THEMATIC

Value Range

USD 22-24/oz

Thursday, 11 August 2022

Precious Metal Prices	(10/08/2022)
Silver (USD/oz)	20.54
Gold (USD/oz)	1,791.76
Platinum (USD/oz)	937.00
Palladium (USD/oz)	1,844.17
Rhodium (USD/oz)	14,800.00

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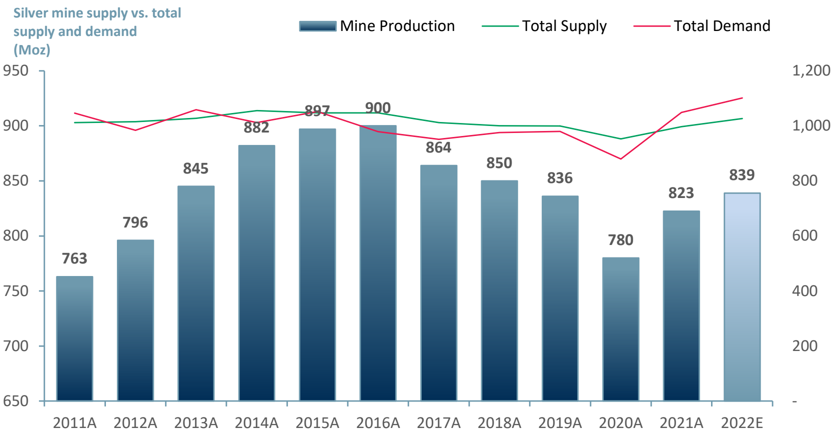
Silver (Ag) Market

The Janus Metal

Silver (Ag) is half store of value and half industrial metal. A hawkish Federal Reserve and spiking bond yields will create significant headwinds for the Ag price 2H22E. Any expectations for global recession, leading to an industrial cycle downturn will also push the silver price down. In 2H22E we assess that both weakening industrial activity (>50% of global silver demand) and monetary policy trends will exert downward pressure on silver's price. Beyond YE22E the physical silver supply deficit remains a positive for the silver price. As the world transitions to greener forms of energy and transport, the commensurate increasing use of silver in electronics and photovoltaics should support structural demand growth and so raise silver's mid-term price beyond YE22E because of the structural silver supply deficit.

- We forecast mined silver production up 7% to 887 Moz in 2022;
- We forecast an Ag physical deficit in 2022 (industrial demand);
- Fed monetary tightening expectations to weigh on the Ag price 22E;
- Global silver reserves were ~503 kmt in 2020 (US Geological Survey).



Sources: ACF Equity Research Forecasts; The Silver Institute.

Investment Case

Federal Reserve actions to dictate the direction of silver prices.

Silver prices fell in 2021 and are likely to remain under pressure in 2022 amid actual and anticipated rate hikes by the Federal Reserve. We think monetary policy and a slowdown in global economic growth will weigh on the sliver price 2H22E, despite a mid and long term robust industrial demand outlook.

The new exports element of the PMI stood at 47.9 in May 2022, indicating contraction. This was the first reading below 50 since July 2020.

Industrial demand - More than 50% of silver's annual demand is from industrial activity. Industrial demand is showing signs of a slowdown due to China's continued zero Covid lock down policy, the Russia-Ukraine conflict creating supply chain disruptions and driving energy input costs up. The global manufacturing Purchasing Managers Index (PMI), which is a proxy for industrial demand, declined in May 2022 led by a drop in demand, disruption from supply chains, elevated inflationary pressures, the war in Ukraine and the lockdown in China.

Silver market to remain in deficit in 2022.

We project that the silver market will remain in supply deficit during 2022 as, in spite of looming economic contraction, demand is still likely to outpace supply. We expect total silver supply (including recycling) to touch 1,093 Moz, while demand is projected at 1,111 Moz, or 1.62% above supply, in 2022.

Store of value - Silver is considered a store of value, a safe haven and a hedge against inflation. Inflation has been running high globally, with both the EU and the US reporting multi-decade high inflation numbers. In the UK, annual inflation rose more than expected, advancing 7.8% in April 2022, a new 40-year high. The US inflation rate accelerated to reach 8.6% y/y May 2022, the highest reading since 1981. Higher inflation numbers are adding to the risk-off sentiment in the marketplace. Risk-off sentiment is positive for the silver price.

Despite favourable mid-term demand and high inflation, the trajectory of silver prices will be determined by the actions of the Federal Reserve. The US 10-year bond yields are nearing 3.5% and a rising yield typically makes non-yielding precious metals such as silver less attractive.

The magnitude of the increase in rates will determine the impact on prices. For now, we expect the Federal Reserve to end 2022 with benchmark interest rate at 3%-3.5% (versus current expected range of 2.25%-2.5% up from 1.5%-1.75%).

Catalysts

Positives: China's economic recovery; Automotive and photovoltaics demand; Silver as a risk-off investment. **Negatives:** Russia-Ukraine conflict; Supply disruptions; Energy cost rises; Bond yields increasing (US 10-year).

Silver Market

Silver is the most affordable and most abundant of all the precious metals (exhibit 1). Much like gold, silver is coveted as an investment option and is available in the form of coins, bars and jewellery.

