WORLD SILVER SURVEY 2017

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Industrias Peñoles, S.A.B. de C.V.

Pan American Silver Corp.

Silver Wheaton Corp.

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WORLD SILVER SURVEY 2017

Produced for The Silver Institute
by the GFMS team at Thomson Reuters

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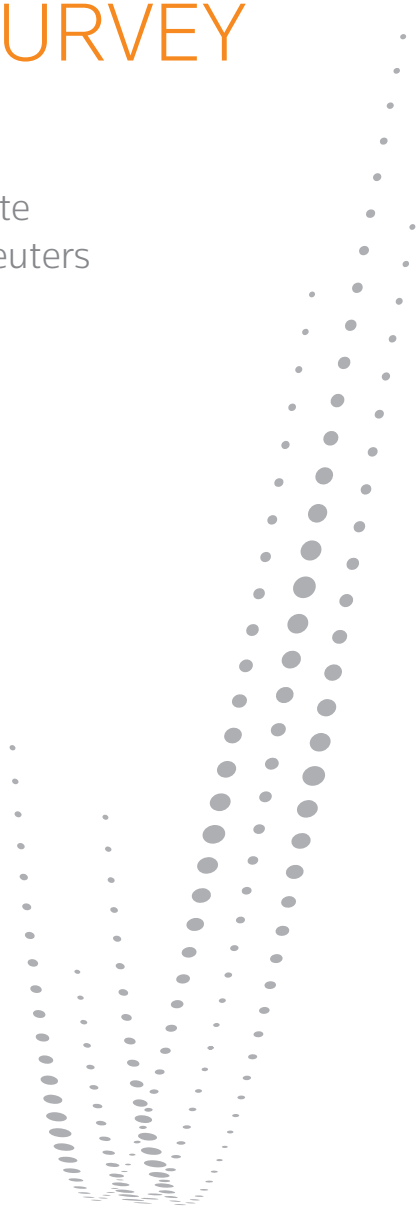

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ABOUT THE MAJOR SPONSORS OF WORLD SILVER SURVEY 2017

Coeur Mining, Inc.

Coeur Mining is a well-diversified, growing precious metals producer with five precious metals mines in the Americas employing over 2,000 people. Coeur produces from its wholly owned operations: the Palmarejo silver-gold complex in Mexico, the Rochester silver-gold mine in Nevada, the Kensington gold mine in Alaska, the Wharf gold mine in South Dakota, and the San Bartolomé silver mine in Bolivia. The Company also has a non-operating interest in the Endeavor mine in Australia. In addition, the Company owns the La Preciosa project in Mexico, a silver-gold exploration stage project. Coeur conducts exploration activities throughout North and South 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-Dipolos1, 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 2018, 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, founded in 1994, is currently the second-largest primary silver producer in the world, with seven operating mines in Mexico, Peru, Bolivia and Argentina, as well as mineral deposits and projects in the USA, Mexico, Peru and Argentina. Pan American's vision is to be the world's pre-eminent silver producer, with a reputation for excellence in discovery, engineering, innovation and sustainable development. The Company has a recognized team of industry-leading professionals with a wealth of experience in exploration, project development, mining operations, and corporate finance.

In 2016, Pan American produced 25.4 million ounces of silver and 183.9 thousand ounces of gold at consolidated cash costs of $6.29 per payable ounce of silver, net of by-product credits, 35% lower than in 2015. In 2017, Pan American expects to produce between 24.5 and 26.0 million ounces of silver and between 155 and 165 thousand ounces of gold at cash costs of between $6.45 and $7.45 per payable ounce of silver, net of by-product credits. Consolidated all-in sustaining costs per silver ounce sold for 2017 are expected to be between $11.50 and $12.90. Also in 2017, the Company expects to complete the expansions of its La Colorada and Dolores mines in Mexico, with remaining project capital estimated at between $58 to $62 million.

Pan American is traded on Nasdaq and the Toronto Stock Exchange under the symbol "PAAS". For more information, visit www.panamericansilver.com.

Silver Wheaton Corp.

Silver Wheaton is the largest precious metals streaming company in the world with the highest production and operating cash flow relative to its peers. The Company has entered into agreements to purchase all or a portion of the silver and/or gold production from high-quality mines for an upfront payment and an additional payment upon delivery of the precious metals. The Company offers investors leverage to increasing silver and gold prices, a sustainable dividend, and both organic and acquisition growth opportunities. Silver Wheaton offers these benefits while at the same time seeks to reduce many of the downside risks faced by traditional mining companies. For example, 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 silver and gold prices. Silver Wheaton currently has streaming agreements covering 22 operating mines and 8 development stage projects. The Company's production profile is driven by a portfolio of world-class 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-seventh annual edition of the World Silver Survey produced for The Silver Institute. The World Silver Survey 2017 was produced by the GFMS team of metals market analysts at Thomson Reuters. 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.

Thomson Reuters 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.

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1. SUMMARY AND OUTLOOK

Last year was a turning point for silver prices on an annual average basis, with dollar denominated prices up 9.3% to $17.14/oz, marking the first increase since 2011. This performance was aided by a deficit of 147.5 Moz (4,788 t), the largest for three years. Central to this performance was a turnaround in investor interest in Exchange Traded Products (ETPs), aided by geopolitical uncertainty. As a result, investors purchased a net 47.0 Moz (1,461 t) of ETPs, a four-year high, sending ETP holdings to a record level.

