

The relevance of gold as a strategic asset

2019 edition



About the World Gold Council

The World Gold Council is the market development organisation for the gold industry. Our purpose is to stimulate and sustain demand for gold, provide industry leadership, and be the global authority on the gold market.

We develop gold-backed solutions, services and products, based on authoritative market insight, and we work with a range of partners to put our ideas into action. As a result, we create structural shifts in demand for gold across key market sectors. We provide insights into the international gold markets, helping people to understand the wealth preservation qualities of gold and its role in meeting the social and environmental needs of society.

Based in the UK, with operations in India, the Far East and the US, the World Gold Council is an association whose members comprise the world's leading gold mining companies.

For more information

Please contact:

Adam Perlaky

adam.perlaky@gold.org
+1 212 317 3824

Juan Carlos Artigas

Director, Investment Research
juancarlos.artigas@gold.org
+1 212 317 3826

Alistair Hewitt

Director, Market Intelligence
alistair.hewitt@gold.org
+44 20 7826 4741

John Reade

Chief Market Strategist
john.ream@gold.org
+44 20 7826 4760

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The relevance of gold as a strategic asset

Gold is a highly liquid yet scarce asset, and it is no one's liability. It is bought as a luxury good as much as an investment. As such, gold can play four fundamental roles in a portfolio:

- a source of long-term returns
- a diversifier that can mitigate losses in times of market stress
- a liquid asset with no credit risk that has outperformed fiat currencies
- a means to enhance overall portfolio performance.

Our analysis shows that adding 2%, 5% or 10% in gold over the past decade to the average pension fund portfolio would have resulted in higher risk-adjusted returns.

Why gold, why now

Gold is becoming more mainstream. Since 2001, investment demand for gold worldwide has grown, on average, 15% per year. This has been driven in part by the advent of new ways to access the market, such as physical gold-backed exchange-traded funds (ETFs), but also by the expansion of the middle class in Asia and a renewed focus on effective risk management following the 2008–2009 financial crisis in the US and Europe.

Today, gold is more relevant than ever for institutional investors. While central banks in developed markets are moving to normalise monetary policies – leading to higher interest rates – we believe that investors may still feel the effects of quantitative easing and the prolonged period of low interest rates for years to come.

These policies may have fundamentally altered what it means to manage portfolio risk and could extend the time needed to meet investment objectives.

In response, institutional investors have embraced alternatives to traditional assets such as stocks and bonds. The share of non-traditional assets among global pension funds has increased from 15% in 2007 to 25% in 2017. And in the US this figure is close to 30%.¹

Many investors are drawn to gold's role as a diversifier – due to its low correlation to most mainstream assets – and as a hedge against systemic risk and strong stock market pullbacks. Some use it as a store of wealth and as an inflation and currency hedge.

As a strategic asset, gold has historically improved the risk-adjusted returns of portfolios, delivering returns while reducing losses and providing liquidity to meet liabilities in times of market stress.

¹ Willis Towers Watson, *Global Pension Assets Study 2018*, February 2018 and *Global Alternatives Survey 2017*, July 2017.

A source of returns

Gold is not only useful in periods of higher uncertainty. Its price has increased by an average of 10% per year since 1971 when gold began to be freely traded following the collapse of Bretton Woods. And gold's long-term returns have been comparable to stocks and higher than bonds or commodities (**Chart 1**).²

There is a good reason behind gold's price performance: it trades in a large and liquid market, yet it is scarce.

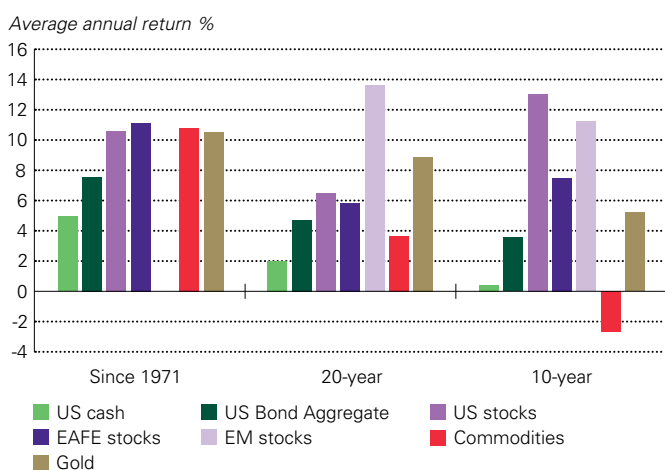
Mine production has increased by an average of 1.4% per year for the past 20 years. At the same time consumers, investors and central banks have all contributed to higher demand.³

On the consumer side, the combined share of global gold demand from India and China grew from 25% in the early 1990s to more than 50% in recent years.⁴

Our research shows that expansion of wealth is one of the most important drivers of gold demand over the long run. It has had a positive effect on jewellery, technology, and bar and coin demand – the latter in the form of long-term savings.⁵

Chart 1: Gold has delivered positive returns over the long run, outperforming key asset classes

Average annual return of key global assets in US dollars*



*As of 31 December 2018. Computations in US dollars of total return indices for ICE 3-month Treasury, Bloomberg Barclays US Bond Aggregate, MSCI US, EAFE and EM indices, Bloomberg Commodity Index and spot for LBMA Gold Price PM. For compounded annual growth rates see Appendix II.

Source: Bloomberg; ICE Benchmark Administration; World Gold Council

2 For other return metrics and y-o-y performance see Appendix II.

3 See Appendix I as well as the demand and supply section of Goldhub.com

4 Ibid.

5 Ibid.

6 As of 31 December 2018. For more information visit Goldhub.com

7 Oxford Economics, *The impact of inflation and deflation on the case for gold*, July 2011.

Additionally, investors have embraced gold-backed ETFs and similar products to get exposure to gold. Gold-backed ETFs have amassed more than 2,400 tonnes (t) of gold worth US\$100 billion (bn) since they were first launched in 2003.⁶

And since 2010 central banks have been net buyers of gold in order to expand their foreign reserves as a means of diversification and safety.

