Portfolio Insight

The Role of Gold in a Portfolio

September 2023

WisdomTree.eu
+44 (0) 207 448 4330

Introduction

In 2022, the 60/40 equity-bond portfolio suffered one of its worst years in history, with both assets posting large losses. Gold, on the other hand, was resilient against the historic bond sell-off. Gold behaves differently to other assets and, thus, adds significant diversification to a strategic asset allocation. This is why, at WisdomTree, we believe that gold should be considered an essential component of a portfolio.

In this Portfolio Insight we:

1. Explore the main traits of gold that make it suitable for a strategic allocation and portfolio diversification.
2. Present a framework to answer, 'what is the optimal weight an investor should allocate to gold in a portfolio'?

The 5 key takeaways are:

1. Portfolio diversification is best achieved by mixing assets that behave differently to one another.
2. Gold is unique and behaves very differently to equities and bonds and, therefore, has a low correlation with these assets.
3. Gold is a defensive asset, providing a hedge against economic and financial downturns. Gold also performs well in times of high inflation.
4. As inflation is often a by-product of an over-heating economy, gold often does well in times of economic growth as well.
5. Our bootstrapping method for illustrating optimal gold allocations indicates relatively large optimal gold holdings. For example, for investment periods of 10 years, the optimal weight to allocate to gold to maximise the risk-adjusted return would have been 16% - 19%.

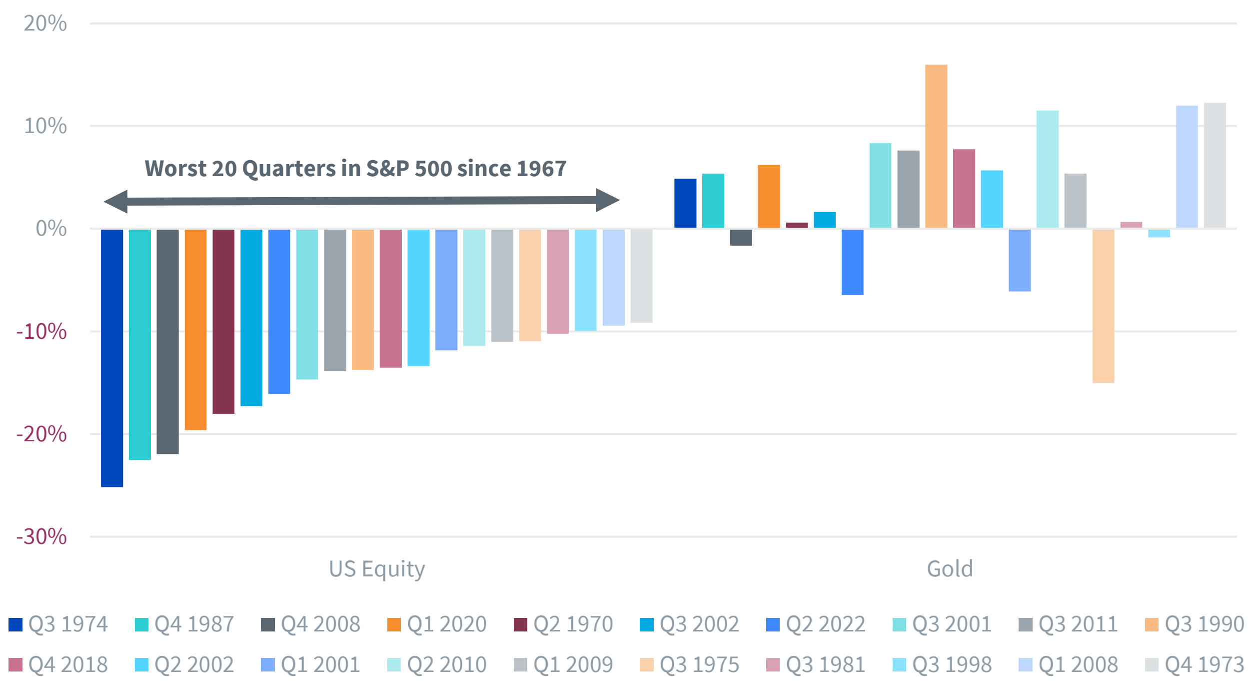
Part 1: 5 key gold traits

1. Gold has strong defensive traits

Gold prices tend to rise in financial crises, economic downturns, and geopolitical shocks. Equities are quite the opposite: they tend to falter in financial crises, early phases of economic downturns, and are sometimes vulnerable to geopolitical shocks.

Gold has, historically, performed well during equity market crises. Gold has returned positive performance in 15 out of the 20 worst quarters of performance for the S&P 500. Of the remaining five quarters, gold has outperformed the S&P in four quarters. The only quarter when gold fell harder than equities (Q3 1975) came a year after abnormally large gains in gold prices; in 1974 gold prices rose 72% and then corrected downward 24% in 1975.