The strength in silver prices however was far from solely due to investors. The physical balance recorded a deficit for the fourth successive year, albeit a markedly smaller one of 20.7 Moz (643 t). Indeed, arguably the key reason for the smaller deficit was the softer offtake from retail investors of coins and bars after the record level of 2015. Even this performance masks some divergence, with coin fabrication remaining exceptionally strong in the first half of last year and at the second highest level ever. In contrast, bar demand struggled, with Indian offtake slumping dramatically. This is hardly surprising given that the level of demand had been aided by bargain hunting in 2015 and the price rise led some investors to take profits. Jewelry demand also came under pressure from rising prices but despite this it remained above 200 Moz (6,220 t) for the fourth successive year. Meanwhile, both the photovoltaic and ethylene oxide sectors saw record high demand for silver despite ongoing thrifting. In the photovoltaic sector, silver demand rose by 34% as the number of global installations shot up.

On the supply side, mine output fell, albeit marginally, for the first time since 2002, due to lower capital expenditures in prior years. More surprisingly, despite the rise in silver prices, scrap flows dropped to a 24-year low. Finally, there was a return to modest dehedging by producers for the first time since 2013. Therefore, total supply dropped for the second year in a row.

During the first quarter of 2017 silver prices rose from below $16/oz to peaks over $18/oz with investor sentiment playing a pivotal role as geopolitical concerns rose.

TABLE 1 - WORLD SILVER SUPPLY AND DEMAND

(million ounces)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Supply										
Mine Production	667.7	684.7	717.3	753.0	758.3	791.7	823.7	868.6	890.8	885.8
Net Government Sales	42.5	30.5	15.6	44.2	12.0	7.4	7.9	-	-	-
Scrap	203.7	200.4	200.1	226.4	260.1	253.8	191.0	165.3	141.1	139.7
Net Hedging Supply	-24.1	-8.7	-17.4	50.4	12.2	-47.1	-34.8	16.8	7.8	-18.4
Total Supply	**889.8**	**907.0**	**915.6**	**1,074.1**	**1,042.7**	**1,005.8**	**987.8**	**1,050.7**	**1,039.7**	**1,007.1**
Demand										
Jewelry	182.3	177.6	176.9	190.0	191.5	187.4	221.8	227.9	228.3	207.0
Coins & Bars	61.6	196.6	92.9	147.7	208.4	159.2	240.6	234.0	290.7	206.8
Silverware	60.2	58.4	53.2	51.6	47.2	43.7	58.8	60.7	62.9	52.1
Industrial Fabrication	646.0	641.8	528.2	633.8	661.4	600.0	604.5	595.7	569.6	561.9
....of which Electrical & Electronics	262.5	271.7	227.4	301.2	290.8	266.7	266.0	263.4	245.9	233.6
...of which Brazing Alloys & Solders	58.6	61.8	53.8	61.2	63.2	61.1	63.7	66.7	61.5	55.4
...of which Photography	117.0	98.2	76.4	67.5	61.2	54.2	50.5	48.5	46.6	45.2
...of which Photovoltaic*	-	-	-	-	75.8	58.2	55.9	51.8	57.2	76.6
...of which Ethylene Oxide	7.9	7.4	4.8	8.7	6.2	4.7	7.7	5.0	10.2	10.2
...of which Other Industrial*	200.0	202.7	165.8	195.2	164.1	155.0	160.8	160.5	148.4	141.0
Physical Demand	950.2	1,074.5	851.1	1,023.1	1,108.5	990.2	1,125.8	1,118.3	1,151.5	1,027.8
Physical Surplus/Deficit	**-60.3**	**-167.5**	**64.5**	**50.9**	**-65.8**	**15.6**	**-137.9**	**-67.6**	**-111.8**	**-20.7**
ETP Inventory Build	54.8	101.3	156.9	129.5	-24.0	55.3	2.5	1.5	-17.7	47.0
Exchange Inventory Build	21.5	-7.1	-15.3	-7.4	12.2	62.2	8.8	-5.3	12.6	79.8
Net Balance	**-136.6**	**-261.7**	**-77.2**	**-71.1**	**-54.0**	**-101.9**	**-149.2**	**-63.8**	**-106.7**	**-147.5**
Silver Price, $ per oz.	13.38	14.99	14.67	20.19	35.12	31.15	23.79	19.08	15.68	17.14

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

WORLD SILVER SURVEY: SUPPLY AND DEMAND METHODOLOGY

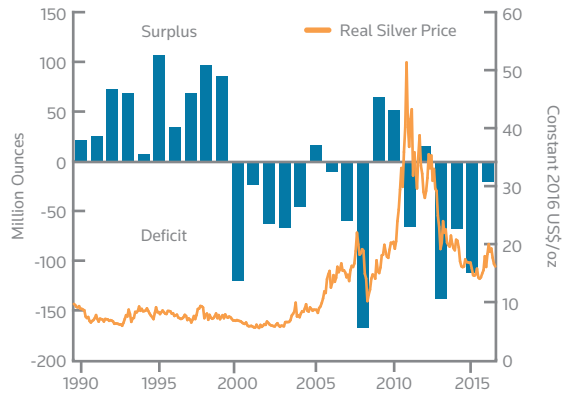
In the silver market physical surpluses and deficits explain and on occasions influence the price, margins, premia and, for example, in the second half of 2015, lead times. However, physical surpluses and deficits are not the only influence on short term price fluctuations. This is due to the fact that, unlike solely industrial metals, there is also substantial demand for silver as a financial asset. Highlighting this is the fact that ETP holdings rose to a record high last year and approximately a fifth of demand for new silver came from the physical coin and bar sector as investors increased their private holdings.

Silver also has an active Over-the-Counter (OTC) market, which acts as a mechanism for risk and price management. OTC trade can have an important impact on silver prices because of the scale of this segment of the market. A broad rule of thumb is that LBMA loco London volumes are roughly twice the LBMA's published transfer numbers and that in order to estimate the global OTC volume we need to assume that loco London accounts for approximately 70% of the total. Interestingly, until only a few years ago loco London accounted for roughly 90% of the global total, but the shifts in the geographical distribution of the market means that we are now looking at around 70%. Indeed after dropping in recent years, 2016 saw global silver transfers increase again surpassing the 100 Bn oz threshold convincingly for the first time since 1999, representing approximately $2.1 Trn; by far its highest level on record. Our full assessment of the impact of investment flows on silver last year can be found in Chapter 3.

