WORLD SILVER SURVEY 2019

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Industrias Peñoles, S.A.B. de C.V.

Pan American Silver Corp.

Wheaton Precious Metals

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Produced for The Silver Institute
by the GFMS team at Refinitiv

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ABOUT THE MAJOR SPONSORS OF WORLD SILVER SURVEY 2019

Coeur Mining, Inc.

Coeur Mining, Inc. is a well-diversified, growing precious metals producer with five mines in North America employing approximately 2,000 people. Coeur's wholly-owned operations include the Palmarejo silver-gold complex in Mexico, the Silvertip silver-zinc-lead mine in British Columbia, the Rochester silver-gold mine in Nevada, the Kensington gold mine in Alaska, and the Wharf gold mine in South Dakota. In addition, the Company owns the La Preciosa project in Mexico, a silver-gold exploration stage project, and conducts exploration activities throughout North America.

Fresnillo plc

Fresnillo plc is the world's largest primary silver producer and Mexico's second largest gold producer, listed on the London and Mexican Stock Exchanges under the symbol FRES. Fresnillo plc has seven operating mines, all of them in Mexico - Fresnillo, Saucito, Ciénega (including the San Ramón satellite mine), Herradura, Soledad-Dipolos[1], Noche Buena and San Julián (phase I), three development projects - San Julián (phase II), the Pyrites plant, and second line of DLP at Herradura, and four advanced exploration projects – Orisyvo, Juanicipio, Las Casas Rosario & Cluster Cebollitas and Centauro Deep, as well as a number of other long term exploration prospects. In total, Fresnillo plc has mining concessions covering approximately 2 million hectares in Mexico. Fresnillo plc has a strong and long tradition of mining, a proven track record of mine development, reserve replacement, and production costs in the lowest quartile of the cost curve for silver. Fresnillo plc's goal is to maintain the Group's position as the world's largest primary silver company, producing 65 million ounces of silver per year by 2019, having already surpassed the gold target of 750,000 ounces.

1 Operations at Soledad and Dipolos are currently suspended.

Industrias Peñoles, S.A.B. de C.V.

Peñoles is a mining group with integrated operations in smelting and refining non-ferrous metals, and producing chemicals. Peñoles is the world's top producer of refined silver, metallic bismuth and sodium sulfate, and the leading Latin American producer of refined gold and lead. The Company was founded in 1887 and it is part of "Grupo BAL", a privately held diversified group of independent Mexican companies. Peñoles' shares have traded on the Mexican Stock Exchange since 1968 under the ticker PE&OLES.

Peñoles highlights:

- Began operations in 1887 as a mining company.
- Has integrated operations in the areas of exploration, mining, metallurgy and chemicals.
- Listed on the Mexican Stock Exchange since 1968; the stock is included in the IPC index.
- One of the largest net exporters in Mexico's private sector.

Pan American Silver Corp.

Pan American Silver is the world's premier silver mining company, with large silver reserves and a diversified portfolio of producing mines.

On February 22, 2019, we completed our acquisition of Tahoe Resources. Our portfolio of assets now includes 10 operating mines located in Canada, Mexico, Peru, Bolivia and Argentina. Through the transaction, we also acquired the Escobal mine in Guatemala, one of the most attractive silver assets in the world. Operations at Escobal are currently suspended, pending, among other things, the completion of an ILO 169 consultation process with Xinka indigenous communities to be undertaken by Guatemala's Ministry of Energy and Mines. Pan American intends to support this consultation process, as well as engage the local communities and Xinka populations in an effort to build long-lasting, trusting relationships for the benefit of all stakeholders.

In 2018, Pan American produced 24.8 million ounces of silver and 178,900 ounces of gold. Consolidated cash costs[1] to produce an ounce of silver were $3.35, net of by-product credits, and all-in sustaining costs per silver ounce sold[1] were $10.73. These results do not reflect the newly acquired Tahoe assets.

At December 31, 2018, our proven and probable silver and gold mineral reserves[2] were approximately 279.8 million and 1.7 million ounces, respectively. Our measured and indicated mineral resources[2] were approximately 682.1 million ounces of silver and 478.5 thousand ounces of gold as at the end of 2018. These results do not reflect the newly acquired Tahoe assets.

Pan American's asset portfolio offers unparalleled upside for investors seeking exposure to silver through the potential restart of the Escobal mine and development of the Navidad project, as well as our major exploration discovery at La Colorada. In 2019, we celebrate our silver anniversary: 25 years of operating in Latin America, earning an industry-leading reputation for operational excellence and corporate social responsibility.

Notes:

1 Cash costs and all-in sustaining costs per silver ounce sold are non-GAAP measures and do not have standardized meanings prescribed by IFRS. Please refer to the Alternative Performance (Non-GAAP) Measures section in Pan American's Management's Discussion & Analysis for the period ended December 31, 2018 (the MD&A) for further information on these measures. The MD&A is available at panmericansilver.com.

2 Please refer to the complete mineral resource and mineral reserve information on the "Reserves & Resources" page of our website at panamericansilver.com for additional information.

Wheaton Precious Metals

Wheaton Precious Metals is one of the largest precious metals streaming companies in the world. The Company offers investors leverage to increasing precious metals prices, a sustainable dividend, and both organic and acquisition growth opportunities. Wheaton's operating costs are contractually set at the time the stream is entered into, allowing investors to benefit from cost predictability and strong margin growth in an environment of rising metal prices. Wheaton currently has streaming agreements covering 19 operating mines and 9 development stage projects. The Company's production profile is driven by a high-quality portfolio of low-cost, long-life assets, including a gold stream on Vale's Salobo mine, and silver streams on Glencore's Antamina mine and Goldcorp's Peñasquito mine.

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This is the twenty-ninth annual edition of the World Silver Survey produced for The Silver Institute. The World Silver Survey 2019 was produced by the GFMS team of metals market analysts at Refinitiv. The information contained herein is based in part on the analysis of publicly available data such as hallmarking series, trade statistics, company reports and other public-domain information. More importantly, it is also based on a large series of interviews with the industry's main players, carried out over the year by the team. This work generates the essential data to allow the compilation of reliable estimates for world supply and demand and inform the analysis of market structures, and the degree of significance of any changes and developments.

Refinitiv is grateful to the many miners, refiners, bullion dealers, bankers and fabricators throughout the world who have contributed their time and information to ensuring that the picture of the industry described in the World Silver Survey is as complete and accurate as possible.

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UNITS USED:

supply and demand data are given in units of million troy ounces (Moz) rounded to one decimal place.
1 Moz = 31.103 t (metric tons)
1 ton = 32,151 troy ounces
1 ton = 1,000,000 grams (g)

TERMINOLOGY:

"-"	Not available or not applicable.
"0.0"	Zero or less than 0.05.
"dollar", "$"	US dollar unless otherwise stated.
"Identifiable Investment"	The sum of physical bar investment and all coin fabrication, plus the net change in Exchange Traded Product (ETP) holdings.
"Physical Surplus/Deficit"	The difference between the supply of new and secondary silver to the market in a calendar year and measurable demand for physical silver. This excludes opaque Over the Counter (OTC) investment in silver and commercial bank transactions.
"Net Balance"	The physical surplus or deficit of silver with the addition of highly visible ETP and exchange stock inventory changes.

PRICES:

Unless otherwise stated, US dollar prices are for the London Silver Market fixing prior to August 15, 2014. As of this date prices refer to the LBMA Silver Price as successor to the silver fix.

TABLE ROUNDING:

Throughout the tables and charts, totals may not add due to independent rounding.

TABLE OF CONTENTS

MAJOR TABLES

FOCUS BOXES

1. SUMMARY AND OUTLOOK

Filtering out the noise in order to lift out the major changes that characterized the industry last year, three main developments stand out. First, physical demand increased 4% in 2018, propelled by a modest rise in jewelry and silverware fabrication, and a jump in coin and bar demand. Indeed, investment in silver bars and coins grew by an impressive 20% last year, driven by an exceptionally strong demand sentiment in India.

Second, Industrial fabrication lost 1% last year which slightly reduced its market share from 59% to 56%. Following three consecutive years of increases, silver demand from the solar industry took a breather in 2018. That might sound counter intuitively considering the continued commitments from the various governments to increase solar as a part of their energy generating portfolio, however, silver powder production fell due to continued thrifting and a glut of inventory that firstly needs to find its way through the system. The drop was countered by a rise of silver demand from the electronics and brazing alloys & solder sectors.

Third, for the third consecutive year, silver mine output fell, declining by 2% last year driven primarily by the lead/zinc sectors. In addition, scrap contracted as well, driven by the 8% decline in the average silver price, with fewer consumers incentivized to return their old jewelry and silverware items, pushing total silver supply for 2018 down 3%.

As a result, the physical market balance reached a minor deficit of 29.2 Moz (908 t), which is approximately 3% of annual demand and therefore, give or take, within the boundaries of error considered as a more or less balanced market. The small shortage was absorbed by metal made available from exchange traded products (ETPs), which recorded net-sales of 20.3 Moz (631 t) last year (only the third recorded net decline in ETPs this decade). A 38% net rise of exchange inventory build, however, pulled metal into the various global warehouses again, pushing the net-balance to a deficit of 80.1 Moz (2,491 t) in 2018.

TABLE 1 - WORLD SILVER SUPPLY AND DEMAND

(million ounces)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Supply										
Mine Production	717.3	753.0	758.3	791.7	823.3	867.8	893.7	893.4	876.9	855.7
Net Government Sales	15.6	44.2	12.0	7.4	7.9	-	-	-	-	-
Scrap	200.6	227.2	261.2	253.8	191.2	167.4	150.2	151.8	153.8	151.3
Net Hedging Supply	-17.4	50.4	12.2	-47.1	-34.8	16.8	7.8	-19.4	1.9	-2.8
Total Supply	**916.1**	**1,074.8**	**1,043.8**	**1,005.8**	**987.6**	**1,052.0**	**1,051.8**	**1,025.8**	**1,032.6**	**1,004.3**
Demand										
Jewelry	176.9	190.0	191.5	186.7	219.7	227.3	223.3	202.7	204.5	212.5
Coins & Bars	79.6	174.1	211.7	161.2	240.7	233.6	293.6	208.7	150.4	181.2
Silverware	53.2	51.9	47.5	43.8	59.3	61.2	63.2	52.4	57.6	61.1
Industrial Fabrication	528.2	633.8	653.0	600.1	604.6	596.3	582.6	566.4	585.8	578.6
....of which Electrical & Electronics	227.4	301.2	290.8	266.7	266.0	263.9	246.0	233.9	243.1	248.5
...of which Brazing Alloys & Solders	53.8	61.2	63.2	61.1	63.7	66.7	61.5	55.3	57.5	58.0
...of which Photography	76.4	67.5	61.2	54.2	50.5	48.5	46.1	44.7	40.9	39.3
...of which Photovoltaic*	-	-	67.4	64.4	54.8	53.9	64.5	74.9	88.9	80.5
...of which Ethylene Oxide	4.8	8.7	6.2	4.7	7.7	5.0	10.2	10.2	6.9	5.4
...of which Other Industrial*	165.8	195.2	164.2	148.9	162.0	158.5	154.4	147.3	148.4	146.9
Physical Demand	**837.8**	**1,049.8**	**1,103.7**	**991.8**	**1,124.3**	**1,118.4**	**1,162.8**	**1,030.2**	**998.4**	**1,033.5**
Physical Surplus/Deficit	**78.3**	**25.0**	**-59.9**	**13.9**	**-136.6**	**-66.4**	**-111.0**	**-4.4**	**34.2**	**-29.2**
ETP Inventory Build	156.9	129.5	-24.0	55.3	2.5	1.4	-17.8	49.8	2.4	-20.3
Exchange Inventory Build	-15.3	-7.4	12.2	62.2	8.8	-5.3	12.6	79.8	51.5	71.2
Net Balance	**-63.3**	**-97.0**	**-48.0**	**-103.5**	**-147.9**	**-62.5**	**-105.8**	**-133.9**	**-19.7**	**-80.1**
Silver Price, $ per oz.	14.67	20.19	35.12	31.15	23.79	19.08	15.68	17.14	17.05	15.71

*Photovoltaic demand included in “Other Industrial” prior to 2011

WORLD SILVER SURVEY: SUPPLY AND DEMAND METHODOLOGY

In the silver market, as for any commodity, physical imbalances both explain and influence price action, physical premia, margins, and logistical areas such as lead times and scrap recycling patterns. Silver is no exception; indeed it also attracts varying attention from the investment and speculative fraternities with, for example, ETP total holdings shifting from modest inflows in 2017 to a 3% decline to 649.5 Moz (20,203 t) in 2018, while bar and coin consumption jumped by over 20% to 181.2 Moz (5,637 t).

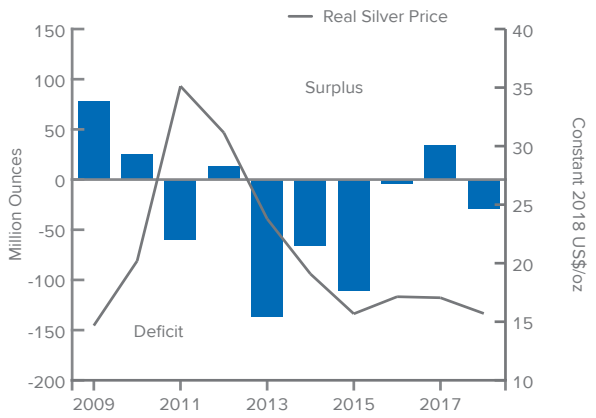
In addition to physical investment, and in order to deal with risk and price management, silver also has a very active Over-The-Counter (OTC) market, in which (a broad rule of thumb is) that LBMA loco London volumes are approximately twice the London Bullion Market Association (LBMA) published transfer numbers. In order to estimate the global OTC volume we assume that loco London now accounts for approximately 70% of the total.

Taking this into consideration, silver implied OTC transactions in 2018 increased for a sixth consecutive year, rising by 2% to 165 bn ounces (4,852,142 t). At that level, global OTC transactions are estimated to be approximately on par with the last peak recorded in 1997, the year when the LBMA started making its data publicly available. As a result of the weaker silver price last year the notional value fell 6% year-on-year to $2.6 tr. Indeed our full assessment of the impact of investment flows can be found in Chapter 3.

A further element that differentiates silver from purely industrial metals is that it is held as an above-ground asset by private and institutional investors, users, dealers, banks, and other entities. Increases or decreases in these stocks (whether accumulations or sales into terminal markets) can be both price takers and price makers. Indeed, old jewelry scrap, coins and bars make up a significant part of the scrap pool (and they are arguably the truly price-sensitive elements in the whole silver market) as opposed to scrap collected from recycled electronics, for example.

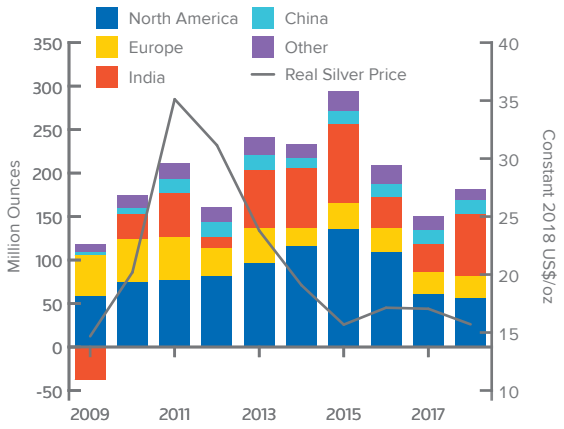
Refinitiv's supply and demand statistics are collected and collated by a team of full time research analysts based in Australia, China, the United Kingdom, United States, India and Singapore, with an extensive field research program that includes interviewing participants throughout the industry. When undertaking that primary research, analysts garner information on jewelry and silverware fabrication, coin fabrication and sales, bar sales, industrial fabrication, refining volumes, shifts in above-ground bullion stocks and scrap sales. On a global basis, Refinitiv also collects information and data on government sales and acquisitions and collates producer hedging and de-hedging levels. As part of compiling the statistics, the GFMS team at Refinitiv maintains individual demand databases for over 85 countries around the world and for almost 600 mines and producer projects.

SILVER PHYSICAL SURPLUS / DEFICIT



Source: GFMS, Refinitiv

WORLD COIN AND BAR DEMAND



Source: GFMS, Refinitiv

SUPPLY IN 2018

- **Global silver mine production declined by 2% in 2018, to a total of 855.7 Moz (26,616 t).**

- **Global scrap supply retreated 1.6% last year to 151.3 Moz (4,707 t).**

Silver **mine** production fell by 21.2 Moz (660 t) in 2018, the third consecutive year-on-year drop. The decline is attributable to the primary and lead/zinc sectors, mainly in the Americas, as Guatemala's High Court suspended the mining license of its biggest operation, while maintenance problems in Canada's top producer negatively affected silver output by a combined 23.5 Moz (736 t). Partially offsetting the losses, India, China and Argentina's silver production rose by a combined 8.8 Moz (275 t). We estimate that on a co-product accounting basis, Total Cash Cost + Capex decreased by 1.6% at a global level, averaging $10.37/ oz. The ramping up of operations in Argentina, India and Mexico are expected for 2019, with global production anticipated to rise.

Global **scrap** supply fell by 2% last year to 151.3 Moz (4,706 t), with a drop recorded across all regions except North America. Supply from North America was slightly higher due to a continued robust economic climate that generated silver industrial waste. Other regions, however, countered that development, generated by a lower silver prices that reduced jewelry scrap returns from the market.

The global silver producer **hedge** book decreased by 2.8 Moz (88 t), leaving the delta-adjusted position at 18.7 Moz (581 t) by the end of 2018. The delivery into the hedge book was led by Nyrstar, followed by Industrias Peñoles and Harmony Gold. The producer community strongly favored forward sales over options.

DEMAND IN 2018

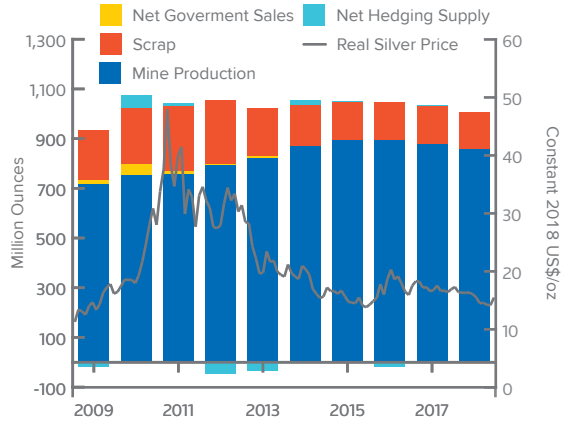
- **Total physical demand rose 4% in 2018 to 1,033.5 Moz (32,146 t), driven higher by a recovery in retail investment (bars and coins), plus further gains from jewelry and silverware. The modest increase in these sectors offsetting a slight contraction in silver used in industrial applications.**

- **Silver jewelry fabrication increased almost 4% to 212.5 Moz (6,611 t) in 2018, with India and North America accounting for the bulk of the rise in demand, offsetting falls across East Asia and Europe.**

- **Industrial fabrication fell to 578.6 Moz (17,997 t) in 2018, a 1% decline from the previous year. A drop in silver demand from the photovoltaic sector (PV) accounted for the bulk of the decline, offsetting annual increases in electronics and electrical and the brazing alloys and solders sectors. Demand from photographic applications continued to retreat, while demand from ethylene oxide (EO) was also weaker.**

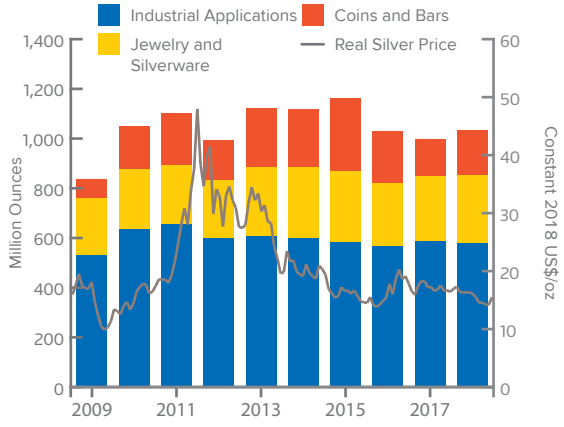
- **The coin and bar investment category rebounded in 2018 due primarily to a rise in physical bar demand.**

WORLD SILVER SUPPLY



Source: GFMS, Refinitiv

WORLD SILVER DEMAND



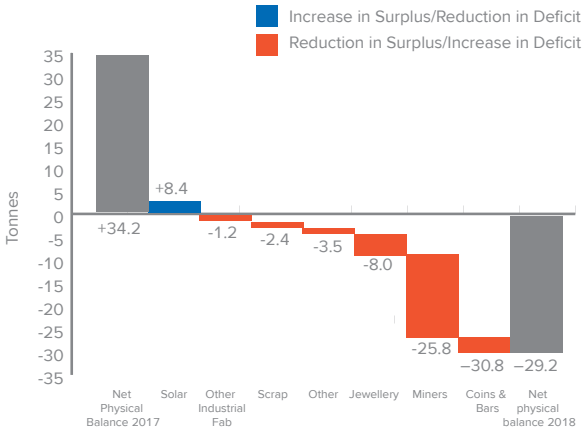
Source: GFMS, Refinitiv

Total **physical demand** saw a 4% increase in 2018 to an estimated 1,033.5 Moz (32,146 t), a three-year high. A strong recovery from retail investment (bars and coins), plus further gains from jewelry and silverware, offset a slight contraction in industrial applications. The 1% decline in industrial demand was largely a function of a drop in silver used in photovoltaic's (PV), with this fall offsetting modest gains in electrical and electronics and brazing alloys and solders.

Global **Industrial** offtake totalled 578.6 Moz (17,997 t) in 2018, a 1% decline from the previous year. A drop in silver demand from the photovoltaic sector accounted for the bulk of the decline as the market adjusted to reduced silver loadings in solar modules, with the lower figure from this sector masking some solid gains elsewhere. Demand from the electronics and electrical sector rose for the second year in succession as did brazing alloys and solders which hit a three-year high. Demand from photographic applications continued to retreat, while demand from EO was the largest casualty in this sector falling by a fifth from 2017 volumes.

In 2018, silver demand for **photographic** applications slipped by 4% to 39.3 Moz (1,222 t). This prolonged long term decline has seen demand from this sector fall acutely to now contribute just 4% of total demand. It would appear that demand has now largely stabilized and that current fabrication volumes may be largely sustainable, or at worst held to modest declines. Indeed there are some industry segments that are having somewhat of a renaissance and may well deliver gains in the future.

SILVER FABRICATION BALANCE PROGRESSION



Source: GFMS, Refinitiv

Silver demand from the **photovoltaic** (PV) sector retreated in 2018, easing 9% to 80.5 Moz (2,504 t). While the market continued to advance (with global installations reaching a record high last year), silver used in this segment declined due to ongoing thrifting of silver loadings. China again dominated new installations in 2018, but a legislative change in May last year had an acute impact on domestic demand.

Silver **jewelry** fabrication increased for the second year in succession, rising 4% to an estimated 212.5 Moz (6,609 t). India was again the standout last year with a surge in demand in the final quarter driving annual consumption 16% higher to a new record level. Elsewhere demand was mixed, with fabrication demand in the United States recording another annual rise (although the pace of expansion slowed from the previous year), while European demand dipped 3%. In East Asia, demand as a bloc was 3% weaker, dragged lower by declines in China and Thailand, offsetting gains in Indonesia and Vietnam as both markets continued to expand.

Global **silverware** fabrication increased for the second year in succession, rising 6% year-on-year to an 61.1 Moz (1,900 t), a three-year high. India once again accounted for the bulk of the annual rise, increasing 10% year-on-year and accounting for more than two-thirds of global consumption.

Identifiable investment, which consists of physical bar investment, coins & medal purchases, and additions or drawdowns to ETP holdings, rose 5% to 161.0 Moz (5,007 t) in 2018. In value terms, identifiable investment was approximately $2.5 billion. Following a precipitous fall in 2017, coin demand eased 4% last year, dragged lower by sizeable falls in Oceania and North America. Meanwhile, bar demand jumped 53% last year to the highest level since 2016, with India accounting for the bulk of the rise, while ETP holdings retreated by 20.3 Moz (631 t) to finish the year at 649.5 Moz (20,202 t).

For the third consecutive year, silver **coin & medals** fabrication fell 4% to 82.6 Moz (2,569 t) last year. The drop was particularly pronounced in North America, where sales continued to be subdued on the back of a challenging retail purchasing climate although numismatic and other coin sales increased substantially.

2. SILVER PRICES

- **The LBMA silver price averaged $15.71/oz in 2018, down by 7.8% year-on-year. Prices traded in a $3.55/oz range last year, reaching a high of $17.52/oz and a low of $13.97/oz.**

- **On an absolute basis, the LBMA silver price lost 8.3% in 2018, after gaining 3.8% in 2017. Many factors played their part in influencing the silver price last year, but nothing had greater influence than the trade dispute between China and the United States, which delivered strength to the dollar as well as dragging down metals prices, including silver.**

2017 was a positive year for metal prices, with the dollar index falling 10% that year. That strong price momentum of silver and other metals was carried over into the first quarter of 2018. Interestingly, after reaching new highs, U.S. equities experienced considerable consolidation in the first week of February, however, gold failed to react as a safe haven asset at that time. Instead it was also sold down as the market searched for liquidity. Silver, from its industrial standpoint, reacted to the correction in the equity markets too, falling below the $17/oz territory, which it did not regain again until April. During the second week of February, the financial markets began to stabilize. In February the newly appointed U.S. Federal Reserve (Fed) Chairman, Jerome Powell, offered his first speech as the Fed Chair, and his views were interpreted as hawkish. The market expected the Fed to raise interest rates at the next meeting on 18th March, resulting in further weakness in the silver price. In addition, political tensions between Russia and the United States escalated in March, which offered some strength to both gold and silver. That, however, did not have the expected result on the silver price, and by the end of the first quarter, as silver managed to stay above $16/oz, the annual return (intra quarter) for the first quarter was -3.5%.

The silver price moved sideways thereafter, mostly between $16-17 through April to June with a slight bias towards the down side, as the market entered a historically soft season for precious metals in the second quarter. Concerns surrounding the fixed income market

US$ SILVER PRICE

	1988	1998	2008	2018
Annual Average	6.53	5.54	14.99	15.71
Maximum	7.82	7.81	20.91	17.52
Minimum	6.05	4.69	8.88	13.97
Range:Average	27%	56%	80%	23%

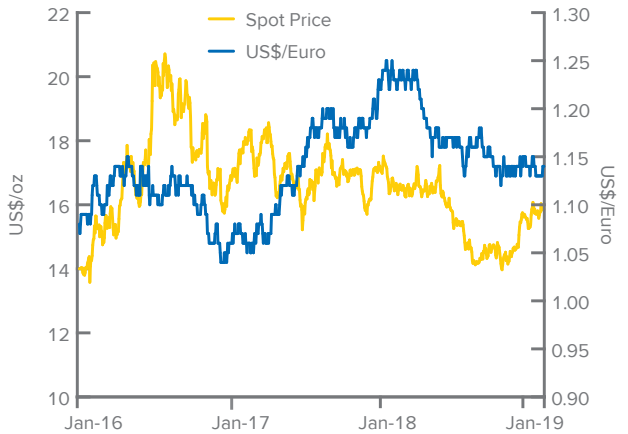
Source: LBMA; GFMS, Refinitiv

THE SILVER PRICE IN OTHER CURRENCIES IN 2018

	Euro/kg	Rupee/kg	Yen/10g	Yuan/kg
Annual Average	427.39	38,505	557.3	3,600
Maximum	477.12	41,380	624.2	3,836
Minimum	388.54	35,700	506.3	3,370
Range:Average	20.7%	14.8%	21.2%	12.9%

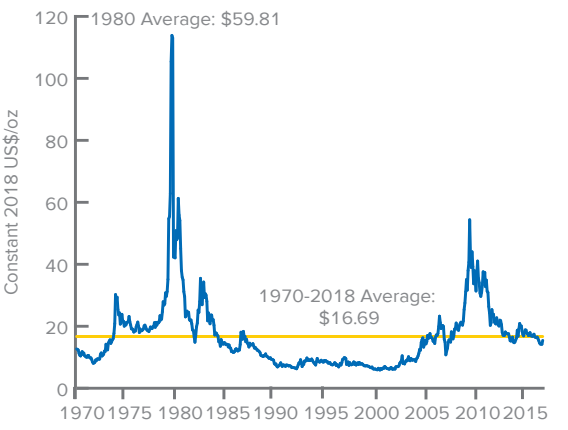
Source: GFMS, Refinitiv

THE SILVER PRICE AND THE U.S. DOLLAR

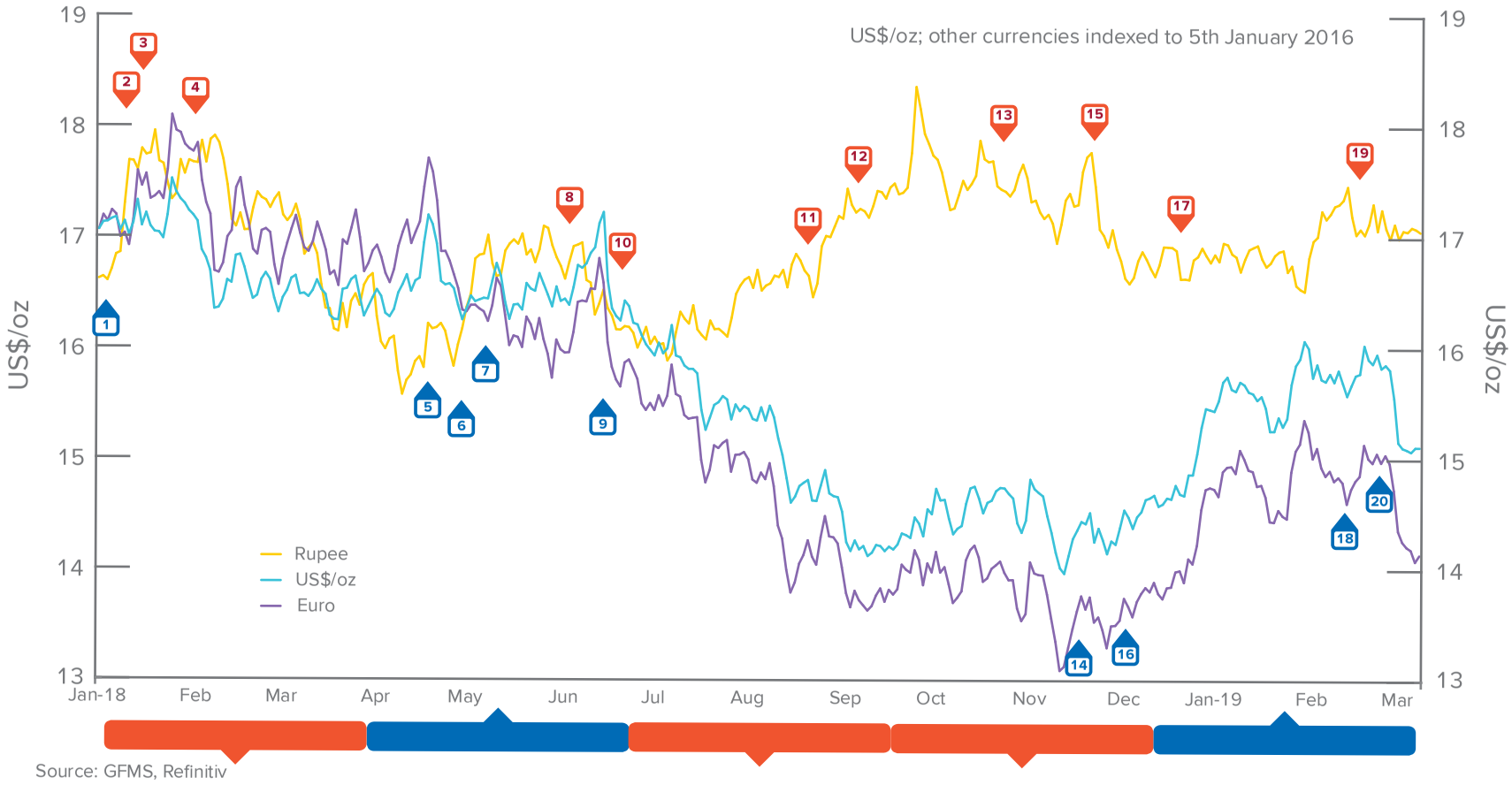


Source: Refinitiv Eikon

MONTHLY REAL SILVER PRICES ($2018)



Source: GFMS, Refinitiv



Source: GFMS, Refinitiv

1 (02/01/2018): Bitcoin prices drop, wiping over $40 in value.

2 (02/05/2018): Jeronme Powell is sworn in as new Federal reserve Chairman

3 (02/06/2018): U.S. wage growth triggers market concerns. Investors unwind short volatility positions; VIX surges

4 (02/24/2018): Trump stated the U.S. will extend tariff hikes on Chinese imports

5 (04/26/2018); Kim jong Un crosses the border into South Korea, after years of escalating tensions

6 (05/08/2018): Trump backs out of Iran's nuclear deal

7 (05/10/2018): First Majestic completed the acquisition of Primero Mining corp.

8 (05/31/2018): U.S. levies tariffs on Canada, EU and Mexico, while announces taxes on steel and aluminium imports of 21% and 10%, respectively

9 (06/12/2018): Kim Jong Un announces plan to denuclearize North Korea

10 (06/18/2018): Italy's National Statistics agency foerscasts a fall in economic growth from 2.3% to 1.7%

11 (08/28/2018): Non-commercial speculators add 100 moz to gross short position. Net position at two months low.

12 (09/03/2018): Guatemala's High Court confirms the suspension of the Escobal silver mine

13 (10/22/2018): Moody's Analytics Survey for Business Confidence posts confidence in the market

14 (11/14/2018): Pan American Silver announces the acquisition of Tahoe Resources creating the largest primary silver producer

15 (11/25/2018): EU approves Brexit bill

16 (12/01/2018): Trade war tensions ease after a truce is promised whithin U.S. and China in Buenos Aires G20 Summit

17 (12/22/2018): U.S. sees the largest Government shutdown in history

18 (02/12/2019): North Korea-United States Summit in Vietnam

19 (02/17/2019): U.S. Commerce Secretary recommended imposing tariffs on global imports of cars and auto-parts

20 (02/26/2019): Theresa May pleaded in Parliament to delay departure from the EU if no deal has been reached by mid-March

became the center of attention for investors in April, as the 10-year bond yield was climbing towards 3%. This concern actually strengthened the U.S. dollar and resulted in downward pressure in gold and silver prices. Towards the end of June, global tensions intensified as rhetoric surrounding a potential trade war between the United States and China gathered momentum. Contrary to expectations, investors perceived the U.S. dollar as the ultimate safe haven and as a result it surged, while metals, including gold and silver, took a beating. The silver price dipped below $16/oz at the end of June, the first time since 2017, losing 1.5% in the second quarter.

In the third quarter, the Brexit negotiations between the U.K. government and the European Union (EU) failed to spark significant safe haven purchasing interest. Meanwhile, the U.S. dollar index reacted positively to Fed Chairman Jerome Powell's hawkish comments, reinforcing the market's expectation that the United States was on track for another interest rate hike in the next meeting. As the markets continued to focus on the trade war, emerging markets were suffering from capital outflows following the expected liquidity tightening in the United States, which resulted in a meltdown in both emerging market currencies and equities. On the other hand, U.S. equities were advancing higher again as the country continued to release robust economic data and together with a strengthening U.S. dollar, the silver price broke below $15/oz level in August, and ultimately lost 10.8% in value in the third quarter.

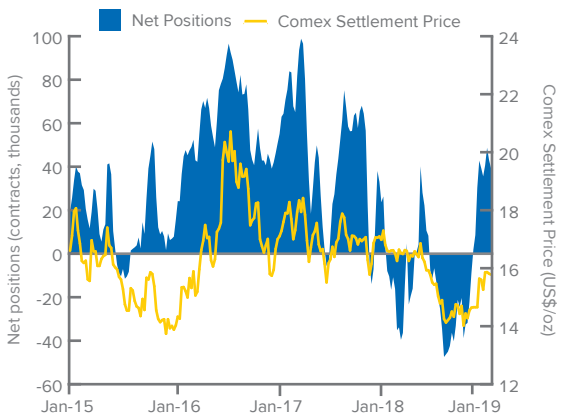
VOLATILITY (US$ PRICE)

	2015	2016	2017	2018
Annual	24%	28%	19%	14%
	Q1-18	**Q2-18**	**Q3-18**	**Q4-18**
Quarterly	13%	15%	13%	15%

Source: GFMS, Refinitiv

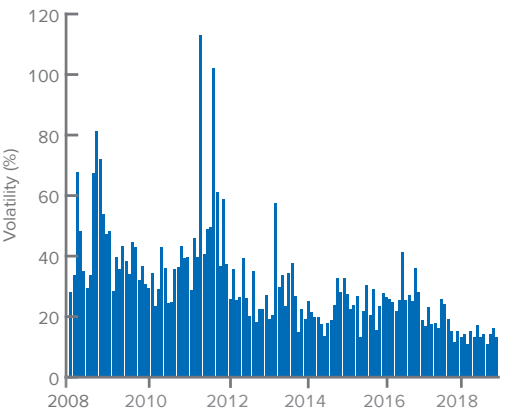
In the final quarter of the year, silver finally rebounded with a vengeance, although it waited until December to do so. During the start of the fourth quarter, silver continued heading lower, falling below $14/oz in mid-November. However, as concerns of a U.S. economic slowdown increased, the market began to speculate that the Fed may temper the pace of its interest rate increases. When the Fed Chair raised interest rates by another 25 basis points in the December meeting, the market did not support the Fed's decision by selling off the equities market. The U.S. dollar index also fell on rate expectations that the Fed would become more conservative, which resulted in a sharp rebound across the precious metals segment. The silver price increased 6% during the final quarter of the year, but lost 8.1% over the entire year. Silver price volatility fell in 2018 from 19% in 2017 to 14% last year. The price volatility has declined during the last two years, with last year's volatility in fact the lowest recorded over the last decade. For reference, silver price volatility on an annual average basis was as high as 61% in 2011.

COMEX NET-MANAGED MONEY POSITIONS



Source: CFTC

DAILY SILVER PRICE VOLATILITY



Source: GFMS, Refinitiv

CHINESE SILVER PREMIA

Based on the silver trading contract on the Shanghai Gold Exchange (SGE), the Chinese silver price lost 3.7% in local terms in 2018, compared to a loss of 8.3% on the international LBMA benchmark. This was due to the depreciation of the yuan in 2018, which lost 5.4% against the U.S. dollar. All silver prices quoted on the domestic futures exchanges in China are inclusive of a 16% Value Added Tax (VAT). The annual average silver premium rose to $1.30/oz in 2018, up from $1.04/oz the prior year. Silver inventories at the Shanghai Futures Exchange (SHFE) slipped from 43.1 Moz (1,342 t) at the end of 2017 to 35.8 Moz (1,114 t) in 2018. Inventories at the SGE rose from 40.5 Moz (1,260 t) to 68.5 Moz (2,131 t) over the same period. As a result, total physical inventories at the two exchanges increased from 83.7 Moz (2,602 t) to 104.3 Moz (3,245 t) at the end of last year, representing a 25% increase year-on-year. The main drivers of the rise in physical inventories at the SGE were the domestic banks, which were accumulating physical silver. The bankers thought the silver price attractive, and they were also benefitting from the deferral fees, only available on the SGE, received from traders with a smaller position. The deferral fee offset the higher trading fee on the SGE.

SILVER IN OTHER CURRENCIES

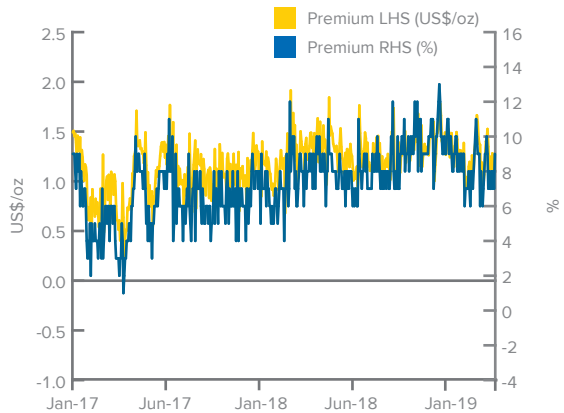
Silver prices in yen terms lost 11% last year as the Japanese currency appreciated by less than 3% against the U.S. dollar. Meanwhile, silver prices in euro and British pounds fell 5% and 3%, respectively, over the year. The Indian silver price was 0.7% lower by end-year.

GOLD:SILVER RATIO

After bottoming in 2010, the gold:silver ratio has increased steadily. The ratio retreated briefly in the middle of 2016 to close the year at 70.9, but resumed its uptrend in the middle of 2017. The gold:silver ratio can rally in the face of a crisis, although the nature of such a crisis would dictate how the ratio develops. If circumstances suggest that market instability increases then investors generally would favor gold over silver. A good example was during the 2008 global financial crisis, when the ratio surged above 80; gold is expensive compared to silver or silver is cheap compared to gold over its long term average of around 57. A high ratio in the early 1990s was in response to the Gulf War. It is arguable that in anticipation of a crisis the market could see a ratio of above 80.

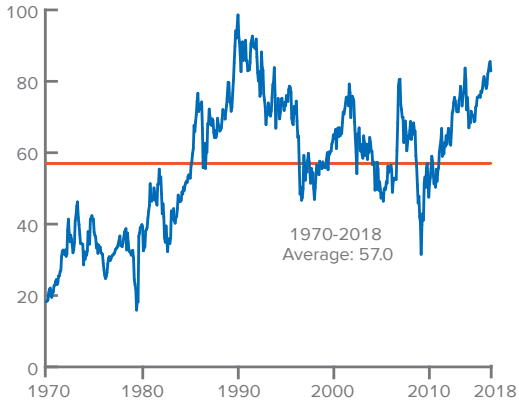
At the end of 2017, the gold:silver ratio stood at 77, a high level that perhaps signaled another major crisis was looming. Indeed the ratio finally reached the 80 territory again in February 2018, and moved sideways between 74-83 until September, when emerging markets entered into a liquidity and an investor confidence crisis. The ratio even reached as high as 86 in the first week of December. However, as both the U.S. equity markets and the U.S. dollar declined sharply shortly after, silver outperformed the gold price (despite a weaker U.S. economic outlook), ending the year at a ratio of 83.6.

SGE SILVER PREMIA



Source: Shanghai Gold Exchange; GFMS, Refinitiv

THE GOLD / SILVER RATIO



Source: GFMS, Refinitiv

SILVER AND OTHER COMMODITY PRICES

The analysis of correlation coefficients provides information about prevailing underlying themes influencing prices. It must be noted, however, that the existence of either a positive or inverse correlation between two assets varies from time to time, and past histories do not necessarily translate into future performances.

In line with expectations, silver has the strongest relationship with gold compared to other assets. Despite that, however, the price relationship with gold fell in 2018. Silver's relation with gold was the strongest in the first quarter throughout the year, though it also recorded a relatively high correlation with the S&P 500 during that time, when both silver and the S&P 500 were sold down in the first quarter.

In the second quarter, silver's relationship with gold fell to the lowest point of the year, with the market treating it more as a base metal than a precious metal, evidenced by the increased correlation with copper.

In the third quarter, silver's relationship with gold increased as both metals were being dragged down by concerns over the global trade war, but panic in the emerging markets also helped soften some losses in the gold price, and the gold:silver ratio shot up notably again in September. Silver's relationship with oil fell into negative territory during the quarter, as the oil price continued to advance when the OPEC denied President Trump's request to increase output.

CORRELATIONS OF CHANGES IN DAILY PRICES

	Q1 18	Q2 18	Q3 18	Q4 18
Gold	0.63	0.42	0.59	0.57
US$ Index	-0.29	-0.15	-0.29	-0.21
Oil (WTI)	0.24	0.05	-0.03	0.40
CRB Spot Metals	0.40	0.18	0.41	0.39
Copper	0.25	0.31	0.28	0.32
S&P 500	0.36	0.15	0.18	0.18
Bitcoin	0.02	-0.15	0.16	-0.10

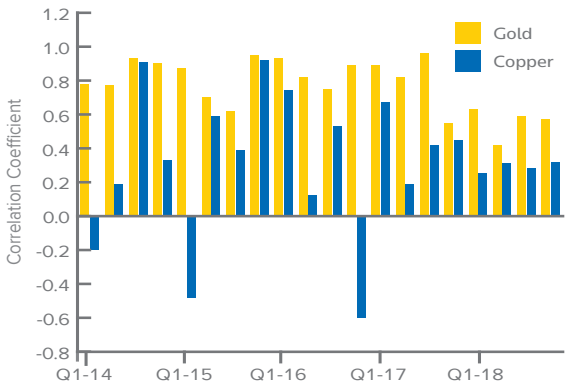
Source: GFMS, Refinitiv

In the final quarter, silver's relationship with other commodities rose, due largely to a sharp decline in both U.S. equities and the U.S. dollar index, which resulted in a strong rise of many commodity prices.

Last year, one of the major themes that consistantly caught the financial market's attention was the trade tensions between the United States and China. Concerns about the trade war had a direct influence on the strength of the U.S. dollar, and as a result silver had an obvious negative correlation with the U.S. dollar throughout the year.

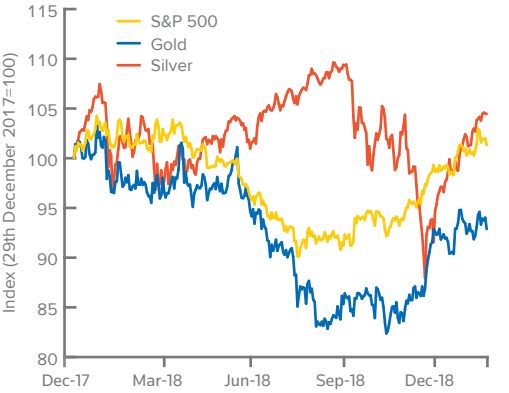
Silver's correlation with gold remained strong in the first two months of 2019, with the relationship with the price of oil and the U.S. dollar index remaining at negative levels.

QUARTERLY CORRELATION OF THE SILVER PRICE



Source: Refinitiv Eikon; GFMS, Refinitiv

GOLD & SILVER PRICES & S&P INDEX



Source: GFMS, Refinitiv

3. INVESTMENT

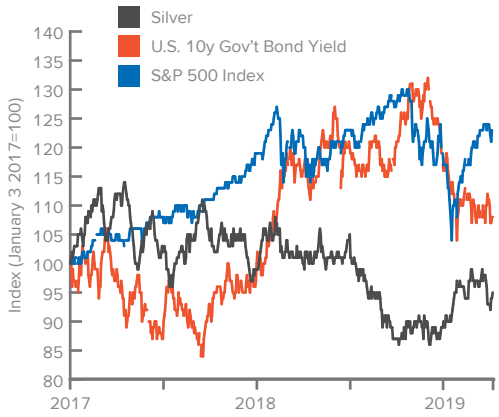
- Identifiable investment, consisting of coin and medal purchases, net-physical bar investment, and changes to ETP holdings, rose by 5% to 161.0 Moz (5,008 t) in 2018.
- In value terms, annual identifiable investment contracted by 3% to $2.5 bn in 2018, 63% below the peak recorded in 2012.
- For the bar and coin category, consumption increased by a fifth to 181.2 Moz (5,636 t), driven by a particularly strong investment sentiment in India.
- Following two consecutive years of increases, ETP holdings fell by 20.3 Moz (631 t) in 2018, compared to an average of 26.1 Moz (812 t) of net inflows recorded in the prior two years.