Exhibit 1: **Price and relative crustal abundance of precious metals**

Metal	Price (US$/kg)	Crustal Abundance (pp bn)
Silver (Ag)	868	75
Palladium (Pd)	75,539	15
Platinum (Pt)	40,957	5
Gold (Au)	56,975	4
Rhodium (Rh)	736,258	1

Sources: ACF Equity Research Graphics; CRC Handbook of Chemistry and Physics.

The three main price drivers for silver are demand from industry, physical investment and jewellery.

Silver possesses notable physical properties including the ability to endure extreme temperatures, high reflectance of light, thermal and electrical conductivity (the highest of all metals), and high malleability and ductility. These versatile physical characteristics lend silver to several uses. Its electrical conductivity lends it to use in the **industrial sector** (e.g., renewable energy infrastructure and automotives), and its stability and malleability lend it for use as a **physical investment** in the form of bars and coins and in jewellery.

Exhibit 2: **Physical characteristics of silver vs. other metals**

Metal	Electrical conductivity ($10\times e^{6}$ S/m)	Thermal conductivity (W/m K)	Melting temperature (°C)
Silver	62.1	420	961
Copper	58.7	386	1083
Gold	44.2	317	1064
Nickel	14.3	91	1455
Platinum	9.3	107	1772

Sources: ACF Equity Research Graphics; Tibtech Innovations.

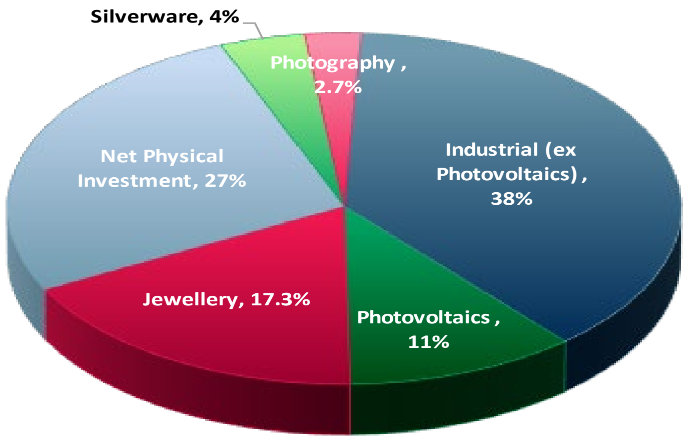
Industrial activity accounts for more than 50% of silver's annual demand today.

We expect the industrial proportional contribution to silver demand to rise.

Silver has many industrial applications such as in mirrors, electrical and electronic products, and photography. Industrial applications accounted for more than 50% of silver demand in 2021 (see exhibit below). This was followed by physical investment (coins and bars) at 27% and jewellery at 17%. The strong industry link implies that demand for silver often correlates with economic output. As such, silver prices are, in part, linked to overall global economic activity and macroeconomic expectations.

Industrial silver demand was estimated at 508 Moz in 2021, up 9% y/y and slightly above pre-pandemic levels. Within industrial demand, electrical and electronics accounted for the majority of demand 2021.

Exhibit 3: **Industrial uses of silver 2021A**



Sources: ACF Equity Research Graphics; The Silver Institute

Peru, Poland, and Australia host ~50% of global economic silver reserves.

Global economic silver reserves were estimated at 500 kmt (~18 bn oz) in 2020, according to data from the US Geological Survey. Peru, Australia, and Poland have the largest silver reserves with 91k, 88k, and 70k metric tons, respectively. In terms of production, Mexico, Peru and China were the top three silver producing countries in 2020.

In the exhibit 5 below we use a single-phase model to examine the effects of higher growth rates for industrial demand for sliver vs. financial demand for physical silver. In the scenario we illustrate, industrial demand for silver accounts for 63.6% of all physical silver demand by 2032E.

Our assumptions are relatively modest for the growth of industrial uses of sliver vs. financial uses. We forecast an overall 10 year CAGR of 3% for total physical demand.

Within the model breakdown we assume a 4.5% growth rate of industrial ex photovoltaics (drivers EVs, Avs, 5G, healthcare et al), 5.5% growth for photovoltaics (solar renewable energy generation), which is probably modest over a 10 year view, and 1.5% for other industrials (photography and silverware). We assume 1% growth rate in investment demand for physical silver.

