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Global Crisis and the Demand for Gold in Indian Economy: An Analytical Perspective

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Abstract

When India purchased 200 tonnes of gold under the International Monetary Fund's limited gold sales programme, it was interpreted inter alia that it may further inflate the gold price when the price was already ruling high. This motivated us to examine the general trend among the central banks' demand for gold during recent global financial crisis. In that context, whether India's purchase of gold was a reserve management strategy or otherwise and whether it affected the gold price trend is examined in this study. In the course of analysis, several related issues such as optimum size of gold in the foreign reserves and rationale of central banks buying gold with special reference to the global crisis are also addressed. The study found that central banks in most of the EMEs and advanced economies had either bought fresh stock of gold or stopped selling their existing stock of gold in the wake of the 'recent global crisis'. This was strongly supported by economic rationale to hold sizable reserves of gold especially during 'heightened uncertainty'. India's purchase did not, apparently, has any impact on the gold price trend and to stock up gold is in line with the global trend.

***Keywords*:** Central Banks, Central Banking Policies, Foreign Exchange Reserves, Global Financial Crisis.

Introduction

The monetary demand for gold has played a significant part in the large swings in gold prices of the past decade, with the selling of gold from government central bank reserves in the late 1990s depressing gold prices and the buying of gold for private investment—including the new gold exchange traded funds (gold-ETFs)—sending gold prices through $1,000/toz twice during the current financial crisis (Exhibit 1). Because the monetary demand for gold has had such a significant influence on gold prices over the past decade, it is tempting to view gold prices as driven simply by the vagaries of government policy and the investor's view of financial distress; however, when viewed within the larger historical context, the past decade's rise in gold prices falls within a longer cycle in gold prices, driven more by the economics of gold supply.

Gold is the most popular as an investment. Investors generally buy gold as a hedge or harbor against economic, political, or social fiat currency crises (including investment market declines, burgeoning national debt, currency failure, inflation, war and social unrest). The gold market is subject to speculation as are other markets, especially through the use of futures contracts and derivatives. Gold price has shown a long term correlation with the price of crude oil. It explains why gold is sold off during economic weakness contrary to what most people generally believe. It is unknown why something that has almost no industrial use should behave like an important industrial commodity. However if gold-oil price correlation continue to hold, gold price will appreciate over time due to Peak oil.

Ever since global financial crisis erupted, there seems to be a perceptible escalation in gold price.

Although a number of reasons have been conjectured, the augmentations of the official reserves of gold across many countries have been widely perceived as one of the important cause for spiralling gold price. This is corroborated by the recent gold investment digest (WGC, 2010) which reported that after two decades, a steady source of supply to the gold market, in 2010, central banks had become 'net buyers of gold'. India also officially purchased 200 tonnes of gold from IMF in October 2009, which placed its position ahead of Russia to ninth place (Bloomberg, 2009). However, with continuous purchase of gold by many central banks during 2010, Russia progressed to eighth position, while India was pushed to eleventh position (WGC, 2010). Besides, it was reported that India's purchase of gold was among the factors that impacted gold price in the world market and also boosted the price expectations (commodity online, 2009). However, Subramanian (2010), stated India's acquisition of gold, from the IMF is seen with some national pride, as a reversal of the early 1990s decision to mortgage gold. Similarly, India's purchase of gold was also viewed with the rationale that the uncertainty of the major reserve currencies, (viz., the dollar and euro) spurred central banks, including India and China, to buy gold. The Reserve Bank had stated that gold was bought with the intent to diversify its foreign exchange reserve, which is not uncommon among the central banks. In this background of widely divergent observations, attempt is made to examine (i) whether Reserve Bank's purchase of gold is an aberration or a strategy to diversify its foreign reserves, (ii) the global trend of gold in official reserves among the central banks, especially during and post global crisis (iii) whether RBI's purchase of gold influenced the escalating gold price trend and (iv) to trace the economic rationale for central banks to prefer buying gold, especially during crisis and the optimum level of gold in the forex reserves.

Objectives of the Study:

- To understand the influence of monetary demand on the price of gold.
- To analyse the monetary and non-monetary demand
- To know the economics of gold supply on the price of gold.
- To study the recent global financial crisis and the demand of gold.

Research Methodology:

The present paper is based on secondary data. The secondary data has been taken from RBI and various national and international research organizations.

Literature Review:

The volume of gold meanings has affected Rs 46,000 crore, most of it for domestic feeding (jewellers and investment). Thus, over 1.5 per cent of GDP is being unfocused into this uncreative property of possessions, at a time when the economy's national good and stock rates have continued successfully trapped at about 23 to 34 percent of GDP. It should be likely to confine gold imports, with a mixture of rules that is reliable with a setting of rule improvements. A large increase in introduction responsibility and obligation of capital tax appear to be the clear applicants. The stopping away of people from gold to financial assets, while it is the answer in the long run, can only be a slow procedure. A healthy wealth market with energetic guidelines limitation unnatural performs may go a long way.

As a Gold [2] Council study (2004) conditions, "India saw a huge bound in its gold feeding after liberalization from 200 tonnes to among 500 and 600 tons a year, following to Authorized deregulation from 1990 forwards. In 2003 India acquired 569 tones - in contradiction of China's 208 tones. India has always continued a country with the largest feeding of gold in the world - usually about 25 percent of the total. The volume of gold imports alone have touched Rs 46,000 core, very little of it for export replenishment or industrial purposes. Thus, today over 1.5 percent of GDP is being allowed to be distracted into this disinfected land of resources year after year, which is being exclusively funded by

hard-earned distant argument. This is when the domestic saving and asset taxes have continued fixed effectively at about 23 to 34 each cent of GDP. In the past, the nation has lent expensive India time and rising bonds, about $ 4 to 5 billion worth each in 1998 and 2000, precisely when gold imports have beat $ 5 billion per year. It has been said that able import of gold is wanted by the want to curb howl in far-off exchange and to en- courage NRIs to remit far-off exchange over official bases. The worth of gold is determined mostly not by market services but by actions of rules. So long as the rule of any vital nation, such as the United States, is set to buy and sell gold at a static price, this price limits the monetary worth of gold. Currencies of all swap nations are linked to this basic value, and the relation of different moneys to each other reflects their relative to gold. This is the relation among gold as an industrial creation and as a monetary unit. As a defining factor in the link of changed moneys to each other, the price of gold in terms of any money has a great effect on global skill and, less right, on virtual price stages in diverse nations. For this cause the value waged or charged for gold in making nations is focus to rule by the Worldwide Monetary Fund. Gold is kept in most countries by the governments or the central banks, largely in gold, and is used to relax such international balances as are not protected by trade in supplies, by the sale of services, or by credits or gifts. A standard of gold cannot defend a country alongside problems arising from a long-continued opposed equilibrium of trade, for no country can have a gold replacement necessary for such a resolve, but the tenure of gold in significant amount allows it to face provisional shortfalls in trade with an amount of theoretical quiet. It stretches it time to progress more long-term mixtures for unfair trade actions, in the time being casing contrary stabilities by the delivery of gold. A standard of gold in the indicators of a government or a central bank stretches the people a sensation of pledge that there is touchable wealth back of their currency and bank credits. When gold changes into a country, it gives additional reserves to commercial banks, and, when it goes out, it derives out of bank reserves. Monetary powers that be have to take this into account. When the reduction or rise of bank reserves begun by gold movements is in agreement with present praise policy, it reduces the need for other central bank act.