OVERVIEW

After two consecutive years of declines, global identifiable investment, which consists of coin purchases, net-physical bar investment and changes to ETP physical holdings, recorded a modest 5% increase to 161.0 Moz (5,008 t) in 2018. The rise was entirely attributed to an increase in net-physical bar purchasing, which, on the back of a strong Indian investment climate, rose by a significant 53% last year. The other two components, coin fabrication and ETP inventory build, recorded losses. The former, coin fabrication, fell for a third consecutive year in 2018, although the pace of last year's decline (-4%) was considerably lower than that recorded the year prior. The latter, ETP inventory build, recorded outflows to the tune of 20.3 Moz (631 t). ETPs have been a very popular investment vehicle among retail and institutional investors alike over the last decade. Only on three occasions have outflows occurred, countered by a multitude of additions.

In spite of the positive rise, identifiable investment was still almost half the volume recorded during the peak of 303.6 Moz (9,443 t) in 2006. In value terms, global identifiable investment stood that year at $6.1 bn, however, that was later beaten in 2012 with investment jumping to $6.7 bn (when the average annual silver price was $31.15/oz). Last year, the value of identifiable investment stood at $2.5 bn, 3% lower than in 2017 due to a 8% weaker average silver price.

EQUITY, FIXED INCOME, & SILVER PERFORMANCE



Source: Refinitiv Eikon

WORLD IDENTIFIABLE INVESTMENT

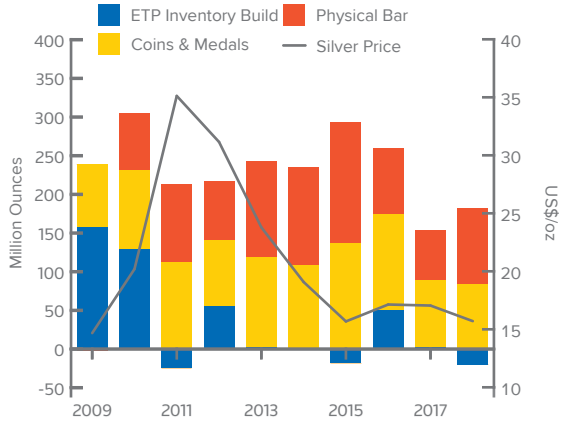
(million ounces)	2016	2017	2018
Physical Bar Investment	85.9	64.6	98.6
Coins & Medals	122.8	85.8	82.6
ETP Inventory Build	49.8	2.4	-20.3
Total Identifiable Investment*	**258.5**	**152.8**	**161.0**
Indicative Value US$(bn)**	**4.4**	**2.6**	**2.5**

* Identifiable Investment is the sum of investment in physical bars, coins & medals as well as the build in ETP holdings and hence is all the quantifiable forms of investment.

** Indicative Value calculated on an annual basis using annual average silver prices.

Source: GFMS, Refinitiv

WORLD IDENTIFIABLE INVESTMENT

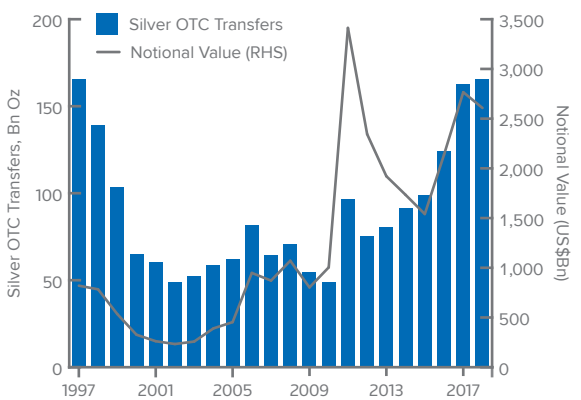


Source: GFMS, Refinitiv

Silver physical investment remains an important component of the silver market. Despite it being subject to value added taxes (VAT), or sales taxes in many countries (particularly in the case of bars), making it an uneven playing field compared to gold (which is sales tax free in almost every country globally), silver continues to play an important part in investor portfolio diversification. Standard one-on-one economic theory suggests a balanced investment portfolio should consists of at least 5-10% precious metals, in order to counter equity boom and bust cycles, of which gold usually makes up the largest part. However, silver is an important alternative to gold, and as such, investors have accumulated a significant chunk of total annual supply over the last decade. Indeed, investment in bars and coins accumulated 1.9 bn ounces (60,182 t), which was one-fifth of total silver supply over that period. Silver demand flourished in the aftermath of the financial crisis and during the height of economic uncertainty in the Eurozone. During the period between 2013 – 2015, silver physical investment accounted for more than 22% of annual supply, with a peak of 28% recorded in 2015.

If we compare with ETP inventory build over the last decade, total holdings rose to 335.7 Moz (10,441 t), contributing to 17% of physical bar and coin demand. Overall, this resulted in total identifiable investment over the period reaching 2.3 bn ounces (71,538 t), marking 22% of total silver supply. If we compare this to last year, total identifiable investment absorbed 16% of total supply (although this is an improvement in performance compared to 2016-2017 period), outlining silver's higher reliance on fabrication demand.

GLOBAL SILVER OTC TRANSFERS



Source: LBMA

OTC MARKET

Silver futures are offered on a wide variety of exchanges globally, but over-the-counter (OTC) deals of non-standardized agreements directly between two parties have always had a strong presence in the market. Due to the opacity of these deals, it is a challenge to present a reliable overview, although the LBMA has made great progress in improving transparency by starting to reveal weekly trade reporting data at the end of last year.

To get the best annual overview, we used LBMA transfers, usually a good gauge of activity, although they cannot capture the whole story. Non loco-London OTC markets, for example, are excluded from their data, but some other physical market movements are included, although with a lack of differentiation between pure investment flows and other forms of activity.

To present an overview of the silver OTC market, therefore, we monitor the LBMA transfer statistics and adjust for international flows. Loco-London volumes, on average, are about twice the amount of the LBMA transfers and to extrapolate this to a global overview we consider London's share of the global market to be around 70% (which, until a few years back used to account for approximately 90% of global OTC market).

Taking this into consideration, last year, silver implied OTC transactions increased for the sixth consecutive year by 2% to 165 bn ounces (4,852,142 t). At that level, global OTC transactions are estimated to have been approximately on par with the last peak recorded in 1997, the year when the LBMA started making its data publicly available. Due to a lower silver price last year (which slipped by 8%), the notional value fell 6% year-on-year to $2.6 tr, which was three times the size of the notional value recorded in 1997 and approximately 10% compared to that of gold. The notional value of silver OTC transfers peaked in 2011 at $3.4 tr, driven by record high gold and silver prices following the great financial crisis.

Volumes recorded on OTC do represent buying and selling and when comparing annual turnover volumes to our physical silver balance, it shows that approximately one billion ounces of physical demand represented a mere 1% of OTC trading activity last year.

LONDON BULLION MARKET ASSOCIATION AND COMEX TURNOVER

(daily averages)	LBMA No. of Transfers	Turnover Moz	COMEX Turnover Moz	LBMA/ COMEX Ratio
2012	811	135	264	0.5:1
2013	872	137	287	0.5:1
2014	778	144	272	0.5:1
2015	681	146	267	0.5:1
2016	754	172	362	0.5:1
2017	970	227	459	0.5:1
2018	950	229	476	0.5:1

Source: LBMA; COMEX

EXCHANGE TRADED PRODUCTS

After rising 0.4% in 2017, total holdings of silver exchange traded products (ETPs) declined by 3% to 649.5 Moz (20,203 t) in 2018, as silver lost its investment luster due to a strong U.S. dollar. In value terms, total holdings decreased by 11% to $10 bn, with both the silver price and the tonnage retreating during the year.

The largest silver ETP, iShares Silver Trust, which represented 49% of total silver ETP holdings at the end of last year, recorded an outflow of 3.4 Moz (106 t), to a total of 317.2 Moz (9,867 t). The outflow represented a modest loss of 1% year-on-year. While the market size of iShares Silver Trust was up from 48% from a year ago, it was still down from 51% recorded in 2016. Meanwhile, ETF Securities' various silver funds combined reported an overall decrease of 7% year-on-year, or 5.8 Moz (181 t), to a total of 83.1 Moz (2,585 t). Combined holdings were dragged down by the ETF Securities Silver, the largest holdings of silver within the brand, which lost 12%. Sprott Gold & Silver Trust as well as Invesco DB Silver Fund also lost 15% and 36% tonnage respectively in 2018. On the other hand, Deutsche Bank's silver funds recorded an overall rise of 6%, or 1 Moz (31 t), to 17.6 Moz (549 t). The increase in holdings in the DB Physical Silver ETC (EUR) was more than compensated by the loss of tonnage in the DB Physical Silver ETC and the DB Physical Silver Euro Hedged ETC. Holdings in iShares ETC also recorded a 21% increase in tonnage last year, to 5.3 Moz (164 t).

Despite a 2.2% increase in the silver price in the first month of 2018, the total tonnage in silver ETPs fell by 4% due to profit taking. When the silver price slipped in February, bargain hunters re-emerged, as total holdings increased by 1%. Investors continued to buy in the following months, and the total tonnage reached 684 Moz (21,285 t) in April, the highest level recorded in 2018. After a 2% dip in total silver holdings in May, capital flowed back into silver ETPs in June and July, as investors' appetite returned on the back of a potential global trade war. Silver holdings remained steady in the next few months, until November when there were notable outflows, as investors anticipated the Fed would hike rates in the December meeting. Despite that silver rallied by 9% in the final month of the year, when both the U.S. equity market and the U.S. dollar contracted on the back of concerns over the outlook of the domestic economy, silver holdings lost another 1% during the month. Bargain hunters took advantage of the opportunity selling the silver back into the market, and the strong correction on the equity markets created a liquidity crunch, which forced investors to liquidate some of their silver holdings.

As the silver ETP constituency is more heavily weighted to retail than institutional holdings, it is not surprising to see that trading activities seemed to be more short term focused. To summarize the trading pattern last year, investors took advantage of the soft dollar in 2017, by taking profits in silver in January, then re-accumulated silver at a modest pace in June as the silver price began to slip, even during the period when concerns on the global trade war increased. Outflows of silver from ETPs became more notable in November, as bargain hunters anticipated a stronger dollar. The continuing outflow of silver in December, despite a strong rebound in the silver price, indicated that institutional investors were bullish on silver while retail investors were liquidating.

Turning to 2019, the outflow of silver continued in the first two months of the year, with 7.1 Moz (221 t) leaving ETPs, representing a 1% loss while the silver price was up by 2%. If progress can be made on the trade negotiations between the United States and China in 2019, the silver price could play catch up with its precious metals peers. A resolution to the trade war could be beneficial for precious metals and silver prices, not only because silver is an industrial metal, but particularly if less uncertainty in the global climate will lead to a softer U.S. dollar. Equity markets recouped much of their previous losses, however, we believe 2019 will be another volatile year in which precious metals could form a solid risk insurance.

INVESTMENT IN COMMODITIES IN 2018

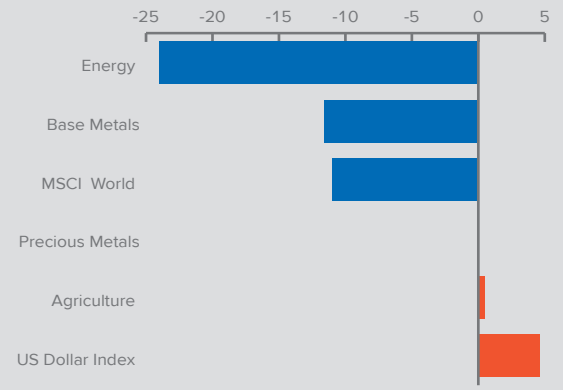
Commodity markets suffered last year, with 17 out of the 22 individual commodities we cover, recording a negative price performance intra-year. A rising U.S. dollar, driven by surging U.S. government bond yields, rising inflation and four interest rate rises by the Fed, in addition to a downgrade in global economic growth (provided by the IMF) and rising global trade tensions (driven by the United States against China, the EU and Turkey), acted as the key drivers behind the weak performance. While Emerging Market (EM) turmoil, heighted volatility across equity markets and disarray within internal politics (across South America and Europe) further aided negative headwinds.

The energy sector recorded the most dramatic decline in price performance over 2018, falling by 24% year-on-year. Losses from crude oil products in the final quarter of the year offset gains made in the prior nine months, in addition to offsetting the significant rise in natural gas prices, which rose to their highest level since June 2016 in November, following the cold snap in the United States. Despite best OPEC-led efforts to rein in crude oil supply for the year (in a very well stocked market), concerns over weaker future demand levels along with falling equity markets and a strengthening U.S. dollar placed negative pressure on the commodity. While news that Russia and Saudi Arabia had been bilaterally deciding oil output policies before consulting with the rest of OPEC and indeed Washington creating sanction exemptions on Iranian oil imports resulted in crude oil prices plummeting by year-end. Brent crude oil and NYMEX WTI fell by 22% and 24% respectively intra-year, with Brent crude oil averaging $72/bbl in 2018.

Base metals were the second weakest performing commodity segment, falling by 12%, with each metal recording a negative price return for the year. Given the backdrop of political and economic uncertainty, in particular the recorded slowdown in economic growth in China, the world largest consumer and producer of industrial metals, price weakness was largely expected (despite LME warehouse stocks for copper, zinc, nickel and lead having reached long-term lows over the period). Individual fundamental's for the metals recorded some volatile price moves over the year. Nickel jumped to its highest level since December 2014 in June last year of $15.750/ ton. This was due to increased demand for the metal in the use of lithium-ion batteries in electric cars and energy storage. After that, it fell back to its lowest level in over a year, alongside aluminium and steel, in light of more flexible industrial production restrictions (against pollution) in China's northern provinces this winter boosting supply levels.

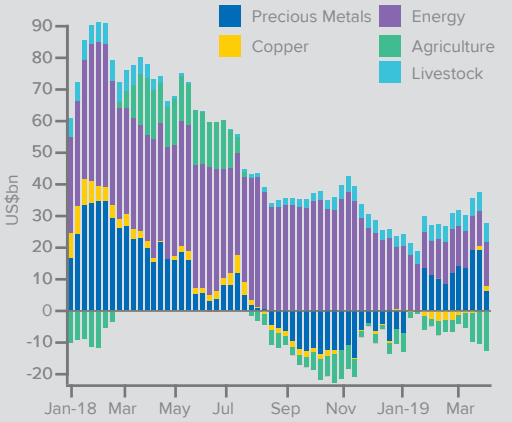
The precious metals segment came under great pressure over the year, gold and to a certain extent silver, were negatively impacted by weaker physical demand, a higher U.S. dollar and increasing interest rates. While gold did benefit from some safe haven purchases throughout the year, the U.S. dollar (often coined the 'ultimate safe haven') ultimately won out. Meanwhile, the story was entirely different for both rhodium and palladium which rose by 43% and 20% (intra-year) in 2018 to their highest levels since May 2010 and on record respectively. Increased emissions legislation and testing on vehicles on a global scale benefited the two metals which are utilized in gasoline internal combustion engine (ICE) vehicle catalytic convertors (while platinum, which is utilized most heavily in diesel ICE catalytic convertors, suffered from a strong decline in sales).

PRICE PERFORMANCE ACROSS VARIOUS ASSET CLASSES IN 2018



Source: GFMS, Refinitiv

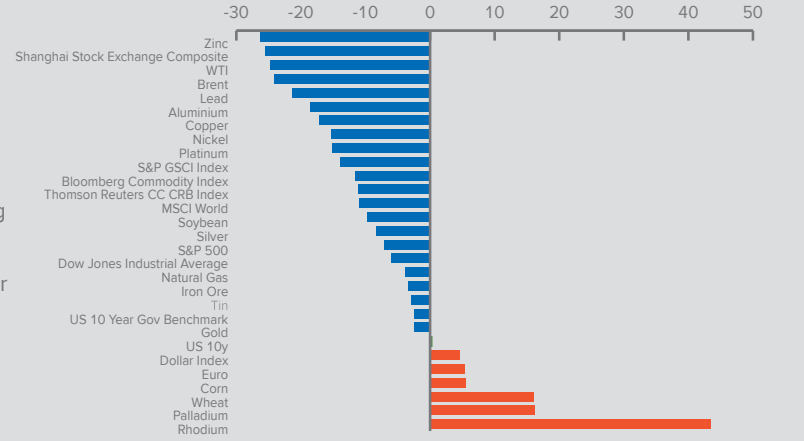
NET POSITIONS IN KEY COMMODITY FUTURES



Source: CTFC

The agriculture segment was the only commodity sector to record a positive price return in 2018, rising by 0.5%. This positive performance was largely driven by two commodities, wheat and corn, which both recorded intra-year increases of 20% and 7% respectively. While wheat benefited from lower production in key exporting countries (including Russia, the world's largest producer of wheat), a weaker corn crop on the basis of bad weather resulted in money managers and hedge funds at the Chicago Board of Trade purchasing an unprecedented $1 mn worth of corn futures and options over the January 11th-March 23rd period. Meanwhile, the combination of higher U.S. inventories, weaker Chinese demand and liberalization in the EU (of tight output quotas and exports limits) saw soybeans, sugar, coffee and cotton all fall in 2018.

INDEXED PERFORMANCE ACROSS ASSETS IN 2018 (JANUARY 1 2018 = 100)

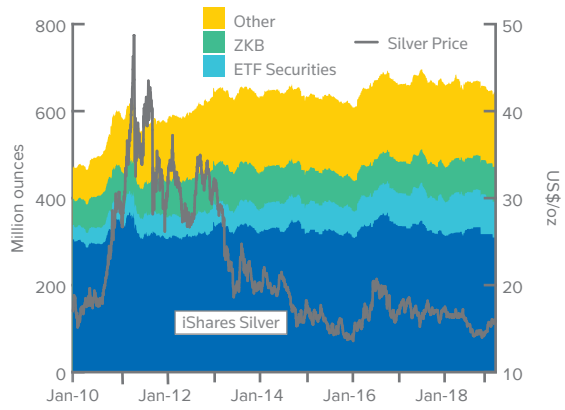


Source: GFMS, Refinitiv

In the first few months of this year, the performance across the commodity markets has been optimistic, with each segment (excluding agriculture) recording positive price returns. A weakened U.S. dollar (driven by a three week U.S. government shutdown, unresolved trade talks between Washington and Beijing and indeed the potential that the U.S. Fed will pause interest rate rises in 2019), favored commodities. While concerns over a global economic slowdown (particularly in light of China's disappointing growth results, which saw the country record its lowest level of annual growth in 28 years in 2018), in addition to heighted volatility across equity markets, resulted in investors seeking out the protection of safe havens, such as gold. A further upside for commodities also came in the form of central bank behavior, in which the People's Bank of China stated its intention to neither keep monetary policy "too tight or too loose", having cut the reserve requirement by 1% in January, in the hope of boosting lending and liquidity.

We believe for the remainder of the year the key areas to watch will firstly be developments (either escalation or de-escalation) in the 'tit-for-tat' tariff war between China and the United States. While movements in the U.S. dollar will remain key to emerging market currencies and the cost of commodities as a whole. It is our house view that while government bond yields remain high, the Fed is only likely to implement two interest rate hikes in H2 this year. A possible market correction would likely see cash return back into non-risky assets, potentially benefitting precious metals.

SILVER ETP HOLDINGS



Source: Respective Issuers

*ETF Securities: includes LSE, Australia, NYSE, GLTR and WITE
**Other: includes Sprott Physical Silver Trust, Julius Bär, DB Physical Silver, BlackRock Silver Bullion Trust, Silver Bullion Trust, Mitsubishi UFJ Tokyo, iShares Physical Silver ETC, Source Physical Silver, Royal Canadian Mint;

SILVER ETP HOLDINGS

(Moz)	end-2017	end-2018
iShares Silver Trust	320.6	317.2
ETF Securities*	88.9	83.1
ZKB Silver ETF	79.7	79.4
Sprott Physical Gold & Silver Trust	75.2	63.7
Others**	105.4	106.1
Total	**669.8**	**649.5**

* Includes LSE, Australia, NYSE, GLTR, WITE and Hong Kong (until the latter closed)

** Includes Sprott Physical Silver Trust, Julius Bär, DB Physical Silver, BlackRock Silver Bullion Trust, Silver Bullion Trust, Mitsubishi UFJ Tokyo, iShares Physical Silver ETC, Source Physical Silver, Royal Canadian Mint.

Source: Respective issuers

PHYSICAL BAR INVESTMENT

Following two consecutive years of annual declines, global physical bar investment rose a whopping 53% reaching 98.7 Moz (3,070 t) in 2018. Although still modest compared to the peak of 157.5 Moz (4,899 t) in 2015, the rise was well overdue and completely attributed to an exceptionally strong demand sentiment in India. South Korea also recorded healthy growth.

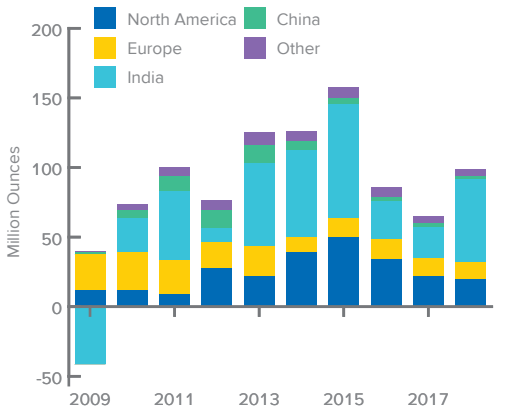
India's silver investment demand witnessed an exponential rise in 2018, increasing by 115% year-on-year to 70.2 Moz (2,183 t), which saw investment demand account for 29% of total supply. Physical bar investment increased by 160% year-over-year to 59.4 Moz (1,848 t). Total physical bar demand remained particularly strong in the second half of last year, reaching 42.1 Moz (1,310 t) which approximates to 71% of total annual bar demand. Investors piled into silver to take advantage of the price drop, with the average silver price at Rs.37,498/kg in the second half of the year 4% lower than the level recorded in the first half. Short term hoarding, especially by traders and jewelers is a common phenomenon, particularly when prices retreat to a certain level. These hoarded stocks will be released when the price moves higher, often disrupting the normal market behavior as premia comes under pressure or even switches to a discount due to the short term excess in supply. Retail demand also remained strong in 2018.

Physical bar investment in **North America** continued to contract last year, falling by 8% to 18.8 Moz (535 t). Although we have recorded another year of declining demand, the rate of decrease looks to be slowing, with last year's fall less significant than the prior two years (when demand slipped on average by 35%). Many bullion dealers still report either stable demand at a lower level compared to some of the previous years or a drop in silver bar sales. Despite the sentiment remaining subdued for much of the year, investor interest in physical bullion seems to be increasing of late, driven by stock market wobbles and the implosion in the crypto currency space, particularly in the last quarter of 2018. Investment funds also stated that their allocation of precious metals is likely to increase in 2019 given the skepticism that major companies will be able to continue to generate higher free cash flow in the future.

European physical bar investment declined by 6% in 2018, marking the second consecutive year of falling demand, to total 12.2 Moz (379 t), the lowest level of investment in the region since 2014. The key driver behind this fall came from Germany (the largest market in the region for bar demand accounting for 55% of market share in 2018), in which silver demand fell by 10% or 0.7 Moz (22 t) over the year. Falling volatility in the silver price (which has contracted over the last three years) may have kept investors on the sidelines in 2018 (despite silver falling to its lowest level since 2010 in September). However, it is worth noting that regardless of the silver price, silver investment in this region is in a long-term decline, with VAT placed on silver bullion bars (while gold is exempt), resulting in European demand contracting by 53% over the last decade. Silver's perceived disadvantage to gold is its storage cost to value ratio, which is considerably higher compared to gold. That said, investors have become more interested in buying silver for storage in bonded warehouses so VAT charges can be avoided.

Chinese physical bar investment increased for the first time since 2013, recording a 4% annual rise to 2.8 Moz (86 t). Unlike gold, which is tax free in China, silver purchases were originally subjected to an additional 17% VAT, which was lowered to 16% in 2018. There were rumors that the Chinese government was considering lowering the VAT further to 13%, which could lead to an increase in Chinese demand supporting upward pressure on local silver prices, in turn sparking more investment interest. While the expected VAT cut did not materialize in 2018, it could occur in 2019.

PHYSICAL BAR INVESTMENT



Source: GFMS, Refinitiv

COMMODITY EXCHANGES ACTIVITY

COMEX continued to be the world's largest silver futures trading platform, with trading volume posting a moderate 4% increase, to a nominal 119,935 Moz (3,730,375 t) equivalent in 2018. Managed money positions on the CFTC exchange are usually a good proxy for investor activity. Net managed positions in silver swung from a net short to a net long position at the start of last year as the U.S. dollar softened. However, that only lasted for six consecutive weeks, before net managed positions reverted back to net short again by mid-February. The streak of managed net shorts lasted for 10 weeks, before turning net long for one week by the end of April, then turning back to net short again for four consecutive weeks. By July, not only did COMEX silver turn back to net short, it sparked its longest streak of net short positions recorded since the CFTC amended its current disclosure since 2007. The 22 consecutive weeks of net shorts ran until mid-December, when funds finally started to cover their positions, pushing silver back to net long. The switch back to net long position was driven by a weaker U.S. dollar and U.S. equities, as both asset classes endured a change in investor expectations.

Trading volume on the Shanghai Futures Exchange (SHFE) declined by 20% to a nominal 20,376 Moz (633,764 t) last year, a fourth consecutive annual drop. The continued fall in silver trading activities in China was partly due to the fluctuation of the yuan in the last two years, which created less price volatility in domestic terms, and became less attractive to trade as a result. The second development in the market was the expectation that the Chinese government would announce a more aggressive VAT cut. Some traders preferred to stock up physical metals rather than trading futures. In addition, the focus of the Chinese market was on nickel and tin last year, where trading volumes on the SHFE increased by 55% and 32% respectively.

Meanwhile, silver trading volume on the Shanghai Gold Exchange (SGE) fell even more than the SHFE in 2018, declining by over 32% to a nominal 12,603 Moz (391,997 t). While the trading fee on the SGE is higher than the SHFE (it is also the highest in the world), traders were still willing to trade on the SGE because the extra costs can be potentially offset by generating extra income through the receivable of the deferral fee

SILVER TURNOVER ON MAJOR COMMODITY EXCHANGES

(total volume in nominal million ounce equivalents)

	2016	2017	2018	Change y-o-y
COMEX*	90,638	115,175	119,935	4%
SHFE	41,716	25,613	20,376	-20%
SGE	19,711	18,572	12,603	-32%
MCX	7,164	5,077	5,358	6%
LME	0	406	695	71%
ICE FUTURES U.S.	147	95	60	-37%
TOCOM	20	7	6	-9%

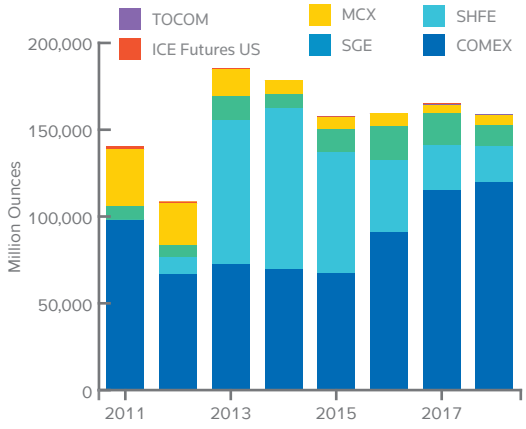
*N.B. : Includes the 5,000-ounce and 1,000-ounce contracts

Source: GFMS, Refinitiv; COMEX, SHFE, SGE, MCX, LME, ICE Futures and TOCOM

(whether long or short, traders with larger position can receive a deferral fee from the traders with a smaller position). However last year, large domestic banks also became active traders at the SGE, and with the size of the capital they deployed they strongly influenced the distribution of the deferral fees. As a result, many small silver traders were squeezed out.

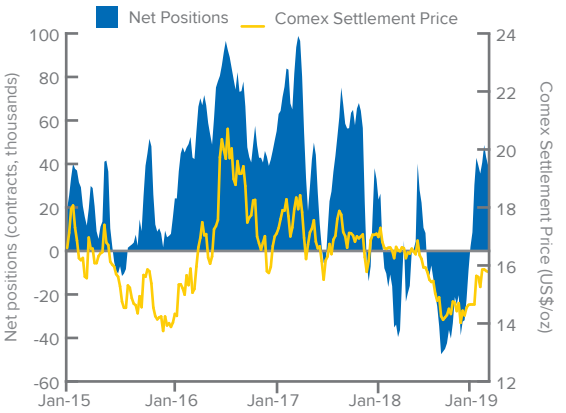
After a 29% drop in 2017, volumes in the benchmark silver contract traded at the Multi Commodity Exchange of India (MCX) increased by 6% year-on-year to 5,358 Moz (166,651 t) in 2018; this was still 29% below the level recorded in 2005. The reason behind the rise can be attributed to the effect of market reforms that took place in the last two years, preventing liquidity to be channeled through unaccounted funds into futures exchanges. Total volumes delivered to the exchange increased by a whopping 93% year-on-year to 7.2 Moz (226 t). However, at 11.6 Moz (359.6 t) it is still 37% lower than 2016.

SILVER TURNOVER ON MAJOR COMMODITY EXCHANGES



Source: GFMS, Refinitiv

NET MONEY MANAGER POSITIONS ON COMEX



Source: CFTC

With the London's precious metals market being dominated by over-the-counter (OTC) trading activity, the LME launched gold and silver contracts in July 2017. The aim was to gain market share from the OTC market, which has to deal with increasing regulatory scrutiny and resultant extra costs for banks trading metals OTC. Last year, silver trading volume at the LME reached 695 Moz (21,617 t). Monthly trading volume peaked in April reaching 15,888 contracts (5,000 ounces per contract), the equivalent of 79.4 Moz (2,470 t) traded during the month. Trading volume declined notably from June through to October, with monthly trading below 10,000 contracts, just as the global trade tensions between the United States and China heated up.

COINS AND MEDALS

Silver coin and medal fabrication declined for a third consecutive year in 2018, falling by 4% to 82.6 Moz (2,569 t). Since hitting a peak in 2015, coin and medal fabrication has slipped by 40% with the approximate value of investment in this category (using annual averages), falling to $1.3 bn, from $1.5 bn in 2017. Similarly, comparing fabrication results to our GFMS' proprietary quarterly bullion survey, weakness in coin sales was also recorded in 2018, with annual demand for bullion coins falling by 4% year-on-year, marking a third successive year of declining demand.

Last year was very much a year of two halves, with the first half of year (H1) recording a significant weakness in coin sales, with demand falling by 26% year-on-year, as investors turned towards higher risk assets. North America (the largest market), recorded a drop in sales

MANAGED MONEY NET POSITIONS IN COMEX FUTURES

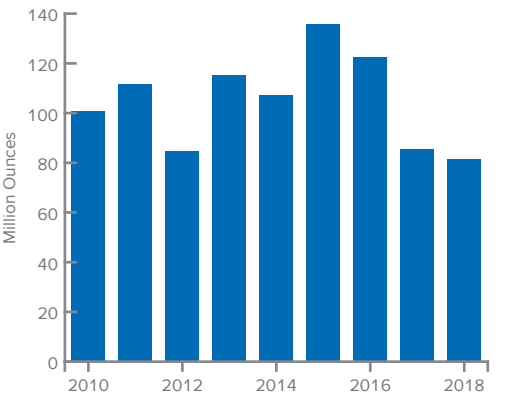
		Contracts	Moz	Price
2015		16,470	82.3	15.65
2016		56,679	283.0	17.11
2017		48,522	242.6	17.05
2018	Q1	731	3.7	16.80
	Q2	-3,803	-19.0	16.48
	Q3	-21,602	-108.0	15.05
	Q4	-23,055	-115.3	14.51

(Managed Money net positions, Moz equivalent and average COMEX settlement price in $/oz)
Source: CFTC

of 34% in H1, as an improving outlook for the economy, with rising interest rates and strong equity markets removed investors' interest away from purchasing silver. In Europe (the second largest market), sales fell by 12% as investors sentiment improved for the region in light of the European Central Bank's decision to end quantitative easing (QE) by end-year. However, following the turbulent political and economic environment in the second half of the year, both these major markets for coin sales reversed their positions with H2 demand (year-on-year) rising by 25% and 22% respectively.

Indeed, if we evaluate demand levels from H1 to H2 2018, total demand jumped by 26% or 5.7 Moz (177 t), with all regions (excluding Japan) recording an increase in demand. Turning to investors in North America, a suspension in the upward momentum of the U.S. dollar, on the back of unsettled politics (given the threat of an upcoming government shutdown, ongoing trade talks with China and indeed growing expectation that the Federal Reserve will pause interest rate rises in 2019), resulted in investors once again returning back

SILVER BULLION COIN SALES



Source: GFMS, Refinitiv

TABLE 2 - SILVER FABRICATION: COINS AND MEDALS (INCLUDING THE USE OF SCRAP)

(million ounces)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Canada	10.8	18.6	23.5	18.0	29.7	31.2	36.3	34.3	19.1	19.3
United States	34.3	41.7	42.2	34.3	43.5	44.7	48.1	39.2	18.8	16.4
China	3.0	1.5	4.1	4.5	5.4	5.4	11.0	11.1	13.4	13.4
India	3.3	4.5	1.9	2.0	5.4	6.3	8.9	9.4	9.7	10.8
Australia	6.5	8.8	11.3	6.5	9.1	7.9	12.3	12.9	10.1	7.0
Germany	7.4	6.4	3.3	1.1	0.6	0.6	3.5	4.8	4.8	4.8
United Kingdom	0.5	0.5	1.0	0.7	2.2	2.1	3.7	3.5	3.1	3.3
Austria	9.5	11.6	18.4	9.2	14.7	4.8	7.5	3.6	2.1	1.9
Japan	0.4	0.6	0.6	0.7	0.8	0.7	0.7	0.7	0.7	0.7
Other Countries	5.2	6.4	5.6	7.9	4.2	3.7	4.0	3.3	4.0	4.9
World Total	**81.1**	**100.6**	**111.7**	**84.9**	**115.7**	**107.4**	**136.1**	**122.8**	**85.8**	**82.6**

to safe havens. Meanwhile, across the pond, growing uncertainty surrounding Brexit, increased the demand for less risky assets across the Eurozone. Elsewhere, remarkable sales were recorded in our Other Countries category, which increased by 22.5% over the period, pushing up its total market share to 6% (which has been on average 5% over the last decade). We believe given the realism of a global economic slowdown approaching, particularly stemming out of China (which recorded their lowest annual growth level in 28 years in 2018), and the weakness in emerging market economy currencies, investors were continuing to seek less risky assets.

Returning back to coin and medal fabrication, on a regional basis, it was Oceania that recorded the greatest decline (in value terms) in fabrication over the year, falling by 31% or 3.1 Moz (96 t), driven solely by a slowdown in Australian production (which is responsible for 9% of global market share), reaching its lowest level since 2012. Meanwhile, North America (which accounts for 44% of global market share), was the second worst performing region, with fabrication sliding by 8% or 3.0 Moz (93 t). While Canada recorded a very modest increase in fabrication levels (1% or 0.2 Moz (6 t)), both the United States and Mexico declined by 3.2 Moz (100 t) and 0.01 Moz (0.3 t) respectively, with the United States recording its lowest level of fabrication last year since 2004.

Meanwhile, coin fabrication in Asia, the second largest producing region in 2018 (with a global share of 31%), recorded a year-on-year increase of 4% to 25.4 Moz (790 t) last year, marking its seventh consecutive rise in fabrication. India held on to its position as the largest manufacture in the region, with its share rising to 97% in 2018, as the country expanded its bullion coin fabrication for the seventh year in a row, with total production at an all-time high of 10.5 Moz (327 t). Falling silver prices in the second half of the year, which tumbled to their lowest level since April 2016 in November, no doubt encouraged bargain hunters and manufactures alike. Fabrication in China in 2018 rose for an eighth consecutive year, jumping to its highest level in our records of 13.4 Moz (417 t). It should be noted that following the explosion in Chinese demand in 2015, fabrication levels over the following three years have been more modest.

Turning to Europe, silver coin fabrication rebounded in 2018, rising by 7% to its highest level in two years of 13.2 Moz (411 t). Spain took the top position for fabrication last year, with demand jumping by 0.4 Moz (12 t) to its highest level since 2007, taking up 46% of European market share, while both Russia and the UK recorded a rebound in fabrication levels, rising by 300% and 7% respectively, with both countries reaching their highest level of fabrication since 2012 and 2016.

4. MINE SUPPLY

- Global silver mine production declined by 2% in 2018, to a total of 855.7 Moz (26,616 t).
- For the second consecutive year, the biggest year-on-year variation was posted by the primary silver mines. Less pronounced drops were witnessed in silver sourced from other metals.
- Losses in the Americas were partly offset by a strong performance in Asia, after a robust performance by India and China.
- On a co-product basis, we estimate cash costs with capex for 2018 averaged $10.37/oz, a 2% decrease relative to 2017.
- In 2018, the delta-adjusted hedge book contracted by 2.8 Moz (87 t), following a strategy change by Fresnillo Plc.

MINE PRODUCTION

- Silver mine supply decreased by 21.2 Moz (659 t) in 2018, the third consecutive drop after thirteen years of uninterrupted growth.

Global silver mine production decreased by 2% in 2018, following supply disruptions across the Americas, mainly in Canada, Guatemala and the United States. The biggest loss was posted by the Escobal mine, as its mining license remains suspended by Guatemala's government, while after 18 months inactivity, negotiations with the communities are still not yielding any positive results.

Unexpected maintenance issues in some of Silver Valley operations and lower grades at Fire Creek and Kidd Creek, drove United States production down by 5.7 Moz (177 t), representing a decrease of 17% compared to 2017. Canada's silver production suffered an acute setback, mainly in Teck's

TOP 20 SILVER PRODUCING COUNTRIES

Rank			Output (Moz)	
2017	2018	Country	2017	2018
1	1	Mexico	194.7	196.6
2	2	Peru	147.5	144.9
3	3	China	112.6	114.9
5	4	Russia	42.0	43.4
4	5	Chile	42.4	42.1
6	6	Bolivia	40.0	39.9
7	7	Poland	39.7	39.6
9	8	Australia	35.1	35.4
10	9	United States	33.7	28.0
11	10	Argentina	25.7	26.5
8	11	Canada	36.4	24.8
13	12	India	17.5	23.2
12	13	Kazakhstan	19.0	19.5
14	14	Sweden	14.9	14.6
17	15	Indonesia	11.4	11.9
16	16	Morocco	11.6	11.2
18	17	Turkey	5.4	5.5
19	18	Armenia	5.0	5.0
20	19	Iran	3.6	3.6
21	20	Dominican Republic	3.3	3.4
		Rest of the World	**35.5**	**21.7**
		World Total	**876.9**	**855.7**

Source: GFMS, Refinitiv

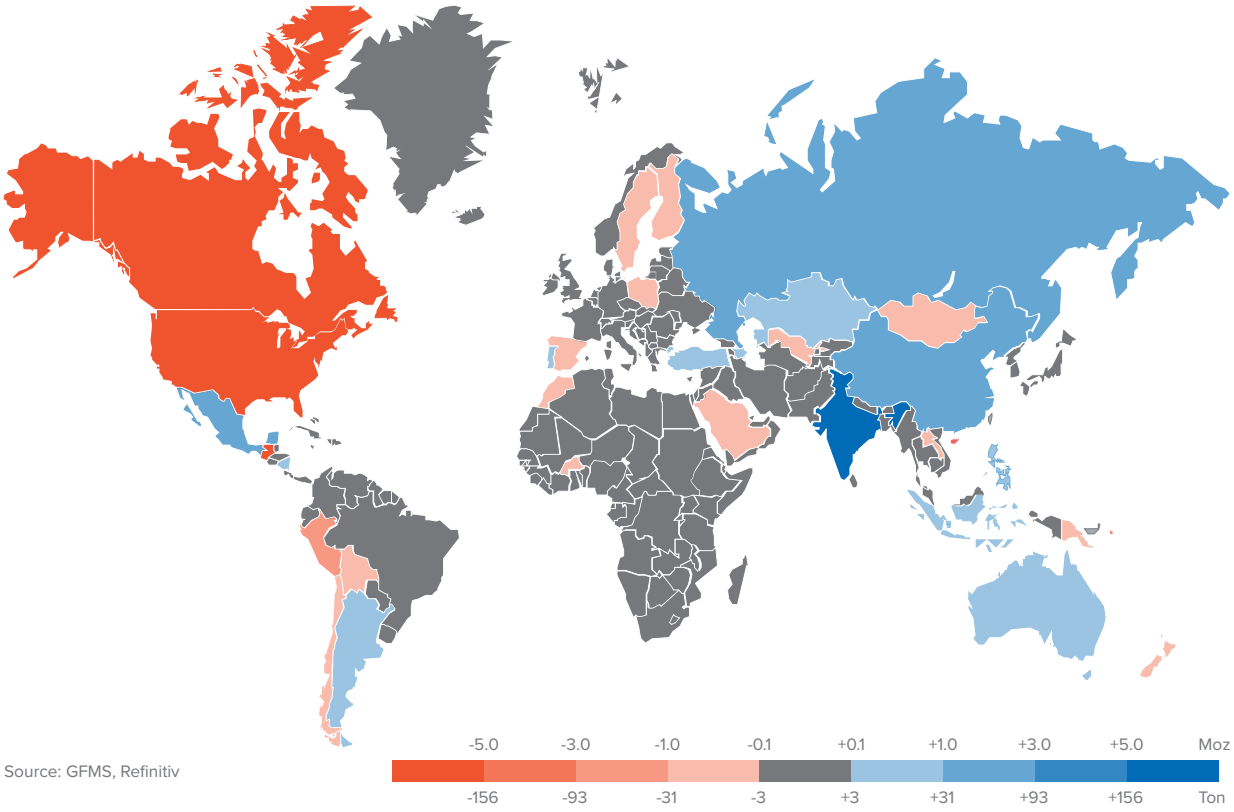
TOP 20 SILVER PRODUCING COMPANIES

Rank			Output (Moz)	
2017	2018	2017	2018	
1	1	Fresnillo plc. [1]	54.2	58.1
2	2	Glencore plc. [2]	37.7	34.9
3	3	KGHM Polska Miedz S.A. Group [3,4]	36.5	33.9
6	4	Cia. De Minas Buenaventura S.A.A. [5]	26.4	26.2
5	5	Polymetal International plc.	26.8	25.3
7	6	Pan American Silver Corp. [2]	25.0	24.8
4	7	Goldcorp Inc.	28.6	24.5
9	8	Hochschild Mining plc.	19.1	19.7
11	9	Hindustan Zinc Ltd. [6]	16.9	19.6
13	10	Southern Copper Corp. [7]	15.9	17.3
12	11	Corp. Nacional del Cobre de Chile	16.8	17.1
10	12	Volcan Cia. Minera S.A.A. [5]	17.3	17.0
17	13	Industrias Peñoles S.A.B. De C.V. [8,10]	12.2	14.8
19	14	South 32 Ltd.	12.0	13.3
14	15	Boliden A.B. [9]	13.3	13.2
18	16	Coeur Mining, Inc. [2]	12.1	12.9
15	17	Sumitomo Corp. [4]	12.8	12.6
22	18	First Majestic	9.7	11.7
8	19	Teck	21.5	11.5
16	20	Hecla Mining Company	12.5	10.4

1 Including 100% of Penmont mines, excluding silverstream; 2 Primary silver producer; 3 Reported metallic silver production; 4 Estimate; 5 includes minority partners; 6 Includes 100% from Pallancata, includes Moris; 7 Integrated refined metal; 8 Mined silver; 9 Metal in concentrate; 10 Excludes 100% of Fresnillo plc.

Source: GFMS, Refinitiv

SILVER MINE PRODUCTION WINNERS AND LOSERS, 2018 VERSUS 2017

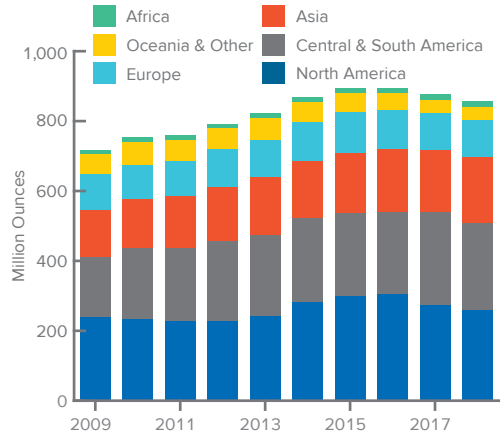


Source: GFMS, Refinitiv

Trail operation, where a fire in the smelting facilities forced the use of alternative processing equipment which led to lower silver grades in the concentrate.

Elsewhere, silver production in China is showing signs of recovery after being strongly affected the previous year by tightening environmental regulations, especially in the copper sector, which was responsible for over two-thirds of the country's total silver output increase of 2.3 Moz (72 t), compared to 2017.

WORLD SILVER MINE PRODUCTION



Source: GFMS, Refinitiv

Australian silver production bounced back after four years of a consecutive falls, fueled by a strong performance in the primary sector, mainly due to higher grades and higher utilization at Cannington. On the other hand, the Australian by-product sector is showing fatigue signs, especially in the lead and zinc mines, where silver production dropped 1.4 Moz (44 t) in 2018.

At a national level, the main driver behind the global decrease was Guatemala, followed by Canada, which was partially offset by higher production in India, China and Mexico.

NORTH AMERICA

North America suffered the biggest contraction at a regional level, as mine production dropped by 6% in 2018, after considerable losses were reported in the primary and gold sectors of the United States and lead/zinc sector in Canada, driven by several maintenance problems and lower throughput. On the other hand, Mexico reported a record-high production, partially offsetting the production decline in the region. We expect silver production to grow in 2019, as the ramping-up of current primary mines, especially in Mexico, and better performance from the gold and copper sector is anticipated.

