WORLD GOLD COUNCIL

Methodology
Gold ETFs: assets, demand and flows

Physically-backed gold exchange-traded funds (gold ETFs) are an important source of gold demand, with institutional and individual investors using them as part of well-diversified investment strategies.[1]

Since their introduction in 2003, gold ETFs have transformed the gold investment market. They have reduced total cost of ownership, increased efficiencies, provided added liquidity and access, and brought new interest in – and demand for – gold as a strategic investment.[2]

Given their relevance, we continuously monitor more than 100 gold ETFs and similar products worldwide.[3] We also provide periodical insights based on the most comprehensive dataset available.

The gold ETF universe

Our dataset tracks open-ended ETFs and similar products, such as close-end funds and mutual funds, that **hold gold in physical form**. These funds are listed in exchanges around the world, which we group into four regions: North America, Europe, Asia and Other (**Table 1**).[4] A complete list is included on the gold ETF section of Goldhub.com.

Most the 106 funds included in this list are fully backed by physical gold. A few funds allow other holdings such as cash or derivatives, but we focus on those whose primary asset is physical gold, adjusting their reported assets under management (AUM) to reflect the proportion of physical holdings if necessary.[5] Similarly, for funds that include physical holdings of multiple precious metals, we only capture the AUM attributed to their gold allocation.

Additionally, some funds offer multiple share classes ('sub-class funds') – for example, some Swiss funds offer share classes in multiple currencies. In such instances, we use each individual sub-class fund to estimate the aggregate holdings and flows of the 'parent' fund, as this method provides the most accurate and reliable measurements. We generally report data at the aggregate fund level, but data for the sub-class funds is also available.

Table 1: Gold ETFs holdings and flows by region*

	Total AUM (US$bn)	Fund Flows (US$mn)	Holdings (tonnes)	Demand (tonnes)	Demand (% of holdings)
North America	100.6	-2,743.2	1,727.1	-74.6	-4.14%
Europe	91.2	943.3	1,565.9	-14.7	-0.93%
Asia	7.3	-1,222.7	118.7	-21.3	-15.21%
Other	3.5	48.6	60.8	0.2	0.38%
Total	202.7	-2,973.9	3,472.5	-110.4	-3.18%

*As of 31 December 2022. See gold ETF section of Goldhub.com for more details.
Source: Bloomberg, Company Filings, ICE Benchmark Administration, World Gold Council

1   We define gold ETFs as regulated securities that hold gold in physical form. These include open-ended funds traded on regulated exchanges and other regulated products such as close-end funds and mutual funds.

2   For additional information please see our Gold Market Primer: Gold ETFs.

3   As of December 2022, we track 106 active gold funds worldwide, some of which include sub-class funds such as additional share classes. We also maintain a list of inactive or 'delisted' funds to provide an accurate historical representation on the evolution of the gold ETF universe.

4   'Other' includes funds listed in Australia, South Africa, Turkey, Saudi Arabia and the United Arab Emirates.

5   As of December 2022, of the 106 funds in our universe, 23 have a hedged component while another 6 hold multiple precious metals.

Assets, demand and flows

Fund Assets

We track gold ETF assets in two ways: the quantity of gold they hold, generally measured in tonnes;[6] and the equivalent value of those holdings in US dollars.

- **AUM (USD):** we calculate the US dollar value of a fund's gold holdings through its total reported AUM by adjusting, when applicable, with (1) the percentage of physical gold relative to the total fund assets (for those holdings instruments other than physical gold); and (2) the exchange rate between the USD and the currency of the fund listing
- **Holdings:** we calculate the quantity of gold held by a fund – usually reported in tonnes –by dividing (1) its AUM in US dollars (as per above), into (2) the LBMA Gold Price (or in the case of China and India, a local benchmark for price).[7] While some funds directly report the amount of gold they hold, this figure usually includes liabilities (e.g. gold that will eventually be sold to cover management fees and other expenses). As such, we only use reported holdings for funds that publish assets on a monthly (or less frequent) basis or those with a fixed amount of gold per share.

See Appendix for algebraic formulations of these metrics.

Demand and flows

We also monitor how fund assets change through time by looking at two key metrics: demand and fund flows.