There will constantly be a struggle in any international monetary system, i.e. governments have independent tasks for preserving domestic success. If there is a struggle between policies suitable to continue richness at home and plans planned to save the international monetary structure steady, the domestic rules obviously will virtually constantly win. For this purpose, it is hypothetically (and frequently almost) unwanted to base a global fiscal system on the currency of one country, though significant that country might be. The making of extra dollars, for example, for national details inside the United States could grow into an outflow of dollars to other countries, unrivalled by a more necessity for US things and amenities by these countries. Below a morally dollar-based worldwide fiscal scheme, these dollars are mostly in- exchangeable by the receiver countries. They can be used, to the range that the must is not previously provided for, to business trade and to add to assets, but if craft is sufficiently funded previously, and the assets of the receiver countries are at a high sufficient close, the extra dollars are unusable without they can be changed into somewhat other that the receiver truly desires. In New Year's several nations, particularly Germany and Japan, have ready up dollar stabilities that were inconvertible in training, were not desired nearby, and thus had very hesitant value. Since these had been usual in argument for things or for justice shareholdings in local businesses, it was not tough to favour the structure as giving a biased benefit to the United States. The license with which such a rich country could residence basically inconvertible IOUs were disturbing.

In terms of the approach to gold pricing, these frameworks can be described as follows:

,, **Currency framework:** Gold priced in relation to the price of potential substitutes for use as a store of value and medium of exchange.

Key price drivers: Exchange rates, financial risk as measured by credit default swap rates on high-risk sovereigns and financials.

Commodity framework: Gold priced in relation to the marginal cost of supply and to the marginal

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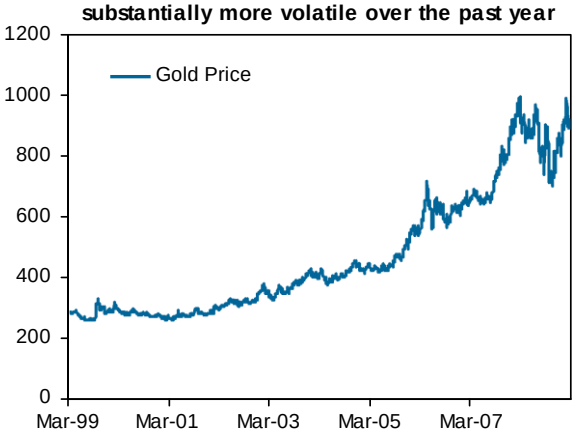
willingness of consumers to pay.

Exhibit 1: Gold prices have increased four-fold over the past decade, and have become substantially more volatile over the past year



Source: Commodities Exchange (COMEX)

Key price drivers: Real interest rates, the overall price level as measured by the consumer price index (CPI), and movements in monetary demand for gold.

The "gold as a commodity" framework explains three key "stylized facts" of gold prices in terms of the influence of real interest rates, inflation, and monetary demand for gold on the supply and demand for gold.

Three stylized facts of gold prices:

,, **Long-term stability of purchasing power:** The real (inflation-adjusted) price of gold has been stable over extremely long periods of time (Exhibit 2). More specifically, over the past 100 years, the real price of gold (in 2008 dollars) has averaged roughly $420/toz, with an ounce of gold having the same purchasing power in 2005 as it did in 1900.

,, **Negative correlation with real interest rates:** While stable over extremely long periods of time, real gold prices tend to move in long cycles, which are negatively correlated with the level of real interest rates.

,, **Positive correlation with financial distress:** Gold prices tend to spike upward during financial crises, as the demand for monetary gold increases.

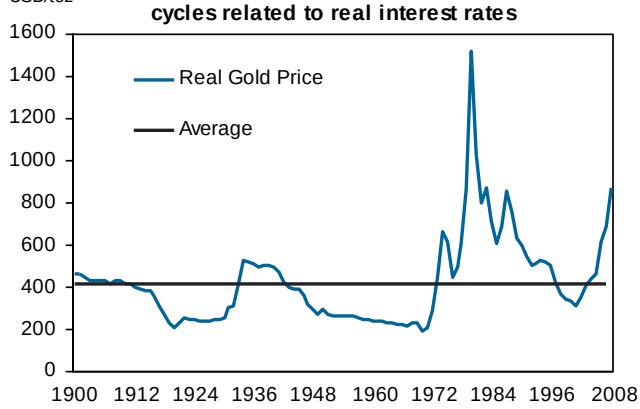
Interestingly, the historical behaviour of supply, demand, and physical inventories in the gold market suggest that the first two "stylized facts" arise from the economics of gold supply, not gold demand, while the third arises from the monetary demand for gold. In particular, the following historical behavior is evident.

Historical behavior of gold fundamentals:

World gold mine production has historically moved in roughly 30-year cycles over the past century or more, with mine production growing at a faster pace during periods of high real interest rates and at a slower pace during periods of low real interest rates.

Global Economics Paper

Exhibit 2: The real price of gold has been quite stable over the long term, with long cycles related to real interest rates



Source: US Geological Service (USGS), GFMS and GS Global ECS Research

Monetary demand for gold—the demand for physical inventories of gold bullion and coin—increases in periods of financial distress such as the current one.

Non-monetary demand—the demand for gold to be used in the creation of jewelry, art, electronics, and dentistry, is relatively stable over time, reacting primarily to the movements in real gold prices, with increasing real gold prices decreasing the non-monetary demand for gold.

As discussed, these three "stylized facts" of gold prices and the historical behavior of gold supply, demand, and physical inventories are consistent with—and can be seen as arising from—the following view of the economics of the gold market. On the supply-side, the marginal cost of extracting gold from the ground consists of the realized cost of extracting the gold plus the opportunity cost of not leaving the gold in the ground to be extracted in the future. The fact that real gold prices are stable over extremely long periods of time suggests that the realized cost of extraction

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increases with the price level of the overall economy. The fact that the rate of world gold mine production increases with the real interest rate suggests that, as the real interest rate increases, the opportunity cost of extracting gold declines, leading to greater gold extraction today. To take an extreme example, imagine that the real rate of interest is extremely high, such that one does not care at all about the future; then one would want to extract as much gold today as possible, given the realized cost of extraction.

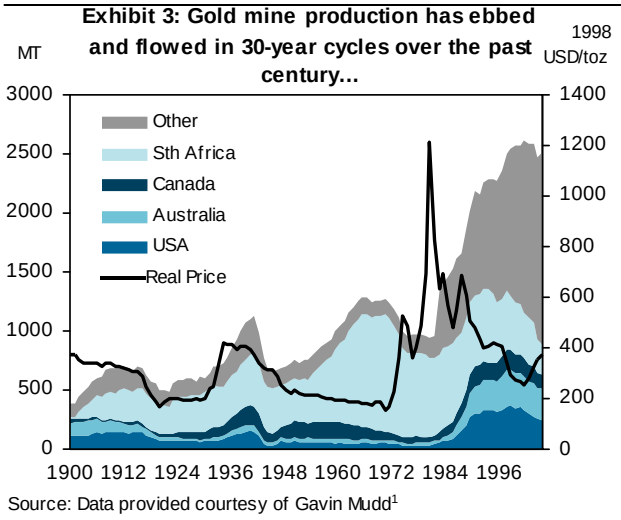
On the demand-side, monetary demand for physical inventories of gold bullion and coin increase with perceived financial distress. Increased monetary demand for gold must be met by increasing prices to motivate greater mine production or reduced non-monetary demand. Non-monetary demand—primarily jewelry demand—largely accommodates movements in gold supply and monetary demand, with higher real gold prices reducing non-monetary demand for gold and even inducing the scrapping of gold jewelry.

The Historical Behavior of Supply, Demand and Physical Inventories, and the Economics of the Gold Market

Gold mine supply: the economics of extraction and real interest rates

Since the beginning of the twentieth century, the production of gold from the world's mines has ebbed and flowed in long cycles extending over the span of decades. As seen in Exhibit 3, world gold production has exhibited a fairly regular cycle, with roughly 30 years between each peak. Interestingly, real gold prices have been strikingly stable over this more than a century of history, although they have tended to be low when world gold production is near a peak and high when world gold production is near a trough, suggesting that it is the movements in supply that are driving real gold prices over these long cycles. If supply is driving the price of gold, then the question becomes what is driving supply?