TABLE 3 - WORLD SILVER MINE PRODUCTION

(million ounces)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Europe										
Russia	42.2	36.8	39.3	45.4	44.4	46.6	51.1	46.6	42.0	43.4
Poland	39.2	37.6	40.8	41.3	37.6	40.7	41.5	38.9	39.7	39.6
Sweden	8.7	9.2	9.1	9.8	10.8	12.7	15.9	16.4	14.9	14.6
Turkey	12.5	12.3	9.3	7.3	6.0	6.6	5.5	5.6	5.4	5.5
Spain	0.1	0.7	1.1	1.2	1.3	1.3	1.3	1.3	1.9	1.1
Portugal	0.7	0.7	1.0	1.1	1.4	1.7	2.4	1.2	0.5	0.8
Greece	0.9	0.9	0.8	1.0	0.9	0.9	1.0	0.8	0.8	0.8
Bulgaria	0.5	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.6
Macedonia	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4
Romania	0.1	0.2	0.4	0.3	0.3	0.1	0.1	0.1	0.1	0.1
Ireland	0.2	0.1	0.2	0.3	0.3	0.2	0.1	0.0	0.0	0.0
Other Countries	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0
Total Europe	**105.5**	**99.4**	**102.8**	**108.6**	**104.2**	**111.8**	**119.9**	**112.0**	**106.3**	**106.8**
North America										
Mexico	114.3	141.8	153.6	172.3	177.3	185.4	192.1	186.3	194.7	196.6
United States	40.2	41.2	36.0	34.1	33.4	37.9	35.0	37.0	33.7	28.0
Canada*	19.6	18.4	18.7	22.0	20.6	15.9	12.2	13.0	36.4	24.8
Total North America	**174.0**	**201.4**	**208.3**	**228.4**	**231.3**	**239.3**	**239.4**	**236.3**	**264.8**	**249.4**
Central & South America										
Peru	127.7	118.7	111.7	114.0	120.7	122.9	138.0	148.7	147.5	144.9
Chile	41.8	41.4	41.5	38.4	39.2	51.3	48.4	48.3	42.4	42.1
Bolivia	42.6	40.5	39.0	38.8	41.2	43.2	42.0	43.5	40.0	39.9
Argentina	18.0	23.3	22.8	24.5	24.9	29.1	34.7	30.1	25.7	26.5
Dominican Republic	0.6	0.6	0.6	0.9	2.8	4.5	4.1	3.4	3.3	3.4
Nicaragua	0.1	0.2	0.3	0.3	0.4	0.4	0.6	0.7	0.6	0.6
Ecuador	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6
Brazil	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6
Colombia	0.3	0.5	0.8	0.6	0.4	0.4	0.5	0.5	0.5	0.5
Venezuela	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
Other Countries	6.2	8.3	10.4	8.4	10.8	29.5	28.7	27.6	12.0	0.0
Total C. & S. America	**238.2**	**234.4**	**228.0**	**226.9**	**241.5**	**282.5**	**298.1**	**303.9**	**273.1**	**259.2**
Asia										
China	86.7	94.6	102.6	109.3	113.0	112.0	112.6	114.8	112.6	114.9
India	6.2	8.2	7.5	9.0	10.7	8.4	12.0	14.0	17.5	23.2
Kazakhstan	19.7	17.6	17.6	17.5	19.6	19.0	17.3	17.8	19.0	19.5
Indonesia	7.7	6.7	6.1	5.3	8.2	7.3	10.0	11.2	11.4	11.9
Armenia	1.3	1.6	2.4	2.9	3.4	3.7	4.0	4.8	5.0	5.0
Islamic Rep. Of Iran	3.4	3.6	3.6	3.5	3.2	3.2	3.3	3.6	3.6	3.6
Mongolia	1.1	1.1	1.1	1.1	1.6	2.1	2.6	2.8	2.1	2.1
Uzbekistan	1.7	1.9	1.9	1.9	1.9	1.7	1.6	1.6	1.6	1.5
Dem. Rep. of Laos	0.5	0.6	0.6	0.6	1.0	1.3	1.3	1.6	1.4	1.2
Philippines	1.1	1.4	1.4	1.5	1.5	0.9	0.9	0.9	0.7	1.0
North Korea	0.8	0.8	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8
Kyrgyzstan	0.3	0.3	0.3	0.2	0.3	0.3	0.4	0.6	0.6	0.6
Japan	0.4	0.3	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5
Saudi Arabia	0.4	0.4	0.3	0.3	0.6	0.7	0.7	0.8	0.8	0.4
Azerbaijan	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.2	0.2	0.2
Thailand	0.7	0.7	0.8	1.2	1.2	1.1	0.8	1.3	0.1	0.1

TABLE 3 - WORLD SILVER MINE PRODUCTION

(million ounces)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Tajikistan	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Pakistan	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other Countries	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Total Asia	**132.2**	**140.2**	**147.9**	**156.2**	**168.0**	**163.2**	**169.3**	**177.5**	**178.1**	**186.8**
Africa										
Morocco	8.7	10.5	8.3	8.3	9.2	8.8	9.6	10.8	11.6	11.2
South Africa	2.5	2.6	2.4	2.2	2.2	1.2	1.5	1.6	1.8	1.8
Eritrea	0.0	0.0	0.1	0.7	0.8	1.5	2.3	0.4	0.9	0.9
Zambia	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Tanzania	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Botswana	0.2	0.2	0.1	0.2	0.3	0.3	0.2	0.1	0.1	0.1
Zimbabwe	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Ethiopia	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Mali	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Ghana	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Dem. Rep. of the Congo	0.0	0.2	0.4	0.4	2.0	0.3	0.2	0.1	0.1	0.0
Burkina Faso	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.7	0.2	0.0
Other Countries	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0
Total Africa	**12.4**	**14.6**	**12.6**	**13.3**	**15.9**	**13.9**	**15.4**	**15.1**	**16.1**	**15.4**
Oceania & Other										
Australia	52.4	60.4	55.5	55.5	59.2	53.9	49.0	45.5	35.1	35.4
Papua New Guinea	2.2	2.1	3.0	2.6	2.9	2.8	2.3	2.9	3.2	2.5
New Zealand	0.5	0.4	0.3	0.2	0.4	0.5	0.4	0.3	0.3	0.2
Total Oceania & Other	**55.0**	**63.0**	**58.7**	**58.3**	**62.4**	**57.2**	**51.7**	**48.7**	**38.6**	**38.1**
World Total	**717.3**	**753.0**	**758.3**	**791.7**	**823.3**	**867.8**	**893.7**	**893.4**	**876.9**	**855.7**

*Canada's 2017 and 2018 production considers imported refined silver not accounted in other countries.

Mine supply from **Mexico** rose by 1.9 Moz (61 t), to a record high of 196.6 Moz (6,116 t), following a solid performance of the primary and gold sectors. The rise was led by a 7% growth in Minera Fresnillo's output, where higher grades and higher recovery rates at the Herradura mine and the ramp-up of phase two of the San Julián mine pushed the company's silver production to 58 Moz (1,804 t). The ramp-up of operations at Saucito's Pyrites Plant, which will be fully operational in 2019, is expected to partially offset the decrease in head grades the mine has experienced the last few years. At Fresnillo's parent company, Industrias Peñoles, better grades and higher throughput boosted production to a total of 14.8 Moz (459 t), representing a 5% increase from 2017.

On the other hand, silver production in Minera Frisco's fell by 8%, to 7.7 Moz (240 t). The main source of this reduction was a 22% decrease in throughput, mainly due to the halt in Porvenir and San Felipe's open pit operations, while the latter continues only with its underground operation.

Production in **Canada** dropped by a staggering 32%, after a fire in the smelting facilities and continuous maintenance problems in Teck's Trail operation caused silver output to drop 10.0 Moz (311 t) or 47% from 2017, to a total of 11.5 Moz (358 t). Production is expected to ramp-up in 2019 to 14 Moz (435 t). Trail's output drop represents 65% of the total decrease for the region. Vale's Sudbury operation lower throughput impacted output by 10%, lowering production to 1.3 Moz (41 t). Glencore's Kidd Creek and Agnico Eagle's LaRonde operations were affected by lower silver grades, pushing down production by a combined 0.6 Moz (19 t).

The **United States** also experienced an output reduction of 17% year-on-year to a total of 28.0 Moz (870 t). The largest decline in 2018 was posted by Americas Silver Corporation, where several issues at its Galena operations forced the shaft to remain shut for over 17 days. Hecla's Lucky Friday and the newly acquired (after the merger with Klondex Mines) Fire Creek posted a

combined decrease of 1.2 Moz (38 t) in their production, mainly due to continuous strikes and lower grades, respectively.

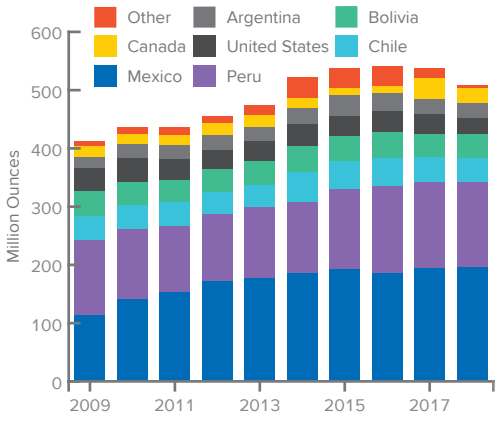
CENTRAL & SOUTH AMERICA

Silver production in the region dropped 13.9 Moz (434 t) in 2018, a 5% decrease, as disruptions and lower grades negatively affected the primary sector.

The largest decrease in any single country globally came yet again from **Guatemala**, where the Escobal mine remained suspended after its mining license was revoked by Guatemala's High Court in Q2 2017. The mine was recently acquired by Pan American Silver, with its acquisition of Tahoe Resources. After several failed attempts during the last 18 months to seek an agreement with the Xinca farming community, which inhabits the neighboring regions of the mine, the new management is confident that production will resume in 2019 and will reach a production of 21.0 Moz (653 t) by 2020.

Peru also posted a silver production drop, declining by 2% to 144.9 Moz (4,508 t), especially the primary and copper sectors. Within the primary sector, Volcan's silver production fell 2% to 17.0 Moz (532 t) in 2018, as Yauli and Chungar operations remained suspended for over two weeks in order to improve safety standards, while Alpamarca processed more ore from stockpiles, lowering the head grade. Buenaventura's silver production was in line with the 2018 guidance, producing a total of 26.2 Moz (815 t) of silver. Tambomayo is reaping benefits from the ramp-up realized during 2017, resulting in a 20% production increase, or 2.1 Moz (67 t), partially offsetting the output drop in Uchucchacua, due to considerable lower grades. Providing a partial offset, Hochschild's Pallancata mine increased its silver output by a further 18%, achieving production of 7.0 Moz (218 t), as better grades were realized in its San Pablo vein.

MINE PRODUCTION IN THE AMERICAS



Source: GFMS, Refinitiv

Turning to the Peruvian by-product sector, Antamina's silver production dropped by 16% to 16.4 Moz (512 t), a 3-year-low. The giant copper-zinc mine is expanding to a low silver-grade phase, but silver production is expected to recover in 2019. Further losses were posted in Newmont's Yanacocha mine after substantial lower throughput affected negatively silver production by 1.3 Moz (41 t). Providing a partial offset, output at Inmaculada and Chungar mines posted a combined increase of 1.1 Moz (34 t).

Moderate losses were posted in **Chile**, as lower grades in Codelco's operations pushed production down by 2.6 Moz (81 t), representing a 12% drop compared to 2017. Turning to the Chilean private sector, BHP's Escondida copper mine, which expected lower grades for 2018, managed to improve its concentrator throughput and recovery rates, achieving a record-high silver production of 7.9 Moz (247 t). Lower grades at Yamana's El Peñon mine pushed production down to 3.9 Moz (121 t), representing an 9% drop compared to 2017, while Glencore's Collahuasi mine posted a silver output of 7.4 Moz (229 t), slightly above the last years' results. Finally, we estimate Antofagasta's Centinela and Los Pelambres mines achieved a combined production of 3.6 Moz (112 t). Chile produced a total of 42.1 Moz (1,311 t) in 2018, lower by just 1% than 2017.

Argentina posted the biggest production increase in the region, after Yamana's Cerro Moro exceeded production forecasts, realizing the production of 4.1 Moz (127 t) in its first six months of commercial production. Cerro Moro is currently ramping up its production, which is expected to achieve a silver output of 6.0 Moz (187 t) during 2019 and a further 8.0 Moz (249 t) in 2020. At the newly formed Puna operation, which includes Pirquitas processing plant and the Chinchillas mine, production dropped by 40% to 3.7 Moz (115 t). The company is analyzing the potential to open an underground mine in Pirquitas, which was closed in January 2017, to partially offset the lower throughput and lower grades currently being processed.

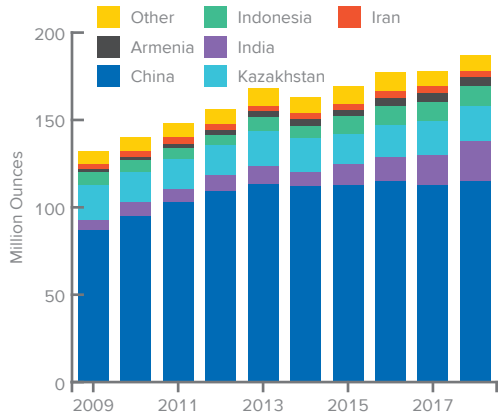
ASIA

Silver output in Asia grew for the fourth consecutive year, achieving production of 186.8 Moz (5,809 t), 5% higher than 2017. The biggest growth was posted in **India**, driven by a robust performance by Hindustan Zinc. The company's underground operations increased its mining output, while better silver grades boosted silver production by 33% in relation with 2017, to a record level of 19.6 Moz (610 t). Hindustan Zinc operations accounted for over two-thirds of total silver production growth in the continent, and growth is set to continue. The company expects silver output to further increase in 2019.

The third and fourth largest Asian producers, **Kazakhstan** and **Indonesia**, posted gains for 0.5 Moz (16 t) each, representing an increase of 3% and 4% from 2017, respectively. Indonesia's Grasberg mine, operated by Freeport-McMoran, reported a 30% increase in its silver production after higher throughput and higher grades were posted in the final phase of the open pit operation, which will transition to underground mine in the first half of 2019. On the other hand, the conglomerate of mines Kazzinc Consolidated, based in Kazakhstan, posted a 7% increase in its silver output in 2018, achieving a total production of 6.2 Moz (193 t).

China reported a 2% increase in silver production in relation with 2017, realizing 114.9 Moz (3,574 t). Over 90% of the world's third largest silver producer is sourced from base metals mines, while only 6% is obtained from primary mines. Production has bounced back somewhat from the effects of tighter environmental controls,

MINE PRODUCTION IN ASIA



Source: GFMS, Refinitiv

experienced in 2017. After meeting new government requirements, lead, zinc and copper mines posted a modest recovery in their production numbers, and in doing so lifted by-product silver production higher. Silver production from primary mines improved by 6%, especially in Silvercorp' s Ying Mining District, where higher throughput and better grades facilitated the increase of their silver production by 11% in 2018, realizing a total output of 5.9 Moz (185 t).

Saudi Arabia's production fell by 46% to 0.4 Moz (11 t), as a result of lower grades. Al Masane Al Kobra (AMAK) corporation produced its first gold and silver bullion on Q2 2018 and is expected to produce 0.5 Moz (16 t) per annum from 2019.

Laos, **Mongolia** and **Uzbekistan** also reported production losses for 2018, accumulating a combined production of 4.8 Moz (150 t), 6% lower than the last year. Lower grades and a decrease in capital expenditure over the last few years are expected to continue affecting negatively future production.

AFRICA

Africa's silver production declined by 0.7 Moz (21 t) in 2018, achieving a total production of 15.4 Moz (479 t). Lower grades in **Morocco**, which produces 72% of the total in the continent, was the main factor responsible for this drop. Output at the Imiter mine, Africa's largest silver producing mine, maintained 2017 production of 7.8 Moz (242 t). The company is improving its infrastructure with plans to increase capacity at the mine that will allow production to grow to 9.7 Moz (300 t) by 2020. Elsewhere, **Burkina Faso** realized a production drop mainly accountable to Glencore's Perkoa zinc mine, which closed in 2018.

OCEANIA

Production in Oceania declined for the fifth consecutive year in 2018, falling 1% year-on-year, or 0.4 Moz (13 t), to hit a 21-year low at 38.1 Moz (1,186 t). The main driver of the decline was **Papua New Guinea**'s tightening environmental policies, pushing down silver production to a 3-year-low of 2.5 Moz (79 t), a 21% decrease from 2017. On the other side of the scale, **Australia**, which accounts for 93% of the region's output, produced 0.3 Moz (10 t) more than the previous year.

CORPORATE ACTIVITY

In 2018 low silver prices were key for larger mining companies' consolidation, through the acquisition of prospective targets and under-developed mines, with special focus in the Americas.

On March 19, 2018, Hecla Mining announced the acquisition of Canadian based Klondex Mines. The deal, valued at $462 million, got the green light by shareholders in early July and subsequently closed at the end of the month. Hecla Mining produced 10.4 Moz (324 t) of silver and 262,000 ounces (8 t) of gold in 2018. It has the potential to substantially increase its silver and gold output after the incorporation of the high gold and silver grade mines Fire Creek, Midas and Hollister. This puts the company in the highly prospective and profitable Nevada region, where it expects to start an aggressive exploration program.

On May 10, 2018, First Majestic Silver Corp. acquired Primero Mining Corp., including its San Dimas Silver/Gold mine, in Mexico. The deal was valued at $320 million, adding 41.2 million silver ounces in reserves. With this acquisition, First Majestic forecasts a production of 24.7-27.5 Moz (768-855 t) in silver equivalent ounces for 2018, 48% of which is represented by the newly assimilated San Dimas mine.

Coeur Mining had another active year in the M&A space. In 2017 it acquired JDS Silver Holdings, which operated the Silvertip mine. The silver-lead-zinc operation reached commercial production on September 4, 2018 and is expected to produce over 1.9 Moz (59 t) of silver in 2019. Turning to 2018, Coeur sold its Bolivian subsidiary, which operated the San Bartolomé Mine and processing facility to Argentum Investments, a private Swedish company. In August, Coeur announced the acquisition of Northern Empire Resources after reaching a $90 million deal, which includes the Sterling Gold project in Nevada. Finally, it declared the acquisition of three highly-propstective targets near the Rochester mine, from Alio Gold, in October. The company forecasts a production between 12.2-14.7 Moz (379-457 t) for 2019, while is expected to continue increasing its annual output in the coming years.

Pan American Silver Corp. and Tahoe Resources Inc. announced on November 14, 2018 an agreement to create one of the world's biggest primary silver mining company. After months of negotiations, on January 8, 2019, over 98% of Pan American's shareholders approved the transaction, which is valued at over $1 bn. The company will strengthen even further its presence in the Americas, incorporating over 264 Moz (8,211 t) in proven and probable silver reserves, in addition to over 1.8 Moz (56 t) of gold reserves, doubling its current silver and gold reserves. One of Pan American's main objectives for the near future is to re-obtain the mining license of the Escobal mine, after being revoked in 2017 by the Guatemala's High Court, for which is currently developing a sturdy community engagement and public consultation. Adding the expansion of the La Colorada mine and the development of several projects as the Navidad mine, in Chile, the company has the potential to produce over 45.0 Moz (1,400 t) annually.

On March 5, 2019, Great Panther Mining announced the acquisition of Beadell Resources Limited, changing its name to Great Panther Mining Limited. The deal reinforces the company's presence in the Americas and will allow the company to further extend its polymetallic portfolio.

Turning to silver streaming, Sandstorm entered into an agreement with Yamana Gold to receive interim silver deliveries through 2018 from several of Yamana's operations, including up to 20% of Cerro Moro's production. Franco Nevada, on the other hand, saw a 10% reduction in its silver streams, but forecasts a recovery in 2019 after expecting better production at Candelaria and Cerro Moro, in which it holds an interest of 2% of its production. Wheaton Precious Metals, the largest silver streamer, is expected to continue its growth particularly in the gold and palladium businesses. The company streamed 24.4 Moz (759 t) of silver in 2018 and anticipates higher production at Salobo and Peñasquito for 2019, offsetting the loss triggered by the termination of the San Dimas silver purchase agreement.

AVERAGE PRICES OF SOURCE METALS

($/ton)

Change	2014	2015	2016	2017	2018	y-o-y
Lead 3-Mth	2,113	1,795	1,875	2,325	2,248	-3%
Zinc 3-Mth	2,167	1,938	2,101	2,890	2,892	0%
Copper 3-Mth	6,827	5,493	4,870	6,200	6,545	6%
Gold ($/oz)	1,266	1,160	1,251	1,257	1,268	1%

Source: GFMS, Refinitiv; LME; ILZSG

WORLD MINE PRODUCTION OF SOURCE METALS

(Thousand tons)

Change	2014	2015	2016	2017	2018	y-o-y
Lead	4,946	4,850	4,687	4,710	4,655	-1%
Zinc	13,493	13,610	13,517	13,440	12,866	-4%
Copper	18,291	19,050	20,042	19,842	20,474	3%
Gold (tons)	3,180	3,222	3,252	3,244	3,244	0%

Source: GFMS, Refinitiv; ILZSG

After recovering from infrastructure damage caused by a fire in 2017, higher grades and higher utilization of the processing plant at South32's Cannington mine, which is Australia's biggest silver producer, boosted production by 11% to 13.3 Moz (416 t) in 2018. We expect silver output to further increase in 2019, as operations in a high-grade phase of the mine are projected to continue.

China Minmetals and Evolution Mining reported an increase of a combined 1.0 Moz (31 t) of silver during 2018 at their respective Australian operations, reaping benefits from the Capex increase the last few years. BHP's Olympic Dam copper mine produced 1.0 Moz (31 t) of silver in concentrates, a 39% increase from 2017. On the other hand, Independence Group's Jaguar zinc-copper mine was sold in May 2018 to CopperChem. The new company cut its throughput, lowering production by 54% to 0.4 Moz (14 t). Glencore's Mount Isa mine reported a further decrease of 0.9 Moz (26 t) in its silver output, mainly due to lower grades.

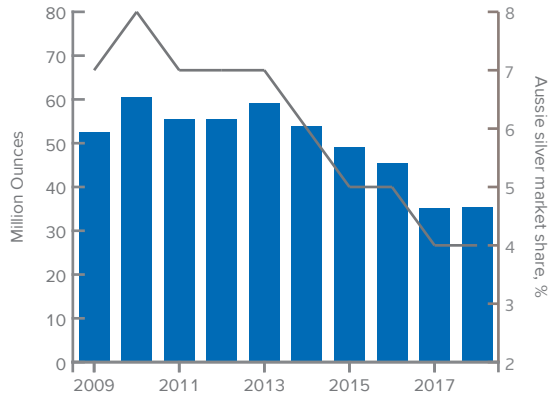
EUROPE

European silver production increased by 1% last year, to a total of 106.8 Moz (3,322 t), the first increase after three consecutive years of declines. Russia and Portugal were responsible for the growth, partially offset by modest falls in production in Poland and Sweden. Output at Europe's top producer, KGHM Polska Miedz, decreased by less than 1% from 2017, realizing a silver production of 33.9 Moz (1,055 t) in 2018. On the other hand, Lundin's Neves-Corvo operation in **Portugal**, achieved production of 0.8 Moz (25 t) in 2018, 51% higher than the previous year.

Russia's primary silver production dropped by 7% in 2018 to a total of 21.3 Moz (663 t), lower grades were a key driver, especially in Polymetal's Dukat and Lunnoye underground mines, where despite an increase in mine throughput, an average of 8% lower grades in both mines negatively affected silver production by a combined 1.6 Moz (50 t). On the other hand, silver production as a by-product in gold mines in the country increased by 32% to 12.6 Moz (392 t), offsetting the primary production deficit.

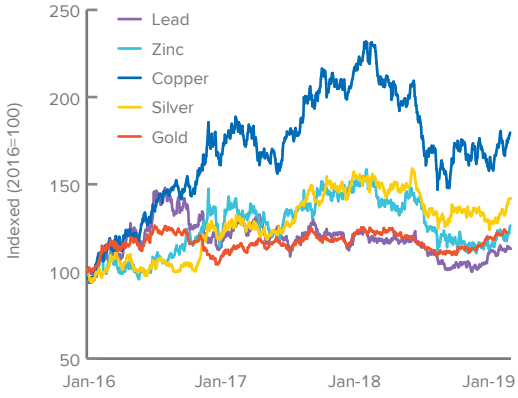
Lower silver grades at Boliden's Aitik, Boliden and Garpenberg mines pushed **Sweden's** silver output down by 3% to 14.6 Moz (454 t).

MINE PRODUCTION IN AUSTRALIA



Source: GFMS, Refinitiv

INDEXED SILVER & BY-PRODUCT METAL PRICES



Source:GFMS, Refinitiv

SILVER OUTPUT BY SOURCE METAL

(million ounces)	2017 Output	% of Total	2018 Output	% of Total	Change y-o-y
Primary	240.9	27%	224.0	26%	-7%
Gold	102.0	12%	104.1	13%	2%
Lead/Zinc	329.9	38%	322.8	38%	-2%
Copper	199.5	23%	200.8	23%	1%
Other	4.6	0%	4.0	0%	-13%

Source: GFMS, Refinitiv

BY-PRODUCT ANALYSIS & OUTLOOK

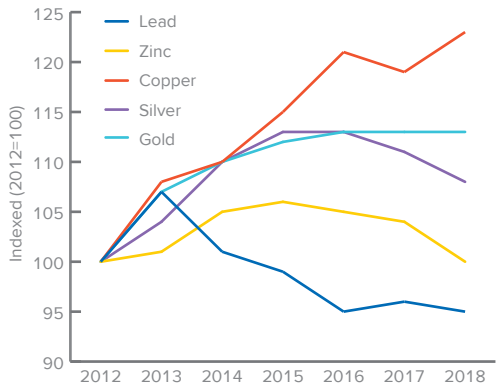
We expect silver supply to grow in 2019 partly due to higher output from gold and primary silver mines in the Americas and an increase at lead/zinc operations in Oceania. Looking at last year's performance and the outlook of the major source metals, global gold mine production was 104.0 Moz (3,235 t), marginally higher than 2017. On a regional basis, Asia registered a 3% higher output, fueled by the development of a higher-grade phase in Indonesia's Grasberg mine, offsetting the decrease in Chinese production. Australia's gold production rose by 0.6 Moz (18.8 t), favored by higher grades and processing throughput, while losses in South America and North America were 1% and 3% year-on-year respectively.

Copper mine output rose by 1% in 2018, reflecting a similar compound average growth rate (CAGR) to that recorded over the past decade, to reach 20.4 M t. However, that reasonable performance was preceded by a slight contraction in 2017 and furthermore is likely to be followed by stagnation in 2019, due to the continued lack of investment in significant new projects. Indeed, it is only after 2022 that mine supply growth looks set to pick up with any real volume with the new mines slated to come on stream.

Production at Chile recovered last year to reach a new record of 5.8 M t, being responsible for almost two-thirds of the overall increase in tonnage terms. The 6% rise in Chilean output was helped by the Los Colorados concentrator expansion, which came on stream towards the end of 2017 and a relatively trouble-free year in terms of labor disruptions, especially given the historically long (43 days) strike that beset the Escondida mine in early 2017. In other major producing nations, the picture was somewhat mixed. In Peru, the second largest producing country, output dipped very slightly from the 2017 record to just under 2.4 M t. Lower production from major mines such as MMG's Las Bambas mine (in which output fell year-on-year by 68,000 t) was only partially offset by increases at some others. In Africa, the Democratic Republic of Congo reaped the benefits of the late 2017 restart of Glencore's Katanga operation, with production at the operation jumping by around 150,000 t from negligible levels recorded in previous year. While the country had been expected to go from strength to strength in 2019, that view has since been tempered following Glencore's announcement of a near term step-down in production at its Mutanda operation as a result of its latest understanding of oxide and transitional ore reserves at the site.

Global lead and zinc mine production took diverging paths in 2018. Zinc mine output increased by 2% year-on-year while lead output fell by 1%, according to latest data from the International Lead and Zinc Study Group (ILZSG). Concentrate treatment charges (TCs), which are determined by raw material availability, also reflected this trend. Zinc TCs for material imported into China rebounded strongly from lows of around $20/t at the start of 2018 to $180/t by the end of the year with most of the gains made in the second half. Meanwhile, lead's TCs continued to languish below $30/t. The gains in global zinc mine production were due primarily to Australia's return to strong growth. Zinc mine production in the country jumped by 30% year-on-year, due in large part to the commissioning of MMG's Dugald River and New Century's tailings project. The ramp up of the polymetallic Dugald River mine also boosted the country's lead concentrate output, producing 16,700 t of contained lead. Overall, Australia's lead mine production grew by more than 6%. However, this was largely offset by a decline in China, the world's top producer, where mine output has been constrained by stringent environmental policies.

INDEXED GLOBAL METAL MINE PRODUCTION



Source:GFMS, Refinitiv

SILVER PRODUCTION GUIDANCE - MINE BY MINE OUTLOOK

(million ounces)	Primary Metal	Country	2018 Output	2019e Output	Change y-o-y
Cerro Moro	Au	Argentina	4.1	6.0	1.9
Penasquito	Au	Mexico	18.3	19.8	1.6
San Dimas	Ag	Mexico	4.4	5.8	1.4
Pallancata	Ag	Peru	7.4	8.9	1.4
Dolores	Ag	Mexico	4.2	5.5	1.3
Ying	Au	China	5.9	5.4	-0.5
Garpenberg Area	Zn	Sweden	9.1	8.4	-0.7
San Bartolome	Ag	Bolivia	4.0	2.7	-1.3

Source: GFMS, Refinitiv

PRODUCTION COSTS

- **On a co-product basis, we estimate Total Cash Costs with capex for 2018 averaged $10.37/oz, a 2% decrease relative to 2017.**

- **We estimate silver equivalent production dropped by 4%, or 32.1 Moz (1,003 t) led by tighter environmental policies in China and the suspension of activities at the Escobal mine in Guatemala.**

Silver Total Cash Costs (TCC) net of by-product credits fell for the sixth consecutive year in 2018, by 48% to $-4.95/oz. This global trend is fuelled by higher production and by-product credits from Poland and India, in addition to higher by-product credits from Peru. However, this was partially offset by less production in Bolivia, Guatemala and China. In 2018, primary silver producers accounted for 26% of global output, of which our cost data capture represented 76% of primary supply.

SILVER MINE PRODUCTION COSTS

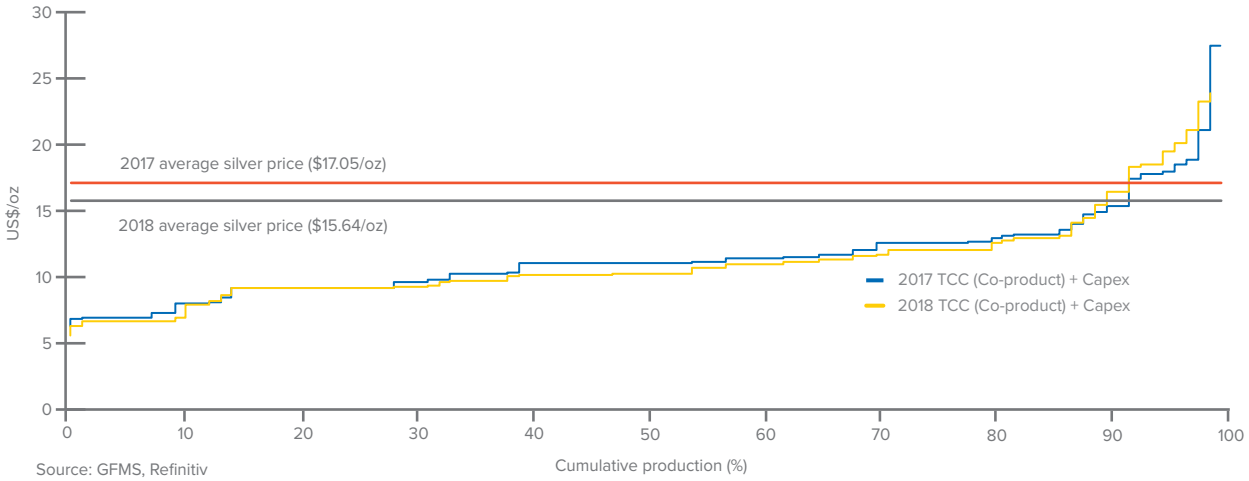
(US$/oz unless stated)	2016	2017	2018
TCC (by-product)	-4.25	-9.46	-4.95
TCC (co-product)	8.77	8.08	8.01
TCC (co-product) + Capex	11.21	10.54	10.37
Average Silver Price	17.14	17.05	15.64
Sample Size (Moz)	318.0	296.6	271.1

Source: GFMS, Refinitiv

On a co-product accounting basis, TCC + capex stood at $10.37/oz, decreasing by 2% from last year. The main cause of this drop was a 8% reduction in capital expenditure (including sustaining and expansionary investments) to $2.1 bn. Guatemala's Escobal mine remains suspended from Q2 2017, accounting for one third of the decrease in silver equivalent ounces produced, while Mexico and Poland decreased their capex substantially.

If we exclude silver production from India and Poland, however, TCC + capex on a co-product basis fell by 2% to $11.11/oz following a 1% decrease in silver ounces. Over 2018, the U.S. dollar saw mixed results against the domestic currencies of the major silver producers. Last year, the Peruvian sol weakened by 4% relative to the U.S. dollar, the Chinese yuan strengthened by 6%, while the Mexican peso remained stable. Silver prices averaged $15.64/oz during 2018, 8% less than in 2017. Considering the co-product TCC+capex measure, 12% of the primary silver producers analyzed, mainly located in Argentina and Mexico, were below the average silver price for the year (and this group accounted for 32% of the drop in production recorded in our cost data capture).

SILVER MINING COSTS



Source: GFMS, Refinitiv

We expect the silver price to slowly regain strength in 2019, pushing co-product costs slightly higher, while by-product costs are anticipated to continue stabilizing, as lower grades and further environmental restrictions will trigger a decline in credits.

PRODUCER HEDGING

- **In 2018, we estimate the delta-adjusted hedge book declined by 2.8 Moz (87 t).**
- **On a nominal basis, the global producer hedge book stood at 18.9 Moz (590 t) at the end of 2018, a reduction of 43% compared to 2017.**
- **De-hedging activity was moderate in scale, consisting mainly in producers delivering into their forward sales agreements.**

The global producer hedge book contracted on a delta adjusted-basis by 2.8 Moz (87 t), representing a 13% decrease on the hedge book total compared to 2017. As a result, the hedge book stood at a total of 18.9 Moz (590 t) at end-December 2018. The net nominal hedge book fell to its lowest level for over a decade, declining by 14.3 Moz (445 t), in large part due to a substantial reduction in the number of outstanding option positions. The forward sales component of the book, on the other hand, grew by 1.5 Moz (47 t). The decline in options means that forwards now represent almost 97% of the total hedge book.

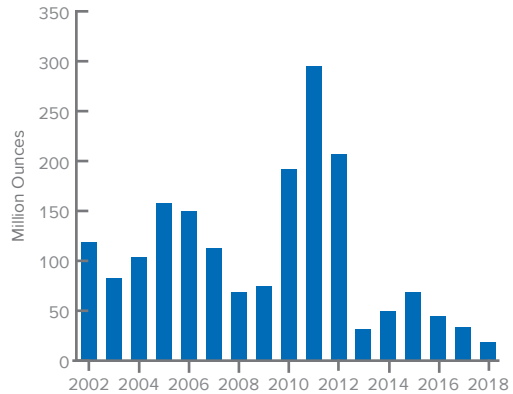
Of the net de-hedgers, Hecla mining delivered 1.4 Moz (45 t) in forward sales, at an average price of $16.64/oz, having no outstanding forward sales, other than provisional hedges, by the end of 2018. The company is focussing on currency protection, while it has yet to confirm any silver hedging for 2019.

Nyrstar delivered into the hedge book 2.7 Moz (84 t) in forward deliveries from its zero-costs collar entered in 2014 and updated in 2017, respectively, in order to help finance facilities modernization. As to December 31, 2018, the company has an estimated outstanding position of 12.0 Moz (373 t) in prepaid agreements, mainly covering part of Port Pirie's silver production.

Approximately 8.3 Moz (261 t) of options expired or were exercised in 2018, of which 92% represented a change of strategy by Industrias Peñoles, temporarily closing it options book and focusing mainly in forwards contracts. By December 31, 2018, the company posted an outstanding 0.4 Moz (11 t) in forward buys at $15.09/oz and 5.8 Moz (180 t) in forwards sales averaging $14.77/ oz. Managem Group, owner of Morocco's Imiter mine, also reported an expiration of 1.8 Moz (56 t) in options during 2018 and is yet to report contracts for 2019. Finally, Harmony posted 0.3 Moz (8 t) of outstanding options by the end of the year.

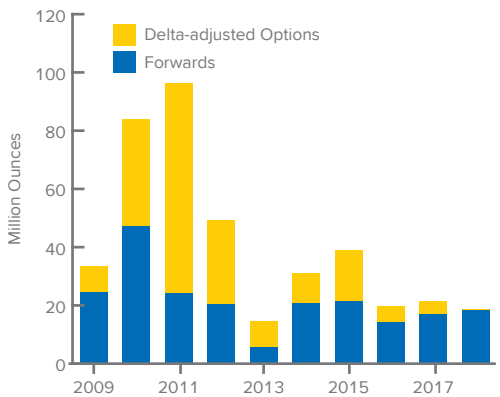
Finally,Minera Frisco, once the biggest hedging player in the market, changed its hedging strategy after the delivery of over 7.4 Moz (231 t) in 2017. The Mexican company reported on December 31, 2018, over 4.0 Moz (124 t) in outstanding swaps, valued over $70 million.

EVOLUTION OF THE NOMINAL HEDGE BOOK



Source: GFMS, Refinitiv; Silver Institute

PRODUCER HEDGING: OUTSTANDING POSITIONS



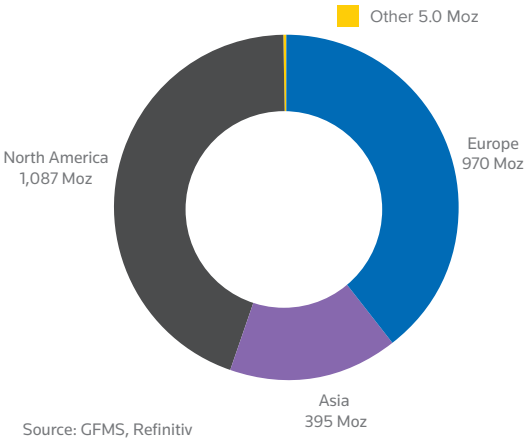
Source: GFMS. Refinitiv: Silver Institute

5. SUPPLY FROM ABOVE-GROUND STOCKS

- **Following nine consecutive annual increases, identifiable above-ground stocks fell 3% year-on-year to 2,549.8 Moz (79,308 t) in 2018. Current inventories can cover 28 months of global demand.**

- **After a slight rise the previous year, global silver scrap supply contracted 2% to 151.3 Moz (4,707 t) last year. Lower silver prices accounted for the bulk of the decline discouraging suppliers and consumers from recycling their silver valuables.**

BULLION STOCKS - REGIONAL BREAKDOWN IN 2018



Source: GFMS, Refinitiv

OVERVIEW

Due to silver's characteristics it is often utilized in a wide variety of uses. Contrary to gold, it has very strong industrial demand for all kinds of end use products. As such, silver is produced in different forms, to accommodate the needs of manufacturers. The most common are doré, grains, powder, bullion and non-bullion coin blanks and bullion bars. Silver products are often stored in custodian vaults (allocated and non-allocated to ETPs), held by futures exchanges, stored by governments or held by investors and industrial manufacturers. The largest category of above-ground stocks is silver held in custodian vaults. Data on these volumes are collected from silver ETP holdings, a confidential survey, field research and other reported volumes. Institutional and retail investors, ETP holders and other long term holders make up the bulk of silver owners.

Jewelry, silverware and other finished fabricated products that are in the possession of end-users are not included in our definition of above-ground refined stocks. Bullion coins and bars and numismatic and collector coins make up the vast majority of our typical above-ground stock numbers. Other open-loop end uses of demand leave our analysis at the industry level, where they get manufactured into a wide range of applications, such as solar panels, jewelry, silverware, photographic paper, etc. Only when these products get refined back into dore or other high purity products do they enter our statistics again. Scrap is added to supply in addition to mine production and hedging.

As is the case with any commodity market, changes in above-ground stocks can have wide ranging implications on price assumptions in a given year. Usually stocks function as a buffer for the supply/demand movements. In the case of gold and silver, however, storage is often also a reflection of demand, particularly for physical investment products like coins and bars.

IDENTIFIABLE ABOVE-GROUND SILVER BULLION STOCKS

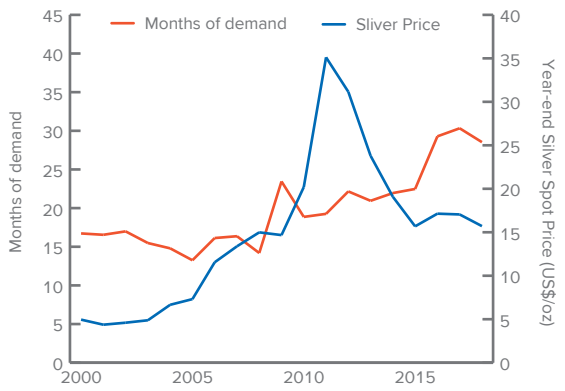
(million ounces)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Custodian Vaults*	972.4	917.0	1,049.1	1,003.9	1,132.8	1,224.5	1,358.0	1,572.4	1,521.9	1,402.7
ETPs	472.3	602.0	578.4	633.6	636.1	637.4	619.4	667.4	669.8	649.5
Exchange*	17.8	18.1	21.4	78.9	88.8	80.6	96.8	169.7	227.6	301.4
Government	160.5	116.4	104.3	97.0	89.1	89.1	89.1	89.1	89.1	89.1
Industry	14.4	18.5	17.7	18.3	15.5	13.8	14.7	15.4	14.6	14.8
Total	**1,637.4**	**1,650.1**	**1,771.0**	**1,831.6**	**1,962.2**	**2,045.4**	**2,178.0**	**2,514.0**	**2,523.0**	**2,457.5**
Months of Demand	23	19	19	22	21	22	22	29	30	28

Source: GFMS, Refinitiv; Respective ETP issuers, exchange websites, Japan Ministry of Economy, Trade and Industry, USGS

*Custodian vault and exchange warehouse stocks exclude stocks allocated to ETPs.

The level of above-ground stocks in the precious metals market can have far ranging implications for the price development in a given year, depending on the liquidity, purity and availability of those stocks in case a market deficit requires them to fill the gap. Silver stocks, just like gold, are a different beast compared to other commodity markets such as energy and most agricultural commodities. The main difference lies in their consumption. Most commodities in agricultural and the energy space lose their original form when consumed. Gold and silver, however, in many instances keep their original form, which can add to the above-ground stock volume and exert downward pressure on the price.

IDENTIFIABLE STOCKS EXPRESSED AS MONTHS OF DEMAND



Source:GFMS, Refinitiv

IDENTIFIABLE BULLION STOCKS

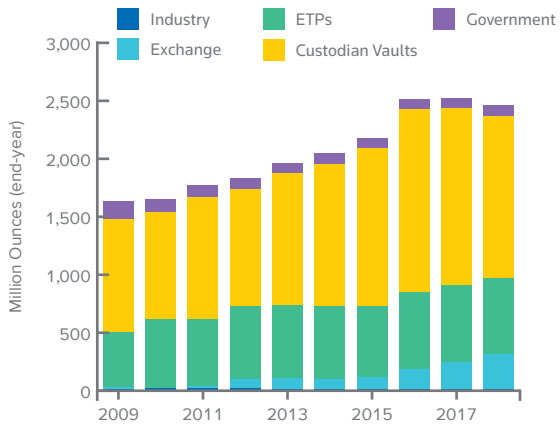
Identifiable bullion stocks can be separated into two categories: reported and unreported bullion stocks. Reported stocks consist of industry, exchange, ETP and part of the government stock category. Insights into these holdings are collected from publicly available sources, company yearbooks and through interaction with industry participants. Unreported stocks represent the largest part of identifiable above-ground stocks and consist mainly of government and custodian vaulted stocks.

Following nine consecutive years of increases, total identifiable above-ground stocks fell 3% to 2,457.5 Moz (76,437 t) in 2018. Above-ground stocks were at their lowest in 2005 at just above 1.0 bn ounces (31,103 t) but have witnessed steady increases since then, reaching a peak of approximately 2.5 bn ounces (77,759 t) last year. Since 1990, above-ground stocks have increased by a CAGR of 1%. The growth rate was a 3.6% CAGR measured from the start of this millennium and 7% over the last decade.

Custodian vault stocks take up the lion's share of the total representing 57% last year, followed by ETPs at 26%. Government and industry held silver stocks remained stable last year at 4% and 1% respectively. The only category that witnessed a considerable rise, representing 12% of the total, was inventory held by exchanges (more about that in the Futures Exchanges section in this chapter).

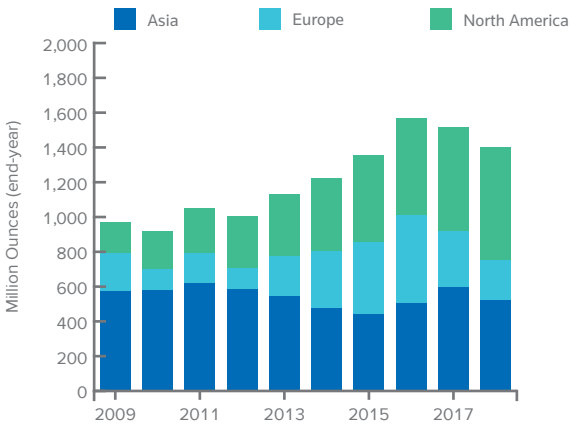
Reported stocks, which consist of ETPs, exchange and industry held inventory, increased 6% to 972.7 Moz (30,254 t) last year, raising their share of total from

IDENTIFIABLE ABOVE-GROUND SILVER INVENTORIES



Source: GFMS, Refinitiv

CUSTODIAN VAULT STOCKS*



Source: GFMS, Refinitiv *Stocks exclude sliver stocks allocated to ETP's

37% to 40%. The rise can be mainly attributed to the increasing popularity of silver backed ETP's, which represent roughly two-thirds of total reported stocks. ETPs have gone through quite the stormy development, from being almost non-existent up until 2002, to 649.5 Moz (20,202 t) last year. Trading of silver on the various exchanges we track has also increased considerably over the years. North America, represented by COMEX, remains the largest destination for silver futures trading. Indeed, silver traded on COMEX last year was still three times as large as the three other silver exchanges in Asia, namely TOCOM, Shanghai Futures Exchange (SHFE) and Shanghai Gold Exchange (SGE) combined. Silver trading by the Far East has considerably increased in popularity in recent years and we expect this growth to continue.

Following a decline in 2017, unreported stocks fell 7% last year to 1,480.2 Moz (46,039 t). The drop was driven by a decline in silver vaulted stocks held by custodians, which almost exclusively makes up the unreported category and decreased 8% to 1,398.2 Moz (43,489 t).