Another factor that typifies the difference between silver and 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, affect prices as well. Indeed, old jewelry scrap, coins and bars make up a significant part of the scrap pool (and they are arguably the only truly price-sensitive elements in the market) as opposed to scrap collected from recycled electronics, for example.

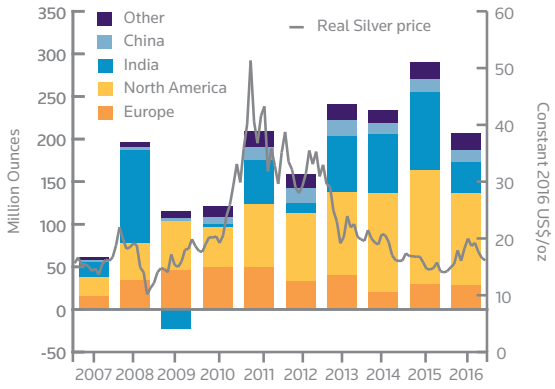
Thomson Reuters' supply and demand statistics are collected and collated by a team of full time research analysts based in Australia, China, the United Kingdom, India and Singapore within an extensive field research program that includes interviewing participants throughout the industry. When undertaking 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, Thomson Reuters also collects information and data on government sales and acquistions and collates producer hedging and de-hedging levels. As part of compiling the statistics, the GFMS team at Thomson Reuters 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, Thomson Reuters

WORLD COIN AND BAR DEMAND



Source: GFMS, Thomson Reuters

SUPPLY IN 2016

- ***Global silver mine production declined by 0.6% in 2016, reaching a total of 885.8 Moz (27,551 t).***

- ***Higher silver prices failed to elicit a rise in scrap returns in 2016, slipping 1% year-on-year to 139.7 Moz (4,345 t).***

Worldwide silver **mine production** contracted slightly for the first time since 2002, registering a relatively modest 0.6%, or 5.0 Moz (157 t), decline year-on-year. A large portion of the drop was attributable to the lead/zinc and gold sectors, where production fell by a combined 15.9 Moz (495 t). Of the key producing countries, Mexico registered the largest drop at the global level, followed by Australia and Argentina. Offsetting the losses was higher output from the copper and primary sectors, led by two low-cost operations in Peru. We estimate that on a co-product accounting basis, Total Cash Cost + Capex at the global level stood at $11.38/oz, up 5% from last year. This noteworthy outcome came from a 13%, or 122.0 Moz (3,795 t) drop in silver equivalent ounces, partially offset by a 6% contraction in capital expenditure to $2 Bn.

Despite higher silver prices, global **scrap** supply edged lower last year, by 1% to 139.7 Moz (4,345 t), the lowest volume since 1996. This outcome, while slightly counterintuitive given the higher silver price, was largely driven by lower Asian flows due in part to weaker industrial fabrication volumes, which weighed on process remelt as stock levels were run down and liquidated. Supply from the industrialized world was also muted, remaining unchanged on 2015 volumes as a jump in flows from the United Kingdom, and Europe more broadly, offset falls across North America and Japan.

The producer community delivered into their silver hedges last year, to leave the **hedge book** amounting to 20.6 Moz (640 t). GFMS calculates that delta hedging activities on behalf of the producers removed 18.4 Moz (572 t) of silver supply from the market over the year. This outcome was primarily led by Industrias Peñoles, though partially offset by fresh new hedging from KGHM Polska Miedz and Minera Frisco.

DEMAND IN 2016

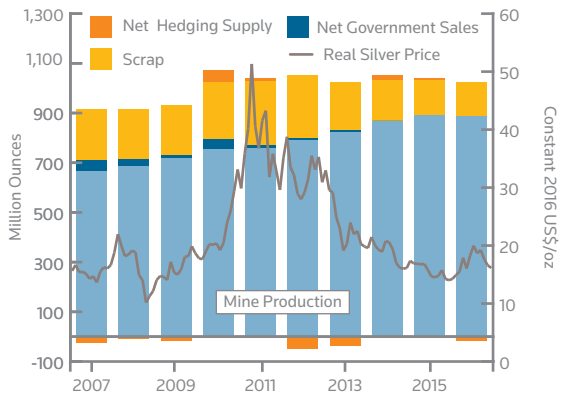
- ***Total physical demand fell by 11% last year to 1,027.8 Moz (31,968 t), dragged lower by weaker jewelry, silverware, and retail investment.***

- ***The largest falls were recorded from coin and bar investment, which declined 29% last year to 206.8 Moz (6,431 t), with a slump in Indian purchases accounting for the bulk of the fall.***

- ***Jewelry fabrication fell 9% in 2016 to 207 Moz (6,438 t), a four-year low, as higher prices and moribund economic conditions dragged consumption lower in key markets, most notably in China and India, which both fell acutely.***

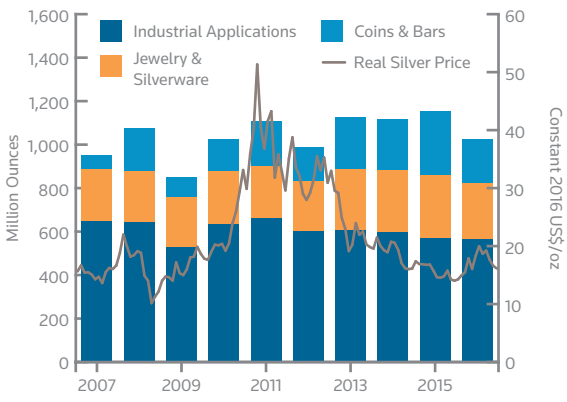
- ***Industrial fabrication slipped to 561.9 Moz (17,478 t), down 1% from the previous year. Declines in electronics, brazing alloys & solders, and photography were partially offset by another record high from photovoltaic applications, while ethylene oxide catalyst demand remained unchanged.***

