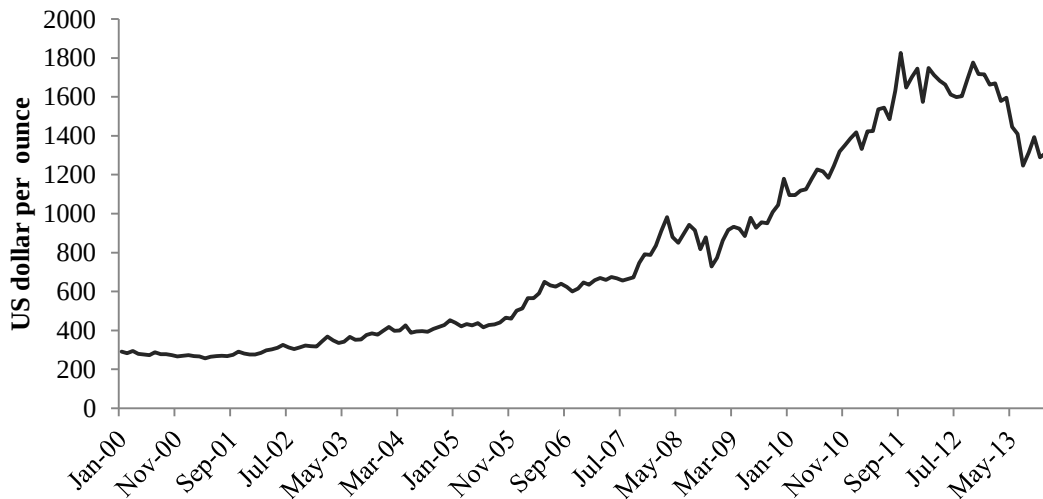


Figure 5 shows movement of the gold bullion price per ounce. Figure indicates that the bull market on gold price begin from April 2001 and for the next ten years rose very fast. During finance crisis 2008-2009 there was big downturn, when gold price fell from \$981.35 to \$727.35. But then subsequently recovers all the losses with the price \$1,826.35 per ounce in September 2011 on the London Bullion Market (LBM). The second downturn occurred over period from October 2012 to December 2013, the gold prices showed dramatic fall from \$1,777 to \$1,227 per ounce.

Figure 6

Price of Silver Bullion on LBM over the period from January 2000 to December 2013

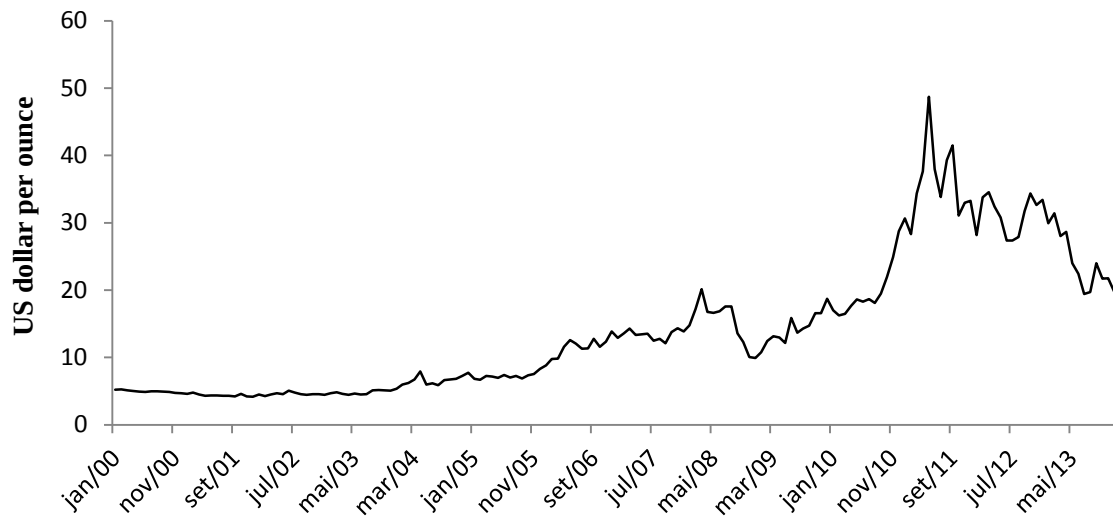


Figure 6 shows movement of silver bullion price per ounce. The silver price from July 2003 indicates the dramatic growth until May 2011 with the highest price reached of \$48.7 per ounce on the London Bullion Market (LBM). During the Great Recession of 2008-2009 was first downturn when the silver price went from \$20.16 to \$10.05, and then started increasing even faster. Over the period from May 2011 to December 2013 occurs next fall of silver price from \$48.7 to \$19.75 per ounce. On Figures 4 and 5, we can see that over 13 years prices of gold and silver generally move in the same direction.

5.2 Descriptive Statistics

Table 5
Summary statistics

Variables	Obs.	Mean	Std. Dev.	Min.	Max.
Gold	167	0.00897	0.04909	-0.12223	0.11307
S&P 500	167	0.00111	0.04923	-0.16880	0.10283
VIX	168	21.3817	8.39389	11.2400	53.6800
Interest rate	168	0.00191	0.00179	0.00011	0.00552
Inflation	165	0.40014	0.61156	-1.88200	2.25501
US dollar	167	-0.00134	0.01746	-0.04784	0.06469
Silver	167	0.00796	0.09257	-0.28852	0.25788
Crude oil	167	0.00825	0.09267	-0.25952	0.19011

Table 5 describes the summary statistics for gold variables over the sample period. The return of gold is dependent variable includes 167 observations. Mean and std. deviation is 0.00897

and 0.04909 respectively. Minimum value negative is (-0.12223), while the maximum value is 0.11307. The return of silver has 167 observations with monthly mean and std. deviation is 0.00796 and 0.09257 respectively. Minimum value negative is (-0.28852), while maximum value is 0.25788.