Custodian vaulted stocks declined from 1990 until 1997 when they reached their lowest point on record of 216.2 Moz (6,725 t). After that, they started a steady increase which was also followed by rising ETP holdings from 2002 onwards. They almost doubled at the start of the millennium and overtook government held stocks in 2002 as well. A rise in vaulted stocks is usually a combination of different factors of which storage of newly purchased physical metal is one. Another reason for a rise in vaulted stock held by custodians is usually due to a rise in metal flowing into the UK and Swiss terminal markets used by refiners when demand is low.

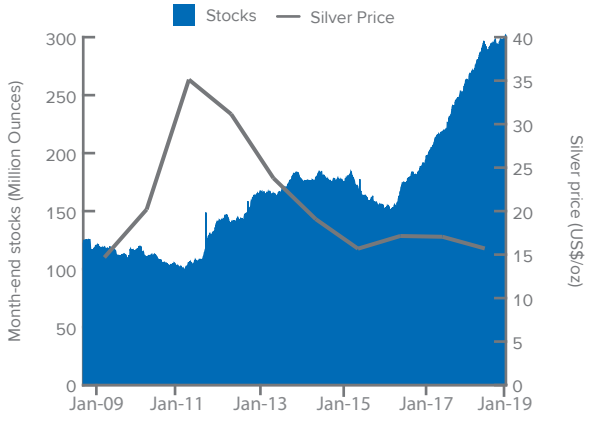
Geographically split, North America was the only region last year that reported an increase in above-ground stocks of 9%, while Europe and Asia recorded a decline of 9% and 14% respectively. Total identifiable above-ground stocks represented approximately 28 months' worth of demand in 2018; which was two month less than the record of 30 months in 2017.

CUSTODIAN VAULT STOCKS

For the second consecutive year, global vaulted stocks contracted, retreating by 6% to 1,402.7 Moz (43,629 t). Our custodian stocks data does not include stocks held by ETPs, however, in many cases silver stocks are also stored in vaults not allocated to ETPs. At 57%, custodian stocks make by far the largest part of above-ground stocks, although its market share fell from 60% in 2017.

Custodian vaulted stocks, not allocated to ETP's, have steadily increased over the last five years, doubling in volumes over the last decade. Unsurprisingly, Asia has accounted for a decent chunk of the rise in custodian stocks, although volumes are still considerably lower than those recorded in North America and Europe, which both accounted for 45% and 37% of total custodian stocks last year respectively. The rise in vaulted stocks for both regions, however, is partly a reflection of weak demand more than anything else. Terminal market inventory finds its way into Europe, driven by refiners off-loading their metal in times when investment demand is weak. The European and U.S. bullion banks in collaboration with major storage providers remain the main facilitators. The rise in Asian stocks is more spread out between Singapore, India, Japan and China, although the latter in particular has had the most dominant role. Indeed, Chinese vaulting has risen considerably in recent years reaching a peak of 479.9 Moz (14,427 t) in 2016. This was driven by

COMEX WAREHOUSE STOCKS



Source: COMEX

SHFE SILVER STOCKS

(million ounces; end period)

	Q1	Q2	Q3	Q4
2016	49.4	59.5	52.6	59.7
2017	63.3	43.6	42.8	43.1
2018	42.4	45.3	41.1	35.8

Source: SHFE

SILVER ETP HOLDINGS BY VAULT LOCATION

This focus box is to demonstrate the difference between the investor domicile and holdings by vault location for silver held by ETPs. A silver ETP listing (or available for the domestic market in one country) does not necessary mean physical holdings of the said ETP are also being stored in the same country.

While total ETP holdings fell by 3% to 649.5 Moz (20,203 t) in 2018, the distribution of stocks by vault location remained largely unchanged. At 327.5 Moz (10,187 t), the United Kingdom was still the largest location for storing silver in 2018, accounting for over 43% of total ETP stocks, while North America took second place with a market share of 35% (please note North American physical storage includes only holdings from the United States and Canada).

Over the last few years a new migration trend has emerged in silver holdings, whereby silver is being migrated out of regions experiencing political uncertainty in favor of stable regions or countries. A key example is the United Kingdom; where concerns over Brexit has resulted in investors removing holdings out of the country (and indeed out of wider Europe) in favor of storing them in Switzerland and the United States.

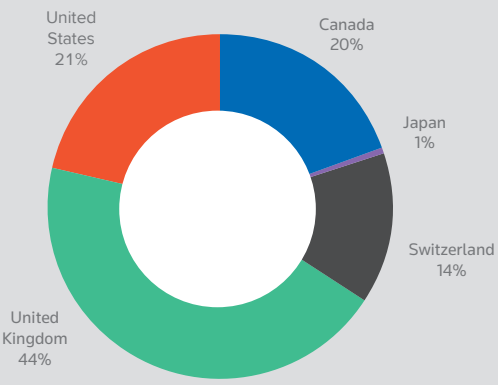
In the case of silver ETP holdings based on investor domicile, or by exchange location, the picture is slightly different. Given that the United States is the global financial hub, it is not surprising to see the country hold a dominant position in holdings (with a market share of over 53% in 2018). However, putting this in historical context, the country has actually recorded an ongoing decline in market share, falling 6% from the 2016 level as a robust economic climate with rising domestic equity and real estate markets resulted in local investors becoming less interested in investing in silver. Further afield, Canada was the second largest country for silver holdings in 2018, with a market share of 20%.

Ironically, while the United Kingdom has become a less stable jurisdiction which has resulted in physical stocks flowing out of the country to safer jurisdictions in recent years, its market share as investor domicile increased, from 11% market share in 2016 to 12% in 2018. Silver tonnage of several UK domiciled ETPs increased, as local investors fearing Brexit uncertainties and a weaker British pound sought safety in physical metals as a way to preserve wealth.

Though being an industrial metal, silver shares a high price correlation with gold, and thus some investors also view silver as a safe haven asset, evidenced by the increase of investors in the UK in recent years. As such, we expect investor domicile of silver ETPs in the European region will continue to increase in the next few years, given the economy outlook of the region does not look bright, and residents will need to invest into alternative assets to diversify risks.

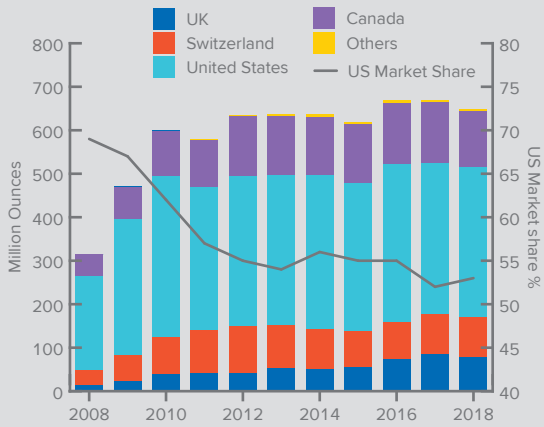
Global ETP stocks held in the United Kingdom is expected to see further falls in 2019, with the on going uncertainty surrounding Brexit encouraging this flight to safety. As a result, stock levels in Switzerland (and other perceived safe havens) will likely be the beneficiaries.

SILVER ETP HOLDINGS BY VAULT LOCATION



Source: GFMS, Refinitiv

SILVER ETP HOLDINGS BY INVESTOR DOMICILE



Source: GFMS, Refinitiv

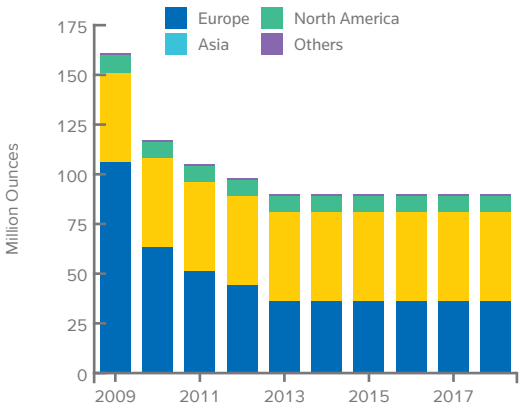
various Chinese banks that steadily increased their precious metals holdings in recent years. But since then, volumes have dropped considerably, at an estimated 198.8 Moz (6,138 t) last year, 59% below the peak recorded in 2016.

North America was the only region where vaulted custodian silver stocks rose last year by 8% or 46.5 Moz (1,446 t) reaching an estimated 644.7 Moz (20,052 t) last year. At 46%, North America holds the largest share of custodian vaulted stocks. Holdings in North America more than tripled over the last decade, which has been a combination of both investor storage as well as a place for refiners to off load extra metal.

In **India**, vaulted silver stocks increased another 20% to 19.6 Moz (610 t) last year. Stock built at the Free Trade Warehousing Zone (FTWZ) in Sri City accounts for the main reason behind the rise in vaulted silver stocks. The FTWZ has increased considerably in popularity in recent years, despite the fact that Indians in general are more prone to owning the physical metal themselves.

European custodian stocks not allocated to ETP's contracted last year by 13% to 519.0 Moz (16,143 t). Europe used to be the region in which the share of vaulted stocks allocated and not allocated to ETPs was balanced. That has tipped into favor of the unallocated section, which due to a fall in ETP allocated stocks and a strong rise in unallocated stocks accounted for 56% of total last year.

SILVER GOVERNMENT STOCKS



Source: GFMS, Refinitiv

FUTURES EXCHANGES

In recent years, the amount of exchanges that offer trading of silver futures globally has risen quite considerably. Various exchanges across the world, particularly in the Far East and the Middle East, have introduced precious metals contracts in a standardized format in order to counter OTC trading. Silver inventories have risen as a result.

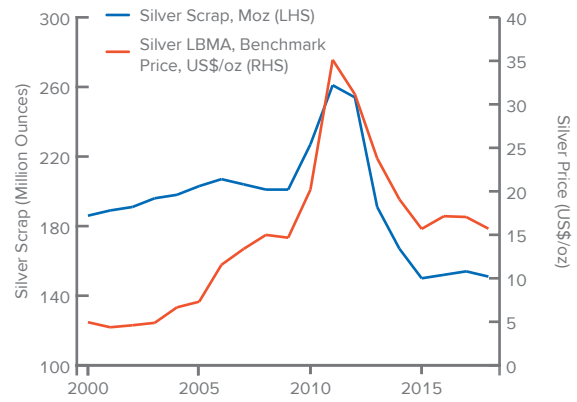
As a rule of thumb, approximately 2% of futures trading activity get settled in physical delivery. Exchanges only hold a fraction of open interest in inventory, if any at all.

Four exchanges report silver stocks; COMEX in the United States, the Tokyo Commodity Exchange (TOCOM) in Japan, and the SHFE and SGE, both in China. For the fourth consecutive year, total silver inventory held by the various exchanges rose 22% to 398.2 Moz (12,385 t) in 2018. The largest exchange that trades silver globally is COMEX which accounted for 74% of total silver stocks held by exchanges. Silver stocks on COMEX continued to rise last year, increasing by 21% to 293.9 Moz (9,141 t) by year-end.

COMEX dominance has waned somewhat in recent years, which until 2012, was the only exchange with considerable silver inventories. From 2012 onwards, trading activity in Asia, and in particular China, increased, first with a rise in activity on the SHFE followed by the SGE not long after. Japan, through TOCOM, also has an impressive silver trading history dating back to 1985.

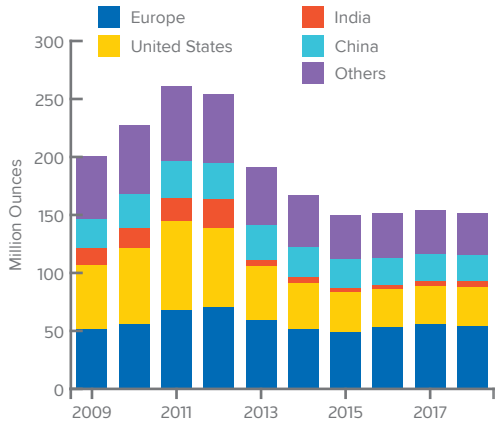
Silver stocks on COMEX can be divided into eligible and reported. Eligible inventory makes up the bulk of the total inventory accounting for 73% last year. That, however, was a significant decline from the 82% share recorded in 2017. The main reason behind the shift lies in the fact that both eligible and reportable stocks rose, but the latter much faster than the former. Eligible stocks rose 7% last year reaching 212.0 Moz (6,594 t) whereas reported stocks increased 83% to 81.9 Moz (2,547 t). Registered stocks are those stocks that meet the criteria for delivery and are ready to be delivered into the market, while eligible stocks are not for immediate market delivery.

WORLD SCRAP SUPPLY



Source: GFMS, Refinitiv

WORLD SCRAP SUPPLY



Source: GFMS, Refinitiv

In **China**, just like the prior year, silver inventories on SHFE and SGE followed opposite trends in 2018. Stocks held by SHFE fell for the second consecutive year, by 17% to 35.8 Moz (1,114 t). Stocks held at the SGE rose for the fourth consecutive year, increasing by 69% to 68.5 Moz (2,131 t). Last year was the first year that silver inventory held at the SGE overtook that held on the SHFE.

Silver trading volumes on both the SHFE and SGE fell last year due to some investors losing interest in silver trading. This was partly a reflection of a lack of silver price volatility, driven by depreciation of the yuan against the U.S. dollar. As a result, investors shifted their focus to tin and nickel trading on SHFE. In addition, the increasing presence of domestic banks trading on the SGE made trading for smaller players more challenging. Due to the large size the banks can trade with, smaller investors were forced to pay deferral fees to the banks. As a result, many small traders were squeezed out.

In line with the sentiment on SGE, silver inventories at TOCOM rose 15% to 5,048 ounces (0.1 t) by year-end. The increase followed a previous year in which silver inventories experienced a dramatic drop of 98%. Unsurprisingly, some replenishing took place last year.

GOVERNMENT STOCKS

In 2018, silver stocks held by governments remained unchanged at 89.1 Moz (2,771 t). In general, there is little public information available on government held silver stocks and we have compiled our numbers through field research and private information. Sales of silver stocks were minimal in the early part of the decade and we expect no significant sales have taken place in the last four years. Governments might deplete their inventories somewhat by providing their domestic mints with metal. However, this is not always the case, with several mints stating that they quite frequently purchase metal in the market.

Asia accounts for approximately half of silver held by governments, spread over a few different countries. Contrary to gold, which is actively purchased by Asian and other central banks, silver enjoys little attention in regards to diversifying foreign exchange reserves. At two-thirds, China accounts for the largest share. In second place, at 40% of total government held silver stocks, is Europe, which is almost exclusively held by Russia. In 2013, Russia had sold approximately 90% of its holdings compared to the peak of 336.1 Moz (10,454 t) recorded in 1994. Since then, holdings have remained unchanged.

INDUSTRY

Industry stocks are mainly concentrated in Japan and the United States. For the second consecutive year, Japan saw a drop in industry stocks, the result of leaner inventory management. As such stocks fell by 5% to 0.9 Moz (29 t). Silver stocks held in the United States consist of producer, consumer and dealer inventory and continued its rise last year, increasing by 13% to 5.5 Moz (171 t). On balance, industry silver stocks rose 1% to 14.8 Moz (460 t) in 2018.

TABLE 4 - SUPPLY OF SILVER FROM THE RECYCLING OF SCRAP

(million ounces)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Europe										
Germany	12.6	14.9	16.7	21.6	17.3	14.3	14.9	16.4	18.9	19.4
Russia	8.4	11.5	11.1	10.9	10.0	8.0	6.7	6.5	8.2	8.5
United Kingdom	10.2	6.4	11.3	9.8	7.2	5.6	5.8	7.9	6.7	6.0
Italy	5.8	6.5	9.7	9.9	8.7	7.9	6.2	6.3	6.3	5.4
France	5.5	6.2	7.0	5.9	5.2	4.9	4.9	5.2	5.0	4.4
Turkey	1.1	1.0	1.2	1.0	1.0	1.5	1.7	2.0	2.1	2.5
Austria	1.1	1.1	1.2	1.2	1.2	1.1	1.1	1.2	1.2	1.2
Czech Republic	0.9	1.2	1.6	1.6	1.4	1.4	1.1	1.2	1.1	1.0
Poland	0.7	0.9	1.1	1.2	1.0	0.9	1.0	1.1	1.0	0.9
Netherlands	1.0	1.1	1.2	1.2	0.9	0.8	0.9	0.9	0.9	0.9
Spain	0.5	0.7	1.3	1.3	1.1	1.0	0.8	0.8	0.7	0.6
Belgium	0.6	0.6	0.7	0.7	0.5	0.5	0.5	0.5	0.5	0.5
Sweden	0.6	0.8	0.6	0.6	0.6	0.6	0.4	0.5	0.4	0.4
Denmark	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3
Other Countries	2.24	2.43	2.74	2.58	2.20	2.09	2.15	2.33	2.26	2.03
Total Europe	**51.6**	**56.0**	**67.9**	**70.1**	**58.7**	**51.0**	**48.5**	**53.2**	**55.8**	**54.1**
North America										
United States	54.4	64.8	76.4	68.9	46.9	40.3	35.3	32.5	33.2	33.8
Canada	1.5	1.6	1.8	1.6	1.1	1.0	0.8	0.8	0.7	0.5
Mexico	3.2	4.0	4.5	4.7	1.3	0.5	0.5	0.4	0.4	0.3
Total North America	**59.1**	**70.4**	**82.7**	**75.2**	**49.3**	**41.7**	**36.7**	**33.7**	**34.2**	**34.7**
South America										
Brazil	1.1	1.5	2.5	2.5	2.0	1.9	2.3	2.4	2.3	2.3
Venezuela	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.4	0.5	0.5
Uruguay	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Argentina	0.4	0.6	0.7	0.7	0.5	0.2	0.2	0.3	0.4	0.4
Other Countries	1.0	1.2	1.5	1.4	0.9	0.8	0.8	0.8	0.9	0.9
Total South America	**2.9**	**3.9**	**5.5**	**5.4**	**4.2**	**3.6**	**4.1**	**4.4**	**4.5**	**4.5**
Asia										
China	25.3	29.2	31.9	30.9	30.1	26.7	24.7	23.8	23.3	22.6
Japan	21.3	20.9	23.0	21.3	20.0	19.6	17.4	16.2	15.7	14.9
S Korea	8.4	9.4	10.0	9.1	8.4	6.9	4.1	4.4	4.3	4.4
India	15.0	17.9	20.6	24.8	5.4	4.9	3.0	3.6	3.9	4.4
Taiwan	3.6	4.1	4.5	4.3	3.6	3.1	2.7	3.0	2.9	2.9
Thailand	3.1	3.7	3.7	3.2	2.8	2.2	2.0	2.1	2.0	1.8
Other Countries	6.2	7.4	7.9	6.1	5.5	5.0	4.4	4.7	4.5	4.2
Total Asia	**82.8**	**92.8**	**101.6**	**99.7**	**75.9**	**68.4**	**58.3**	**57.7**	**56.6**	**55.4**
Africa										
Egypt	1.4	1.4	0.7	0.8	0.7	0.6	0.6	0.6	0.6	0.6
Morocco	0.5	0.5	0.5	0.5	0.6	0.4	0.4	0.4	0.4	0.3
Other Countries	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6
Total Africa	**2.5**	**2.6**	**1.9**	**2.0**	**1.8**	**1.6**	**1.5**	**1.6**	**1.6**	**1.6**
Oceania										
Australia	1.6	1.6	1.6	1.4	1.3	1.2	1.1	1.1	1.1	1.0
Total Oceania	**1.6**	**1.6**	**1.6**	**1.4**	**1.3**	**1.2**	**1.1**	**1.1**	**1.1**	**1.0**
World Total	**200.6**	**227.2**	**261.2**	**253.8**	**191.2**	**167.4**	**150.2**	**151.8**	**153.8**	**151.3**

SCRAP

- **After a slight rise the previous year, global silver scrap supply slipped by 2% to 151.3 Moz (4,707 t) in 2018. Weaker silver prices accounted for the bulk of the decline deterring both suppliers and consumers from recycling their silver valuables.**

- **Asia was again the largest market, accounting for 37% of the global total. The region as a whole dipped 2% year-on-year, with surge in supply from India not sufficient to offset price led falls elsewhere.**

- **In western markets scrap supply eased from 2017 levels, led lower by a 3% fall from Europe, while recycling volumes in North America edged 1% higher year-on-year to a three-year high.**

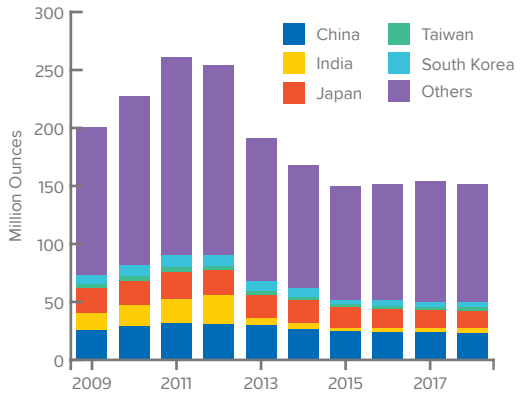
In 2018, silver **scrap** supply retreated 2% to an estimated 151.3 Moz (4,707 t). The decline was largely a function of weaker metal prices which tempered recycling volumes in most regions. Asia and **Europe**, which combined accounted for more then 70% of the global total, both drifted lower last year, slipping 2% and 3% respectively. North America was the only outlier, with scrap supply rising only at the margin, mainly due to a rise in industrial recycling volumes in the **United States**.

Scrap supply in **India** increased by 13% year-on-year to 4.4 Moz (138 t). While the sources of supply remained similar to those recorded in 2017, domestic traders revealed that inflows of old jewelry and silverware rose compared to the prior year. The general tendency in India is to exchange jewelry articles within an average of three years. This is a continuous process and in the past, when gold and silver prices were low, scrap returns were plentiful. Due to religious traditions, newly purchased items must be exchanged for new items every few years. Somewhat counter intuitively, when the silver price remained low last year compared to that recorded in 2015, the flow of these sort of articles back to the market increased substantially. People that were unable to purchase a new gold jewelry item for bridal celebrations often exchanged silver jewelry for a new heavier silver piece.

Last year, silver scrap across East Asia (excluding Japan) fell by 2% to an estimated 33.1 Moz (1,031 t), the seventh consecutive decline and the lowest level since 2005. Almost across the board recycling volumes from the region were tempered by the 8% decline in the U.S. dollar silver price, with several countries dealing with even larger falls due to weaker domestic currencies. The low price environment deterred consumers from scrapping jewelry and silverware while industrial players were prepared to stockpile scrap in the hope of higher prices. Recycling volumes from **China**, accounting for almost 70% of the regional supply, retreated 3% to 22.6 Moz (704 t), a ten-year low. The weaker silver prices (the yuan price declined 10% last year) accounted for the annual decline. Recycling volumes in **Taiwan** and **South Korea** held broadly steady in 2018, rising at the margin, with the former implementing a circular economic program, upscaling its effort to recycle old electronics. Elsewhere, price was largely the culprit, dragging scrapping volumes lower in **Thailand**, **Vietnam**, and **Indonesia**, with supply from these markets retreating 6%, 6%, and 13% respectively.

Silver recycled from scrap material collected in **Japan** fell to 14.9 Moz (464 t) in 2018. This 5% annual fall was the seventh consecutive decline. The decline in silver prices (the yen price fell 9% last year) was a large factor behind the fall, as lower prices reduced the flow of high-grade material such as jewelry and silverware and coins. A stronger economic performance in the country also reduced jewelry scrap, as households' disposable incomes rose after stagnating for several years. The lower price environment deterred other industries from recycling, preferring, where possible, to delay the processing of the material.

ASIA SCRAP SUPPLY



Source: GFMS, Refinitiv

6. SILVER BULLION TRADE

- **Global silver bullion movements were once again dominated by India, with imports jumping by 36% to 223.7 Moz (6,958 t), its highest level since 2015.**

- **Swiss exports climbed by 24% to 51.1 Moz (1,589 t), driven by robust shipments to India and Germany. India took over the United Kingdom as the largest trading partner to Switzerland, responsible for just under a quarter of all transactions.**

EUROPE

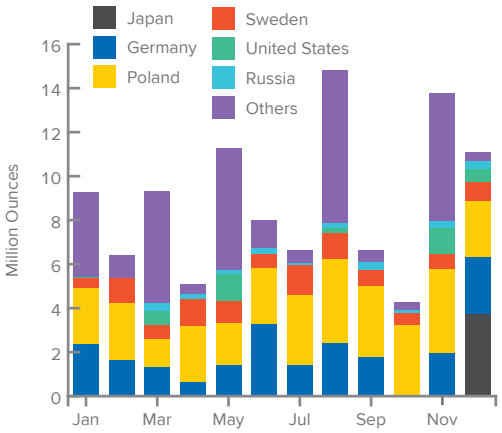
UK official exports of silver bullion rebounded in 2018, reversing declines recorded in the prior two years, doubling to 86.5 Moz (2,690 t), the highest level recorded since 2015. This rise was supported by the UK's largest export destination, India, with volumes to the country increasing by 183%, returning back to levels last recorded in the 2013-2015 period (market share for the year stands at 81%). Given the UK is a terminal market, it is likely that silver transported to India was largely for investment purposes. This is supported by our figures, shipments from the UK to India recorded a rise of 116% to 70.2 Moz (2,183 t), its highest level since 2015. Meanwhile, exports to Switzerland (responsible for just under 6% of market share) recorded an explosion in demand, with total exports jumping to their highest level since 2008 of 4.8 Moz (149 t). As alluded to in our Investment chapter 5 (on 'Silver ETP Holdings By Vault Location'), this move in silver holdings from the UK to Switzerland is in line with a trend that has seen silver migrating out of regions experiencing political uncertainty, given the UK's concern over Brexit. This move, to a certain extent, was therefore expected. Elsewhere, demand from traditional markets such as Belgium, Hong Kong, Germany and Canada recorded declines over the year of 11%, 45%, 21% and 37% respectively.

Meanwhile, UK bullion imports declined in 2018, falling by 27% to 106.5 Moz (3,313 t). Despite increases in Polish flows this was not enough to offset the falls in flows from key players Germany and Kazakhstan, which recorded 46% and 27% declines over the period. The United Kingdom remains a net importer for the third year in a row, with net imports of 20.0 Moz (622 t), a significant decrease of 81% from a year earlier.

Italian silver bullion imports rose in 2018, marking the second consecutive year of growth, jumping by 3% to 20.0 Moz (622 t). Germany was the key driving force behind this positive result with flows increasing by 17% year-on-year (with the country responsible for just under half of the total flows for the year). This positive result offset declines recorded from the second (United States), third (Switzerland) and fourth (Bulgaria) largest bullion providers to the country.

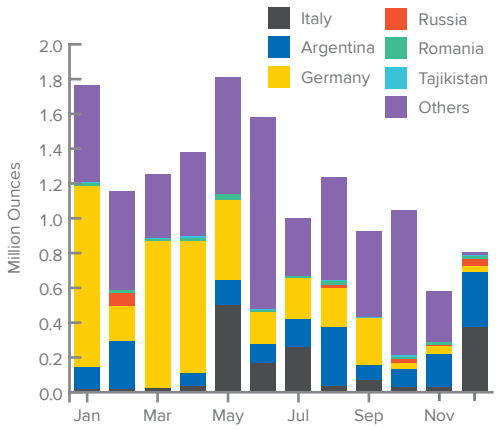
Italian exports declined in 2018, falling by 15% to 6.0 Moz (188 t). While increased flows between major trading partner India were recorded (rising 23%), this was not enough to offset declines from countries such

2018 MONTHLY UNITED KINGDOM BULLION IMPORTS



Source: GFMS, Refinitiv

2018 MONTHLY SWISS SILVER IMPORTS



Source: GFMS, Refinitiv

as France, which last year was the largest importer of Italian bullion flows. Last year, France recorded a weakening in demand of 24%, moving its market share year-on-year from 21% down to 17% (we believe this result was largely due to the weakening demand performance in the country, which recorded weak industrial fabrication (with growth at 1%) and declining jewelry demand (-6%) over the year). Italy remains a net importer of bullion at 14.0 Moz (435 t), an increase of 13% year-on-year.

Russian silver bullion exports rose again last year, jumping by 16% to 29.3 Moz (911 t), their highest level since 2015. India, which has remained the top importing country for Russia since 2014, recorded a second consecutive year of growth, importing 26.2 Moz (815 t), bringing its total market share up to 86% (firming India's position as highly relevant trade hub for silver). While flows from the UK rebounded over the year jumping by 3%. Elsewhere, a return to purchasing arose from Turkey (which previously has remained mute in buying Russian bullion since 2015), with the trading partner recording imports of 0.4 Moz (12 t), the highest level of imports from the country in our records. Meanwhile, reduced imports from Switzerland continued last year, marking the second consecutive year of declines following its sudden eruption in imports in 2016 which saw flows rise by 903%.

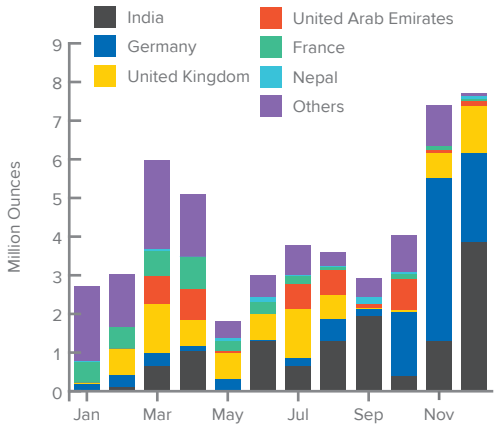
Swiss import statistics revealed a marginal decline of 2% last year reaching a total of 14.5 Moz (452 t). Almost one third of silver bullion metal came from Germany at 4.3 Moz (134 t), with shipments increasing by 59% last year. Switzerland also recorded more imports from Argentina and Italy, both rising by 94% and 35% to 1.9 Moz (60 t) and 1.5 Moz (48 t) respectively.

Silver bullion exports from Switzerland rose 24% year-on-year to 51.1 Moz (1,588 t) in 2018. Bullion trade in Switzerland is very much focused on exports. Last year, exports were 3.5 times the size of imports, which was 27% up from the prior year. Destinations for Swiss silver bullion were plentiful last year with India spanning the crown at a quarter of total exports (a five-fold increase year-on-year) to 12.4 Moz (387 t). Closely following behind was Germany (representing 21% of total exports) with 10.5 Moz (326 t); double the level compared to the prior year. Shipments to the UAE exploded in 2018 from virtually zero in 2017 to 3.9 Moz (123 t) last year, although that seems to be more a reinstatement of flows considering exports to the UAE in 2015 were even higher. But no country has received as much silver bullion as the United Kingdom did over the past six years, representing 40% of the 350.4 Moz (10,898 t) that were exported globally over the 2013-2018 period.

The United Kingdom represent a combination of an expensive measure of last resort for refiners but more importantly a storage for the various silver (backed) ETP's. Indeed, the United Kingdom houses a host of vaults that store metal for ETP's, which have witnessed quite the uptake since 2002 and remain a liquid and popular investment vehicle amongst institutional and retail investors alike.

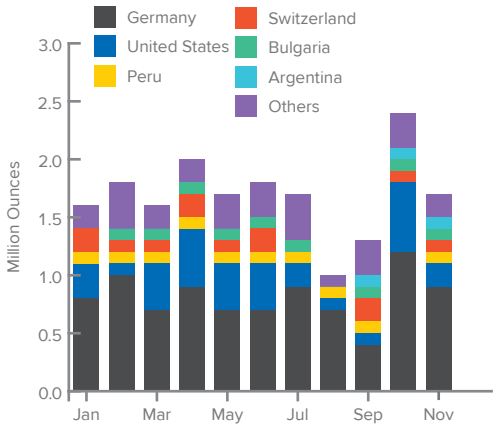
German silver bullion exports contracted 27% year-on-year in 2018, reaching 37.5 Moz (1,165 t). The drop was the second in succession after exports hit a five

2018 MONTHLY SWISS SILVER EXPORTS



Source: GFMS, Refinitiv

2018 MONTHLY ITALIAN SILVER BULLION IMPORTS



Source: GFMS, Refinitiv

year high of 51.0 Moz (1,617 t) in 2016. The annual decline at 13.5 Moz (421 t) was almost entirely caused by fewer shipments to the United Kingdom, which could well be a reflection of a lower need for refiners to ship metal to the London terminal market. Despite the drop, the United Kingdom still accounted for half of Germany's bullion exports in 2018. Another 21% of total flows went to Switzerland (which offset some of the lower shipments to the United Kingdom) by rising 46% to 7.8 Moz (244 t) in 2018. With both London and Zurich accounting for almost three-quarters of global shipments, just like in 2017, the continued large share of the terminal markets reflects lower investment demand domestically and abroad, with refiners opting to send their metal there as a more expensive measure of last resort.

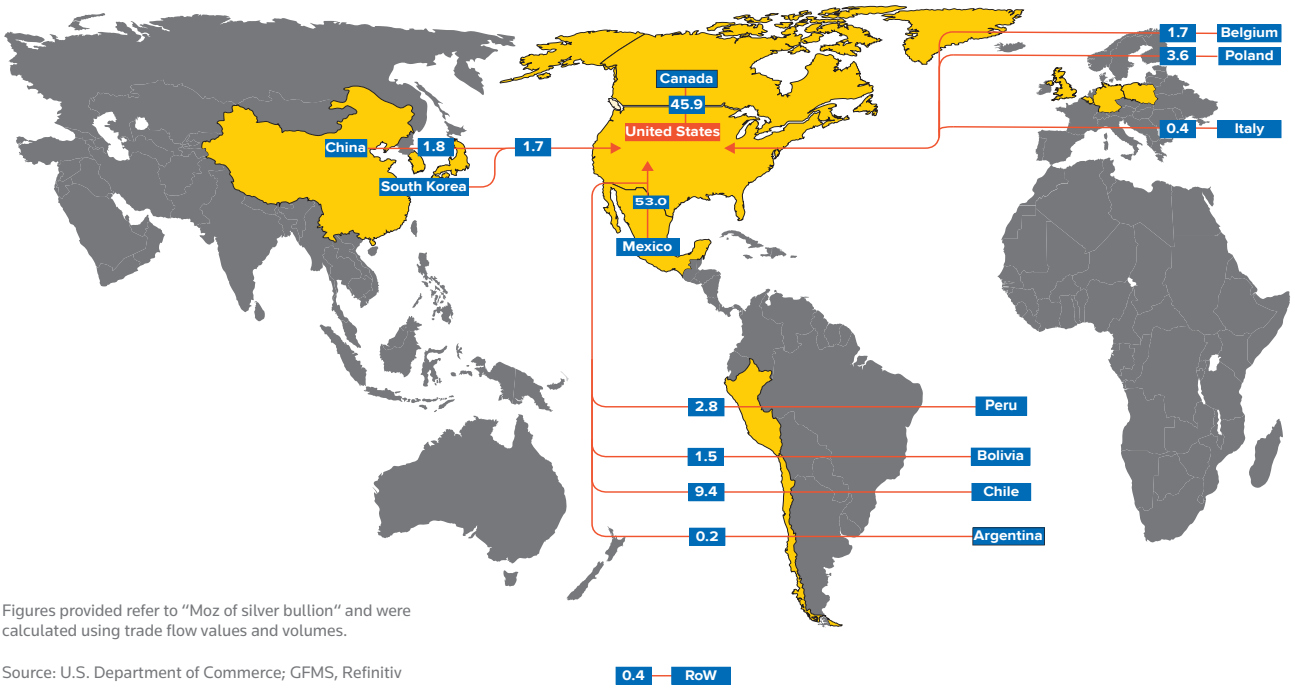
Following an 83% increase in 2017, German bullion imports fell 13% year-on-year to 15.6 Moz (485 t) in 2018. At 3.5 Moz (108 t), or 22%, Sweden was the largest supplier of silver bullion to Germany followed closely by Kazakhstan at 3.2 Moz (99 t), representing a fifth of imports. In the last six years, Sweden has been the largest supplier of German silver bullion, followed by Argentina at 14% or 14.3 Moz (445 t). This metal is likely in the form of doré.

THE AMERICAS

Silver bullion trade in North America has particular characteristics, in which **Canada** and particularly **Mexico** are the net silver producing countries that ship a lot of their metal to the **United States** for refining. Mexico, which basically imports virtually zero bullion and doré, accounts for about half of the United States annual requirement. As such, both Canada and Mexico are net-exporters and ship almost all their metal to the United States, which acts as a net-importing country of bullion and doré.

Bullion imports into the United States remained flat in 2018 at 194.1 Moz (6,037 t) with 78% of supply coming from Mexico and Canada combined. Other sources of demand were mainly South American countries. Metal enters the United States in either grains or doré form which then, in many cases, gets further refined into physical bullion bars. Those bars in turn find their way mainly into the domestic market, serving institutional and retail clients as well as ETP requirements. This is also indicated by the strong net-imports position (with the United States import:export ratio at an average of 8:1 over the last decade). Of total U.S. exports, more than half (18.0 Moz or 560 t) went to India last year, which was a massive increase year-on-year, serving a

MAJOR TRADE FLOWS IN SILVER BULLION TO THE UNITED STATES IN 2018



Figures provided refer to "Moz of silver bullion" and were calculated using trade flow values and volumes.

Source: U.S. Department of Commerce; GFMS, Refinitiv

strong demand sentiment there. This was a welcome development considering the on-going challenging domestic silver investment sentiment in the country.

Canadian silver bullion trade is a bit more balanced. Despite its net-export position, it also sources a fair amount of metal from countries outside of North America, particularly Asia, such as South Korea and Taiwan. On balance, the North American region was fairly self-sufficient last year with net-imports only amounting to 23.3 Moz (715 t), which was half the amount required in 2017.

MIDDLE EAST AND INDIAN SUB-CONTINENT

Imports of silver bullion to **Turkey**, which include fine silver, scrap and mined doré, slipped 4% to 8.4 Moz (260 t) last year according to customs data. Switzerland emerged as the largest source of supply, with imports more than tripling on 2017 volumes and accounting for almost 40% of the total. Morocco and Belgium, which combined added more than 50% of imports in 2017 both retreated, with the latter falling 75% on an annual basis and contributed just 8% of the total. Turning briefly to exports, reported bullion exports fell sharply last year, slumping 57% to a ten-year low. Singapore remained the largest market for Turkish silver bullion, but flows to this market slumped 45% from 2017 volumes. Shipments to Egypt saw a healthy rise, while shipments to the UAE retreated by 70% year-on-year.

The **United Arab Emirates** (UAE) received 4.0 Moz (123 t) of silver from Switzerland in 2018, which was eight times more compared to 2017. Altogether,

INDIAN BULLION IMPORTS

(million ounces)	2014	2015	2016	2017	2018
Total Imports	220.0	243.7	89.8	164.3	223.7
Spot Price/kilogram	42,374	36,500	40,639	39,586	38,238

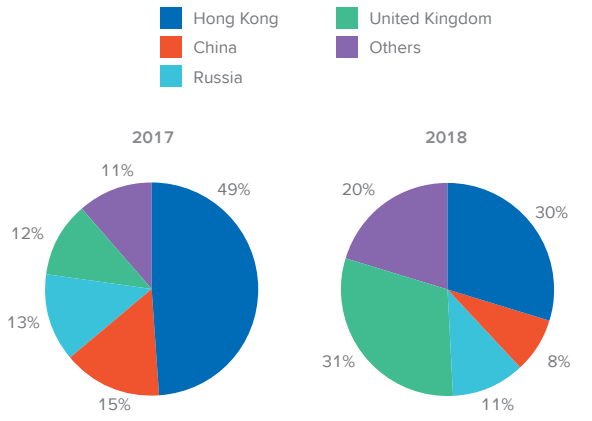
** Includes duty free and duty paid imports

Source: GFMS, Refinitiv; Indian Ministry of Commerce; MCX

the country received a total of 4.2 Moz (130 t) of refined silver in 2018, which means the share of silver as by product of gold doré refining fell drastically compared to 5.6 Moz (173 t) in 2017. The rise of gold shipments by 56% from Switzerland also confirms the fact that the UAE refiners received less gold doré in 2018. Meanwhile, silver bullion exports from the UAE last year increased by 113% to 1.0 Moz (31 t) with India and Switzerland as the main destinations.

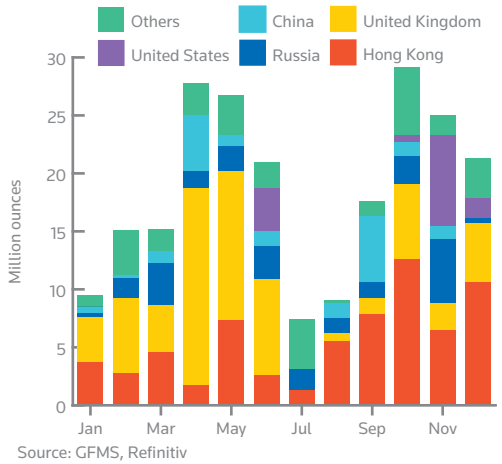
Indian silver bullion imports increased 36% year-on-year to 223.7 Moz (6,958 t) in 2018, the second highest imports on record after 2015. Aside from imports, silver supply was also recorded from domestic mines, to the tune of 18.1 Moz (563 t), from metal concentrates and doré. We estimate total Indian bullion supplies from these sources rose 8.4% on year-on-year to around 25.2 Moz (784 t) in 2018. In many respects, last year turned out to be similar to that of 2015 in regards to India importing large volumes of silver. In 2015, silver jewelry fabricators re-stocked en masse as the silver price declined by 55% in rupee terms by mid-2014 from the mid-2013 highs. In addition, there was a strong investor interest to make use of the opportunity for risk free returns in the cash-future arbitrage. This helped silver imports to surge in 2015 to 243.7 Moz (7,579 t).

2018 INDIAN SILVER IMPORTS- SUPPLY REGION SHARE



Source: GFMS, Refinitiv

2018 MONTHLY INDIAN SILVER IMPORTS



Source: GFMS, Refinitiv

Last year the market development in India was very similar, except the proportion of price advantage of that time. First, while jewelry and silverware fabrication increased in volumes last year, investment demand rose as well but at a lower rate compared to 2015. Second, cash in circulation in the market used to be huge in 2015, particularly during the period before the demonetization. That sentiment created opportunity for traders and investors to buy additional stocks. After the demonetization and subsequent implementation of GST, cash in circulation in the Indian market decreased. Without those events, we consider it very likely that silver imports last year would have reached levels close to those of 2015.

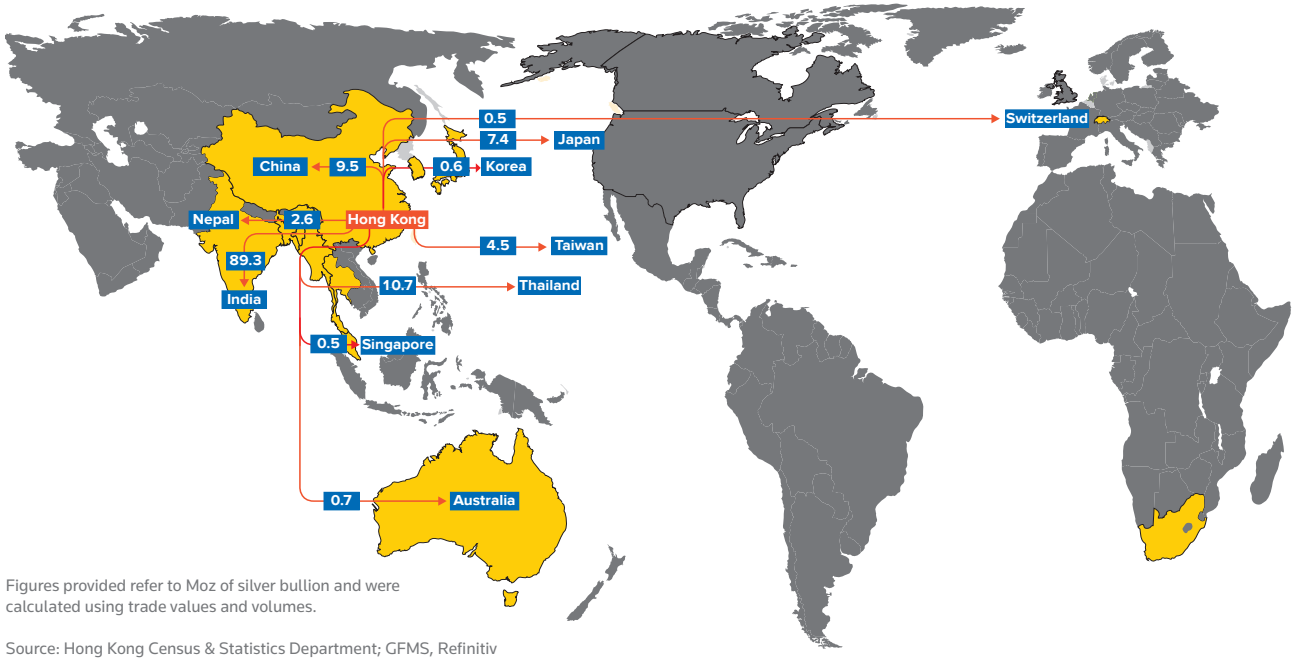
The port of Kandla is the second trade zone that is about to begin its operation this year, which means increased volumes will be redirected through there. The United Kingdom remained the single largest supplier of silver to India in 2018, increasing its share by a whopping 262% year-on-year exporting 68.4 Moz (2,127 t) to India. While Russia increased its share by 14% year-on-year to 24.9 Moz (774 t), Hong Kong and China's share decreased by 17% and 25% respectively to 67.1 Moz (2,087 t) and 16.4 Moz (572 t). The rise of metal from the UK confirms investors preferred good delivery LBMA investment grade bars over non-good delivery metal.

EAST ASIA

The imports of silver to **China** as discussed are focused on bullion form. Meanwhile, silver contained from base metal concentrate imports fell 10.5% in 2018 to an estimated 200.8 Moz (6,275 t). We believe part of the reason for the annual decline was not a lack of market demand, but the lack of liquidity in the domestic system that has forced many local refiners to shut down operations during the year. On the other hand, after rising by 0.6% in 2017, China's silver bullion imports fell by 38% in 2018, to 14.2 Moz (440 t). Australia surpassed Hong Kong to become the mainland's second largest supplier in 2018, with supply from this market reaching 1.8 Moz (56 t). Meanwhile import volumes from Hong Kong saw a substantial decline, falling to just 1.6 Moz (50 t) last year, with import volumes 83% less than the levels recorded in 2016. Hong Kong's market share fell from 45% in 2016, to just 11% in 2018.

Looking at bullion exports, after surging 28% in 2017, volumes contracted by 14% in 2018, to 76.5 Moz (2,379 t). Hong Kong remained the largest destination. Exports to India, which jumped to 1.8 Moz (57 t) in 2017, were nonexistent in 2018, due to tax issues. Direct exports to Thailand rose by 320% last year to an estimated 2.2 Moz (68 t).