Exhibit 4: **Top 20 silver producing countries**

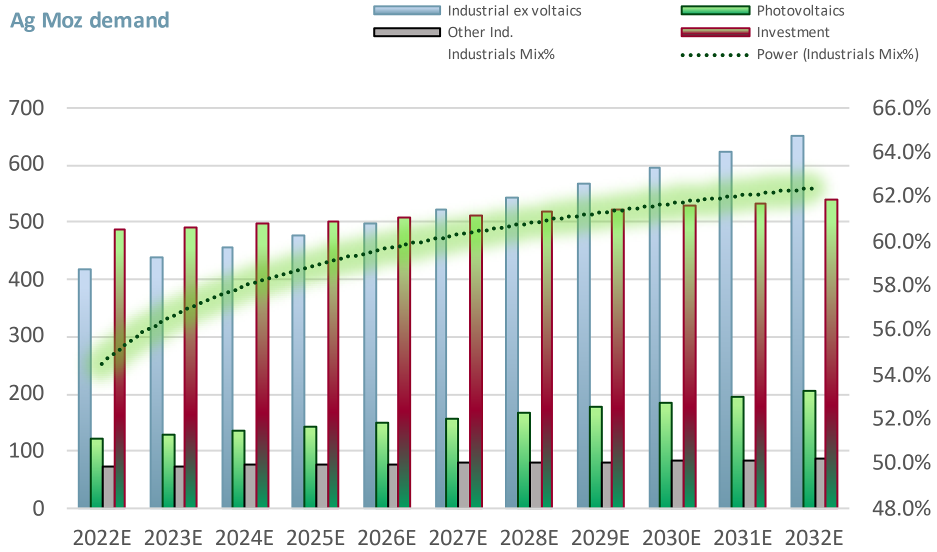
Silver is mostly obtained as a by-product of mining other metals such as Cu, Zn.

Million ounces (Moz)	2021	Change (%) y/y
Mexico	196.7	9%
China	112.9	3%
Peru	107.9	6%
Australia	42.9	0%
Poland	42	7%
Bolivia	41.5	39%
Chile	41.2	-13%
Russia	39.0	-8%
United States	32.5	3%
Argentina	26.5	16%
India	22.2	3%
Kazakhstan	15.3	-12%
Sweden	13.9	4%
Indonesia	10.8	30%
Morocco	9.3	16%
Canada	9.0	-5%
Uzbekistan	6.8	9%
Turkey	5.5	38%
Dominican Republic	3.4	-18%
Portugal	3.1	2%
Others	40.4	8%
Total	**822.8**	**6.8%**

Sources: ACF Equity Research Graphics; The Silver Institute.

Exhibit 5: **Demand development forecasts for industrial Ag 2022-32E**

In our model we estimate industrial demand will account for >63% of all physical silver demand by 2032E, up from around 55% YE22E.

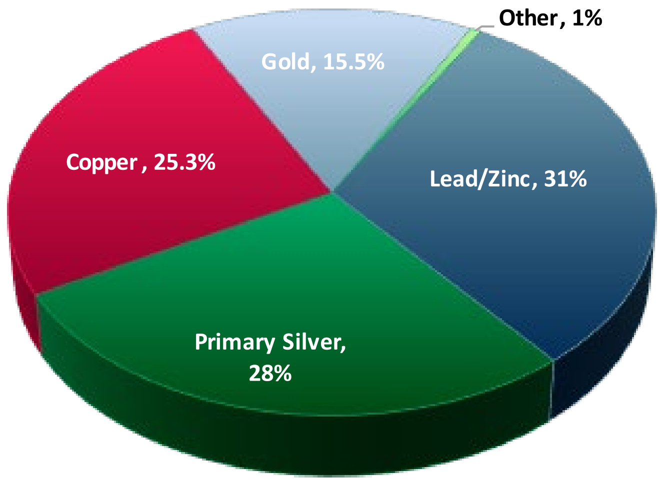


Sources: ACF Equity Research Estimates; The Silver Institute.

Mexico-based Fresnillo Plc was the world's largest producer of silver in 2020A.

Mined production - It is important to note that only 28% of mined production came from primary silver mines in 2021. Remaining production was mostly collected as a by-product through the mining of other metals like copper, lead, zinc, and gold, which accounted for 72% of total production in 2021. This means that silver's fortunes are tied to other metals. Nearly 56% of silver was produced from copper and lead/zinc operations in 2021 and the mining of these industrial metals has a dominating effect on how much silver is produced each year.

Exhibit 6: **Silver mine production by source metal 2021A**



Sources: ACF Equity Research Forecast; Metals Focus.

Scrap production - Other than mine production, the only other significant silver supply is from recycling or scrap recovery (which means melting of jewellery, silverware and industrial components). During 2021, silver scrap supply was 173 million ounces, according to the Silver Institute. This was an increase of 7% y/y but remains 25% below the recycling seen during the peak-price cycle of 2011 and 2012 (232 million ounces per year).

Company production – Silver production at the company level is diversified. In 2021, the top silver producer was UK-listed, Mexican miner **Fresnillo Plc** (LSE: FRES). The company produced a total of 50 Moz of silver. Following Fresnillo, the next top producers were:

- **KGHM Polska Miedz** (WSE: KGH) which produced 43.9 Moz,
- **Glencore Plc** (LSE: GLE) which produced 31.5 Moz,
- **Newmont Corp** (NYSE: NEM) which produced 31.4 Moz,
- **Codelco** which produced 23.6 Moz.

Exhibit 7: Top 10 silver producing companies

Million ounces (Moz)	2021	Change (%) y/y
Fresnillo	50.0	-1%
KGHM Polska Miedz	43.9	1%
Glencore	31.5	-4%
Newmont	31.4	13%
Codelco	23.6	-4%
Hindustan Zinc	22.2	3%
Polymetal Internationa	20.4	8%
Pan American Silver	19.2	11%
Southern Copper	19.0	-12%
Volcan Cia Minera	15.0	24%
Total	**276.2**	**2.8%**

Sources: ACF Equity Research Graphics; The Silver Institute.

