Silver Monitor

Capitalight Research Inc.

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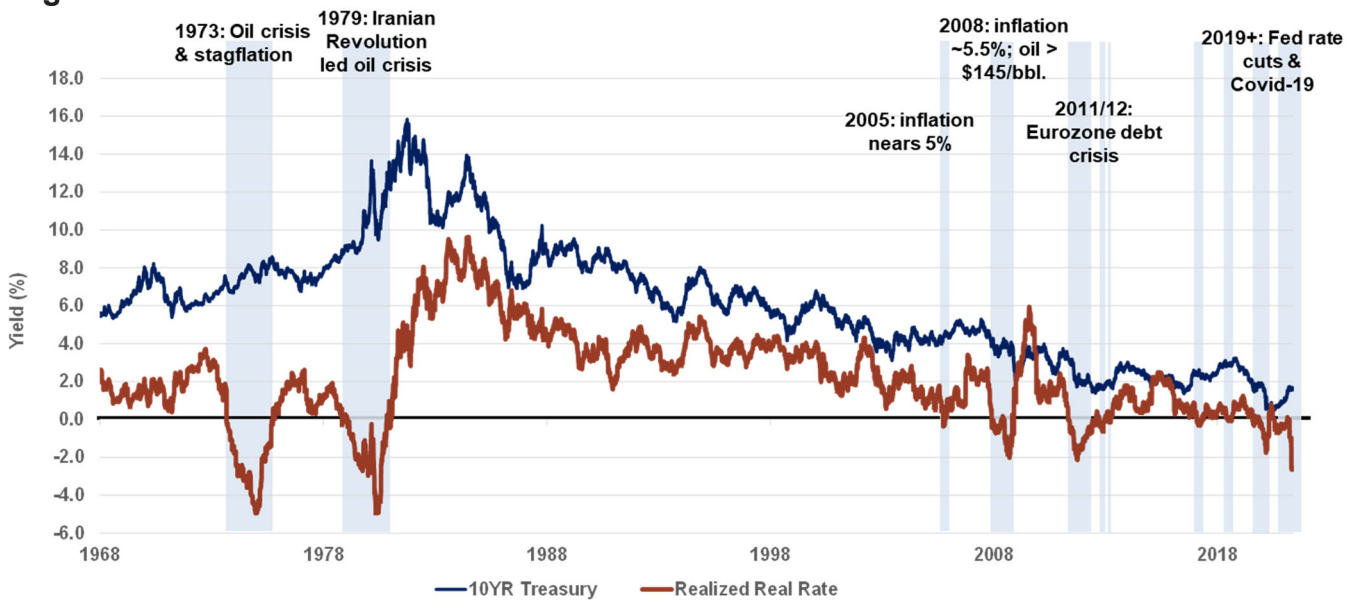
Silver Prices and Real Interest Rates

This month our in-depth analysis looks at the relationship between silver and real-interest rates (or rates that exclude inflation). Focusing on the 10-year US Treasury yield we start by taking the nominal and subtracting the headline consumer price index to give us a real yield – or how much is the 10-year yield (realized yield) after inflation is considered. Figure 1 displays the US 10-year Treasury (nominal with the blue line) and the realized yield (red line) back to the late 1960s.

Considering that the aforementioned US 10-year Treasury nominal yield is comprised of duration risk (or the time until the principal is returned to an investor) and inflation risk (or how inflation can erode the value of the interest and principal values) it follows that, in general, that realized real yields would be somewhat in line with nominal yields, which is the case most of the time. However, during times of economic crisis and recessions this relationship can change. As highlighted with the shaded areas of Figure 1 when realized real rates have been negative, the most drastic of these dislocations occurred during the 1970s with the oil

Sections:

Figure 1: Nominal and Realized Real Interest Rates



Source: Bloomberg, Capitalight Research

crisis and Iranian revolution, when the 10-year nominal yield was rising, but inflation was rising faster, which pushed the realized yield negative. This was also the case during the 2008 Great Financial Crisis and the 2011/2012 Eurozone debt crisis. Since November 2019, rates have again been negative resulting from Fed rate cuts, particularly at the onset of the Covid-19 Pandemic.