Figure 1: Gold performance during the 20 worst quarters for US equity markets



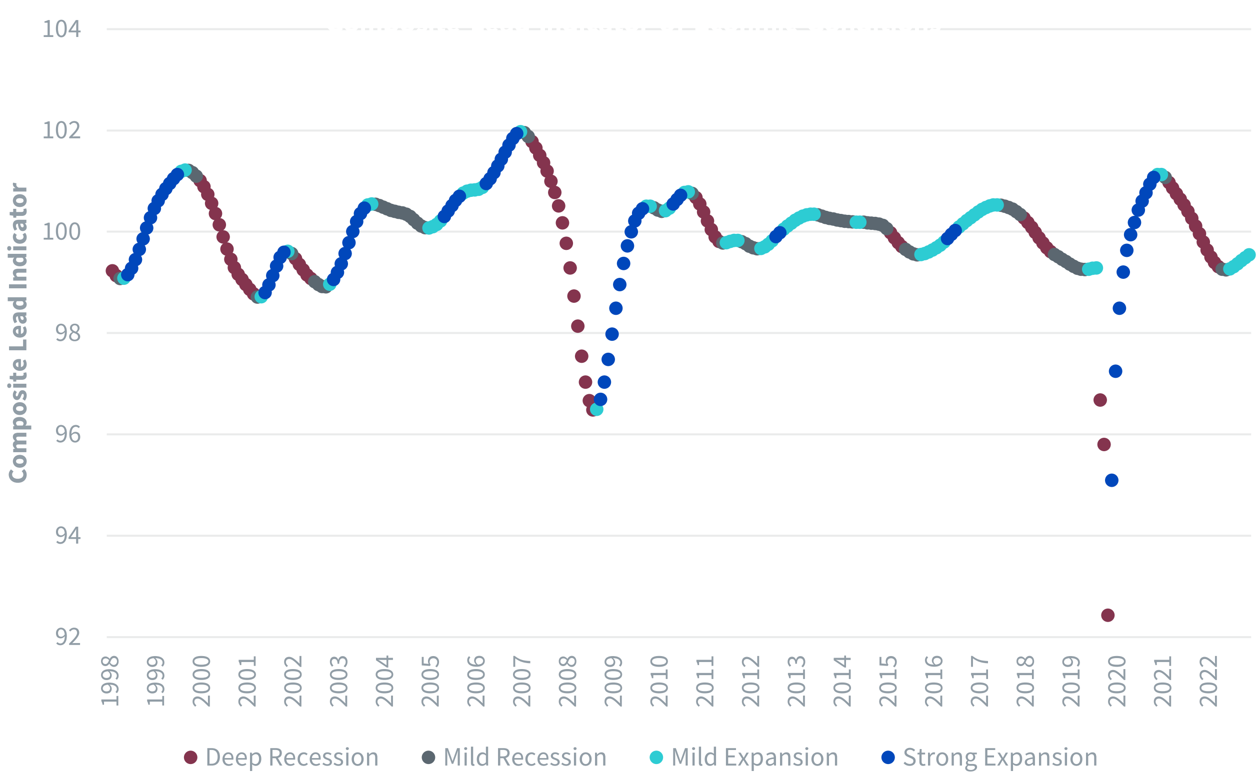
Source: WisdomTree, Bloomberg. From December 1967 to 30 June 2023 using quarterly data. Asset descriptions at the end of this report. **Historical performance is not an indication of future performance and any investments may go down in value.**

2. Gold performs well in deep recessions and strong expansions

Gold performs well in times of inflation. Given that inflation is often elevated in times of strong economic growth, gold is not just a defensive asset. In fact, no other asset behaves like gold: the metal performs strongly in both economic downturns and upturns. This uniqueness in behaviour once again makes it a prime candidate for diversification.

As a point of illustration, we look at the performance of assets at different points in the economic cycle. Composite leading indicators (CLIs), provide signals of turning points in the economic cycle[1]. Figure 2 shows various phases of the economic cycle derived from CLIs.

Figure 2: Composite Leading Indicator of Economic Conditions

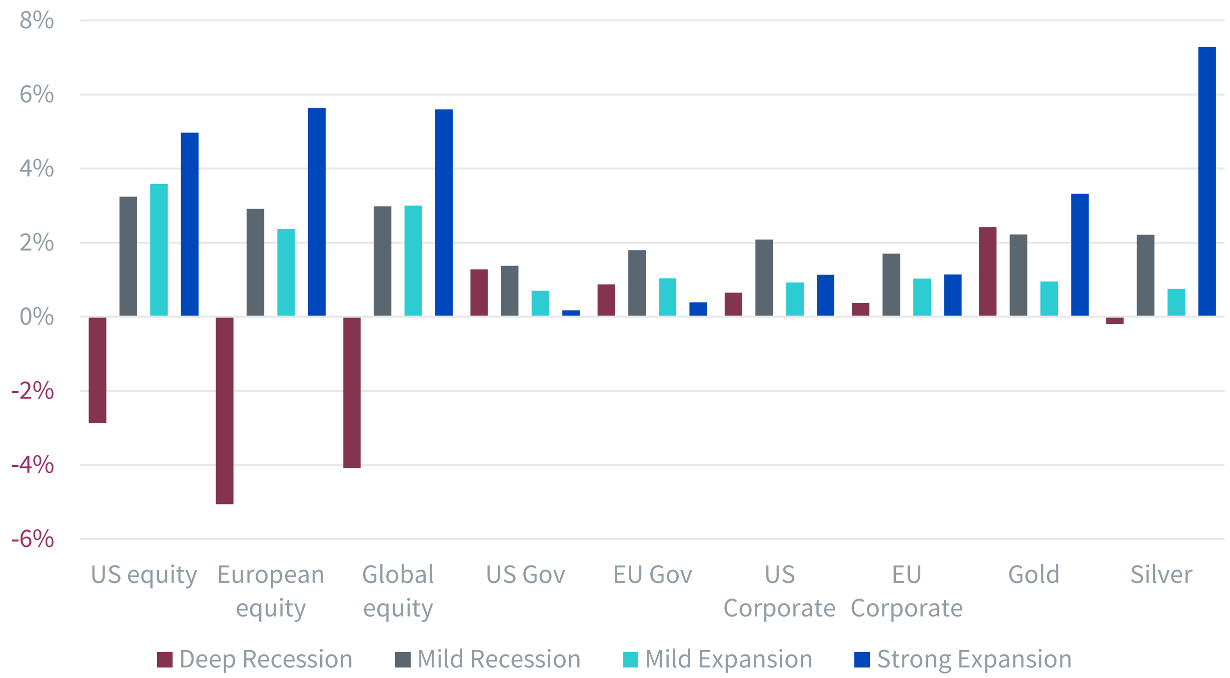


Source: WisdomTree, OECD, Bloomberg. OECD calculates the index so that the long-term average is 100. The index is designed to correlate and provide timely leads on economic output gaps (economic performance relative to potential). Deep recession equates to the lowest quartile of data. Strong expansion relates to highest quartile of data. June 1989 to June 2023. **Historical performance is not an indication of future performance and any investments may go down in value**.