Next we considered summary statistics of gold variables. The first variable is return of S&P 500 has 167 observations. Mean is 0.00111 and std. deviation is 0.04923. Maximum and minimum values are 0.10283 and (-0.16880) respectively. The second variable is VIX (volatility) has 168 observations. Mean is 21.3817 and std. deviation is 8.3939. Maximum value is 53.68 and minimum value is 11.24. The third variable is interest rate has 168 observations. Maximum value is 0.00552 and minimum value is 0.00011. Monthly mean is 0.00191 and std. deviation of 0.00179. The fourth variable is inflation has 165 observations. Maximum value is 2.25501, while minimum value negative is (-1.88200). Std. deviation and mean is 0.61156 and 0.40014 respectively. The next variable is return of US dollar has 167 observations. Mean is negative (-0.00134), while std. deviation is 0.01746. Minimum and maximum values are (-0.04784) and 0.06469 respectively. Lastly, we have the return of crude oil. The number of observations is 167. Std. deviation and monthly mean is 0.09267 and 0.00825 respectively. Maximum value is 0.19011, while minimum value negative is (-0.25952).

Table 6
Correlations

	Gold	S&P 500	VIX	Silver	Crude oil	Interest rate	Inflation	US dollar
Gold	1.0000							
S&P 500	0.0432	1.0000						
VIX	0.0051	-0.4436	1.0000					
Silver	0.7479	0.1863	-0.1160	1.0000				
Crude oil	0.2012	0.3525	-0.2686	0.2969	1.0000			
Interest rate	0.0091	-0.0980	-0.2093	-0.0279	-0.0083	1.0000		
Inflation	0.2457	0.2218	-0.2858	0.2705	0.5935	0.0886	1.0000	
US dollar	-0.2671	-0.2134	0.0831	-0.2537	-0.2714	0.0796	-0.2938	1.0000

Table 6 describes correlation between return of gold and return of gold variables over the full sample period. We can see there is no correlation between return of gold and return of S&P 500, VIX and interest rate. Correlations coefficients are 0.0432, 0.0051, and 0.0091

respectively. There is weak positive correlation between return of gold and inflation rate and between return of crude oil and return of gold, correlation coefficients are 0.2457 and 0.2012 respectively. The negative correlation occurred between return of gold and return of US dollar, correlation coefficient is (-0.2671).

Meanwhile, strong positive is correlation observed between return of gold and return of silver, coefficient we get is 0.7479. Furthermore, moderate positive correlation occurs between inflation rate and return of crude oil, correlation coefficient we get is 0.5935. The moderate negative correlation occurs between return of S&P 500 and VIX, correlation coefficient is (-0.4436).

Table 7
Summary statistics of Exchange-Traded Funds returns

Panel A: Gold Exchange-Traded Funds						
Ticker Symbol	Variable	Obs.	Mean	Std. Dev.	Min.	Max.
GLD	SPDR GOLD SHARES	108	0.00882	0.05677	-0.18991	0.13426
IAU	ISHARES GOLD TRUST	106	0.00974	0.05703	-0.19106	0.13403
DGL	POWERSHARES DB GOLD FD.	82	0.00549	0.06018	-0.19055	0.12371
GDX	MARKET VECTORS GD.MINERALS ETF	90	-0.00679	0.11623	-0.47457	0.40931
PHAU	ETFS MTL.SECS.PHYC.(LON) GOLD U\$	79	0.00725	0.06165	-0.18652	0.12264
GBS	GOLD BULLION SECS.(LON) ETF	115	0.00959	0.05516	-0.18897	0.12296
Panel B: Silver Exchange-Traded Funds						
Ticker Symbol	Variable	Obs.	Mean	Std. Dev.	Min.	Max.
SLV	ISHARES SILVER TRUST	91	0.00314	0.11009	-0.31774	0.22070
DBS	POWERSHARES DB.SIL.FD	82	0.00209	0.11298	-0.32332	0.22663
PHAG	ETFS METAL SECS. PHYSICAL SILVER	79	0.00439	0.11973	-0.30309	0.27107
ZSIL	ZKB SILVER ETF	78	-0.00008	0.10477	-0.23697	0.23873
SLVR	ETFS CMOD. SECS.SILVER	86	0.00413	0.11717	-0.30757	0.27227

Table 7 describes summary statistics of the ETFs returns. Panel A presents the summary statistics of the returns of gold ETFs. The number of observations is different since ETFs have different creation date. The first largest fund is SPDR GOLD SHARES. Observations range

from December 2004 to December 2013. Mean and std. deviation is 0.00882 and 0.05677 respectively. Maximum value is 0.13426, while minimum value is negative equal to (-0.18991). The next is ISHARES GOLD TRUST. Observations range from February, 2005 to December, 2013. Mean of the fund is 0.00974, while std. deviation is 0.05703. Maximum value is 0.13403 and minimum value is negative (-0.19106).