Exhibit 8: Peer group - 5 largest listed silver miners by production

In the trading metrics Glencore is excluded from the average and median to reduce distortion.

TTM Metrics / Company Name	Market	Tkr	MCAP US$(m)	EV $(m)	Revs $(m)	EBITDA $(m)	FCF $(m)	GM%	EBITDA M%	EBIT M%	FCF M%
Glencore	XLON	GLEN	74,272	105,672	203,750	16,030	6,350	6.08%	7.87%	4.81%	3.12%
Fresnillo	XLON	FRES	6,661	6,701	2,700	1,190	482	34.87%	44.07%	24.45%	17.85%
Pan American Silver	XNAS	PAAS	5,673	5,415	1,700	559	240	37.60%	32.86%	14.81%	14.10%
KGHM Polska Miedz	XWAR	KGH	4,987	5,669	7,049	1,606	68	20.51%	22.78%	16.35%	0.96%
Polymetal Internationa	XLON	POLY	1,202	2,880	2,890	1,450	255	60.90%	50.17%	42.77%	8.81%
Average								32.0%	31.6%	20.6%	9.0%
Median								34.9%	32.9%	16.4%	8.8%

Sources: ACF Equity Research Estimates; Refinitiv.

In the trading metrics Glencore is excluded from the average and median to reduce distortion.

TTM Metrics / Company Name	Market	Tkr	MCAP US$(m)	Rev / Per Head	FCF / Per Head	RoA	RoE	RoI	β 5yr	Fwd Div (p)	Fwd Div %
Glencore	XLON	GLEN	74,272	2,506,643	78,121	4.99%	12.20%	5.31%	1.49	0.20	0.03%
Fresnillo	XLON	FRES	6,661	343,031	61,221	7.22%	11.82%	8.51%	0.16	0.26	0.03%
Pan American Silver	XNAS	PAAS	5,673	239,437	33,762	4.57%	6.94%	5.89%	1.14	0.44	2.11%
KGHM Polska Miedz	XWAR	KGH	4,987	210,399	2,027	6.98%	26.67%	18.17%	1.55	0.66	2.65%
Polymetal Internationa	XLON	POLY	1,202	215,800	19,023	16.19%	43.43%	22.62%	0.50	0.96	0.37%
Average				252,167	29,008	8.74%	22.22%	13.80%	0.84		1.29%
Median				227,619	26,392	7.10%	19.25%	13.34%	0.82		1.24%

Sources: ACF Equity Research Estimates; Refinitiv.

In the trading metrics Glencore is excluded from the average and median to reduce distortion.

TTM Metrics / Company Name	Market	Tkr	MCAP US$(m)	EV $(m)	EV / REVS	EV / EBITDA	EV / FCF	EV / NI	PER	P/ sales	P/ book
Glencore	XLON	GLEN	74,272	105,672	0.52x	6.59x	16.64x	21.26x	4.77x	0.37x	1.84x
Fresnillo	XLON	FRES	6,661	6,701	2.48x	5.63x	13.91x	15.91x	28.08x	2.45x	1.83x
Pan American Silver	XNAS	PAAS	5,673	5,415	3.19x	9.69x	22.59x	29.79x	24.41x	2.51x	1.59x
KGHM Polska Miedz	XWAR	KGH	4,987	5,669	0.80x	3.53x	83.47x	3.85x	3.39x	0.68x	0.76x
Polymetal Internationa	XLON	POLY	1,202	2,880	1.00x	1.99x	11.30x	3.19x	1.48x	0.39x	0.51x
Average					1.87x	5.21x	32.82x	13.19x	14.34x	1.51x	1.17x
Median					1.74x	4.58x	18.25x	9.88x	13.90x	1.57x	1.18x

Sources: ACF Equity Research Estimates; Refinitiv.

Price setting mechanism for silver

The two major trading centres for silver are the London Bullion Market Association for OTC trading and the Chicago Mercantile Exchange for futures trading

Once the silver is extracted from the ground and processed price setting takes place, silver is traded on over the counter (OTC) market as well as futures exchanges. OTC markets are systems of broker-dealer networks rather than a central exchange. Pricing and spreads are less efficient and fewer counterparties are involved in price setting.

Compared to a centralised electronic exchange there is an increased risk of price manipulation, lower liquidity and aggressive volatility on an OTC market, because of the lower number of market participants.

Over the Counter (OTC) silver price setting

The biggest marketplace for physical or over the counter (OTC) silver is London, where banks and brokers handle buy and sell orders from clients across the world.

Trading is conducted amongst members of the London Bullion Market Association (LBMA), which is an international trade association representing the global over the counter (OTC) market for precious metals trading. Most of the members of LBMA are major international banks or bullion dealers and refiners.

Prices set by the LBMA are internationally recognised as benchmark prices.

The market is underpinned by bars of bullion, which sit in the vaults of large banks such as JPMorgan and HSBC. The London Bullion Market Association (LBMA) represents the market in London. The prices set by the LBMA are in US$ and internationally recognised as benchmark prices.