WORLD SILVER SUPPLY



Source: GFMS, Thomson Reuters

WORLD SILVER DEMAND



Source: GFMS, Thomson Reuters

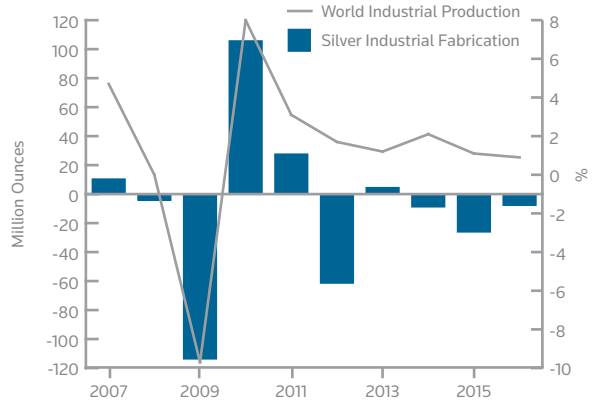
Total **physical demand** saw a 11% drop in 2016, falling to 1,027.8 Moz (31,968 t). The weakness was experienced across the board with a hefty decline in retail investment from stellar levels the previous year, and a multi-year low for jewelry and silverware fabrication dragging the annual total lower. Industrial demand slipped only at the margin with another surge in offtake from the photovoltaic sector unable to offset falls across the other industrial sectors.

Following a 4% fall in 2015, **industrial** fabricators consumed 561.9 Moz (17,478 t) of silver last year, a drop of just over 1% or 7.7 Moz (239 t). Another year of significant expansion from the photovoltaic sector to a new record level was offset by falls across most other industry segments. The demand for ethylene oxide (EO) was stable, but electrical and electronic and brazing alloys and solders and other miscellaneous applications were all victims of weaker economic conditions which dragged down silver consumption. Photographic demand continued its long term downtrend though the rate of attrition is now easing and appears close to stabilizing.

Photographic fabrication demand for silver retreated by just 3% in 2016, slipping to 45.2 Moz (1,405 t), just 20% of the volume recorded at its peak in 1999. Nonetheless, this marked the lowest percentage decline seen since 2004. Indeed, it would appear that demand has now largely stabilized; 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.

Photovoltaic (PV) demand for silver surged again in 2016, up 34% from the previous year. This growth was the strongest since 2010 and was driven by a 49% increase in global solar panel installations, fueled largely by a doubling of annual solar panel installations in China and the United States.

SILVER INDUSTRIAL FABRICATION



Source: GFMS, Thomson Reuters

In 2016, silver **jewelry** fabrication declined 9% from the record level achieved the previous year to 207.0 Moz (6,438 t). The losses were widespread, led lower by heavy falls in the developing world, most notably in China and India, where demand was materially weaker due to higher silver prices, a build-up of stocks, and in the case of India the introduction of an excise duty on gold which had a spillover effect. Elsewhere in Asia, demand was stronger in Indonesia and Vietnam as a jump in exports and stronger domestic consumption boosted fabrication volumes. Demand in the industrialized world also suffered, despite a more optimistic economic outlook, with offtake in North America slipping 2% year-on-year, as healthy United States demand was more than offset by falls in Mexico and Canada.

Silverware fabrication also retreated, declining 17% in 2016 to an estimated 52.1 Moz (1,621 t). Higher silver prices accounted for the bulk of the fall, most notably in price sensitive markets where weaker domestic currencies accentuated the rise in the dollar price.

Identifiable investment, which consists of physical bar investment, coins & medals purchases, and additions or drawdowns to ETP holdings, retreated 7% from the impressive level achieved in 2015 to 253.8 Moz (7,893 t) last year. To put this in a broader context, this level of investment was still 23% higher than the average over the decade preceding 2015. A close analysis of the individual segments of our identifiable investment figure reveals a significant decline in bar and coin demand last year, with falls of 46% and 9% respectively, the latter dragged lower by a material fall in India. Meanwhile, ETP holdings increased by 47.0 Moz (1,461 t) last year, reaching an all-time high in late October.

Silver coin fabrication fell in 2016 by 9% from the all-time high in 2015, to bring total **coin and medals** fabrication to 123.2 Moz (3,831 t). As a result, fabrication was still at its second highest level this century, with demand actually up year-on-year in the first half of 2016.

2. SILVER PRICES

- ***The LBMA silver price averaged $17.14/oz in 2016, a 9.3% increase year-on-year. Prices traded in a range of $13.58/oz-$20.71/oz, beginning the year at $14.00/oz and ending it at $16.24/oz.***

- ***The silver price appreciated by 40% during the first three quarters of 2016, but lost 16.1% in the final quarter. The market optimism after Trump's victory prompted capital flows from safe haven assets into riskier assets, and the Federal Reserve's decision to raise interest rates at the end of the year contributed to further strength in the dollar.***

At the beginning of 2016, silver prices were being aided by gold's strength, as the market fully digested the Federal Reserve's decision to raise interest rates near the end of 2015. The turmoil in global equity markets in the beginning of the year, drove the gold price up by $51.80/oz or 5.0% in the first month of the year, emphasizing gold's nature as a safe haven asset. The silver price was up by only 1.9% during the same time period, benefiting from the rally in gold and short-covering activities in the futures market. Silver's upward momentum continued in the next two months, stimulated by Draghi's (President of the European Central Bank) comments on the likely cessation of further easing measures for the ECB and the implication from the Federal Reserve (FOMC) meeting in March of a reduction in the number of rates rises in 2016. Silver closed at $15.38/oz at the end of March, 11.3% higher than the level at the beginning of the year.