Using the CLI indicators from Figure 2, we look at the performance of assets in Figure 3. Gold performs better than any other asset in deep recessions. It also strongly outperforms defensive assets in times of economic expansion. It even outperforms bonds (government and corporate) in times of mild recession. Moreover, the pattern of its behaviour is markedly different to other assets; gold performs the best at the extremes. This diversity in behaviour makes it an ideal candidate to add variety to a portfolio.

1. Or, more precisely, fluctuation of economic activity around its long-term potential level.

Figure 3: Asset performance in different phases of economic cycle, with gold and silver

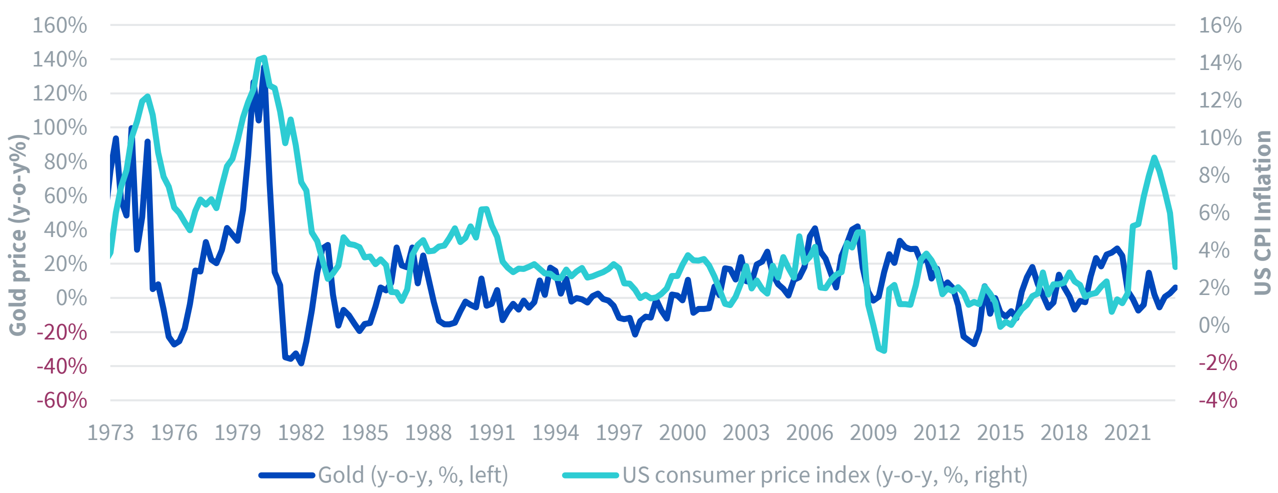


Source: WisdomTree, Bloomberg, Organisation for Economic Cooperation and Development. Period June 1989 to June 2023. Asset descriptions at the end of this report. **Historical performance is not an indication of future performance and any investments may go down in value.**

3. Inflation hedge

Gold is a great hedge for inflation. Figure 4 highlights that commodity prices tend to move in the same direction as the Consumer Price Index (CPI) consumption basket used for inflation calculations. And they can move by significantly larger margins. For example, in the 1970s when US inflation was rising in the 10s of percentage points, gold prices were moving in the 100s of percentage points.

Figure 4: Gold price vs US inflation



Source: WisdomTree, Bloomberg. From Q1 1972 to Q2 2023. Calculations are based on year-on-year returns in USD based on quarterly data. Asset descriptions are provided at the end of this report. **Historical performance is not an indication of future performance and any investments may go down in value.**

4. Gold has a low correlation with traditional assets

As shown in Figure 5, gold has a low correlation with stocks and bonds. While gold is technically a commodity, it behaves very differently to most cyclical commodities. The drivers of gold price (such as inflation, bond yields, exchange rates and market sentiment) make the metal appear more like a currency than a regular commodity. Even though gold futures are part of a broad commodity allocation, they have a relatively low correlation with the rest of the commodity complex (0.37) and so they can also be considered as a separate line item for further diversification.

Figure 5: Correlation matrix

	US equity	Global equity	European equity	Global HY	US Corporate	EU Corporate	EU Gov	US Gov	Broad Commodities	Gold
US equity	1.00	0.97	0.82	0.69	0.33	0.37	0.03	-0.18	0.39	0.02
Global equity	0.97	1.00	0.90	0.74	0.39	0.40	0.02	-0.17	0.47	0.09
European equity	0.82	0.90	1.00	0.67	0.34	0.34	0.00	-0.14	0.42	0.08
Global HY	0.69	0.74	0.67	1.00	0.63	0.60	0.13	-0.03	0.44	0.19
US Corporate	0.33	0.39	0.34	0.63	1.00	0.80	0.60	0.64	0.21	0.30
EU Corporate	0.37	0.40	0.34	0.60	0.80	1.00	0.73	0.39	0.19	0.15
EU Gov	0.03	0.02	0.00	0.13	0.60	0.73	1.00	0.68	-0.12	0.13
US Gov	-0.18	-0.17	-0.14	-0.03	0.64	0.39	0.68	1.00	-0.12	0.28
Broad Commodities	0.39	0.47	0.42	0.44	0.21	0.19	-0.12	-0.12	1.00	0.37
Gold	0.02	0.09	0.08	0.19	0.30	0.15	0.13	0.28	0.37	1.00

Source: WisdomTree, Bloomberg. Dates: from January 1990 to June 2023. European equity and Global HY start from January 1999, EU Corporate and EU Gov start from June 1998. Asset descriptions at the end of this report.
Historical performance is not an indication of future performance and any investments may go down in value.

