May 2012



Gold...has two significant shortcomings, being neither of much use nor procreative. True, gold has some industrial and decorative utility, but the demand for these purposes is both limited and incapable of soaking up new production. Meanwhile, if you own one ounce of gold for an eternity, you will still own one ounce at its end. -Warren Buffett, Fortune, 12 February 2012

The inclusion of gold bullion reduces both the expected return and the volatility in the investment returns...This reduction in volatility also causes a reduction in the probability that the investment return is below a particular figure that may be deemed by trustees or investors to be unreasonable, unacceptable or indicative of a high level of risk - Dr David Knox, PwC Actuarial, 2002

Overview

Responding to the severe market shocks of the global financial crisis (GFC), investors are increasingly being attracted to alternative assets, and to gold in particular. In fact, the price of gold has doubled over the last 3 years – seemingly indicating that investors believe that gold can be a valuable component of an investment portfolio during periods of volatility. But just how real are the portfolio benefits of investing in gold?

Because gold doesn't lend itself to valuation using "normal" techniques (eg it doesn't produce a future cash flow which can be valued), it is susceptible to criticism as an asset whose value is primarily derived from speculation. Gold "bugs" advocate holding gold at all times, and gold "skeptics" counter by likening gold to a bubble asset (where the value to an early investor is increasingly driven by greed and fear led investment from subsequent investors). Given the increasingly significant central bank investment in gold since the GFC, and the recent explicit allocations being included in several research houses model portfolios, some "real" value for gold does seem to exist, suggesting that the simplistic "love" or "hate" for gold may be overly superficial.

To help resolve these questions, in the last decade several academic studies have attempted to identify the value drivers for the price of gold, and also to evaluate the role of gold in a diversified portfolio.

Knox (2002) concluded that gold is a valuable component of an Australian diversified portfolio, especially as a dampener against adverse market conditions. More recently, a detailed study conducted by Oxford Economics (2012) has tabulated the diverse range of inputs to the price of gold, and used these to build a valuation model. Applying that model to a range of possible future economic scenarios, the Oxford Economics paper indicates that gold may provide an important addition to a portfolio in the case of global deflation, inflation, or stagflation. Both studies also show that gold may not be an important part of the portfolio if economic conditions are benign or display consistent growth.

TABLE 1: EXPECTED RELATIVE PERFORMANCE OF GOLD IN VARIOUS MARKET CONDITIONS.

Performance score in different scenarios 2011-2015						
	Baseline	Deflation	Stagflation	Inflation		
Gold	1	3	2	5		
Equities	5	2	3	4		
Bonds	2	4	1	1		
Cash	4	5	5	3		
House prices	3	1 1	4	2		

Note: Scaling has 5=bost performance; 1=worst performance, as shown in the relative performance charts in each scenario

Source: Oxford Economics. Future results are not guaranteed

In this research paper we outline the key components of the value of gold and illustrate the portfolio impact of including an allocation to gold in an investment portfolio. We show that gold can add value to an Australian investment portfolio. We also assess the merit of hedging the cross currency risk for Australian investors, and conclude with a brief discussion of the BetaShares Gold Bullion ETF, (ASX Code: QAU).

The investment worth of gold can be modeled and valued

Gold can add portfolio value in a number of different market conditions



Executive Summary

In research conducted by Oxford Economics (2012) a detailed analysis of the various inputs to and drivers of the performance of gold over an extended historical period was used to build a forward looking model which can be used to illustrate the likely performance under a range of scenarios. This study is a serious and credible attempt to analyse the value of gold, in light of the shortcomings of the traditional securities analysis of income producing assets (which is therefore unable to model the value of gold). Put simply, the Oxford Economics research showed that gold would underperform assets like equities in a benign/ growth environment, but would add significant portfolio benefits in deflationary, inflationary and stagflationary economic conditions. The Oxford Economics paper also modeled the portfolio construction benefits of gold in a broadly diversified portfolio, and recommended the inclusion of a 5% allocation to gold in a balanced portfolio.