MAJOR TRADE FLOWS IN SILVER BULLION FROM HONG KONG IN 2018



Figures provided refer to Moz of silver bullion and were calculated using trade values and volumes.

Source: Hong Kong Census & Statistics Department; GFMS, Refinitiv

In China, a quota is required for exporting silver, and the quota is usually not fully utilized because the Chinese silver price is value-added tax (VAT) inclusive and thus the price is higher than the international benchmark. Besides the quota restriction, exported silver usually is recovered from base metal concentrates in order to enjoy the VAT refund; otherwise exporting is generally a non-profitable business due to reasons explained above. Due to export quota restrictions, silver bullion cannot flow freely between China and the international market. All silver produced domestically is required to stay in China. However, that did not stop unofficial flows of bullion in and out of the country.

Imports of bullion into **Hong Kong** fell by 2% in 2018 to 49.2 Moz (1,532 t). Imports from mainland China were 7% higher year-on-year, and made up 68% of Hong Kong's total silver imports last year. On the other hand, imports from South Korea fell 26%. On the exports front, after more than doubling in 2017, export shipments fell 29%, to 128.3 Moz (3,990 t). India remained the largest destination of Hong Kong's silver, and though direct export volumes fell 25% last year.

Taiwan's total silver bullion imports fell 4% to 5.5 Moz (171 t), as exports from the mainland fell by 22%, diving its market share from 41% in 2017 to 33% last year. Meanwhile silver exports fell by 76% last year. The 37% increase of exports to South Africa were not enough to offset the decline of shipments to Switzerland, Hong Kong and Malaysia.

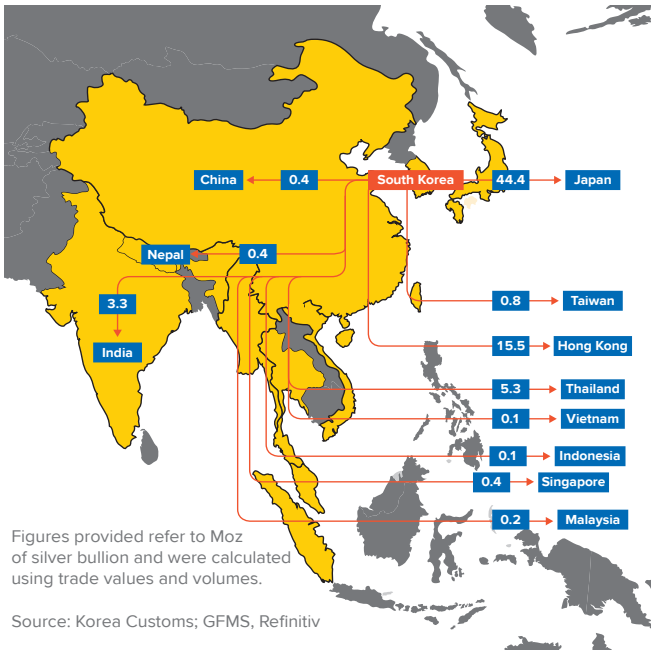
Imports of silver bullion to **Singapore** jumped almost 20% in 2018 to 6.4 Moz (201 t), an eleven year high. Indonesia remains the largest source of supply, accounting for 75% of total. Bullion exports remained flat and were again dominated by flows to India (at 93% of the total), which held steady, while flows to Indonesia, albeit at a low level, fell by 30% on a year-on-year basis.

South Korea's silver bullion imports slumped over 60% to 0.7 Moz (22 t) last year on a calculated basis, with China easily the largest contributor, taking up over 75% market share. Meanwhile exports, which are primarily the outturn from the country's base metal smelters, edged up 2% to 76.6 Moz (2,383 t). Japan remained the largest market, commanding 57% market share, with shipments to this key market rising almost 6% in 2018. Elsewhere, shipments to Hong Kong were stable, while Thailand and India saw a sharp rise, and flows to the United States slumped almost 60%.

In what may appear slightly counterintuitive given the drop in industrial demand **Japanese** silver bullion imports inched slightly higher in 2018, rising 2% to 67.0 Moz (2,084 t). South Korea remains the main source of silver bullion supply, accounting for over 80% of the total. Japan's silver exports fell again last year, by over 20%, to an estimated 0.5 Moz (17 t). In a reflection of the loss of market share in the solar industry, Japanese silver powder exports fell 19% in 2018 to 55.6 Moz (1,729 t) on a calculated basis.

Thailand's silver bullion imports increased in 2018, despite the jewelry sector edging lower. According to GFMS analysis, imports reached 32.1 Moz (998 t) last year. On the other hand, exports also jumped quite sharply, more than tripling to 3.2 Moz (98 t) as several traders took the opportunity to import metal and then redirect it to India where demand was high. There were four main sources of supply in 2018. Imports from China / Hong Kong combined, dominating at over 50% of total, rose sharply, while imports from Belgium, the next largest source of supply, edged 7% lower. Imports from South Korea were also marginally stronger than the previous year, while shipments from Switzerland surged from trivial volumes in 2017 to almost 6% of total.

TRADE FLOWS IN BULLION FROM SOUTH KOREA IN 2018



Figures provided refer to Moz of silver bullion and were calculated using trade values and volumes.

Source: Korea Customs; GFMS, Refinitiv

7. INDUSTRIAL FABRICATION

- Industrial fabrication fell to 578.6 Moz (17,997 t) in 2018, a 1% decline from the previous year. A drop in silver demand from the photovoltaic sector accounted for the bulk of the decline, offsetting annual increases in electronics and electrical and the brazing alloys and solders sectors.

- Silver demand from the photovoltaic (PV) industry in 2018 stood at 80.5 Moz (2,503 t), easing by 9% from 2017's record levels due largely to ongoing thrifting of silver loadings.

- Silver used in electronics and electrical and the brazing alloys and solders sectors both recorded modest gains in 2018, with the former up 2% to 248.5 Moz (7,730 t) and the latter by 1% to 58.0 Moz (1,805 t), however, a slowdown in the second half of the year limited further expansion.

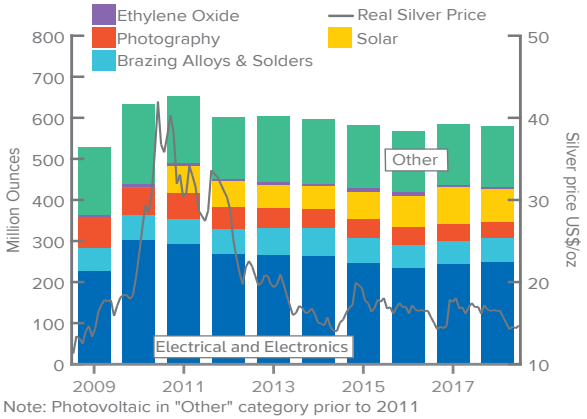
- Demand for silver from the Ethylene Oxide (EO) industry declined 21% last year to 5.4 Moz (169 t), a six-year low, dragged down by a fall in new installations.

- Declines in demand from photography, ethylene oxide, other industrial, and photovoltaics amounted to 13.0 Moz (405 t) in 2018, which outweighed the combined annual gain of 5.9 Moz (182 t) from the electronics and electrical and brazing alloys and solder sectors.

Industrial manufacturers consumed 578.6 Moz (17,997 t) of silver in 2018, down just 1% or 7.2 Moz (223 t) from a year ago. A drop in silver demand from the photovoltaic (PV) sector accounted for the bulk of the annual decline, but modest falls were also registered in photographic, our other miscellaneous fabrication sector, and from ethylene oxide (EO) offtake. These falls were partially offset by year-on-year increases for silver used in brazing alloys and solders and for electronics and electrical applications. Geographically, the falls were concentrated mainly in Asia, with Japanese offtake slipping by 7% as demand for silver powder retreated. In the western world, demand was more stable with demand in North America recording a slight uptick, while European demand was broadly steady.

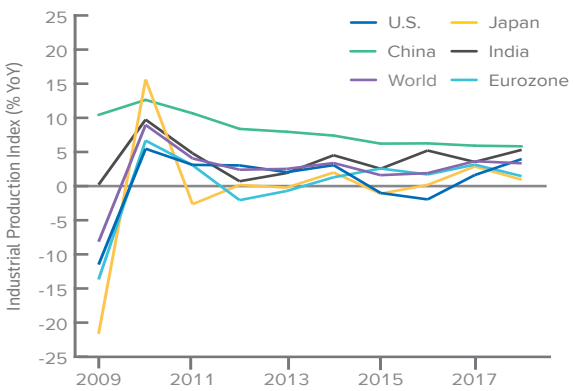
After a sharp rise in 2017 global industrial production dipped 8% last year as several key industrial markets cooled on a more uncertain global economy. The United States was clearly an outlier last year recording a sharp rise in industrial output (jumping to an eight-year high), thanks to a robust domestic economy which grew 2.9% in 2018. Elsewhere the performance was less impressive, with China's economic growth rate at 6.6% (the lowest level of growth in the country in 28 years), a fact that has fanned concerns about the country's economic outlook. Also of concern, especially in the second half of the year, was the deteriorating economic growth within the eurozone. Industrial production across the eurozone is falling at the fastest pace since the

INDUSTRIAL SILVER FABRICATION (BY CATEGORY)



Note: Photovoltaic in "Other" category prior to 2011
Source: GFMS, Refinitiv

INDUSTRIAL PRODUCTION IN KEY SILVER-USING COUNTRIES



Source: GFMS, Refinitiv; Datastream

TABLE 5 - SILVER FABRICATION: INDUSTRIAL APPLICATIONS (INCLUDING THE USE OF SCRAP)

(million ounces)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Europe										
Germany	20.3	26.5	25.4	21.7	21.3	20.9	20.9	21.5	23.0	24.0
United Kingdom	17.7	20.6	20.8	19.0	17.9	17.6	17.5	17.4	17.3	17.0
Russia	18.7	20.3	19.4	19.1	19.2	18.2	16.6	15.6	15.5	15.5
Belgium	19.4	18.3	16.4	15.4	14.3	14.2	13.5	13.6	11.0	10.2
Italy	9.0	9.9	9.2	8.6	8.4	8.4	8.1	7.7	8.0	7.9
France	7.5	8.8	8.0	7.2	7.0	6.8	6.9	6.8	6.9	7.0
Switzerland	2.2	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.4
Bulgaria	0.4	0.4	1.9	2.0	2.1	2.1	2.1	2.1	2.1	2.1
Czech Republic	1.3	1.5	1.6	1.8	1.9	1.9	1.9	1.8	1.8	1.9
Turkey	1.3	1.4	1.5	1.4	1.5	1.5	1.6	1.6	1.6	1.6
Netherlands	1.3	1.5	1.5	1.4	1.4	1.4	1.4	1.4	1.5	1.5
Spain	1.7	1.8	1.4	1.2	1.1	1.1	1.2	1.2	1.3	1.3
Poland	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8
Austria	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Other Countries	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Total Europe	**102.3**	**115.1**	**111.2**	**102.7**	**100.1**	**98.3**	**95.6**	**94.7**	**94.2**	**94.3**
North America										
United States	124.4	151.2	166.4	132.7	127.4	124.3	127.1	127.3	131.3	134.7
Mexico	3.1	4.8	6.0	6.6	6.6	6.7	7.9	8.0	8.0	6.2
Canada	1.3	1.9	1.8	1.8	1.9	1.8	1.7	1.8	1.8	1.8
Total North America	**128.8**	**157.9**	**174.2**	**141.1**	**135.9**	**132.8**	**136.6**	**137.1**	**141.0**	**142.6**
Central & South America										
Brazil	4.6	5.7	5.4	5.3	4.7	4.5	4.1	3.9	3.9	3.9
Argentina	0.8	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.7	0.7
Colombia	0.1	0.1	0.1	0.1	0.3	0.6	0.5	0.4	0.4	0.4
Other Countries	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Total C. & S. America	**5.9**	**7.2**	**6.9**	**6.8**	**6.3**	**6.4**	**5.8**	**5.5**	**5.5**	**5.5**
Asia										
China	136.7	156.8	164.1	165.4	179.7	185.9	168.6	144.0	155.6	157.5
Japan	65.5	94.2	101.2	89.0	90.0	83.8	95.4	103.4	109.2	101.4
India	31.9	35.1	38.6	36.3	35.1	33.5	31.8	31.9	34.3	32.2
Taiwan	12.3	15.1	15.8	14.3	14.6	15.1	14.4	14.6	15.4	15.7
South Korea	9.7	24.5	24.5	23.6	22.3	20.4	14.4	12.2	12.4	11.9
Hong Kong	5.5	6.4	6.4	6.2	5.8	4.9	4.4	3.6	3.2	2.3
Iran	1.8	1.9	1.8	1.8	1.7	1.8	1.8	4.3	2.1	2.0
Kazakhstan	1.6	1.8	1.7	1.7	1.7	1.7	1.5	1.5	1.5	1.5
Uzbekistan	1.6	1.8	1.7	1.7	1.7	1.7	1.5	1.5	1.4	1.4
Singapore	0.1	1.8	1.9	0.5	0.7	0.8	1.6	1.0	1.1	1.1
Indonesia	0.5	0.8	0.8	0.9	0.8	0.9	0.9	1.0	1.0	1.0
Israel	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.9	0.9
Thailand	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.2	0.9	0.9
Other Countries	3.0	7.1	6.1	3.4	0.8	0.8	1.0	0.9	2.8	0.7
Total Asia	**286.0**	**348.1**	**363.6**	**343.8**	**356.8**	**353.2**	**339.1**	**323.7**	**339.6**	**330.7**
Oceania										
Australia	4.5	4.9	5.0	5.0	4.8	5.0	4.8	4.8	4.8	4.9
Total Oceania	4.5	4.9	5.0	5.0	4.8	5.0	4.8	4.8	4.8	4.9
Africa										
Morocco	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

TABLE 5 - SILVER FABRICATION: INDUSTRIAL APPLICATIONS (INCLUDING THE USE OF SCRAP)

(million ounces)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
continued										
South Africa	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other Countries	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Total Africa	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
World Total	**528.2**	**633.8**	**653.0**	**600.1**	**604.6**	**596.3**	**582.6**	**566.4**	**585.8**	**578.6**

GFMS, Refinitiv / The Silver Institute

financial crisis. In spite of the economic uncertainly, and the underperformance in some regions, silver consumed in industrial applications actually performed quite well in 2018, retreating only slightly, as there is often a tight correlation between the growth in silver industrial fabrication and industrial production.

Looking to the individual industrial applications, it was the photovoltaic (PV) sector that was largely responsible for the decline in overall industrial demand in 2018, slipping 9% last year. Like many industrial segments we cover, PV continues to face ongoing thrifting and substitution pressures, with the production weighted average silver loadings per cell falling 6% from the previous year and indeed has fallen by 80% in the last decade as fabricators look to lower production costs.

A strong electronics industry (most notably from the semi-conductor sector), in the first half of 2018 and prior to the China-United States trade war (which saw the brakes applied to demand in China), drove healthy demand for silver consumed in the electrical and electronics sector and brazing alloys and solders, with both sectors recording annual increases of 2% and 1% respectively. Demand from photographic application continued its downward trend, retreating 4% in 2018, while EO was another casualty with demand falling 21% to a six-year low on a drop in new installations.

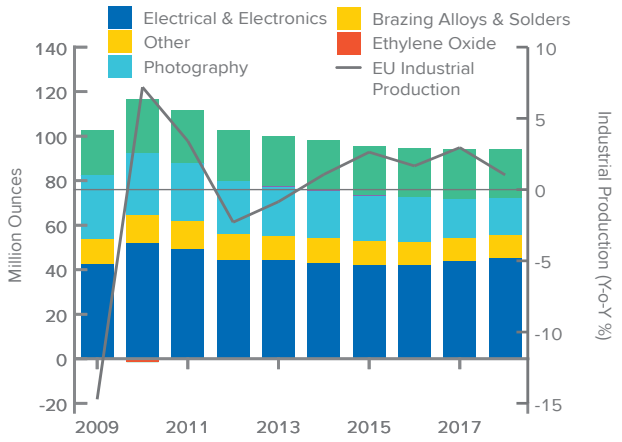
EUROPE

Silver industrial fabrication across **Europe** remained broadly in line with demand recorded in 2017 at 94.3 Moz (2,933 t), a modest increase of 0.03% or 0.03 Moz (1 t) year-on-year. This uptick marks the first rise in industrial production across the region in seven years. Given continuous falls for most of the past decade, the European share of global silver industrial fabrication fell to 16% in 2018, from 20% a decade ago.

Turning to specific industrial segments, while declines were recorded across photography, other fabrication and brazing alloys and solders (all of which declined by 6%, 2% and 0.06% respectively), positive results were recorded elsewhere, with electrical and electronics and the ethylene oxide (EO) industries recording growth of 3% and 30% respectively. While the main reasons behind falling demand in photography are described below (in the Belgium paragraph), falling demand in other fabrication and brazing alloys and solders are as much a result of industrial technological changes (which has seen the optimization of silver in applications continue), as it is in the tough economic environment facing Europe. While external factors such as the threat of levying taxes against the European Union (from President Donald Trump on the automotive industry), in conjunction with escalating trade talks between China and the United States shook confidence in an already weak industrial sector. Despite the decision taken by the European Central Bank (ECB) to end its four-year quantitative easing program by end-year, the euro weakened by 5% over the year.

The positive result in the electrical and electronics sector, which has recorded growth over the last two

EUROPE INDUSTRIAL FABRICATION



Source: GFMS, Refinitiv, Datastream

years (with total demand at 45.0 Moz (1,400 t) in 2018, its highest level since 2011), comes as a result of the growing need for miniaturization and automation (not only in end products such a laptops or tablets but in manufacturing processes requiring robots, of which noble metals such as silver are a necessity). Furthermore, it is key to highlight that the automotive industry (which is undergoing great change with the revolution of battery technology and stricter emission legislation - leading to hybrid and electric vehicles becoming mainstream), will be a key area in the growth of silver demand. Meanwhile in the European EO industry, governmental incentives have boosted the current and future growth of new capacity in the region, with silver powder demand touching its highest level since 2015 last year at 0.13 Moz (4 t).

Industrial fabrication in **Belgium** fell again last year, slipping by 7% to 10.2 Moz (314 t), the lowest level this century. Much of this fall was attributed to a decline in silver used in photographic fabrication which declined by 8% over the year. Belgium is the leading country for European photographic fabrication, however, a decade long decline (in which digital photography is replacing traditional applications such as X-ray films in the healthcare sector) has seen silver use fall in this area.

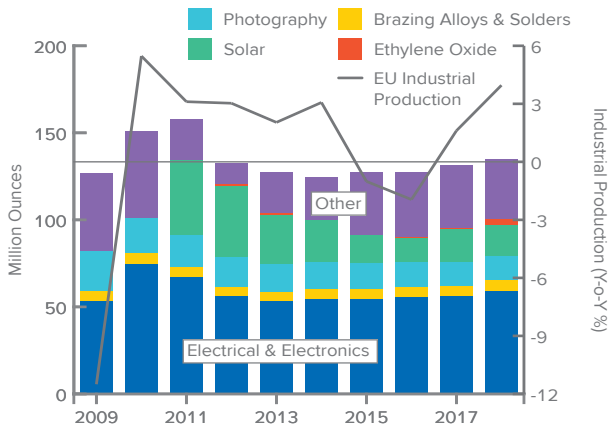
Russian industrial fabrication of silver declined in 2018, falling 0.5% or 0.1 Moz (3 t), to 15.5 Moz (482 t). While silver demand in the electronics industry continued a second year of increases, declines were largely recorded across other segments of fabrication. Despite higher oil prices in 2018 helping to support the export driven country, the ruble continued to decline last year, falling by 8% year-on-year.

NORTH AMERICA

Silver used in industrial fabrication in **North America** grew 1% to 142.6 Moz (4,437 t) in 2018. Of the North American total, the United States accounts for the overriding majority of fabrication, 94%, with Mexico second at 4% and Canada at 1% making up the regional balance. The largest segment of total industrial production in the United States is silver's use in electrical contacts and electronics and accounts for 43% of the total, or 57.3 Moz (1,782 t). Silver used in electrical applications have a wide range of varied end-uses, such as automotive or robots used in the manufacturing process. Modern manufacturing plants tend to use an increasing amount of robots which, depending on their size, utilize different sized chips that contain silver. The announcement of BMW and Daimler to collaborate in the production of electric vehicles (EV), for example, will be a platform in which robots will be heavily utilized that carry switches and chips containing silver. The automotive space therefore remains an important driver with the production process as well as cars using silver.

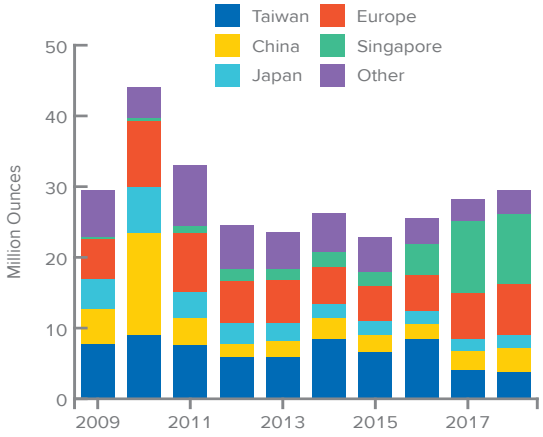
Shipments of printed circuit boards ended the year up compared to 2017, despite a considerably weaker second half of the year, particularly in the case of bookings. Other electrical applications such as semi-conductor sales rose as well by almost 14% globally, reaching a total of $1 tr. Growth for semiconductors (of which North America accounts for around a quarter

US INDUSTRIAL FABRICATION



Source: GFMS, Refinitiv, Datastream

US SILVER POWDER EXPORTS



Source: U.S. Dept of Commerce; GFMS, Refinitiv

of global annual sales), was even higher than that last year, with the industry serving sectors such as artificial intelligence, virtual reality and the internet of things.

Despite continued annual growth in global solar capacity additions, we estimate that silver powder demand from the Photovoltaic sector declined by 3% to 18.0 Moz (560 t) in the United States last year. The tariffs that President Trump put in place at the beginning of last year to protect the industry have not yet had the desired effect. Some demand has been redirected but the industry seems to be awash with overproduction of solar cells, particularly from the cheaper Chinese fabricators. According to some sources in the market, Chinese powder manufacturers have received between 5-10% discount on their silver, which has given them a competitive edge in recent years. Given the current glut, we expect some changes in the market dynamics to continue to unfold and some of the above ground stock to be drawdown. However, the continued drive of various governments worldwide (even local ones in the United States), to diversify their energy generating portfolio away from fossil fuels towards renewables (such as wind and particularly solar), will continue. As such, powder production is likely to remain a valuable source of silver demand the United States as well.

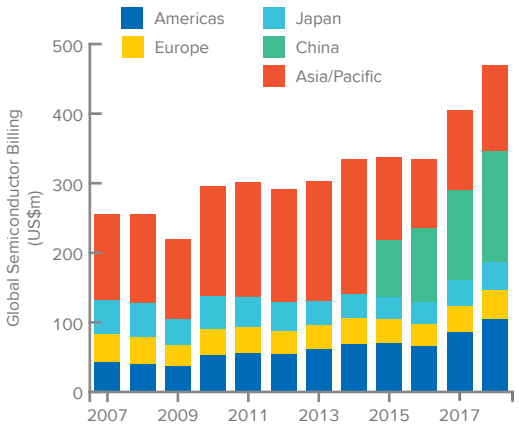
EAST ASIA

Chinese silver industrial demand continued marching higher in 2018, as the global trade war had yet to have any substantial effect on silver consumption in the Chinese industrial sector. Total silver demand from the industrial sectors increased 2.3%, to 157.5 Moz (4,898 t) last year. Putting this into context, China's silver application into the industrial sector peaked in 2014, at 186.1 Moz (5,788 t). To gauge the health of the Chinese economy, China's GDP grew 6.6% in 2018, the slowest growth pace in 28 years.

After finishing every month in the year of 2017 above the 50.0 level, the official manufacturing Purchasing Manager's Index (PMI) still managed to maintain this trend for the first eleven months in 2018, only dipping below 50.0 in the last month of the year. (Please note a value below 50.0 indicates that manufacturing activities are contracting, while a value above indicates expansion.) Other than the official release of the GDP growth and the PMI data, another useful metric that the market likes to use is the country's electricity consumption (enabling a more complete picture on the overall status of the Chinese economy). In 2018, the country consumed 6,840 billion kilowatt-hours of electricity, a 6.8% year-on-year growth. This compared to 0.5%, 5.0% and 6.6% annual increases in 2015, 2016 and 2017 respectively. Annual growth in the electricity usage last year was also the fastest since 2014. However, in 2018, we think the PMI data has painted a more accurate picture about the current state of the Chinese economy.

The electrical and electronics sector remained the largest area of silver industrial fabrication, which made up approximately 41% of silver used in industrial applications. The use of silver in this segment increased by 2.1% year-on-year, to 64.6 Moz (2,008 t). According to the International Data Corporation (IDC), global smartphone shipments were expected to fall by 3%, to 1.42 billion units in 2018, the second consecutive year of annual decline. Although China, the largest global smartphone consumption market (which represents approximately one-third of the world's market share), showed some sign of recovery last year, we estimate that 2019 is on track to record another year of single digit declines. This is even more evident when taking into account the ongoing trade war between China and the United States, in which the United States placed sanctions on Chinese telecommunications enterprise ZTE, which had a negative impact on phone shipments (particularly in the third quarter of last year). On the other hand, IDC expects that global smartphone shipments

GLOBAL SEMI-CONDUCTOR BILLINGS



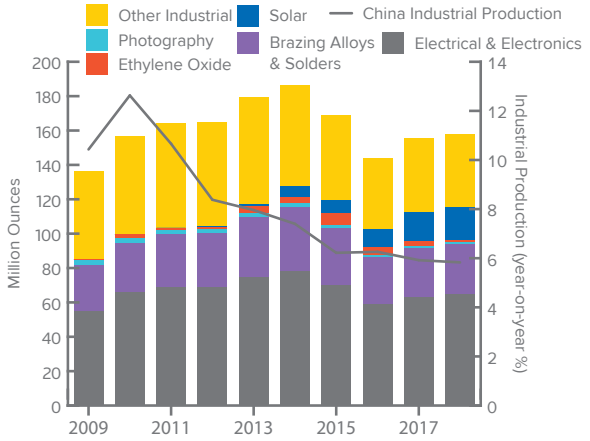
Source: SIA

could return to modest annual growth in 2019, as manufacturers are shifting toward larger screens and ultra-high-end devices, increasing silver's usage in smartphones.

Electrical contacts, which had a robust year in 2017, continued to do well for most of 2018, especially in the first half of the year. It was only towards the fourth quarter of the year, that orders fell substantially, with the country admitting trade war implications and a slowing domestic economy were the key drivers behind the fall. In terms of home appliances, the air conditioning segment has been doing very well over the last decade, with the only recorded decline in annual production or sales occurring in 2015. Despite recording production growth in air conditioners last year, sales volumes for the retail market actually stalled, and its market share for the whole air conditioning market shrunk from 34.4% in 2017 to 33.3% in 2018.

On the other hand, sales of refrigerators fell by over 3% in the Chinese market last year. Despite a strong period of sales achieved from March through June, full year sales volumes were mostly dragged down by performance in the second half of the year. The Chinese solar industry went through some turbulence in 2018, as the Chinese government suddenly announced a cut in sector subsidies in May. The subsidy level of all new distributed installations after May 31st, 2018 was reduced to CNY 0.5 ($0.07), from CNY 0.6 in 2017, for each kW sold. For further details please refer to the text dedicated to the solar section within this chapter.

CHINESE INDUSTRIAL FABRICATION



Source: GFMS, Refinitiv

Silver usage in the Chinese ethylene oxide (EO) industry fell 51% year-on-year, to 1.2 Moz (36 t). Looking in more details reveals newly installed demand fell 55% to 0.99 Moz (31 t), while replacement demand also fell 7% to 0.2 Moz (5 t). In the EO industry, silver is used as a catalyst, and thus whenever there is new producing capacity going in, silver is required (newly installed demand). While silver is not consumed during the process, it is recycled after a period of time, and thus there is demand for silver once the old silver is to be replaced.

When we talked to different contacts across various industries, they all shared a common theme in that financial liquidity had tightened since the start of 2018, with even public listing companies struggling to gain access to liquidity. The Chinese government wanted to deleverage financial risk in the system, and it was believed that banks had tightened their credit lines to avoid bad debt. Despite this, the Chinese economy, including the industrial sector, still managed to grow in the first half of the year, regardless of the concerns over a global trade war. However, as the trade war escalated in the second half of the year, along with several investment busts in the Peers to Peers (P2P) sectors that resulted in further liquidity strain, orders across various industries were notably lower, hitting their the lowest point in December. Massive layoffs and restructuring of Chinese enterprises therefore took place in the second half of 2018, further pushing up the unemployment rate, which in turn hindered consumer sentiment.

Looking forward, many industrial participants are not optimistic about China's industrial sector in 2019, after finishing 2018 at a low point. Both the Chinese official manufacturing PMI and Caixin manufacturing PMI were below 50 in the first two months of 2019, suggesting that manufacturing activities have been contracting for three consecutive months. However, as we expect trade talks will progress (whether a formal agreement will be signed within 2019 or not), in addition to the Chinese government's introduction of more stimulus policies and liquidity injections to kick start the domestic economy, we think the country's industrial sector should bottom sometime in the first half of 2019. This would suggest demand levels for silver may not be as negatively impacted this year as once thought.

Following three consecutive years of growth, industrial silver fabrication in **Japan** slipped 8% in 2018 to an estimated 101.4 Moz (3,154 t), giving back some of the more recent annual gains. As was the case in the last few years, it was silver powder production performance that influenced the annual total. In the last couple of years, strong growth for silver powder production for the solar sector has helped lift total Japanese silver industrial demand, and at times, offset weakness in other sectors. Last year it was the decline in this individual sector that dragged the overall figure lower, masking some healthy annual gains elsewhere.

Japanese economic growth was particularly volatile in 2018. All in all, it decreased sharply for the full-year 2018 to 0.7%, from 1.9% in 2017. The country was hit by a typhoon in the third quarter of 2018 that weakened most of the components of demand, and thus growth. In the fourth quarter, activity picked up moderately, but inversely, external trade continued to strain growth amid deteriorating global trade conditions.

The Japanese manufacturing sector finished 2018 on a solid footing, with business conditions improving at a stronger rate. Driving the firmer upturn was a sharper expansion in production, which rose at the strongest rate since last April. Japan's Nikkei Manufacturing PMI for December ticked higher to 52.6, compared to the previous reading of 52.4, but the outlook for 2019 is less optimistic with activity in Japan's manufacturing sector contracting in February for the first time in two and a half years.

JAPANESE NON-PHOTOGRAPHIC NITRATE & CONTACT PRODUCTION

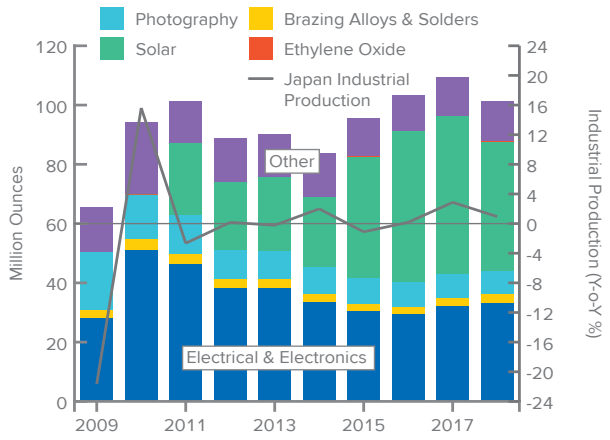
(million ounces)	2014	2015	2016	2017	2018
Non-Photo Nitrates	1.1	1.2	0.9	1.1	2.3
Contacts	2.1	2.2	1.9	2.0	2.0

Source: GFMS, Refinitiv

Last year saw only modest gains in demand from the electronics industry, most notably in the first half of the year, both for domestic consumption and from the export sector. However, a slowdown in the fourth quarter limited annual growth. These findings are backed up by data published by the Japanese Electronics and Information Technology Industries Association (JEITA). According to their findings, Japanese exports of electronics (a broad term covering many individual segments) rose just 1% in value terms in 2018 with the largest segment of 'electronic components and devices' edging 1% higher. On the domestic front, they report a slight 2% decline in production compared to 2017, with several segments failing to exceed 2017 levels as sharp declines were recorded in the final months of the year.

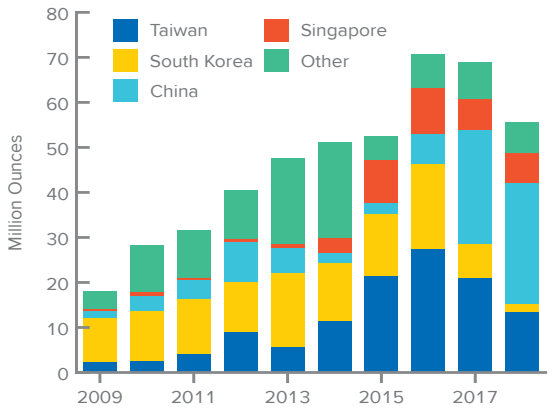
Turning to the individual sectors' performance, the electrical and electronics sector rose for the second year in succession increasing 4% to a four-year high of 33.3 Moz (1,035 t). The annual rise augmented by strong demand (especially in the first half of the year) for contacts points, switches, and electronic components for the automotive sector. Brazing alloys and solders also recorded modest growth last year, rising 2% over 2017 volumes to an estimated 2.8 Moz (87.2 t), with increased domestic infrastructure supporting demand, as did higher electronics demand. The photographic

JAPANESE INDUSTRIAL FABRICATION



Source: GFMS, Refinitiv, Datastream

JAPANESE SILVER POWDER EXPORTS



Source: GFMS, Refinitiv

sector continues to drag silver consumption lower, but a 4% decline last year suggests that the current fabrication volumes may be largely sustainable moving forward. Meanwhile, demand from our 'other fabrication' segment which captures ethylene oxide among other smaller sectors rose 4% year-on-year to a three year high.

The standout in recent years (and accounting for as much as 47% of total industrial offtake), has been silver powder fabrication produced to make silver paste for the solar industry, with Japanese production expanding at annual average growth rate of 9% between 2015 and 2017. In 2018, demand from this sector retreated by an estimated 18% from the previous year's record level to 43.7 Moz (1,360 t), due in part to competition from other manufacturing countries such as China and the United States, in addition to ongoing thrifting of silver loadings for PV modules. As outlined in the photovoltaic text on page 65, China released a new policy in May last year signaling the government's intention to slow the rate of solar station growth and reduce the subsidies for distributed solar panels installation. This, not surprisingly, had a significant impact on demand with the surprise announcement acutely lowering demand levels initially, before orders recovered later in the year. The slowdown in production is reflected in Japanese silver powder exports which fell 19% in 2018 to 55.6 Moz (1,729 t) on a calculated basis, with flows to China rising 5%, but shipments to Taiwan, Singapore, and South Korea sharply weaker on a year-on-year basis.

South Korean industrial offtake fell by 4% in 2018 to an estimated 11.9 Moz (369 t), after recording modest growth in 2017. South Korea's economic status continued to be in a bad shape last year with the country's GDP growing by 2.7%, its lowest level in six years. Meanwhile, exports rose 4.2% last year, up from 1.9% increase in 2017. Consumer spending also rose 2.8% (the highest rate in seven years), as state spending jumped by over 5% as the government attempted to boost the local economy. On the other hand, according to the South Korea Nikkei Markit Manufacturing PMI, only four months of 2018 recorded a PMI index at expansion levels, meaning that eight months of last year had a PMI below 50.0, indicating industrial contraction.

TABLE 6 - SILVER FABRICATION: ELECTRICAL AND ELECTRONICS (INCLUDING THE USE OF SCRAP)

(million ounces)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
China	55.4	66.2	69.1	69.5	75.3	77.8	69.9	59.0	63.3	64.6
United States	53.4	74.6	67.0	56.1	53.1	54.3	54.3	55.3	55.8	59.0
Japan	28.2	51.1	46.2	38.4	38.3	33.6	30.4	29.5	32.1	33.3
Germany	15.7	21.3	20.3	17.2	17.0	16.7	16.7	17.2	18.5	19.5
India	16.1	17.1	17.2	17.6	15.1	16.1	14.5	14.6	14.0	14.5
Taiwan	9.9	12.1	12.7	11.3	11.8	12.3	11.7	12.0	12.6	12.9
Russia	10.3	11.3	10.9	10.7	10.9	10.1	9.2	8.6	8.7	8.9
South Korea	12.5	16.1	16.0	15.5	14.6	13.3	9.1	8.0	8.2	8.0
France	5.7	6.9	6.1	5.3	5.3	5.1	5.2	5.1	5.2	5.3
Mexico	2.2	3.8	5.0	5.7	5.7	5.8	6.9	6.9	6.8	5.0
United Kingdom	3.4	3.9	4.0	3.9	3.9	4.0	4.1	4.1	4.2	4.2
Italy	3.4	3.9	3.3	2.8	2.5	2.4	2.3	2.2	2.2	2.3
Czech Republic	1.0	1.2	1.3	1.4	1.4	1.5	1.4	1.4	1.4	1.4
Brazil	1.2	1.6	1.6	1.6	1.5	1.5	1.3	1.2	1.2	1.2
Hong Kong	2.7	3.1	3.1	3.0	2.8	2.3	2.1	1.8	1.6	1.0
Turkey	0.9	0.9	1.0	0.9	0.9	1.0	1.0	1.0	1.0	1.0
Kazakhstan	1.0	1.1	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9
Uzbekistan	1.0	1.0	1.1	1.0	1.0	1.0	1.0	0.9	0.9	0.9
Singapore	0.0	0.2	0.2	0.3	0.3	0.5	0.6	0.7	0.8	0.9
Other Countries	4.0	3.3	3.8	3.6	3.5	3.5	3.5	3.5	3.5	3.6
World Total	**227.4**	**301.2**	**290.8**	**266.7**	**266.0**	**263.9**	**246.0**	**233.9**	**243.1**	**248.5**

Silver bonding wire, which recorded relative growth in 2017, did not fare well last year, recording double-digit declines. While the functionality of silver bonding wire is similar to a palladium coated copper wire, the former still costs more than the latter, making it an unattractive alternative. Manufacturers have introduced other silver bonding wires, including gold-coated-silver wire (ACA) and metal-coated silver wire (MCS), however, these are still relatively new products, and while the workability of these silver wires remain at a higher cost than that of copper based wires, the level of demand may remain muted. We believe it will take many years for the market to begin to treat silver in this application more seriously. Another interesting observation in the semiconductor industry last year was the increasing demand for solder balls. A solder ball is an electronic solder part that attaches semiconductor chips, circuit modules, and PCB boards. In the past, solder balls were made up of tin and lead, but because of environmental restrictions, many of today's solder balls are lead free and use silver instead. Unfortunately silver only make up a very small portion of a solder ball and thus the growth in the segment only offered a limited support to the overall demand for silver.

Looking forward in 2019, South Korea's economy continues to suffer from softer global demand from the electronics industry, especially from China. The country's PMI index started the year in contraction in the first two months, while Korea's exports contracted at their steepest pace in nearly three years in February. Similar to China, we believe Korea's industrial and exports sectors may bottom sometime in the first half of 2019, with orders beginning to improve once the Chinese economic stimulus package comes into full effect.

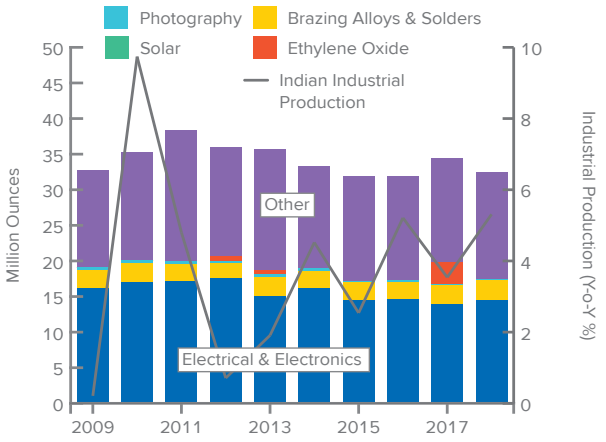
Taiwan's industrial use of silver is estimated to have increased by less than 2% last year to 15.6 Moz (486 t). The island's GDP grew by 2.6% in 2018, but the local government has revised down its economic forecast to 2.3% growth this year. Electronic products are Taiwan's largest export items, and it grew by a decent 7.6% last year. Electronics accounted for 47% of Taiwan's exports to China and Hong Kong in 2018.

Indian industrial fabrication reached 32.2 Moz (1,002 t) in 2018, an decrease of 6% year-on-year. Following a 4% decline year-on-year in 2017, consumption of silver in electrical contacts and electronics increased by 3.7% to 14.5 Moz (451 t) in 2018. The majority of silver demand in this segment comes from electrical contacts. Double-digit growth has been observed in the domestic low voltage (LV) switchgear market in 2018, with increased demand coming from the rural electrification segment. While imports of LV switchgears, including panels, increased by 86% year-on-year, Indian manufactures also raised their capacity for a rise in domestic and export demand. After a 22% drop in 2017, exports increased 26% in 2018. Following that rise, demand for LV switchgear will likely be more muted during the first half of 2019. Indeed, with general elections looming in May, there is likely going to be sluggish growth in rural electrification in H1, which will be compensated by a stronger demand sentiment in second half of the year.

A rise in demand for electrical silver containing products is also expected from the consumer electronic segment this year, with Samsung India expanding its mobile phone manufacturing capacity in the city of Noida to 120 million sets annually last year. Apart from that, Samsung will also produce air-conditioners, refrigerators and flat screen TV panels. A couple of other companies are also looking to expand their manufacturing activities in the consumer electronic segment, after identifying massive growth potential in the region.

Demand of silver in brazing alloys and solders increased 4.4% year-on-year to 2.6 Moz (80.2 t) last year. This was driven by strong demand in the automotive and power distribution sectors. Automobile production in India increased 12.5% between April - November 2018 and we are expecting double-digit growth for the full year.

INDIAN INDUSTRIAL FABRICATION



Source: GFMS, Refinitiv, Datastream

SILVER ETHYLENE OXIDE CATALYST MARKET

Ethylene oxide (EO) is a critical chemical intermediate in the production of products like polyester, detergents, polyurethane foam, antifreeze and other products we use everyday. In the last decade, global EO capacity expanded at a 4.9% compound rate per annum. Demand for EO is generally tied to the global economy. However, in recent years demand has been more closely linked to growth in emerging economies, where a rapid improvement in living standards has been driving increased demand for EO-derived products like textiles, detergents, plastic bottles and cosmetics. Over half of global EO production is used for manufacturing polyethylene terephthalate (PET) bottles.

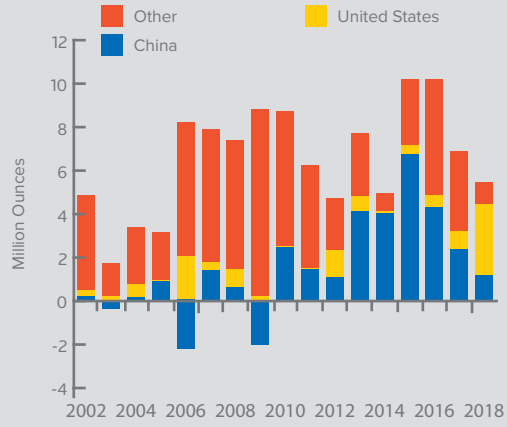
EO is produced from polyethylene grade ethylene. The manufacturing process involves mixing ethylene and oxygen in the presence of a silver catalyst at a temperature between 200 and 300 degrees celsius. Silver acts as the reaction site, enabling ethylene to react with oxygen. While it is not consumed in the reaction process, the silver does needed to be recycled (approximately 2% of silver is lost during the recovery process), and the cycle varies from 18 to 36 months depending on the technology used and capacity utilization at the plant. As a result, the demand for silver from the EO industry directly depends on new capacity built.

New catalysts, in general, contain higher silver content than older models. The higher the silver content is, the longer the cycle can last for before recycling.

We estimate that global EO production capacity grew by just 2.8% in 2018, the slowest annual growth rate since 2012. On the other hand, silver demand from the EO industry in 2018 fell by over 20% from the year prior, to 5.4 Moz (171 t). It was also 46% less from the peak level reached in 2016, when total volume hit 10.2 Moz (317 t). To break this down further, demand from newly installed EO capacity (the main engine for silver demand from this sector), fell by 26% year-on-year, as fewer EO plants were commissioned last year. On the other hand, demand for replacing the old metal (replacement demand) increased by 22% last year.

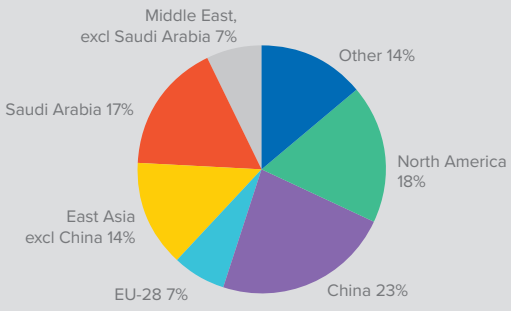
In 2019, EO made the headlines of the mass media, but in a negative way. According to the United States Environmental Protection Agency (EPA)'s National Air Toxics Assessment, residents in a Chicago suburb were possibly exposed to air pollution that could develop into cancer. The primary culprit was EO gas which emanated from a local plant with emission levels far exceeding federal safety standards. The plant, locating in west suburban Willowbrook, used EO to sterilize medical instruments. In February 2019, the Illinois EPA ordered a shutdown of the operation for further investigation. Meanwhile, other local politicians asked the EPA to conduct EO testing in Lake County but the request was denied. Whether the accusation is legitimate or false, it has certainly raised public awareness on the possible harm to public health if EO is not being processed appropriately, and it could be a drag to the development of new plants moving forward.

GLOBAL SILVER EO DEMAND



Source: GFMS, Refinitiv

LOCATION OF SILVER INSTALLED IN EO FACILITIES IN 2018



Source: GFMS, Refinitiv

NEW USES OF SILVER - THE AUTOMOTIVE INDUSTRY

The advent of the rise of increased electrification in the automotive industry has affected the metals spectrum differently. Depending on what development you focus on, some metals have benefitted greatly. Nickel, for example, has always been at the forefront of battery usage through the use of the nickel cadmium chemistry and the nickel-metal-hydride battery. The emergence of electric vehicles has, through the use of lithium-ion battery technology, resulted in a higher use of a wider range of powertrain metals. In addition to nickel, some other prominent metals that increasingly feature in EVs are lithium, cobalt and graphite, mainly found in the nickel-manganese-cobalt (NMC) chemistry used in the cathode side of batteries utilized in EVs. Other chemistries include commodities like phosphate, iron or aluminium, the latter heavily used by Tesla's electric powertrains.

