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Is gold a volatile asset?

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**Summary**

Gold is widely perceived to be volatile relative to other asset classes and even relative to other precious metals, and the turmoil in asset markets since the credit crisis erupted in the latter half of 2007 has heightened this perception. In this paper, we aim to refute this myth. During the last 20 years, gold has consistently been less volatile than oil, other precious metals, and the GSCI commodity index. It has also, on average, been less volatile than the major equity indices. We explain the reasons why this is the case and why many of these reasons are unique to gold.

**Gold's history in terms of average volatility**

The graph below shows average 22-day volatility in the gold price since the beginning of 1974 during 1973, movements in the price of gold were still constrained by the two-tier market that followed Nixon's closing of the gold window two years earlier, and it was not until November of that year that the two-tier system was finally abandoned. A mathematical analysis is not required to see that the years immediately following gold's free-float were very volatile. Volatility surged with the run up in the gold price of 1979/early 1980, and remained high for several years thereafter. By the mid-1980s, however, volatility had calmed down significantly and this lower volatility has persisted. There have been several corrections in gold's recent strong bull run that have resulted in pockets of increased price volatility, but they pale in comparison to that experienced during the price spike of 1979/early 1980.

**Gold Price and 22-Day Average Volatility**

Average 1974-2008: 17.2%

0 200 400 600 800 1000 1200

1974 1979 1984 1989 1994 1999 2004

0% 20% 40% 60% 80% 100% 120%

Gold Price, \$/oz (LHS) Volatility (RHS)

Data: Global Insight, WGC

How does the volatility of gold during that 34 year period compare to other asset classes? During the period 1974 August 2008, volatility in the gold price was higher than for the S&P500 17.2% compared to 14.4%. This differential largely reflects the fact that the S&P500 did not exhibit the high levels of volatility that were evident in gold around the period following gold's float. In fact, the graph below suggests that the volatility of gold reduced after 1985, but the volatility of the S&P500 may have increased.

Closer analysis proves that the relativities did, in fact, shift if we remove the 1974-85 period from our calculations, the average volatility in gold falls to 13.2%, while the volatility of the S&P500 rises slightly to 14.8%.

**S&P500 and Gold; 22-Day Average Volatility**

Average, 1974-2008:

Gold 17.25%

S&P500 14.44%

0% 20% 40% 60% 80% 100% 120%

1974 1979 1984 1989 1994 1999 2004

Gold

S&P500

Data: Global Insight, WGC

While this division in our analysis around the mid-1980s may seem somewhat arbitrary, there were, in fact, some significant structural economic factors at play that make it valid. Before making these arguments, it is useful to broadly divide the 34 year period according to major shifts in the economic and inflation environment:

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The high inflation period of the late 1970s. Volatility in the gold price increased sharply in the run-up to the January 1980 peak. This spike was unusual in the history of gold due its sheer magnitude and speed. Between August 1976 and January 1980, the gold price rose more than 700%; it more than doubled in the two and a half months from November 1 1979 and mid-January 1980. The speed of this rise left gold vulnerable to a correction, which inevitably occurred.

The underlying economic and political environment at that time was highly unstable. During 1979, the oil price rose from \$15 to \$40 a barrel and inflation in most countries was running in double digits. Furthermore, the US dollar was falling sharply and political uncertainty was heightened – a revolution was underway in Iran; in November 1979 Iranian radicals took over the US embassy in Tehran in a hostage crisis that was to last until 1981; and the Russians were building up their strength in southern Yemen, near Afghanistan's border with Iran, and near Bulgaria's border with Yugoslavia.

Although the inflation-adjusted level of oil prices has recently surpassed the highs reached in the 1970s, the inflation and policy environment is now markedly different. Inflation during the 1960s had typically been overlooked in favour of other policy goals, particularly full employment. This was the era of Keynesian economics, where fiscal policy and government spending were considered to be more important than monetary policy. By the time the first oil price shock hit, inflation was already very high. In 1970, US inflation was running at 5.8%; in the UK in 1971, it was 9.4%.

Policymakers responded to the oil price shock by trying to keep inflation down artificially – the Nixon administration imposed price and wage controls in 1971 and several other countries followed suit. Labour markets were also rigid and often highly unionised, so as petrol and food prices increased, wages typically followed, triggering wage-price spirals. It is not surprising, therefore, that significant pain was required to bring inflation back under control. By the end of 1979, the fed funds rate was close to 14%. The UK base rate was 17%.