Next three gold ETFs such as: MARKET VECTORS GD.MINERALS ETF following by POWERSHARES DB GOLD FD and ETFS MTL.SECS.PHYC. (LON) GOLD U\$ are relatively new.

The maximum value of return of MARKET VECTORS GD.MINERALS ETF is 0.40931, while minimum value is negative (-0.47457). Mean and std. deviation is (-0.00669) and 0.11623 respectively. Observations range from June 2006 to December 2013. The next is POWERSHARES DB GOLD FD. Observations range from February 2007 to December 2013. Mean and std. deviation is 0.00549 and 0.06018 respectively. Maximum value is 0.12371, while minimum value is negative (-0.19055). The next is ETFS MTL.SECS.PHYC (LON) GOLD U\$. Observations range from May 2007 to December 2013. Maximum value is 0.12264, while minimum value negative is (-0.18652). Mean and std. deviation is 0.00725 and 0.06165 respectively. The last and oldest gold ETF is GOLD BULLION SECS. (LON) EFT USD. Observations range from May 2004 to December 2013. Maximum and minimum values are 0.12296 and (-0.18897) respectively. Mean is 0.00959 and std. deviation is 0.05516.

On Panel B, we have summary statistics of the silver ETFs returns.

The first largest silver ETF is ISHARES SILVER TRUST. Observations range from May 2006 to December 2013. Mean is 0.00314, while std. deviation is 0.11009. Maximum value is 0.22070 and minimum value is negative (-0.31774). The next is POWERSHARES DB.SIL.FD. Observations range from February 2007 to December 2013. Maximum value is 0.22663 and negative minimum value is (-0.32332). Mean and std. deviation is 0.00209 and 0.11298 respectively. The third is METAL SECS. PHYSICAL SILVER. Observations range from May 2007 to December 2013. Std. deviation is 0.11973 and mean is 0.00439. Maximum and minimum values are 0.27107 and (-0.30309) respectively. The next is ETF is ZKB SILVER ETF. Observations range from June 2007 to December 2013. Mean is 0.000075 and std. deviation is 0.1047743. Maximum value is 0.02387, while minimum value negative is (-

0.23697). The last is ETFS CMOD.SEC.SILVER. Observations range from October 2006 to December 2013. Mean and std. deviation is 0.00413 and 0.11717 respectively. Maximum value is 0.27227, while minimum value is negative (-0.30757).

Table 8
Correlations between return of gold and gold ETFs returns

	Gold	SPDR GOLD SHARES	ISHARES GOLD TRUST	POWER SHARES DB GOLD FD.	MARKET VECTORS GD. MINERAL S ETF	ETFS MTL.SEC S.PHYC. (LON) GOLD U\$	GOLD BULLION SECS. (LON) ETF
Gold	1.0000						
GLD	0.9806	1.0000					
IAU	0.9803	0.9999	1.0000				
DGL	0.9787	0.9983	0.9984	1.0000			
GDX	0.8063	0.8534	0.8535	0.8517	1.0000		
PHAU	0.9905	0.9906	0.9903	0.9885	0.8293	1.0000	
GBS	0.9899	0.9908	0.9905	0.9886	0.8299	0.9999	1.0000

On Table 8, we can see the result of correlations between return of gold and returns of gold ETFs. The return of gold has strong correlation with the returns of gold ETFs. The largest positive correlation occurs between return of gold and return of ETFS MTL.SEC.S.PHYC (LON) GOLD U\$ (PHAU), correlation coefficient is 0.9905.

Meanwhile, there is strong positive correlation between returns of gold ETFs such as: SPDR GOLD SHARES (GLD) and ISHARES GOLD TRUST (IAU) and between ETFS MTL.SEC.S.PHYC (LON) GOLD U\$ (PHAU) and GOLD BULLION SECS (LON) ETF (GBS).

Table 9
Correlations between return of silver and silver ETFs returns

	Silver	ISHARES SILVER TRUST	POWER SHARES DB.SIL. FD	ETFS METAL SECS. PHYSICAL SILVER	ZKB SILVER ETF	ETFS CMOD. SECS. SILVER
Silver	1.0000					
SLV	0.9631	1.0000				
DBS	0.9606	0.9986	1.0000			
PHAG	0.9807	0.9827	0.9814	1.0000		
ZSIL	0.9351	0.9171	0.9180	0.9814	1.0000	
SLVR	0.9818	0.9824	0.9811	0.9998	0.9431	1.0000

Table 9 shows correlations between return of silver and silver ETFs returns over the sample period. The return of silver is strong positively correlated with returns of silver ETFs.

Meanwhile, strong positive is correlation occurs between the returns of silver ETFs such as: ETFS METAL SECS PHYSICAL SILVER (PHAG) and ETFS CMOD.SECs SILVER (SLVR), and between ISHARES SILVER TRUST (SLV) and POWERSHARES DB.SIL FD (DBS) correlation coefficients are 0.9998 and 0.9985 respectively.

5.3 Regression Analysis

Table 10 provides the result of the linear regression with return of gold as dependent variable and several independent variables. The standard errors are robust. The number of observations is 165 and R-squared is 0.1125. The R-squared indicates that 11.25% of the variance in the S&P 500, US dollar returns, VIX, interest rate, inflation rate and return of crude oil are explained by the return of gold.