Silver's strength accelerated in April, gaining more than 16% during the month to $17.86/oz, and was its best monthly gain since 2013. It also represented a 29% rise from the opening of the year, helping silver outperform all its precious metals counterparts. The strength was aided by a weaker dollar, as the dollar index plummeted to the 92 level, the lowest since January 2015. A slowdown in the U.S. manufacturing sector and consumer spending lowered expectations for an interest rate hike, and hence the weakness in the dollar. However, after a buoyant April, silver went through a full month of correction. The dollar index bounced back from April's low given a series of stronger-than-expected U.S. economic data in April. This dragged down metal prices, while the dollar index and the domestic equities edged higher. Silver prices, however, did rebound in June, partially supported by the surprising

US$ SILVER PRICE

	1986	1996	2006	2016
Annual Average	5.46	5.20	11.55	17.14
Maximum	6.31	5.83	14.94	20.71
Minimum	4.85	4.71	8.83	13.58
Range:Average	27%	21%	53%	42%

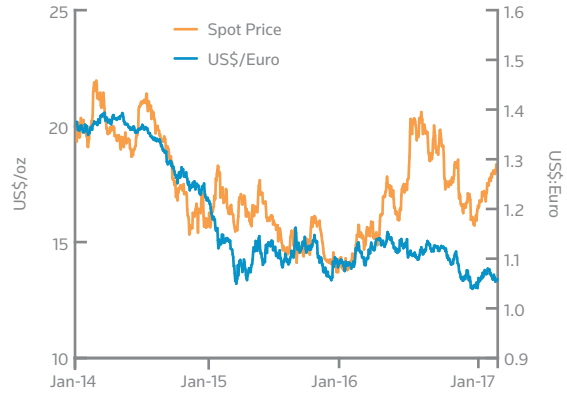
Source: LBMA; GFMS, Thomson Reuters

THE SILVER PRICE IN OTHER CURRENCIES IN 2016

	Euro/kg	Rupee/kg	Yen/10g	Yuan/kg
Annual Average	497.71	41,752	595.6	3,818
Maximum	595.27	48,530	690.6	4,473
Minimum	399.2	33,650	518.7	3,193
Range:Average	39%	36%	29%	34%