**2. The deflationary period of the early 1980s.** The early 1980s broadly marked a severe deflationary period. The very tight monetary policy that was implemented in many countries during the late 1970s had started to take its toll. The US economy fell into recession, and many other major global economies followed suit. By 1982, US unemployment had reached almost 11%. The fall in inflation rates in many countries during that decade was substantial. In the US, inflation had fallen below 4% by 1982. In the UK, the inflation rate peaked at 24% in 1975 and was back down to 4.6% by 1983, although it bounced several times to levels of above 8% before finally stabilizing below 4% in the early 1990s.

The early 1980s were also a time when significant policy changes were implemented in order to reverse the damage done by the poor policy response to the oil shocks. These changes included a shift in monetary policy focus towards controlling inflation and less focus on secondary policy targets, measures to reduce rigidity in labour markets, and cost cutting to reduce large fiscal deficits. These policy changes proved to be structural, not temporary.

The recessionary phase that marked the first half of the 1980s was very negative for commodities, including gold. For commodities in general, this reflected the slowing in global demand, but for gold, there was the added impact of a sharp slowing in inflation rates. The gold price had fallen back to \$500/oz by late March 1980 and although it bounced back to test \$700/oz later that year, the rally was short-lived. By July 1982, the gold price was at \$300/oz.

Given the economic and policy environment, it is not surprising that the gold price remained volatile throughout the early part of the 1980s. Average 22-day volatility reached 113% around the time of the \$850 peak in the gold price and the following two years saw another two spikes where volatility reached 60%.

It is clear, therefore, that the first 10 years following gold's free-float was also one where the inflation environment was extremely uncertain. One could also argue that the 1980s represented a structural, permanent shift in the macroeconomic policy and interest rate environment, and also in the inflation environment.

**3. The period of transition.** The exact starting point of the new low-inflation era is murky. The period of adjustment from a high to a low inflation environment continued into the second half of the 1980s in the UK, while in wider Europe, it persisted even longer due to the stringent criteria facing ERM countries in the run up to the introduction to the Euro. However, in the US, which is a key driver of global financial markets, low inflation had been achieved by the mid-1980s. Notably, it is the linkages between US inflation and the gold price that are the most widely documented. Consequently, we have called the second half of this decade one of transition.

By the second half of the 1980s, the gold price was still trending downwards, but volatility had abated significantly. The sharp sell-off in equities of October 1987 had little impact on either the gold price or gold price volatility. Notably, the equities sell-off was very short-lived and the bounce-back rapid.

**4. The new paradigm of the 1990s.** By the 1990s, most of the major economies had managed to get inflation under control. While the early part of that decade marked a recession in many parts of the world, it wasn't long before economic growth rates started to improve. This improvement was led by the US, which embarked on an

unprecedented period of uninterrupted growth with low inflation the new paradigm had begun. Technology improvements, the internet and the development of financial markets were resulting in productivity gains in many sectors and the outsourcing of both manufacturing and services to China and India was commonplace. There was also a widespread, arguably somewhat overinflated, belief that these productivity improvements and cost reductions would be both significant and ongoing. Notably, emerging economies (many of which are major gold consumers) recovered well during the first half of the decade, but imploded in spectacular fashion around 1998. However, the flow-on effects onto growth in the developed world were generally modest and short-lived.

In summary, inflation was low during this decade and political uncertainty was relatively benign. Gold entered a period of range trading, but within a continued downward trend. Gold price volatility during the 1990s averaged just 10.6%.

The end of this range-trading period for gold largely ended on September 26th 1999 when the first Central Bank Gold Agreement (which was also known as the Washington Agreement on Gold) was announced. The agreement came in response to concerns in the gold market after the United Kingdom treasury announced that it was proposing to sell 58% of UK gold reserves through Bank of England auctions, coupled with the prospect of significant sales by several other European central banks

and possibly also the IMF. The price of gold spiked sharply during the days following the signing of the agreement, and provided the first sign that the price had reached a bottom. However, the bull market did not take hold until 2001.