5. Geopolitical hedge

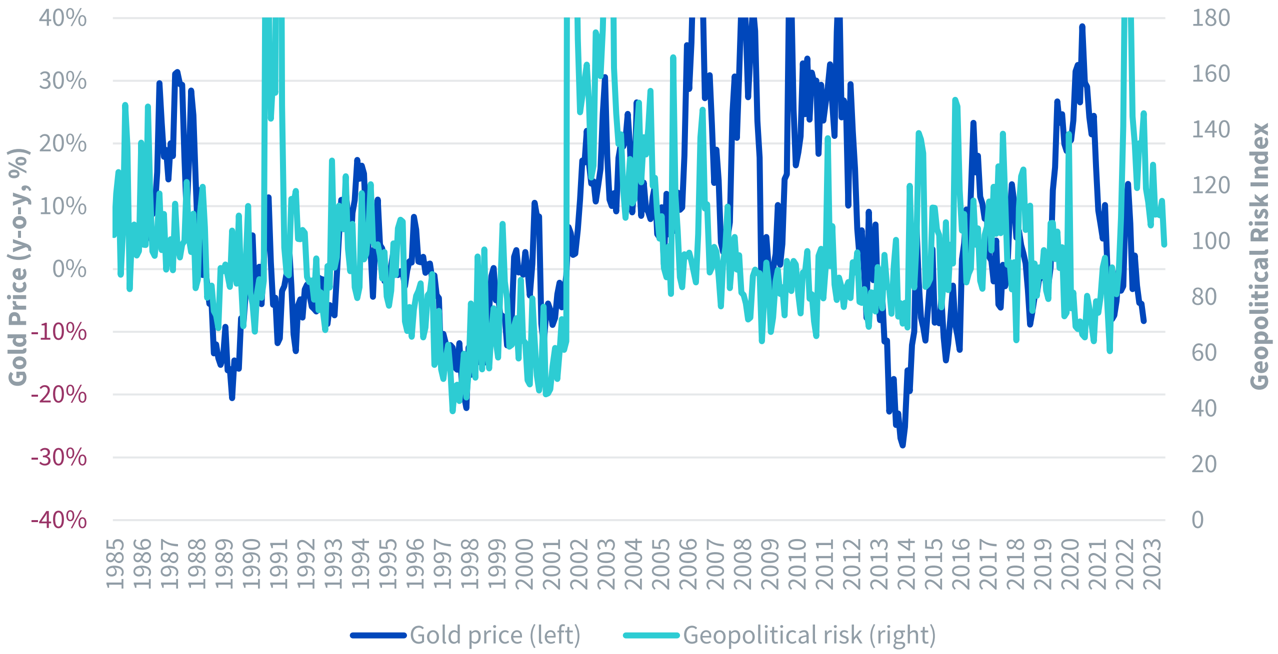
Geopolitical tensions can threaten the economic status quo. Wars often need to be debt funded. Gold, as the antithesis to fiat currencies (which are often debased through excessive sovereign debts) and as a defensive asset, often does well in times of geopolitical stress.

The Ukraine war, for example, that started on 25 February 2022, triggered a 4% rally in gold prices within one month of the event[2].

Figure 6 illustrates that gold prices often rise in times of heightened geopolitical risk. The relationship is clearly not perfect: gold rises for many other reasons than geopolitical risk, but it is clear that when geopolitical risk spikes, there is usually a positive (albeit short-lived) response from gold.

2. Source: Bloomberg.

Figure 6: Gold and geopolitical risks



Source: Dario Caldara and Matteo Iacoviello's Geopolitical Risk Index based on a tally of newspaper articles covering geopolitical (war) tensions, Bloomberg, WisdomTree. Asset descriptions at the end of this report. **Historical performance is not an indication of future performance and any investments may go down in value.**

Part 2: Identifying optimal gold weights

As we demonstrated in Figure 5 of The investment case for gold, adding gold to a portfolio can improve Sharpe ratios and reduce drawdowns. We also posited that ideal gold weights would be 12% when optimising on Sharpe ratios and 27% when minimising worst 12-month performance.

In this section, we present an alternative framework to answer the same question: what is the optimal weight an investor should allocate to a gold portfolio? We arrive at a similarly large gold allocation using this alternative approach.

What is bootstrapping? It is a Monte Carlo simulation approach that uses existing historical data instead of generating random data. It is a technique that uses random sampling from historical returns series with replacement. It is similar to a Monte Carlo simulation, but the main difference lies in how the different series of returns used in the calculations are generated: Monte Carlo generates random data series for a specific probability distribution given its generic moments (average returns, volatility…), while the bootstrap creates random data series by resampling with replacement from the historical series of returns. In other words, bootstrapping creates new series of returns by reordering existing historical series. This makes the bootstrap samples inherit the same distribution as the original data, allowing estimation of the sampling distribution of various statistics.