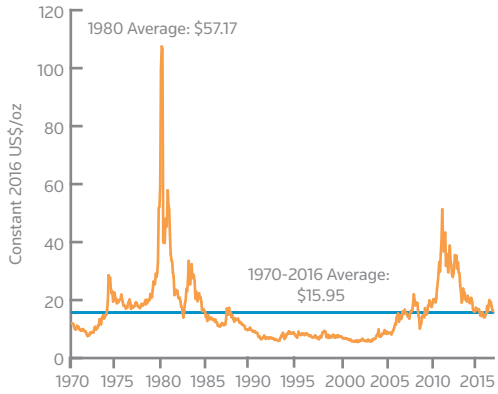
Source: GFMS, Thomson Reuters

THE SILVER PRICE AND THE U.S. DOLLAR



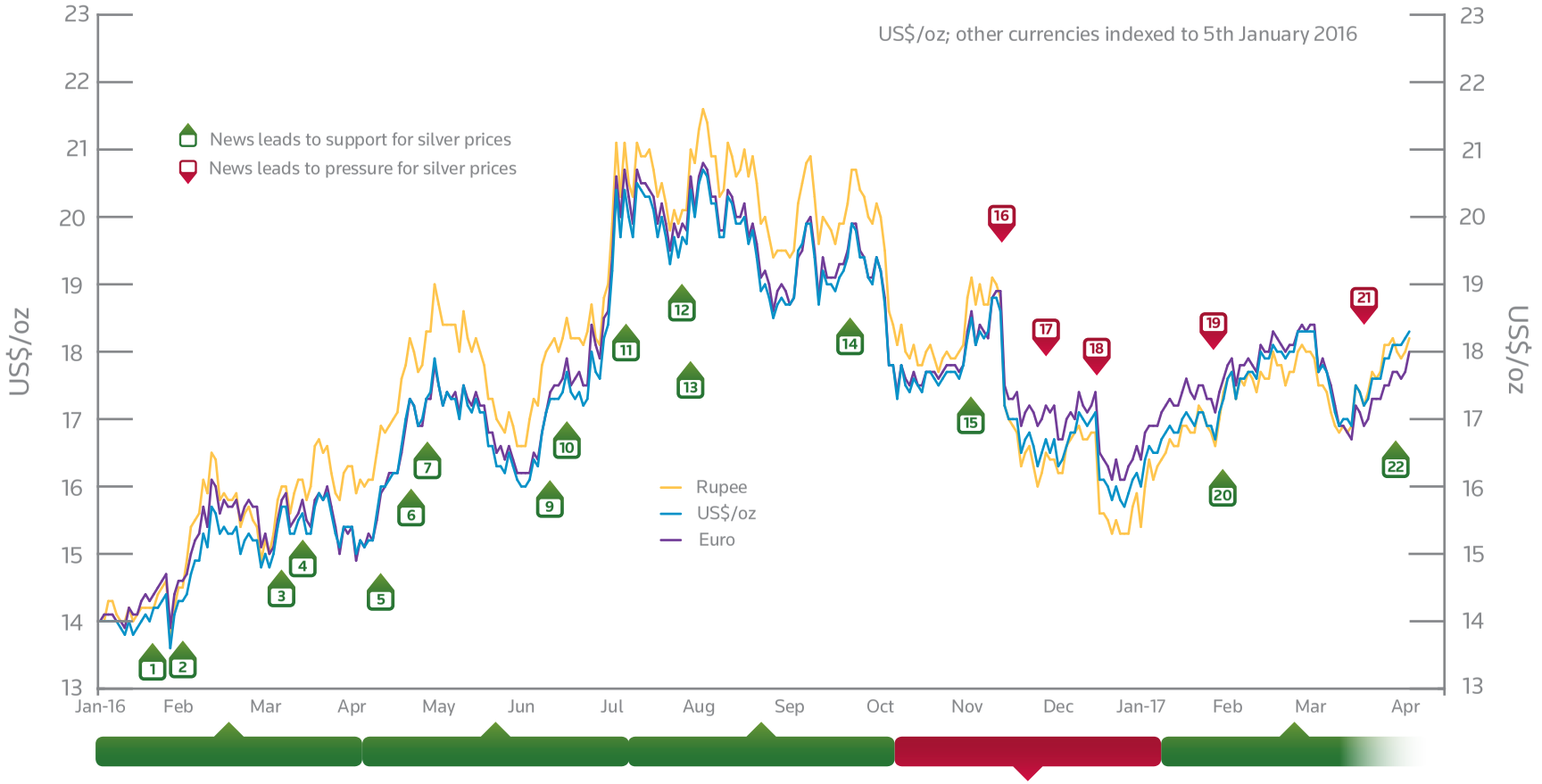
Source: Thomson Reuters Eikon

MONTHLY REAL SILVER PRICES ($2016)



Source: Thomson Reuters Eikon; GFMS, Thomson Reuters

LONDON SILVER MARKET: SPOT PRICE



1 (01/25-26/16): Silver tests $14.50/oz on renewed weakness in oil and stock market. Fed leaves rates unchanged

2 (02/01/16): US Dollar Index (DXY) fails to break above 100 level on weak factory data in China. Precious metals rise

3 (03/10/16): European Central Bank (ECB) cuts deposit rate by 10 basis points (bps)

4 (03/15-16/16): March FOMC Meeting, rates unchanged

5 (04/11/16): Gold tests $1,300/oz drawing confidence from continued low interest rates. Weak economic data boosts investor appetite.

6 (04/26-27/16): April FOMC Meeting, rates unchanged

7 (04/28/16): Bank of Japan decides to hold off expansionary monetary stimulus. US dollar under pressure

8 (05/18/16): Dollar hits three week high after strong CPI data. Fed rate hike expectation weigh-in

9 (05/14-15/16): June FOMC Meeting, rates unchanged

10 (06/23/16): The United Kingdom (UK) voted to leave the European Union (EU).

11 (07/16/16): Terrorist attack in Nice, France leave 84 people dead, 100 injured

12 (07/26/16): July FOMC Meeting, rates unchanged.

13 (07/29/16): Silver closes 16% up month-on-month

14 (09/20-21/16): September FOMC Meeting, rates unchanged

15 (10/01-02/16): November FOMC Meeting, rates unchanged

16 (11/08/16): Donald Trump is elected the 45th President of the United States of America

17 (11/30/16): OPEC agrees to first output cut in eight years

18 (12/13-14/16): December FOMC Meeting, Fed raises rates by 25 bps

19 (01/26/17): S&P500, Dow Jones, and Nasdaq Composite Index hit record highs on the back of escalating inflationary expectations

20 (01/31/17): DXY falls below 100 level following comments by Trump on currency manipulation

21 (03/14/17): Speculative net long position hits a two week low as investors cut silver exposure by 10 Moz according to COMEX futures positions

22 (03/22/17): US Mint American Eagle coins sales rise above the 1 million mark. Prices tested $17.60/oz again on an intra-day basis

Source: GFMS, Thomson Reuters

Brexit vote, forcing capital reallocation into precious metals as safe haven assets. For the first half of the year, silver gained 33% while gold increased by 25%.

The risk-off sentiment across the markets continued to support silver in July, as the silver price broke through the level of $20/oz on widespread buying. Silver prices peaked at $20.71 on 2nd August, and began a series of corrections thereafter, as hawkish comments from the Federal Reserve raised markets' expectation of a possible rate hike in the near future, which caused a general weakness across the commodities sector and a modest rebound in the dollar index. A small bounce in the following month helped silver regain the $19/oz level, ending the quarter at $19.35/oz, with the price realizing a 40% gain since the end of 2015.

With the markets directing their attention to the possibility of further interest rate hikes, the silver price plunged sharply in October, dropping over 8% during the month. The surprising win of Donald Trump in the U.S. presidential election in November did not help the silver price either, as markets became optimistic towards the economic outlook under the Trump presidency. Capital flowed out from risk free assets to equities as well as base metals, and the dollar index spiked. Silver fell 6.1% in November while gold fell 7.4%.

Market optimism carried forward to December, as both the domestic equities market and the dollar index continued inching higher. The silver price was relatively stable for the first half of December, dragged down along with gold after the Federal Reserve decided on the 14th December to raise interest rates. The S&P 500 equity index gained 9.5%

VOLATILITY (US$ PRICE)

	2013	2014	2015	2016
Annual	32%	22%	24%	28%
	Q1-16	**Q2-16**	**Q3-16**	**Q4-16**
Quarterly	26%	25%	32%	30%

Source: GFMS, Thomson Reuters

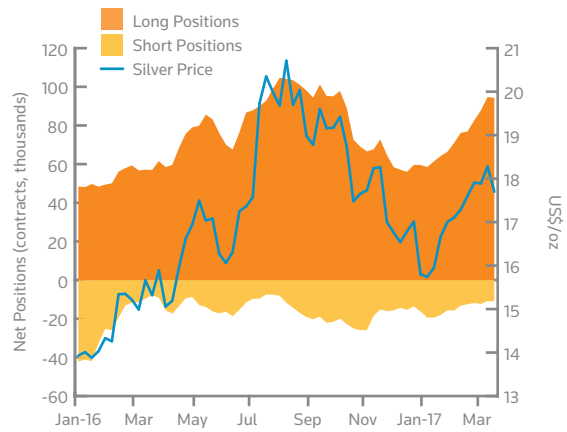
during the year, while the dollar index closed the year at 102.21, a 3.6% increase annually. The silver price lost 16.1% during the final quarter, but still managed to gain 17.5% for the full year in 2016. Meanwhile, the gold price rose 8.1% in 2016.