Silver is not excluded from this development, quite the contrary, but is not as prominently present in the powertrains as some of the other above mentioned metals do. However, due to its excellent electric conductivity, it is widely used in and around the electric powertrain and other applications that are increasingly featured in hybrid ICE cars and EVs alike. In fact, nearly all electrical connections in a modern automobile are outfitted with silver-coated contacts. Starting the engine, opening windows, adjusting seats and closing a trunk each use silver membrane switches. Silver is also crucial to infotainment systems, window defogging, heated seats, and luminescent displays.

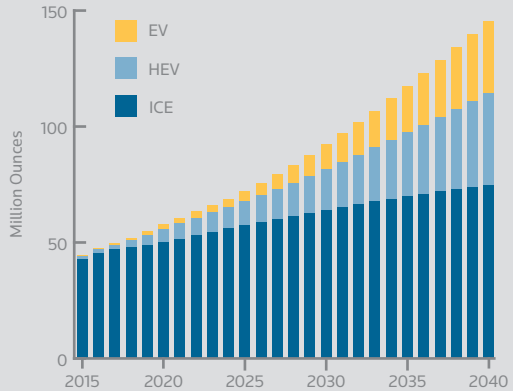
Batteries also contain silver, but usually not in the automotive powertrain itself. Batteries that have silver are usually very small, like a button, powering small consumer applications or appear in larger customized form, such as torpedo's used in submarines. Silver batteries have an excellent energy-to-weight ratio and the best electric conductivity of all metals. The silver-zinc battery, for example, uses a variation of the silver-oxide chemistry and can deliver one of the highest specific energy out of all presently known electrical chemical power sources.

Batteries of small applications which are based on a silver chemistry, like silver hydroxide, contain very little actual silver. As such, the raw material costs are not really an issue. However, as soon as applications become larger than that, choosing for a silver based battery might not be the most cost effective way. It is therefore not surprising that we don't see any major battery manufacturers actively trying to use silver based batteries in the powertrains of, for example, electric vehicles. As such, silver batteries find more usage in applications that are operated in demanding environments, or have extremely high quality requirements. These sort of applications are mostly found in niche sectors, such as the military space. Although, more recent it is becoming more widely available in mainstream markets too, for example, silver batteries used in laptops and hearing aids.

Flexible electronics are a promising emerging feature in which silver batteries actually play a prominent role too. This development also contributes to another silver based application, solar cells, which is actively being deployed in energy independent vehicles. Although still in its infancy, silver based solar cells will be applied on the roof and integrated in the bodywork using flexible forms, contributing towards extending the range of the battery. EVs will be charged either at home or at a superfast charging station generated by silver based solar cells.

Due to silver's relative high cost compared to other metals, thrifting – using less silver but not replacing it entirely – will continue to play an important part in developing these promising features but offset by the rise in sheer volume some of these applications will demand in the near future. Silver might not find wide usage in the battery chemistry that powers ICE cars and EVs but continues to be of paramount importance to their surrounding applications. We estimate 51.8 Moz (1,611 t) of silver was used in automotive last year, up 4% from the prior year.

SILVER DEMAND IN AUTOMOTIVE



Source: GFMS, Refinitiv; Silver Institute

TABLE 7 - SILVER FABRICATION: BRAZING ALLOYS AND SOLDERS (INCLUDING THE USE OF SCRAP)

(million ounces)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
China	26.6	28.6	30.5	31.4	34.7	37.6	33.3	27.2	28.5	28.9
United States	5.2	5.9	6.0	5.3	5.7	5.8	6.0	6.1	6.2	6.3
Japan	2.5	3.7	3.5	3.0	2.8	2.5	2.4	2.3	2.7	2.8
India	2.2	2.6	2.7	2.4	2.1	2.6	2.5	2.5	2.5	2.6
United Kingdom	1.8	2.3	2.4	2.2	2.1	2.2	2.2	2.2	2.3	2.3
Germany	2.3	2.8	2.8	2.3	2.2	2.1	2.1	2.1	2.2	2.2
Canada	1.1	1.7	1.7	1.6	1.6	1.6	1.5	1.5	1.6	1.6
Russia	1.7	1.9	1.8	1.8	1.8	1.8	1.6	1.5	1.5	1.5
South Korea	2.1	2.3	2.4	2.2	2.1	1.9	1.5	1.4	1.5	1.4
Italy	1.7	1.8	1.7	1.6	1.5	1.5	1.5	1.4	1.5	1.4
Switzerland	1.2	1.3	1.3	1.3	1.2	1.3	1.3	1.3	1.3	1.3
Taiwan	1.0	1.2	1.3	1.2	1.2	1.1	1.1	1.1	1.1	1.1
Brazil	0.9	1.0	1.0	1.0	1.0	0.9	0.8	0.8	0.8	0.8
Australia	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.5
France	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5
Mexico	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.7	0.6	0.5
Belgium	0.6	0.6	0.6	0.7	0.7	0.5	0.5	0.5	0.5	0.5
Spain	0.6	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4
Other Countries	1.2	1.0	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4
World Total	**53.8**	**61.2**	**63.2**	**61.1**	**63.7**	**66.7**	**61.5**	**55.3**	**57.5**	**58.0**

Supported by government policy of giving electricity to every household, power transmission and distribution also witnessed robust growth last year. The installed capacity to generate electricity increased by 3% in the fiscal year (FY) 2018-19 and as a result the power distribution infrastructure has also witnessed another year of robust growth. As per data released by the Central Electricity Authority (CEA), India's energy deficit decreased to 6.4 bn units (MU) in the FY 2018-19 from 38.1 bn units (MU) recorded in 2014-15. This rapid expansion has supported India's rise on the "Getting Electricity" rankings published by the World Bank from 99 in 2015 to 29 in 2018.

We have also observed another year of steady growth of silver demand in the food and health sector driven by increased consumer spending. In addition, silver demand also rose by an estimated 3.3% in the traditional 'jari' (a mechanism through which silver threads is entwined inside traditional Indian silk 'sari') industry.

Although India increased its installed solar generating capacity by 12.2 GW last year, pushing the country's total to 26 GW, the industry still almost entirety relies on imports of solar panels and silver paste. A high tariff (10%) on imported silver powder made it unfeasible for Indian companies to import the material and convert it into paste for solar panels. The Ministry of Renewable Energy, however, has set an ambitious target to achieve 100 GW of solar power capacity by 2022. This will be a great opportunity for India to build silver powder producing facilities themselves in order to facilitate the projected growth in domestic solar generating power capacity. However, for that to happen, changes in government induced policies will be required to reduce the cost of production and make Indian producers competitive with more established powder and paste manufacturers from China, Japan and the United States.

PHOTOGRAPHY

- **Demand for silver used in photographic applications fell by 4% last year to an estimated 39.3 Moz (1,222 t).**

In 2018, silver demand for photographic applications slipped by 4% to 39.3 Moz (1,222 t). This prolonged long term decline has seen demand from this sector fall 50% in the last decade and more than 80% from the peak in 1999. At that time photography's share of total silver physical demand stood at 74%, compared to just 4% in 2018. After averaging a 14% annual decline between 2006 -12 it would appear that demand has now largely

TABLE 8 - SILVER FABRICATION: PHOTOGRAPHIC USE (INCLUDING THE USE OF SCRAP)

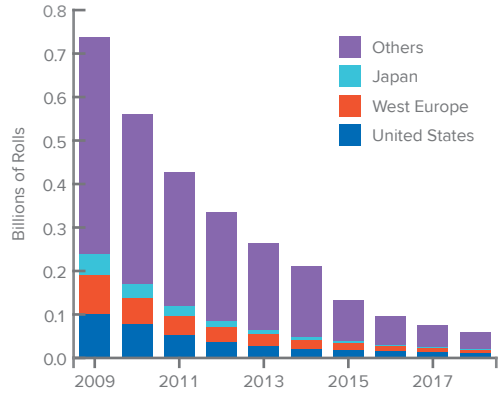
(million ounces)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
United States	23.4	20.2	17.9	16.8	16.0	15.3	14.8	14.2	13.7	13.6
Belgium	18.6	17.4	15.5	14.4	13.6	13.5	12.9	12.9	10.3	9.5
Japan	19.6	15.0	13.2	9.7	9.5	9.3	8.8	8.4	8.2	7.8
United Kingdom	8.6	9.0	9.4	8.4	7.4	6.7	6.5	6.2	6.0	5.9
China	3.1	2.6	2.4	2.2	1.9	1.8	1.6	1.5	1.4	1.2
Russia	1.5	1.4	1.2	1.2	1.1	1.1	1.0	1.0	0.9	0.9
Brazil	1.0	1.4	1.2	1.1	0.5	0.3	0.2	0.2	0.2	0.2
India	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.1
Czech Republic	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Australia	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other Countries	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
World Total	**76.4**	**67.5**	**61.2**	**54.2**	**50.5**	**48.5**	**46.1**	**44.7**	**40.9**	**39.3**

stabilized; with the average decline in the last five years dipping below 5%, suggesting that the bulk of structural change in the photography market may now be behind us and that current fabrication volumes may be largely sustainable. Indeed there are some industry segments that are having somewhat of a renaissance and may well deliver gains in the future.

The acute fall in silver used in the photographic sector has been driven primarily by substitution into digital technologies. The introduction of the digital cameras into the mainstream in the mid to late 1980's followed by the advent of cameras on cell phones in the early 2000's drove the rapid migration away from the use of silver halide technology to digital processing applications. The shift to digital applications impacted not just cameras and paper but also lithography, cinema film, and medical applications (X-ray). In the medical sector demand for silver halide film in X-ray continues to decline (after an acute fall initially) but the migration rate has been tempered somewhat in recent years by the higher costs associated with delivering advanced health care into emerging countries. However, as costs fall and the ability to access digital images cheaply and then be able to share them via the internet and with remote medical practitioners, we expect wet chemical systems will eventually be a thing of the past.

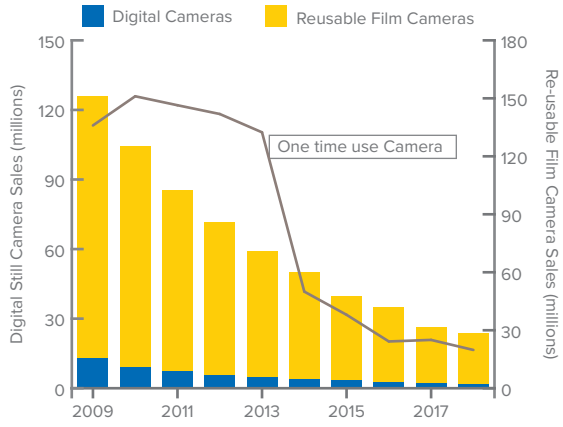
There has been some positive news emerge from this sector recently with traditional photographic film and paper having somewhat of a rebirth as a new generation of mainly professional photographers, who have never used this medium, have begun dabbling in film. While the professionals are leading the charge, the amateur market is also seeing an uptick in interest. Ilford, the British firm that specializes in black and white film, paper

WORLD PHOTOGRAPHIC FABRICATION



Source: GFMS, Refinitiv

DIGITAL AND FILM CAMERA SALES



Source: Photofinishing News Inc.; GFMS, Refinitiv

and chemicals, reported an uptick in sales last year and released data from an online survey that revealed that the resurgence and growth of film over the past five years, has seen 57% of their responders returning to or trying the medium for the first time. When breaking down the demographics, 37% of those under 44 were new to film with 27 % returning after an absence.

Another segment of the industry on the rise, this time buoyed by the youth demographic, as been demand for instant photo systems. Currently, Fujifilm, Polaroid and Leica are the leaders of instant film industry with this sector exploding in the last few years. The worldwide market for instant camera's consumables (photo film & photo paper) is expected to grow at a CAGR of roughly 6.4% over the next five years, reaching 200 million US$ in 2024, from 140 million US$ in 2019. Fuji , who dominates this space, has enjoyed significant success and an acute rise in sales of its Instax series, thanks to the Fujifilm Instax Square SQ20 and the Taylor Swift-branded SQ6.

Turning to individual markets, and firstly to **Japan**, where silver consumed in this sector fell 4% to an estimated 7.8 Moz (243 t). After experiencing some acute falls during the first decade of the millennium, the falls have moderated and in the last five years have averaged just 4%. Demand for consumer film and paper continued to retreat but this was partially offset by growth for instant film cameras such as Fujifilm's Instax camera which has rapidly gained in popularity among the brand focused youth market. The sales volume of the Instax series totaled 8.5 million units in the first 9 months of the year.

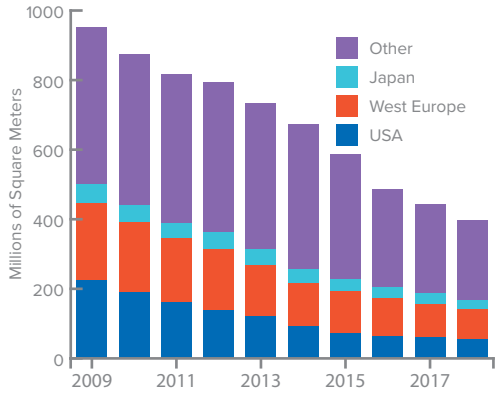
In the **United States** photographic demand fell by just 1% to reach 13.6 Moz (422 t) last year, the seventh successive year of moderate single digit declines. Demand for both photographic film and color negative paper offtake continued to retreat in 2018* retreating 10% and 19% respectively. **European** demand was also weaker, sliding 6% over 2017 volumes to an estimated 16.3 Moz (508 t). The market continues to deal with consolidation and closures with Kodak Alaris, announcing it will likely be split and sold. As a bloc demand for 24 exposure rolls of film fell by another 28% in 2018*. (* source: Photofinishing News)

PHOTOVOLTAIC

- **Silver demand from the photovoltaic (PV) industry in 2018 stood at 80.5 Moz (2,503 t), easing by 9% from 2017 levels. China was the main contributor for the silver demand in 2018, accounting for almost half of the new solar panel installations.**

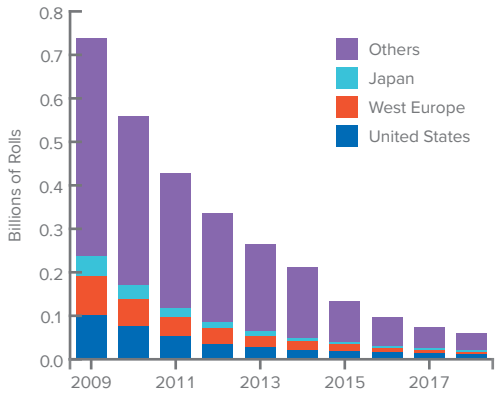
Silver demand from the photovoltaic (PV) sector retreated in 2018, easing 9% to 80.5 Moz (2,503 t). While the market continued to advance (with global installations reaching a record high last year), silver used in this segment declined due to ongoing thrifting of silver loadings. The modest decline last year was the first decline since 2014 after the industry recorded double-digit growth rates between 2015 and 2017. Demand for silver from the PV sector is forecast to remain high as governments from various countries will continue to offer incentives. Australia, Europe and India are anticipated to see a larger share of demand.

WORLD COLOR PHOTOGRAPHIC PAPER CONSUMPTION



Source: Photofinishing News Inc.

CONSUMER & PROFESSIONAL FILM SALES



Source: Photofinishing News Inc.

Global PV installations rose by 6% in 2018 to reach an estimated 104 GW. In 2019, installations are likely to touch 123 GW, an 18% year-on-year rise, with China again being the largest contributor with close to 40 GW of new installations, from just 39.8 GW in 2018. The total cumulative installments reached 504.6 GW in 2018 and is anticipated to touch 627.6 GW in 2019. China continues to lead global installations and is expected to retain that mantle in the years to come. While India, set for rapid expansion, is likely to take second position.

Total silver demand from the industry is measured based on annual solar cell production, with no adjustments made for lead times. Production typically exceeds installations in a given year due to a range of factors, namely lead times, cell breakage, and overproduction to maintain cost competitiveness. Solar cell production was estimated at 107.6 GW last year, roughly 11% higher than installations. This margin was slightly higher compared to 2017 with the drop in Chinese government policy catching many fabricators off guard leading to an oversupply. Silver thrifting continues to provide headwinds for the industry as module fabricators looks to lower production costs, with silver still contributing close to 20% of the total module cost. Silver demand per cell has now fallen below 100 MG per cell, half the level it was just five years ago. Module fabricators are forecasting this could drop to just 60 MG per cell within the next five years, placing further pressure on silver consumption in this industry segment.

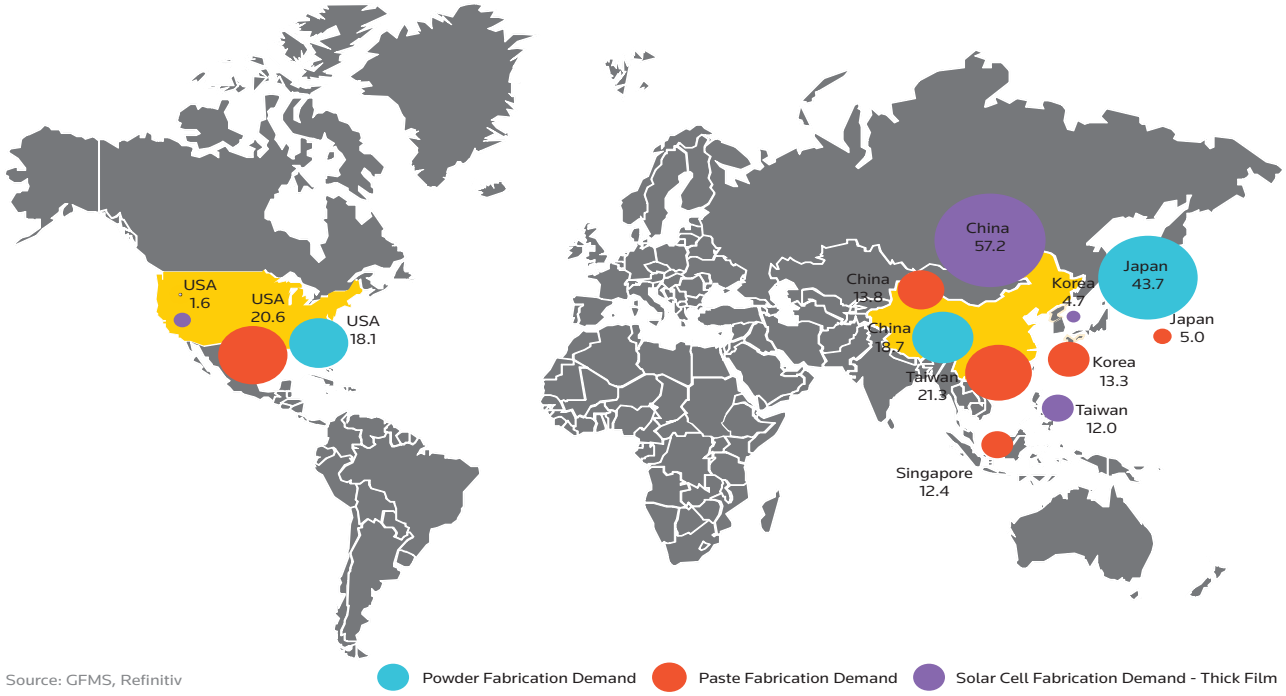
On May 31, 2018, China's "531" policy was announced by the National Development and Reform Commission, the Ministry of Finance, and the National Energy Administration. The policy was designed to control growth in solar installations by accelerating the removal of subsidies. No new installations of solar farms were eligible for subsidies in 2018 and up to 10 GW of new distributed solar installations were ineligible for subsidies, while electricity price subsidies were also reduced. Without subsidies there is no return on investment for over a decade, so investors and property owners were not as focused on utilizing this alternative. In comparison, using the previously available subsidies,

ESTIMATED SILVER POWDER PRODUCTION FOR PV BY COUNTRY

(million ounces)	2014	2015	2016	2017	2018
Japan	23.3	40.8	50.8	53.0	43.7
United States	24.3	15.9	13.7	18.6	18.0
China	6.2	7.7	10.5	17.2	18.7
World Total	**53.9**	**64.5**	**74.9**	**88.9**	**80.5**
..of which Frontside	40.9	49.0	56.9	67.5	61.2
..of which Backside	12.9	15.5	18.0	21.3	19.3

Source: GFMS, Refinitiv

SILVER SUPPLY CHAIN IN GLOBAL PV INDUSTRY IN 2018 (MOZ)



Source: GFMS, Refinitiv

it only took on average seven years to recoup the initial investment. China's commitment to the Paris Climate Agreement has led to major policy changes in its renewable energy sector. In line with the Paris Climate Agreement, it has agreed to lower its carbon intensity by 40- 45% below the 2005 levels. Distributed solar projects, such as small-scale commercial and consumer rooftop installations will see the biggest change and it is these sectors that will drive future expansion.

India, which imports most of its solar panels and modules, imposed safeguard duties on imports from China in July 2018. New Delhi chose to impose a 25% duty on Chinese solar cells and modules as imports have put the domestic solar manufacturing sector at risk. Imports lowered the solar power generation cost and sped up the implementation of renewable energy. The increasing cost competitiveness of solar generation will support strong growth in the sector over the coming decade. It is expected that India's solar capacity will increase at an annual average rate of 16% in the coming years. Karnataka is the top solar state of India followed by Telangana, Andhra Pradesh and Rajasthan.

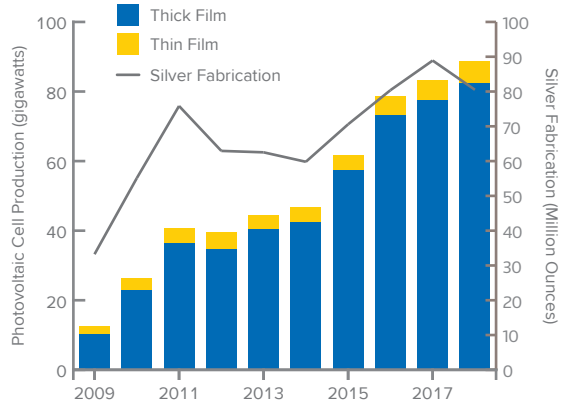
The United States is forecast to install 13 GW solar panels in 2019 from the estimated 10 GW delivered in 2018. In January 2018, U.S. President Donald Trump placed a 30% tariff on all imported solar equipment to establish trade restrictions under seldom-used trade laws. The tariff allows 2.5 GW of unassembled solar cells to be imported tariff-free in each year. The imposition of tariff led U.S. renewable energy companies to either hold on or cancel investments of more than $2.5 billion.

According to a fact sheet released by the U.S. Trade Representative, this tariff will last for four years and from the initial 30% and will fall by 5% annually, dropping to a 15% tariff by 2021.

Japan has raised its PV installation target from 7.5 GW installed in 2018 to 7.9 GW in 2019, contributing 7% of global installations in 2018. It is expected to add 17 GW in the next two years, on the back of accumulation projects under Japan's FIT mechanism. For projects approved between 2012 and 2014 and over 2 MW, Japan has postponed the Feed-in-tariff cut off until September 2019.

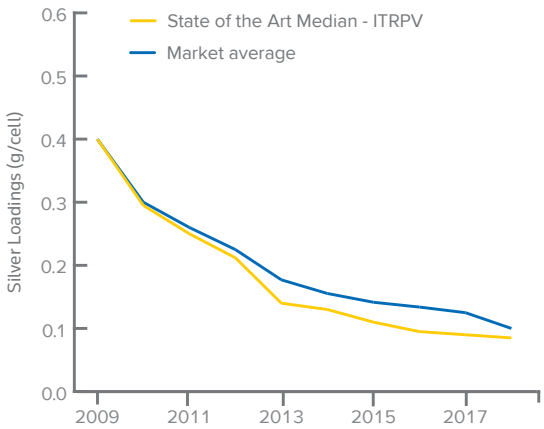
Countries such as Argentina, Egypt, South Africa, Spain and Vietnam are likely to account for the growth expected in 2019, with 7 GW of new capacity forecast from these countries combined. About 16 countries are likely to add more than 1 GW capacity in 2019. Global PV industry demand is expected to rise from the middle of 2019, while lower spot market prices along the PV supply chain and a rise in construction in the second half of the year is expected to deliver further gains.

SILVER PHOTOVOLTAIC FABRICATION



Source: Solarbuss; Earth Policy Institute; ITRPV; GFMS, Refinitiv

SILVER LOADINGS IN PHOTOVOLTAIC CELLS



8. JEWELRY & SILVERWARE

JEWELRY

- **Another standout performance from India and continued expansion in North America saw global silver jewelry fabrication increase 4% in 2018, to 212.5 Moz (6,611 t).**
- **Indian silver jewelry fabrication surged 16% in 2018, setting a new record of 76.5 Moz (2,378 t), helped higher by migration to silver due to elevated gold prices and expansion of retail outlets.**
- **Chinese jewelry fabrication slipped 5% last year to 25.4 Moz (789 t), with the fifth consecutive annual decline driven by softer economic performance and industry consolidation.**

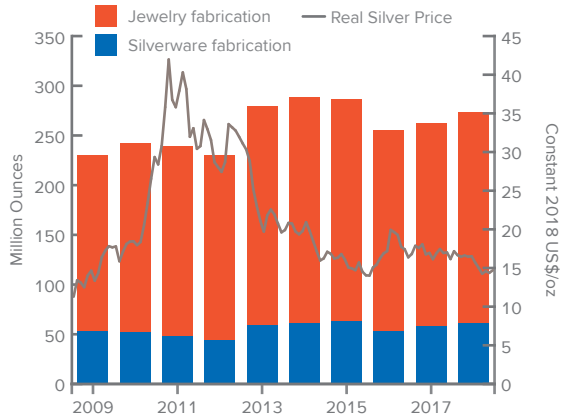
Last year, silver jewelry fabrication increased for the third year in succession, with the 4% annual rise leaving the total at 212.5 Moz (6,611 t). Another strong performance from India, which surged 16% to a record high and accounted for more than a third of total global demand, helped drive silver offtake higher. Demand in Europe was 3% weaker in 2018, dipping to a five-year low as economic pressures took a toll, while in East Asia a decline from China and Thailand offset gains from Indonesia and Vietnam to pull fabrication 3% lower for the region. Demand in North America was again robust, albeit recording a slightly weaker growth rate then seen in 2017, with a 7% rise in fabrication demand from the United States, and a broadly stable outcome in Canada, offsetting a drop in demand from Mexico.

EUROPE

Jewelry fabrication in **Europe** declined in 2018, falling by 3% or 1 Moz (31 t) to 32.8 Moz (1,020 t), its lowest level since 2016. To put this in historical context, the European share of global jewelry fabrication declined to 15% last year, compared to 23% a decade ago, with total demand having fallen by 7.2 Moz (224 t) over the period. The weak performance last year was largely driven by a contraction in Italian fabrication (which accounts for 30% of jewelry manufacturing in the region), with fabrication falling by 6% year-on-year, its lowest level of production since 2014. If we exclude Italy from regional totals, then fabrication across Europe almost remained unchanged from 2017 levels, moving up a modest 0.01%.

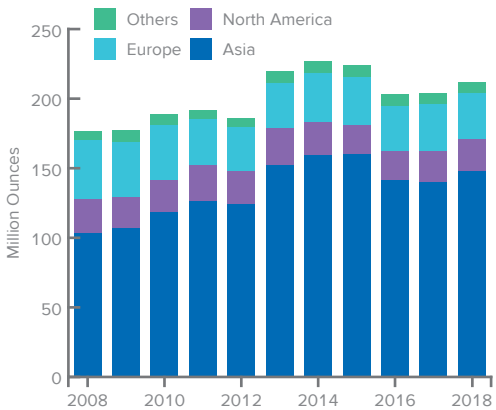
Italy is a bulk exporter of jewelry to foreign markets and therefore is largely reliant of the health of external countries and their demand to support fabrication. The significant fall in Italian jewelry fabrication to 17.9 Moz (557 t) in 2018, reversed gains created in 2017 as weakness in demand was recorded across major trading partners in the Middle East, Asia and the United Kingdom. Meanwhile, the United States (which is Italy's largest trading partner responsible for 17% of market share last year) also recorded a decline, albeit modest. Indeed, if we look at official trade figures last year (which include December estimates), a year-on-year comparison illustrates that Italy's top four trading partners all recorded declines last year, with the United States, Romania, Hong Kong and the

WORLD JEWELRY AND SILVERWARE FABRICATION



Source: GFMS, Refinitiv

WORLD JEWELRY FABRICATION



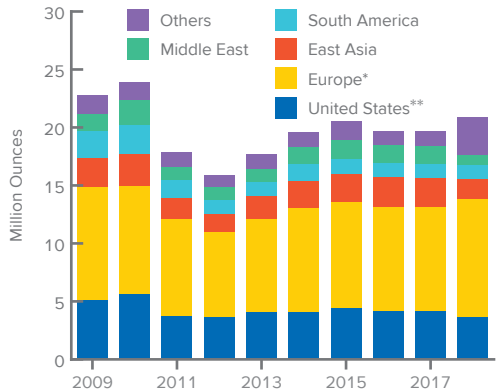
Source: GFMS, Refinitiv

United Arab Emirates contracting by 5%, 14%,17% and 7% respectively. One thing to point out here is that anecdotal evidence has suggested that December export figures are likely to be very weak, and our estimates reflect this.

Meanwhile, domestic demand for Italian jewelry also recorded weakness last year. Over the last few years, we have recorded a shift in demand away from jewelry, with consumers instead preferring to spend their money on branded items (such a clothes and bags), on the latest technological items (such as smartphone's) or on experiences. Meanwhile, with the fiscal health of Italy long being in question (with rising debt, double-digit unemployment levels and a Gross Domestic Product (GDP) which contracted from 1.5% to 1.2% last year), consumers are only looking to spend money on what is absolutely necessary.

Elsewhere in Europe, silver jewelry fabrication also suffered with the largest falls recorded in **Poland, France, Greece** and **Germany**, with each country's fabrication declining by 18%, 6%, 16% and 2% respectively. A slower Eurozone negatively impacted the export-driven market, while country-by-country internal turmoil further worsened the outlook for demand. Turning to **French** jewelry fabrication, social upheaval following protests from the 'Gilets Jaunes' and indeed higher taxes and price increases affecting consumers, resulted in fabrication falling to its lowest level this century at 1.5 Moz (47 t). While in Germany, demand fell for the eighth consecutive year, bringing total demand to 2.9 Moz (90 t), its lowest level since the turn of the century. Silver jewelry has to deal with increased competition from gold and non-precious metals, particularly among the younger generations. Items that remained trendy in 2018 were chokers and chains, which have tended to become longer again. Chains often decorated a coin with both made out of either gold or silver.

ITALIAN JEWELRY EXPORTS



* including Turkey and Russia; ** Jan-Nov 2017
Source: GFMS, Refinitiv; Eurostat

Last year saw silver jewelry fabrication in the **United Kingdom** reverse gains created in 2017, falling by 7% to an estimated 0.3 Moz (9 t). Despite a weakening pound favoring lower silver prices (which dropped by an annual average of 11% last year), the economic slowdown across Europe and uncertainty surrounding Brexit resulted in hallmarking contracting in the country. Meanwhile, local fabricators continued to face growing competition from imported branded silver jewelry such as Pandora as well as alternative materials that offer creative and personalized designs.

Turkish silver jewelry fabrication recorded a somewhat surprising increase in 2018, rising 6% to an estimated 4.6 Moz (143 t), its highest level since 2014. Weaker domestic demand, a casualty of a fragile economy and acute losses in the value of the lira was not enough to dampen overall fabrication volumes, with the export sector continuing to pave the way for further expansion. Shipments to the United States dipped last year but a rise in exports to Libya, France and Iraq boosted overall demand for this sector.

While **Russia** similarly also recorded a rise in demand, with an increase of 4% or 0.1 Moz (3 t) to 2 Moz (62 t), its highest level since 2016. This jump in fabrication marks the first annual rise in silver demand for the country in three years, with an improving outlook for the economy and higher crude oil prices (Brent crude oil averaging $72/bbl in 2018) pushing up GDP for the country, which rose to 1.7% last year (after rising out of negative growth in 2017). Official trade statistics recorded export quantities over the year jumped by 7.4 Moz (230 t), while imports increased by 1.3 Moz (40 t), suggesting that domestic demand also recorded a rise last year.

NORTH AMERICA

Jewelry fabrication in **North America** rose 4% to 22.9 Moz (687 t) in 2018. Unsurprisingly, the United

States makes up approximately three-quarters of the fabrication total followed by **Mexico** with 22% and **Canada** making up the residual 2%. Mexico and the United States are strongly interwoven when it comes to jewelry manufacturing, although the United States also sources its finished and semi-finished products from other countries, particularly in the Far East. Indeed, although Mexico might depend (for a large part) on how much of its fabricated jewelry it can send across its northern border, the United States dependency on Mexico to fulfill its jewelry sales is much lower, actually last year only to the tune of 2%. At one third, Thailand makes up the largest portion, followed by China and India both at 19%.

U.S. jewelry imports contracted 1.1% in 2018, reaching 41.4 Moz (1,288 t). That is more than twice the size of domestic jewelry fabrication. The United States has always been strongly dependent on foreign sources to satisfy their domestic demand. With exports, however, contracting by a third, total wholesale jewelry consumption is estimated to have risen by as much as 17% to 45.4 Moz (1,412 t) last year.

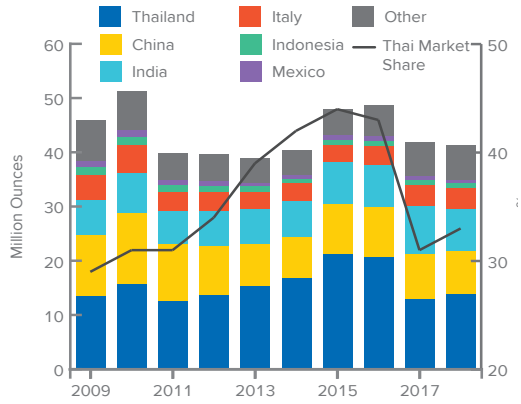
Various silver jewelry fabricators indicated that the rate of growth slowed a bit last year but that demand is still expanding. However, silver jewelry tends to see increased competition from gold again with the fashion trend moving towards yellow. As a result, some fabricators are embracing yellow gold a bit more, although silver tends to do better among the younger population. Indeed, the silver monitor, a survey conducted among a wide range of silver retailers and published by the Silver Promotion Service (a marketing body of the Silver Institute), concluded that silver has the best inventory turnover rate and is the ultimate female self-purchase item (with the majority of price points up to $500). In addition, gifting and millennials also continued to play an important part in silver jewelry sales in the United States last year.

Retail demand for silver jewelry is expected to have risen in the single digits last year. Despite demand still being robust, there is an element of saturation taking place in the U.S. market. Retail giants, like Pandora have relied on silver for years and made good margins of it, but with the recent shift back to yellow gold, they have also expanded their range into gold products with Pandora Shine. Particularly on the lower carat segments, 10 carat and 14 carat, gold jewelry again is taking some market share away from silver (although the balance of the lower caratage gold jewelry in many cases is also silver or copper).

The methods of jewelry purchasing are slowly changing, particularly among Millennials, with online shopping becoming more popular. Having an online presence as a retail outlet therefore is increasingly more important, one which also facilitates the pre-buying purchasing process. Buyers seem to be better informed and quite frequently also engage in the art of quote shopping to get the best deal before they make their final purchase.

Mexican silver fabrication contracted 5% last year reaching 5.0 Moz (156 t). Silver jewelry in Mexico has a long standing heritage and is widely utilized. Mexican fabricators in general supply the domestic market with a lot of traditional and religious designs, a sort of style that is not that appealing for the international market. Different designers, big and small, have been increasingly trying to combine forces in order to come up with more attractive, light-weight designs. The government has also indicated it wants to support these sorts of initiatives. However, Mexican jewelry fabricators have found it increasing difficult to sell their designs domestically and large designer markups have left consumers unwilling to pay premiums for branded designs. They rather prefer to stick to simple designs that are more closely priced towards raw material costs.

U.S. OFFICIAL SILVER JEWELRY IMPORTS



Source: GFMS, Refinitiv

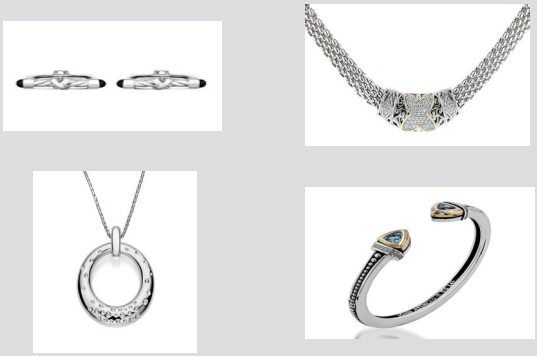
IS THE U.S. RETAIL INDUSTRY READY FOR THE MILLENNIALS?

The old retail model, whereby consumers physically travel to brick-and-mortar outlets, is becoming a thing of the past with online, or e-commerce transactions, rapidly gaining traction; not only in western markets but across the entire world as younger generations embrace this technology. E-commerce represented 14.3% of total retail sales in the United Sates in 2018, with Amazon accounting for 40% of U.S. online retail sales. Retailers are facing a dilemma. After decades of strong retail activity, driven by demand from Baby Boomers and more recently Generation Xers, retailers are now trying to target the next wave of shoppers, the Millennials, those born between 1981 and 1996.

On paper, Millennials look to be a great source of future revenue. There are more of them than Baby Boomers, their salaries are increasing and they are going to benefit from the largest wealth transfer in history as the Baby Boomers continue to age. According to Invesp, Millennial shopping in the United States is expected to account for about 30% of total retail sales by 2020. This will be the equivalent of $1.4 trillion in sales revenue. Their sheer numbers and strong online presence mean merchants, big and small, are dependent on this customer base now more than ever. Take Amazon Prime, for instance, where close to 40% of users were between the ages of 18 to 34 in 2017.

The greatest challenge for retailers will be to encourage this generation to open their wallets, as contrary to their parents, Millennials are not discretionary spenders. In fact, they are highly budget-conscious. Even amid a strong economy they are concerned about the state of their personal finances. With about $1.46 trillion in student loans outstanding in the United States, coupled with rising credit card debt has many Millennials reluctant to spend, often placing big ticket luxury items, like jewelry, on the back burner.

While embracing the various e-commerce platforms (Millennials now make 54% of their purchases online) these consumers are not completely shunning bricks and mortar outlets, but gravitating toward a combination of the two: using technology in the pre-buying process to eventually make in-store decisions. The challenge for the retail industry, and for the silver market in particular, is how to deliver the retail experience this generation is seeking, and importantly, to offer a product price point that will encourage increased retail activity.



Clockwise from top: Sterling silver cufflinks by Philip Gavriel, Sterling silver necklace by PiYaRo, Braclette in sterling silver by JOHN_ATE, Sterling silver necklace by Nambe.

AFRICA

Egyptian silver jewelry fabrication edged 4% higher in 2018 to an estimated 0.6 Moz (19 t), returning to growth for the first time since 2014. A stronger economic footing (albeit far from a sustained recovery), coupled with a rise in tourist visitors last year help support higher offtake. While the number of visitors remains well below the numbers seen previously, the recovery in inbound tourism has been celebrated by both the government and the millions employed in this vital industry. Initial figures show that nearly nine million tourists visited Egypt in 2018, up from 5.4 million in 2016. While inflation has eased and the value of the local currency has strengthened, consumer spending for discretionary products remains muted.

ASIA

For the fifth consecutive year, **China's** silver jewelry fabrication registered a decline in 2018, although the drop is lower than the one recorded in the prior year. When the domestic jewelry industry witnessed its peak in 2013, the sector's demand for physical silver was as high as 62.9 Moz (1,955 t). After falling 5% in 2017, silver used in jewelry fabrication declined another 5% in 2018, to 25.4 Moz (789 t). As of 2018, jewelry demand was 60% the peak levels recorded in 2013. Be that as it may, the rate of decline is slowing and last year was the second consecutive year of only single digit declines in terms of physical demand registered.

The challenges the silver jewelry industry is facing can be attributed to several factors. First and the foremost, is a notably weaker Chinese economy, which negatively impacted the spending sentiment last year. The Chinese economy took a deep dive in 2018, especially during the second half of the year. There was a liquidity crunch in the domestic market as corporates found it increasingly more difficult getting access to liquidity. The bankruptcy of several Peer to Peer Lending (P2P) platforms, venture capital funds and the threat of a trade war with the United States, resulted in a liquidity tightness, which in turn affected various industries in the country. Massive layoffs materialized across different sectors, during the second half of 2018, and factory workers could also head home early in 2019 for the Chinese new year. Manufacturing order books seem to have slimmed and as a result capacity utilizations were reduced in order to save labor costs. While gold has always been the preferred metal for jewelry consumption in China, it is also notable that fabrication demand for gold jewelry slowed down substantially towards the end of last year.

Second, the consolidation of the silver jewelry fabrication industry that manifested in the last few years has already wiped out a large number of industry participants. Players with inadequate capital filed for bankruptcy while others reallocated their business strategy towards higher yielding ventures. The remaining companies could then share the entire market, which put less pressure on fabrication margins.

Similar to the gold jewelry industry, silver jewelry fabricators have also been focusing on trying to sell higher margin products. In the past, fabricators turned to bulk fabrication, for example silver bracelets, which normally carry higher silver content compared to other silver jewelry pieces. These bulk products are sold by weight. However in recent years, fabricators have been focusing on producing higher margin products that come with more sophisticated designs and of higher quality. Such designs carry increased amounts of rhodium mixed with silver jewelry to counter oxidation, or are used in combination with pearls and crystals, to offer a more elegant look. Consumers are willing to pay more for premium products, and thus fabricators have been shifting their sales strategy from selling by weight to selling by piece. As a result, the average price tag for a silver jewelry item increased last year.

While the Chinese silver jewelry market looks to have stabilized, we think the entire jewelry industry could possibly enjoy better business opportunities in 2019. Despite the domestic economy outlook remaining uncertain in 2019, the Chinese government fully realizes the potential threats. As such, we estimate that the Chinese government will facilitate a rise in liquidity this year, making sure many small and medium sized enterprises survive. The potential reduction of the VAT rumored to take place sometime in 2019 could possibly be another positive catalyst for the industry and could raise silver demand.

India's silver jewelry fabrication increased 16% year-on-year to 76.5 Moz (2,378 t) in 2018, with the largest share, one third, arriving in the final quarter of the year. This was driven by the diversion in price performance between gold and silver, with the former rising by 6.8% and the latter falling by 3.3% quarter-on-quarter respectively in Q4. Silver jewelry in general is more affordable compared to gold jewelry, and as such is of more interest to the less well-off in India. It is an alternative to gold jewelry and is frequently used in rural Indian weddings, especially when the price of gold is high. With the gold price at an average Rs30,689/10gram in 2018, gold was considered as expensive and a significant part of traditional gold demand spilled over to silver.

On the trade side, silver jewelry export contracted by 25% year-on-year in 2018. However, if we look at value to volume ratio, last year's performance was actually better than that of 2017, since less bogus exports in form of 'round tripping' did occur. Regulatory reforms along with authorities cracking down on a few fraudulent exporters made the value of exports decline in 2018 but increased the volume ratio. That said, our interaction with genuine exporters revealed that they are now also exploring new destinations, such as Australia and Denmark, apart from shipping to their traditional partners such as the United States and Eastern Europe. Exporters believe that if the Indian government enforces mandatory hallmarking in silver jewelry it will reduce the adulteration (using less copper) and raise confidence amongst foreign buyers.

In the domestic market, our extensive field research reveals that in the traditional jewelry manufacturing markets in Agra or Salem, the volume of business

as well as competition has increased. New players have entered the markets in the last 2-3 years, which eventually put pressure on individual profit margins. In India, adulteration in silver jewelry fabrication is a common practice which is stimulated by requests from wholesalers. Retailers justify this practice by stating that consumers are not willing to pay a higher price for high purity silver jewelry, which, in our view, is a gross understatement.

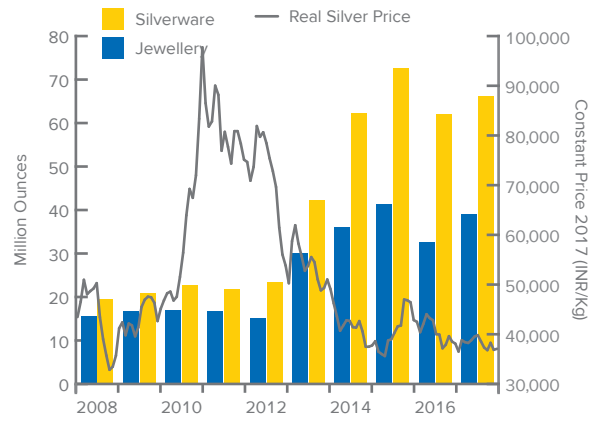
On the demand side, leg chains or anklets are still most popular carrying maximum demand. However, designs differ strongly between towns. For example, wholesalers source basic leg chain designs from locations like Agra or Salem and modify them with local artwork to make it appropriate to sell in the specific local market. In addition, silver jewelry demand for older designs with tribal artwork remains popular as well, particularly among urban dwellers opting for less expensive silver jewelry compared to the same item weight in gold. In the western part of the country, demand for heavy bracelets also recovered.

Thailand's silver jewelry fabrication eased 4% last year to an estimated 25.6 Moz (795 t). This marks the third consecutive decline for this once dominant market. In previous Surveys we have outlined the impact that the Danish giant Pandora has had on local fabrication. This influence continued into 2018 with production from the world's biggest jewelry maker again dominating overall Thai production volumes. Not only does Pandora have its own production facilities in the Gemopolis Industrial Estate in Bangkok and an additional plant in Lamphun in the north of Thailand, but they also outsource production to several fabricators that can produce high-end products.

This flow on impact has boosted fabrication volumes across a number of the larger Thai based fabricators, many of which already produce branded jewelry for the United States, European, and leading Asian brands. However this outsourcing and dominance of Pandora masks a more serious issue because the remaining industry continues to suffer as operational costs rise and competition erodes export demand. Thailand once dominated the low-end market globally, producing predominately plain light-weight items, but today many of these fabricators no longer exist, unwilling to invest significant capital in new machinery and promotion in a market that has been shrinking in recent years due to rising competition from China and changing consumer purchasing habits. Operating margins and labor charges have not kept up with rising employee wages and higher production costs, with many fabricators at this end of the market squeezed out.