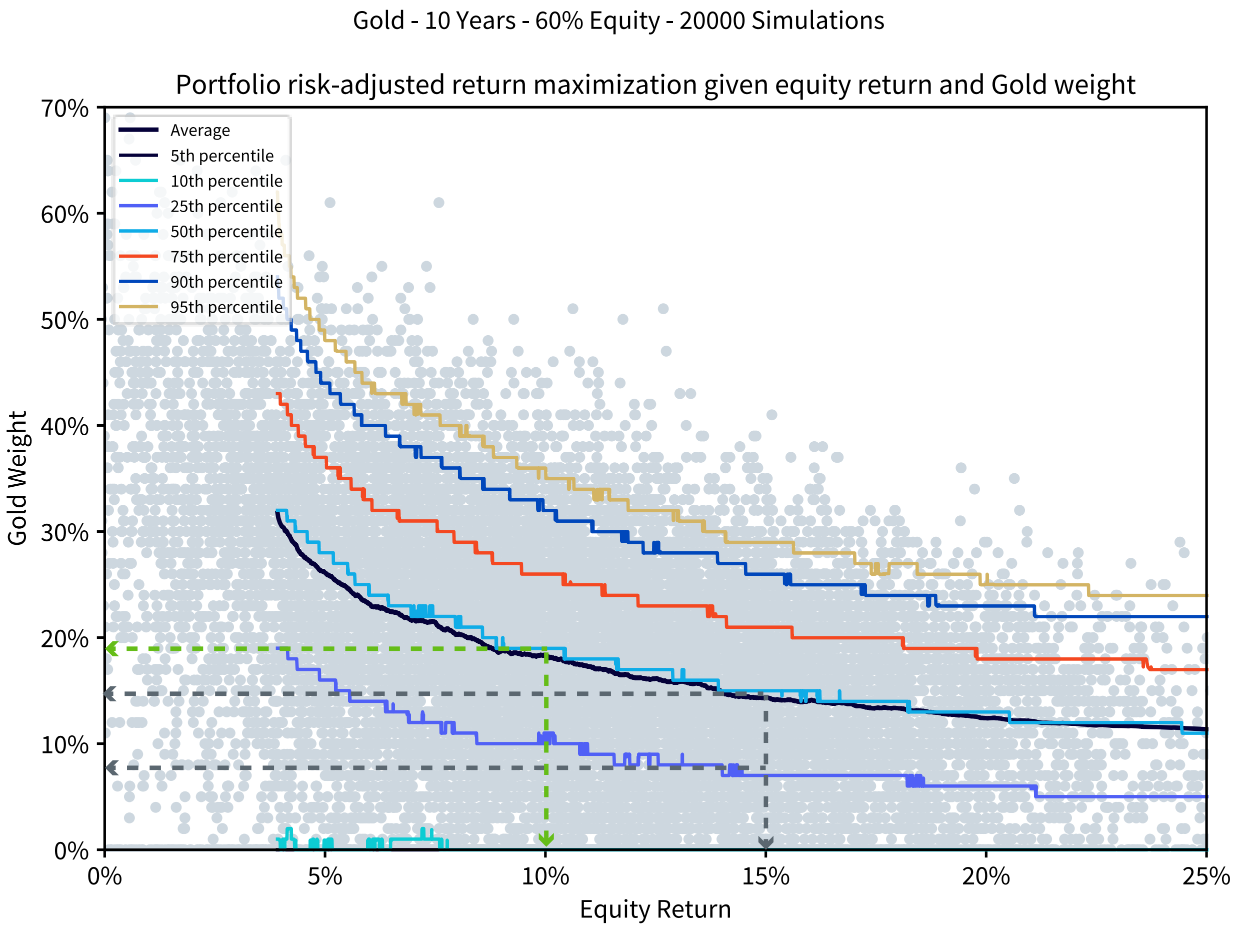
The procedure is as follows: we randomly select 120 months (equivalent to 10 years of data) with replacement from the monthly return time series for equity, bonds, and gold[3]. This simulation represents an investor's hypothetical situation, considering 10 years of investment within the past 50 years. We repeat this process 20,000 times.

For each hypothetical realisation, we obtain three time series: one each for gold, equity, and bonds. We maintain a fixed proportion between equity and bonds, following the well-known 60/40 split. Subsequently, we calculate the optimal weight an investor should assign to gold to maximise the risk-adjusted return[4] of their portfolio in that specific hypothetical investment. These optimal weightings are represented as grey dots in Figure 7.

3. The bond time series is the Bloomberg US Treasury Total Return Index (LUATTRUU Index), the equity time series is the S&P 500 Total Return (SPX Index), and the gold time series is the London Bullion Market Association (LBMA) Gold Price (GOLDLNPM Index).

4. We define 'risk-adjusted return' as the ratio between the annualised performance and the annualised volatility over a defined period.

Figure 7: Risk-adjusted return maximisation with bootstrapping



Source: WisdomTree, Bloomberg, S&P. From January 1973 to June 2023. Calculations are based on monthly returns in USD. Asset descriptions at the end of this report. Each grey point represents the equity return and the gold allocation for which every realisation is maximised. The coloured lines represent various rolling percentiles, where the rolling window is made of 2000 simulations, that is, 10% of the total simulations. **Historical performance is not an indication of future performance and any investments may go down in value.**

Each dot corresponds to a draw from our returns distribution, with the dots' y-axis representing the commodities weight that maximised the risk-adjusted return for that particular realisation and the x-axis denoting the performance of the equities for that realisation, providing insight into the relative luck or unluckiness of selecting those 10 years from the available 50.