Well above inflation

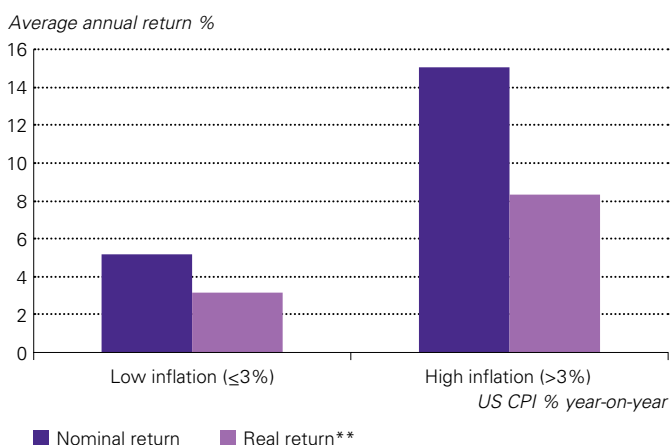
During the Gold Standard, and subsequently the Bretton Woods system, when the US dollar was backed by and pegged to the price of gold, there was a close link between gold and US inflation. But once gold became free floating US inflation was not its main price driver.

Sure enough, gold returns have outpaced the US consumer price index (CPI) over the long run due to its many sources of demand. Gold has not just preserved capital, it has helped it grow.

Gold has also protected investors against extreme inflation. In years when inflation has been higher than 3% gold's price has increased by 15% on average (**Chart 2**). Additionally, research by Oxford Economics shows that gold should do well in periods of deflation.⁷

Chart 2: Gold has historically rallied in periods of high inflation

Gold returns in US dollars as a function of annual inflation*



*Based on y-o-y changes of the LBMA Gold Price and US CPI between 1971 and 2018.

**For each year on the sample, real return = $(1 + \text{nominal return}) / (1 + \text{inflation}) - 1$.

Source: Bloomberg; ICE Benchmark Administration; World Gold Council

A high-quality, hard currency

Over the past century, gold has greatly outperformed all major currencies as a means of exchange (**Chart 3**). This includes instances when major economies defaulted, sending their currencies spiraling down, as well as after the end of the Gold Standard. One of the reasons for this robust performance is that the available above-ground supply of gold has changed little over time – over the past two decades increasing approximately 1.6% per year through mine production.⁸ By contrast, fiat money can be printed in unlimited quantities to support monetary policies.

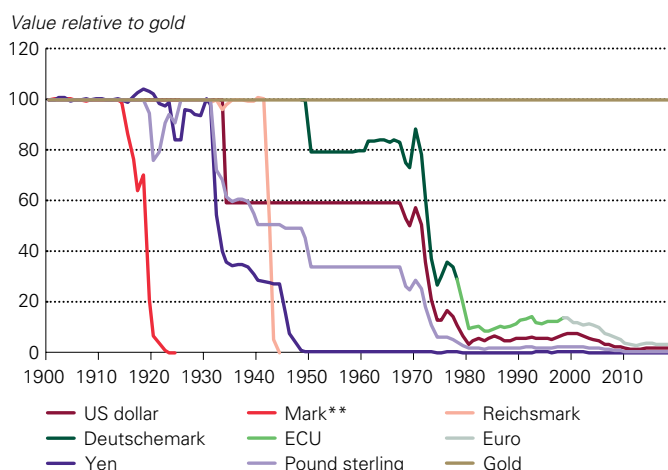
Diversification that works

Although most investors agree about the relevance of diversification, effective diversifiers are not easy to find. Correlations tend to increase as market uncertainty (and volatility) rises, driven in part by risk-on/risk-off investment decisions. Consequently, many so-called diversifiers fail to protect portfolios when investors need it most.

For example, during the 2008–2009 financial crisis, hedge funds, broad commodities and real estate, long deemed portfolio diversifiers, sold off alongside stocks and other risk assets. This was not the case with gold.

Chart 3: Gold has outperformed all major fiat currencies over time

Relative value between major currencies and gold since 1900*



*As of 31 December 2018. Based on the annual average price of a currency relative to the gold price.

**The 'Mark' was the currency of the late German Empire. It was originally known as the Goldmark and backed by gold until 1914. It was known as the Papermark thereafter.

Source: Bloomberg; Harold Marcuse – UC Santa Barbara; World Gold Council

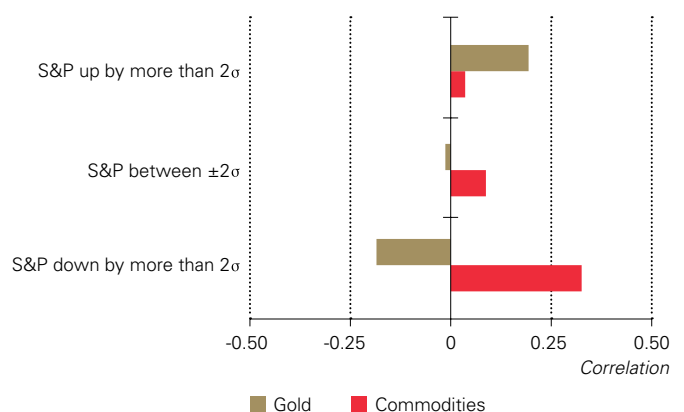
Gold historically benefits from flight-to-quality inflows during periods of heightened risk. By providing positive returns and reducing portfolio losses, gold has been especially effective during times of systemic crisis when investors tend to withdraw from stocks.⁹ Gold has also allowed investors to meet liabilities while less liquid assets in their portfolio were undervalued and possibly mispriced.¹⁰

The greater a downturn in stocks and other risk assets, the more negative gold's correlation to these assets becomes (**Chart 4**).¹¹ But gold's correlation doesn't only work for investors during periods of turmoil.

Due to its dual nature as a luxury good and an investment, gold's long-term price trend is supported by income growth. As such, our research shows that when stocks rally strongly their correlation to gold can increase, driven by the wealth effect and, sometimes, by higher inflation expectations.

Chart 4: Gold's correlation with stocks helps portfolio diversification in good and bad economic times

Correlation between gold and US stock returns in various environments of stocks' performance*



*As of 31 December 2018. Correlations computed using weekly returns based on the Bloomberg Commodity Index and the LBMA Gold Price PM since January 1971. The middle bar corresponds to the unconditional correlation over the full period. The bottom bar corresponds to the correlation conditional on S&P 500 weekly return falling by more than two standard deviations (or 'σ') respectively, while the top bar corresponds to the S&P 500 weekly return increasing by more than two standard deviations. The standard deviation is based on the same weekly returns over the full period.