As seen in Exhibit 4, changes in the rate of world gold mine production tend to move with the level of real interest rates, with high real interest rates leading to faster growth in gold mine production.



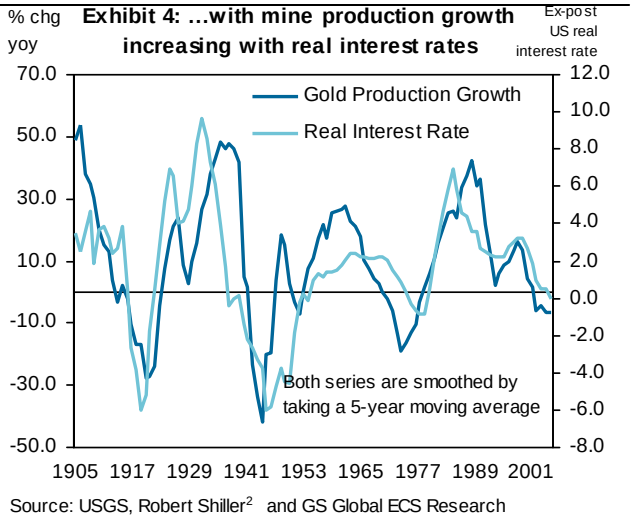


Exhibit 4 suggests that higher real interest rates increase the rate of gold mine production while lower real interest rates slow the rate of mine production. This is consistent with the economics of an extraction industry. The marginal cost of extracting today is not only the actual cost of mining, but the opportunity cost of not having the same gold to mine in the future. This suggests that higher interest rates lead one to discount the future more heavily, driving down the opportunity cost and leading one to extract at a faster rate. To take an extreme example, if one did not care at all about the future (i.e., an extremely high interest rate), one would extract the gold as quickly as possible.

It is important to note, however, that the above economic behavior does not require that gold be viewed as an exhaustible resource. In fact, the economics of extraction can be seen as the mirror image of the economics of investment. It is conventional economic wisdom that high real interest rates discourage investment, as they increase the cost of capital. Consequently, one expects to see less investment in factories and manufacturing plants in high real interest rate environments. For a gold mine, however, extraction offers a second—more rapid—way to divest, by pulling the gold out of the ground today. Viewed in this way, the economics of extracting from an existing gold mine is the mirror image of the economics of investing in a new one. A high real interest rate reduces the motivation to invest and increases the motivation to extract. Consequently, higher real interest rates lower the marginal cost of extraction, which leads to greater supply and lower prices.

Monetary demand:

Once gold is extracted from the mine and refined, it can be used to satisfy both monetary and non-monetary forms of demand. The monetary demand for gold consists primarily of demand from the official sector for central bank gold reserves, from the private sector for holdings of gold bullion and coins (including those held by the gold-ETFs), and from the demand for warehouse stocks on the gold futures exchanges, principally the Commodity Exchange (COMEX).

Non-monetary demand:

Gold is not consumed in use (as is, for example, petroleum), one could conceptualize the non-monetary demand for gold as the physical inventory of gold jewelry and art for example; however, the evidence suggests that the more relevant measure of non-monetary demand is not the physical inventory of jewelry and art but the demand for gold for the creation of new jewelry and art. That is, the change in the physical inventory of gold jewelry and art. Consequently, our concept of the gold market supply- demand balance would be that the change in amount of physical gold inventories held for monetary reasons equals supply less non-monetary demand.

Supporting the idea that the more relevant measure of non-monetary demand is not the physical inventory of jewelry and art but rather the demand for gold for the creation of new jewelry and art is the fact that, once gold is embedded in high value jewelry and art, it is effectively locked up, much as it would be in a mine. Consequently, gold can either be held in a liquid monetary form, as inventory, or in illiquid jewelry. Gold for monetary holdings must either be sourced from the mine or from the scrapping of gold jewelry, both areas from which some expense is required to extract the gold.

Perhaps because gold jewelry is purchased with the idea it will be held for long periods of time, non-monetary gold demand is remarkably stable over time. As seen in Exhibit 5, the apparent gold consumption per capita in the United States has seemed to simply fluctuate inversely over time with the real price of gold. This suggests that, unlike many commodity markets, gold prices are not driven by non-monetary demand but that gold prices drive non-monetary demand.

Highlighting the responsiveness of jewelry demand to gold prices is the fact that world jewelry demand fell in line with higher prices throughout the 1990s despite the rapid rise in jewelry demand from India (Exhibit 7). The strong growth in income in India, matched with a cultural proclivity for gold, has led India's share of annual gold jewelry demand to more than double over the past 15 years, increasing from 9.4% in 1993 to 23.0% in 2008 (Exhibit 8). Interestingly, Chinese jewelry demand was roughly flat over the same period, with its share of gold jewelry demand increasing only slightly, from 11.9% in 1993 to 12.6% in 2008.

Exhibit 5: Jewelry dominates non-monetary

Exhibit 6: Historically, non-monetary

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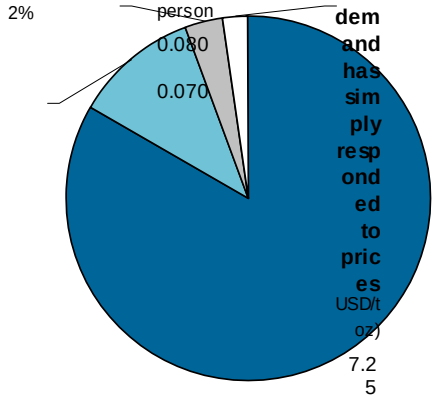
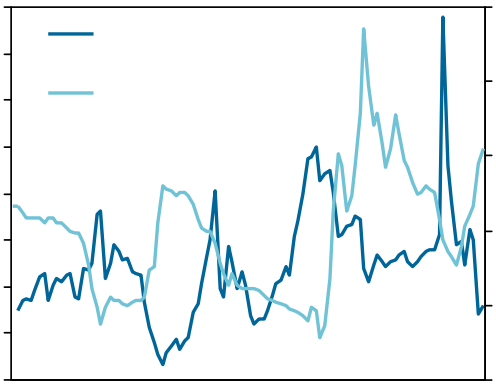


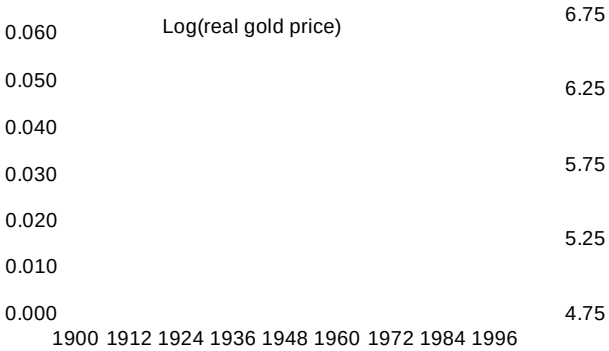
US per capita gold consumption



Electronics
11%

Jew elry
84%

Source: GFMS and GS Global ECS Research



Source: USGS and GS Global ECS Research

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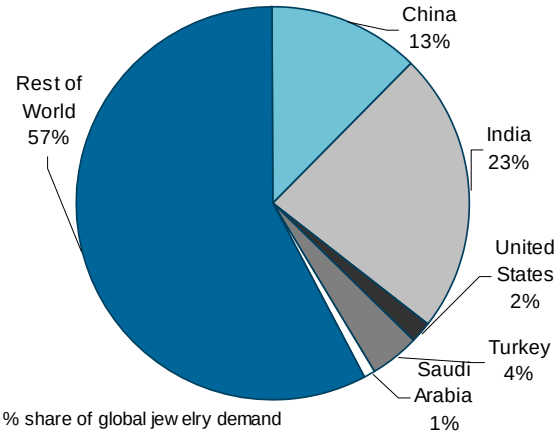
Exhibit 7: World jewelry demand has continued to respond to prices over the past 15 years...