Table 1 below shows the price returns during each of the periods when the real interest rate was negative for both silver and gold. As shown in the 3rd and 4th columns in the table, silver and gold price returns during periods of negative real rates have been mixed. Also displayed are price returns over the subsequent 1-, 3- and 12-months when real rates are in negative territory. Following the negative rate periods in the 1970s, 1980s and in 2005, both silver and gold prices responded favorably. In general, however, following the negative rate environment during the Global Finanacial Crisis (late 2007 through November 2008) and onwards, the positive price response breaks down, particularly for silver. On average (last row of Table 1), silver and gold prices tend to react positively over the following 1 month to 1 year when real rates are negative. It is also interesting to note on the table, that, while not consistent, both during or after periods of negative rates, silver tends to outperform gold (either positively or negatively) which echoes our earlier findings discussed in our September 2020 Silver Monitor.

On average, silver and gold prices tend to react positively over the following 1 month to 1 year when real rates are negative. It is also interesting to note on the table, that, while not consistent, both during or after periods of negative rates, silver tends to outperform gold (either positively or negatively).

Table 1: Silver & Gold Price Returns (when real rates are negative)[1]

		Price Returns							
Negative Real Rates		Current (Over Period)		Next 1-Month (Avg.)		Next 3-Months (Avg.)		Next 12-Months (Avg.)	
Period Start	Period End	Silver	Gold	Silver	Gold	Silver	Gold	Silver	Gold
Sep-73	Sep-75	71%	32%	3%	1%	8%	6%	7%	4%
Nov-78	Dec-78	-5%	-11%	1%	3%	25%	20%	192%	96%
Jan-79	Jan-81	130%	141%	6%	4%	20%	13%	25%	36%
Sep-05	Oct-05	3%	-1%	2%	1%	18%	16%	51%	25%
Dec-07	Nov-08	-30%	-2%	-2%	0%	-4%	1%	-2%	10%
May-11	Dec-12	-20%	14%	0%	1%	-2%	1%	-19%	-9%
Mar-13	Apr-13	-2%	1%	-10%	-6%	-26%	-15%	-28%	-16%
Feb-17	Apr-17	1%	4%	-2%	0%	-7%	0%	-7%	7%
Jul-18	Aug-18	-8%	-3%	-4%	-3%	-8%	-3%	-2%	14%
Aug-19	Apr-20	-7%	15%	0%	1%	2%	6%	51%	20%
Jul-20	Jun-21	24%	0%	1%	0%	2%	-2%		
Avg. (1968 +)				2%	1%	6%	5%	12%	13%

Source: Bloomberg, Capitalight Research

1. Negative interest rate periods have ranged in length from ~1 month (in September 2005) to over 2 years (September 1973 to September 1975), with the current period approaching 50 weeks.

Real Interest Rate Correlations

Table 2 summarizes the correlation of silver prices, gold prices, and the S&P 500 during periods when real rates are either positive or negative. As mentioned previously, negative interest rate environments generally occur during times of economic turmoil and or financial recessions. As such during these periods, gold, silver and equities tend to decline and thus the positive correlations in the 1st row of the table. When real rates are positive, there is a tendency for investors to migrate out of silver, gold and equities as interest returns on fixed income assets improve. As an example, in the Spring of 2013, real interest rates where positive and increasing. At this time, the U.S. Fed threatened to increase the Fed Funds rate, silver and gold prices declined, while equities remained relatively flat[2].