Source: Bloomberg; ICE Benchmark Administration; World Gold Council

8 See Appendix I as well as the demand and supply section at Goldhub.com

9 See Chart 19 in Appendix II.

10 See Chart 20 in Appendix II.

11 See also Chart 21 in Appendix II.

A deep and liquid market

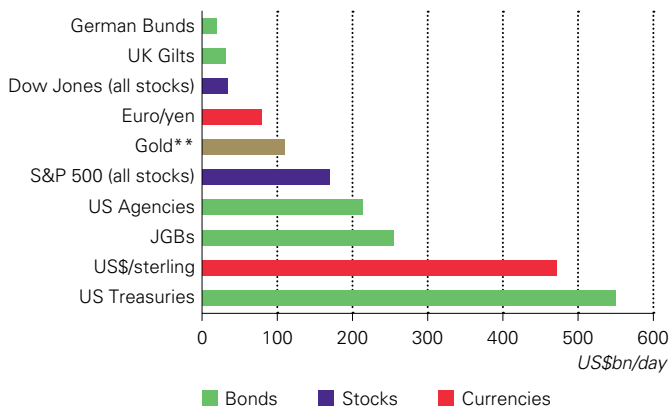
For large buy-and-hold institutional investors, size and liquidity are important factors when establishing a strategic holding.

Gold benefits from its large, global market. We estimate that physical gold holdings by investors and central banks are worth approximately US\$2.9 trillion (tn), with an additional US\$400bn in open interest through derivatives traded on exchanges or over-the-counter.¹²

In addition, the gold market is liquid (**Chart 5**). Gold trades between US\$50bn and US\$80bn per day through spot and derivatives contracts over-the-counter. Gold futures trade US\$35–50bn per day across various global exchanges. Gold-backed ETFs offer an additional source of liquidity, with the largest US-listed funds trading an average of US\$1bn per day.

Chart 5: Gold trades more than many other major financial assets

Average daily trading volumes in US dollars*



*Based on one-year average trading volumes as of December 2018, except for currencies that correspond to full-year 2016 volumes due to data availability.

**Gold liquidity includes estimates on over-the-counter (OTC) transactions, published statistics on futures exchanges, and gold-backed exchange-traded products. For methodology details visit Goldhub.com.

Source: BIS; Bloomberg; German Finance Agency; Japan Securities Dealers Association; LBMA; UK Debt Management Office (DMO); World Gold Council

Enhancing portfolio performance

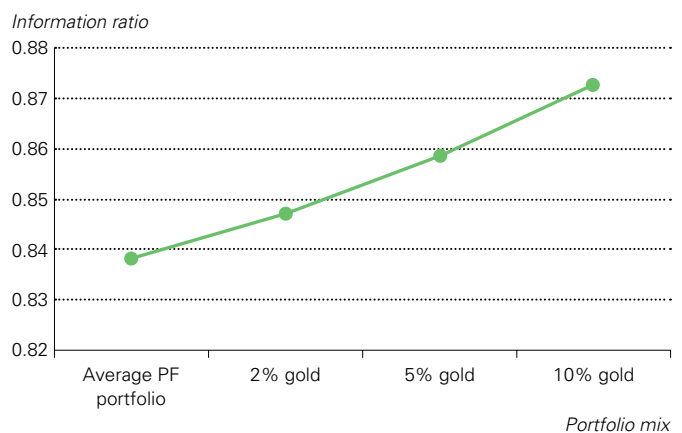
The combination of all these factors means that adding gold to a portfolio can enhance risk-adjusted returns.

Over the past decade, institutional investors with an asset allocation equivalent to the average US pension fund would have benefitted from including gold in their portfolio. Adding 2%, 5% or 10% in gold would have resulted in higher risk-adjusted returns (**Chart 6**).

But studying simulated past performance alone of a hypothetical average portfolio does not allow us to evaluate how much gold investors should add to a portfolio to achieve the maximum benefit.

Chart 6: Gold increased risk-adjusted returns of a hypothetical average pension fund portfolio

Information ratio of a hypothetical average pension fund (PF) portfolio with various allocations to gold*



*Information ratio defined as portfolio return divided by annualised volatility and based on the total return indices and benchmarks listed below using data from December 2008 to December 2018. The composition of the hypothetical average PF portfolio is based on Willis Tower Watson *Global Pension Assets Study 2018* and *Global Alternatives Survey 2017*. It includes a 50% allocation to stocks (30% Russell 3000, 20% MSCI ACWI ex US), 25% allocation to fixed income (22% Barclays US Aggregate, 1% Barclays Global Aggregate ex US, 1% JPMorgan EM Global Bond Index and 2% short-term Treasuries), and 25% alternative assets (9% FTSE REITs Index, 7% HFRI Hedge Fund Index, 7% S&P Private Equity Index and 2% Bloomberg Commodity Index). Gold's performance is based on the LBMA Gold price and the respective 2%, 5% and 10% portfolio allocations come from proportionally reducing all assets.

Source: Bloomberg; ICE Benchmark Administration; World Gold Council

12 See Chart 8 in Appendix I as well as the holders and trends section at Goldhub.com

Asset allocation analysis indicates that, for US dollar-based investors, holding 2% to 10% in gold as part of a well-diversified portfolio can improve performance even more (**Chart 7**).¹³ Broadly speaking, the higher the risk in the portfolio – whether in terms of volatility, illiquidity or concentration of assets – the larger the required allocation to gold, within the range in consideration, to offset that risk.

The analysis shows that gold’s optimal weight in hypothetical portfolios is statistically significant even if investors assume an annual return for gold between 2% and 4% – well below its actual long-term historical performance (**Chart 7**).

Our research shows that this is also the case for investors who already hold other inflation-hedging assets, such as inflation-linked bonds,¹⁴ as well as for investors who hold alternative assets (e.g., real estate and hedge funds).¹⁵

Gold goes beyond commodities

Gold is often lumped together with the commodity complex by investors and investment practitioners alike. Whether as a component in a commodity index (e.g., S&P Goldman Sachs Commodity Index, Bloomberg

Commodity Index), one of the securities in an ETF, or as a future trading on a commodity exchange, gold is viewed as a part of this complex.