- **Demand:** we define gold ETF demand as the change in gold holdings during a given period. We use this metric to calculate the quarterly demand estimates reported in Gold Demand Trends
- **Fund flows:** these represent the amount of money – reported in US dollars – that investors have put into (or retrieved from) a fund during a given period. When fund flows are not directly available, we multiply the daily number of shares issued or redeemed by the net asset value of those shares over a given period. Alternatively, when shares outstanding are not available, we estimate fund flows by multiplying daily changes in holdings by the corresponding US dollar price and aggregating those over a given period.

See Appendix for algebraic formulations of these metrics.

Differences between demand and fund flows

Both demand and fund flows capture movements in fund assets and generally move in the same direction, but there are a few factors that create small differences between the two metrics. These include the reference gold price used to convert AUM to gold holdings, the timing of the fund net asset value calculation, the way management fees are accounted for, and the use of currency hedging.[8] Our analysis shows that, in general, fund flows plus management fees plus currency FX fluctuations closely match the US dollar value equivalent of demand.

- **Management fees:** Most gold ETFs make regular sales of gold to cover their expenses. However, these sales do not generate a fund flow, as they do not relate to the creation or redemption of shares. Over time, management fees reduce the quantity of gold per share and increase the difference between the amount of gold implied by cumulative fund flows compared to actual gold holdings.[9] Where management fee information is available we can explicitly account for the effect of management fees
- **Gold price and FX fluctuations:** While some funds use a local benchmark to value the underlying gold, many funds use the LBMA Gold Price in USD. For funds listed in a non-USD currency, there may be currency fluctuations between the time the gold price benchmark is set and when the net asset value of the fund is calculated. In addition, some gold ETFs, known as currency-hedged ETFs, use derivatives to mitigate currency fluctuations or track the price of gold in a different currency. This can impact the amount of gold per share and create a difference between fund flows and the US dollar value equivalent of demand.

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6   One tonne is equivalent to 32,150.7466 troy ounces.

7   Ibid.

8   We monitor management fees, initial and final flows, FX hedging and other sources of changes to gold holdings to ensure the equivalency between fund flows and demand.

9   For example, the share of a fund may initially be set to 1/10 or 1/100 of an ounce of gold. Over time, the quantity of gold per share will decrease by an equivalent amount to the management fee. The share price of the fund takes this into account and reflects the correct amount of gold per share.

Fund aggregation

We group fund by country, region, fund size and magnitude of flows. We also aggregate funds by those that saw a net inflow/outflow of investment funds over a given period (e.g. month, quarter, etc.).

Additional categorisations
- *Low-cost ETFs* have gained popularity among investors over the past few years. While there is no standard definition of what constitutes a low-cost ETF, our low-cost universe encompasses funds with management fees that are 20bps or less.[10]
- *FX hedged funds* allow investors to track the performance of gold in a currency different to their own. Investors typically use these funds to mitigate currency uncertainty or to express currency views in addition to their gold exposure. For example, a European fund that would normally settle in euros may use derivatives hedging the USD/EUR FX to better track the USD-denominated gold price
- Finally, the *most liquid funds* are those that have the greatest trading volume globally. While there is no standard definition, the largest funds by AUM are usually the most traded, with North American funds providing the bulk of the global gold liquidity.

Calculation process

Where do we get the data?
Our dataset uses information provided by Bloomberg, the respective ETF providers, ICE Benchmark Administration, the Shanghai Gold Exchange and MCX (India).

How is the data compiled?
- *Automated:* approximately 90% of total gold ETF assets are compiled automatically in our database via the sources listed above. Each fund's assets, demand and flows are calculated through a hierarchy of methods determined by the quality of available data
- *Manual:* approximately 10% of total gold ETF assets are sourced manually. These are funds that are not available through data repositories or that only provide data infrequently. Usually, we will obtain the holdings and flows for these funds by examining the funds' bar lists on their websites, or via our relationships with the firms
- Occasionally the quality of the data will have improved or deteriorated over the history of an ETF. We regularly review the data provided and may switch between sources.

How do you verify data?
Before publication, the dataset is checked rigorously and reviewed to ensure that errors are caught and to give users confidence in the data produced. This includes:

- *Cross-checking raw data from multiple sources* to identify any potential issues prior to publication; in some instances, this may involve contacting the fund directly for confirmation of the data
- *Manually sourced data is double-checked* before publication to minimise the risk of errors both in the data itself and the process we use to collect, estimate and aggregate it.