Table 10
Linear Regression for gold variables

Number of obs.	165
F(5, 158)	2.82
Prob. > F	0.0122
R-squared	0.1125
Root MSE	0.04708

Gold	Coef.	Robust Std. Err.	t	P>t	Standardized Beta
S&P 500	-0.02552	0.098865	-0.26	0.797	-0.025702
VIX	0.00049	0.000578	0.83	0.409	0.085047
US dollar	-0.59406	0.256181	-2.32	0.022**	-0.212296
Interest rate	0.75539	2.062476	0.37	0.715	0.273970
Inflation	0.01320	0.008223	1.61	0.110	0.164595
Crude oil	0.41143	0.049663	0.83	0.409	0.077987
_cons	-0.00921	0.014491	-0.64	0.526	.

t statistics in parentheses

= "*" p<0.10 ** p<0.05 *** p<0.01"

Table 10 demonstrates that return of US dollar is statistically significant and has an effect on the return of gold. The significant value stands at 0.022 on 5% level. The standardized beta indicates that variation of one standard deviation in the return of US dollar, it is expected

variation in the return of gold by (-0.212). Meanwhile the return of S&P 500, VIX, interest rate, inflation rate and return of crude oil are statistically insignificant and do not affect the return of gold.

Table 11
Linear Regression for silver variables

Number of obs.	165
F(5, 159)	4.65
Prob. > F	0.0002
R-squared	0.1327
Root MSE	0.08802

Silver	Coef.	Robust Std. Err.	t	P>t	Standardized Beta
S&P 500	0.127858	0.150294	0.85	0.396	0.068098
VIX	0.000001	0.001069	-0.10	0.999	-0.000169
US dollar	-0.849454	0.377174	-2.25	0.026**	-0.160511
Interest rate	-0.898623	3.894136	-0.23	0.818	-0.017233
Inflation	0.017271	0.013998	1.23	0.219	0.113851
Crude oil	0.161235	0.086775	1.86	0.065*	0.161601
_cons	0.000682	0.028523	0.02	0.981	.

t statistics in parentheses

= " * p<0.10 ** p<0.05 *** p<0.01 "

On Table 11, we can see the result of the linear regression with return of silver as dependent variable and several independent predictors. The standard errors are robust. The number of observations is 165 and R-squared is 0.1327. The R-squared indicates that 13.27% of the variance in the S&P 500, US dollar returns, VIX, interest rate, inflation rate and return of crude oil are explained by the return of silver. S&P 500 return, VIX, inflation rate, interest rate are statistically insignificant and do not affect the return of silver. The return of US dollar is statistically significant and has effect on silver return. The significant value stands at 0.026 on 5% level. The value of standardized beta is (-0.161). The beta coefficient indicates that variation of one standard deviation in the return of US dollar, it is expected variation in the return of silver by (-0.161). Meanwhile, return of crude oil has a weak effect on silver return at the 10% level.

Table 12 shows the result from regression with the return of gold ETFs as dependent variables and return of gold as independent variable. The return of gold is statistically significant at the 1% level and has effect on return of ETFs. The values of beta indicates that variation of one

standard deviation in the return of gold, it is expected variation in SPDR GOLD SHARES by 1.017, ISHARES GOLD TRUST by 1.02, POWERSHARES DB. GOLD FD by 1.01, MARKET VECTORS GD.MINERALS ETF by 1.645, ETFS MTL.SEC.S.PHYC (LON) GOLD U\$ by 1.030 and GOLD BULLION SECS (LON) EFT USD by 1.026. Thus, return of gold has greatest effect on return of MARKET VECTORS GD.MINERALS ETF. The adjusted R-squared for MARKET VECTORS GD.MINERALS ETF is 0.632. The result indicates that 63.2% of the variance of MARKET VECTORS GD.MINERALS ETF is explained.

Table 12
Gold Regression explained by gold ETFs returns

	(1)	(2)	(3)	(4)	(5)	(6)
	SPDR GOLD SHARES	ISHARES GOLD TRUST	POWER SHARES DB GOLD FD	MARKET VECTORS GD. MINERALS ETF	ETFS MTL. SECS.PHYC. (LON) GOLD U\$	GOLD BULLION SECS. (LON) EFT USD
Gold	1.017*** (31.01)	1.020*** (30.34)	1.010*** (27.14)	1.645*** (8.95)	1.030*** (33.25)	1.026*** (36.90)
Constant	-0.001 (-0.87)	-0.001 (-0.87)	-0.003* (-1.87)	-0.020*** (-2.66)	-0.001 (-1.13)	-0.001 (-1.26)
Observations	108	106	82	90	79	115
R-squared	0.958	0.960	0.956	0.636	0.981	0.981
Adjusted R-squared	0.958	0.960	0.956	0.632	0.981	0.980

t statistics in parentheses

= " * p<0.10 ** p<0.05 *** p<0.01"

Table 13 describes the regression result with return of gold ETFs as dependent variables and gold variables as independent. The return of S&P 500, VIX, return of crude oil, interest rate and return of US dollar are statistically insignificant and do not affect the return of gold ETFs. Inflation rate is not statistically significant and has not effect on returns of SPDR GOLD SHARES and ISHARES GOLD TRUST.

However, inflation has a weak effect at the 10% level on returns of POWERSHARES DB GOLD FD, MARKET VECTORS GD.MINERALS ETF, and ETF MLT SECS PHYC (LON) GOLD U\$, GOLD BULLION SECS (LON) ETF.

