

Gold Price Movements: Common Wisdom and Myths

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Abstract. Gold has a unique status in the economic world: a precious metal with wide uses and the measure of economic power of nations and the cornerstone of international monetary regimes. It has provided an important store of wealth to diverse investors, from individual to institutions, for centuries. It is an asset class and the foundation of a modern portfolio. In recent years, the world witnessed an aggressive growth in gold price. The role of gold in investment has drawn more attention since this transformational economic crisis began to unfold in 2008. This paper is an attempt to understand the price movement of gold. Can we find support for some popular opinions about gold on finance media? For instance: is gold a safe haven, a negative-beta asset, or an inflation hedge? How should we think about gold: a commodity or a currency? This paper provides some thoughts on these questions.

Keywords: Gold, Inflation, Repo rate, Commodity

1 Introduction

Since ancient times, gold has always been an important asset and a value store. Gold was used as an exchange medium even before the Roman Empire existed. The gold was also used for currency by Chinese and Hindu cultures. This shows that the gold was used not only by the western cultures but the eastern cultures also. Gold has been used in rituals, decorations, and jewellery for thousands of years. Its unusual chemical properties—high density, superb malleability, imperishable shine—and its genuine rarity all contribute to it being the most coveted commodity in nearly every culture¹. But it is not until in the late nineteenth century when the gold standard formed that gold went onto the central stage of global economic life.

Great Britain started the suit by adopting a gold-backed paper currency and the rest of the industrialized world followed this. Since 17th century, London has been the centre of gold trading. It was because the gold was brought to London for refining and distribution purposes. Meanwhile, it began a method for disseminating the price of Gold known as the "Fix" in 1919 as

¹Gold provides outstanding performance due to its unique technical properties. It combines high conductivity with corrosion resistance, and can be physically manipulated as it is both highly malleable and ductile. Gold is also a material of choice in medicine and dentistry as a consequence of its biocompatibility, and recent years have seen it emerge as a key nano material.

the center of distribution. The price, at which the most buy and sell orders, of the members or Fixing Seat Holder's, matched, or balance, is known as the Fix. A large volume of physical Gold can be bought or sold at a single, clearly posted price, the fix. The fix is a benchmark price for many transactions worldwide, whether for mines, fabricators or central banks, because it is undisputed prices at which all six of the largest Gold trading houses are willing do business.

The United States also started using gold in its currency and by the end of 1933, the United States Dollar was equal to 1/20th of an ounce of gold. Gold backed up the United States Dollar under an agreement known as the Bretton Woods agreement. Under this agreement, a specific value of gold tied the Dollar and also the other global currencies. This specific value was \$35/tr. oz of gold from 1934 to 1968. That made it illegal for the citizens of the US to own gold so that the level of gold and subsequently the value of dollar could be protected.

When the Gold Standard was evocated, it became a popular investment medium, and it led to risen gold prices to \$1710.6/tr. oz(almost equivalent to Rs.30710 per 10 gms using a factor .3215 and USD/INR = 55.84 on 6th September, 2012 3:55 pm) from \$35/tr. Oz (year 1968). Since then, no matter whatever happened, be it famines, floods or even world wars, gold's importance as an investment medium hasn't changed at all. Returning to gold standard has never been seriously discussed for decades. After waves of gold reserves sales in the last fifteen years or so, gold is being seen more and more as a common commodity.

1.1 History of gold in India

Prior to 1962, India was the world's largest gold market and the main trading center was Bombay. In 1962, the government enacted the Gold Control Act, which prohibited the citizens of India from holding pure gold bars and coins due to loss of reserves during the indo-china war. It was declared that the old holdings in pure gold had to be compulsorily converted into jewellery. Pure gold bars and coins were to be dealt only by licensed dealers².

²The Gold purity is measured in terms of Carats or fineness. A carat is a unit of purity of gold alloys and this Carat will tell you the percentage of Gold and other metal. Carat purity is measured as 24 times the purity by mass:

$$X = 24 \frac{M_g}{M_m}$$

where

X is the carat rating of the material,

M_g is the mass of pure gold or platinum in the material, and

A large unofficial market sprung up which dealt in cash only as a consequence of this legislation that adversely affected the official gold market. This also made way for smuggling and black marketing, which comprised of many jewellers and bullion traders.

In 1990, India was on a verge of default of external liabilities as it had a major foreign exchange problem. It had to give up the concept of controlling and licensing as it led to nothing more than corruption and shortages. As a result, the Indian government pledged 40 tonnes from their gold reserves with the Bank of England. India had to adopt the concept of liberalization. The government abolished the 1962 Gold Control Act in 1992 and liberalized the import of gold in India for a duty payment of Rs.250 per 10 grams. The government made up for the foreign exchange problem by allowing free imports and earning the taxes. This step expanded the gold market and it also waved off the unofficial trade i.e. smuggling and black marketing. This makes India the most price-sensitive market for gold in the world.