Source: GFMS, COMEX, and GS Global ECS Research

Exhibit 8: ...while the center of jewelry demand has moved increasingly to India



* % share of global jewelry demand

Source: GFMS and GS Global ECS Research

Recent Global Financial Crisis and the Demand for Gold by the Central Banks: Some Evidence

The period between mid-2007 and 2009 have been the most tumultuous in financial markets' recent history as the world economy plunged into 'Great Recession' Volcker (2009) since the 'Great Depression'. It resulted in banks collapse, equity markets tumbled across the globe, trade shrunk, capital flows dried up, growth slumped and credit spreads escalated sending investors fleeing for the cover of traditional safe haven assets such as government bonds and gold (Green, 2009). Most notably, the unique feature of the 'Great Recession' was that, it virtually put even the long trusted financial institutions, to 'acid test' on their competence of 'liquid portfolio' management. Moreover, brought to the fore the extraordinary vulnerability of the global financial system to disruptions in wholesale funding markets (IMF, 2011B). Even century old financial institutions were reduced to rubble. It is distressing to note that, even after the lapse of three years, the global recovery remains elusive and heavily reliant on monetary and fiscal stimulus for whatever little growth it has, making a quick reversal in the fiscal situation unlikely (IMF, 2010). Downside risks were increasing and continued to do so in early Financial Year 2011 (IMF, 2011A). In fact, symptoms of excessive risk taking are evident in a few advanced and a number of emerging market economies (IMF, 2011B). The IMF estimated that advanced economies' debt/GDP ratios will exceed 100 per cent of GDP in 2014, some 35 percentage points higher than when the crisis began. As a result, sovereign bond issuance is likely to remain at historically high levels in the coming years and further sovereign downgrades seem likely (WEO, 2010). Accordingly, adding to the woes, some of the prominent European countries' (i.e., GIIPS)[5] sovereign bonds debacle shook the confidence of investors and institutions in the sovereign bond market. Over and above, the latest and biggest in the series of events that contributed to the uncertainty in global markets was the recent downgrading of the U.S credit rating from 'AAA to AA+'. While on the other, the gold market remained liquid throughout the financial crisis and, even at the height of liquidity strains in all other markets (Green, 2009). This reflects the depth and breadth of the gold market, as well as the flight-to-quality tendencies exhibited by investors. Because, gold holds its values even at the adverse market conditions (Baur *et al.*, 2010). A study estimates that the daily turnover volumes in the gold market to be larger than even the UK Gilt and German Bund markets. Despite recession following crisis, gold price soared by 25 per cent in 2009 to US$ 1,087.5 /oz registering the ninth consecutive annual increase. It further continued to increase to reach US$ 1,410/oz by end of December 2010[6] (further up by more than 24 per cent). Baur *et al.* (2010) stated since the

beginning of the financial crisis in July 2007 to March 2009, the nominal gold price has risen by 42 per cent. Thus gold has proved to be the sole reliable instrument, which bears no counterparty or credit risk, and is a permissible reserve asset, practically, in every central bank in the world. In view of this, many central banks either stopped selling or turned out to be net buyers of gold (Table 1) during the global crisis. Incidentally, it may be underscored that countries opting to buy gold, especially during economic crisis and uncertainty are not new as such trends were observed even during the earlier occasions of crisis. The credit and economic crisis triggered fresh demand for the precious metal, similar to what were experienced during other major global crises, for instance, even the U.S. opted for steady purchases of gold in the 1930s and 1940s (Green, 2009).

Table 1: Select major Net Buyers of Gold during the Crisis (and thereafter)

(in tonnes)

	2007-I	**2007-II**	**2008-I**	**2008-II**	**2009-I**	**2009-II**	**2010-I**	**2010-II**
1.Russia	5.5	43.4	12.6	56.5	30.6	87.1	31.4	65.4
2.Ukraine	0.3	0.7	0.3	0.2	0.2	0.3	0.2	0.2
3.Venezuela	-0.3	-	-	-	-	4.4	3.1	-
4.China	-	-	-	-	454.0	-	-	-
5.India	-	-	-	-	-	200.0	-	-
6.Saudi Arabia	-	-	-	-	-	-	180.0	-
7.Mexico								94.0

Source: Compiled based on WGC publications. I = first half (January –June) and II = second half (July–December).

WGC (2010) also reported that the central banks became net buyers of gold for the first time in 21 years. In the first half of 2011, central banks were net buyers of over 155 tonnes of gold, almost double the 87 tonnes of net purchases in 2010 (WGC, 2011) – signalling the end of an era in which the official sector had been a source of significant supply to the gold market.

The Central Bank of Philippines is well known for active buying of gold even from the open market. Therefore, its gold reserve is subject to fluctuation as it buys up domestic production and later sells in the market. The Philippines was also a net purchaser in both 2008 and 2009, in contrast to being a net seller in the years 2003 to 2007. The Philippines central bank has stated explicitly that it holds gold for its diversification, security and inflation hedge benefits. Venezuela, also periodically buys gold from the domestic production but for many years it had used gold in such a way that it did not entail increasing its formal gold reserves. However, it also bought from domestic production adding to its gold reserves during and after the global financial crisis (2009 and 2010).

Similarly, Qatar reported to have added 12 tonnes to its reserves during 2007. The Governor of the Saudi Arabian Monetary Agency (SAMA) has, confirmed that the increase of 180 tonnes in the country's gold reserves announced earlier did not represent a recent purchase of gold, but rather a reclassification of gold it already owned into the category of official reserves. Germany and France were among the prominent EU countries for big sale of gold but ostensibly slowed down their sale during and post crisis.

Some of the Central Commonwealth Independent States (CIS) countries such as Russia, Ukraine, Belarus and Kazakhstan are also prominent in purchasing gold in the recent years. The Central Bank of the Russian Federation bought almost at regular intervals some quantity of gold thereby bringing the total of Russia's gold reserves to 664 tonnes (businessworld.com). In 2011, Russia has planned to buy 100 tons as reported by Bloomberg.com (2011).

China being the world's top producer of gold overtaking South Africa, revealed that it had

stacked up its own government holdings of gold to 1,054 tonnes from 600 tonnes when it last reported its holdings in 2003 thus increasing its gold reserves by as much as 76 per cent since 2003 as reported by the official Xinhua News in April 2009. Incidentally, China do not permit export of gold ingots, only jewellery are permitted, leaving plentiful supplies for the domestic market (financialpost.com). Ever since the global crisis which impacted the US dollar strongly, China is reported to be converting its sizable forex reserves into gold (commodityonline.com). China has further aggressive programme to buy gold as an alternative asset (Subramanian, 2010).

Mexico bought 93.3 metric tons since January 2011, increasing its holdings from just around 6.9 metric tons to 100 metric tons in recent months. Mexico's purchase formed part of the central bank's ordinary investment activities, and the gold represents about 4 per cent of the nation's international reserves as reported by the Banco de Mexico. It further clarified that these purchases are part of the "regular policy of the Bank in regards to investment and diversification". The Bank of Thailand also purchased 15.6 tonnes of gold in July 2010. With the country's foreign currency reserves growing rapidly in recent years, this purchase helped to restore the proportion of gold in Thailand's total reserve portfolio. Along with India, Bangladesh and Sri Lanka also bought gold from IMF at around the same time. South Korea's central bank became the latest official sector buyer, announcing the purchase of 25 tonnes, its first foray into the gold market in more than a decade (Reuters, 2011).