Table 13
Regression for gold variables explained by gold ETFs returns

	(1) SPDR GOLD SHARES	(2) ISHARES GOLD TRUST	(3) POWER SHARES DB GOLD FD	(4) MARKET VECTORS GD. MINERALS ETF	(5) ETFS MTL. SECS.PHYC. (LON) GOLD U\$	(6) GOLD BULLION SECS. (LON) ETF
S&P 500	0.050 (0.27)	0.040 (0.22)	0.006 (0.03)	0.663 (1.41)	-0.035 (-0.18)	0.054 (0.34)
VIX	0.001 (1.14)	0.001 (1.02)	0.001 (1.284)	0.003 (1.51)	0.001 (1.23)	0.001 (1.14)
Crude oil	0.087 (1.00)	0.091 (1.01)	0.101 (0.98)	0.86 (0.39)	0.117 (1.08)	0.050 (0.67)
Interest rate	4.408 (1.38)	4.293 (1.45)	1.299 (0.33)	6.108 (1.09)	2.247 (0.45)	4.330 (1.38)
Inflation	0.016 (1.61)	0.016 (1.52)	0.022* (1.76)	0.045* (1.89)	0.024* (1.88)	0.018* (1.88)
US dollar	-0.346 (-0.86)	-0.321 (-0.79)	-0.111 (-1.37)	-0.784 (-0.94)	-0.084 (-0.18)	-0.368 (-1.00)
Constant	-0.028 (-1.23)	-0.024 (-1.06)	-0.033 (-1.37)	-0.112** (-2.01)	-0.033 (-0.36)	-0.026 (-1.29)
Observations	106	104	80	88	77	113
R-squared	0.144	0.139	0.131	0.270	0.148	0.133
Adjusted R-squared	0.092	0.086	0.059	0.216	0.074	0.084

t statistics in parentheses

=** p<0.10 ** p<0.05 *** p<0.01"

Table 14 presents the regression result with return of silver ETFs as dependent variables and return of silver as independent variable. The return of silver is statistically significant at the 1% level and has an effect on return of silver ETFs. The values of beta indicates that variation of one standard deviation in the return of silver, it is expected variation in SPDR SILVER SHARES by 0.959, POWERSHARES DB.SIL.FD by 0.958, ETFS METAL SECS. PHYSICAL SILVER by 1.024, ZKB SILVER ETF by 0.849 and ETFS CMOD SECS.SILVER by 1.032 standard deviations.

Thus, we conclude that return of silver has greatest effect on returns of ETFS.CMOD SECS SILVER ETFS and METAL SECS. PHYSICAL SILVER, while lowest effect on return of ZKB SILVER ETF.

Table 14
Silver Regression explained by silver ETFs returns

	(1) ISHARES SILVER TRUST	(2) POWER SHARES DB.SIL.FD	(3) ETFS METAL SECS. PHYSICAL SILVER	(4) ZKB SILVER ETF	(5) ETFS CMOD. SECS.SILVER
Silver	0.959*** (26.24)	0.958*** (24.35)	1.024*** (55.85)	0.849*** (19.74)	1.032*** (58.95)
Constant	-0.002 (-0.46)	-0.002 (-0.61)	-0.000 (-0.18)	-0.004 (-0.97)	-0.002 (-0.91)
Observations	91	82	79	78	86
R-squared	0.916	0.918	0.962	0.875	0.965
Adjusted R-squared	0.915	0.917	0.962	0.874	0.964

t statistics in parentheses

=** p<0.10 ** p<0.05 *** p<0.01"

On Table 15, we can see the regression result with return of silver ETFs as dependent variables and gold variables as independent. Inflation rate is statistically significant at the 1% level and has a strong effect on returns of POWERSHARES DB. SIL.FD, ETFS METAL SECS PHYSICAL SILVER, ZKB SILVER ETF and ETFS CMOD SECS SILVER. Meanwhile inflation has weak effect on return of ISHARES SILVER TRUST, at the 10% level.

The return of crude oil is significant at the 5% level and has strong impact on returns of ETFS METAL SECS PHYSICAL SILVER, ZKB SILVER ETF and ETFS CMOD SECS SILVER. However return of crude oil has weak affect the return of POWERSHARES DB SILV FD at the 10% significant level and has not affect the return of ISHARES SILVER TRUST. The returns of S&P 500 and US dollar, VIX, interest rate are statistically insignificant and do not affect the return of silver ETFs.

Table 15
Regression for silver variables explained by silver ETFs returns

	(1)	(2)	(3)	(4)	(5)
	ISHARES SILVER TRUST	POWER SHARES DB.SIL.FD	ETFS METAL SECS. PHYSICAL SILVER	ZKB SILVER ETF	ETFS CMOD. SECS.SILVER
S&P 500	0.171 (0.51)	0.061 (0.18)	-0.056 (-0.16)	-0.312 (-1.23)	-0.007 (-0.02)
VIX	0.001 (0.79)	0.002 (1.01)	0.002 (1.01)	0.002 (1.27)	0.001 (0.87)
Crude oil	0.290 (1.61)	0.356* (1.88)	0.435** (2.18)	0.409** (2.57)	0.377** (2.08)
Interest rate	-1.660 (-0.27)	-7.355 (-1.07)	-7.175 (-0.85)	-11.635 (-1.43)	-3281 (-0.48)
Inflation	0.036* (1.98)	0.048*** (2.72)	0.050*** (2.70)	0.048*** (2.65)	0.051*** (2.79)
US dollar	-0.040 (-0.95)	-0.258 (-0.41)	-0.110 (-0.17)	0.373 (0.56)	-0.227 (-0.36)
Constant	-0.040 (-0.90)	-0.052 (-1.17)	-0.052 (-1.13)	-0.051 (-1.35)	-0.048 (-1.06)
Observations	89	80	77	76	84
R-squared	0.243	0.275	0.277	0.244	0.264
Adjusted R-squared	0.187	0.216	0.214	0.178	0.207

t statistics in parentheses
="* p<0.10 ** p<0.05 *** p<0.01"