On average, more than 200m ounces of silver are cleared daily in the London market. All bullion transactions between the clearing members of the LBMA are cleared and settled by London Precious Metals Clearing Limited. The average daily volume of silver cleared at the LBMA auctions in April 2022 was 233.3m ounces valued at US$ 5.7bn.

Physical silver demand in London is underpinned by the LBMA London vault silver holdings. There is some market concern that LBMA's London vaults do not currently hold enough sliver to meet demand.

The numbers published by LBMA suggest it generally holds over a 1bn oz of silver in its vault. However, much of this physical silver, perhaps as much as 85%, is held by funds and as such is not explicitly available for industrial demand. In June 2022 the LMBA London vaults fell below 1bn oz of silver to 997.4 Moz, according to LMBA data.

Over the last 7 months LBMA London vault silver holdings have declined m/m. They are now below 1 bn oz for the first time since November 2016. At the end of June 2022 the LBMA stated that it had 31,023 tonnes of silver in the London vault, down 2.3% vs. May 2022 and down 15.5% y/y.

At the end of May 2022, the amount of silver held in the LBMA London vault was 31,758 tonnes (a decrease of 5.6% vs. April 2022). At the time this silver was valued at US$ 22.2bn and equated to 1,058,598 silver bars.

Futures

Silver is also trades on futures exchanges. The largest silver futures exchanges are the Shanghai Futures Exchange in China and Chicago Mercantile Exchange (CME) Group's Comex in New York, each of which host trading of around half a billion ounces of silver per day.

The CME is the world's largest financial derivatives exchange and the world's largest silver trading centre by volume. In January 2022, a total of 1.28m futures contracts were traded on the CME.

Shanghai Futures Exchange traded nearly RMB 44.5bn (or US$ 6.6bn) of silver on 20 June 2022. All time high traded volumes were printed 12x higher on the 19th August 2020 reaching RMB 542.8bn (or US$ 85.5bn).

Silver supply and demand

We expect the silver market to remain in deficit in 2022 as demand is likely to outpace supply. There is also some short run possibility that industrial buyers may not be able to take delivery of the silver they require out of the London market.

Silver supply to increase 7% in 2022 supported by growth in mine production.

We expect the total silver supply (including recycling) to touch 1,027 Moz in 2022 driven by higher global silver mine production. In our view, mine production could register an increase of 2% in 2022 to 839 Moz.

Mexico, Peru and China are likely to remain the largest contributors towards supply of silver.

We view the strong growth in mine production in 2022 as part of a medium term trend. This growing mine production trend will be driven by higher output from major operating silver mines coupled with large new projects coming online. Mexico, Peru and China are likely to remain the largest contributors towards silver mine production growth during the period 2022E-2025E. We forecast global silver supply will reach 1,122 Moz by 2025E, a compounded annual growth rate (CAGR) of 3%.

Demand for silver likely to outstrip supply in 2022.

Demand is likely to remain strong in 2022 following on from last year when demand rose across all key sectors. Industrial sectors, which account for more than 50% of global silver consumption will be key drivers in 2022, albeit growth is likely to be lower vs. 2021, which was 9% y/y and exceeded pre-pandemic levels.

Rising industrial activity to support demand outlook for silver in 2022.

The S&P global manufacturing Purchasing Managers Index (PMI), which is a proxy for industrial demand, declined in May 2022 to 49.7, indicating economic contraction. This is the first reading below 50 since July 2020.

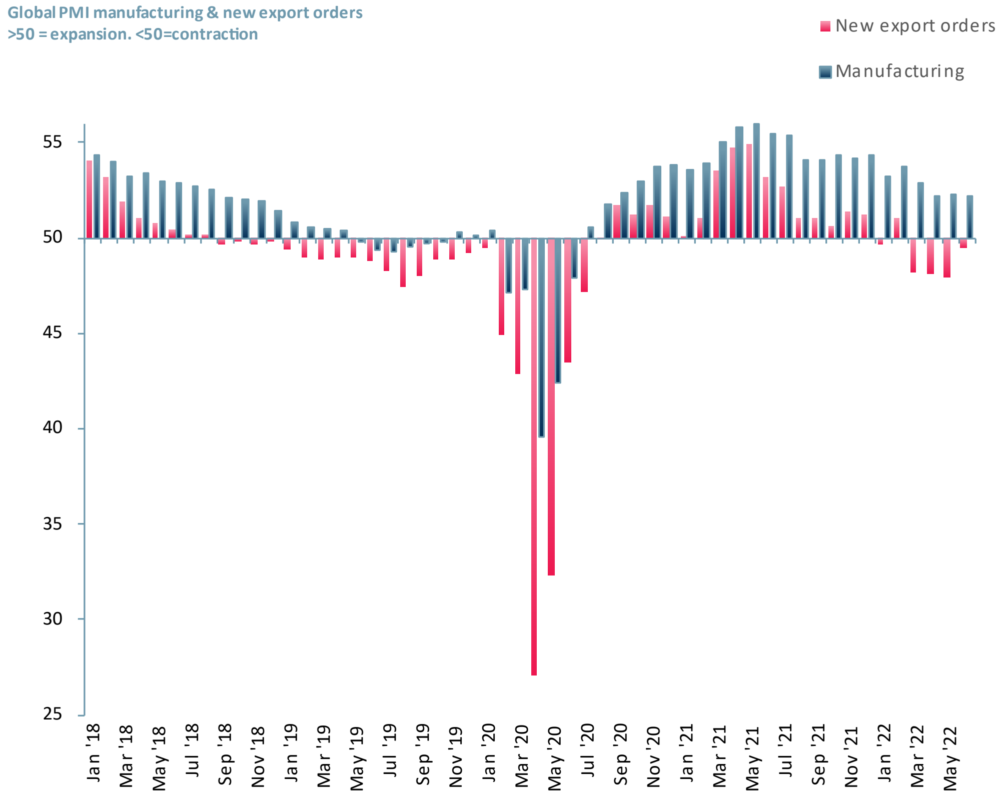
The World Bank/JP Morgan Chase equivalent manufacturing PMI index data is less gloomy and indicates an improvement in sentiment in June 2022, with manufacturing sentiment at 52.2 vs. 52.3 and new export orders sentiment at 49.5 vs. 47.9 in May 2022. Nevertheless, the overall trend is still one of declining confidence overall (see exhibit below).