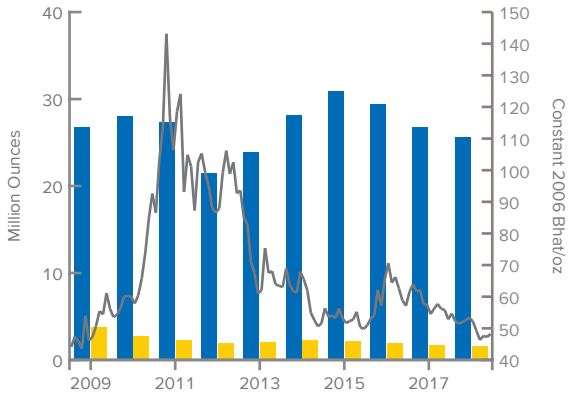
Those fabricators in the mid to high-tier range who have reinvested in technology and the latest machinery to enhance the design and finish quality of the jewelry produced have managed to survive and in some cases thrive. The additional fabrication volumes farmed out by Pandora have certainly helped as has the growth within the fashion branded jewelry sector in recent years. Most saw export orders decline last year or at best remain steady. Thai customs numbers indicate gross jewelry exports declined 10% in 2018, with the annual fall

INDIAN JEWELRY AND SILVERWARE FABRICATION



Source: GFMS, Refinitiv

THAI JEWELRY AND SILVERWARE FABRICATION



Source: GFMS, Refinitiv

TABLE 9 - SILVER FABRICATION: JEWELRY (INCLUDING THE USE OF SCRAP)

(million ounces)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Europe										
Italy	21.3	21.8	16.5	15.1	15.9	17.8	18.4	18.1	19.0	17.9
Turkey	3.9	3.4	3.1	3.4	4.0	4.8	4.4	4.3	4.3	4.6
Germany	3.7	3.8	3.7	3.6	3.4	3.3	3.3	3.1	3.0	2.9
Russian Federation	3.0	3.3	2.7	2.6	2.6	2.8	2.3	2.0	1.9	2.0
France	1.7	1.9	2.2	2.0	1.7	1.6	1.6	1.6	1.6	1.5
Poland	1.5	1.3	0.8	0.6	0.6	0.6	0.5	0.5	0.5	0.4
Spain	1.2	1.1	1.1	1.0	0.9	0.9	0.9	0.9	0.9	0.9
Greece	1.0	0.9	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.4
Portugal	0.6	0.6	0.4	0.2	0.2	0.3	0.3	0.3	0.3	0.3
United Kingdom	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Sweden	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Switzerland	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Netherlands	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Denmark	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
Norway	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other Countries	0.6	0.6	0.6	0.6	0.5	0.6	0.5	0.5	0.5	0.5
Total Europe	**40.1**	**40.3**	**33.2**	**31.1**	**31.8**	**34.7**	**34.2**	**33.1**	**33.9**	**32.8**
North America										
United States	10.7	12.0	11.1	10.3	11.0	12.0	12.6	14.0	16.2	17.4
Mexico	10.5	10.4	13.9	13.3	15.2	11.6	7.7	6.5	5.3	5.0
Canada	0.8	0.8	0.8	0.8	0.7	0.6	0.7	0.6	0.5	0.5
Total North America	**22.0**	**23.2**	**25.8**	**24.3**	**26.9**	**24.3**	**21.0**	**21.0**	**22.1**	**22.9**
Central & South America										
Brazil	1.7	1.9	1.5	1.5	3.0	2.8	2.1	2.0	2.2	2.4
Dominican Republic	1.5	1.4	0.9	0.9	1.3	1.4	1.5	1.4	1.4	1.4
Peru	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.5
Bolivia	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2
Other Countries	1.05	1.23	1.12	1.15	1.53	1.59	1.44	1.30	1.28	1.27
Total C. & S. America	**5.2**	**5.5**	**4.3**	**4.4**	**6.6**	**6.7**	**5.9**	**5.5**	**5.6**	**5.7**
Asia										
India	20.8	22.7	21.8	23.3	42.3	62.2	72.5	62.1	66.2	76.5
China	40.0	46.4	54.4	56.6	62.9	46.7	33.9	28.1	26.7	25.4
Thailand	26.7	28.0	27.3	21.4	23.9	28.1	30.9	29.4	26.7	25.6
Indonesia	4.2	4.7	5.5	5.5	5.8	5.5	5.9	6.4	6.6	6.9
S Korea	4.2	4.7	5.2	5.4	5.5	5.0	4.8	3.8	3.4	3.1
Japan	2.1	2.2	2.2	2.3	2.4	2.2	2.2	2.2	2.3	2.3
Vietnam	1.2	1.4	1.4	1.4	1.4	1.5	1.6	1.8	1.9	2.0
Nepal	1.2	1.1	1.1	1.2	0.7	0.7	0.8	0.8	0.8	0.9
Bangladesh	0.8	0.8	0.8	0.8	0.5	0.6	1.1	0.8	0.7	0.8
Saudi Arabia	0.6	0.7	0.8	0.8	0.9	0.8	0.8	0.7	0.7	0.6
Cambodia	0.6	0.7	0.7	0.8	0.8	0.7	0.8	0.7	0.8	0.8
Malaysia	0.6	0.6	0.7	0.7	0.8	0.8	0.7	0.6	0.6	0.7
Sri Lanka	0.5	0.5	0.5	0.5	0.4	0.4	0.1	0.1	0.2	0.2
UAE	0.5	0.6	0.7	0.7	0.8	0.7	0.7	0.4	0.4	0.4
Pakistan	0.4	0.4	0.4	0.4	0.3	0.3	0.5	0.3	0.4	0.4
Israel	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3
Hong Kong	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.1
Taiwan	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2

TABLE 9 - SILVER FABRICATION: JEWELRY (INCLUDING THE USE OF SCRAP)

(million ounces)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Kazakhstan	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Uzbekistan	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
Syria	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Iran	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Philippines	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3
Other Countries	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6
Total Asia	**106.8**	**118.1**	**125.9**	**124.4**	**151.8**	**158.8**	**159.5**	**140.6**	**140.5**	**148.4**
Africa										
Egypt	1.2	1.1	0.5	0.7	0.8	0.9	0.8	0.7	0.6	0.6
Morocco	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3
Tunisia	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Other Countries	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5
Total Africa	**2.0**	**2.0**	**1.4**	**1.6**	**1.7**	**1.8**	**1.7**	**1.6**	**1.6**	**1.6**
Oceania										
Total Oceania	**0.7**	**0.7**	**0.8**	**0.8**	**0.8**	**0.8**	**0.9**	**0.9**	**0.9**	**0.9**
World Total	**176.9**	**190.0**	**191.5**	**186.7**	**219.7**	**227.3**	**223.3**	**202.7**	**204.5**	**212.5**

driven by a sizeable decline in shipments to the United States (which accounts for over 35% of total exports), the United Kingdom, and Australia. Offsetting some of this weakness were increases in shipments to markets such as Germany, Hong Kong, and China.

Local silver jewelry consumption saw a modest uptick last year as a stronger economy and rising tourist visitors helped boost retail activity. Thailand saw a record 38.3 million tourists in 2018, up 7.5% from 2017. Chinese visitors are the top source of foreign receipts in an industry that makes up about a fifth of the economy. While local demand has remained resilient, Thailand is facing heightened political risks ahead of a general election this year, which could hurt sentiment and domestic investment.

Jewelry fabrication in **South Korea** registered a 9% drop to a total of 3.1 Moz (98 t) in 2018. It was the fifth consecutive year of decline and a cumulative loss of 42% since the peak in 2013. The Korean economy remained lackluster, and consumer sentiment low. Silver fabricators lowered silver content and weight in jewelry pieces in order to save costs and reduce sticker prices, hoping to stimulate demand.

Indonesian silver jewelry fabrication recorded another annual increase in 2018, rising 5% to an estimated 6.9 Moz (214 t). The healthy increase, the fourth in succession, saw demand hit a record high as both domestic offtake and the export sector expanded. Indonesia posted slightly stronger economic growth in 2018, with Southeast Asia's biggest economy expanding 5.1%. Domestic demand for jewelry has been rising in recent years but growth has been modest. While demand for imported branded product, such as Pandora, have continued to sell well and expanded into most urban markets, locally produced items have not had the same penetration as yet. Silver designs are attracting the fashion conscious youth demographic in the cities but in rural areas gold jewelry still dominates market share, as the ability to sell back the item without a significant discount is important to those in agricultural regions. The export sector, which accounts for over 60% of total fabrication was again the standout last year, recording annual growth of 9%, with a rise in shipments to the United States, Singapore, and Hong Kong in particular accounting for much of the increase.

SILVERWARE

- **Global silverware fabrication increased 6% in 2018 to an estimated 61.1 Moz (1,900 t) with another strong performance in Indian demand accounting for much of the rise.**

Global silverware fabrication increased for the second year in succession, rising 6% year-on-year to an

estimated 61.1 Moz (1,900 t), a three-year high. India once again accounted for the bulk of the annual rise, increasing 10% year-on-year to 41.8 Moz (1,301 t) and accounting for more than two-thirds of global consumption. The annual increase in India was largely due to a rise in stock building from regional and national retail chains as consumer demand gathered pace and a jump in exports, which more than doubled in 2018. Turkish fabrication had a good year rising 20% over 2017 volumes, winning market share in Israel and the United States. Meanwhile, European demand edged higher last year while the United States was stable after solid gains in 2017. In East Asia, Chinese demand retreated by 4% to a new low and Thailand slipped 8% on lower export orders.

EUROPE

European silverware fabrication rose by 2% or 0.2 Moz (6 t) in 2018 to 9.4 Moz (292 t), the highest level since 2016. This positive result is the first stabilization in demand this century after consecutive declines since 2000, resulting in European market share eroding by more than 50% over the last decade. Typically, offtake from the European markets have suffered from a structural shift in gifting culture driven by growing competition from other consumer goods such as electronic gadgets. However, last year both Turkey and Italy reversed multi-year declines in this segment.

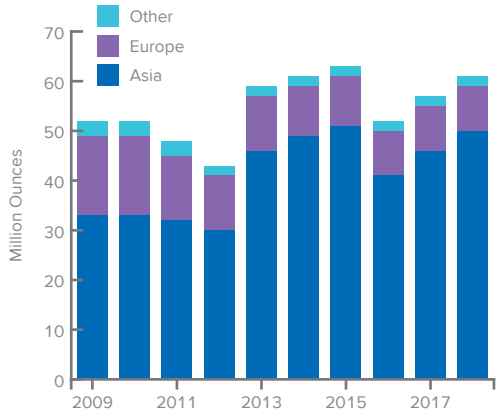
Turkish silverware production (which accounts for 17% of European demand) rose by 20% or 0.3 Moz (9 t) in 2018 to 1.6 Moz (50 t), the highest level of production in the country since 2009. Turkish silverware fabrication benefited from a stronger export sector last year, driven primarily by a rise in shipments to Israel and the United States. **Italian** silverware jumped by 3% to 1.6 Moz (50 t), its highest level since 2016. While a long-running shift in local gifting culture away from heavyweight and costly silverware towards fashion accessories and electronic gadgets exists in the country, official trade export volumes rebounded in 2018, jumping by a significant 4.7 Moz (146t), reversing multi-year declines. Meanwhile, imports into Italy increased by an estimated 0.12 Moz (4 t).

Silverware fabrication in **Russia**, the largest fabricator in the region with a share of 39% of the total, declined by 1% last year to an estimated 3.7 Moz (115 t). Demand in this sector continued to be affected by structural changes in consumer spending behaviour, as well as affordability issues against a weakening rouble (which fell by 8% on an annual average basis in 2018). Similarly, silverware fabrication in **Germany**, which accounted for 9% of Europe's total silverware offtake, recorded a year-on-year drop of 2%. Central to this was a continued decline in exports (which fell 11% year-on-year), with key trading partners Switzerland and the United States recording declines of 32% and 14% respectively, while local domestic market continued to remain weak.

NORTH AMERICA

Following a contraction of 5% in 2017, **North American** silverware fabrication fell 9% to 1.4 Moz (44 t) in 2018. At 58%, the United States accounts for the largest part of the region, followed by **Mexico** with 29% and **Canada** making up the balance. In the United States, silverware is often used for gifting purposes in luxury dining sets or sometimes even religious artifacts, particularly in Mexico. Demand from high-end hotels tends to be a good consumer of silverware dining sets while silverware, sometimes, gets bought at an early age to last through various generations. Sterling silver 925 remains most popular. Silverware is a reflection of underlying consumer spending power and although the U.S. economy did reasonably well in 2018, silverware fabrication and sales contracted last year. The majority of the decline was actually attributed to Mexico which struggled with keeping exports elevated in 2018.

WORLD SILVERWARE FABRICATION



Source: GFMS, Refinitiv

TABLE 10 - SILVER FABRICATION: SILVERWARE (INCLUDING THE USE OF SCRAP)

(million ounces)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Europe										
Russian Federation	5.5	6.0	5.0	4.8	4.6	4.4	4.1	3.9	3.8	3.7
Turkey	1.8	1.5	1.3	1.1	1.2	1.4	1.5	1.4	1.4	1.6
Italy	4.6	4.0	2.8	2.3	2.0	1.9	1.8	1.6	1.6	1.6
Germany	1.6	1.6	1.4	1.1	0.9	0.9	0.9	0.9	0.9	0.8
Norway	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3
Sweden	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2
Greece	0.8	0.6	0.5	0.3	0.3	0.3	0.3	0.2	0.2	0.2
Denmark	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
United Kingdom	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
France	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Austria	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other Countries	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2
Total Europe	**16.3**	**15.7**	**12.8**	**11.3**	**10.6**	**10.3**	**10.0**	**9.5**	**9.2**	**9.4**
North America										
United States	0.9	0.8	0.8	0.7	0.7	0.7	0.7	0.8	0.8	0.8
Mexico	0.9	0.7	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.4
Canada	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
Total North America	**1.9**	**1.6**	**1.4**	**1.3**	**1.3**	**1.3**	**1.4**	**1.5**	**1.6**	**1.4**
Central & South America										
Colombia	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
Peru	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other Countries	0.6	0.5	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.2
Total Central & South America	**1.0**	**0.9**	**0.8**	**0.8**	**0.7**	**0.6**	**0.5**	**0.4**	**0.4**	**0.4**
Asia										
India	16.6	16.9	16.6	15.2	30.0	36.1	41.3	32.6	38.2	41.8
China	6.9	7.6	8.3	8.6	10.0	6.1	3.4	2.4	2.4	2.3
Thailand	3.7	2.7	2.2	1.9	2.0	2.2	2.1	1.9	1.7	1.6
Israel	1.1	1.0	0.7	0.6	0.7	0.8	0.9	0.8	0.9	0.9
Iran	1.2	1.2	1.0	0.9	0.9	0.8	0.8	0.8	0.8	0.7
Bangladesh	0.7	0.6	0.6	0.5	0.4	0.4	0.5	0.4	0.7	0.7
Indonesia	0.7	0.7	0.6	0.5	0.4	0.4	0.4	0.4	0.3	0.4
Pakistan	0.5	0.5	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.3
S Korea	0.6	0.6	0.6	0.5	0.5	0.4	0.3	0.3	0.3	0.3
Cambodia	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Saudi Arabia	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other Countries	1.1	1.1	1.0	0.9	0.8	0.8	0.8	0.5	0.5	0.5
Total Asia	**33.5**	**33.2**	**32.2**	**30.2**	**46.3**	**48.6**	**51.2**	**40.7**	**46.2**	**49.6**
Africa										
Africa	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Total Africa	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Oceania										
Australia	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01
Total Oceania	**0.03**	**0.03**	**0.03**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**
World Total	**53.2**	**51.9**	**47.5**	**43.8**	**59.3**	**61.2**	**63.2**	**52.4**	**57.6**	**61.1**

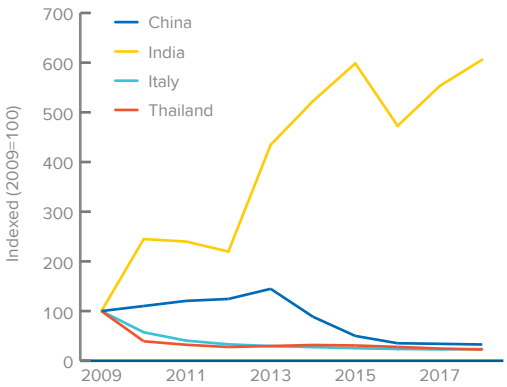
ASIA

India's silverware fabrication industry once again enjoyed a fabulous year in 2018 raising demand for silver by 9.5% year-on-year to 41.8 Moz (1,301 t). The trend that started in 2017 continued into 2018, which was focused on regional and national retail chains increasing stocks. During our field research, we found that manufacturers have increased efforts to make their products more attractive for buyers ranging from design optimization to offering a larger variety of caratage. Manufacturers are combining regional artwork with western designs to address the various demand requests. While the standard 850 silver (a silver alloy consisting of 85% silver purity) remains most popular, sterling silver of 925 and above is increasing in popularity as well among retail consumers.

In 2018, India's silverware exports increased by 108% on year-on-year basis reaching 0.33 Moz (10.3t). In volume terms, India shipped almost an equal amount of silverware to both the United States and the United Arab Emirates. Qatar, the United Kingdom and Canada were next in line. We expect exports to rise in 2019 based on exporters revealing that they are exploring more markets for their goods due to their previous successes.

In 2018, **Chinese** silverware retreated by 4% year-on-year to an estimated 2.3 Moz (70 t). Similar to silver jewelry, this was also the fifth consecutive annual decline, though another year of modest declines suggests this market too is now stabilizing. Physical demand from this sector slumped by an average of 37% per annum between 2014 and 2016. However, unlike the jewelry sector, the severe contraction was largely the result of the crackdown on corruption by government authorities affecting gifting in earlier years. Therefore the contraction of the size of the silverware sector in China has been a function of structural changes as opposed to developments in the underlying economic cycle. In recent years, Chinese banks have massively supported this industry, with fabricators receiving orders from the banks themselves to fabricate silverware as gifting items destined to banking clients in order to express appreciation for their business.

MAIN GLOBAL SILVERWARE FABRICATORS



Source:GFMS, Refinitiv

Thailand's silverware fabrication is believed to have declined by 8% last year to an estimated 1.6 Moz (48.4 t), the fourth consecutive annual decline and the lowest level for Thailand since our records began. Despite a weaker annual average silver price (the domestic price retreated 12% last year) demand for silverware failed to respond with fabrication volumes impacted more by weaker export demand and ongoing changes in societal consumer habits in the local market. While the economy appears to be in an upward trend, demand for silverware continues to wane as younger generations have less interest in purchasing silver tableware, flatware, and ceremonial bowls, for example, and have greater focus on fashion and electronics. Silverware exports (on a calculated basis) declined by 7% in 2018, with increased flows to Brunei, the United Kingdom, and Hong Kong unable to offset a sizeable decline in shipments to the United States and France.

Silverware production in **Israel** hit a nine-year high in 2018, rising 6% year-on-year, the second annual rise in succession, to an estimated 0.9 Moz (29 t). Stronger domestic consumption of Judaic products and a slight rise in exports helped lift overall fabrication volumes. The United States, especially on the east coast where large Jewish communities are found, remains the main focus for Israeli fabricators. Indeed, the largest brand in Israel, Hazorfim, has set up retail outlets in Brooklyn, and in particular Williamsburg last year to focus on the high-end market. The greatest challenge in recent years for local fabricators has been the rising competition from low cost producer Turkey, who are now eroding market share in the domestic Israeli market due to the lower retail cost, and this again had an impact last year.

9. APPENDICES

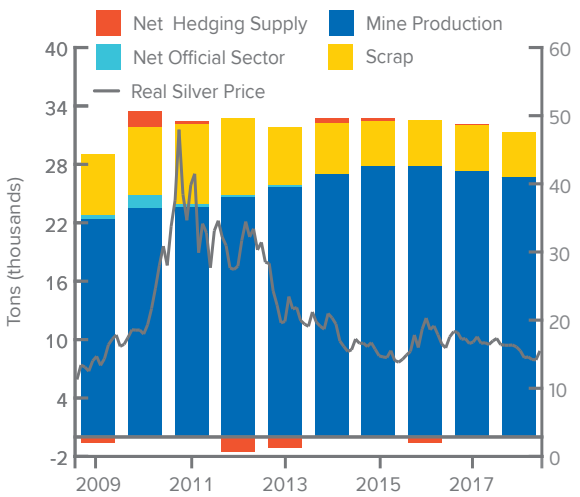
APPENDIX 1

WORLD SILVER SUPPLY AND DEMAND

(tons)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Supply										
Mine Production	22,312	23,422	23,587	24,625	25,607	26,993	27,798	27,789	27,276	26,616
Net Government Sales	486	1,375	374	229	245	0	0	0	0	0
Scrap	6,239	7,066	8,123	7,894	5,948	5,207	4,672	4,721	4,783	4,707
Net Hedging Supply	(541)	1,569	381	(1,464)	(1,081)	521	244	(603)	58	(86)
Total Supply	**28,495**	**33,431**	**32,465**	**31,284**	**30,719**	**32,721**	**32,713**	**31,907**	**32,116**	**31,237**
Demand										
Jewellery	5,502	5,909	5,956	5,808	6,835	7,068	6,945	6,306	6,362	6,611
Coins & Bars	2,476	5,416	6,584	5,015	7,486	7,267	9,131	6,491	4,679	5,637
Silverware	1,654	1,613	1,476	1,363	1,844	1,903	1,967	1,628	1,793	1,900
Industrial Fabrication	16,427	19,715	20,312	18,664	18,805	18,548	18,122	17,617	18,221	17,997
....of which Electrical & Electronics	7,072	9,367	9,044	8,295	8,274	8,208	7,652	7,275	7,563	7,730
...of which Brazing Alloys & Solders	1,674	1,905	1,965	1,900	1,981	2,073	1,912	1,721	1,789	1,805
...of which Photography	2,377	2,098	1,905	1,687	1,569	1,508	1,433	1,390	1,273	1,222
...of which Solar	0	0	2,095	2,002	1,704	1,675	2,005	2,331	2,764	2,503
...of which EO	148	272	194	148	239	154	317	317	214	169
...of which Other Industrial	5,156	6,073	5,108	4,631	5,038	4,930	4,804	4,583	4,617	4,569
Physical Demand	**26,059**	**32,653**	**34,328**	**30,850**	**34,969**	**34,787**	**36,166**	**32,043**	**31,054**	**32,146**
Physical Surplus/Deficit	**2,436**	**778**	**(1,863)**	**434**	**(4,250)**	**(2,066)**	**(3,452)**	**(136)**	**1,063**	**(909)**
ETF Inventory Build	4,880	4,027	(747)	1,720	77	44	(552)	1,548	74	(631)
Exchange Inventory Build	(475)	(231)	378	1,934	273	(166)	392	2,482	1,602	2,215
Net Balance*	**(1,970)**	**(3,018)**	**(1,494)**	**(3,220)**	**(4,601)**	**(1,944)**	**(3,292)**	**(4,165)**	**(614)**	**(2,493)**
Silver Price, $ per oz.	**14.67**	**20.19**	**35.12**	**31.15**	**23.79**	**19.08**	**15.68**	**17.14**	**17.05**	**15.71**

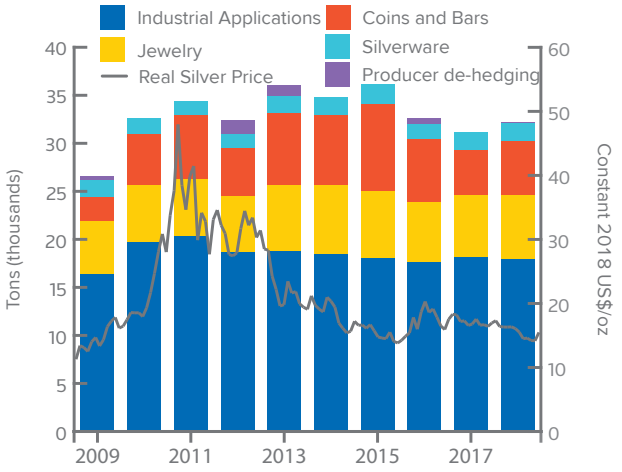
*Photovoltaic demand included in "Other Industrial" prior to 2011

WORLD SILVER SUPPLY



Source: GFMS, Refinitiv

WORLD SILVER DEMAND



Source: GFMS, Refinitiv

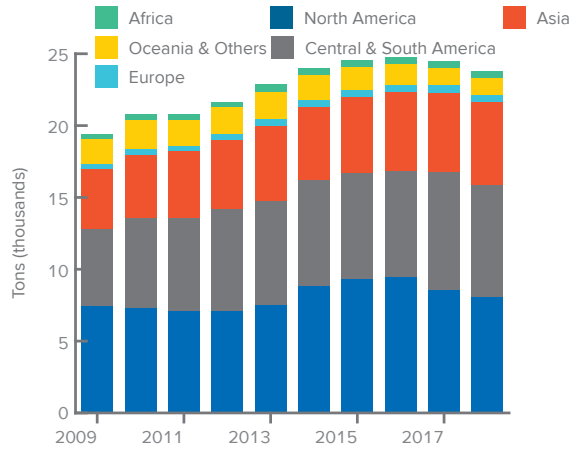
WORLD SILVER MINE PRODUCTION

(tons)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Europe										
Russia	1,312	1,145	1,221	1,412	1,381	1,448	1,588	1,450	1,305	1,350
Poland	1,220	1,171	1,270	1,284	1,170	1,264	1,291	1,209	1,236	1,233
Sweden	270	285	283	306	337	396	494	511	465	453
Turkey	389	384	288	228	188	205	172	175	167	170
Spain	5	23	33	37	41	40	40	39	58	35
Portugal	22	23	31	34	45	54	74	39	16	24
Greece	29	27	25	30	29	27	32	24	24	24
Bulgaria	15	13	17	19	19	18	19	18	17	17
Macedonia	9	9	9	10	11	10	11	11	11	11
Romania	3	7	12	9	9	3	3	3	3	3
Ireland	5	4	6	9	8	6	4	1	1	1
Other Countries	1	2	2	1	4	4	4	4	4	1
Total Europe	**3,281**	**3,092**	**3,198**	**3,378**	**3,240**	**3,476**	**3,730**	**3,484**	**3,307**	**3,323**
North America										
Mexico	3,554	4,411	4,778	5,358	5,513	5,767	5,975	5,796	6,055	6,116
United States	1,250	1,280	1,120	1,060	1,040	1,180	1,090	1,150	1,048	870
Canada	609	573	582	685	640	495	380	405	1,133	773
Total North America	**5,412**	**6,264**	**6,480**	**7,104**	**7,193**	**7,442**	**7,445**	**7,350**	**8,236**	**7,758**
Central & South America										
Peru	3,971	3,691	3,473	3,547	3,754	3,821	4,291	4,625	4,587	4,508
Chile	1,301	1,287	1,291	1,195	1,218	1,597	1,504	1,501	1,319	1,311
Bolivia	1,326	1,259	1,214	1,206	1,281	1,345	1,306	1,353	1,243	1,240
Argentina	560	726	708	762	774	906	1,080	935	798	824
Dominican Republic	18	19	19	27	87	141	127	105	102	106
Nicaragua	4	7	8	10	14	14	18	21	19	18
Ecuador	13	15	16	17	16	18	18	17	17	17
Brazil	12	12	12	12	15	15	17	17	17	17
Colombia	11	15	24	19	14	12	16	16	16	16
Venezuela	1	1	1	1	1	1	2	2	2	2
Guatemala	129	195	273	205	281	858	856	838	372	0
Honduras	58	58	49	51	51	57	35	18	0	0
Other Countries	4	4	3	6	5	3	3	2	2	1
Total C. & S. America	**7408**	**7290**	**7091**	**7057**	**7511**	**8788**	**9270**	**9451**	**8495**	**8061**
Asia										
China	2,698	2,942	3,192	3,401	3,515	3,484	3,503	3,569	3,502	3,574
India	193	255	234	280	333	261	374	436	545	722
Kazakhstan	614	548	547	545	611	590	538	554	591	607
Indonesia	240	209	190	165	255	227	310	347	355	369
Armenia	41	51	74	90	105	115	124	150	155	156
Islamic Rep. of Iran	107	112	112	110	99	98	104	111	112	112
Mongolia	35	34	33	33	49	64	82	88	67	65
Uzbekistan	52	59	59	59	60	54	49	49	49	47
Laos	15	17	18	20	32	40	41	51	43	38
Philippines	35	42	43	48	47	27	29	27	21	31
N Korea	25	26	27	27	28	28	26	26	26	26

WORLD SILVER MINE PRODUCTION

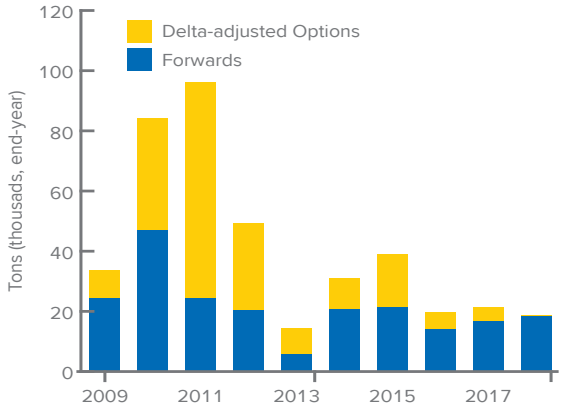
(tons)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Kyrgyzstan	9	10	10	6	11	10	12	18	18	18
Japan	12	11	17	17	15	15	16	16	14	14
Saudi Arabia	12	12	9	11	19	22	23	24	24	13
Azerbaijan	0	1	4	3	1	1	1	5	5	7
Thailand	21	23	24	38	36	34	25	40	4	4
Tajikistan	1	1	2	2	3	3	4	4	4	4
Other Countries	4	7	5	5	4	4	4	3	3	3
Total Asia	**4,112**	**4,360**	**4,601**	**4,858**	**5,225**	**5,077**	**5,266**	**5,520**	**5,539**	**5,809**
Africa										
Morocco	270	326	257	260	285	274	298	337	362	348
South Africa	78	79	73	67	69	37	47	50	56	56
Eritrea	0	0	4	23	25	47	70	13	28	28
Zambia	14	15	15	15	16	15	15	15	15	15
Tanzania	11	12	13	13	12	12	12	13	12	12
Botswana	5	5	5	7	10	10	5	5	5	5
Zimbabwe	2	3	3	4	4	4	4	4	4	4
Ethiopia	2	2	3	3	3	3	3	3	3	3
Mali	3	2	2	3	3	2	3	3	3	3
Ghana	2	2	2	2	3	3	2	2	3	2
DRC	1	7	11	14	62	8	5	2	2	1
Burkina Faso	0	0	0	1	1	13	12	22	6	1
Other Countries	1	1	2	2	2	2	2	2	2	1
Total Africa	**386**	**455**	**392**	**414**	**494**	**431**	**478**	**471**	**500**	**479**
Oceania & Other										
Australia	1,631	1,880	1,725	1,727	1,840	1,675	1,525	1,416	1,092	1,102
PNG	67	67	92	82	91	87	71	90	99	79
New Zealand	14	13	8	6	11	16	12	8	8	5
Total Oceania	**1,712**	**1,960**	**1,826**	**1,814**	**1,942**	**1,778**	**1,609**	**1,514**	**1,199**	**1,186**
World	**22,312**	**23,422**	**23,587**	**24,625**	**25,607**	**26,993**	**27,798**	**27,789**	**27,276**	**26,616**

WORLD SILVER MINE PRODUCTION



Source: GFMS, Refinitiv

SILVER PRODUCER HEDGING: OUTSTANDING POSITIONS



Source: GFMS, Refinitiv; Silver Institute

SILVER FABRICATION: COINS AND MEDALS INCLUDING THE USE OF SCRAP

(tons)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Canada	336	579	729	561	925	971	1129	1068	594	600
United States	1067	1296	1312	1067	1352	1390	1495	1219	585	486
China	94	46	128	141	168	168	343	344	416	418
India	103	146	58	61	169	195	278	291	297	328
Australia	201	272	350	201	283	245	384	401	315	219
Germany	232	200	102	35	20	20	110	150	150	150
United Kingdom	17	16	31	22	68	66	115	108	96	102
Austria	296	360	571	285	458	149	233	112	64	60
Japan	12	19	19	23	25	22	22	22	22	22
Hungary	4	4	4	4	0	1	18	23	20	22
Other Countries	153	190	166	232	120	112	99	73	99	121
World Total	**2,516**	**3,129**	**3,470**	**2,633**	**3,588**	**3,338**	**4,225**	**3,811**	**2,658**	**2,528**

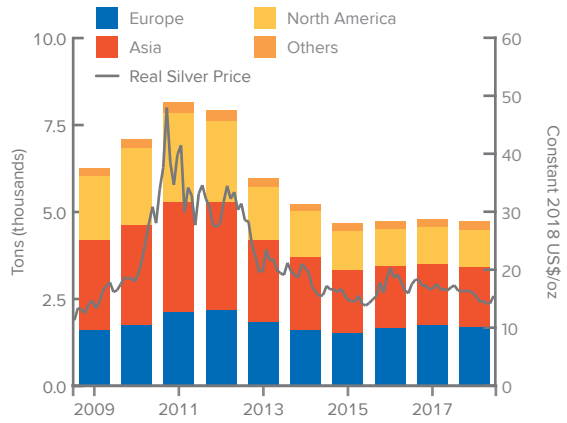
SUPPLY OF SILVER FROM THE RECYCLING OF SCRAP

(tons)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Europe										
Germany	391	465	519	672	537	446	464	510	587	604
Russia	261	356	346	340	311	249	208	203	254	263
United Kingdom	316	198	350	305	223	173	182	245	209	188
Italy	181	203	303	309	270	245	193	197	195	169
France	170	193	217	182	161	153	151	160	157	137
Turkey	33	32	36	32	32	46	53	61	67	79
Austria	33	35	38	37	36	34	35	39	38	37
Czech Republic	28	37	48	51	45	42	33	37	35	30
Netherlands	32	35	38	39	27	25	27	29	28	29
Poland	23	28	35	36	31	29	31	33	32	28
Spain	16	23	40	41	35	32	25	26	23	18
Belgium	18	20	21	22	15	15	14	15	15	14
Sweden	19	26	19	19	19	20	13	14	14	13
Denmark	14	16	17	16	13	12	12	13	12	11
Slovakia	6	7	10	11	9	8	10	10	10	9
Hungary	6	8	11	11	10	9	9	10	10	9
Bulgaria	13	13	13	13	11	10	9	10	9	9
Finland	10	10	11	11	9	8	8	9	9	8
Portugal	12	12	14	8	8	10	10	11	10	8
Other Countries	24	25	26	26	22	20	20	22	22	21
Total Europe	**1,606**	**1,742**	**2,112**	**2,181**	**1,825**	**1,585**	**1,508**	**1,655**	**1,734**	**1,682**
North America										
United States	1,692	2,015	2,375	2,143	1,457	1,252	1,099	1,011	1,031	1,052
Canada	48	51	56	51	34	30	26	24	21	17
Mexico	98	123	140	145	42	17	17	12	12	10
Total North America	**1,838**	**2,189**	**2,571**	**2,339**	**1,533**	**1,299**	**1,142**	**1,047**	**1,065**	**1,079**
Central & South America										
Brazil	34	46	78	79	62	59	72	76	73	71
Venezuela	8	10	11	10	12	11	13	14	15	16

SUPPLY OF SILVER FROM THE RECYCLING OF SCRAP

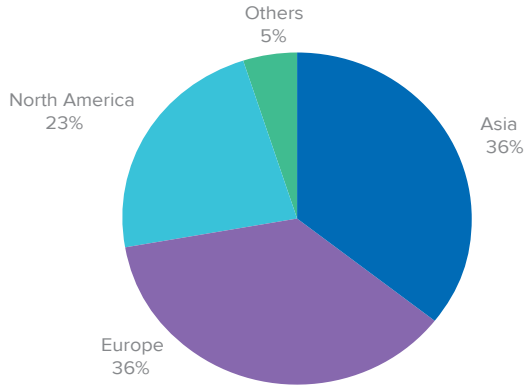
(tons)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Uruguay	5	8	13	12	11	11	12	12	13	13
Other Countries	44	58	68	66	45	30	32	36	40	41
Total C & S America	**91**	**122**	**170**	**167**	**131**	**111**	**128**	**138**	**141**	**140**
Asia										
China	787	909	992	962	935	830	769	739	724	704
Japan	662	649	714	662	623	609	542	504	487	464
India	465	558	642	771	169	151	93	111	122	138
S Korea	262	294	310	281	262	215	126	135	133	136
Taiwan	111	129	140	133	113	97	85	94	90	91
Thailand	96	115	116	99	87	69	62	65	61	57
Saudi Arabia	60	69	65	48	50	54	47	49	47	41
Uzbekistan	7	9	9	9	8	8	9	10	13	17
Israel	13	16	17	16	13	14	13	14	13	12
Singapore	15	17	18	17	16	14	12	13	12	11
Kazakhstan	7	9	9	9	8	8	10	11	10	10
Indonesia	12	13	15	14	13	11	9	10	10	8
Vietnam	11	12	12	11	10	9	8	8	8	7
Other Countries	69	85	102	67	53	38	29	31	27	25
Total Asia	**2,577**	**2,885**	**3,162**	**3,100**	**2,361**	**2,127**	**1,814**	**1,795**	**1,759**	**1,724**
Africa										
Egypt	43	43	21	23	21	20	18	20	19	20
Morocco	16	16	16	16	17	11	11	12	12	11
Tunisia	4	5	6	5	5	4	4	5	5	4
Other Countries	14	15	16	16	14	14	14	15	15	15
Total Africa	**77**	**80**	**59**	**61**	**57**	**48**	**47**	**51**	**51**	**50**
Oceania										
Australia	49	49	49	45	41	37	33	35	33	32
Total Oceania	**49**	**49**	**49**	**45**	**41**	**37**	**33**	**35**	**33**	**32**
World Total	**6,239**	**7,066**	**8,123**	**7,894**	**5,948**	**5,207**	**4,672**	**4,721**	**4,783**	**4,707**

WORLD SILVER SCRAP SUPPLY



Source: GFMS, Refinitiv

WORLD SCRAP SUPPLY, 2018



Source: GFMS, Refinitiv

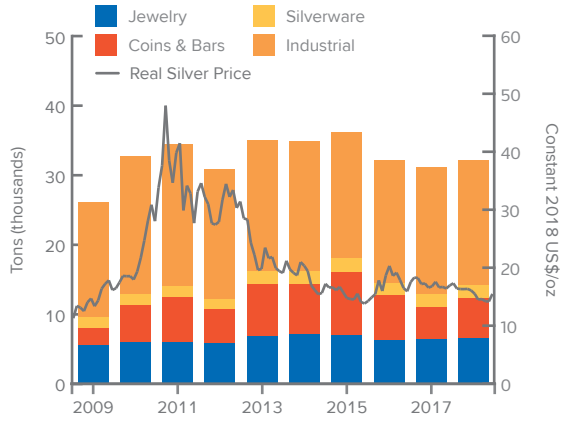
WORLD SILVER FABRICATION INCLUDING THE USE OF SCRAP

(tons)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Europe										
Germany	1,503	1,690	1,488	1,204	1,205	1,003	1,121	1,213	1,216	1,224
Italy	1,088	1,109	886	808	820	875	878	854	890	855
Russian Federation	854	944	864	845	832	793	724	671	663	673
United Kingdom	588	677	698	631	641	629	677	665	650	646
France	633	697	633	544	551	415	446	439	440	438
Belgium	613	577	519	487	449	447	425	426	345	322
Turkey	221	201	181	184	208	240	233	228	228	243
Spain	112	109	96	83	76	81	66	69	91	105
Switzerland	86	92	92	89	88	86	85	85	88	88
Austria	315	380	591	304	476	168	251	130	83	79
Bulgaria	21	22	67	68	69	71	70	68	69	69
Czech Republic	48	56	58	61	64	65	63	61	60	62
Netherlands	58	63	61	61	62	56	55	52	53	54
Poland	82	77	58	48	48	49	48	44	49	43
Norway	30	33	34	34	32	30	28	27	27	26
Hungary	4	4	4	4	0	1	18	23	20	22
Portugal	19	18	12	8	7	9	9	10	16	21
Greece	56	46	36	28	24	25	24	23	23	20
Sweden	21	29	19	19	18	19	18	18	18	18
Denmark	15	16	16	15	14	15	15	14	14	15
Other Countries	12	17	14	16	14	13	14	12	13	12
Total Europe	**6,378**	**6,857**	**6,427**	**5,541**	**5,699**	**5,088**	**5,267**	**5,131**	**5,054**	**5,034**
North America										
United States	5,664	6,768	6,878	6,393	6,336	6,831	7,383	6,660	5,812	5,818
Canada	404	667	813	644	1,031	1,079	1,243	1,181	734	742
Mexico	504	556	689	657	729	618	532	494	456	386
Total North America	**6,572**	**7,992**	**8,380**	**7,694**	**8,096**	**8,528**	**9,159**	**8,334**	**7,003**	**6,946**
South America										
Brazil	219	319	345	349	416	379	358	304	228	234
Dominican Republic	46	42	28	29	42	45	47	46	45	44
Argentina	34	39	39	38	40	39	36	34	34	34
Colombia	17	18	17	17	24	35	29	28	27	27
Peru	25	26	22	22	23	24	23	23	22	23
Other Countries	57	61	51	52	55	54	49	45	43	42
Total South America	**399**	**504**	**503**	**509**	**601**	**576**	**543**	**479**	**399**	**404**
Asia										
India	976	3,222	4,001	2,697	5,379	6,247	7,374	5,081	5,327	6,864
China	5,843	6,792	7,534	7,710	8,421	7,784	6,866	5,873	6,241	6,262
Japan	2,113	3,020	3,234	2,864	2,901	2,700	3,056	3,307	3,490	3,246
Thailand	982	991	954	763	843	979	1,063	1,015	914	875
Taiwan	397	486	510	463	471	488	467	471	492	502
S Korea	763	929	941	928	895	820	628	516	514	492
Indonesia	166	199	225	225	234	223	234	248	253	262
Singapore	12	89	93	61	80	68	102	104	105	109
Iran	98	102	95	92	91	89	88	167	99	95
Hong Kong	182	210	211	300	192	162	145	117	103	75
Israel	69	67	55	50	57	62	64	62	67	67

WORLD SILVER FABRICATION INCLUDING THE USE OF SCRAP

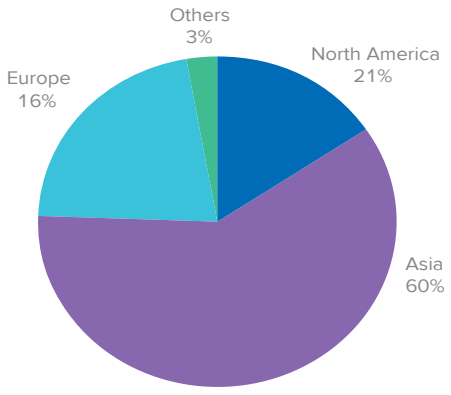
(tons)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Vietnam	40	45	46	46	45	49	51	56	60	65
Kazakhstan	61	66	63	62	62	61	55	53	53	53
Uzbekistan	61	66	63	62	62	61	55	53	51	51
Other Countries	480	467	387	314	287	282	297	312	250	258
Total Asia	**12,246**	**16,750**	**18,412**	**16,637**	**20,020**	**20,073**	**20,545**	**17,435**	**18,020**	**19,277**
Africa										
Egypt	44	43	19	27	29	32	29	24	23	24
Morocco	17	18	18	18	18	19	18	18	18	19
Tunisia	10	11	10	10	11	11	11	10	10	10
Mali	9	9	9	9	9	9	9	9	9	9
South Africa	8	8	8	8	8	8	8	8	8	8
Algeria	6	6	5	5	6	6	6	5	5	5
Other Countries	4	5	4	4	4	4	4	5	5	5
Total Africa	**98**	**99**	**74**	**81**	**85**	**89**	**85**	**79**	**78**	**80**
Oceania										
Australia	364	450	531	387	467	430	566	583	499	404
Other Countries	1	1	1	2	2	2	2	2	2	2
Total Oceania	**365**	**452**	**532**	**388**	**468**	**432**	**568**	**585**	**501**	**406**
World Total	**26,059**	**32,653**	**34,328**	**30,850**	**34,969**	**34,787**	**36,166**	**32,043**	**31,054**	**32,146**

WORLD SILVER FABRICATION



Source: GFMS, Refinitiv

WORLD SILVER FABRICATION, 2018



Source: GFMS, Refinitiv

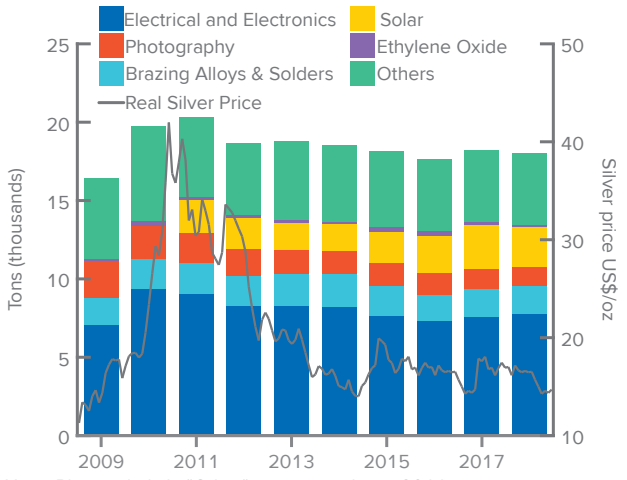
SILVER FABRICATION: INDUSTRIAL APPLICATIONS INCLUDING THE USE OF SCRAP

(tons)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Europe										
Germany	632	824	791	673	664	651	651	667	715	748
United Kingdom	550	640	647	591	557	546	545	541	539	528
Russian Federation	582	630	602	593	599	565	515	484	483	482
Belgium	603	568	510	478	444	443	420	422	341	318
Italy	281	307	287	267	261	260	250	241	250	246
France	232	274	248	223	218	211	213	210	216	218
Switzerland	69	75	74	71	70	72	71	71	73	75
Bulgaria	11	14	60	62	65	66	66	64	65	66
Czech Republic	41	48	51	55	58	60	59	57	57	58
Turkey	42	44	46	45	46	48	50	49	51	50
Netherlands	40	47	46	45	44	45	44	45	46	47
Spain	53	55	45	38	35	36	36	37	39	41
Poland	21	23	22	22	22	23	24	24	25	25
Austria	15	16	16	16	16	15	16	16	16	16
Norway	11	13	12	12	12	12	12	12	12	12
Finland	1	1	1	1	1	1	1	1	1	1
Slovakia	2	2	0	3	3	3	3	3	3	3
Total Europe	**3,181**	**3,579**	**3,458**	**3,195**	**3,114**	**3,056**	**2,975**	**2,946**	**2,931**	**2,932**
North America										
United States	3,868	4,702	4,912	4,126	3,963	3,867	3,953	3,959	4,083	4,189
Mexico	97	148	187	206	205	209	245	250	249	192
Canada	40	60	57	56	59	56	53	55	54	55
Total North America	**4,006**	**4,910**	**5,155**	**4,388**	**4,227**	**4,131**	**4,250**	**4,264**	**4,386**	**4,437**
Central & South America										
Brazil	142	177	168	165	148	140	128	121	121	121
Argentina	24	28	28	27	27	26	25	24	23	23
Colombia	4	5	4	4	9	19	14	13	13	13
Other Countries	13	14	13	13	13	13	13	13	13	13
Total South America	**183**	**223**	**214**	**210**	**196**	**198**	**180**	**171**	**170**	**170**
Asia										
China	4,251	4,876	5,104	5,145	5,589	5,782	5,244	4,479	4,840	4,898
Japan	2,036	2,931	3,147	2,769	2,801	2,607	2,966	3,216	3,397	3,154
India	992	1,093	1,200	1,128	1,091	1,041	990	993	1,068	1,002
S Korea	612	762	761	733	694	636	447	378	385	369
Taiwan	382	470	492	445	453	471	449	456	478	488
Hong Kong	171	199	199	193	180	152	137	112	99	72
Iran	55	59	55	55	54	55	55	132	65	63
Kazakhstan	51	56	54	53	54	52	48	46	46	46
Uzbekistan	51	56	54	53	54	52	47	46	45	44
Singapore	4	55	58	16	22	26	51	31	34	35
Other Countries	292	270	186	105	105	114	114	178	108	114
Total Asia	**8,897**	**10,826**	**11,310**	**10,694**	**11,096**	**10,987**	**10,547**	**10,067**	**10,563**	**10,287**
Africa										
Morocco	7	8	8	8	8	8	8	8	8	9
South Africa	4	4	4	4	4	4	4	4	4	4