1.2 Gold Demand

Gold has both private demands and government demands. As previously discussed, in the gold-standard era, government demand is monetary gold. Private demands can be further divided using different criteria:

- i. Investment (ETFs, bullions, bars etc.) and non-investment (jewellery, industrial and dental) demands.
- ii. Depletive uses (manufacturing and dentistry) and non-depletive uses (bullions, jewellery, ornamentation and hoarding etc.).

What are the shares of different gold demands? We couldn't find any data for the gold-standard era. But there have been estimates that between half and two-thirds of the annual production went to private uses. One snapshot of recent years' gold demand breakup came from Q2 2012. In this year, the gold reserves of central banks and international institutions (IMF, for instance, is a large holder of gold reserves) was 990 tonnes, down 7% from the 1065.8 tonnes in Q2 2011 according to the World Gold Council's Gold demand trend reports. This dip in demand

M_m is the total mass of the material.

Jewellery standards specifies the benchmarks for gold to ascertain its fineness i.e., parts per thousand. So a 24 Carat Gold is considered as 999.999 parts per thousand pure. Similarly a 22 Carat Pure Gold is 22/24 i.e. 916.000 parts per thousand Gold and 84 Parts other metals, 18 Carat gold is 18/24th (gold is 750 parts per thousand and other metals have 250 parts). This system of calculation gives only the weight of pure gold contained in an alloy.

was partly due to the comparison with exceptional demand last year, and also reflects the challenging global economic climate. In value terms of gold demand remained relatively stable year on year at US\$51.2 billion, compared to US\$51.6 billion in Q2 2011. During the quarter, the average price of gold was US\$1609.49 per ounce, 7% higher than the average for Q2 2011 (see figure 1a &b).Annexure 1 provides the detail relating to demand of gold in different regions of the world.

Figure 1a:
Demand of Gold during Q2 2011-12

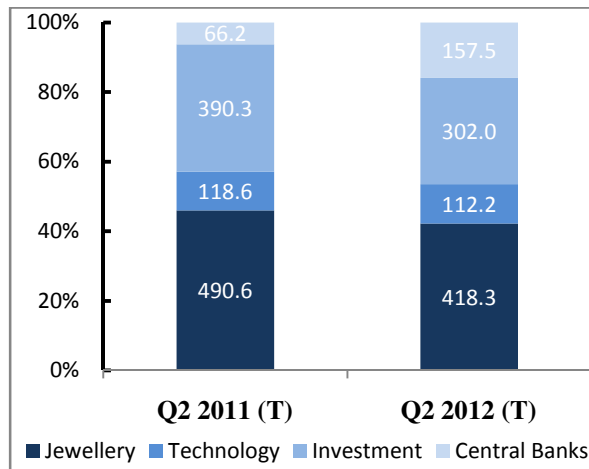
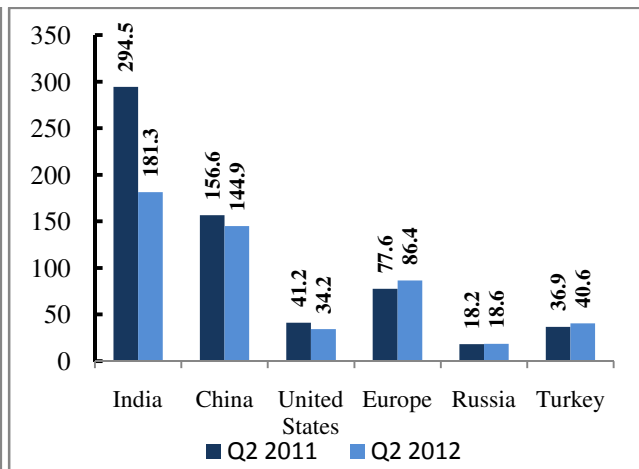


Figure 1b:
Gold Jewellery/investment demand by region



Source: World Gold Council

India and China continued to dominate global consumer demand, accounting for a combined 45% of total jewellery and bar and coin demand. The global demand numbers are therefore heavily reflective of movements in these two countries, which was not necessarily mirrored by other markets across the globe.

In India, investment and jewellery demand fell to 181.3t, down from 294.5t in Q2 2011. At 56.5t, investment demand was less than half the level in Q2 2011. Indian jewellery demand also experienced a noticeable drop to 124.8t, down 30% year-on-year from 179.5t. These marked declines were partly a reflection of the strength of demand in Q2 2011 and also driven by Indian investors taking advantage of the weak rupee against the US dollar. The fluctuations in the exchange rate and the rise in the gold price to records of around Rs.30, 000/10g in June were compounded by domestic inflation and concerns over a weak monsoon season.