Drivers for the PMI contraction are supply chain disruption, elevated inflationary pressures, the war in Ukraine and the Covid lockdown in China, and possibly in expectation of higher interest rates to combat inflation.

The transition from fossil fuels to renewable energy should buttress the demand for silver.

Despite the overall slowdown in industrial activity, we expect certain pockets such as green energy to outperform and make up for the lost demand in other areas. The green energy silver uses such as vehicle electrification and photovoltaic cells will drive rapid silver demand growth in 2022. The Ukraine crisis, however, has hurt the recovery in vehicle output and introduced uncertainty, as has the recent rise in Chinese COVID infections.

Exhibit 9: **World Bank global manufacturing PMI 2018A-2022A**



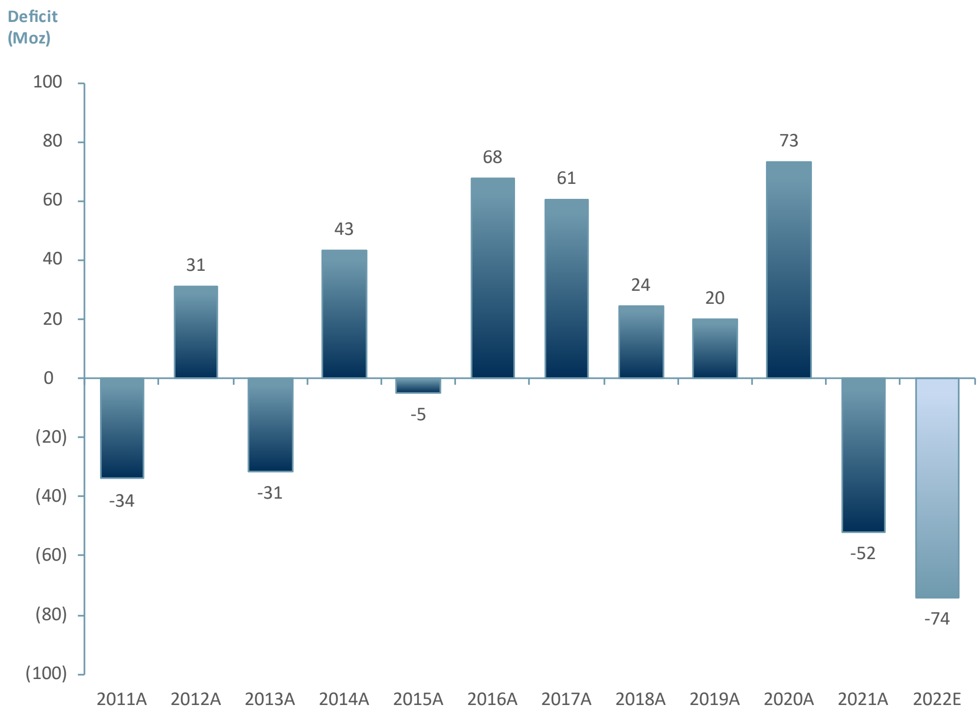
Sources: ACF Equity Research Graphics; World Bank, Haver Analytics, JPMorgan Chase, IHS Markit.

Additionally, there is renewed demand from photography, jewellery, and silverware sectors as well. Overall, we forecast silver demand to rise 5% to 1,101 Moz in 2022 and then further increase at a CAGR of 3% to reach 1,204 Moz by 2025. The transition to green technologies is a leading catalyst for future.

Silver is a key component of photovoltaics (solar panels). Around 11% (114 Moz) of all silver used in 2021 was in photovoltaics. We expect the use of photovoltaics to expand as the world moves to meet its emission criteria.

The European Union, United States and Japan have all committed to net zero emissions by 2050, with similar commitments from China by 2060.

Exhibit 10: **Silver market net supply Moz**



Sources: ACF Equity Research; Silver Institute.