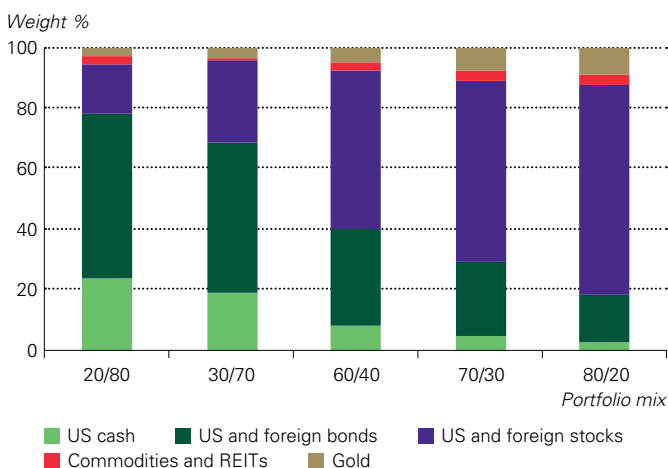
Gold undoubtedly shares some similarities with commodities. But a detailed look at the make-up of supply and demand highlights that differences outnumber similarities:

- the supply of gold is balanced, deep and broad, helping to quell uncertainty and volatility
- because gold is not consumed like typical commodities, its above-ground stocks are available for continuous utilisation
- gold is used for many purposes and purchased all around the world, reducing its correlation to other assets
- gold is both a luxury good and an investment, resulting in more effective downside portfolio protection.

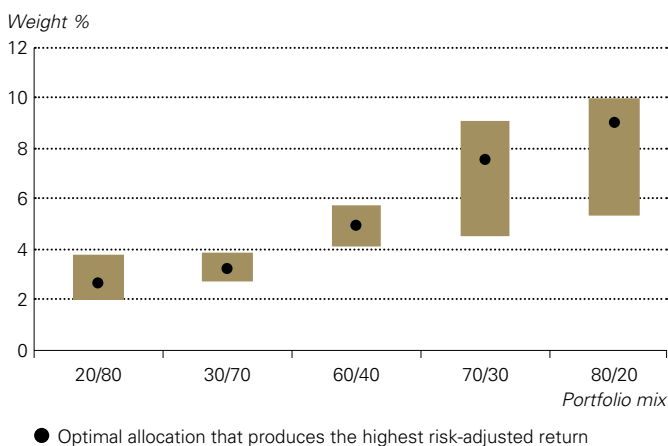
Gold’s unique attributes set it apart from the commodity complex. From an empirical perspective, including a distinct allocation to gold has improved the performance of portfolios with passive commodity exposures.¹⁶

Chart 7: Gold can significantly improve risk-adjusted returns of hypothetical portfolios across various levels of risk

(a) Long-run optimal allocations based on asset mix*



(b) Range of gold allocations and the allocation that delivers the maximum risk-adjusted return for each hypothetical portfolio mix*



*Based on monthly total returns from January 1989 to December 2018 of ICE 3-month Treasury, Bloomberg Barclays US Bond Aggregate, Bloomberg Barclays Global Bond Aggregate ex US, MSCI US, EAFE and EM indices, FTSE Nareit Equity REITs Index, Bloomberg Commodity Index and spot returns of LBMA Gold Price PM. Each hypothetical portfolio composition reflects a percentage in stock and alternative assets relative to cash and bonds. For example: 60/40 is a portfolio with 60% in stocks, commodities, REITs and gold, and 40% in cash and bonds. Analysis based on New Frontier Advisors Resampled Efficiency. For more information see *Efficient Asset Management: A Practical Guide to Stock Portfolio Optimization and Asset Allocation*, Oxford University Press, January 2008.

Source: World Gold Council

13 Analysis based on the re-sampled efficiency methodology developed by Richard and Robert Michaud and praised as a robust alternative to traditional mean-variance optimisation. See *Efficient Asset Management: A Practical Guide to Stock Portfolio Optimisation and Asset Allocation*, Oxford University Press, January 2008.

14 *Gold as a tactical inflation hedge and long-term strategic asset*, July 2009.

15 *How gold improves alternative asset performance*, Gold Investor, Volume 6, June 2014.

16 See *Gold: A commodity like no other*, April 2011, and *Gold: metal by design, currency by nature*, Gold Investor, Volume 6, June 2014.

Appendix I: Demand, supply and drivers of gold

Consumption, investment, both

The dual nature of consumer and investment demand, linked to both pro-cyclical and counter-cyclical factors, makes gold a useful tool for investors by complementing the performance of other assets and enhancing portfolios.

Broadly speaking, drivers of the gold price can be grouped into four categories:

- **Economic expansion:** periods of growth are very supportive of jewellery, technology, and long-term savings
- **Risk and uncertainty:** market downturns often boost investment demand for gold as a safe haven
- **Opportunity cost:** the price of competing assets such as bonds (through interest rates), currencies and other assets, influences investor attitudes towards gold
- **Momentum:** capital flows, positioning and price trends can ignite or dampen gold's performance.

While gold's performance is the result of interactions between these categories, drivers related to economic expansion and uncertainty play a key role in determining its long-term behaviour and are central to gold's role as a strategic asset. Additionally, drivers linked to opportunity costs and momentum heavily influence gold's tactical positioning among investors.

Large yet scarce

The gold market has two attractive features for investors. Gold's scarcity supports its long-term appeal. But gold's market size is large enough to make it relevant for a wide variety of institutional investors – including central banks.

We estimate that there are approximately 193,000t of gold above ground, worth more than US\$7.9tn.¹⁷ Mine production adds approximately 3,000t per year, equivalent to an annual 1.6% increment.¹⁸

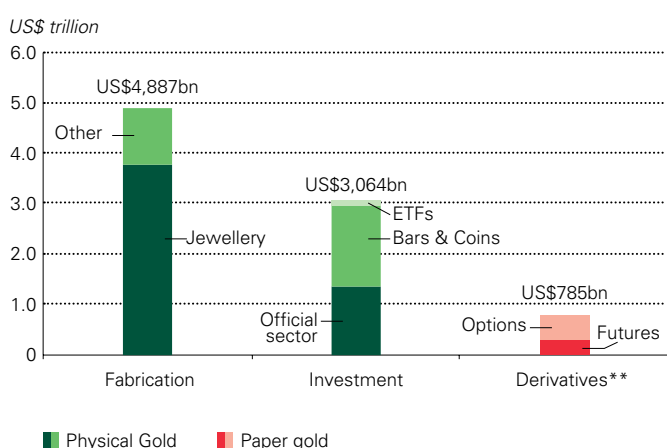
The approximate breakdown of physical gold,¹⁹ based on its use, is:

- **Jewellery:** 92,000t (US\$3.8tn) 48%
- **Official sector:** 33,200t (US\$1.5tn) 17%
- **Bars and coins:** 38,800t (US\$1.6tn) 20%
- **ETFs and similar:** 2,490t (US\$100bn) 1%
- **Other and unaccounted:** 26,800t (US\$1.1tn) 14%.