According to World Gold Council, 75% of Indian women say they are constantly searching for new designs. Whilst over 50% of gold jewellery in India is bought for weddings,

the wedding anniversary has now become the most aspirational occasion for receiving gold today, extending a couple's relationship with gold beyond the marriage ceremony (According to World Gold Council). The festival of Dhanteras, the most auspicious day in the calendar just before Diwali, has traditionally created a strong seasonal surge in sales. However, the strategic development of the Akshaya Tritiya festival in May, together with leading trade partners, has seen phenomenal recent success; sales during that period grew over 28% in the last year.

India's culture and mythology embrace gold. And India's traditions of unparalleled craftsmanship and skill are exemplified by the country's gold jewellery manufacturing, with the majority of pieces still made meticulously by hand. Each region's symbols and designs are reinterpreted in gold which is overwhelmingly high in caratage.

Although an active market for physical gold buying and selling has been in existence in India for a long time, the use of gold as a financial product has been a more recent phenomenon. The introduction of gold futures trading³ allows integration of demand and supply of market participants, i.e., gold and jewellery manufacturers, exporters and importers, and investors, in organized markets. Two local exchanges—the MCX, and the National Commodity Derivatives Exchange (NCDEX) introduced gold futures contracts in late 2003. The focus on the MCX is due to its dominance in gold futures trading in India⁴.

MCX was established on 10 November 2003 as an independent demutualized multi-commodity exchange. MCX's business focuses on globally traded commodities such as gold, silver, copper, crude oil and natural gas to serve a large cross-section of participants including producers, traders, importers, and exporters among others⁵. The market is opened from Mondays through Saturdays. The MCX uses an electronic platform to match incoming orders. Trading sessions begins 10.00 a.m. to 11.30 p.m. on Mondays to Fridays and from 10.00 a.m. to 2.00 p.m.

³Futures markets perform two important roles, hedging of risks and price discovery. The efficacy of the hedging function is dependent on the price discovery process or how well new information is reflected in price. In general, futures markets are found to respond faster to new information than spot markets since the transaction cost is lower and the degree of leverage attainable is higher.

A **hedge** is an investment position intended to offset potential losses/gains that may be incurred by a companion investment

The **price discovery process** (also called **price discovery mechanism**) is the process of determining the price of an asset in the marketplace through the interactions of buyers and sellers

⁴MCX accounts for over half of gold futures trading activity in India. Both MCX and NCDEX have similar structures. However, activity on NCDEX is largely driven by regional domestic crops whereas activity on MCX revolves around precious metals and crude oil.

⁵ Among the three major national commodity exchanges, MCX account for almost 60% of total commodity trading.

on Saturdays. Trading of standard and mini gold futures on the MCX requires a 4% initial margin. All open positions are marked-to-market at the end of the day. A special margin in case of additional volatility can be imposed as deemed fit.

Gold futures contracts on MCX are settled with physical delivery. Quality specification for gold trading on MCX is at 99.5% purity. The gold must be serially numbered gold bars supplied by London bullion market association (LBMA) approved suppliers or other suppliers with quality certificates approved by MCX. On COMEX, a subdivision of New York Mercantile Exchange, Gold futures started trading in 1974, and have since become the world's principal exchange-traded instrument for this commodity.

1.3 Gold Supply

Gold supply comes from mining, sales of gold reserves, and “old gold scrap” (the recycling of gold). The gold mining went hand in hand with the geographical discovery of the earth by mankind. During the Gold Rushes years (from 1850 to 1900), about twice as much gold was mined as in previous history. The annual production of gold continued to increase dramatically in the twentieth century: from less than 500 tons per year in the 1900s all the way to more than 2000 tons per year in late 1980s. In the last fifteen years though, the annual mining production fluctuated around 2500 tons, which revealed the increasing difficulty of finding new deposits and mining and extraction in non-rich sites. Most of the gold left to be mined exists as traces buried in marginal areas of the globe, for instance, in the rain forests of Indonesia, the Andes and on the Tibetan plateau of China.

Reduction in recycling activity, with mine production growth rates also subdued that has resulted in total supply of gold. Gold mining has been bringing environmental disasters in forms of mercury linkage, deforestation and waste rocks among others to Africa, Latin America and East and Southeast Asia. This has drawn more and more attention worldwide.

1.4 Gold Price Movements

We chose the perspective of testing some commonly-held or heatedly-debated opinions about the price of gold as a means to analyze its price movement. Several common-wisdom “theories” are considered:

Firstly, people claim that as gold remains the eternal symbol of wealth in people's minds; people will switch their investments to gold in ages of turbulence. Gold is the “**safe haven**” on the financial market. To test this hypothesis, we look into “fear” measures as volatility in the stock market. A somewhat related hypothesis—the negative-beta asset hypothesis “**gold goes up when everything else going down**” is also tested.

Secondly, people marketing gold investment products will always describe gold as an “*inflation hedge*”. A straightforward analysis is provided on the real gold price (level), the return of gold and expected and actual inflation to test this claim. Instead of viewing gold as a special asset, we view gold as another currency, whose value is a reflection of the value of U.S. dollar. We investigate extensively on the relationship between gold price and dollar and dollar-valued assets. Some other less theoretical sayings are considered too, for example the effect of surging demands in India on the gold price.