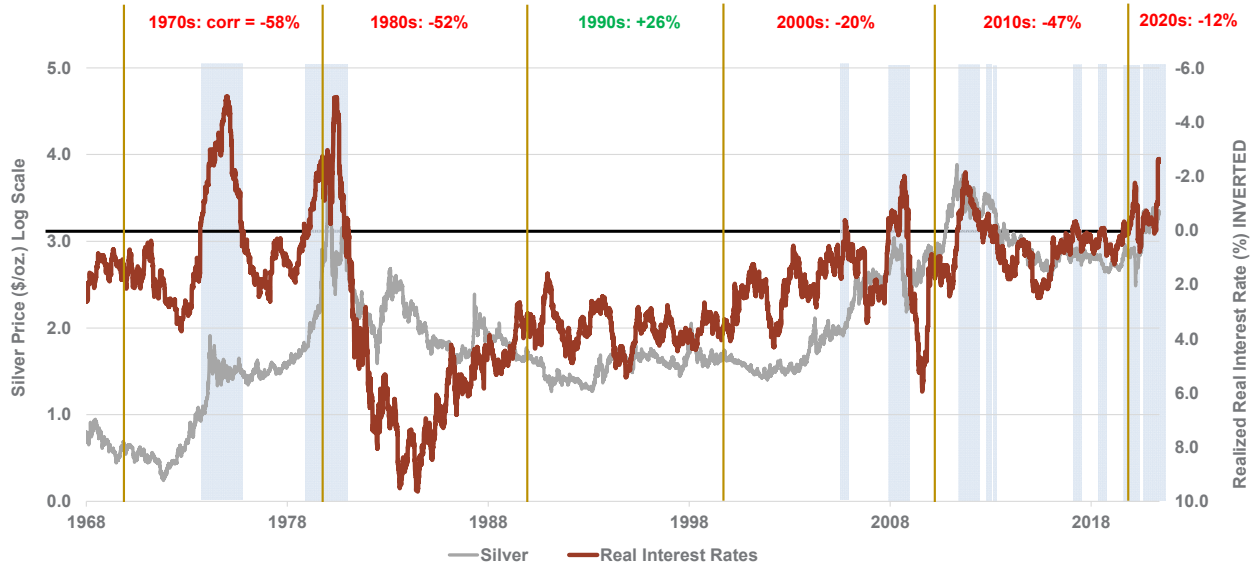
Table 2: Overall Correlations (when real rates are positive and negative)

	Correlations		
Real Interest Rate	Silver	Gold	S&P 500
< 0%	38%	52%	51%
> 0%	-25%	-28%	-43%

Source: Capitalight Research (based on daily data, 1968 onward)

In Figure 2 below we chart the same realized real interest rate (red line in Figure 1) with silver prices, but with a twist, we inverted the axes on the realized rate line – so now when the realized rate is negative is on the top of the chart[3]. The reason we show it this way is because the correlation of the real yield with silver prices is generally negative. As shown, the negative correlations exceeded -50% during the 1970s and 1980s. The inverted relationship

Figure 2: Realized Real Interest Rates & Silver Price Correlations



Source: Bloomberg, Capitalight Research

2. This was known as the "Taper Tantrum".

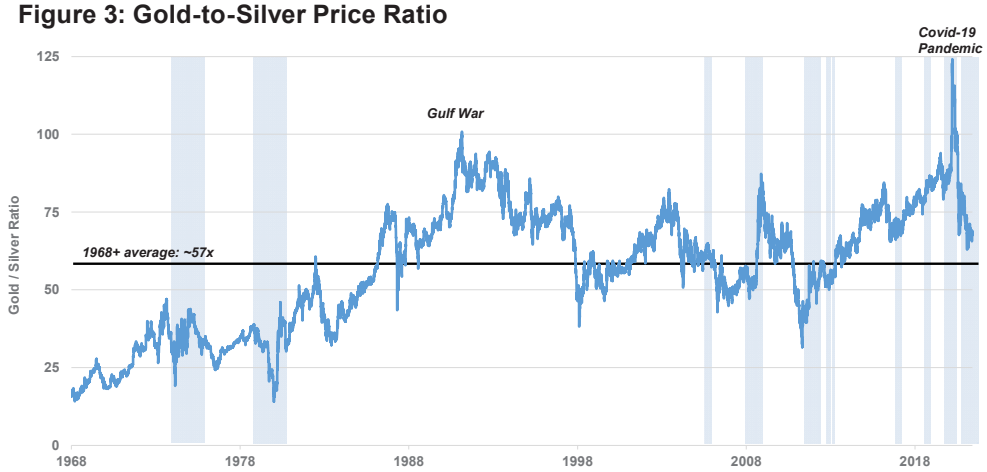
3. As mentioned last month, with the volatility of silver prices over past 30+ years, we include prices in log form. With this type of scale, a price increase from $5 to $10/ounce (or 100% increase) is shown similar to a price increase of $25 to $50/ounce (also a 100% increase). This assists in providing more detail to changes without the excessive influence of very high price spikes (such as in 2011 when silver approached $50/ounce)..

disappeared during the 1990s when real yields and silver prices were somewhat flat, but has returned since the turn of the millennium (though to a lesser degree).