Silver price volatility edged higher, to 28% in 2016, from 24% the previous year. For reference, silver price volatility on an annual average basis was as high as 61% in 2011. The volatility of silver increased substantially in the second half of last year, when the market focused on the Federal Reserve's timetable on the interest rate which resulted in a stronger dollar.

CHINESE SILVER PREMIA

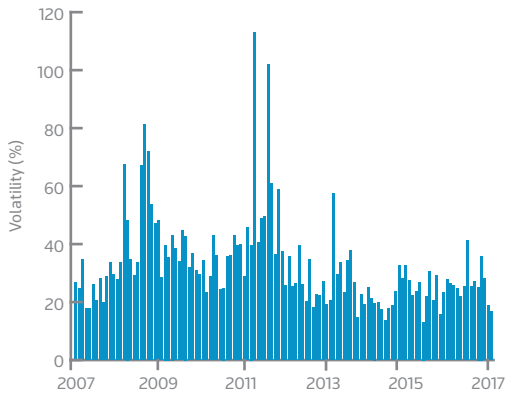
All the silver prices quoted on the domestic futures exchanges in China are inclusive of a 17% Value Added Tax (VAT). Silver prices quoted on the Shanghai Gold Exchange (SGE) increased 24.2% in Chinese yuan terms last year. Despite the impressive return in local terms, lackluster domestic demand, along with the increasing stockpiles, caused the Chinese silver premia to decline from $1.24/ oz in 2015 to $0.74/oz in 2016. Silver inventories at the Shanghai Futures Exchange (SHFE) increased from 19.2 Moz (596 t) at the end of 2015 to 59.7 Moz (1,858 t)

COMEX LONG AND SHORT MANAGED MONEY POSITIONS



Source: CFTC

DAILY SILVER PRICE VOLATILITY



Source: GFMS, Thomson Reuters

a year later, while inventories at the SGE increased from 15.7 Moz (490 t) to 32.1 Moz (999 t) during the same time frame. The total increase of 56.9 Moz (1,770 t) or of 163% year-on-year in inventories at both exchanges reflected the sluggishness of the Chinese economy. Indeed, due to poor domestic demand and high stockpiles, many Chinese are not optimistic about silver's price in the longer run, as higher prices could induce further inventory stockpiling in the country.

SILVER IN OTHER CURRENCIES

While average silver prices increased 9.3% in U.S. dollar terms last year, prices rose 14.2% and 21.4% in yen and euro terms respectively. The particular weakness in the British pound last year, due to the result of the Brexit vote, caused silver prices to jump 40.4% in domestic terms. Silver prices in India also rose 19.6% in local terms last year.

While the market continued to spend most of its attention speculating on the Fed's interest rate timetable, particularly in the second half of the year, the appreciation of the dollar actually slowed down in 2016. The dollar index opened the year at 98.6, and closed the year at 102.2, an increase of 3.6% in 2016, after appreciating 9.3% in 2015.

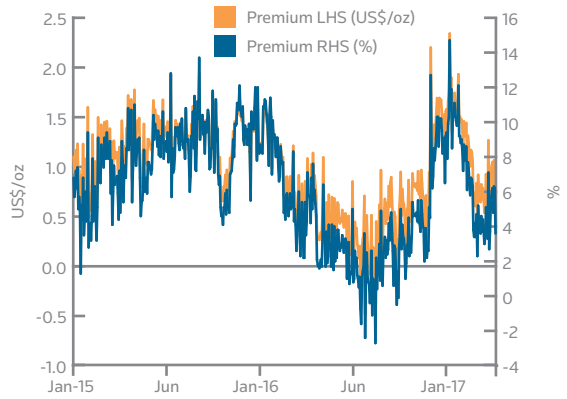
GOLD:SILVER RATIO

The gold:silver ratio began 2016 at 77.3, traded between 65.4 and 83.7 throughout the year, and ended the year at 71.4. That makes the ratio average 73.4 for the full year, a less than one percent decrease from the 2015 average. Less than stellar economic data from the United States caused turmoil in global stock markets, emphasizing gold's nature as a safe haven asset. The gold:silver ratio rose beyond the 80 level towards the end of February and lasted there until mid-March, indicating market concerns and the reluctance in taking risks during that time. However, as strong rebounds in global equities were seen across the board, the gold:silver ratio also started to retreat. Throughout history, the gold:silver ratio has tended to be very high during periods of time encompassing major wars, economic recessions or market panics. Indeed, when looking back at history, the gold:silver ratio quickly rose from the 50s in 2007 to an average of 60s during the 2008 financial crisis, with the ratio also staying above the 80 level for two straight months during that year.

The gold:silver ratio ranged between 68.0 and 72.2 during the first quarter of 2017, averaging 70.0 during the period. The retreat of the ratio was in conjunction with market optimism after Donald Trump won the Presidential election in November 2016. Financial markets believed the U.S. economy would continue trending upwards under Trump's leadership, buoyed by rising optimism of tax cuts and reforms in domestic spending. Capital flowed from risk haven assets into riskier assets, with the U.S. equity indices making historical highs. However, the strong momentum in equities started to lose steam in March, particularly after Trump needed to withdraw his healthcare bill after it failed to gain enough support to pass in Congress, unsettling the market and instilling doubt as to whether tax cuts and infrastructure spending would meet the same fate. After spending most of February at the level under 70, the gold:silver ratio crept back above the 70 level in March.