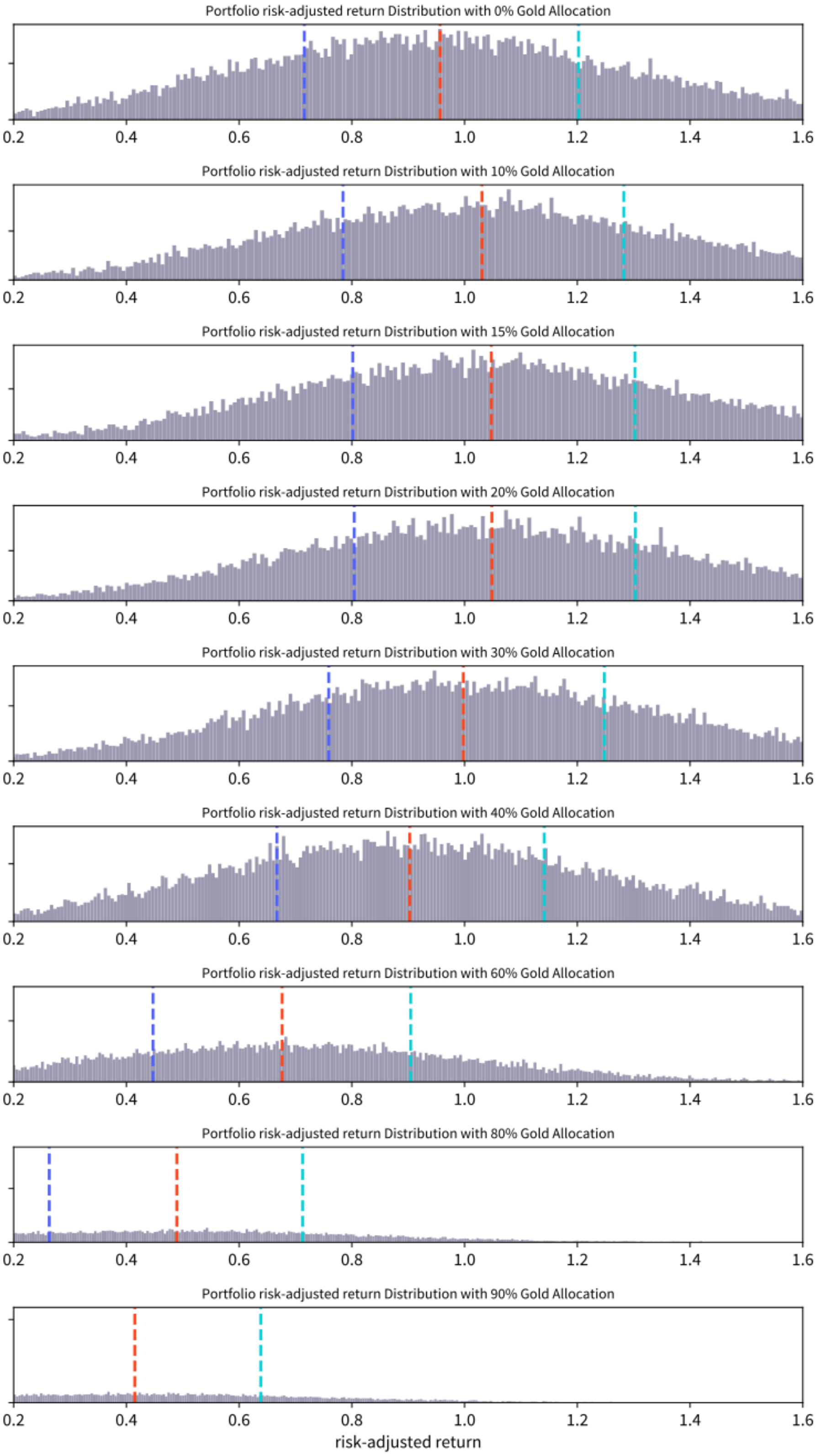
The coloured lines on the graph represent percentiles. Let's focus on the light blue line, which represents the 50th percentile (the median). For approximately a 10% equity return (or, more precisely, for realisations with an annualised equity performance of around 10%), half of the time an investor would have maximised their risk-adjusted return by allocating over 19% of their portfolio to gold, while the other half of the time they would have maximised it with a lower gold weight (see the dashed green arrows).

If the investor had been luckier and drawn a realisation corresponding to around 15% annualised equity performance, the median exposure needed to maximise the risk-adjusted return would have been lower, approximately 15% (see the dashed blue arrows). However, even in this fortunate scenario, the investor would still require a gold allocation of more than 7% to have a relatively high probability (roughly 75%, as indicated by the bottom dashed blue horizontal arrow crossing the iris line, which represents the 25th percentile) of maximising their risk-adjusted return.

In summary, the graph conveys the following message: as equity returns decrease, the likelihood that the portfolio with the best risk-adjusted return includes more gold increases. On the other hand, for higher equity returns, an investor would have likely achieved the maximum risk-adjusted return with a lower gold weight, although some allocation to gold would still be beneficial.

The challenge, of course, lies in the fact that investors typically have little insight into future equity returns over the next 10 years. As a result, it is often easier to approach the question from a slightly different perspective: given a certain allocation to gold, how would my portfolio have performed? Figure 8 aims to address this question.

Figure 8: Risk-adjusted return distribution given gold allocation



Source: WisdomTree, Bloomberg, S&P. From January 1973 to June 2023. Calculations are based on monthly returns in USD. Each histogram represents the risk-adjusted return distribution for a given gold allocation. The iris, orange and light blue lines represent the 25th, 50th (median) and 75th percentile respectively. **Historical performance is not an indication of future performance and any investments may go down in value.**