5.4 Rolling Window Estimation

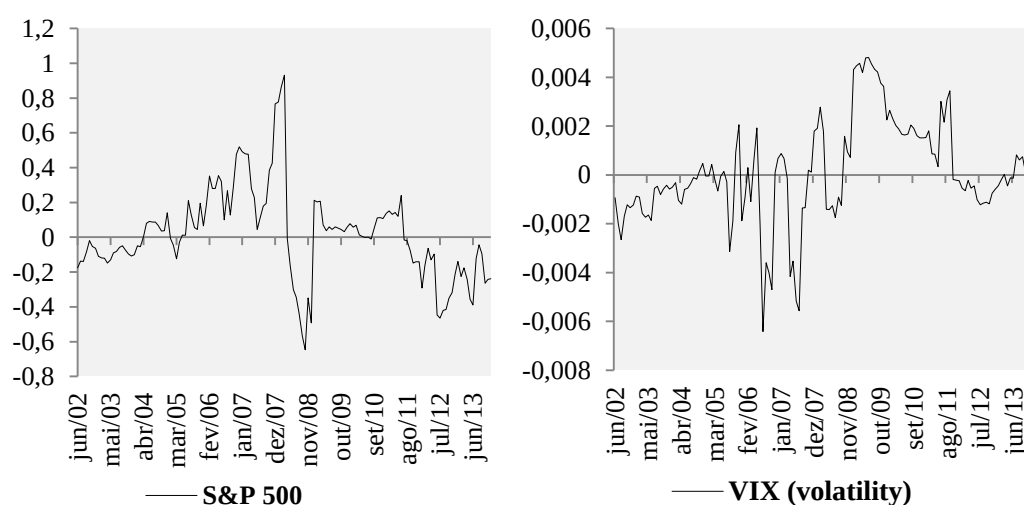
Figure 7 shows rolling window regression for gold of the 30 days moving window, to see how the gold variables change over the sample period. The S&P 500 has risen from January 2000 to March 2008 to almost 0.93 and showed the higher correlation with return of gold. Market crash always associate with the shocks and during the Great Recession 2008 return of market stock falls to almost (-0.64). In December 2013 the S&P 500 remains negative and indicates there is no correlation with return of gold.

Correlation between the return of gold and VIX over the period from January 2000 to December 2013 has range from 0.004 to (-0.006) respectively. The large decline occurred in

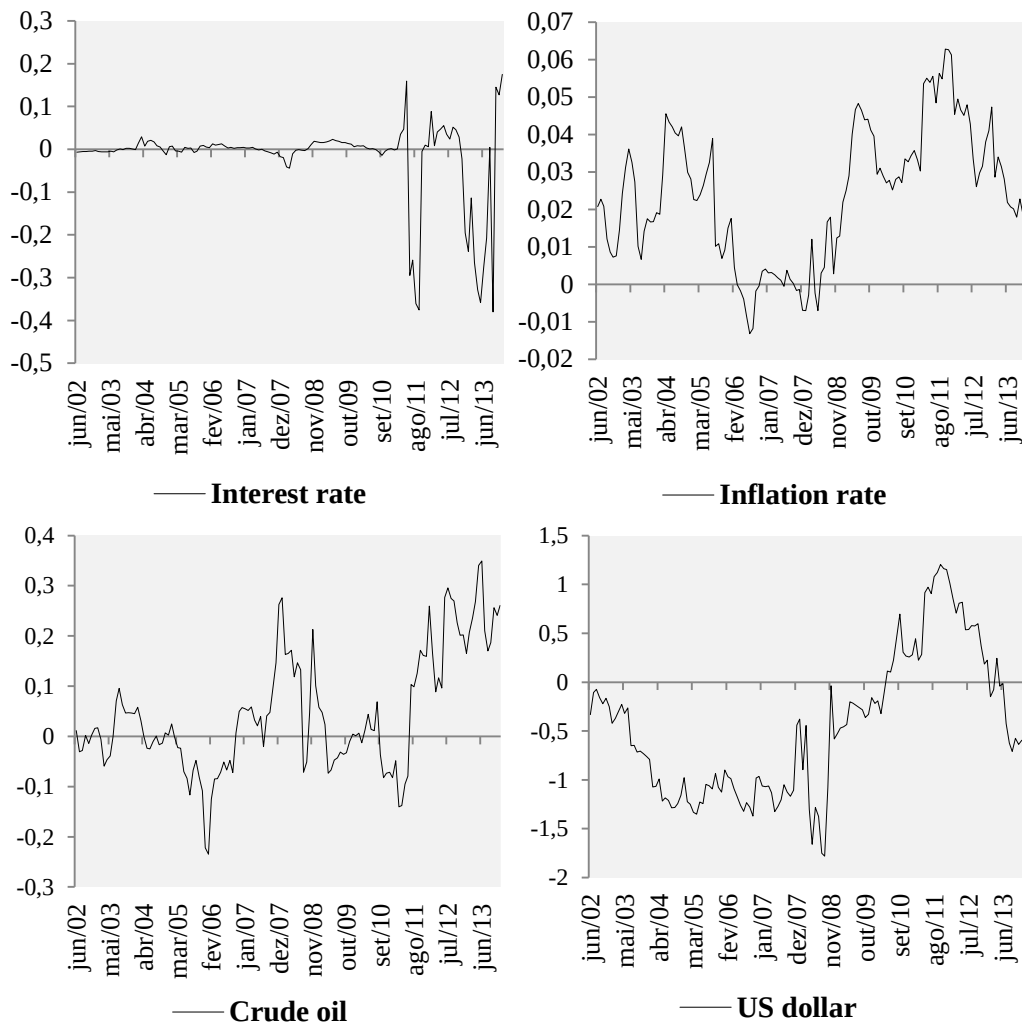
July 2007, correlation decreased from 0.002 to (-0.006), but in June 2009 increased to 0.004. The second downturn was in October 2012 to almost (-0.001). Thus, there is no correlation between return of gold volatility and VIX. Correlation between return of gold and interest rate from January 2000 to November 2010 was close to zero. Afterwards, we can see the first fast drop to (-0.33) in August 2011 and the second downturn in September 2013 from 0.09 to (-0.39). The December 2013 correlation between return of gold and interest rate has gone from (-0.38) to 0.15 and indicates weak correlation. The first downturn in correlation between the return of gold and inflation rate occurs in June 2006 from 0.004 to (-0.014), but in October 2011 had shown increasing to almost 0.06. The December 2013 correlation remains positive but significant low and indicates that return of gold do not influenced by inflation rate. The first downturn in correlation between the return of gold and return of crude oil occurs in December 2005 from 0.09 to almost (-0.32). In March 2011, correlation decreased from 0.26 to almost (-0.14). To December 2013, return of crude oil was positive and showed weak correlation between gold.