**5. The 21st century so far.** The initial part of the 21st century marked a period of ongoing economic uncertainty. The internet and tech bubble burst and geopolitical uncertainty was extreme. As the decade progressed, however, economic growth rates improved, but this time, the improvement was synchronized across both the developed and developing economies. The latter, in particular, fuelled a commodity boom that included gold. While one could interpret this era as a period of low inflation, one could equally argue that it was one where the preconditions for a surge in inflation were building rapidly. Monetary policy was very stimulatory, credit conditions were very easy and liquidity was ample. The warning signs were ample strong growth in emerging economies was pushing up commodity prices, growth in monetary and credit aggregates in the world's major economies was alarmingly strong, and housing markets were booming. There were numerous debates going on as to whether inflation was permanently under control or just around the corner.

Regardless of which of these theories will prove to be true and just how persistent the recent higher rates of inflation will be, there are several crucial differences between the current phase and that of the 1970s. Firstly, inflation is now generally well under control in developed economies and low inflation expectations are well entrenched. While inflation pressures have recently increased, it is unlikely that inflation rates will reach anywhere near the levels seen at that time. This largely reflects the underlying stability in the policy environment, the commitment by central banks to low inflation and the increased flexibility of labour markets.

In summary, there are valid structural reasons related to the policy and inflation environment that explain why the high levels of volatility in the gold price experienced during the 1974-1985 period should not return. The next phase of our paper therefore excludes that era. However, rather than starting our comparison of asset class volatilities in 1985, we have chosen to start it in 1987, thereby excluding the spike in equity market volatility in October 1987. The introduction of circuit breakers in equity markets following the October 1987 crash suggests that this cut-off is valid i.e. the extreme levels of volatility seen during that time are unlikely to return.

#### **Gold is not a volatile asset...the proof**

In the following section, we compare gold volatilities against those for both equities and commodities. The x-axis scale on the equities graphs has been standardized at 0-60%, while for commodities it is standardized at 0-100%. The exception is oil, where the scale has been widened to 200% to accommodate the extreme ranges in volatility.

#### **Gold vs Equities**

Gold and S&P500; 22-Day Average Volatility

Average 1988 2008:

Gold 12.7%

S&P500 14.6%

0% 10% 20% 30% 40% 50% 60%

1988 1993 1998 2003 2008

Gold S&P500

Data: Global Insight, WGC

Gold and FTSE; 22-Day Average Volatility

Average 1988 2008:

Gold 12.7%

FTSE 14.7%

0% 10% 20% 30% 40% 50% 60%

1988 1993 1998 2003 2008

Gold FTSE 100

Data: Global Insight, WGC

Gold and Nikkei; 22-Day Average Volatility

Average 1988 2008:

Gold 12.7%

Nikkei 20.4%

0% 10% 20% 30% 40% 50% 60%

1988 1993 1998 2003 2008

Gold Nikkei

Data: Global Insight, WGC

Gold and DAX; 22-Day Average Volatility

Average 1988 2008:

Gold 12.7%

DAX 19.4%

0% 10% 20% 30% 40% 50% 60%

1988 1993 1998 2003 2008

Gold DAX

Data: Global Insight, WGC

**Gold vs Commodities**

Gold and Silver; 22-Day Average Volatility

Average 1988 2008:

Gold 12.7%

Silver 23.9%

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

1988 1993 1998 2003 2008

Gold Silver

Data: Global Insight, WGC

Gold and GSCI; 22-Day Average Volatility

Average 1988 2008:

Gold 12.7%

GSCI 17.9%

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

1988 1993 1998 2003 2008

Gold GSCI

Data: Global Insight, WGC

Gold and Oil; 22-Day Average Volatility

Average 1988 2008:

Gold 12.7%

Oil 35.6%

0% 20% 40% 60% 80% 100% 120% 140% 160% 180% 200%

1988 1993 1998 2003 2008

Gold Oil

Data: Global Insight, WGC

Unfortunately, daily data is only available from 1996 for palladium and platinum. The results for this period are shown in the following charts, with the x-axis scale set to 120% for consistency. As for the other precious metals, the results are conclusive gold is significantly less volatile, and this is reasonably consistent over time.

Gold and Platinum; 22-Day Average Volatility

Average, May 96 August 08:

Gold 13.9%

Platinum 19.9%

0% 20% 40% 60% 80% 100% 120%

1996 1999 2002 2005 2008

Gold Platinum

Data: Global Insight, WGC

Gold and Palladium; 22-Day Average Volatility

Average, May 96 August 08:

Gold 13.9%

Palladium 31.9%

0% 20%

40% 60% 80% 100% 120%

1996 1999 2002 2005 2008

Gold Palladium

Data: Global Insight, WGC

**Where does gold's relative stability stem from?**

All asset classes carry some degree of risk risks which inevitably influence how the price of that asset will respond to shocks. While the entire domain of risks is too numerous to describe in detail, we can summarise the key ones as

follows:

Credit risk the risk that a debtor will not pay.