The Gold/Silver Price Ratio and Negative Real Rates

Figure 3 displays the gold to silver price ratio overlaid on the aforementioned periods of negative real interest rates (shaded areas)[4]. The ratio hit an all-time high of over 124x in March of 2020 when the Covid-19 Pandemic became more widespread globally. Currently the ratio is slightly under 70x, over the longer-term average of ~57x. Through quick inspection of the shade areas on the figure, the gold to silver ratio appears to first decline during the earlier stages (indicating silver prices outperforming gold) and then to increase through the remainder of the period (gold outperforming silver).

Figure 3: Gold-to-Silver Price Ratio



Source: Capitalight Research

Table 3 summarizes gold/silver ratios over the time spans of negative real interest rate periods. For each period (row), the gold/silver price ratio is presented at the beginning of the period, at the 1st quartile (25% column), midpoint (50% column), 3rd quartile and at period end. In addition, for a given period, higher ratios are shown in darker blue with lower ratios lighter in color. As shown, in general there is a tendency for the ratio to decline in the earlier stages of a negative rate environment (see the 25% and 50% columns with lighter blue colors and lower relative ratios) and then to increase as the period matures and ends[5]. In other

Table 3: Gold/Silver Ratio Trends During Negative Real Rate Periods

Negative Real Rates		Gold / Silver Ratio *(During Negative Rate Period)*				
Period Start	Period End	Begin	25%	50%	75%	End
Sep-73	Sep-75	41	30	39	42	31
Nov-78	Dec-78	37	36	34	33	34
Jan-79	Jan-81	36	32	17	39	38
Sep-05	Oct-05	62	62	60	61	61
Dec-07	Nov-08	55	50	53	60	81
May-11	Dec-12	39	53	49	57	55
Mar-13	Apr-13	55	55	55	55	56
Feb-17	Apr-17	70	69	69	69	73
Jul-18	Aug-18	78	78	79	80	82
Aug-19	Apr-20	89	85	84	88	113
Jul-20	Jun-21	84	79	73	68	69

Source: Capitalight Research

4. 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
5. Note, the 25% column represents the gold/silver ratio during the 1st quarter of the negative interest rate period; 50% is the ratio at the halfway point.

words, during the initial trading days/months of a negative rate period, silver prices generally outperform gold, only to reverse as the period matures and ends.

Summary and Outlook

In the aftermath of Covid-19 with Fed policy rate cuts and higher inflation, realized real interest rates have been negative for nearly the last full year. In addition to this current episode of negative rates, the U.S. has experienced 10 additional periods since the early 1970s, with some relatively short (lasting less than 1 month as in 2005 and in 2013) and others extending over multiple years (1973-75 and in 2011-13). Until the Global Financial Crisis, silver prices responded favorably both during and post negative interest periods. Since the GFC, however, the silver price response has been mixed and, while not consistent, the silver price does outperform gold both in positive and negative directions. In addition, through examination of the gold/silver price ratio during a given negative rate period, silver prices generally outpace gold (resulting in lower ratios), only to underperform as the period matures. Within the current negative period, silver has definitely outpaced gold with the gold/silver ratio declining from 84x to 69x currently. If past trends repeat, as this negative rate period persists and eventually ends, this trend should reverse with gold prices outperforming silver.

Until the Global Financial Crisis, silver prices responded favorably both during and post negative interest periods. Since the GFC, however, the silver price response has been mixed and, while not consistent, the silver price does outperform gold both in positive and negative directions.

The Silver Price Outlook and the Macroeconomic Environment

Over the last several months we have examined the relationships of silver prices with various macro-economic variables. Starting with our March 25 report where we discussed silver prices and the US dollar. We reviewed three different measures of the US dollar, the DXY, the Federal Reserve's Broad Trade Index and our Silver Demand Index (where currency weightings are based on annual silver demand data). Our analysis shows that the negative correlation between the US dollar and silver prices held up during times when the US dollar both appreciates and depreciates. Focusing on four main factors that tend to drive US dollar movements: trade flows, interest rates, economic growth, and investor appetite for risk, our outlook was that the US dollar will moderately strengthen over the near-term, weighing on silver prices.