It is amply clear from the above survey, the series of events in recent years, notably the unsettled global financial crisis, followed by the GIIPS debt crisis and the recent downgrading of sovereign credit rating of the U.S. have tipped the balance away from net selling of gold by the official sectors towards net buying. Seen from that perspective, two aspects become palpable. Firstly, the increasing uncertainty due to global financial crisis and aftermath pushed central banks, both advanced and emerging economies to stock up gold. Secondly, India's recent purchase of gold is no exception and is in line with global trend. Thus the recent global macroeconomic and financial crisis has only reinforced the importance of gold as part of official reserves in the balance sheets of central banks around the world. The IMF's latest Annual Report (2010) also revealed that the market value of gold reserves increased by 25.2 per cent, largely due to substantially higher gold prices in 2009. There is also a perception that '…the strategies of reserve managers have changed in the last couple of years since the global financial crisis...'(Natalie, 2011). Further, she stated that there is much more 'emphasis now on risk-management strategies, as opposed to yield enhancement…'

Although central banks do not always publish the reasons for their reserves management decisions and even when reasons are publicly announced they are unlikely to fully reflect the long deliberations that go into develop policy (WGC). Pihalman and Han (2010) however, stated that central banks reveal '...slowly, but surely more and more information about their reserves management activities typically in their annual reports...' Nonetheless, it is not always extremely hard to surmise the reasons for such accumulation.

Thus, the global financial crisis and the series of events following the crisis have clearly resulted in increased uncertainty and the corresponding increase in the demand for gold. More central banks are buying the precious metal to hedge against the euro and dollar debt crises (Deutsche Welle, 2011). Further, with down grading of the US credit rating and the consequent global uncertainty, there are views that buying trend of gold will continue upwards as long the debt problems in Europe and the US remain unsolved Eugen Weinberg (2011) and Natalie (2011). The demand for gold is also coming from emerging-market nations that are accumulating foreign- exchange reserves according to Natalie (2011).

India – Ascending from Pledging to a Net Buyer of Gold

In 1990, when India faced external sector crisis, the foreign currency assets depleted to

less than three weeks' imports. With financial liberalisation and opening up of economy, the foreign currency reserves rose due to capital inflows, while the quantum of gold remained more or less constant over the years. With no fresh purchases of gold, its proportion fell sharply until the addition of 200 tonnes in the late 2009.

India Pledged Gold in 1991

The foreign exchange crisis in August 1990 was mainly aggravated by the loss of remittances from the Middle East countries due to 'Gulf War' (RBI, 1991). The additional burden of oil imports due to sharp oil price hike as a consequence of Gulf crisis added fuel to fire. Besides the above, recessionary trend in the West had depressed the demand for India's exports. All these gave sufficient indications that the net resource transfer on account of official and private credit to be negative in 1990-91 i.e., the fresh inflows were paltry to meet the obligations on account of amortization and interest payments. By 1991, the size of the India's debt was US $ 71,557 million (Basu, 1993), while, the level of foreign exchange reserves fell to US$1.2 billion in July 1991 (International Food Policy Research Institute, 2005). Reddy (2005) stated that in June 1991 the foreign exchange reserves fell to a level equal to barely a week's imports.

This distressed situation compelled the Reserve Bank to pledge gold with the Bank of England to raise loans. This was not, however, unprecedented among countries to pledge gold to meet exigencies. For instance, Lakshmi (2007) pointed out that Italy pledged gold with Bundesbank and secured a $2 billion loan and Romania used gold as collateral to secure a loan to repay external debt in 1974. Russia, when encountered with financial crisis in 1998 sold off 33 per cent of its gold reserves. In 2001, Russia again sold its gold holdings to generate funds to tackle the series of natural disasters that had befallen on the country. India redeemed the pledged gold after repaying the loans. In May 1991, the Government had leased 19.99 tonnes of gold, out of its stock of confiscated gold to the State Bank of India (SBI), which, in turn, sold 18.36 tonnes in the international market with a repurchase option. SBI repurchased gold in November-December 1991. Subsequently, the 18.36 tonnes of gold was sold by the Government to the RBI. The balance of 1.63 tonnes of gold had been returned by the SBI to the Government. The gold involved in both the transactions, adding up to 65.27 tonnes, was kept abroad (RBI, 1991). This gold continued to be deposited abroad earns some returns. The physical holding of gold reduced by about 39 tonnes and the stock stood at 358 tonnes in 1998 and this is due to the repayment on maturity of gold backed bonds issued in 1993 (Lakshmi, 2007). This level almost continued till as recently as the new transaction took place. Thus it is clear, when the country was facing external sector crisis gold holdings came in a big way to help, as gold is regarded as 'universally accepted currency'.

India's Purchase of Gold in 2009

When the Reserve Bank bought 200 metric tons of gold at US $ 1045 /ounz for a total amount of US $ 6.7 billion, at the same time, there was a view that, with the dollar getting further weaker (at that point of time) the RBI's move to buy gold was seen as a forward looking and a diversification effort. The Economist (2009) reported that '…every central bank with a large holding of American debt is worried about capital losses if the dollar continues to weaken...' this holds good even in the case of India and China. The Reserve Bank, as part of its transparent policy made it clear that it was attempting to rebalance its reserves composition with the purchase of 200 tonnes of gold. In fact, this is in line with the strategy adopted by most of the central banks around the world as pointed out earlier. Correspondingly, Chart 2 reveals that the gold reserve was fairly flat for a fairly long time and then a moderate increase mainly due to increase in gold price, while the foreign currency and total foreign reserves showed a sharp increase. The value of gold reserves showed a sharp increase only since mid 2008-09.

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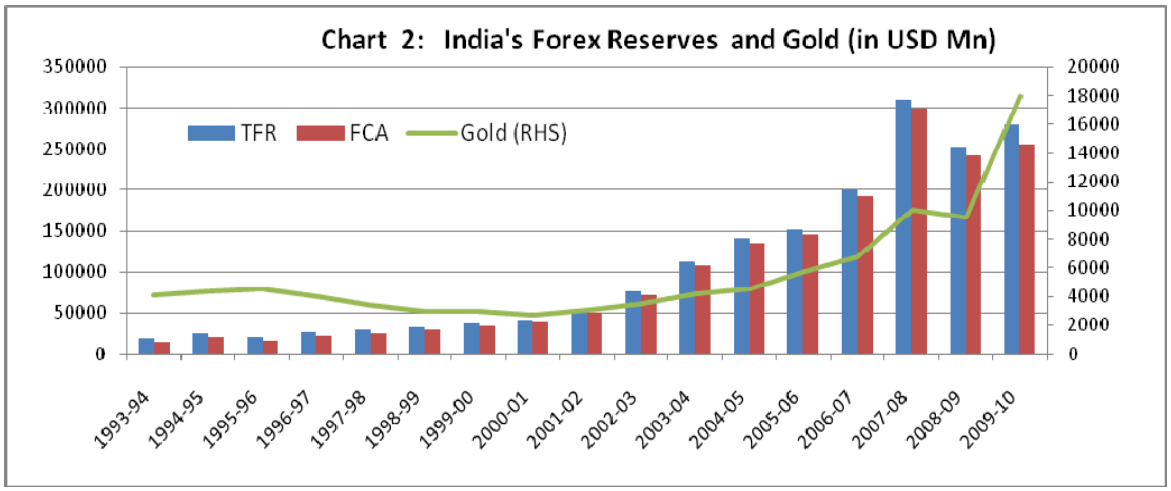
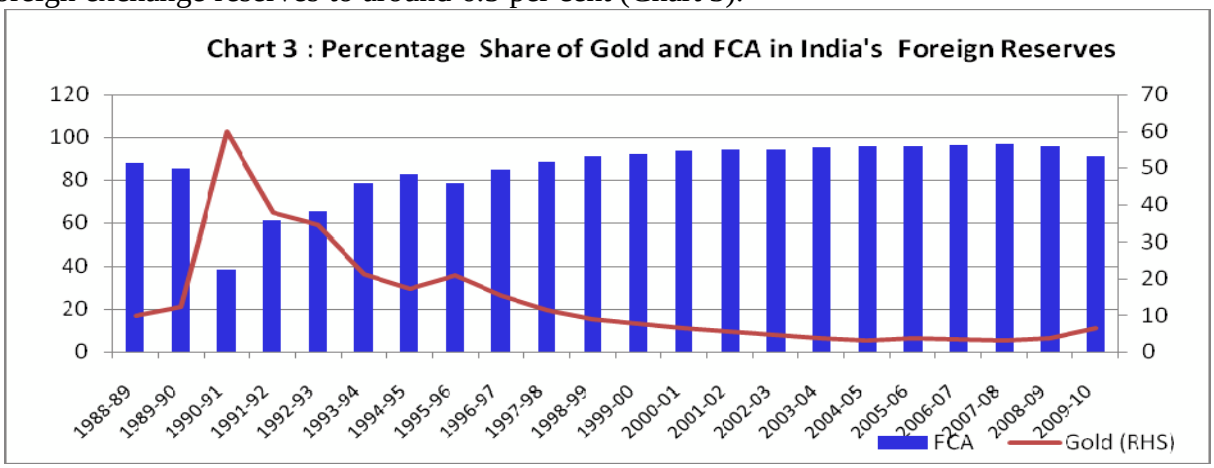