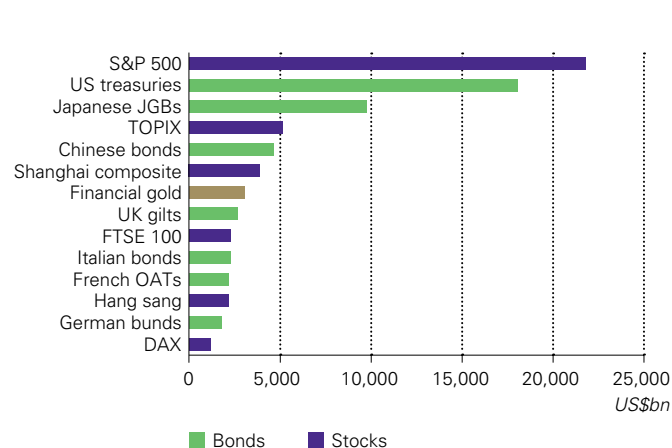
The financial gold market is made up of bars, coins, gold-backed ETFs and central bank reserves. This segment of the gold market compares favourably to the size of major financial markets (**Chart 8**).

Chart 8: The size of the financial gold market is large compared to many global assets and dwarfs known open interest in gold derivatives*

(a) Value of above-ground gold and gold derivatives



(b) Market size of major global financial assets



*As of 31 December 2018.

**Represents open interest in COMEX, TOCOM and over-the-counter.

Source: Bank for International Settlements; Bloomberg; ETF company filings; ICE Benchmark Administration; Metals Focus; World Gold Council

17 Based on the December 2018 LBMA Gold Price and 2018 above-ground estimates by Metals Focus, Refinitiv GFMS and the World Gold Council.

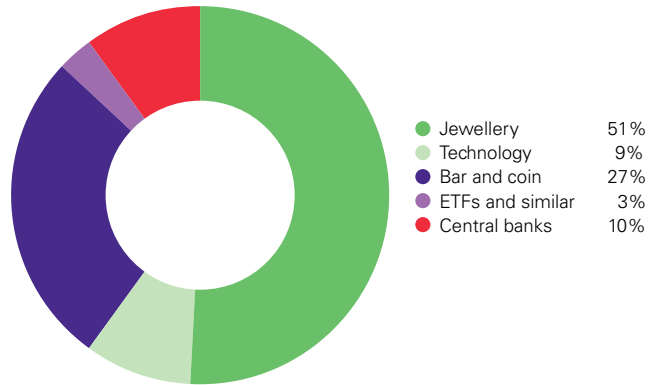
18 Based on Metals Focus and Refinitiv GFMS 10-year mine production average as a percentage of above ground stocks, as of December 2018.

19 Ibid 17.

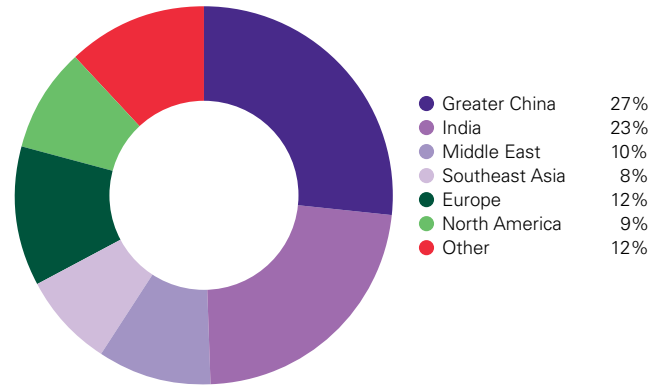
Demand diversity underpins gold's low correlations

Chart 9: Gold is bought around the world for multiple purposes – as a luxury good, a component in high-end electronics, a safe-haven investment or a portfolio diversifier

(a) 10-year average gold demand by source*



(b) 10-year average gold demand by region*



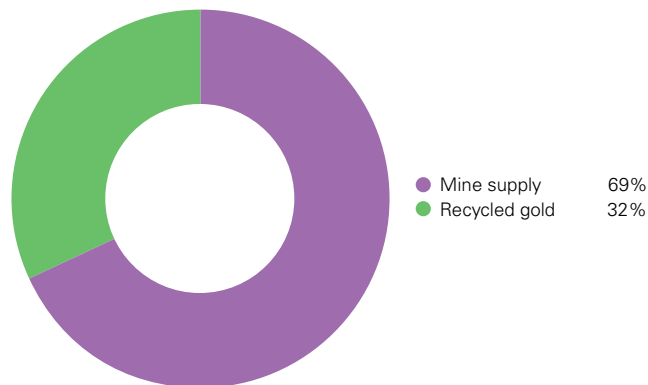
*Computed using annual demand from 2009 to 2018. Regional breakdown excludes central bank demand due to data availability.

Source: ETF company filings; Metals Focus; Refinitiv GFMS; World Gold Council

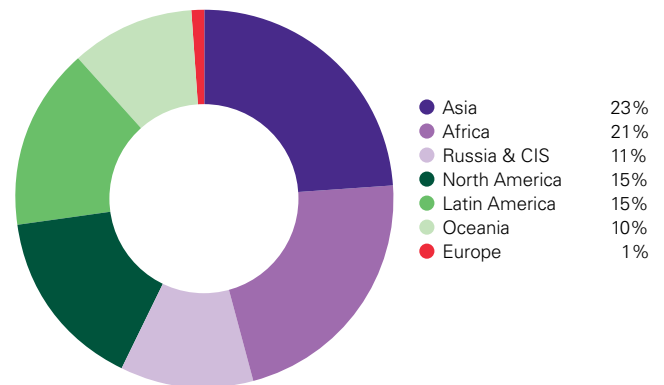
Fewer supply side shocks help reduce gold's volatility

Chart 10: Gold supply is a combination of mined and recycled gold; mine production is evenly spread across continents, contributing to gold's low volatility relative to commodities

(a) 10-year average gold supply by source*



(b) 10-year average gold-mine production by region*



*Computed using annual demand from 2009 to 2018. Regional breakdown excludes central bank demand due to data availability.