The amount of studies that have attempted to statistically model the price of gold is numerous. This include studies by Ariovich (1983), Dooley, Isard and Taylor (1995), Kaufmann and Winters (1989), Sherman (1982, 1983, 1986) and Sjaastad and Scacciallani (1996), they modelled variation in the price of gold in terms of variation in main macroeconomic variables, such as exchange rates, interest rates.

We attempted to examine the continued bull run of the past few years of gold futures on MCX, India. Daily data for the gold futures contracts traded in the U.S. and India were obtained from Reuters India. Our study covers the period from March 1968 – October, 2003 (Comex gold trading prices in US\$) and November 2003 to June 2012 (MCX and Comex gold trading prices). The data set is constructed by rolling over the near-term futures contract on the first trading day of the contract's expiration month. The daily close prices of the COMEX Gold futures are adjusted to Indian rupees using the daily Indian U.S. dollar/rupee exchange rate along with a factor of 0.3215 for each conversion one troy ounce to one gm. Overall, gold prices appear to have been in a downward trend since the peak in the early 1980s but showed an impressive upward movement in recent five to ten years, as shown in Figure 2a & b.

Figure 2a: Gold Price Movement during March, 1968 – October, 2003

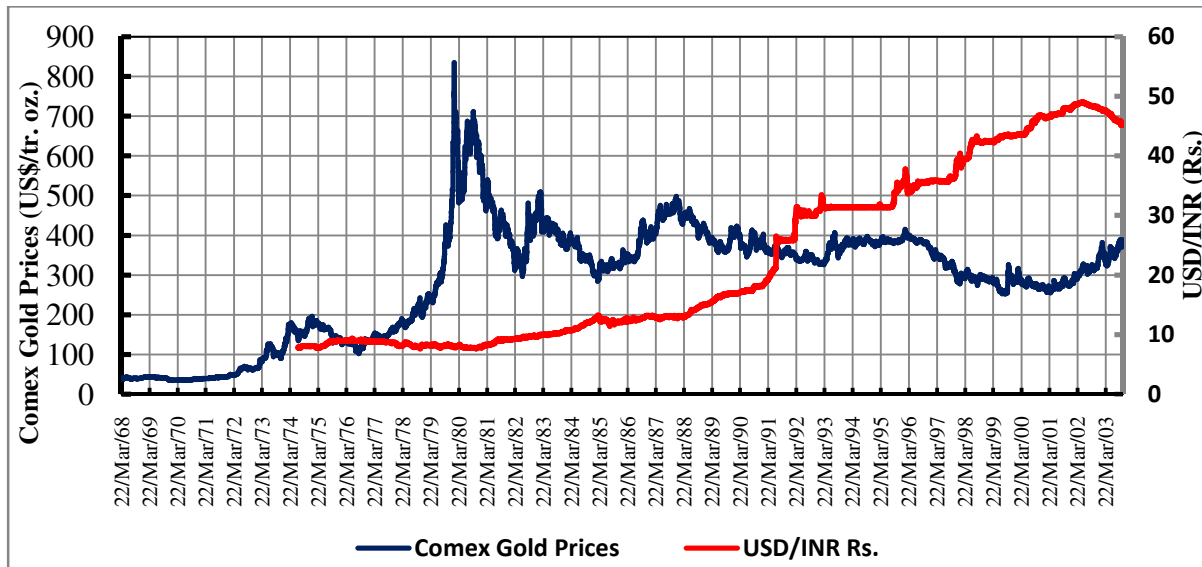
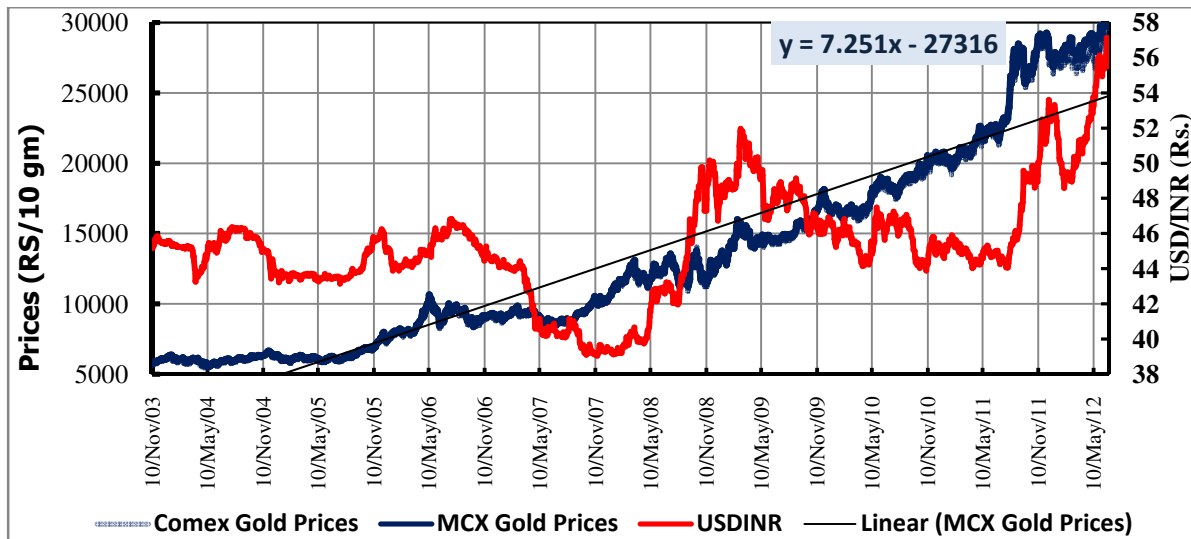