In Knox (2002) a variety of Australian portfolio construction metrics were used to determine the benefits of including a component of gold in a broadly diversified portfolio. Knox analyses the portfolio benefits historically using known data, and then develops a forward looking model to assess the conditions in which gold will be useful to portfolios going forward. Detail of the methodology and assumptions will be considered in more detail in following sections.

The core portfolio construction findings in Knox (2002, p.13) are:

- "For 1992 1997 the introduction of gold would have reduced the return by approximately 0.1% - 0.2% pa for each 1% investment in gold bullion. However, in most cases the volatility would also have reduced...;
- For 1997 2002 the introduction of gold bullion has virtually no impact on the portfolio return but reduces the volatility measure in every case."

Importantly, Knox states clearly that for the historical review, gold was uncorrelated with all other major asset classes (an important factor in periods of market volatility):

- "The correlation co-efficients of investment returns from gold bullion with all other asset classes are slightly negative or close to zero;
- Gold bullion has characteristics in terms of risk and return that suggest that it is very different from all other asset classes" (Knox, 2002, p. 22).

In the forward looking analysis, Knox finds broadly similar results applying:

- "The inclusion of gold bullion reduces both the expected return and the volatility in the investment returns;
- This reduction in volatility also causes a reduction in the probability that the investment return is below a particular figure that may be deemed by trustees or investors to be unreasonable, unacceptable or indicative of a high level of risk" (Knox, 2002, p. 26). (Emphasis added)

These findings are in line with the Oxford Economics research which indicates that the Knox findings still hold true. For Australian investors, we have modeled the portfolio benefit of including a 5% exposure to physical gold bullion (with the A\$/US\$ exchange rate hedged) – see Chart 1 below. In this example, we blended a 5% allocation to physical gold bullion (currency hedged) with a 95% allocation to the return of the "Mercer Wholesale Balanced Growth Fund." Chart 1 shows the overall return of the blended portfolio, and Chart 2 shows the modified risk/return profile of the blended portfolio. These charts show that including a 5% allocation to the BetaShares Gold Bullion ETF, (ASX:QAU), would have improved the return and lowered the overall portfolio risk over ten years ending December 2011. This is in line with the findings of Knox (2002) that gold can provide a real source of portfolio diversification.

Gold can add portfolio value in deflationary, inflationary and stagflationary markets

Gold has negative or low correlation with other asset classes

Gold can reduce portfolio volatility

Inclusion of 5% gold in a diversified portfolio



CHART 1: RETURN OF BLENDED PORTFOLIO WITH INCLUSION OF 5% ALLOCATION TO QAU

95% MWBG/5% QAU, Mercer Wholesale Balanced Growth Average



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Source: Mercer, BetaShares Capital Limited. QAU performance is simulated and represents the performance of the spot price of gold bullion with a currency hedge against movements in the AUD/USD exchange rate (which QAU aims to track). Past performance, simulated or actual, is not a reliable indication of future performance and does not take into account QAU's management costs, which would reduce QAU's returns by approximately 0.59% per annum.

CHART 2: RISK/RETURN OF BLENDED PORTFOLIO WITH INCLUSION OF 5% ALLOCATION TO QAU

95% MWBG/5% QAU, Mercer Wholesale Balanced Growth Average Return and Std Deviation in \$A over 7 yrs ending December-11 (monthly calculations) Comparison with the Wholesale-Balanced Growth universe 7.0 6.0 5.0 (ede) 4.0 . 0 3.0 2.0 1.0 6.0 7.0 8.0 10.0 11.0 9.0 Std Dev (%pa) 🔶 MWBG 🚸 Median Universe Composite2 MERCER Created on 15 Mar 2012 at 8:34 PM

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Source: Mercer, BetaShares Capital Limited. QAU performance is simulated and represents the performance of the spot price of gold bullion with a currency hedge against movements in the AUD/USD exchange rate (which QAU aims to track). Past performance, simulated or actual, is not a reliable indication of future performance and does not take into account QAU's management costs, which would reduce QAU's returns by approximately 0.59% per annum.

