

## The Portfolio Benefits of Investing in Gold

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This article presents a number of compelling arguments for investing in gold. It explores gold's role as a risk management tool that offers excellent portfolio diversification benefits and provides tail-risk protection, as well as gold's use as a source of capital preservation that hedges against inflation and currency devaluation. Finally, empirical evidence from various academic studies is provided to show gold's optimum allocation in an investment portfolio.

**Gold has two primary functions in investors' portfolios:** as a risk management vehicle and as a source of capital preservation.<sup>1</sup>

### 1. Gold as a risk-management vehicle:

1.1 **Gold provides excellent portfolio diversification** due to its lack of correlation with traditional asset classes. As changes in the gold price are not significantly correlated with changes in the price of other mainstream asset classes, gold brings considerable diversification benefits to an investor's portfolio. Importantly, this is a relationship that has been shown to hold across markets and over time.<sup>2</sup>

Modern Portfolio Theory suggests that investors should hold a combination of assets in their portfolio that achieves the least volatility for a given return, or achieves the maximum return for a given exposure to volatility.<sup>3</sup> Portfolio diversification allows investors to reduce the likelihood of substantial losses that may be caused by a change in economic conditions that negatively affects one or more asset classes.

Chart 1 shows the correlation of the monthly performance of gold to a variety of traditional and alternative asset classes and illustrates the diversification benefits of gold.

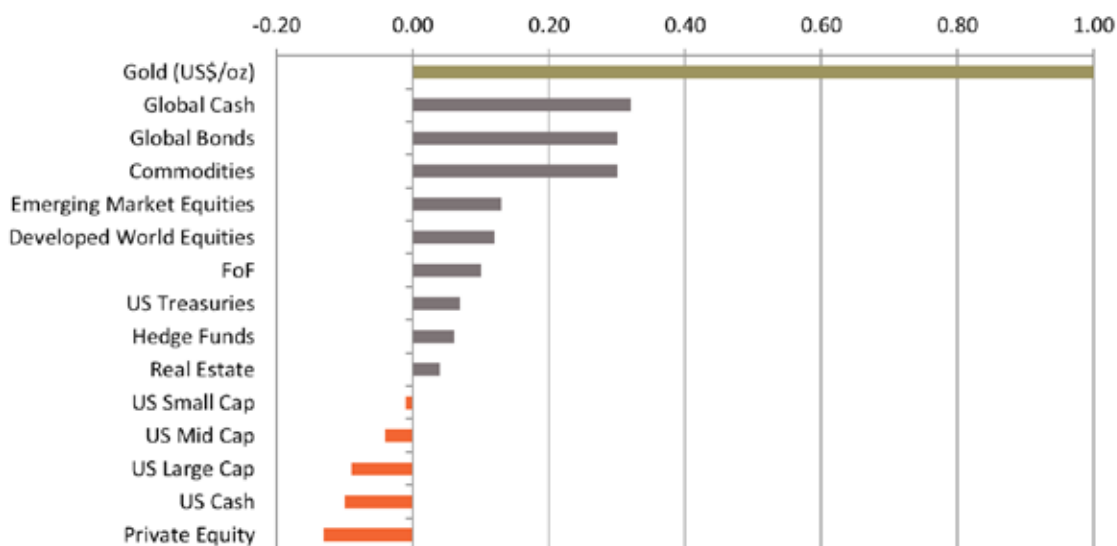
Chart 2 shows the year-on-year performance of five individual asset classes which are widely considered to be relevant to Australian investors, compared with a diversified portfolio containing gold priced in Australian dollars. The red dashed line passes through the returns of a portfolio that consists of 100% Australian equities. The white dashed line passes through the returns of a portfolio that is arbitrarily diversified among property (22.5%), cash (22.5%), fixed interest (22.5%), equities (22.5%), and an allocation of 10% in Australian dollar-denominated gold, illustrating the decreased volatility achieved through diversification.

<sup>1</sup> World Gold Council, Gold Investor: Risk management and capital preservation (2013).

<sup>2</sup> World Gold Council, An investor's guide to the gold market, UK edition (2010).