The correlation between return of gold and return of US dollar, during 13 years ranges from (-1.75) to 1.12. We can observe strong decrease from (-0.10) to almost (-1.75) in August 2008. In September 2011 correlation increased to almost 1.12. However, in December 2013 return of US dollar decreased to almost (-0.57) and has shown negative correlation with return of gold.

Figure 7
Rolling Window Regression for gold

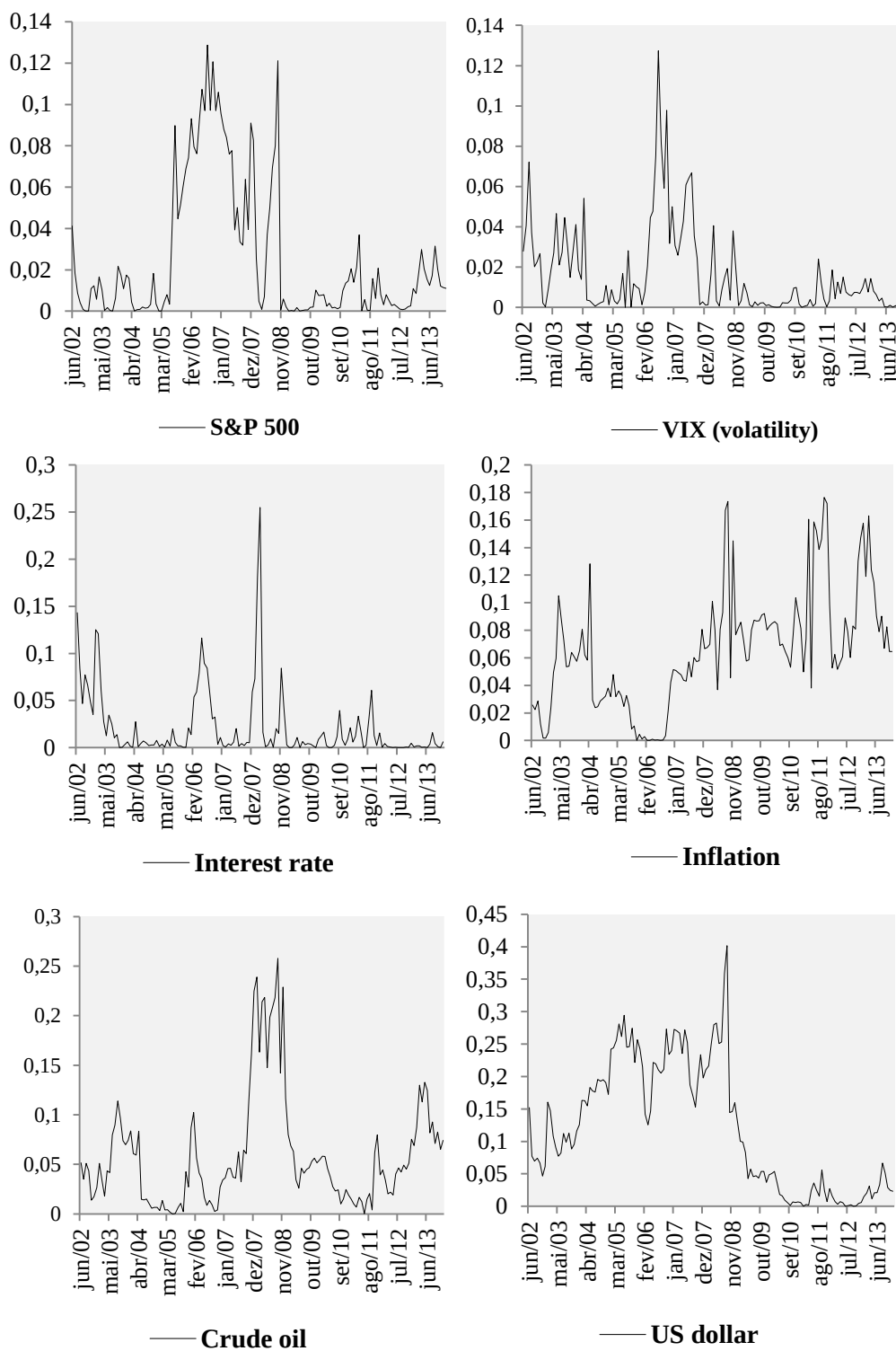


Gold as safe haven or speculative investment



On Figure 8, we can see rolling R-squared estimation for gold of 30 days moving window over period from January 2000 to December 2013. The R-squared for the return of S&P 500 was very volatile in range from 0.004 to 0.13, indicates that during 13 years change in stock market not cause of the change in return of gold. The same we can say about VIX with coefficient R-squared in range from 0.002 to 0.13. The R-squared for interest rate was in range from 0.006 to almost 0.25, while inflation rate in range from 0.0003 to 0.17 indicates that movements of interest rate and inflation rate do not impact gold much. R-squared for US dollar to September 2008 increased to almost 0.40, but to December 2013 occurred fall to 0.03 and indicates that return of US dollar cannot explain movement of return of gold. R-squared for return of crude oil over long period was in range from 0.005 to almost 0.30 indicates low correlation between returns of crude oil and gold.

Figure 8
Rolling R-squared for gold



6. Conclusion

In this study we examined the role of gold as an investment. In order to understand whether gold is a safe or speculative investment, we analysed the factors that may affect the prices of gold, silver, six gold ETFs and five silver ETFs. The relevant factors are: S&P 500, VIX (volatility), interest rate, inflation, US dollar and crude oil returns, from the period from January 2000 to December 2013.

The empirical findings find a weak negative correlation between returns of gold and US dollar. The positive correlation occurred between returns of gold and silver. Whereas weak positive correlation is between return of gold and inflation, return of crude oil and return of gold. The return of S&P 500, VIX and interest rate do not correlate with return of gold.

The regression analysis in the study was performed by using Least Square Method, standard errors are robust. We found that return of S&P 500, VIX, interest rate and inflation do not have significant relationship to the returns of gold and silver. The return of US dollar has negative effect on gold and silver returns. When the return of US dollar appreciates (depreciates), this drives the return of gold down (up). The variation of one standard deviation in the return of US dollar, it is expected decrease in variation of returns of gold by 0.21 and silver by 0.16 standard deviations. The return of crude oil has no relationship with return of gold, but it has a weak affect the return of silver at the 10% significant level.