12.0

5% allocation to gold would have improved the return and lowered the risk to a balanced portfolio over last 10 years



What are the current drivers of the value of gold?

Understanding the difference between "normal" assets which produce a future return, and an asset like gold which does not produce a future return, is the key to understanding the value of gold. Additionally, the durability of gold compared to other assets which waste/ deteriorate or are consumed, is another driver of the value of gold. For example, apart from the 10% of current demand for gold from industrial users – which use the gold in components or processes which deteriorate over time –the majority inputs to the value of gold aren't directly linked to the changing supply and demand of the business cycle:

As a result, gold prices lack the strong link to the economic cycle that other commodities have and gold has thus often exhibited low or even negative correlations with these and other financial assets. Gold is also unusual among financial assets in not delivering a yield, e.g. a dividend or coupon as paid by equities and bonds and this can be seen a disincentive to hold gold; however, gold has a significant advantage compared to some other financial assets which is its lack of default risk. (Oxford Economics, 2012, p. 5)

The concept of securities valuation was conceived as a theory which was based on and seemed to reflect the actual workings of the securities market. Because gold isn't susceptible to this valuation method, it has suffered from criticism as a speculative and sometimes volatile investment.

As a result, a number of academic research projects have been undertaken in an attempt to build a reliable valuation model for gold. These add a layer of analytical rigour beyond the empirical portfolio research of the sort conducted by Knox (2002). The most recent of these research projects was conducted by Oxford Economics in 2012¹.

The Oxford Economics research is useful for its summary of the findings of previous similar research projects, as well as for its debunking of some popular myths. The authors note that gold hasn't always behaved in line with inflation – despite the typical belief that gold is an inflation hedge because of its relative price stability over time. They adopt the view that there are multiple inputs to the price and value of gold, more than simply being an inflation hedge. For example, gold rose to more than 3x its long term average price during the 1980s and then fell well below its long run average price during the 1990s. These swings were far wider than would be explained through a simple link between gold and inflation. So what are the inputs to the price of gold?

- **Real interest rates** impact the price of gold because as rates rise the opportunity cost of holding gold also rises, and vice versa, low real interest rates make gold more attractive to hold;
- The value of the US\$ typically moves inversely with the price of gold. Since exchange
 rates were floated in the 1970s, several studies have tracked the link between the US\$
 and gold, including the IMF. The rationale for the inverse link between the price of gold
 and the US\$ is that:
 - "A falling dollar increases the purchasing power of non-dollar area countries (and a rising dollar reduces it) driving up prices of commodities including gold (or driving them down in case of a stronger dollar)
 - In periods of dollar weakness, investors look for an alternative store of value, driving up gold prices. This includes dollar-based investors concerned about possible inflationary consequences of a weak dollar. In strong dollar periods the dollar itself is often seen as an appropriate store of value." (Oxford Economics, 2012, p. 8).
- Financial stress drives up the price of gold. This is because of a number of factors:
 - o Concerns about the default risk for normal investments like bonds and shares rises in periods of financial stress;
 - o The liquidity in the gold market becomes more attractive when illiquidity rises in traditional markets;
 - o The low to negative correlation between gold and other asset prices highlights its value as a store of wealth which is highly attractive during stress periods.
 - "The Impact of Inflation and Deflation on the case for Gold" (Oxford Economics, 2012).