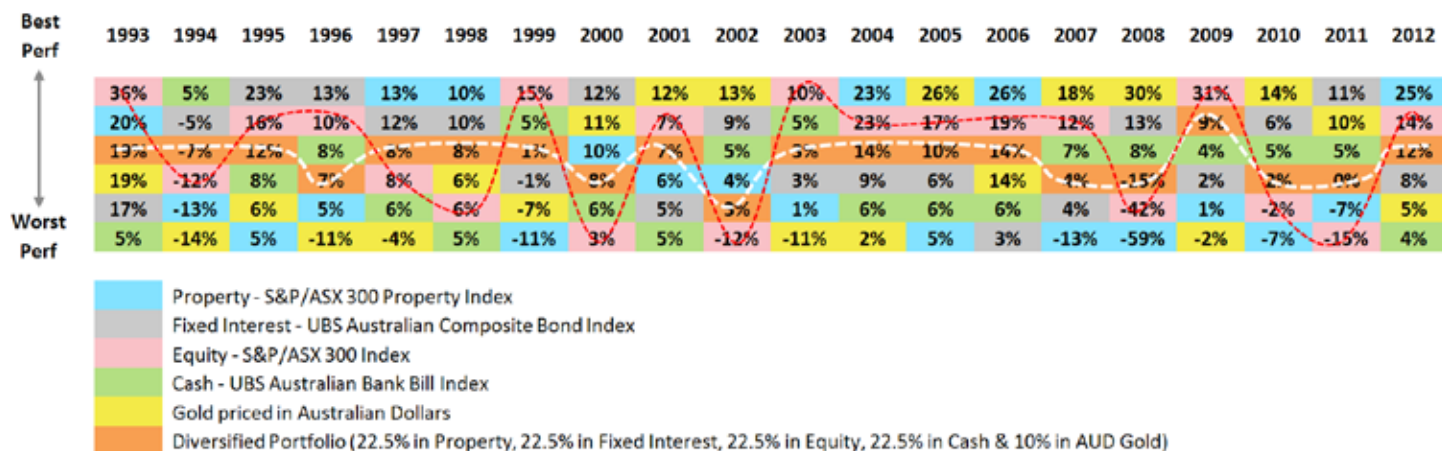
<sup>3</sup> H.M. Markowitz, Portfolio Selection: Efficient Diversification of Investments (1959).

Chart 1: Correlation of gold vs. other asset classes in US dollar terms



Data source: Barclays Capital, Bloomberg, Hedge Fund Research, J.P. Morgan, Thomson Reuters, World Gold Council.

Chart 2: Improved long term average return and lower volatility through diversification



Data source: Thomson Reuters, UBS AG, Investment Solutions

Table 1 shows the returns and volatility of the example portfolio as shown in Chart 2. The diversified portfolio with a 10% AUD gold allocation has an equal return and less volatility than the diversified portfolio with no gold allocation.

Our calculations show that the example portfolio would have achieved a better risk-return with a coefficient of variation<sup>4</sup> of 1.28, compared with 1.45 for a portfolio of 0% AUD gold allocation. In other words, for the same average return, the portfolio would have had less risk as measured by the standard deviations.

Table 2 shows how the diversified portfolios with and without gold would have performed against other traditional asset classes over the same period.

**1.2 Gold provides tail-risk protection** by consistently reducing portfolio losses incurred in extreme circumstances. Gold helps manage risk more effectively by protecting against infrequent or unlikely but consequential negative events, often referred to as “tail risks”.<sup>5</sup>

Short- and medium-term holders can take advantage of the lack of correlation of gold to other assets to achieve better returns during times of turmoil. Long-term holders can manage risk through an allocation to gold, without necessarily sacrificing returns.<sup>6</sup>

Gold returns tend to outperform other assets during periods of economic and financial turmoil, allowing investors to reduce risk when it is most needed.<sup>7</sup> This allows investors to use gold as an asset to hedge risk and reduce losses under extreme market conditions, such as during periods of

fiscal or monetary mismanagement, crises of various kinds, or a fundamental change in their dominant currency.<sup>8</sup>

Ultimately, gold can be used to manage risk more effectively and protect an investor’s capital against potential losses during negative economic conditions<sup>9</sup>. As can be seen in Chart 3, gold consistently outperforms Real Estate and US Stocks in times of economic crisis.