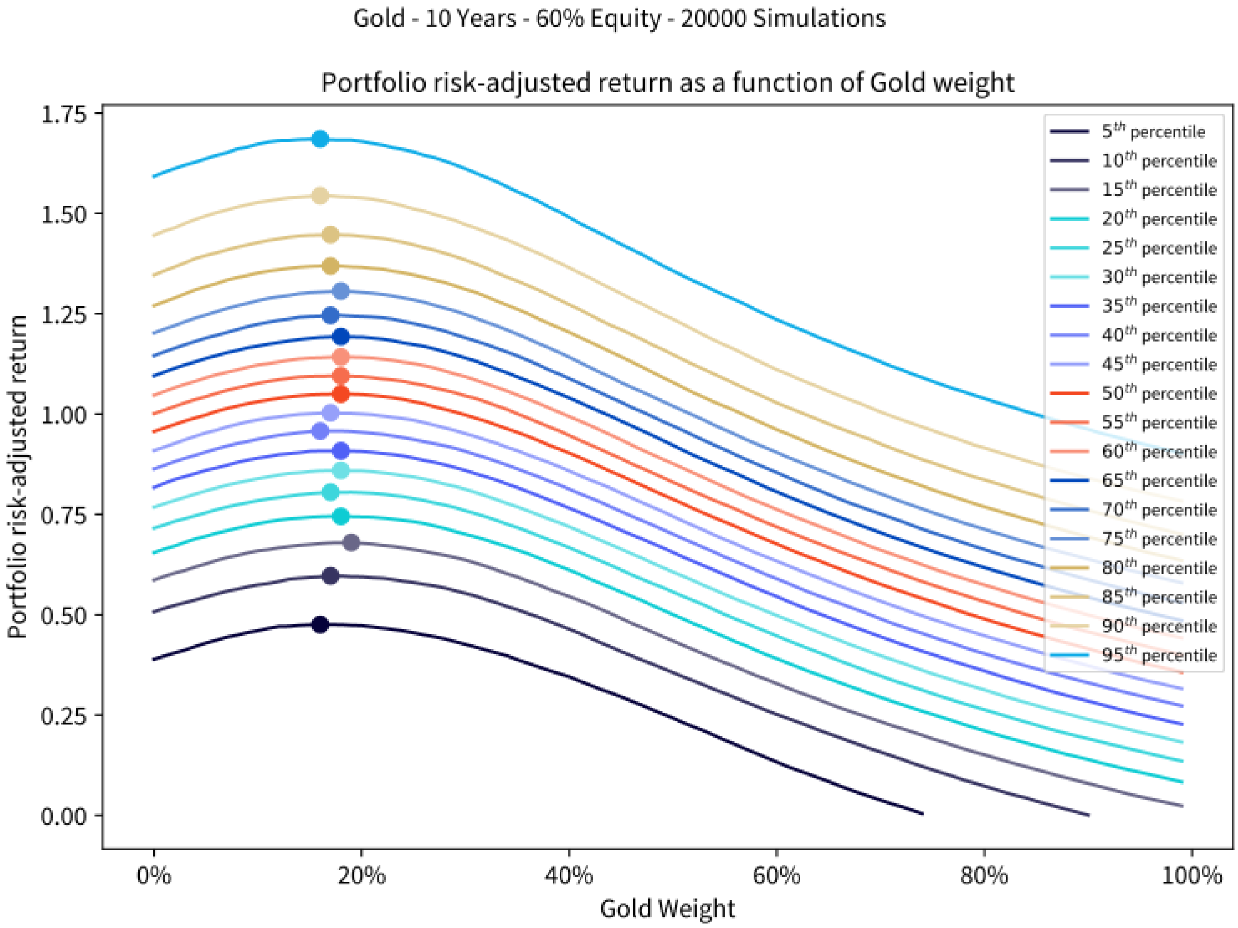
Starting from the top with a 0% gold allocation, the 25th percentile would have yielded a risk-adjusted return of approximately 0.7 (indicated by the iris dashed line). To clarify, sorting all the 20,000 simulated risk-adjusted returns obtained when investing in a 60/40 portfolio (with no gold) and selecting the 5000th worst (25% of 20,000) would result in a risk-adjusted return of 0.7.

Now, let's explore what happens when gradually increasing the allocation in gold. The 5000th worst risk-adjusted return would improve, reaching a peak at around an 20% gold allocation (with a risk-adjusted return reading of ~0.80). Beyond that point, the risk-adjusted return 25th percentile starts to diminish.

The previous example focused on the 5000th worst risk-adjusted return, but it's interesting to observe what happens when choosing different percentiles. For instance, considering the median (50th percentile, represented by the orange dashed line) or the 75th percentile (light blue dashed line) leads to similar behaviour as observed with the 25th percentile. Increasing the gold allocation enhances the risk-adjusted return for the chosen percentile up to a certain point.

Summarising these findings in a single chart, we arrive at Figure 9, which illustrates how all these percentiles behave as we increase the allocation to gold. Notably, for every percentile, the risk-adjusted return is maximised at approximately the same gold allocation, which falls between 16% and 19%.