SILVER FABRICATION: INDUSTRIAL APPLICATIONS INCLUDING THE USE OF SCRAP

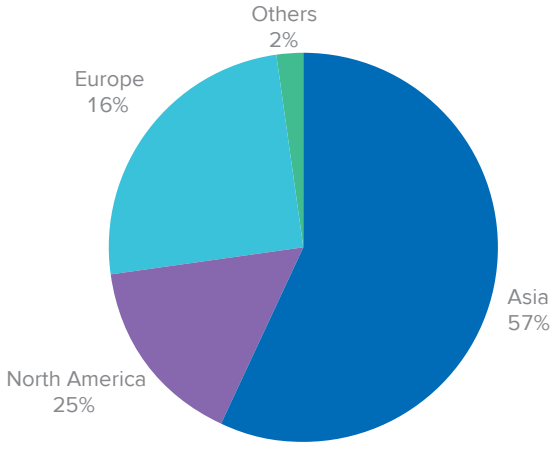
(tons)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Other Countries	9	11	9	9	9	19	9	8	9	8
Total Africa	**20**	**23**	**21**	**21**	**21**	**22**	**21**	**20**	**21**	**21**
Oceania										
Australia	140	154	154	157	150	154	150	149	150	151
Total Oceania	**140**	**154**	**154**	**157**	**150**	**154**	**150**	**149**	**150**	**151**
World Total	**16,427**	**19,715**	**20,312**	**18,664**	**18,805**	**18,548**	**18,122**	**17,617**	**18,221**	**17,997**

COMPONENTS OF INDUSTRIAL DEMAND



Note: Photovoltaic in "Other" category prior to 2011
Source: GFMS, Refinitiv

WORLD SILVER INDUSTRIAL FABRICATION, 2018



Source: GFMS, Refinitiv

SILVER FABRICATION: ELECTRICAL AND ELECTRONICS INCLUDING THE USE OF SCRAP

(tons)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
China	1,722	2,058	2,148	2,161	2,343	2,419	2,173	1,836	1,968	2,008
United States	1,660	2,320	2,085	1,745	1,651	1,688	1,689	1,721	1,737	1,836
Japan	877	1,588	1,438	1,194	1,190	1,044	945	918	998	1,035
Germany	488	664	631	534	529	521	519	536	577	606
India	502	531	534	547	470	501	451	453	435	451
Taiwan	309	377	395	353	367	384	365	372	393	401
Russia	321	353	339	334	338	315	285	266	271	278
South Korea	390	500	499	481	453	415	282	250	256	249
France	178	215	189	166	164	159	161	159	162	166
Mexico	69	118	157	177	176	179	213	213	212	155
United Kingdom	107	120	125	122	121	125	127	128	129	132
Italy	107	121	103	86	78	75	72	69	70	72
Czech Republic	30	36	39	42	45	46	45	44	44	45
Brazil	37	50	49	48	47	45	42	38	38	38
Hong Kong	83	97	97	94	87	72	66	55	51	32
Turkey	28	29	31	29	29	30	31	31	32	30
Kazakhstan	31	34	32	32	32	31	29	27	27	28
Uzbekistan	31	34	32	32	32	31	29	27	27	27
Other Countries	103	123	122	119	123	128	128	130	137	140
World Total	**7,072**	**9,367**	**9,044**	**8,295**	**8,274**	**8,208**	**7,652**	**7,275**	**7,563**	**7,730**

SILVER FABRICATION: BRAZING ALLOYS AND SOLDERS INCLUDING THE USE OF SCRAP

(tons)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
China	826	890	949	975	1,079	1,169	1,037	845	887	898
United States	162	182	187	166	178	182	187	190	193	195
Japan	78	115	108	93	87	79	75	73	85	87
India	68	80	83	75	65	82	77	77	77	81
United Kingdom	57	72	76	67	66	68	69	70	70	70
Germany	71	87	86	70	68	66	65	65	68	70
Canada	34	53	53	49	49	48	47	48	50	51
Russia	54	59	56	56	56	55	51	48	47	46
S Korea	64	72	73	68	64	59	45	45	45	45
Italy	52	57	54	50	48	47	45	44	45	43
Switzerland	38	41	41	39	39	40	39	39	41	42
Taiwan	31	38	39	38	36	35	34	34	35	36
Brazil	27	30	31	30	30	29	26	24	24	24
France	17	20	19	17	16	16	16	16	16	16
Australia	15	16	18	18	17	17	16	15	16	16
Mexico	12	13	12	12	12	12	14	20	20	15
Belgium	18	20	21	22	15	15	14	14	15	15
Spain	18	18	16	13	11	11	11	12	12	12
Other Countries	32	41	42	43	44	44	42	42	43	43
World Total	**1,674**	**1,905**	**1,965**	**1,900**	**1,981**	**2,073**	**1,912**	**1,721**	**1,789**	**1,805**

SILVER FABRICATION: PHOTOGRAPHIC USE INCLUDING THE USE OF SCRAP

(tons)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
United States	728	630	556	521	498	476	459	443	427	422
Belgium	580	540	482	448	423	420	400	400	320	295
Japan	610	465	410	303	295	290	275	261	254	243
United Kingdom	268	280	292	260	229	207	201	192	187	183
China	95	81	74	69	60	56	49	46	43	39
Russia	47	42	38	37	36	34	32	30	29	28
Brazil	32	45	37	35	14	10	8	7	6	5
India	10	10	10	10	10	10	6	6	4	4
Czech Republic	4	3	3	3	2	2	2	2	2	2
Australia	3	3	2	2	2	2	2	2	2	2
Other Countries	-	-	-	-	-	-	-	-	-	
World Total	**2,377**	**2,098**	**1,905**	**1,687**	**1,569**	**1,508**	**1,433**	**1,390**	**1,273**	**1,222**

SILVER FABRICATION: ETHYLENE OXIDE CATALYST USE INCLUDING THE USE OF SCRAP

(tons)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
United States	(69)	2	1	39	22	3	13	17	27	102
China	11	76	46	33	129	125	209	134	73	36
Mexico	1	6	1	0	1	0	1	0	1	10
Saudi Arabia	162	153	53	7	5	0	11	69	2	9
Kuwait	16	24	33	0	0	3	0	1	2	1
Brazil	4	0	4	24	1	0	1	0	1	1
Iran	1	6	1	1	0	1	2	72	2	1
Japan	(4)	2	0	2	0	2	1	1	1	1
S Korea	37	0	3	1	49	6	37	1	4	0
India	(16)	(1)	2	20	20	1	1	1	95	0
Malaysia	0	0	1	0	0	1	0	0	1	0
Russian Federation	1	(2)	(6)	0	1	3	4	0	1	0
Other Countries	5	6	54	19	11	9	36	20	4	8
World Total	**148**	**272**	**194**	**148**	**239**	**154**	**317**	**317**	**214**	**169**

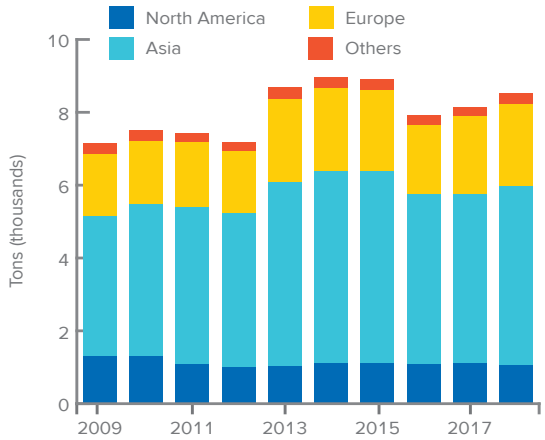
SILVER FABRICATION: JEWELRY AND SILVERWARE INCLUDING THE USE OF SCRAP

(tons)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Europe										
Italy	806	802	599	540	559	614	627	612	639	608
Turkey	175	153	134	139	162	192	184	177	177	193
Russia	263	291	240	228	225	223	199	183	177	178
Germany	166	169	159	147	134	131	130	123	120	117
France	59	64	73	67	56	54	53	52	51	49
Spain	41	37	37	32	29	30	29	30	30	31
Greece	56	46	36	28	24	25	24	23	23	20
Sweden	20	20	19	19	18	18	18	18	18	18
United Kingdom	21	21	20	18	16	17	17	15	16	15
Denmark	15	16	16	15	14	15	15	14	14	15
Poland	49	41	24	19	20	19	17	17	17	14
Norway	19	20	18	18	16	17	16	15	15	14
Portugal	18	18	12	8	7	8	9	9	9	9
Netherlands	8	8	7	7	7	7	7	7	7	7
Switzerland	7	7	7	7	7	7	7	7	7	7
Bulgaria	9	7	5	4	4	4	4	4	4	3
Belgium	4	4	4	4	4	4	3	3	3	3
Finland	5	5	5	5	4	3	3	3	3	3
Austria	3	3	3	3	3	3	3	3	3	3
Czech Republic	4	4	4	3	3	3	3	3	3	2
Cyprus	3	3	3	2	1	2	2	2	2	2
Croatia	2	2	2	2	2	2	1	1	1	1
Other Countries	3	3	3	3	1	2	2	2	1	2
Total Europe	**1,754**	**1,744**	**1,429**	**1,317**	**1,318**	**1,401**	**1,373**	**1,325**	**1,339**	**1,314**
North America										
United States	362	400	370	342	361	394	412	458	530	565
Mexico	355	344	450	428	490	378	258	220	183	169
Canada	28	28	27	26	26	23	26	22	22	22
Total North America	**745**	**772**	**847**	**797**	**877**	**796**	**696**	**700**	**735**	**757**
Central & South America										
Brazil	52	60	47	47	92	88	67	62	67	73
Dominican Republic	46	42	28	29	41	43	46	44	43	42
Peru	18	19	16	17	18	19	19	18	18	18
Colombia	10	10	9	9	12	13	12	12	11	12
Argentina	7	8	8	8	11	10	10	9	9	9
Chile	7	7	7	7	10	10	10	8	7	7
Ecuador	4	5	4	5	7	8	7	7	7	7
Uruguay	7	11	8	8	10	10	7	7	7	7
Other Countries	44	40	33	32	30	28	22	21	20	20
Total Central & South America	**196**	**202**	**162**	**164**	**231**	**230**	**200**	**187**	**189**	**194**
Asia										
India	1,164	1,233	1,194	1,196	2,248	3,058	3,539	2,945	3,246	3,679
China	1,457	1,681	1,952	2,029	2,266	1,642	1,160	951	902	859
Thailand	946	954	917	726	806	942	1,026	974	882	844
Indonesia	150	168	190	187	195	186	195	210	216	225
S Korea	150	167	179	183	186	167	161	126	116	106
Japan	64	69	68	71	74	70	68	69	71	70

SILVER FABRICATION: JEWELRY AND SILVERWARE INCLUDING THE USE OF SCRAP

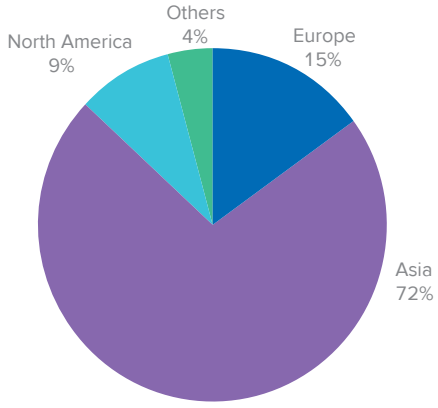
Vietnam	37	42	44	44	43	47	50	55	59	63
Bangladesh	45	43	41	40	28	30	50	35	43	45
Israel	46	42	32	29	34	37	39	37	40	38
Islamic Rep. of Iran	44	43	40	37	37	34	33	34	34	32
Cambodia	26	27	28	28	28	27	27	27	28	29
Nepal	36	35	35	37	22	21	25	26	26	27
Saudi Arabia	23	24	26	29	29	27	26	25	23	21
Pakistan	31	28	24	23	20	20	26	20	21	21
Malaysia	19	20	21	23	24	24	21	20	20	20
UAE	16	18	20	22	24	22	21	13	11	12
Philippines	6	6	7	7	7	7	8	8	8	8
Taiwan	8	9	10	10	10	9	10	7	7	7
Sri Lanka	17	16	14	14	12	13	4	5	6	6
Bahrain	4	5	5	5	6	5	6	5	6	6
Kazakhstan	8	7	7	6	6	7	6	6	6	5
Uzbekistan	8	7	7	6	6	7	6	6	5	5
Hong Kong	8	9	10	11	10	8	7	4	3	2
Other Countries	50	50	47	43	41	40	38	29	28	28
Total Asia	**4,362**	**4,705**	**4,918**	**4,809**	**6,162**	**6,451**	**6,553**	**5,637**	**5,806**	**6,158**
Africa										
Egypt	36	34	15	22	24	27	25	21	19	20
Morocco	7	8	8	8	8	8	8	8	8	8
Tunisia	7	7	7	7	7	7	7	7	7	7
Other Countries	28	27	22	24	25	25	23	23	22	23
Total Africa	**78**	**76**	**52**	**60**	**64**	**67**	**63**	**58**	**56**	**58**
Oceania										
Australia	19	21	22	23	24	24	25	26	27	27
New Zealand	1	1	1	1	2	2	2	2	2	2
Total Oceania	**22**	**23**	**25**	**26**	**26**	**27**	**27**	**28**	**29**	**30**
World Total	**7,156**	**7,522**	**7,432**	**7,171**	**8,678**	**8,971**	**8,912**	**7,934**	**8,155**	**8,511**

WORLD JEWELRY & SILVERWARE FABRICATION



Source: GFMS, Refinitiv

WORLD JEWELRY & SILVERWARE FABRICATION, 2018



Source: GFMS, Refinitiv

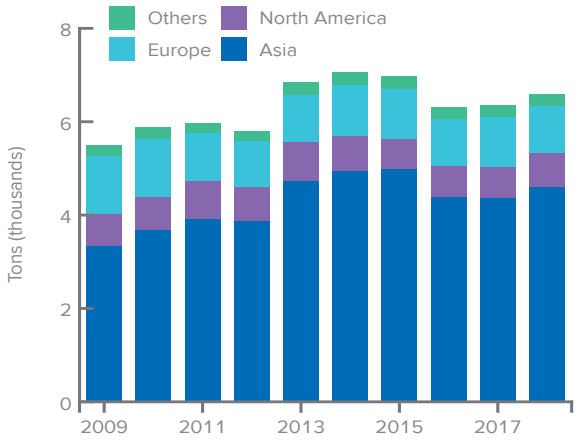
SILVER FABRICATION: JEWELRY INCLUDING THE USE OF SCRAP

(tons)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Europe										
Italy	663	679	512	469	495	555	572	561	590	557
Turkey	120	105	95	105	124	149	137	133	135	142
Germany	115	119	115	113	104	103	102	96	93	91
Russia	92	104	84	80	82	87	72	63	60	62
France	54	59	68	63	53	51	50	49	48	46
Spain	38	34	35	30	27	29	27	28	29	29
Poland	48	41	23	18	19	19	17	17	17	14
Greece	32	28	22	18	16	17	16	15	15	13
Sweden	9	10	9	10	10	10	10	10	10	10
United Kingdom	12	13	12	11	9	10	10	9	9	9
Norway	5	5	5	5	5	5	4	4	4	4
Other Countries	1,187	1,195	980	920	945	1,033	1,017	987	1,010	977
Total Europe	**1,246**	**1,254**	**1,032**	**966**	**988**	**1,080**	**1,063**	**1,031**	**1,054**	**1,022**
North America										
United States	334	374	346	321	341	374	391	434	504	540
Mexico	327	323	433	412	472	361	241	202	165	157
Canada	24	25	24	23	23	20	22	17	17	17
Total North America	**685**	**722**	**803**	**757**	**836**	**755**	**654**	**653**	**687**	**713**
Central & South America										
Brazil	52	60	47	47	92	88	67	62	67	73
Dominican Republic	46	42	28	29	41	43	46	44	43	42
Peru	16	17	14	15	17	18	17	17	17	17
Colombia	7	7	7	7	10	12	10	10	10	10
Argentina	7	8	8	8	11	10	10	9	9	9
Chile	7	7	7	7	10	10	10	8	7	7
Ecuador	4	5	4	5	7	8	7	7	7	7
Uruguay	7	11	8	8	10	10	7	7	7	7
Other Countries	19	17	13	13	13	13	11	10	9	9
Total Central & South America	**165**	**174**	**137**	**140**	**210**	**211**	**185**	**173**	**175**	**180**
Asia										
India	647	707	679	724	1,315	1,936	2,254	1,930	2,058	2,378
China	1,243	1,444	1,693	1,762	1,955	1,452	1,053	875	829	789
Thailand	832	870	848	667	742	874	960	915	830	795
Indonesia	129	146	172	172	181	172	183	198	205	214
S Korea	131	147	162	168	172	154	151	117	107	98
Japan	64	69	68	71	74	70	68	69	71	70
Vietnam	37	42	44	44	43	47	50	55	59	63
Bangladesh	24	23	23	24	16	17	33	23	23	24
Nepal	36	35	35	37	22	21	25	26	26	27
Cambodia	19	22	23	24	24	23	23	23	24	25
Saudi Arabia	20	21	23	26	26	25	24	23	21	20
Malaysia	19	20	21	23	24	24	21	20	20	20
UAE	16	18	20	22	24	22	21	13	11	12
Pakistan	14	13	11	11	10	10	15	10	11	11
Islamic Rep. of Iran	6	7	8	8	9	9	8	9	10	9
Israel	12	13	10	10	11	13	12	12	12	8
Philippines	6	6	7	7	7	7	8	8	8	8

SILVER FABRICATION: JEWELRY INCLUDING THE USE OF SCRAP

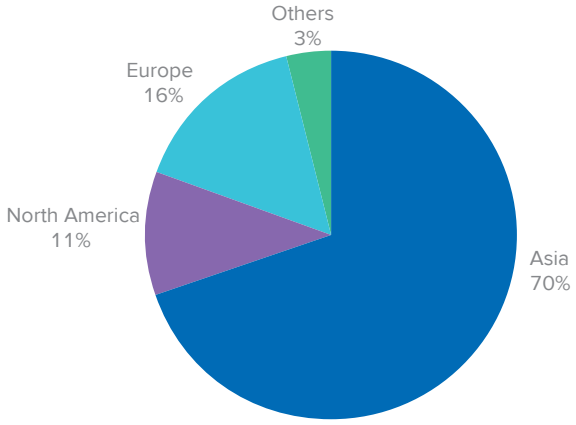
(tons)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Taiwan	8	9	10	10	10	9	10	7	7	7
Sri Lanka	17	16	14	14	12	13	4	5	6	6
Bahrain	4	5	5	5	6	5	6	5	6	6
Kazakhstan	8	7	7	6	6	7	6	6	6	5
Uzbekistan	8	7	7	6	6	7	6	6	5	5
Hong Kong	8	9	10	11	10	8	7	4	3	2
Other Countries	14	16	17	16	16	15	14	14	13	14
Total Asia	**3,322**	**3,674**	**3,917**	**3,870**	**4,721**	**4,940**	**4,961**	**4,372**	**4,369**	**4,617**
Africa										
Egypt	36	34	15	22	24	27	25	21	19	20
Morocco	7	8	8	8	8	8	8	8	8	8
Tunisia	7	7	7	7	7	7	7	7	7	7
Other Countries	14	14	13	14	15	15	14	14	14	15
Total Africa	**64**	**62**	**43**	**50**	**54**	**57**	**54**	**50**	**48**	**50**
Oceania										
Australia	19	21	22	23	24	24	25	26	27	27
New Zealand	1	1	1	1	2	2	2	2	2	2
Total Oceania	**21**	**22**	**24**	**25**	**26**	**26**	**27**	**27**	**28**	**29**
World Total	**5,502**	**5,909**	**5,956**	**5,808**	**6,835**	**7,068**	**6,945**	**6,306**	**6,362**	**6,611**

WORLD JEWELRY FABRICATION



Source: GFMS, Refinitiv

WORLD JEWELRY FABRICATION, 2018

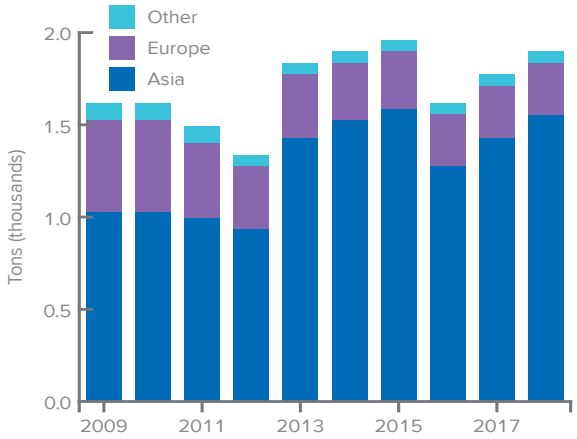


Source: GFMS, Refinitiv

SILVER FABRICATION: SILVERWARE INCLUDING THE USE OF SCRAP

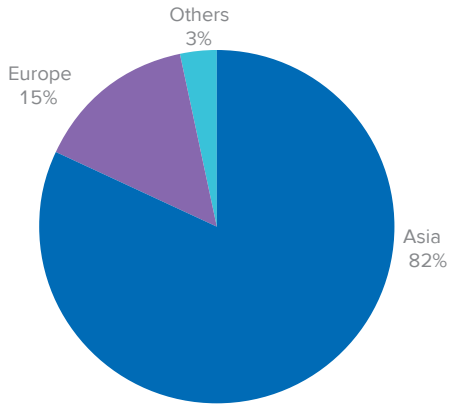
(tons)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Europe										
Russian Federation	171	187	156	148	144	136	127	120	117	116
Italy	143	123	87	71	64	59	54	51	49	51
Turkey	55	48	39	34	38	43	46	44	42	51
Germany	51	51	44	34	30	29	28	27	26	26
Norway	14	15	14	14	12	12	12	11	11	11
Sweden	10	10	9	9	8	8	8	8	8	8
Greece	24	18	14	10	8	8	8	8	7	7
Denmark	9	9	9	8	7	7	7	7	7	7
United Kingdom	9	8	8	7	6	7	6	6	6	6
France	6	5	5	4	3	3	3	3	3	3
Austria	3	3	2	2	2	2	2	2	2	2
Other Countries	14	13	10	9	8	7	7	6	6	6
Total Europe	**508**	**490**	**397**	**350**	**330**	**322**	**310**	**294**	**286**	**293**
North America										
United States	28	26	24	21	20	21	21	24	26	26
Mexico	28	21	17	16	18	18	17	18	17	13
Canada	4	3	3	3	3	3	4	5	6	6
Total North America	**60**	**51**	**45**	**40**	**41**	**42**	**42**	**46**	**49**	**44**
Central & South America										
Colombia	3	3	3	2	2	2	2	2	2	2
Peru	2	2	2	2	2	1	1	1	1	1
Other Countries	25	23	20	19	17	15	11	11	11	11
Total C. & S. America	**30**	**27**	**24**	**23**	**21**	**18**	**14**	**14**	**13**	**14**
Asia										
India	517	526	515	472	933	1,122	1,285	1,015	1,188	1,301
China	215	237	259	267	311	190	107	76	73	70
Thailand	115	84	69	59	64	68	66	60	53	48
Israel	34	30	22	19	23	24	27	26	28	29
Iran	37	36	32	29	28	26	25	25	25	23
Bangladesh	21	20	17	16	13	12	17	12	21	21
Indonesia	21	22	18	15	14	14	12	12	11	11
Pakistan	17	15	13	11	10	10	11	10	10	10
S Korea	20	19	17	15	14	12	11	9	9	8
Cambodia	6	6	5	4	4	4	4	3	3	4
Saudi Arabia	3	3	3	3	3	2	2	2	2	2
Other Countries	36	34	30	27	25	25	24	15	15	14
Total Asia	**1,041**	**1,031**	**1,001**	**9,38**	**1,441**	**1,511**	**1,591**	**1,265**	**1,437**	**1,541**
Africa										
Africa	14	13	9	10	10	10	9	9	8	8
Total Africa	**14**	**13**	**9**	**10**	**10**	**10**	**9**	**9**	**8**	**8**
Oceania										
Australia	1	1	1	1	1	1	1	1	1	1
Total Oceania	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
World Total	**1,654**	**1,613**	**1,476**	**1,363**	**1,844**	**1,903**	**1,967**	**1,628**	**1,793**	**1,900**

WORLD SILVERWARE FABRICATION



Source: GFMS, Refinitiv

WORLD SILVERWARE FABRICATION, 2018



Source: GFMS, Refinitiv

TOP 20 SILVER PRODUCING COUNTRIES

Rank			Output (tons)	
2017	2018	Country	2017	2018
1	1	Mexico	6,055	6,116
2	2	Peru	4,587	4,508
3	3	China	3,502	3,574
5	4	Russia	1,305	1,350
4	5	Chile	1,319	1,311
6	6	Bolivia	1,243	1,240
7	7	Poland	1,236	1,233
9	8	Australia	1,092	1,102
10	9	United States	1,048	870
11	10	Argentina	798	824
8	11	Canada	1,133	773
13	12	India	545	722
12	13	Kazakhstan	591	607
14	14	Sweden	465	453
17	15	Indonesia	355	369
16	16	Morocco	362	348
18	17	Turkey	167	170
19	18	Armenia	155	156
20	19	Iran	112	112
21	20	Dominican Republic	102	106
		Rest of the World	1,104	674
		World Total	**27,276**	**26,616**

Source: GFMS, Refinitiv

TOP 20 SILVER PRODUCING COMPANIES

Rank			Output (tons)	
2017	2018		2017	2018
1	1	Fresnillo plc [1]	1,687	1,922
2	2	Glencore plc [2]	1,174	1,085
3	3	KGHM Polska Miedz S.A. Group [3,4]	1,136	1,055
6	4	Cia. De Minas Buenaventura S.A.A. [5]	822	816
5	5	Polymetal International plc	834	787
7	6	Pan American Silver Corp. [2]	777	771
4	7	Goldcorp Inc.	890	762
9	8	Hochschild Mining plc	595	613
11	9	Hindustan Zinc Ltd. [6]	526	610
13	10	Southern Copper Corp. [7]	495	538
12	11	Corp. Nacional del Cobre de Chile	521	531
10	12	Volcan Cia. Minera S.A.A. [5]	538	529
17	13	Industrias Peñoles S.A.B. De C.V. [8,10]	379	459
19	14	South32 Ltd.	375	457
14	15	Boliden A.B. [9]	413	410
18	16	Coeur Mining, Inc. [2]	376	403
15	17	Sumitomo Corp. [4]	398	392
22	18	First Majestic Silver Corp.	303	363
8	19	Teck	669	358
16	20	Hecla Mining Company	386	324

1 Including 100% of Penmont mines, excluding silverstream; 2 Primary silver producer; 3 Reported metallic silver production; 4 Estimate; 5 includes minority partners; 6 Includes 100% from Pallancata, includes Moris; 7 Integrated refined metal; 8 Mined silver; 9 Metal in concentrate; 10 Excludes 100% of Fresnillo plc.

Source: GFMS, Refinitiv

APPENDIX 2

NOMINAL SILVER PRICES IN VARIOUS CURRENCIES

Prices are calculated from the London price and the average exchange rate for the year.
In the case of India, the price shown is the one actually quoted in the Mumbai and Ahmedabad market.

	London US$/oz	India Rupee/kg	Thai Baht/oz	Japan Yen/10g	Korea Won/10g	China Yuan/kg	Eurozone* Euro/kg	Mexico Peso/oz
1984	8.145	3,514	192.53	622.0	2,111	608	382	1.37
1985	6.132	3,880	166.54	470.3	1,715	579	296	1.58
1986	5.465	4,105	143.71	296.1	1,549	607	195	3.34
1987	7.016	5,124	180.46	326.2	1,855	840	208	9.67
1988	6.532	6,231	165.23	269.2	1,536	782	189	14.85
1989	5.500	6,803	141.36	244.0	1,187	666	170	13.54
1990	4.832	6,779	123.62	224.9	1,099	743	129	13.59
1991	4.057	6,993	103.51	175.7	956	694	111	12.24
1992	3.946	7,580	100.24	160.7	991	700	101	12.21
1993	4.313	6,163	109.20	154.2	1,113	799	117	13.44
1994	5.285	6,846	132.92	173.7	1,365	1,465	141	17.84
1995	5.197	6,864	129.49	157.2	1,289	1,395	122	33.36
1996	5.199	7,291	131.77	181.8	1,345	1,390	128	39.51
1997	4.897	7,009	153.60	190.5	1,498	1,305	139	38.78
1998	5.540	8,016	229.30	233.3	2,498	1,476	160	50.65
1999	5.218	8,022	197.38	191.2	1,994	1,389	158	49.90
2000	4.953	8,002	198.61	171.6	1,800	1,318	172	46.82
2001	4.370	7,420	194.15	170.7	1,814	1,163	157	40.82
2002	4.599	7,934	197.57	185.4	1,850	1,224	156	44.41
2003	4.879	8,138	202.39	181.8	1,869	1,298	139	52.64
2004	6.658	10,606	267.79	231.6	2,452	1,772	172	75.14
2005	7.312	11,083	294.07	259.1	2,407	1,926	189	79.68
2006	11.549	17,843	437.51	431.8	3,545	2,958	296	125.88
2007	13.384	18,794	461.98	506.7	3,999	3,273	314	146.26
2008	14.989	21,620	499.34	498.1	5,311	3,349	328	166.82
2009	14.674	23,815	503.12	441.4	6,024	3,223	339	198.30
2010	20.193	32,007	640.59	569.7	7,507	4,393	489	255.16
2011	35.119	55,638	1,069.25	900.0	12,508	7,296	811	436.30
2012	31.150	57,086	967.03	799.0	11,187	6,309	777	405.47
2013	23.793	48,618	730.53	742.1	8,366	4,708	576	303.52
2014	19.078	41,805	585.76	646.5	6,448	3,778	461	253.93
2015	15.680	36,146	537.10	610.3	5,704	3,168	560	248.91
2016	17.138	40,639	604.48	595.6	6,369	3,662	498	318.00
2017	17.048	39,885	578.35	591.0	5,810	3,454	442	322.36
2018	15.705	38,505	507.50	557.3	5,550	3,600	427	300.98

* From 1977-1998, the DM/kg price is expressed in Euro/kg at the official conversion rate of 1.95583

APPENDIX 3

REAL SILVER PRICES IN VARIOUS CURRENCIES (LOCAL CPI DEFLATED - CONSTANT 2017 MONEY TERMS)

Prices are calculated from the London price and the average exchange rate for the year.
In the case of India, the price shown is the one actually quoted in the Mumbai market.

	London US$/oz	India Rupee/kg	Thai Baht/oz	Japan Yen/10g	Korea Won/10g	China Yuan/kg	Eurozone Euro/kg	Mexico Peso/oz
	US$/oz	Rupee/kg	Baht/oz	Yen/10g	Won/10g	Yuan/kg	Euro/kg	Peso/oz
1984	19.367	38,131	538.84	754.42	7,113	2,529	618.62	317.81
1985	14.079	39,957	454.78	559.02	5,640	2,153	469.11	232.37
1986	12.319	38,813	385.88	349.85	4,958	2,110	309.43	263.58
1987	15.244	44,541	473.27	384.88	5,762	2,723	329.25	329.25
1988	13.646	49,628	416.81	315.53	4,453	2,135	295.43	236.11
1989	10.961	52,378	338.39	279.62	3,255	1,537	258.55	179.37
1990	9.136	47,862	279.84	250.14	2,776	1,663	191.04	142.16
1991	7.359	43,487	221.40	189.18	2,209	1,500	174.39	104.38
1992	6.947	42,115	205.80	170.13	2,154	1,423	151.01	90.14
1993	7.376	32,144	217.07	161.20	2,310	1,418	167.51	90.41
1994	8.809	32,460	251.76	180.35	2,666	2,092	196.48	112.19
1995	8.425	29,516	231.62	163.42	2,410	1,704	167.12	155.40
1996	8.189	28,752	222.94	188.74	2,396	1,568	172.84	136.96
1997	7.537	25,814	245.82	194.35	2,555	1,432	184.23	111.44
1998	8.396	26,077	339.90	236.45	3,963	1,633	210.10	125.56
1999	7.739	24,895	291.81	194.42	3,138	1,559	206.30	106.10
2000	7.106	23,871	289.07	175.64	2,770	1,475	221.32	90.92
2001	6.097	21,347	277.91	176.13	2,682	1,293	198.09	74.53
2002	6.316	21,891	281.01	193.84	2,662	1,371	194.07	77.20
2003	6.552	21,606	282.51	189.76	2,598	1,437	171.15	87.52
2004	8.708	27,176	363.87	241.75	3,291	1,888	208.31	119.34
2005	9.250	27,233	382.05	271.20	3,144	2,016	225.41	121.69
2006	14.153	41,272	543.31	450.88	4,528	3,051	347.55	185.52
2007	15.947	40,897	561.30	528.78	4,982	3,223	360.40	207.33
2008	17.199	43,423	575.02	512.77	6,321	3,115	366.83	224.95
2009	16.898	43,118	584.76	460.60	6,977	3,019	377.95	253.94
2010	22.878	51,750	720.72	598.79	8,445	3,983	539.23	313.72
2011	38.571	82,605	1,158.95	948.65	13,530	6,276	876.13	518.76
2012	33.518	77,562	1,017.76	842.47	11,842	5,287	822.87	463.06
2013	25.232	59,551	751.97	779.67	8,741	3,844	600.96	333.92
2014	19.909	48,142	592.12	661.12	6,653	3,025	476.65	277.69
2015	16.343	39,328	547.36	619.18	5,844	3,294	577.66	268.31
2016	17.499	42,758	609.16	602.45	6,439	3,730	505.22	332.75
2017	17.693	41,345	604.42	661.13	6,072	4,012	471.29	308.18
2018	15.705	38,505	507.50	557.32	5,550	3,600	427.22	300.98

* From 1977-1998, the DM/kg price is expressed in Euro/kg at the official conversion rate of 1.95583

Source: Refinitiv Datastream

APPENDIX 4

SILVER PRICES IN US$ PER OUNCE

	London Silver Market Fix*			COMEX Settlement Price		
	High	Low	Average	High	Low	Average
1993	5.4200	3.5600	4.3130	5.4430	3.5230	4.3049
1994	5.7475	4.6400	5.2851	5.7810	4.5730	5.2808
1995	6.0375	4.4160	5.1971	6.1020	4.3750	5.1850
1996	5.8275	4.7100	5.1995	5.8190	4.6760	5.1785
1997	6.2675	4.2235	4.8972	6.3350	4.1550	4.8775
1998	7.8100	4.6900	5.5398	7.2600	4.6180	5.4953
1999	5.7500	4.8800	5.2184	5.7600	4.8720	5.2142
2000	5.4475	4.5700	4.9525	5.5470	4.5630	4.9653
2001	4.8200	4.0650	4.3702	4.8050	4.0260	4.3597
2002	5.0975	4.2350	4.5990	5.1130	4.2160	4.5955
2003	5.9650	4.3700	4.8787	5.9830	4.3460	4.8916
2004	8.2900	5.4950	6.6578	8.2110	5.5140	6.6927
2005	9.2250	6.3900	7.3115	9.0000	6.4270	7.3220
2006	14.9400	8.8300	11.5492	14.8460	8.8090	11.5501
2007	15.8200	11.6700	13.3835	15.4990	11.4650	13.3762
2008	20.9200	8.8800	14.9891	20.6850	8.7900	14.9471
2009	19.1800	10.5100	14.6743	19.2950	10.4200	14.6961
2010	30.7000	15.1400	20.1929	30.9100	14.8230	20.2382
2011	48.7000	26.1600	35.1192	48.5840	26.8110	35.2485
2012	37.2300	26.6700	31.1497	37.1400	26.2470	31.1459
2013	32.2300	18.6100	23.7928	32.4090	18.5330	23.7469
2014	22.0500	15.2800	19.0778	22.0470	15.3920	19.0304
2015	18.2300	13.7100	15.6800	18.3460	13.6660	15.6576
2016	20.7100	13.5800	17.1376	20.6660	13.7370	17.1365
2017	18.5600	15.2200	17.0481	18.4930	15.3710	17.0208
2018	17.5200	13.9700	15.7100	17.5500	13.9500	15.6500

* "LBMA Silver price" as of 15 August 2014; operated by CME and administered by Refinitiv

US PRICES IN 2018

COMEX Settlement

US$ per ounce	High	Low	Average
January	17.5500	16.8600	17.1024
February	17.1200	16.1200	16.5420
March	16.7200	16.1300	16.3929
April	17.2300	16.2100	16.6044
May	16.6800	16.0400	16.4176
June	17.2300	15.9500	16.4873
July	16.0500	15.3400	15.6637
August	15.4200	14.4200	14.9205
September	14.6200	14.0400	14.1835
October	14.7300	14.2300	14.5088
November	14.7300	13.9500	14.3017
December	15.3300	14.3800	14.6713

Source: COMEX

LEASE RATES, 2018

Quarterly Averages

Average	3-month	6-month	12-month
Q1 2018	-0.4958	0.0685	-0.0082
Q2 2018	0.7940	0.0723	0.1098
Q3 2018	-0.7142	0.0693	0.3038
Q4 2018	-0.7832	0.0757	0.3089

Calculated using silver forward offered rate and LIBOR;
forward rates dataset was discontinued with effect from May 2014 and replaced with Silver Forward Lending Rate Composite.

The lease rates shown here are indicative, reflecting the difference between prevailing forward rates in the currency markets and in the silver market itself. They do not take into account the counter-party risk that any lender would apply to a transaction, or any other external influences, and should therefore be seen as a guide to the shape of the forward curve, rather than absolute levels.

Source: Eikon, Refinitiv

APPENDIX 5

LEADING PRIMARY SILVER MINES

Rank	Mine Name	Country	Company	2017 Tons	2018 Tons
1	Saucito	Mexico	Fresnillo plc.	660	618
2	Dukat	Russia	Polymetal International plc. [1]	551	513
3	Uchucchacua	Peru	Cia. De Minas Buenaventura S.A.A.	516	480
4	Fresnillo Mine	Mexico	Fresnillo plc.	514	470
5	San Julian	Mexico	Fresnillo plc.	328	455
6	Cannington	Australia	South 32 Ltd. [2]	375	416
7	San Jose	Mexico	Fortuna Silver Mines Inc.	234	248
8	Greens Creek	United States	Hecla Mining Company	231	247
9	Imiter	Morocco	Managem	244	244
10	La Colorada	Mexico	Pan American Silver Corp.	221	234
11	Palmarejo	Mexico	Coeur Mining	225	234
12	Pallancata	Peru	Hochschild Mining plc.	185	218
13	San Jose	Argentina	Hochschild Mining plc./McEwen Mining Inc	201	190
14	Ying	China	Silvercorp Metals Inc.	167	185
15	Rochester	United States	Coeur Mining	147	157

[1] including Goltsovoye; [2] reported payable metal in concentrate

SILVER MINE PRODUCTION BY SOURCE METAL

(tons)	2014	2015	2016	2017	2018
Primary					
Mexico	2,663	2,753	2,767	3,056	2,998
Peru	1,060	1,097	1,222	1,218	1,170
Russia	756	859	800	713	663
Other	3,514	3,452	3,441	2,506	2,136
Total	**7,993**	**8,160**	**8,230**	**7,493**	**6,967**
Gold					
Mexico	800	932	903	810	816
Peru	239	363	360	430	463
Argentina	293	423	282	300	415
Other	2,051	1,919	1,897	1,756	1,544
Total	**3,383**	**3,636**	**3,442**	**3,296**	**3,238**
Copper					
Peru	745	1,090	1,264	1,310	1,256
Poland	1,256	1,283	1,201	1,228	1,225
Chile	1,187	1,154	1,237	1,150	1,171
Other	2,411	2,455	2,605	2,572	2,594
Total	**5,599**	**5,982**	**6,306**	**6,260**	**6,245**
Lead/Zinc					
China	2,420	2,479	2,540	2,479	2,496
Mexico	2,098	2,089	1,855	1,943	2,057
Peru	1,756	1,726	1,761	1,613	1,619
Other	3,593	3,573	3,496	4,046	3,870
Total	**9,867**	**9,867**	**9,652**	**10,081**	**10,042**
Other	**150**	**151**	**158**	**145**	**124**
World Total	**26,993**	**27,797**	**27,789**	**27,276**	**26,616**

Source: GFMS, Refinitiv; Company Reports

SILVER MINE PRODUCTION BY MAIN REGION AND SOURCE METAL

(tons)	2014	2015	2016	2017	2018
North America					
Primary	3,179	3,300	3,360	3,548	3,470
Lead/Zinc	2,465	2,355	2,034	2,682	2,478
Copper	583	492	641	657	615
Gold	1,138	1,212	1,225	1,269	1,121
Other	78	86	90	79	74
Total	**7,442**	**7,445**	**7,350**	**8,235**	**7,758**
Central & South America					
Primary	2,688	2,742	2,875	2,261	1,809
Lead/Zinc	2,844	2,765	2,818	2,594	2,618
Copper	1,996	2,294	2,554	2,500	2,459
Gold	1,237	1,455	1,186	1,123	1,175
Other	22	15	18	16	0
Total	**8,788**	**9,270**	**9,451**	**8,495**	**8,061**
Asia					
Primary	**225**	**200**	**220**	**198**	**210**
Lead/Zinc	3,099	3,185	3,361	3,451	3,644
Copper	1,307	1,435	1,466	1,461	1,541
Gold	396	396	422	379	364
Other	50	50	50	50	50
Total	**5,077**	**5,266**	**5,519**	**5,539**	**5,809**
Rest of the World					
Primary	1,900	1,918	1,775	1,487	1,479
Lead/Zinc	1,459	1,563	1,440	1,353	1,302
Copper	1,713	1,762	1,645	1,642	1,629
Gold	613	574	609	524	578
Total	**5,685**	**5,817**	**5,468**	**5,006**	**4,988**
World Total	**26,993**	**27,797**	**27,789**	**27,276**	**26,616**

APPENDIX 6

COMEX FUTURES AND OPTIONS TURNOVER AND OPEN INTEREST, AND LONDON BULLION MARKET (LBMA) TRANSFERS

Turnover [3]	Comex				LBMA Clearing		
	Number of Contracts				Ounces		
	Futures		Options		transferred	Value	Number of
	Turnover [1]	Open Interest [2]	Turnover [1]	Open Interest [2]	(millions)	(US$bn)	transfers
2017 Jan	1,414,048	187,630	94,442	111,063	207.5	3.49	966
Feb	1,809,310	199,354	80,783	97,934	171.6	3.07	1,007
Mar	1,495,885	217,076	129,651	108,239	203.2	3.57	924
Apr	2,120,883	200,033	113,784	105,294	218.3	3.94	1,132
May	1,904,525	204,633	152,980	116,395	265.7	4.45	1,029
Jun	2,371,502	201,430	108,479	102,991	203.7	3.45	892
Jul	1,829,718	208,072	131,387	115,501	207.1	3.34	939
Aug	2,604,600	179,356	172,149	113,211	190.3	3.22	957
Sep	1,730,400	183,000	130,003	109,781	225.4	3.93	857
Oct	1,826,444	198,755	108,549	126,957	260.6	4.41	772
Nov	2,539,514	187,033	104,738	93,564	241.7	4.11	1,083
Dec	1,388,100	194,009	119,985	116,700	326.1	5.27	1,080
2018 Jan	2,186,615	198,246	158,284	151,840	306.4	5.26	1,096
Feb	2,155,693	192,118	129,662	140,872	233.4	3.89	954
Mar	1,842,321	229,252	125,745	151,782	198.8	3.27	834
Apr	2,625,756	193,851	117,207	175,093	248.8	4.13	1050
May	1,702,205	210,701	141,157	191,463	231.9	3.82	931
Jun	2,486,341	209,485	191,832	190,624	229.1	3.79	1004
Jul	1,582,406	227,415	143,979	202,544	210	3.30	904
Aug	2,364,109	212,641	197,561	221,366	180.9	2.71	899
Sep	1,648,326	204,131	151,172	226,174	218	3.11	817
Oct	1,793,534	211,879	146,547	245,758	211.4	3.08	842
Nov	2,299,125	184,700	169,002	210,531	220.2	3.16	985
Dec	1,300,620	176,289	114,737	221,151	261.8	3.85	1,082

[1] Monthly total; [2] Month-end; [3] Daily average; Source: LBMA, COMEX

SILVER ETP HOLDINGS

(Moz, end-period)	iShares Silver Trust	ETF Securities*	ZKB	Sprott Gold & Silver Trust	Other**	Total	Value US$ Bn***
2017 Q1	330.3	80.9	73.4	75.6	99.6	659.8	11.92
Q2	339.6	88.7	75.3	75.6	103.2	682.4	11.24
Q3	326.7	85.5	77.9	75.6	106.5	672.2	11.34
Q4	320.6	88.9	79.6	75.2	105.5	669.8	11.29
2018 Q1	319.0	89.0	78.6	72.8	108.6	668.2	10.8
Q2	323.8	85.3	75.3	68.6	107.9	664.5	10.6
Q3	332.9	87.0	78.6	64.3	106.3	669.3	9.57
Q4	317.2	83.1	79.3	63.7	106.1	649.5	10.04

*Includes ETF Securities LSE, Australia, NYSE, GLTR, and WITE & Hong Kong until they closed

**Other: includes Sprott Silver Trust, Julius Bär, DB Physical Silver, iShares Silver Bullion ETF, Silver Bullion Trust, Mitsubishi UFJ Tokyo, iShares Physical Silver ETC, Source Physical Silver, Royal Canadian Mint ETR

***Using the quarter-end London price

Source: Respective issuers; GFMS, Refinitiv

Back Cover Image: Sterling Silver Dazzle Pendant Necklace by Nambé

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