In the April 26 Silver Monitor we turned our attention to the current hot topic of inflation. We looked at different methods of measuring inflation. We started with concurrent inflation, including the Consumer Price and the Personal Consumption Expenditure

indices, then reviewed measures of expected inflation, such as consumer survey-based measures, analyst expectations, and market-based methods. We concluded with a discussion of the relationship between silver prices and inflation measures answering the question: *As concurrent or expected inflation measures record higher values from less than 0% to over 3% inflation, do subsequent silver price returns migrate from negative to less negative to slightly positive to positive? The answer was yes! In general, as the market prices in higher future inflation levels, average silver price returns over the subsequent 12-months increase. Current higher levels of realized and expected inflation should provide a boost to silver!*

Then in our May 20 Silver Monitor we explored the relationship between nominal interest rates (or rates that include inflation) and silver prices. In the analysis we looked at the relationship between silver prices and the fed funds target rate, medium- and longer-term rates, and then with the shape of the overall the yield curve. The combination of the Fed continuing to signal its intention to keep target rates low – and inflation expectations increasing as the economy recovers has steepened the yield curve in recent months. We expect it to steepen further in coming months, which is favorable for silver prices. Our conclusion: *While not consistent, we do find evidence supporting an "opportunity cost" thesis between silver and nominal interest rates (or increases in interest rates weigh on silver prices). However, while silver prices generally have an inverse relation with interest rates, positive correlations are shown to exist with interest rate spreads (or in other words, silver prices tend to react favorably to a steepening of the U.S. bond yield curve).*

Our deep dive this month has explored realized real interest rates calculated as the difference between yields on the 10-year Treasury less inflation via the posted Consumer Price Index.

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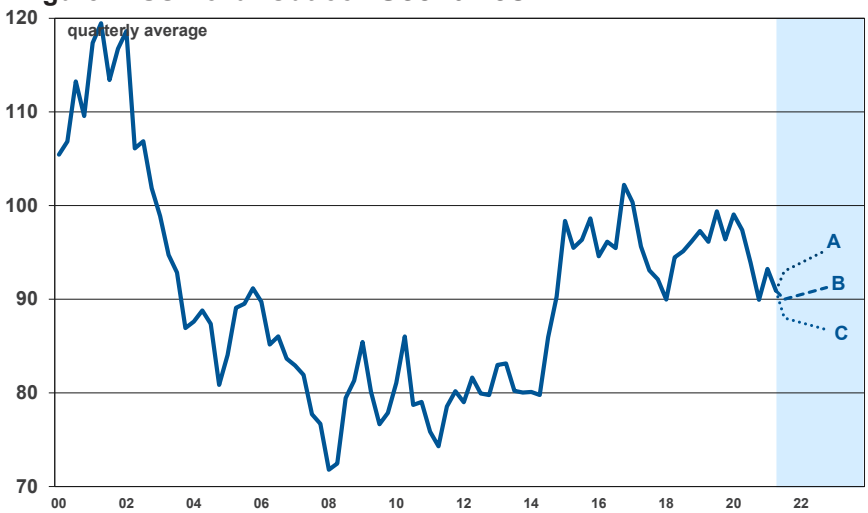
In our three forecast scenarios we make assumptions about the macroeconomic environment. For example, in Scenario A our assumptions include: the US dollar strengthens due to the Fed tightening policy sooner than other central banks. This scenario also includes higher both nominal and real-interest rates. In Scenario B, our baseline scenario, the US dollar continues to

be somewhat firm due to the US economy outperforming its peers, but the Fed (and ECB) remains behind the inflation curve, which leads to higher inflation expectations, and lower real-interest rates (the fact that the Fed is determined to let inflation run above their 2% target, the growing US government debt, and income inequality are some of the factors we consider with this outlook). And in Scenario C, the US dollar weakens (due to pressure from the US Administration), inflationary pressures build faster than currently anticipated (real-interest rates decline further in this scenario). It follows that the macroeconomic environment outlook then works into the silver supply/demand outlook.