Back in the mid-1970s, gold accounted for around 20 to 25 per cent of total reserves and later on it came down in the range of 5 per cent to 12 per cent till 1989-90. However, in 1990-91 the percentage share of gold in the total foreign reserves shot up to as high as 60 per cent. This was mainly due to revaluation of gold in line with the gold price in the international market in mid-October 1990[8] besides dwindling of the foreign currency reserves. However, the strong liberalisation on the external sector and the corresponding forex inflows led to build up of foreign exchange reserves. With no matching addition to the physical gold stock, the percentage share of gold in the total foreign reserves, reached to less than 4 percent in 2007 and 2008. The fresh addition of 200 tonnes of gold to the stock in late 2009 increased the share of gold in the foreign exchange reserves to around 6.5 per cent (Chart 3).



Optimum Level of Gold in the Foreign Exchange Reserves

Traditionally, the adequacy of foreign exchange reserves was measured in terms of the 'import cover of say three to four months' of country's imports. This has been holistically followed by the multilateral bodies such as IMF and World Bank as well, to measure the adequacy of foreign exchange reserves with a particular country. However, with huge capital flows, across the globe, in the form of FDI and portfolio type, such a measure proved to be inadequate and the upshot was the currency crises in the 1990s which challenged the validity of this measure. Then came the 'Guidotti-Greenspan' rule which entailed countries to hold 'liquid reserves' equal to their short term foreign liabilities (maturing within a year), and later when IMF endorsed, this

rule came to be known as 'Guidotti-Greenspan-IMF' rule. De Beaufort Wijinholds and Kapteyn (2001) proposed a new criterion of 'reserve adequacy' for the emerging market economy which incorporates both short term external debt and a measure of the scope for capital flight (part of M2) modified by a "probability factor" captured by a country risk index. Yet, it is significant to note that for the 'international reserves', there is no widely accepted benchmark of 'adequacy' in the current state of global monetary system (Bery, 2011). IMF (2001) is also of the view that there are no universally applicable measures for assessing the adequacy of reserves. This is more so when it comes to optimum level of gold as a part of foreign reserves. A study by Wozniak (2008) pointed out that 'portfolio optimizer models' are used to show that the 'efficient frontier' of a typical developing or emerging market economy's central bank can be enhanced by adding gold. The empirical study pointed out that an allocation between 2.4 per cent and 8.5 per cent to gold is found to be optimal for a central bank with around a 5 per cent risk tolerance. At a risk tolerance of 8.3 per cent, the allocation to gold increases substantially to 29 per cent. Nonetheless, there is no universally accepted norm of gold allocation as optimum level, among the central banks as it depends upon a combination of factors, including the legacy of the past, its investment policy objectives and guidelines, its existing asset mix, its risk appetite, its tactical view on market trends and its liquidity requirements. Central banks' actual portfolios will differ widely based on their risk and return expectations, and constraints. Therefore, in practice, the allocations of emerging and developing countries that already hold gold in their portfolios vary widely. It may be cited that the European Central Bank recommends its member banks to hold 15 per cent of their reserves in gold (Financial Post, 2009). For international reserves held in the form of gold, the opportunity cost is given directly by the yield foregone if these assets would have been invested in other high yielding securities. It may however, be noted that international reserves held in the forms of interest-yielding assets will possess a smaller degree of liquidity than the reserves held in the form of gold or demand deposits. Moreover, even the best of securities are subject to high level of market risk and the macroeconomic policy measures. We may, therefore, well regard the premium earned on these assets as a payment for liquidity sacrificed (Heller, 1966).

Did India's purchase of gold affect the general gold price trend?

When India bought gold, it was viewed that, it will only result in further escalation in price when the gold price was already high (Bloomberg). Further, it also reported that India and Russia's central banks helped to push gold price to nearly $1,200 an ounce. On the contrary, our analysis of gold price reveals hardly any significant aberration in the global price movement when the Reserve Bank bought gold (Chart 4). This is despite the fact that India's purchase transaction is the single largest in the last 30 years and which is equivalent to 8 per cent of global gold mine output. This is mainly because India's purchase transaction was not from the open market. Furthermore, generally reaction of gold to news about economic fundamentals was relatively small, compared to their effects on markets for Treasury Bonds and foreign exchange (Brodsky and Gary, 1980). On the other hand, a recent IMF study (Shaun, et al, 2009) finds that '...gold prices react to specific scheduled announcements in the United States and the Euro Area (such as indicators of activity or interest rate decisions) in a manner consistent with its traditional role as a safe- haven and store-of value…' It however, finds that gold prices tend to be counter-cyclical, with the price rising when there is a downside surprise in the data, suggesting that gold is seen as a safe-haven during 'bad times'. In fact this phenomenon was observed even during the recent global financial crisis as pointed out in the preceding section that a large number of central banks resorting to buying gold during the crisis. The gold price soared in recent years when practically all economies around the world were in trouble. More so, when the major economies were under Great Recession. In India, gold price showed steady increase in

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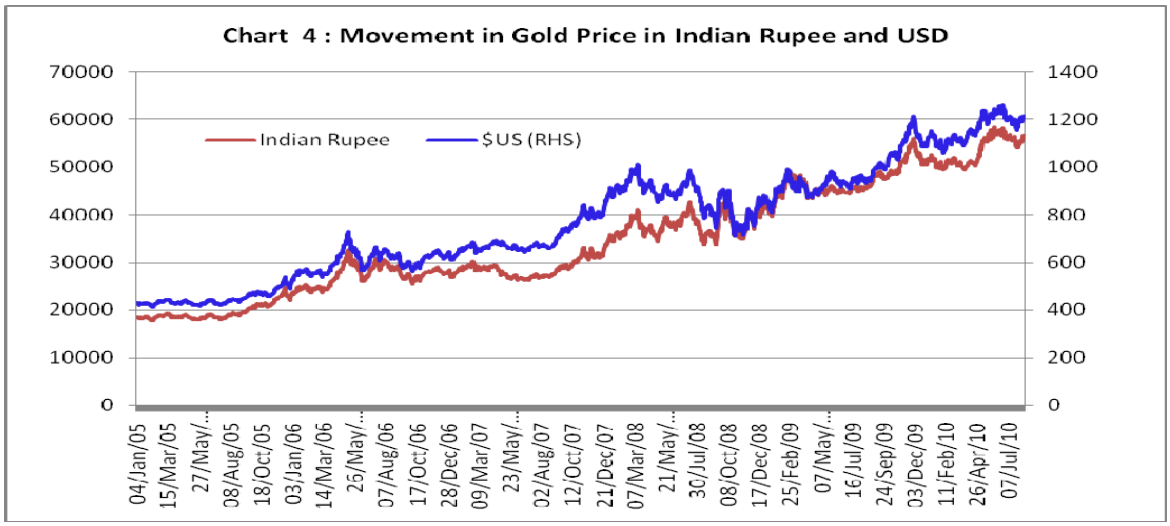
tandem with the world gold price movement rather than it is other way round.