**1.3 Gold is a high quality and liquid asset.** According to the LBMA, 10.9bn ounces of gold worth approximately USD 15,200bn were traded in the first quarter of 2011.<sup>10</sup> This equates to a daily turnover of around USD 240bn and means a higher daily turnover than most liquid equities, German Bunds, UK Gilts, and most of the currency pairs.<sup>11</sup> By comparison, the daily turnover of Apple shares is about USD 5.5bn.<sup>12</sup>

Gold’s liquidity therefore reduces its risk as an investment, as investors can easily translate their gold investment into currency.

Additionally, the lack of credit risk associated with holding allocated gold assists investors in balancing the risks present in their fixed income and equity allocations. Allocated physical gold is one of the very few liquid investment assets that involve neither a liability nor a creditor relationship.

4 The coefficient of variation allows an investor to determine the amount of risk (volatility) assumed in comparison to return. A lower ratio is preferred from a risk-reward perspective.

5 World Gold Council, Gold Investor: Risk management and capital preservation (2013).

6 World Gold Council, Gold: hedging against tail risk (2010).

7 World Gold Council, Gold: alternative investment, foundation asset (2011).

8 World Gold Council, Gold As A Strategic Asset (2006).

9 World Gold Council, Gold: hedging against tail risk (2010).

10 London Bullion Market Association (LBMA), Gold Turnover Survey for 2011 (2011).

11 World Gold Council, Gold Investor: Risk management and capital preservation (2013).

12 Erste Group Research, Goldreport 2012 (2012).

Table 1: Portfolio returns and volatility

December 1993 - December 2012			
	Mean Return	Volatility (Std. Dev.)	Coefficient of Variation
Diversified 10% gold*	6%	7.7%	1.28
Diversified 0% gold**	6%	8.7%	1.45

\*Property (22.5%), Fixed Interest (22.5%), Equity (22.5%), Cash (22.5%), AUD Gold (10%)

\*\*Property (25%), Fixed Interest (25%), Equity (25%), Cash (25%), AUD Gold (0%)

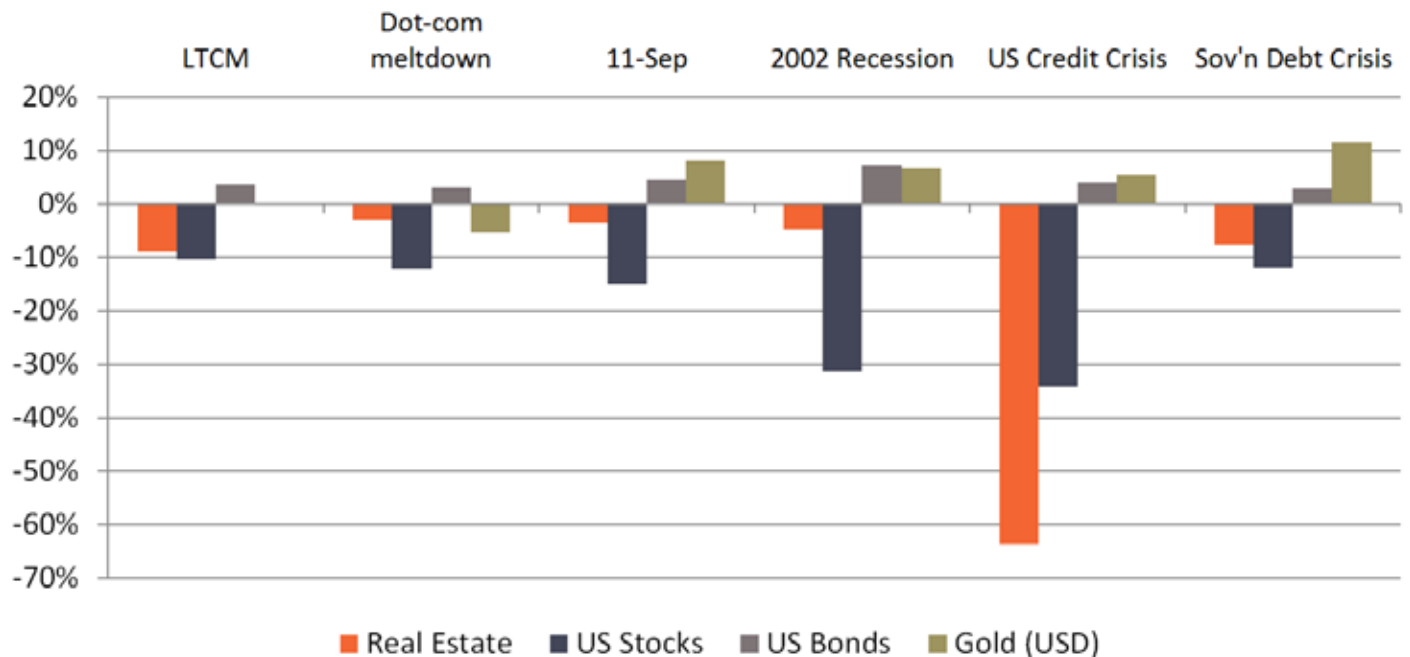
Table 2: Portfolio and asset class returns and volatility