Finally, I checked whether the return of gold had strong affect the return of gold ETFs and the return of silver influences the return of silver ETFs at the 1% significant level. The variation in one standard deviation in the return of gold, it is expected strong variation in return of MARKET VECTORS GD.MINERALS ETF by 1.645. Whereas the variation in one standard deviations in return of silver, it is expected strong variation in returns of ETFS.CMOD SECS.SILVER ETFS by 1.024 and METAL SECS. PHYSICAL SILVER by 1.032 standard deviations.

The return of S&P 500, volatility, interest rate, US dollar and crude oil returns do not reflect the changes in return of the gold ETFs. However, inflation has weak affect the returns of POWERSHARES DB GOLD FD, MARKET VECTORS. GD MINERALS ETF, and ETF MLT SECS. PHYC (LON) GOLD U\$, and GOLD BULLION SECS. (LON) ETF USD at the 10% significant level.

The return of few silver ETFs such as: POWERSHARES DB. SILV.FD, ETFS METAL SECS PHYSICAL SILVER, ZKB SILVER ETF and ETFS CMOD SECS SILVER are influenced by inflation at the 1% significant level. The variation of the inflation rate will cause immediate changes in returns of these ETFs. Meanwhile, the return of crude oil has strong effect on the returns of ETFS METAL SECS PHYSICAL SILVER, ZKB SILVER ETF and ETFS CMOD SECS SILVER, while it has a weak effect on the return of POWERSHARES DB SILV FD at the 10% significant level. The inflation and return of crude oil do not affect the return of ISHARES SILVER TRUST. The remaining variables are not statistically significant and their changes do not reflect the changes in the return of silver ETFs.

In summary, gold and silver are safe investments which provide diversification benefits for investment portfolio. Gold ETFs and silver ETFs are also an option for investors who seek the benefits from diversification, despite the fact that they are a new investment vehicle in the finance market.

However, the analyzed precious metals have ability to hedge against a weaker US dollar. Investors tend to invest more in gold when the US dollar depreciates which leads to higher prices for precious metals. However, when the US dollar appreciates, investors trust more in paper money rather than gold and silver. Moreover, gold and silver cannot provide strong hedge against inflation. But we believe that investment in gold and silver will provide to investors a possibility to protect their wealth in case of future possible inflation. Investment in gold ETFs provides a weak hedge against inflation. Whereas silver ETFs has ability hedge against inflation and hedge against adverse movements in oil prices.

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