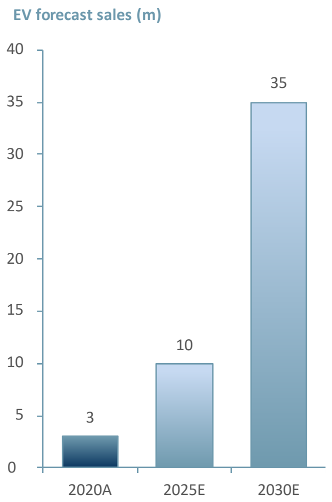
The European Commission (EC) announced a mandate in May 2022 to install rooftop solar panels on public and commercial buildings over the next five years. The aim is to increase EU solar capacity and reduce dependency on Russian fossil fuels faster. The EC solar mandate will boost demand for silver consumption in photovoltaics.

Silver is also used throughout much of the rest of the future renewable energy grid infrastructure including in turbines, grid management systems and batteries used to achieve grid balancing in renewable power generation.

The transition to electric mobility (EVs) is creating demand growth for silver from the automotive sector.

Electric vehicles contain a far greater number of sensors and electric connections than traditional ICE vehicles. Automotive sensors require silver to function efficiently. Silver is used extensively in electrical contacts throughout a vehicle's electronic systems. This includes switches, relays, connectors, circuit-breakers and fuses.

Exhibit 11: **New electric vehicle (EV) sales (m)**



Sources: ACF Equity Research Forecast; IEA.

The Silver Institute notes that an average ICE vehicle needs 15-28g of silver. EV vehicles require 25-50g of silver, an increase of between 67%-79%.

The inevitable, and eventually pervasive, move to autonomous driving in hyper developed economies is leading to a dramatic increase in sensor numbers per vehicle and vehicle complexity, requiring ever more silver consumption. Autonomous vehicles require additional sets for sensors for camera, lidar, radar, microbolometers (night vision) etc. We asses that autonomous vehicles will predominantly also be electric vehicles.

These automotive developments support the case for a rapid mid-term increase in forecast silver consumption. Market participants, including ACF Equity Research, all expect total EV units and autonomous EV units sales volumes to grow faster than ICE unit sales. Global automotive silver demand was 50 Moz in 2020A and is expected to rise to 88 Moz by 2025E, according to the Silver Institute.

Our analysis suggests additional demand drivers for silver as an industrial metal will include the expansion in global connectivity driven by the underlying infrastructure requirements for the rollout of 5G cellular mobile communications networks.

Silver is used in 5G network equipment, and the expansion of 5G networks is a major driver of electronics silver demand over the next 5 years.

Silver prices

Silver price is more volatile than gold due to its wide variety of uses.

The price of silver is more volatile than gold for two reasons – there are fewer counterparties price setting in the silver market than there are for gold and silver. 50% of silver demand comes from its industrial applications.

The industrial demand schedule means that economic activity has a greater effect on the silver prices. However, like gold, silver is viewed as a hedge against inflation and so the price is also affected by inflationary concerns.

We conclude that industrial demand, the silver supply deficit and silver's inflationary hedge characteristics are likely to outweigh the effect of bond yields, monetary policy and a strengthening USD. This leads us to consider the prospects for an upward silver price in 2H22E more favourably than many market participants.

Industrial demand is rising, driven by green energy, automotive and communications networks. We also predict a deficit for silver in 2022, which supports prices.

Monetary policy to continue to weigh on silver prices in the near term.

Inflation has been running high globally, with both the EU and the US reporting multi-decade high inflation numbers. In the UK, annual inflation rose more than expected, advancing to 9% in April 2022, a 40-year high. US inflation rose to 8.6% year-over-year in May 2022, its highest reading since 1981. Higher inflation numbers are adding to the risk-off sentiment in the marketplace - risk-off sentiment is positive for the silver price.

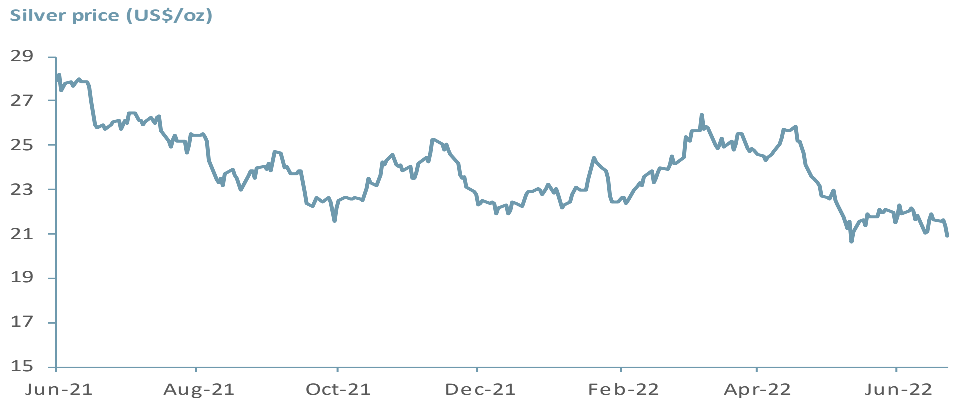
However, aggressive expected and actual rate hikes by Federal Reserve in 2022 have reduced the probability of a silver price boom. Higher interest rates typically lead to a stronger US dollar which is negative for the precious metal's price.