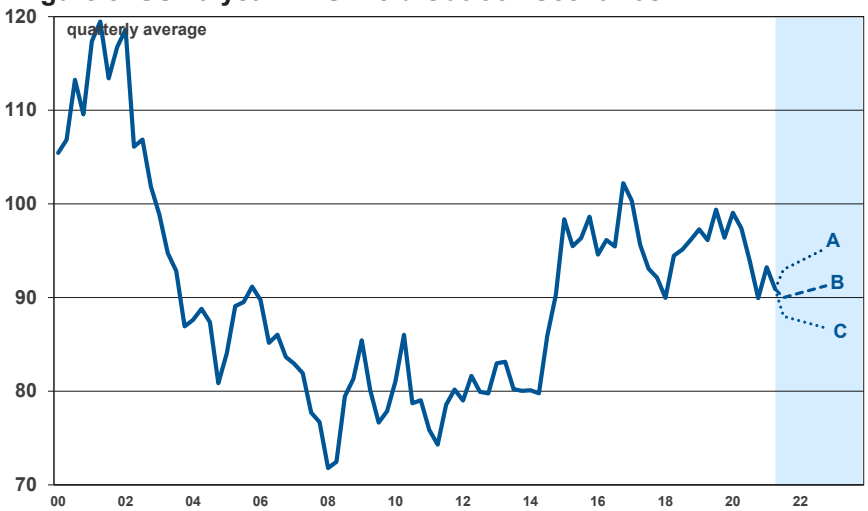
Our silver forecast model incorporates real interest rates. However, rather than using the aforementioned realized rate (discussed in the in-depth section above)[6], we incorporate the market implied interest rates from Treasury Inflation Protected Securities (or TIPS). In addition, we update our forecasts each quarter so that we can incorporate new developments into the forecast scenarios.

Figure 4: US Dollar Outlook Scenarios



DXY Index
Source: Bloomberg, Capitalight Research

Figure 5: US 10-year TIPS Yield Outlook Scenarios



Source: Bloomberg, Capitalight Research

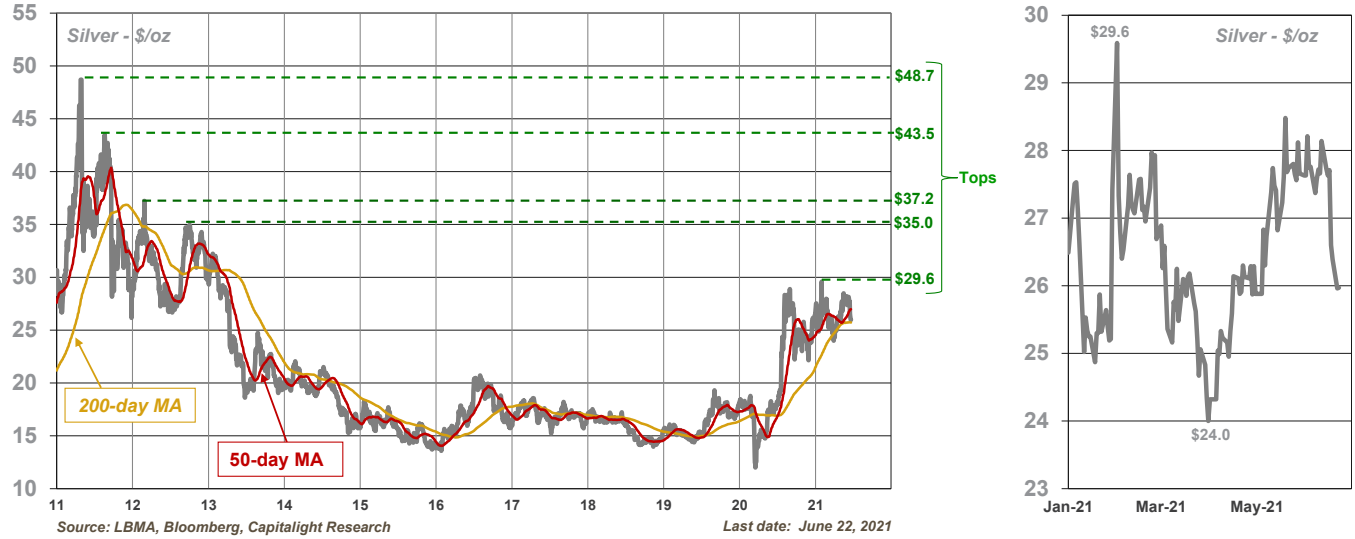
Capitalight Silver Price Forecast – Update

As shown on Figure 6, the silver price has averaged $26.47 this year-to-date (this compares to an average of $16.56 over the same time period in 2020). The 2021 year-to-date high was set on February 1 at $29.6 and the low was set on March 31 at $24.

The silver price has ranged between $24.32 and $28.48 and has averaged $26.70 to date in Q2, slightly above our probability-weighted forecast of $25.8 on March 25.