Economic Rationale for holding Gold as part of Reserve by the Central Banks

Gold as a metal itself has several 'unique properties' that makes it attractive to humans for centuries. It is both a commodity and a monetary asset virtually indestructible that ensures almost always recovered and recycled as revealed by the centuries of experience. It is interesting to note that so far, whatever the quantity of physical gold excavated from the earth, almost the entire quantity is available with the mankind as stated by WGC. Which essentially means that consumption of gold, in the economic sense, is only shift in ownership from one party to another, while the stock of gold at the global level remains largely unvarying. As gold mine production is also relatively inelastic for fairly long period, the recycled gold (or scrap) becomes the important potential source of easily traded supply when needed. Based on the global experience, the key considerations are as under:

Safety and Liquidity considerations

Safety and liquidity consideration constitutes a 'critical objective' of foreign exchange reserve management, then comes the return consideration. The emerging markets particularly in Asia, have chosen to self insure by accumulating large stocks of official reserves, particularly in the wake of Asian crisis of 1997. India is no exception to this strategy. Though foreign exchange reserves is nothing but the claims on other countries or foreign institutions' instruments, that are subject to several risks more prominent being market and exchange rate risks, central banks hold them to meet several exigencies, besides to stabilise the external value of its own currency. The recent global crisis proved an important testimony of the protective value of such reserve accumulation. Gold becomes an essential element of foreign reserves because of its unique abilities to meet the above requirements. It is in this context, central banks rely upon gold, for instance, the Swedish Riksbank stated to have relied heavily upon its gold reserves for liquidity at the height of the crisis, using gold to finance temporary liquidity assistance. Therefore, gold comes as an obvious choice, as gold's liquidity is underpinned by its diverse range of buyers and sellers who have differing trading motivations and who react differently to price movements. It was observed that as the price increased consistently the valuation gain of gold was quite substantial in the balance sheets of central banks even during the height of crisis. For instance, in the case of India, the valuation gain works out to around US$ 2.32 billion as at end December 2010 on its purchase of 200 tons of gold.

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Gold a good Diversifier

Emphasizing the importance of diversification aspects alongside the liquidity, Eichengreen (2005) writes that "…it may pay to hold reserves in the most liquid market, which tends to be the market in which everyone else holds reserves, but market liquidity is not all that matters. It may be worth tolerating a bit less market liquidity in return for the benefits of greater diversification..." In fact, Jeffrey (1989) empirically proved that gold returns are generally independent of those on other assets; this suggests that gold can play an important role in a diversified portfolio. In a study, tests of four hypothetical portfolios of varying risk showed that the addition of gold in each case increases average return, while reducing standard deviation. Therefore, it is suggested that if an investor, for the purpose of diversification, is looking for an asset which is largely uncorrelated with the market, gold will serve that purpose marginally better than even the mutual funds (Blose, 1996). Natalie (2009) also concluded in her study that gold proved a far superior diversifier when compared with many other financial products as well (Table 5).

Table 2 : Performance of Other Financial Instruments vs Gold

(in per cent)

(As at the end of)	Gold Lon Fix (INR/oz)	Gold Lon Fix (US$/oz)	DJ UBS Comdty Index	Brent crude oil (INR/bbl)	INR 3-month deposit	MSCI India	BSE SENSEX 30 spot	Westpac effective FX INR
1-month	0.2	4.9	2.5	4.7	0.3	11.1	11.7	2.1
3-month	1.7	5.1	8	6.7	0.6	11.7	13.4	-0.8
6-month	17.2	17.2	6.3	0.2	1.8	12.9	14.5	-1.5
1-year	22.7	31.3	2.8	12.5	4.2	19.1	17.2	6.7
3-year	98.9	75.9	-8.6	15.9	23.3	18.3	16.1	-9.6
5-year	182.6	176.7	-9.7	32.1	43.2	144.4	132	-6.2
3yr CAGR	25.8	20.7	-2.9	5	7.2	5.8	5.1	-3.3
5yr CAGR	23.1	22.6	-2	5.7	7.4	19.6	18.3	-1.3

CAGR = compounded average growth rate;
Source: World Gold Council.

An econometric analysis by Baur *et al.* (2010) for a sample period from 1979 to 2009 demonstrated that gold is both a hedge and a safe haven for major European stock markets and the US.

Gold as Hedging Instrument against Inflation

One of the most remarkable qualities of gold is its ability to hold its real value and therefore to act as inflation hedge Burton *et al.* (2006). The four most commonly purchased inflation hedge are gold, commodities, real estate and inflation-linked bonds. However, due to gold's unique hedging properties, inflation had been tackled traditionally by gold for centuries and much before other hedges like commodities, real estate came to be recognized. If gold prices rise faster than the general price level (and even compared with the prices of financial investments), investment in gold is seen as a superior hedge against inflation and preferred for that reason Vaidyanathan (1999). One of the WGC studies stated that gold's history as a monetary asset makes it an attractive store of value in periods of high inflation or rising inflation expectations.

Empirically, Ghosh *et al.* (2002) have validated that gold can be regarded as a long-run inflation hedge. Aggarwal (1992) is of the view that gold may be an inflation hedge in the long-run but it is also characterized by significant short-run price volatility. Blose (1996) found that gold tends to move in the same direction as inflation, and bonds tend to move inversely to inflation. Natalie (2009) in her empirical study established that gold always performed high during

high inflation years. The study also bought out that gold not only performed best in terms of real returns during the high inflation years, it also delivered a better risk /return profile. Gold's relationship with inflation is best illustrated by contrasting the performance of the gold price during high inflation years with its performance in moderate and low inflation periods. In the Indian context, Mani and Vuyyuri (2004) in their study, for the period from 1978-79 to 1999-2000, found that the price of gold have shown upward trend establishing gold can act as a store of value and therefore the inflation hedge. Interestingly, Brown and John (1987) were of the view that gold may be a long-term inflation hedge, but not a short-term store of value. They further pointed out that gold may be predominantly a hedge against something other than inflation, *viz.,* political instability. However, Ghosh *et al.* (2002) who studied 100 years data for American economy concluded that the real price of gold increased on average by only 0.3 per cent per year in this hundred-year period. In that context, they firmly stated that at least for American investors, long-run investment in gold may be an effective long-run inflation hedge. Similarly, Kolluri (1981) has studied the period from 1968 to 1980 for the industrialised countries, has also concluded that gold was a good inflation hedge, and stated that an increase of 1 percentage point in anticipated inflation resulted in an increase of 5 per cent in the capital gain on gold. For greater detailed survey of literature on 'gold as an inflation hedge' Burton *et al.* (2006) can be referred. Referring to inflation hedge character of gold Greenspan (1966) stated that '…in the absence of the gold standard, there is no way to protect savings from confiscation through inflation…'