Figure 2b: Bullion Price Movement of Gold Prices during November, 2003 – June, 2012



An examination of how Gold prices and the US dollar are related. Gold prices are typically denominated in US dollars and this implies that the exposure gained from buying/selling gold is influenced by changes in the exchange rate for US dollars. Many academic studies as well as market and media reports refer to the negative relationship between gold and the US dollar. The argument goes that as gold is traded primarily in dollars, a weaker dollar makes gold cheaper for other nations to purchase and increases their demand or the yellow metal. This increase in foreign demand then drives up the dollar price of gold, giving gold and the

dollar their negative relationship. This general notions holds throughout the entire period (although less so during 1990-96) the gold price and the dollar exhibit an inverse relationship. For example, from 1978to 1982, the dollar falls and gold rises, from 1982 to 1987, the dollar rises and gold falls. Peaks seem to match up very closely with troughs, and even smaller dollar movements such as those that occurred in 1982-1983 are matched inversely by gold price movements. This graphical analysis suggests gold has a very strong relationship with the value of the dollar.

The simple linear regression confirms this. We used the daily data of the USD/dollar value as the independent variable. The coefficient is -.471. It has a t-statistic of -5.74 ($p < .01$). A rise of one unit in value of the rupee against a dollar (dollar strengthens) decreases the real price of gold by \$.47.

During 2008 global financial crisis and after some significant change in relationship has been identified. Even a strong dollar (weaker rupee) could not hold to weaken the prices of gold making every month touching a new all-time high. The demand of gold in India, buoyed by brisk buying by stockists for festivals every year has led the prices on an upward swing. Gold prices in the domestic market were also supported by a firming global trend as traders await outcome of Eurozone debt crisis, raising demand for the metal as a safe heaven. The simple regression results obtained on data during November 2003- June 2012, with gold prices as dependent and dollar value as independent variable confirms it. The coefficient is 58.78 with t-statistic value 23.579, which is significant at 1% level indicates a strengthening of dollar by one rupee increases the real gold by \$58.7.

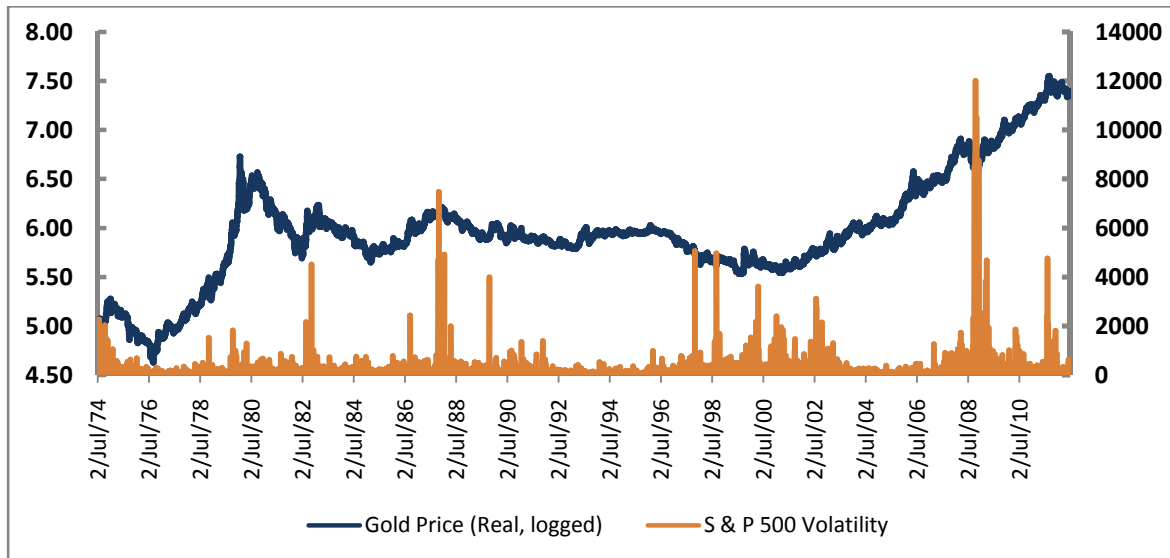
To confirm the structural change, we test the structural changes pre and November, 2003 using Chow test. We obtained p-value <0.01 , that indicates sufficient evidences for the significant structural changes in the gold prices after it starts futures trading on MCX.