Figure 9: Risk-adjusted return maximisation with bootstrapping

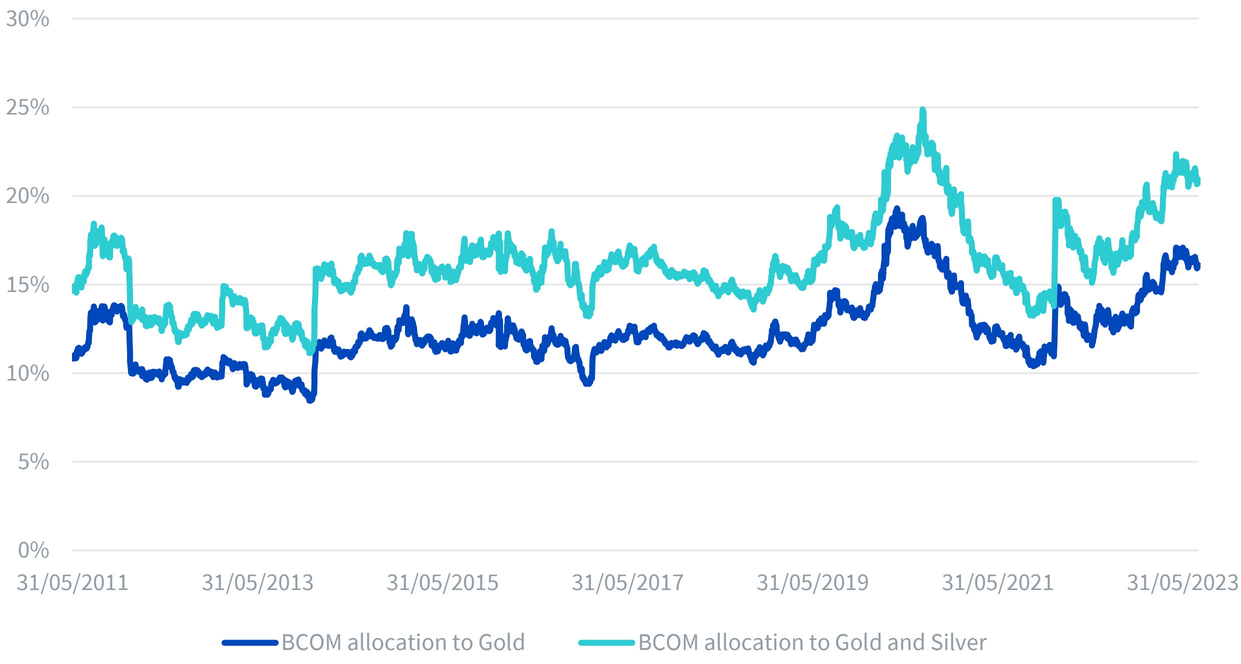


Source: WisdomTree, Bloomberg, S&P. From January 1973 to June 2023. Calculations are based on monthly returns in USD. Asset descriptions are provided at the end of this report. Each line depicts the Sharpe Ratio percentile as the Commodity weight varies. The dots on each line represent its maximum. **Historical performance is not an indication of future performance and any investments may go down in value.**

Overall, through this bootstrapping analysis and using data for the last 60 years, we observe that, for investment periods of 10 years, the optimal weight to allocate to gold in order to maximise the risk-adjusted return would have been between 16% to 19%.

These conclusions are numerically similar to the ones we reached for broad commodities. Such similarity is not unexpected. Firstly, broad commodities encompass a significant portion of gold, historically fluctuating between 8% and 19% of the portfolio (Figure 10). This percentage increases to 11% to 25% if we include silver, which shares some of the safe-haven characteristics of gold. Additionally, the resemblance in results can be attributed to the inflation-hedging properties of both gold and commodities. Gold's limited supply throughout history has established its reputation as a hedge against inflation, while commodities, as a primary input in many goods and services, play a crucial role in the inflationary process.

Figure 10: Broad commodity (BCOM) allocation to gold and silver



Source: WisdomTree, Bloomberg. Dates: from 31/05/2011 to 01/08/2023. Asset descriptions at the end of this report. **Historical performance is not an indication of future performance and any investments may go down in value.**

However, it is worth delving into the differences between the outcomes of the two analyses. An exaggerated allocation to gold causes the risk-adjusted return to decrease faster than a similarly large allocation to broad commodities. This behaviour is a consequence of gold's 'safe haven' attributes. Acting as an insurance, gold preserves its value during times of economic uncertainty or market downturns. Nevertheless, during periods of economic expansion, it tends to lag other assets.

Furthermore, analysing the maximum points reached in each percentile (Figure 9) and moving from the worst to the best percentile (that is, from the bottom to the top in the chart), we observe a subtle decrease in the optimal allocation to gold and a slight increase in the optimal allocation to broad commodities. Once again, this can be attributed to gold being less essential during periods of economic expansion. In contrast, commodities tend to perform well during market rallies, supporting the need for a slightly higher allocation in such scenarios.

Part 3: Implementation solutions

WisdomTree is a leading provider of physically-backed gold exchange-traded commodities (ETCs). Since creating Europe's first physical gold ETC almost two decades ago, we have continued to build our suite of gold products, offering clients best in-class features and price competitive solutions.

WisdomTree Core Physical Gold (WGLD), for example, was launched in December 2020 with the highest responsible gold standards applied with custodians asked to act on a best-efforts basis to only allocate 2019 or later London Bullion Market Association (LBMA) gold bars and has a management fee of only 12 basis points.

Today, WisdomTree offers a comprehensive range of physical gold ETCs that cater for different investor objectives and preferences.

	WisdomTree Core Physical Gold	WisdomTree Physical Swiss Gold	WisdomTree Physical Gold – GBP Daily Hedged	WisdomTree Physical Gold – EUR Daily Hedged
ISIN	JE00BN2CJ301	JE00B588CD74	JE00B7VG2M16	JE00B8DFY052
Exposure	Physically backed – spot gold	Physically backed – spot gold	Physically backed – spot gold GBP hedged	Physically backed – spot gold EUR hedged
Vault Location	London, United Kingdom	Zurich, Switzerland	London, United Kingdom	London, United Kingdom
Custodian	HSBC Bank plc	JP Morgan Chase Bank N.A.	JP Morgan Chase Bank N.A.	JP Morgan Chase Bank N.A.
Base Currency	USD	USD	GBP	EUR
Currency hedged	No	No	Yes – Daily	Yes – Daily
Management fee	0.12% p.a.	0.15% p.a.	0.15% p.a.	0.15% p.a.
Responsible gold	Yes	Yes	Yes	Yes
Physical delivery option	Yes	Yes	No	No
Product Page	WisdomTree Core Physical Gold	WisdomTree Physical Swiss Gold	WisdomTree Physical Gold – GBP Daily Hedged	WisdomTree Physical Gold – EUR Daily Hedged

Full details on our range of physical gold ETCs can be found here.

In addition to physical gold, we also offer products with synthetic and short and leveraged exposure to the price of gold, as well as other precious metals. View the full range.

Asset descriptions

Asset	Index	Bloomberg code
US equity	S&P 500 Total Return Index	SPXT Index
European equity	EURO STOXX 50 Net Return EUR	SX5T Index
Global equity	MSCI World Net Total Return USD Index	NDDUWI Index
US Corporate	Bloomberg U.S. Corporate Investment Grade	LUACTRUU Index
EU Corporate	Bloomberg Euro-Aggregate: Corporates	LECPTRUH Index
US Gov	Bloomberg US Government Bond	LUAGTRUU Index
EU Gov	Bloomberg Euro Government	H02001US Index
Global HY	Bloomberg Global High Yield	LG30TRUH Index
Broad Commodities	Bloomberg Commodity Total Return	BCOMTR Index
Gold	LBMA Gold Price PM USD	GOLDLNPM Index
Silver	LBMA Silver Price PM USD	SLVRLND Index

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