December 1993 - December 2012			
	Mean Return	Volatility (Std. Dev.)	Coefficient of Variation
Cash	6%	1.2%	0.20
Fixed Interest	8%	6.4%	0.80
Diversified 10%*	6%	7.7%	1.28
Diversified 0%**	6%	8.7%	1.45
Gold (AUD)	7%	12.3%	1.76
Equities	7%	17.5%	2.50
Property	2%	18.7%	9.35

\*Property (22.5%), Fixed Interest (22.5%), Equity (22.5%), Cash (22.5%), AUD Gold (10%)

\*\*Property (25%), Fixed Interest (25%), Equity (25%), Cash (25%), AUD Gold (0%)

Chart 3: Return on alternatives during periods of turmoil, in US dollars<sup>13</sup>



Notes: LTCM: Q3 1998, Dot-com meltdown: Q1 2001, September 11: Q3 2001, 2002 Recession: Q2/Q3 2002, US credit crisis: Q4 2008/Q1 2009, European sovereign debt crisis: Q2 2010

Data source: Thomson Reuters, World Gold Council

<sup>13</sup> World Gold Council, Gold: alternative investment, foundation asset (2011).

## 2. Gold as a source of capital preservation

**2.1 Gold hedges against extreme inflation situations** such as deflation and hyperinflation. Independent analysis from Oxford Economics shows, in Table 3, that investors with an average risk profile can benefit from adding a gold allocation of around 5% to their long-term portfolio. Gold's optimal share in an average risk portfolio rises in a scenario with higher inflation and is also seen to rise for low risk investors in a lower growth and lower inflation environment.<sup>14</sup>

The optimal allocation of assets in a multi-asset portfolio depends on the aim of the investor, the nature and duration of their liabilities, and the degree of risk that the investor is prepared to take. Lower risk investors place more emphasis on reducing the riskiness of their overall portfolio and allocate investment to assets such that portfolio returns are less volatile. Consequently, Table 4 illustrates that investors with a lower risk tolerance will be attracted to assets whose returns are negatively correlated with other assets, such as gold, as the diversification decreases portfolio volatility. Higher risk portfolios place more of an emphasis on boosting returns and will allocate investment in line with higher absolute returns at the expense of the lower volatility generated through diversification.<sup>15</sup>

**2.2 Gold protects against currency devaluation.** Gold typically exhibits a negative correlation with the U.S. dollar and against most other developed currencies.<sup>16</sup>

Historically, gold has exhibited a strong inverse relationship to the U.S. dollar. Gold's role as a store of value and its broader monetary characteristics result in it, over the long-term, comparing favourably to all major currencies in terms of its ability to maintain its relative value and purchasing power.<sup>17</sup>

Consequently, gold has been found to serve as effective protection against exchange rate fluctuations during periods of considerable economic turbulence.<sup>18</sup>

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14 Oxford Economics, The impact of inflation and deflation on the case for gold (2011).

15 Oxford Economics, The impact of inflation and deflation on the case for gold (2011).

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16 World Gold Council, Gold Investor: Risk management and capital preservation (2013).

17 World Gold Council, An investor's guide to the gold market (UK Edition) (2010).

18 World Gold Council, Gold as a hedge against the US dollar (2004).

Table 3: Changes in investor optimum weightings in different scenarios:<sup>19</sup>

Effect on optimal asset allocations for investors with an average risk profile*					
Scenario	Cash	Equities	Gilts	Property	Gold
Base case allocation	5%	45%	30%	15%	5%
Higher inflation	unch.	++	--	-	++
Lower inflation and lower growth	unch.	--	++	-	unch.