Gold does not have a default risk, unlike normal financial assets

Building a valuation model for gold

Main factors driving the value of gold



- **Rising political instability** also links to the price of gold, being seen in the rising gold price after the Iranian revolution and the Soviet invasion of Afghanistan in the 1970s and 1980s, and the aftermath of the September 11 terror attacks on the USA;
- Official sector activity (governments, central banks, sovereign wealth funds) has a material impact on the gold price. As at 2010, the sector held globally 30,500 tons, which was 15% of total above ground reserves (Oxford Economics, 2012, p. 11). The growth in official reserves in the 2000s was led by the emerging markets (many of which moved into trade and current account surpluses during the 2000s) and followed by developed nations after the GFC. Net central bank buying of gold was 73 tonnes in 2010 and 77 tonnes in 2011;
- Quantitative easing has coincided with a sharply rising gold price. The simplest explanation of this is that the value of the paper money with which gold is purchased has fallen as a result of the deliberate debasement of the US\$ and Euro (the latter implements quantitative easing through measures such as the LTRO). The impact of increased liquidity within the global monetary system since the GFC has not yet triggered strong inflation, but it is widely expected that this risk could materialise when and if the banking system is repaired (and becomes a better transmission system of liquidity into the broader economies). The link between quantitative easing and the gold price may be seen in Chart 3:

CHART 3: GOLD PRICE AND US MONETARY POLICY.



Source: Oxford Economics, 2002, p.12.

The Oxford Economics research combined each of these observed value drivers for gold into a pricing model, which was tested against the actual price behaviour of gold over time and found to be an accurate reflection of previous price movements. Chart 4 shows the outcome of this testing, which suggests that the model should be a robust determinant of the future value and price behaviour of gold.

CHART 4: ACTUAL AND MODELED VALUES OF GOLD.





Post GFC drivers of the gold price

Applying this model to decompose the large rise in the price of gold since the GFC, Oxford Economics suggests that there are 3 main factors currently driving the price, with some subsidiary factors also contributing:

- "The depreciation of the effective dollar exchange rate
- · The recent financial crisis, which raised financial stress levels
- Most recently the Federal Reserve's quantitative easing policy, which has raised fears over medium term inflation" (Oxford Economics, 2012, p.16)

These findings are core to the prospects for the gold price in the near to medium term. Let's now look at the prospects for the gold price under the three most likely economic scenarios over the next few years. Depending on which view the investor has will indicate the benefit/ role that gold can play in the investor's portfolio. The results are shown in Chart 5 below:

CHART 5: EXPECTED RELATIVE PERFORMANCE OF GOLD UNDER VARIOUS MARKET CONDITIONS

Performance score in different scenarios 2011-2015						
	Baseline	Deflation	Stagflation	Inflation		
Gold	1	3	2	5		
Equities	5	2	3	4		
Bonds	2	4	1	1		
Cash	4	5	5	3		
House prices	3	1	4	2		

Note: Scaling has 5=best performance; 1=worst performance, as shown in the relative performance each scenario

Source: Oxford Economics, 2012, p. 18 Future results are not guaranteed.

Gold under various future economic conditions

The "Benign" scenario

Assuming the global recovery continues, ie that any further banking system crises are relatively small and well contained, and that global economic growth is maintained, the Oxford Economics model predicts that gold would be a relatively weak contributor to portfolio returns. Growth assets like shares and property should provide better returns in this scenario.

The Deflationary scenario

In the event of continued instability in the global financial system, with peripheral European banking and sovereign defaults (eg Spain, Portugal, etc), the likely impact is a deflationary environment (triggered by massive withdrawals of liquidity from the system, responded to by further debasement of the monetary systems through expanded quantitative easing). In this deflationary scenario, gold is an important part of the investment portfolio, with expected returns better than shares and property but behind the returns from bonds and cash.

The Inflationary scenario

Inflation is the usual response to loose monetary policy. Loose monetary policy in the US following September 11 and the "tech wreck" is linked to the rising asset price inflation in the mid to late 2000s. The concern is that this rising inflation might be repeated in the near to medium future – which could happen if economic recovery accelerates and liquidity isn't withdrawn in pace with the recovery.

Gold is the best performing asset in the Oxford Economics model in the inflationary model, followed by equities. Bonds are the worst performer, as the return of capital at maturity doesn't match the rising cost of real assets.