Source: ETF company filings; Metals Focus; Refinitiv GFMS; World Gold Council

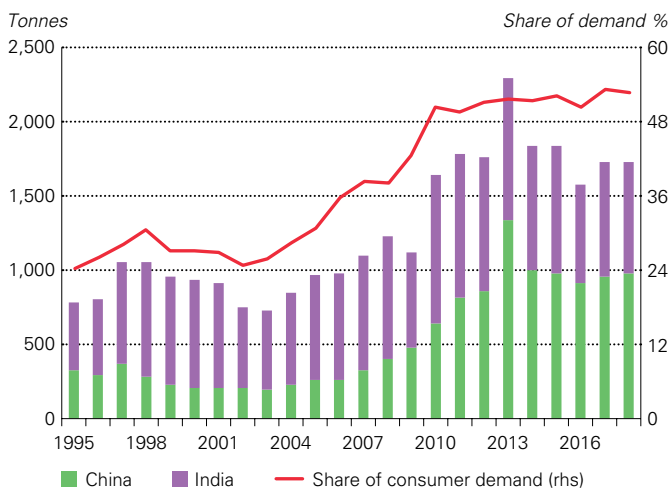
Four trends have reshaped gold demand

- **Emerging markets:** The economic development experienced for almost two decades within emerging markets – especially China and India – has increased and diversified gold’s consumer and investor base (**Chart 11**)
- **Gold-backed ETFs:** The advent of exchange-traded products reduced total cost of ownership, increased efficiencies, provided liquidity and access, and brought new interest in – and demand for – gold as a strategic investment (**Chart 12**)

- **The 2008–2009 financial crisis:** Gold has benefitted from a change in investor attitude towards risk and risk management following the Great Recession – new markets have appeared and old markets resurfaced, lifting demand (**Chart 13**)
- **Central banks:** The expansion of foreign reserves, led by emerging markets, has resulted in net gold demand from central banks as a source of return, liquidity and diversification (**Chart 14**).

Chart 11: India and China have doubled their gold market share in less than two decades

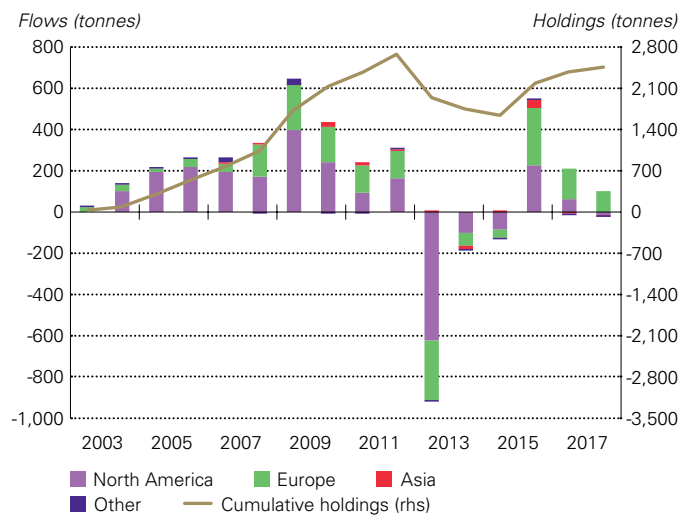
Consumer demand and market share in India and China*



*Consumer demand is defined as the sum of jewellery, bar and coin demand.
Source: GFMS, Thomson Reuters; Metals Focus; World Gold Council

Chart 12: Gold-backed ETFs have introduced new investors to gold across the world

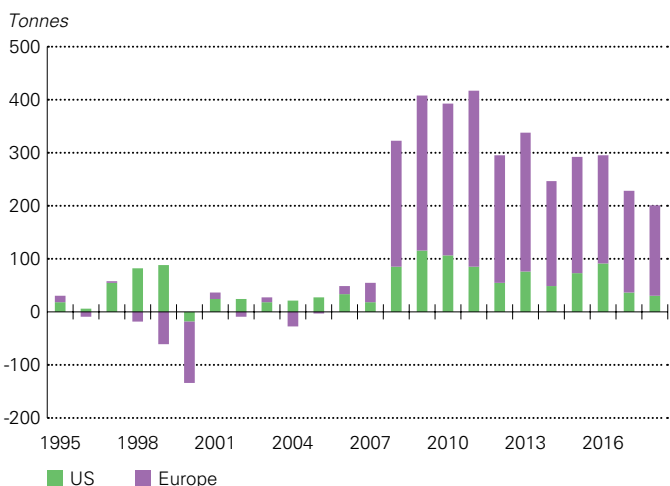
Annual ETF gold demand and cumulative holdings*



*Includes gold-backed ETFs and similar products. For more details, visit the gold-backed ETF holdings and flows section at Goldhub.com.
Source: Bloomberg; ETF regulatory fund filings; World Gold Council

Chart 13: The bar and coin market in the US and Europe strengthened in the wake of the financial crisis

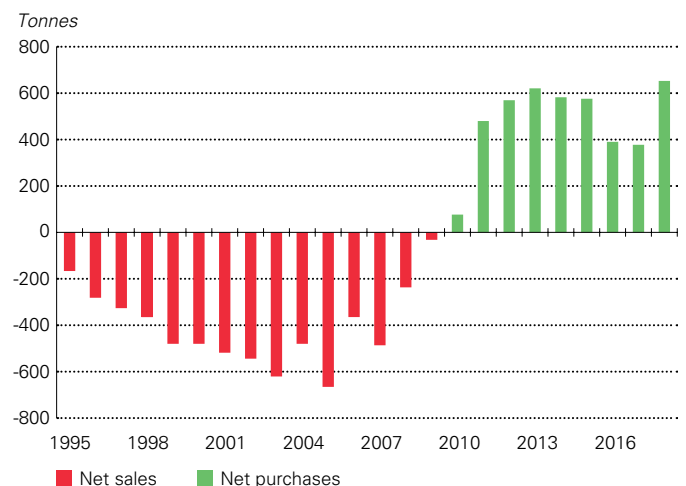
Bar and coin demand in US and Europe*



*Europe excluding Russia and ex-CIS countries.
Source: GFMS, Thomson Reuters; Metals Focus; World Gold Council