\* Average investor range covers standard deviations of returns from 10-20, average allocations across this range used.

Key:  
 ++ denotes a significantly higher number  
 - denotes a lower number  
 -- denotes a significantly lower number  
 unch. denotes an unchanged allocation

Table 4: Optimum gold weighting in different scenarios according to the risk tolerance of the investor<sup>20</sup>

Effect on optimal gold allocation			
Scenario	Lower risk*	Average*	Higher risk*
Base case allocation	9	5	0
Higher inflation	++	++	++
Lower inflation and lower growth	+	-	unch.

\* Lower risk investor is defined as having standard deviation of returns at 10, average at 15, and higher risk at 20.

Key:  
 ++ denotes a significantly higher number  
 + denotes a higher number  
 - denotes a lower number  
 unch. denotes an unchanged allocation

<sup>19</sup> Oxford Economics, The impact of inflation and deflation on the case for gold (2011).

<sup>20</sup> Oxford Economics, The impact of inflation and deflation on the case for gold (2011).

### 3. Gold Allocation According to Academic Studies

Perhaps the most studied aspect of the gold market is the role and weighting that gold may have in a diversified investment portfolio.<sup>21</sup>

Eight such studies, outlined in the table below, provide a recommended percentage allocation to gold and the reason for such a recommendation.

Table 5: Numerous academic studies advise an allocation of between 5% and 25%.<sup>22</sup>

Author	Allocation	Reason
<b>Sherman (1982)</b>	<b>5% in an equity portfolio</b>	Lower risk and higher return
<b>Chua (1990)</b>	<b>As high as 25%</b>	Mainly due to the low or negative correlation between gold and equities at the time of the study
<b>Hiller, Draper et al (2006)</b>	<b>A small percentage</b>	A small percentage weighting for a variety of precious metals was suggested, with gold acting as the most efficient diversifier
<b>Bruno and Chincarini (2010)</b>	<b>Allocation of 10%</b>	Considering oil and gold together, suggest such an allocation for non-US domiciled investors seeking portfolio diversification
<b>Klement and Longchamp (2010)</b>	<b>Between 5% and 10%</b>	Allocation to gold in an equity portfolio for high net worth individuals
<b>Scherer (2009)</b>	<b>Between 5% and 10%</b>	For sovereign wealth funds
<b>Oxford Economics (2011)</b>	<b>Around 5% for the average investor</b>	Gold has a zero or negative correlation with other assets and therefore its inclusion in a portfolio reduces overall volatility
<b>World Gold Council (2011)</b>	<b>Between 3.3% and 7.5%</b>	Significantly improves the profile of a portfolio. Gold has proven a constant diversifier, risk management vehicle and store of wealth

### 4. Conclusion

The research that we have conducted when producing this article indicates that:

- Gold provides excellent portfolio diversification** due to its lack of correlation with traditional asset classes. As changes in the gold price are not significantly correlated with changes in the price of other mainstream asset classes, gold brings considerable diversification benefits to an investor's portfolio.
- Gold provides tail-risk protection** by consistently reducing portfolio losses incurred in extreme circumstances. Gold helps manage risk more effectively by protecting against infrequent or unlikely but consequential negative events, often referred to as "tail risks".<sup>23</sup>

- Gold is a high quality and liquid asset.** Physical gold is one of the very few liquid assets which involve neither a liability nor a creditor relationship.
- Gold hedges against extreme inflation situations** such as deflation and hyperinflation.
- Gold protects against currency devaluation.** Gold typically exhibits a negative correlation with the U.S. dollar, as well as other currencies.
- Numerous academic studies advise an allocation of between 5% and 25%.**<sup>24</sup>

<sup>21</sup> Brian M. Lucey, What do Academics Think They Know About Gold? (2011).

<sup>23</sup> World Gold Council, Gold Investor: Risk management and capital preservation (2013).

<sup>22</sup> Erste Group Research, Goldreport 2012 (2012).

<sup>24</sup> Erste Group Research, Goldreport 2012 (2012).

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