How often do you perform data revisions?
Revisions usually result from backfilling missing values due to publication lag, the first inclusion of a newly identified fund or the launch/delisting of funds.[11] The size of revisions will vary depending on the length of lagged time or size of the new fund but, in general, any revisions are small.

We regularly review the global gold ETF universe in a bid to expand data coverage. If you have identified any funds that are missing from our dataset, please contact us at: research@gold.org.

Reporting

Most funds report activity on a daily basis. The remaining few provide data on gold holdings weekly, monthly or quarterly, and the data can either be month-end or – rarely – a quarterly average. When faced with lower frequency data we use the latest available data point and roll it forward until it is next updated.

Weekly
We update assets, holdings, demand and fund flows weekly on our gold ETF data page for funds that report either daily or weekly. This update occurs on the first business day of the week.

Monthly
We publish a comprehensive monthly report, usually between four and seven business days after month end. This report includes assets, holdings, demand and fund flows, as well as commentary discussing key drivers and regional highlights.

To be notified when this data becomes available, you can register to receive our report on Goldhub.com

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10 As of December 2022, there are 23 such funds. The most up-to-date list can be found here: Gold ETFs holdings and flows | World Gold Council.

11 A source of discrepancy often happens when a fund is launched or delisted. By the time most funds are launched they include seed capital either from the management company or from initial institutional investors. Historically, fund flow information is not always available on the day a fund starts trading, which may create a mismatch between demand and flow estimates. Conversely, when funds get delisted (close), outflows are usually not reported; instead, the fund eventually liquidates assets that may not classify as a sale of shares. However, this reduction in holdings is captured by our demand metric.

Appendix:
Algebraic formulations

Gold holdings

Our estimation of gold holdings can be expressed mathematically as:

$$\text{holdings}_t = \left(\frac{\text{Gold AUM (USD)}_t}{P_t^{\text{gold}}/oz}\right) \times \left(\frac{1 \text{ tonne}}{\sim 32{,}151 \text{ oz}}\right)$$

Gold AUM (USD) represents the value of gold holdings of a fund given by the AUM, adjusted, when applicable, by the proportion of physical gold in the fund relative to its total assets. And P_t^{gold} represents the gold price benchmark that best matches the fund's objectives, calculated in USD. These include the LBMA Gold Price PM USD (most used), LBMA Gold Price AM USD, Au9999 at the Shanghai Gold Exchange, the spot gold price at the Multi Commodity Exchange of India and the MUFG Commodity Gold Index at the TOCOM.

Demand

Our demand estimation can be expressed mathematically as: $\text{demand}_{t-m}^t = \Delta_{t-m}^t \text{ holdings}_i = \text{holdings}_t - \text{holdings}_{t-m}$, where holdings are defined as above.

Fund flows

When fund flows are not directly reported we usually estimate them in one of two ways:

$$\Delta_{t-m}^t \text{ flows} = \sum_{i=t-m+1}^{t}\left(\Delta_{i-1}^i \text{SO}_i\right) \times P_i^{\text{share}},$$

where SO represent 'shares outstanding' and P_t^{share} the 'price per share' of a fund in USD.

Alternatively, when shares outstanding are not available we estimate fund flows through changes in holdings:

$$\Delta_{t-m}^t \text{ flows} = \sum_{i=t-m+1}^{t}\left(\Delta_{i-1}^i \text{holdings}_i\right) \times P_i^{\text{gold}},$$

where holdings and P_t^{gold} are defined as above.

About the World Gold Council

We're the global experts on gold.

Leveraging our broad knowledge and experience, we work to improve understanding of the gold market and underscore gold's value to individuals, investors, and the world at large.

Collaboration is the cornerstone of our approach. We're an association whose members are the world's most forward-thinking gold mining companies. Combining the insights of our members and other industry partners, we seek to unlock gold's evolving role as a catalyst for advancements that meet societal needs.

We develop standards, expand access to gold, and tackle barriers to adoption to stimulate demand and support a vibrant and sustainable future for the gold market. From our offices in Beijing, London, Mumbai, New York, Shanghai, and Singapore, we deliver positive impact worldwide.

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