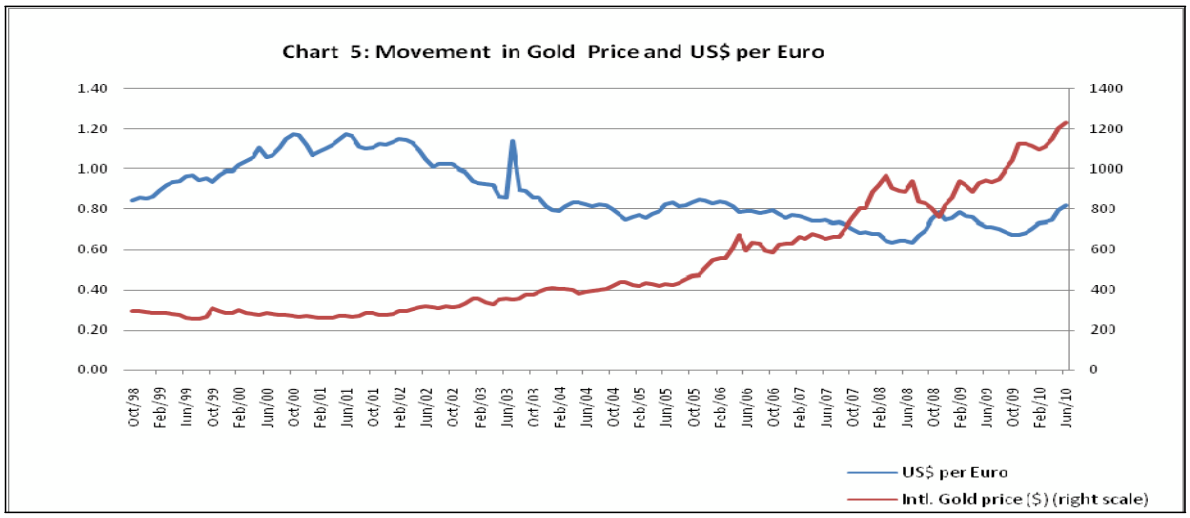
Movement in Gold Price vs US Dollar

A detailed study by Capie *et al.* (2004) explored the extent of relationship between gold and the exchange rates of various major currencies against the US Dollar to examine if gold acts as a hedge against US Dollar by taking into account the trade weighted pound between 1971 and 2002. The study also gave a particular focus on hedging properties of gold during economic crisis and political turmoil, and concluded that compared with weekly changes in exchange rates, gold price tends to overshoot. It has been widely perceived that the movement of gold price and US dollar are inverse, for instance Subramanian (2010) points out that evidently there was a growing inverse relationship between the values of gold and the US Dollar. In the context of the recent global financial crisis, he further noted that there was an uneasy balance for some months and the balance came under severe stress around mid-2008 when the financial crisis erupted. An additional reason for some central banks to consider buying gold is the recent decline in the value of US dollar against the world's main trading currencies and feared that it may decline further. Between the end of 2001 and the end of 2009 the US currency lost 38 per cent of its value against the euro, while its effective rate fell by 32 per cent. The U.S dollar declined every year during this period with the exception of 2005 and 2008. The dollar remains the mainstay of the reserves portfolio of advanced, emerging and developing economies. Gulati *et al.* (1982) who studied on the international gold price movements during 1972 to 1982 are of the view that uncertainty in the expected value of currencies as well as general uncertainty in the economic environment may be expected, in part, to create greater investment demand for gold, raising the gold price. Thus, besides the need to diversify away from the dollar, gold has a reputation as a dollar hedge. Arguably a diversified portfolio is more important in a time of crisis. However, the diversification argument for gold is more broad-based than that. These stem from the fact that its value is determined by a set of different factors, *vis-a-vis* currencies and government securities markets which depend on macroeconomic policies including the variations in central banks' monetary policies. For instance, the repetitive quantitative easing can lead to inflation and erode the value of fiat currencies. The price of gold therefore behaves in a completely different way from the prices of currencies or the exchange rates between currencies. Thus, gold can provide investors with a 'natural hedge' against dollar weakness and is easily demonstrated and it is also an effective

diversifier (Burton *et al.,* 2006).

For instance, between June 2007 and June 2009, when the world economy was showing signs of bottoming out, the gold price increased by 43 per cent in dollar terms. This compares better with increases between 3 per cent and 9 per cent (local currency terms) in the main sovereign bonds held by central banks (WGC). In view of these, Paranjape, (2005) is of the firm view that gold is the only asset that gives the average Indian a hedge against currency depreciation.

During the recent global financial crisis, particularly, when Lehman Brothers collapsed the liquidity constraints in the wholesale market for dollars and the FX swap market were most pronounced. Under these circumstances, fund managers who faced huge redemptions and/or margin calls turned to gold as an "asset of last resort" to stay solvent as pointed out by the World Gold Council reports. As the dollar is the world's main trading currency and which also offers a wide range of financial instruments, has excellent liquidity, practically all central banks across the world continue to accumulate as reserves in their balance sheets. However, the dollar's value is susceptible to US economic policies[10]; it did lose its value over the lastdecade against both the euro and gold in recent years (Chart 5). Burton (2006) also concluded that in the face of a decline in the dollar exchange rate, gold price in local
currency would not decline by as much as the pure exchange rate calculation would suggest.



Source: gold price, WGC and for exchange rates of US $ and Euro RBI publications.

It may be cited that '…gold invariably moves inversely with the US dollar and also rises in value when international inflation gathers momentum. Thus, there are strong reasons for holding a reasonable proportion of Indian foreign exchange reserves in gold…' (Financial Express, 2006). Between 2001 and 2009, the gold price increased from USD 276.5/oz to US 1087.5/ oz, a cumulative rise of 293 per cent or an average compounded annual return of 18.7 per cent, five of those 8 years were marked by gains of 20 per cent or more. Unlike other assets, gold appears to react positively to negative shocks according to Baur *et al.* (2010).

Conclusion

It is clear from the above analysis that in the wake of global crisis and the consequent heightened uncertainty, there has been high demand for gold from the central banks across the globe. It was found that central banks had either bought more gold or stopped selling their existing

stock and India is no exception. In India's case, while foreign reserves increased substantially over the years, the physical stock of gold as part of official reserves, however, remained stable. Eventually, gold's proportion in the total foreign reserves sharply came down. In fact, even with the latest purchase of gold by the Reserve Bank, gold accounted to just around 7.9 percent of the forex reserves. This is very small when compared with a sizable holding by a number of central banks in advanced countries and even some EMEs as pointed out above. In that context, India's purchase of gold as a diversification strategy is fully justified and is in line with the global trend and still there is scope to increase its holding.

What constitutes the 'optimum level of gold' for India is, of course a difficult question to address and unfortunately even international experience is scarce on this question. However, there is strong economic rationale to hold sufficient quantity of gold as part of official reserves, especially during the uncertainty such as the recent global financial crisis going by the historical experience.

India's recent purchase of 200 tonnes of gold, apparently, did not cause any aberration on the international gold price trend, probably, as gold was not bought from the open market. Similar method can be followed even in future, preferably in smaller quantities. Further, as India is a depository of huge private gold holdings, this can be channelled into official reserves especially those available in the form of coins and biscuits. This will also provide opportunity for the private holders to liquidate gold without much loss as presently banks are not permitted to buy back gold from the public.

In the context of increased degree of uncertainty, especially when the U.S dollar became subject to tough challenges when U.S. attempted to salvage its economy by pumping in with heavy stimulus packages, there was a fear that it may accelerate the process of depreciation of the dollar. This in turn threatened the safety of many country's dollar-denominated assets. Over and above, the recent downgrading of the U.S credit rating from 'AAA to AA+' coupled with the ongoing 'government debt crisis' among select European countries pushed up the demand for gold from central banks in general. In these situations, gold continued to maintain its value and therefore it is considered to act as a hedge against loss of wealth. Thus, the recent global financial crisis, only reiterated that gold as part of foreign exchange reserves continued to play a key role in the macroeconomic management devoid of its erstwhile purely monetary role.

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