The gold to silver ratio represents the number of ounces required to buy one ounce of gold, calculated by dividing the price of a gold ounce by the price of a silver ounce. This ratio tends to rally during periods of market crisis, disruption and instability and peaks generally during recessionary periods. Traders will monitor this ratio for spread trading opportunities, by entering into simultaneous positions that include buying at spot or a futures contract in one metal and selling at spot or a futures contract in the other metal. Under the premise that both gold and silver prices should generally move with some level of coordination, “extreme high or low” levels of the ratio, may signal opportunities to buy one metal and short the other.

As shown in Figure 1, the gold to silver ratio demonstrates significant periods of trending, thereby allowing traders to take a directional view and thus implement strategies on these. The ratio spiked in the early 1980s (as a result of rapid increases in interest rates by the U.S. Fed in conjunction with Russia’s invasion of Afghanistan and the Iranian hostage crisis). The ratio also peaked in the early 1990s (towards the end of the 1st Gulf War) as well as early in Global Financial Crisis in 2008. Under the Covid-19 pandemic, the ratio just recently climbed to its all-time high of nearly 125, inferring it takes nearly 125 silver ounces to buy a single ounce of gold.

This article explores the relationship of gold and silver prices in the attempt to further understand trends with the gold to silver ratio.

**Gold and Silver Prices**

Figure 2 displays gold and silver prices from 1972 onward. As shown, these prices have gone through periods of high correlation including in the 1970s and early 1980s due to the aforementioned macroeconomic and geopolitical events. Gold and silver were again highly correlated during the “Metals Super Cycle” (2002 – 2011) and its downside aftermath (2012 – 2016), where prices (as well as for most non-precious metals) climbed significantly due primarily
Gold Price ($/oz)

Gold to Silver Ratio

Silver (gold) beta measures the prices the silver price is to changes in gold price. The gold price beta (or how sensitive the silver price is to changes in gold price) is sensitive to moves in gold prices than during than in the 1970s through 1995 where the beta averaged slightly under 1.0. From the mid-1990s through the early 2000s, silver's sensitivity to changes in gold price was significantly lower, with the beta averaging ~0.35. Since the turn of the millennium, the silver (copper) beta is higher, averaging closer to 0.5.

Silver betas (measuring price sensitivities)

Figure 3 displays the silver to gold price beta (or how sensitive the silver price is to changes in gold price\(^1\)). Under this calculation, the silver (gold) beta measures the volatility of silver prices relative to gold. A beta equal to 1.0 indicates silver prices are strongly correlated with gold and have similar volatility. When this beta is greater than 1.0, the volatility of silver is higher than gold and less than that of gold when the beta is less than 1.0. As shown on Figure 3, the silver (gold) beta appears to have migrated through three regimes: from 1972 until 1995 where the beta averaged slightly under 1.0. From the mid-1990s through the early 2000s, this beta has increased to average 0.8. To summarize, more recent silver sensitivities to changes in gold price was significantly lower, with the beta averaging ~0.35. Since the turn of the millennium, the silver (copper) beta is higher, averaging closer to 0.5.

Figure 2: Gold and Silver Prices

Source: Bloomberg, Tom Brady, and Murenbeeld & Co.

Silver Price ($/oz) vs Gold Price ($/oz)

- 1972 - 1984
  - Correlation = 87%
- 1985 - 1995
  - Corr = 58%
- 1996 - 2001
  - Corr = 22%
- 2002 - 2011
  - Corr = 95%
- 2012 - 2016
  - Corr = 93%
- 2017 +
  - Corr = 41%

Figure 3: Silver (to Gold Price) Beta

Source: Bloomberg, Tom Brady, and Murenbeeld & Co.

(1 year trailing beta (based on daily price changes)). Shaded areas are 95% confidence intervals.

1Specifically, the silver gold beta is calculated as the covariance between gold and silver prices divided by the variance of gold prices.
findings are statistically significant, however it is an interesting trend with silver price moves more related to those with copper price changes (as opposed to apparent lower price relations with gold shown in figure 3).

**Demand breakdown**

Figure 5 provides a demand breakdown from 2018 for both gold and silver. Silver has many industrial applications including electrical, photovoltaic and others, which collectively accounted for nearly 60% of total demand (Figure 5). By comparison, industrial demand only accounted for 7% of total demand for gold in 2018. As such, U.S. and global economic growth trends have a much larger impact on silver than gold. Investment demand for silver represented 15% of demand, whereas for gold 30% of total demand is for investment, not including demand from central banks (another nearly 15%).

This relationship between industrial and investment demand and gold and silver can be viewed under the recent pandemic. Since late February, when the virus began to significantly

As discussed in the next section, industrial uses for silver are significantly higher than for gold and thus more aligned with overall economic cycles. To measure silver’s sensitivity to economic activity, a silver (copper) beta is calculated (using copper prices as a proxy for the economy) and shown in Figure 4. From the mid-1980s through the 1990s, silver’s sensitivity to moves in copper prices is low, with this beta averaging below 0.10 (where 0.0 implies zero correlation). Since the turn of the millennia, the silver (copper) beta is higher, averaging closer to 0.4). Note, however, with overlapping confidence intervals between the two displayed regimes, we cannot conclude these

**Figure 5 – 2018 Gold and Silver Demand Breakdown**

Source: World Gold Council, Silver Institute, Tom Brady, and Murenbeeld & Co.
impact global financial markets, silver prices have declined by over 20%, with gold only declining ~1% (thus driving the gold to silver ratio to record territory).

**Market Investment Demand**

To further understand the relationship gold and silver and the financial investment markets, correlations between prices and respective ETF holdings and speculative positions have been calculated. Figure 6 summarizes correlations with respective global ETF holdings. As shown, since the inception of these funds (in 2004 for gold and 2006 for silver), daily gold price moves are very highly correlated with changes in gold ETF holdings. By comparison, silver prices are much less correlated with holding changes in silver ETFs (as have been negatively correlated over the last 5 years).

Similarly, Figure 7 displays correlations between gold and silver prices with respective speculative net-long futures positions on the Comex. As shown, in 1990s silver prices appear to be more sensitive to weekly changes in speculative positions. This has reversed since 2000 with both metals experiencing periods of high and lower correlations with respective speculative interests.

To summarize, compared with silver, gold prices are significantly more correlated with investor preferences toward respective ETFs and slightly more sensitive to speculative interest.

Since the onset of Covid-19, gold ETF holdings have increased by over 3M ounces (or by 4%) while silver ETF holdings have liquidated 4M ounces (or ~22%). On the Comex, net-long speculative futures positions have declined for both metals: 6.4M ounces for gold (or down 17%) and 5.5M ounces (down 55%) for silver.

Overall, silver with its strong tie with overall global economic activity and gold’s sensitivity to investor preference for safe-havens have driven the gold to silver ratio to record levels. At this point, I am expecting the current global recession to persist well into the third quarter of this year, followed by a slow recovery. As such, I am anticipating the ratio to persist (in the 100 range) over the coming weeks.

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2These positions are net-speculative long positions (long – short) futures contracts on the Comex and include positions from both commercial and non-reportable (using weekly data).
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