1.5 Safe Haven hypothesis with “Fear Premium”

People often associate gold with the notion of a safe haven. We define safe haven assets to be assets that people would like to invest in when uncertainty and fear increases. These assets would preserve their values in times of turmoil or recession. If this hypothesis is true, if people become more fearful in the markets, the price of gold should rise.

We start investigating the safe haven hypothesis with a “fear” indicator as stock market volatility computed using the squared monthly returns of the S&P 500 Index. Looking at Figure 3, a graph of the logged real price of gold and the constructed volatility measure, the safe haven effect is not evident. The movement in the graph either provide evidence that is contrary to the idea of gold being a safe haven, or provide no evidence at all. For an evidence, the price of the gold rises from \$124.5 (August, 1976) to \$835 (January, 1980), while volatility falls from 27 to 11. At the same time we could see some elevations in the volatility and the rises in the gold prices. For an instance, during 2006-08 where the volatility seems to be high from 1.09 to 12006 (Oct, 2008) and the prices of the gold rises from \$629.3 to \$830.25. The only caveat is the price of gold does not rise by as much as the fear premium hypothesis would lead us to expect.

Figure 3: Gold and Volatility



Regressing daily real gold price pre November 2003 on the constructed volatility measure yields an R-squared of only .0001 and a p-value of the beta coefficient .953. So it is statistically insignificant. Post November 2003, we obtain R-square of only .003 and a p-value of .011 of the beta coefficient equal to 0.036. The coefficient on the volatility measure at .036 means a one percent rise in volatility leads to a daily increase in the real gold price by 4 cents, which is economically insignificant. This confirms what the graph shows. Gold price and volatility are uncorrelated and changes in volatility do not seem to have any effect on the price of gold.

We then turn to the *negative-beta asset hypothesis* (Gold returns are negatively correlated with stock markets). During pre-november 2003 period, regressing daily returns on the

difference in the S&P 500 day to day yields a coefficient of $-.00009$ with a p-value of $.51$ and an r-squared of $.003$. The simple linear regression rejects the negative beta asset hypothesis. This means, not only does the S&P 500 explain less than 1% of the variation in monthly gold return, but we cannot reject the hypothesis that the coefficient for the S&P 500 is zero. “gold shows the characteristics of Zero beta implying, it does not follow or counter the S&P 500 at all, instead, it is uncorrelated” (similar results were obtained by McCown and Zimmerman (2006) get the same result over a slightly different sample period of 1970 to 2003). Post-november 2003, regression results with coefficient of $.00005$ with a p-value of $.32$ and r-squared of $.004$, which confirms the notion of “gold as zero beta asset with S&P”.

1.6 Gold as Inflation hedge

Gold is also commonly believed to be a hedge against inflation. We define inflation as the general rise in the level of prices of goods and services in an economy over a period of time and use changes in the Consumer Price Index as the measure of monthly inflation⁶. Inflation is an autonomous occurrence that is impacted by money supply in an economy. Central governments use the interest rate to control money supply and, consequently, the inflation rate. When interest rates are high, it becomes more expensive to borrow money and savings become attractive. When interest rates are low, banks are able to lend more, resulting in an increased supply of money.

To be a hedge against inflation as the idea is most commonly understood, gold would not only have to be uncorrelated with inflation, it would have to be negatively correlated. Alteration in the rate of interest can be used to control inflation by controlling the supply of money in the following ways:

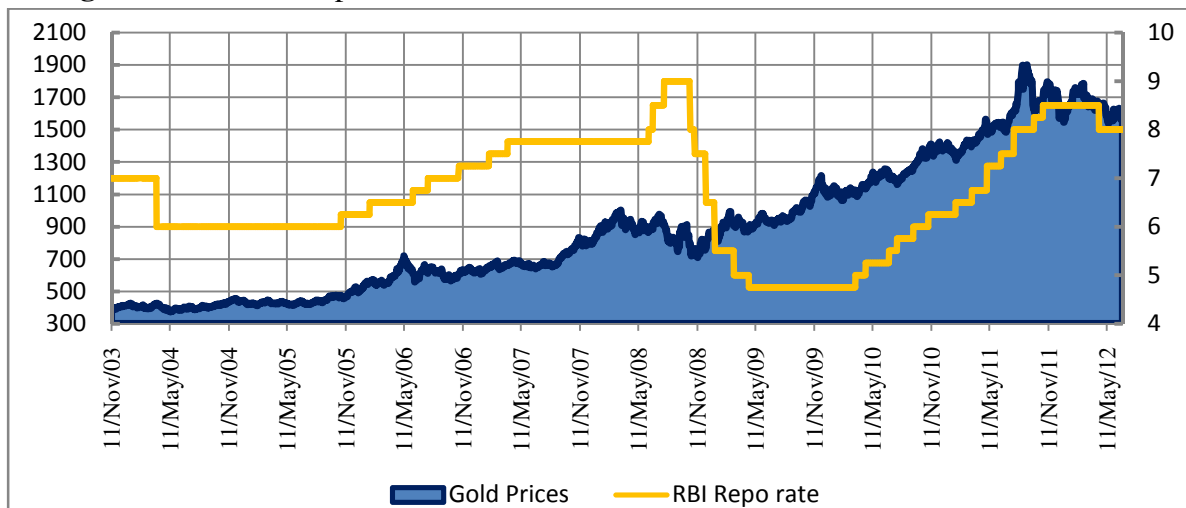
- A high interest rate influences spending patterns and shifts consumers and businesses from borrowing to saving mode. This influences money supply.
- A rise in interest rates boosts the return on savings in building societies and banks. Low interest rates encourage investments in shares. Thus, the rate of interest can impact the holding of particular assets.

⁶See Abel & Bernanke (1995), Wylasz & Burda (1997), Barro (1997) and Blanchard (2000)

- A rise in the interest rate in a particular country fuels the inflow of funds. Investors with funds in other countries now see investment in this country as a more profitable option than before.

We used RBI repo rate⁷ from June 2000-12 to understand the phenomena of gold price, as a general notion that gold prices drops with higher interest rates. For an evidence, during 30-july-2008 to 17th October 2008, repo rates were all time high at 9%, while gold prices drop down from \$905 to \$781. During April 2009 to march 2010, repo rates were at the lowest 4.75%, and in the same period gold raised from \$882.25 to \$1125.45. Regressing daily gold returns on repo rates yields a coefficient of -.00027 with a t-statistic of -1.153 and an R-squared of .0006. This means a one point rise in the interest rate is associated with a \$.0003 decrease in the price of gold in a day. This is economically insignificant as a one point rise in interest rates is huge.

Figure 4: Gold vs. Repo rate



1.7 Conclusion

This paper is an attempt to examining several commonly-held opinions about gold price movements. We tried to establish relations in dollar exchange rate, safe haven with fear indicators as volatility, inflation hedge with RBI repo rates hypotheses.

We started with examining the continued Bull Run of the gold prices during 1968 – 2003 and post 2003 till June 2012. Gold prices has touched \$1710.6/tr. Oz on September, 2012

⁷When reference is made to *the Indian interest rate* this often refers to the repo rate, also called the key short term lending rate. If banks are short of funds they can borrow rupees from the Reserve Bank of India (RBI) at the repo rate, the interest rate with a 1 day maturity. If the central bank of India wants to put more money into circulation, then the RBI will lower the repo rate.

(almost equivalent to Rs.30710 per 10 gms using a factor .3215 and USD/INR = 55.84) from \$35/tr. Oz (year 1968). Overall, gold prices appear to have been in a downward trend since the peak in the early 1980s but showed an impressive upward movement after 2003.

An examination of how Gold prices and the US dollar are related. The argument goes that as gold is traded primarily in dollars, a weaker dollar makes gold cheaper for other nations to purchase and increases their demand for the yellow metal. Before 2003, we found sufficient evidences of drop in the gold prices with increase in the dollar rupee exchange rates. During 2008 global financial crisis and after some significant change in relationship has been identified. Even a strong dollar (weaker rupee) could not hold to weaken the prices of gold making every month touching a new all-time high. The demand of gold in India, buoyed by brisk buying by stockists for festivals every year has led the prices on an upward swing. Gold prices in the domestic market were also supported by a firming global trend as traders await outcome of Eurozone debt crisis, raising demand for the metal as a safe heaven. The simple regression results obtained on data during 2003-12 confirms it.

The safe haven hypothesis claims that gold returns will increase as fear increases. We used volatility in the S&P as a measure of fear. We concluded insignificant rise in the price of gold with the fear premium. Moreover in pre November 2003 and post period gold prices and volatility are uncorrelated and changes in volatility do not seem to have any effect on the price of gold. Regression analysis conducted Gold returns and S&P 500 index also confirms the notion of “gold as zero beta asset with the stock market” that is the stock markets have no negative correlation with the gold movements.

The inflation hedge hypothesis postulates the negative correlation between expected inflation and the return of gold. We find a very economically insignificant relationship between the price movement of gold and the repo rates.

The central message of the paper is that gold’s relationships with fear and inflation are not what most people believe. We should not regard gold as a mysterious asset that is immune to fluctuations and behaves uniquely on the market. Rather, we should regard it as another currency of the future that may seem far-fetched but **Gold as a currency of the future may seem far-fetched but given the state of paper money and the interest in Gold who knows, it is already**

being planned as alternative stable money in certain places. Even if gold coins do not re-enter circulation they are being used as a more certain tangible investment.