Chart 14: Central banks have been a steady net source of demand since 2010, led by emerging markets

Net global central bank gold demand



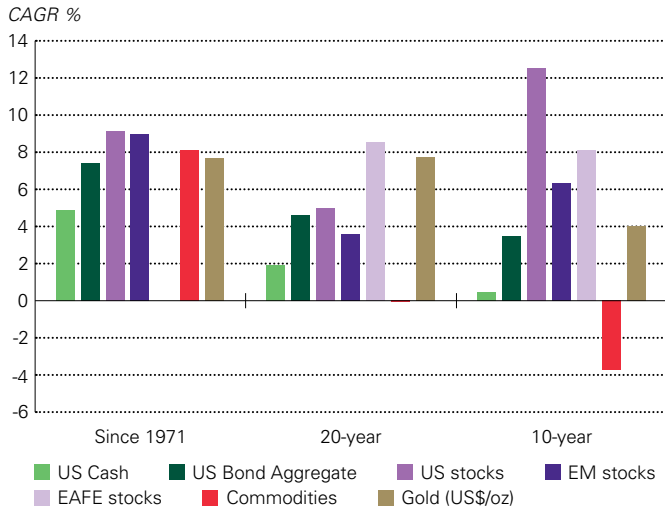
Source: GFMS, Thomson Reuters; Metals Focus; World Gold Council

Appendix II: Gold's performance over time

Annual growth rates and historical returns

Chart 15: Gold's compounded returns compare favourably to many asset classes including stocks

Compounded annual growth rate for major asset classes*

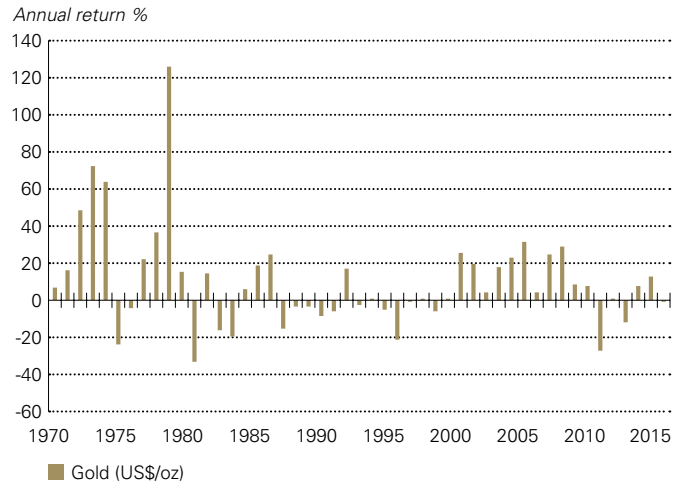


*As of December 2018. Computations in US dollars of total return indices for ICE 3-month Treasury, Bloomberg Barclays US Bond Aggregate, MSCI US, EAFE and EM indices, Bloomberg Commodity Index and spot for LBMA Gold Price PM.

Source: Bloomberg; ICE Benchmark Administration; World Gold Council

Chart 16: After high price volatility in the 1970s, gold returns have been steadier

Gold price return per year since 1971*



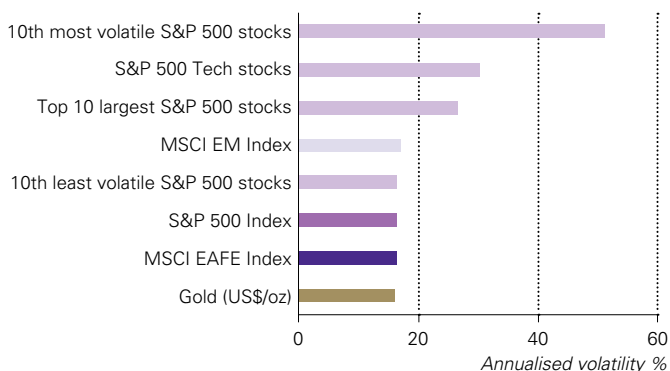
*As of 31 December 2018. Computations based on the LBMA Gold Price PM.

Source: Bloomberg; ICE Benchmark Administration; World Gold Council

Gold is less volatile than most stocks and commodities

Chart 17: Gold's volatility sits below that of many individual stocks and stock indices

Realised volatility of stocks, stock indices and gold*

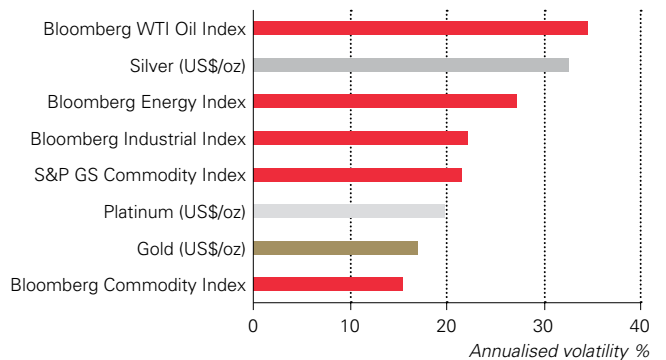


*Annualised volatility is computed based on daily returns between 1 January 2009 and 31 December 2018. Only stocks with 10 years' worth of data are included in the computations.

Source: Bloomberg; ICE Benchmark Administration; World Gold Council

Chart 18: Gold is also less volatile than individual commodities

Realised volatility of commodities and gold*



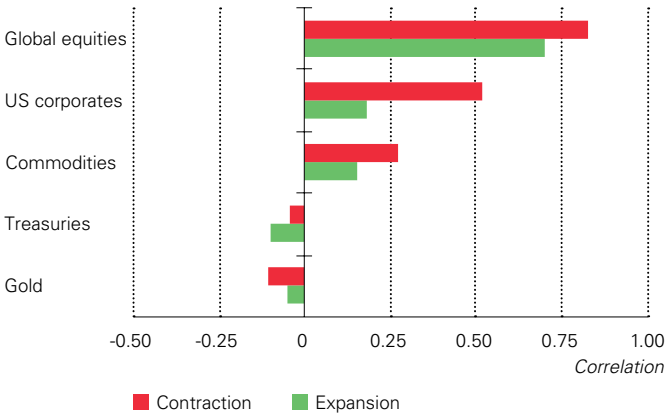
*Annualised volatility is computed based on daily returns between 1 January 2009 and 31 December 2018.