Quantitative easing impacts the value of gold

Gold is expected to add value in a deflationary environment

Gold is expected to outperform other assets under inflationary conditions



The Stagflationary scenario

The stagflationary scenario contemplates that a sharp oil price rise (to US\$150 per gallon) triggers sharp increases in inflation, which turn into a wages and price spiral as workers demand higher wages to compensate for rising costs – prompting companies to increase prices to compensate for higher costs, etc. Interest rates rise to dampen inflation and this in turn introduces recessionary conditions, with a gradual return to economic growth and lower inflation several years later.

The prospect of an oil price spike rises with geopolitical instability, especially in the Middle East. Possible Iran/Israel conflict is one potential trigger for this scenario. In the stagflationary environment, in the Oxford Economics model, gold performs better than bonds but behind equities, cash and property.

The role of currency hedging for Australian gold investors

Based on the findings of Knox (2002) and Oxford Economics (2012) we can conclude that there is a plausible basis for the inclusion of 5% of gold bullion in a broadly diversified investment portfolio. Investors holding a strong positive view of global and Australian economic conditions may not be inclined to hold this level of gold, but investors with a less benign investment outlook will find strong support in these findings for holding at least a 5% allocation to gold.

Australian investors can choose from a number of different methods for holding gold:

- Physical gold bullion (where gold coins or bars are held for the investor, with storage costs applying, and where existing investors wishing to sell need to be matched against incoming buyers);
- ASX listed structured products which give exposure to physical gold bullion or use derivatives to obtain that exposure (typically the reference price for these structured products is US\$, such that the investor has an A\$/US\$ exchange rate risk);
- ASX listed ETFs such as the BetaShares Gold Bullion ETF (ASX code: QAU), which is backed by physical gold bullion, and which also hedges the cross currency risk using a simple mechanism of buying 1 month A\$/US\$ forward contracts.

As shown above, the price of gold typically moves inversely with the US\$. That makes currency a serious and significant component of the case for an Australian investment in gold. Buying physical gold and ASX listed structured products where the cross-currency risk isn't hedged can and has detracted from the price performance of gold to Australian investors. Chart 6 below shows that an investment in gold after the GFC has been a prudent and positive result, but also shows that doing so without hedging the currency risk has generated a strong under-performance compared to an investment in gold where the cross-currency risk has been hedged (eg as with QAU).

CHART 6: GOLD BULLION SPOT PRICE PERFORMANCE A\$ HEDGED V UNHEDGED: 1 JANUARY 2009 – 31 DECEMBER 2011.



Source: Bloomberg, BetaShares Capital Limited. Past performance is not an indicator of future performance.

Hedging the A\$/US\$ exchange rate can add value to Australian gold investors



The A\$ has significantly appreciated against most major currencies, including the US\$, since the GFC. This is because of the strength of the Australian economy (buoyed by a positive terms of trade) and the related high A\$ interest rates. As the prospects for the Australian economy have moderated somewhat in recent times – compared to the slightly improving US economy – and as A\$ interest rates have started to moderate, the A\$ has fallen against the US\$. Typically this could be seen as an indicator that hedging the A\$/US\$ exchange rate would not be sensible in the expectation that the gains in holding gold could be undermined by a falling A\$ (against the US\$).

Closer scrutiny suggests that this outlook may be overly simplistic. Chart 7 below shows that during the first few months in 2012, when the A\$ has fallen against the US\$ (ie the US\$ has appreciated), so too has the price of gold.

CHART 7: COMPARATIVE PRICE PERFORMANCE OF BETASHARES GOLD BULLION ETF (ASX: QAU VS GOLD - AN UNHEDGED GOLD EXCHANGE TRADED PRODUCT LISTED ON ASX VS A\$/US\$ EXCHANGE RATE, 30 DECEMBER 2011 TO 30 MARCH 2012.