While it is highly probable that interest rates will continue to rise during 2H22E to curb inflation, the magnitude of the increases are uncertain. What is more certain is that market expectations for rate rises are set higher for 2H22E vs. 1H22A. These expectations will contain any upward rise in silver prices based upon underlying industrial demand factors.

In an environment of rising bond yields, non-yielding precious metals such as silver become less attractive to investors.

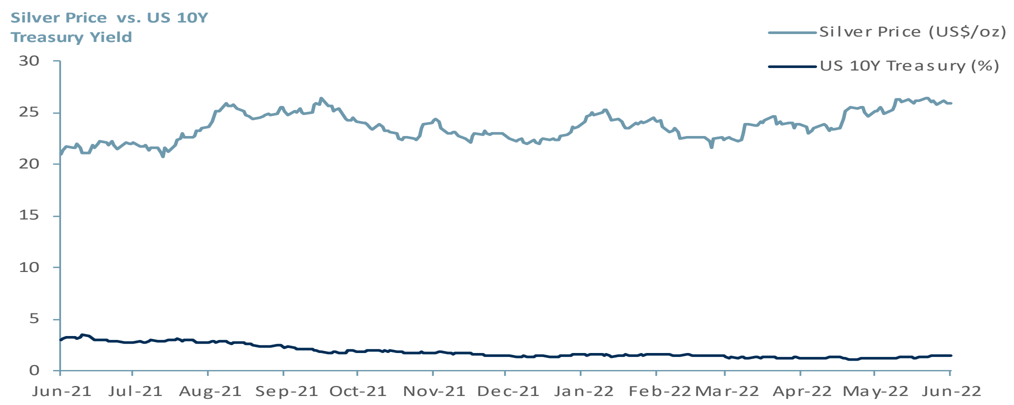
Silver prices in 2021 were down more than 15%. Silver ended 2021 with a price of around $23.1/oz. We forecast silver prices 2H22E to trade in the range US$ 22 -24/oz.

Exhibit 12: **Silver price Jun 21 – Jun 22**



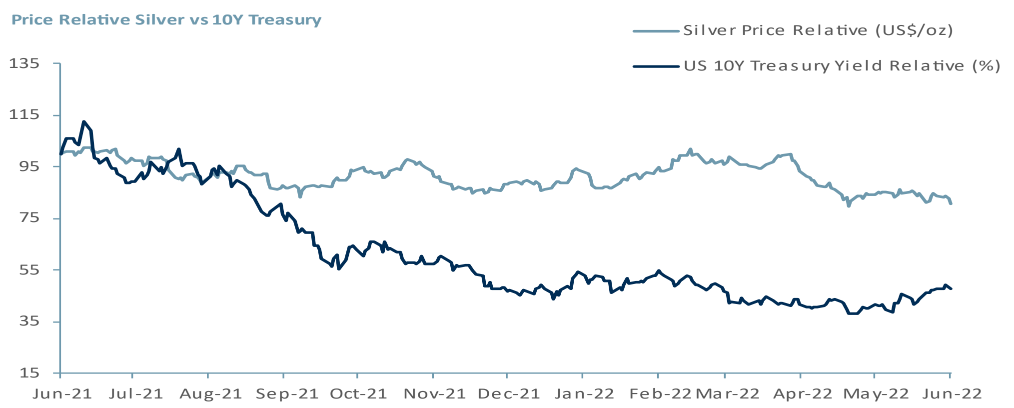
Sources: ACF Equity Research; Bloomberg.

Exhibit 13: **Sliver price vs. US 10-year treasury yields**



Sources: ACF Equity Research; Bloomberg.

Exhibit 14: **Price relative silver vs. 10-year treasuries**



Sources: ACF Equity Research; Bloomberg.

Glossary

CAGR	Compounded annual growth rate is the mean annual growth rate of an investment over a specified period.
Computer chips	These are small pieces of electronics that comprise the processing and memory units of a digital computer. They have a wider variety of applications from cars to mobile phones.
ESG	Environmental, Social and Governance (ESG) is a measure of a company's sustainability across the three main areas. This is a growing trend and it will soon become mandatory for companies to have an ESG policy and report ESG data.
Financial derivatives	A contract between multiple parties in which the value is based upon an asset (silver). Common financial derivatives include futures contracts, forward contracts, swaps and options.
Inflation	The rise in price of goods and services over a period of time.
Parts per billion (ppb)	Measures the abundance of an item. One ppb is the equivalent to the absolute amount of the substance multiplied by one billion.
Photography	Silver is used in older style photography and films. The rise of digital cameras is reducing demand for silver in photography.
S/M	Siemens per meter. This is a measure of electrical conductivity.
Semiconductors	These are a critical part of electronics. Semiconductors have a conductivity somewhere between conductors and insulators
Silverware	Objects such as cutlery, plates, and cups.
Solder and brazing alloys	A substance that contains energy which can be converted to heat or another form of energy at a later point in time
Troy ounce	A unit if mass commonly used for precious metals. One troy ounce is equal to 31.1035 grams
USGS	United States Geological Survey.
W/m K	W/m K - Watts per meter kelvin - a measure of thermal conductivity.

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