6. Since 2003, silver prices and the 10-year TIPS yields have strong negative correlation (~-70%).

Figure 6: Silver Prices (2011 onward)



Our current outlook for the silver price is still constructive but has been lowered slightly from the March report. We expect the headwinds that kept the silver price in the $24-$28.5 range to dissipate over this coming year as the global economy recovers post-Covid-19.

As the discussed above, the US dollar will likely to continue to be firm in the near-term, which will, all else equal, weigh on silver prices. However, the yield curve is expected to steepen as inflation (both realized and expected) continues to rise and the Fed holds rates low at the short end of the curve for the time being. Our projection is that the Fed will not raise interest rates until after the forecast period, although the tapering of its asset purchases will likely commence sooner.

Our updated silver price outlook for the next six quarters is shown in Figure 7. The objective of our outlook is to provide the reader with three silver price scenarios that are based on plausible global financial and economic developments measured via statistical

Figure 7: Capitalight Silver Price Outlook (June 2021)

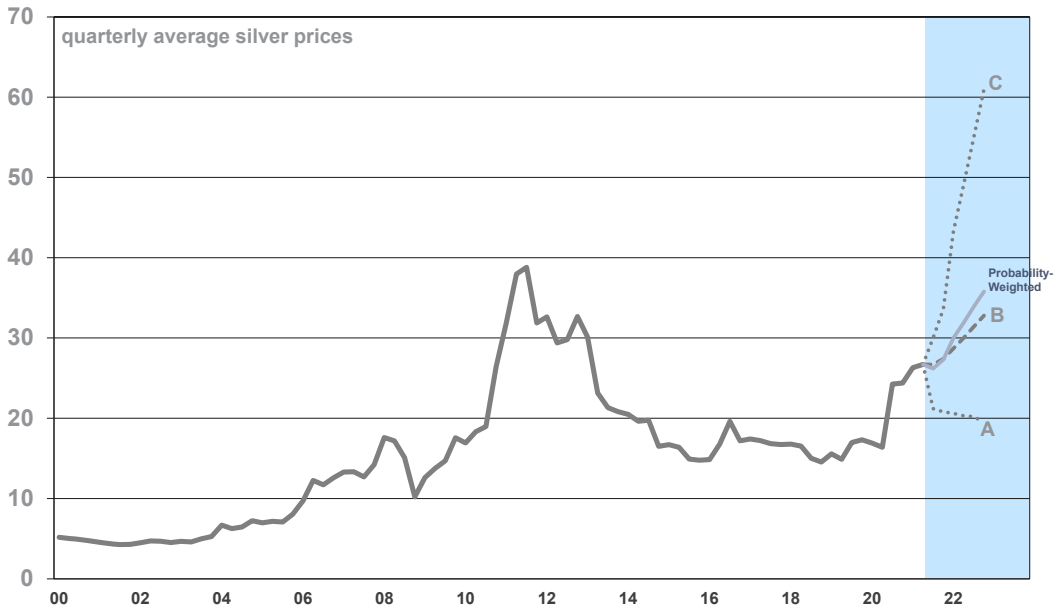
		To Date										
		20-2	20-3	20-4	21-1	21-2	21-3	21-4	22-1	22-2	22-3	22-4
Actual		**16.4**	**24.3**	**24.4**	**26.3**	**26.7**						
Scenario	**A**						21.2	20.8	20.6	20.3	20.2	19.5
	B						**26.7**	**27.4**	**28.7**	**30.0**	**31.4**	**32.8**
	C						30.0	33.6	43.3	49.1	55.0	61.0
Probability	**A**						0.20	0.20	0.20	0.20	0.20	0.20
	B						0.60	0.60	0.60	0.60	0.60	0.60
	C						0.20	0.20	0.20	0.20	0.20	0.20
Probability-Weighted							**26.2**	**27.3**	**30.0**	**31.9**	**33.9**	**35.8**

Source: Capitalight Research

analysis. Each scenario is given a subjective probability based on our view of things. We believe our scenarios cover all the bases (i.e., 95% of probable outcomes), but unforeseen events can always affect the outcome.

Scenario B factors in headwinds (i.e. firmer dollar) over the next two quarters. After that, the price rises on increased consumer and industrial demand, along with the above-mentioned steeper yield curve and low real-interest rates.

Figure 8: Silver Price with Outlook Scenarios



Source: Bloomberg, Capitalight Research
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