Source: Bloomberg, BetaShares Capital Limited. Past performance is not an indicator of future performance.

This is in line with the historically observed inverse correlation between the US\$ and the price of gold. In essence, as the US\$ has risen in real terms during the start of 2012 – essentially reflecting an increasingly benign outlook for the US economy – the price of gold has fallen. This is in line with the Oxford Economics research which has modeled that the comparative performance of gold compared to other assets – in benign to growth economic conditions – generally falls when equities rally.

A possible conclusion from this is that, unless an investor has a benign outlook for the global recovery (in which case an allocation to gold may not be attractive), it is rational for Australian investors to hold an allocation to gold and to hedge the A\$/US\$ exchange rate risk. This is because the appreciation in US\$ against the A\$ that has been experienced recently – reflecting an increasingly positive US and global economic outlook – would not be expected to be maintained in the event of a slowdown or deterioration in the US economy. A sharp external shock could trigger a short term rally in the US\$ (as a "safe haven") but would be expected to be followed by further expansion of the US (and probably European) money supply through additional quantitative easing. Further debasement of the US\$ via quantitative easing would be expected to trigger the continued decline/weakness of the US\$. In these conditions, ie further market instability leading to a deflationary, inflationary or stagflationary environment – holding an allocation to gold would be in line with the approach outlined in Knox (2002) and Oxford Economics (2012); and hedging the A\$/US\$ cross currency risk is consistent with the investment rationale for holding gold in those scenarios.



Conclusion

In this research paper we have canvassed the various theories (for and against) the case for including a component of gold bullion in a diversified portfolio. Despite the criticism from "traditional" securities analysts – that gold produces no income and is therefore not capable of rational valuation, we have identified a number of studies (eg Knox (2002) and Oxford Economics (2011) which have formulated an approach to valuation and portfolio construction using gold bullion. These studies advocate inclusion of 5% gold bullion in in a balanced investment portfolio. Oxford Economics (2011) also model the expected behaviour of gold under a range of possible future market conditions and conclude that gold bullion should perform well compared to other assets in a deflationary, inflationary or a stagflationary environment. Finally, we analysed the rationale for an Australian investor to hedge the A\$/US\$ currency risk for their gold bullion investment, and concluded that hedging the currency risk could be a rational investment risk management tool.

Sources

Bernstein, Peter: The Power of Gold: The History of an Obsession (John Wiley and Son, New York, 2000)

Bienkowski, Nik: "A Golden Rule in Risk Management" (JASSA, Issue 3, Spring 2002, 2-5)

Knox, David: "Gold Bullion and Superannuation Investment Policies: A review and analysis of the role that gold bullion could play in the investment policy of Australian superannuation funds" (Pricewaterhouse Coopers Actuarial, November 2002)

Oxford Economics: "The Impact of Inflation and Deflation on the Case for Gold" (July 2011)

BetaShares Gold ETF Trading Information

BetaShares ETFs can be bought or sold throughout the trading day on the ASX, and trade like ordinary shares.

EXCHANGE	ASX
ASX CODE	QAU
CURRENCY	AUD
TRADING	10:00-16:00 (AEST)
BLOOMBERG	QAU AU
IRESS CODE	QAU.AXW
IRESS INAV	QAUINAV.ETF

Fund Information

ISSUER	BetaSha	res Capital Ltd
UNDERLYING ASSE	TS Physic	al Gold Bullion
GOLD VENDOR	National Bar	nk of Canada
GOLD CUSTODIAN	JP N	lorgan Chase
FUND ADMINISTRA	TOR	RBC Dexia
AUDITOR	Pricewaterh	ouseCoopers
DISTRIBUTIONS*		Annual
MANAGEMENT COS	STS	0.49% p.a
GOLD VENDOR/CUS	STODY COSTS	0.10% p.a
FUND INCEPTION		3 May 2011

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We do this by providing ETFs that track the performance of a range of market indices and asset classes. Investing is as easy as buying any share.

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