Liquidity risk the risk that the asset cannot be sold as a buyer cannot be found.

Market risk the risk that the price will fall due to a change in market conditions.

An analysis of these three risks and how they relate to gold shows that gold has some unique qualities that tend to dampen its response to certain shocks.

**1. Credit risk.** Gold does not carry credit risk as it is no-one's liability. There is no risk that a coupon or a redemption payment will not be made, as for a bond, or that a company will go out of business, as for an equity. And unlike a currency, the value of gold cannot be affected by the economic policies of the issuing country or undermined by inflation in that country.

**2. Liquidity risk.** Measuring the liquidity of a share or equity index is relatively simple. Gold is more complicated, however its liquidity extends beyond the turnover in financial instruments such as ETFs and futures that we would typically associate with investable assets. Trading is undertaken around the clock by a wide range of buyers from the jewellery sector to financial institutions to



consumers to manufacturers of industrial products in a wide range of products that extends to bars and coins, jewellery, futures and options, exchange-traded funds, certificates and structured products. The gold market is deep and liquid, as demonstrated by the fact that gold can be traded at narrower spreads and more rapidly than many competing diversifies or even mainstream investments.

Because gold is virtually indestructible, nearly all of the gold that has ever been mined still exists, much of it in near market form in the form of jewellery. This means that sudden excess demand for gold can usually be satisfied with relative ease. This makes gold unique to other precious metals, which are used mainly in industrial applications and cannot be easily brought back to the market.

The supply of gold, including mining output and additions to supply from central bank selling, tends to be stable over time. Mine production has been gradually trending lower for some years and given the very long lead times between exploration and production, the absence of recent significant new discoveries suggest that supply is likely to remain subdued. Supply is also geographically dispersed across several continents and many countries, so disruptions to any one mine or group of mines in one location are unlikely to have a significant impact on the gold price. This makes gold very different to oil, which is highly concentrated in the Middle East. Furthermore, the Central Bank Gold Agreements of 1999 and 2004 have ensured that any central bank selling is done in a controlled basis, it is likely that a new agreement will be signed next year when the current agreement expires.

Gold Reserves By Region (as at end 2005)

% of total reserves

0% 5% 10% 15% 20% 25%

Asia/Oceania

Australia

Canada

Europe/Middle East

Former E Bloc

Latin America

Other Africa

South Africa

USA

Data: Brook Hunt

Oil Reserves By Region (as at end 2007)

% of total reserves

0% 10% 20% 30% 40% 50% 60% 70% 80%

North America Central & South America

Europe & Eurasia

Middle East Africa Asia & Oceania

Data: BP Statistical Review

**3. Market risk.** Gold is, of course, subject to market risk, as is clear from the experience of the 1980s when the gold price declined sharply. But many of the downside risks associated with the gold price are very different to the risks associated with other assets, a factor which enhances gold's attractiveness as a portfolio diversifier. For example, should a central bank announce its intention to engage in substantial sales of gold, as happened prior to the Central Bank Gold Agreement in 1999, this would reasonably be expected to affect the gold price in the short run, but is unlikely to have an impact on broader equity market returns. Similarly, the specific risks to which bonds and equities are exposed, including pressure on the health of the government and corporate sector during an economic downturn, are not shared by gold. This variation in economic risks helps explain gold's lack of correlation with both equities and bonds.

#### Recent history

There is a commonly held misperception that since the credit crisis erupted in 2007, gold has become a volatile asset. While it is clear from the graphs presented earlier that volatility has increased, a comparison of volatility since August 2007 shows that gold has, in fact, remained less volatile than equities, oil, the GSCI commodity index and

other precious metals.

**Summary**

Our analysis clearly shows that while the volatility in the gold price has increased somewhat with the rally of the last few years, the perception that gold is a volatile asset is not correct. In fact, during the last 20 years, gold has consistently proven to be less volatile than silver, oil, and major equity indices. These lower levels of volatility have proven to be reasonably consistent over time, and have been sustained into the recent credit crisis. The reasons for this price behaviour are well entrenched in gold's investment characteristics and its supply-demand characteristics.

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