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Annexure 1

Tonnes	2010	2011	Q3'10	Q4'10	Q1'11	Q2'11	Q3'11	Q4'11	Q1'12	Q2'12 ¹	Q1'12 vs Q1'11 % chg	4-quarter % chg ²
Jewellery	2,016.8	1,973.9	513.4	562.5	551.7	490.6	458.3	473.3	488.1	418.3	-15	-13
Technology	465.6	452.7	119.8	115.9	115.5	118.6	115.1	103.5	108.7	112.2	-5	-6
Electronics	326.0	319.9	85.9	81.1	80.4	84.1	82.7	72.7	76.6	80.5	-4	-6
Other Industrial	90.9	89.4	22.0	23.2	23.7	23.6	21.8	20.3	21.6	21.6	-8	-8
Dentistry	48.7	43.4	11.8	11.6	11.3	10.9	10.7	10.5	10.5	10.1	-7	-8
Investment	1,583.1	1,689.7	360.5	369.1	339.3	390.3	504.1	455.9	407.4	302.0	-23	14
Total bar and coin demand	1,200.9	1,504.6	310.2	339.2	400.1	336.2	416.8	351.5	354.2	302.8	-10	3
Physical Bar demand	899.5	1,171.3	228.9	271.5	313.6	260.9	322.1	274.8	275.4	226.2	-13	2
Official Coin	213.1	245.5	57.0	42.2	61.8	50.3	74.7	58.7	52.3	53.8	7	13
Medals/imitation Coin	88.3	87.8	24.3	25.5	24.7	25.0	20.0	18.1	26.5	22.8	-9	-12
ETFs & similar products³	382.2	185.1	50.4	29.9	-60.8	54.1	87.4	104.4	53.2	-0.8	-	232
Official sector purchases	77.3	457.9	22.6	-17.3	137.0	66.2	142.0	112.7	96.7	157.5	138	144
Gold demand	4,142.8	4,574.3	1,016.3	1,030.2	1,143.5	1,065.8	1,219.6	1,145.4	1,100.9	990.0	-7	5
London pm fix, \$/oz	1,224.5	1,571.5	1,226.8	1,366.8	1,386.3	1,506.1	1,702.1	1,688.0	1,690.6	1,609.5	7	22

\$Mn	2010	2011	Q3'10	Q4'10	Q1'11	Q2'11	Q3'11	Q4'11	Q1'12	Q2'12 ¹	Q1'12 vs Q1'11 % chg	4-quarter % chg ²
Jewellery	79,399	99,734	20,250.3	24,718.1	24,591.1	23,755.8	25,079.9	25,686.7	26,527.5	21,647.5	-9	6
Technology	18,331	22,875	4,724.6	5,092.9	5,146.2	5,744.3	6,300.7	5,617.4	5,908.7	5,806.0	1	14
Electronics	12,836	16,164	3,389.3	3,562.9	3,584.0	4,074.8	4,523.2	3,945.7	4,164.3	4,164.8	2	15
Other Industrial	3,579	4,518	868.6	1,020.0	1,058.2	1,142.1	1,193.6	1,100.5	1,171.7	1,117.0	-2	12
Dentistry	1,916	2,192	466.7	510.0	504.0	527.4	583.8	571.1	572.7	524.1	-1	12
Investment	62,327	85,373	14,220.1	16,220.9	15,122.5	18,900.3	27,589.1	24,743.6	22,141.8	15,626.5	-17	40
Total bar and coin demand	47,280	76,023	12,233.6	14,906.7	17,833.8	16,279.0	22,808.7	19,077.8	19,249.9	15,667.9	-4	25
Physical Bar demand	35,414	59,181	9,027.5	11,931.3	13,976.2	12,633.9	17,624.8	14,910.9	14,966.6	11,703.3	-7	24
Official Coin	8,389	12,406	2,246.7	1,855.5	2,756.1	2,433.3	4,089.7	3,187.0	2,841.6	2,783.0	14	39
Medals/imitation Coin	3,477	4,436	959.4	1,119.9	1,101.5	1,211.8	1,094.2	979.9	1,441.7	1,181.5	-2	7
ETFs & similar products³	15,047	9,350	1,986.5	1,314.2	-2,711.3	2,621.3	4,780.4	5,665.8	2,892.0	-41.4	-	314
Official sector purchases	3,044	23,136	889.6	-760.0	6,106.2	3,207.2	7,769.9	6,116.1	5,257.6	8,147.9	154	189
Gold demand	163,100	231,117	40,084.6	45,271.8	50,966.0	51,607.5	66,739.7	62,163.7	59,835.5	51,227.8	-1	28

Source: World Gold Council

¹Provisional

²Percentage change, 12 months ended June 2012 vs 12 months ended June 2011.

³Exchange Traded Funds and similar products