Source: Bloomberg; ICE Benchmark Administration; World Gold Council

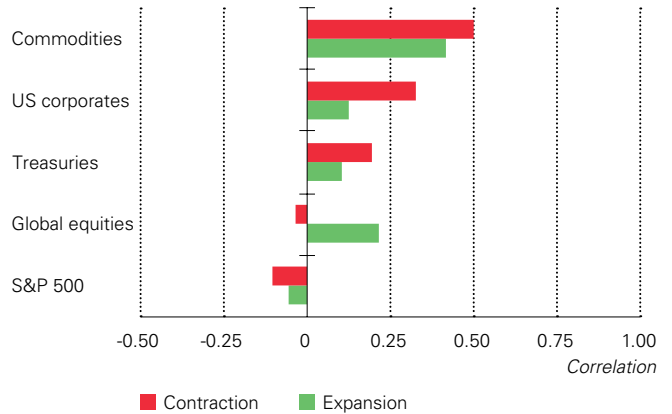
Effective correlation during expansions and contractions

Chart 19: Gold behaves as an effective diversifier in periods of economic expansion and contraction

(a) Correlation between US stocks and major assets*



(b) Correlation between gold and major assets*



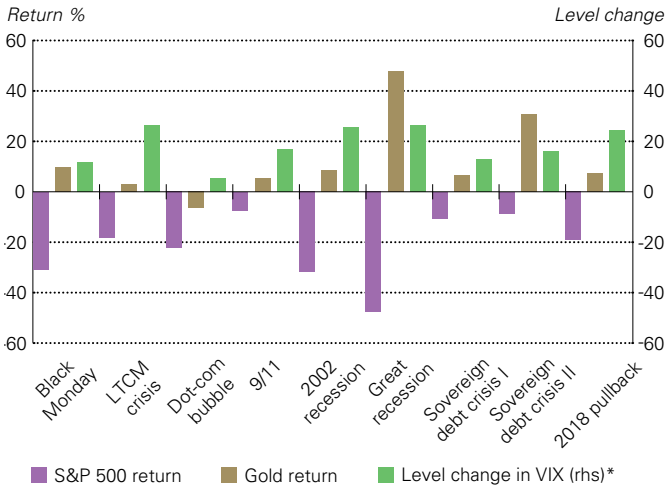
*Based on monthly returns between January 1987 and December 2018. Economic expansions and contractions as determined by the National Bureau of Economic Research (NBER).

Source: Bloomberg; NBER; World Gold Council

Gold is often seen as a safe haven

Chart 20: The gold price tends to increase in periods of systemic risk of S&P 500 and gold return vs change in VIX level*

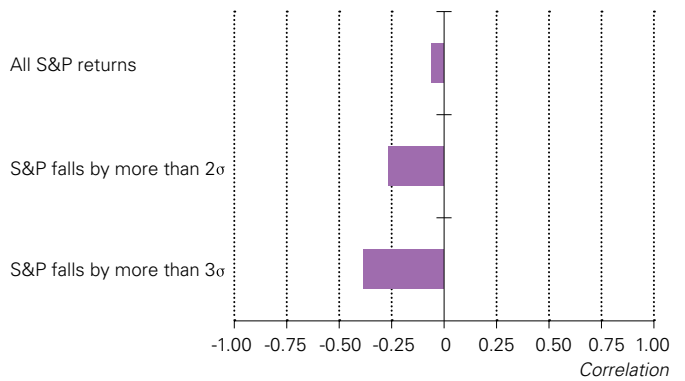
S&P 500 and gold return vs change in VIX level*



*The VIX is available only after January 1990. For events occurring prior to that date annualised 30-day S&P 500 volatility is used as a proxy. Dates used: Black Monday: 9/1987-11/1987; LTCM: 8/1998; Dot-com: 3/2000-3/2001; September 11: 9/2001; 2002 recession: 3/2002-7/2002; Great Recession: 10/2007-2/2009; Sovereign debt crisis I: 1/2010-6/2010; Sovereign debt crisis II: 2/2011-10/2011; 2018 pullback: 10/2018-12/2018. Source: Bloomberg; World Gold Council

Chart 21: The price of gold tends to increase more when stocks pull down sharply

Conditional correlation between gold and the S&P 500 relative to the magnitude of the stock pullback*



*Based on weekly returns between January 1987 and December 2018.

Source: Bloomberg; World Gold Council

Further reading

We include below a list of publications by the World Gold Council that discuss relevant aspects of gold for investors:

Gold Investor

- *Cash down, gold up: Ken Rogoff on the value of gold on a cashless society*, Gold Investor, February 2019
- *The new China: Forging a path for growth*, Gold Investor, October 2018
- *Gold and technology: Forged in the past, fit for the future*, Gold Investor, July 2018
- *In gold we trust: the Bundesbank on transparency, confidence and security*, Gold Investor, December 2017
- *A significant force: Russia on the gold stage*, Gold Investor, September 2017.

Market and Investment Updates

- *Outlook 2019: Global economic trends and their impact on gold*, January 2019
- *Increased transparency on gold trading*, December 2018
- *Cryptocurrencies are no substitute for gold*, January 2018.

In-depth reports

- *Recommendations for the further development of China's gold market*, July 2017
- *Gold 2048: the next 30 years for gold*, May 2018
- *Enhancing the performance of alternatives with gold*, February 2018.

Gold Demand Trends

- *Full year 2018*, January 2018
- *Third quarter 2018*, November 2018
- *Second quarter 2018*, August 2018
- *First quarter 2018*, May 2018.

You can find all publications listed above in the research section of [Goldhub.com](https://www.goldhub.com)

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World Gold Council
10 Old Bailey, London EC4M 7NG
United Kingdom

T +44 20 7826 4700

F +44 20 7826 4799

W www.gold.org