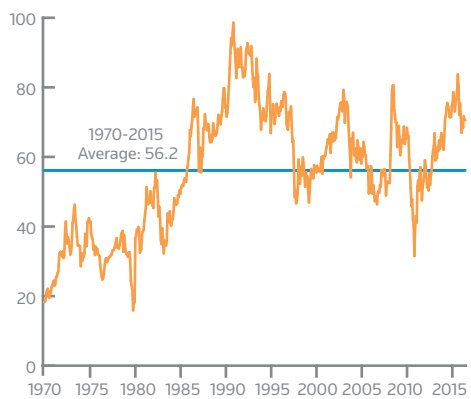
SILVER PRICES

SGE SILVER PREMIA



Source: Shanghai Gold Exchange; GFMS, Thomson Reuters

THE GOLD / SILVER PRICE RATIO



Source: Thomson Reuters Eikon

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 is insufficient to establish direct causality.

Silver's strongest sustained relationship remained with gold over the course of 2016 and throughout the first quarter of 2017. During the first quarter of 2016, a weaker dollar propelled gold and silver upwards. The turmoil in global equity markets, along with weaker than expected economic figures from the United States, dashed any hope that the Federal Reserve would raise interest rates anytime soon. Due to the weaker dollar, most of the commodities, including oil, went up in the first quarter.

The dollar weakened further in April, only followed by a bounce back in May that caused some major corrections in the metals sector. Oil and the S&P GSCI (an index of commodity prices), both laggards within the commodities sector, continued to advance in May. The Brexit vote in late June saw capital flowing into risk free assets, with both gold and the dollar leading the way, while other assets were sold off. Silver, copper and other commodities benefited from gold's strong momentum and began to rebound days after the Brexit vote.

The risk-off sentiment across markets continued to support the equities as well as metals in July. Silver broke through the $20/oz level for the first time since the third quarter of 2014 on widespread buying. In contrast, the oil price collapsed by 16% in July, with the market concerned that the reserves of the United States remained at high levels despite a slowdown in production and the increasing production output from Saudi Arabia. While silver prices peaked in early August and began to retreat, oil prices came back in a big way, with the market speculating that there could be a possible global output freeze at OPEC's upcoming meeting.

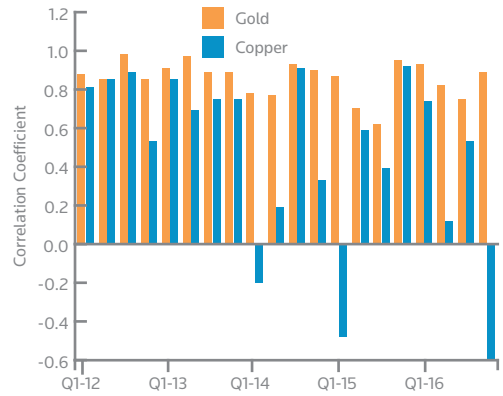
The anticipation of interest rate hikes in the final quarter of the year, along with Trump's election, caused enormous optimism in the market and the dollar surged. Capital flowed from risk free assets into equities. Base metals also surged on Trump's infrastructure plans for the United States. However, gold and silver were sold heavily. The dollar has weakened since the start of 2017 and was dealt another blow immediately following the U.S. interest rate hike in March. Metals continued moving upwards, along with equities while oil prices turned weaker. The trend in the dollar, as well as the pace of growth in the global economy, will undoubtedly have a big influence on the silver prices for the rest of the year.

CORRELATIONS OF CHANGES IN DAILY PRICES

	Q1 16	Q2 16	Q3 16	Q4 16	Q1 17
Gold	0.89	0.08	-0.21	0.54	-0.17
US$ Index	-0.68	-0.14	0.01	-0.74	0.81
Oil (WTI)	0.28	0.53	0.30	-0.08	0.75
CRB Spot Metals	0.84	0.65	-0.28	-0.22	0.58
S&P GSCI	0.52	0.56	0.28	-0.21	0.77
Copper	0.71	-0.02	0.46	-0.73	0.74
S&P 500	0.25	0.73	-0.25	0.48	0.68

Source: GFMS, Thomson Reuters

QUARTERLY CORRELATION OF THE SILVER PRICE



Source: Thomson Reuters Eikon; GFMS, Thomson Reuters

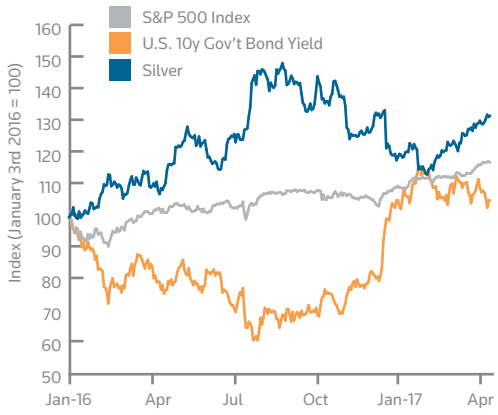
GOLD & SILVER PRICES & S&P INDEX

Source: Thomson Reuters Eikon

3. INVESTMENT

- ***Identifiable Investment, which includes physical bar investment, coins and medals and changes to ETP holdings, dropped 7% to 253.8 Moz (7,893 t) in 2016.***
- ***In 2016 coin and bar investment failed to match the all time high of 2015 and fell by 29% to 206.8 Moz (6,431 t), despite very strong coin demand in the first half of the year. Meanwhile investors bought a net 47.0 Moz (1,461 t) from ETP holdings, which hit an all-time high in October.***
- ***Last year, annual identifiable investment in value terms increased 2% to an estimated $4.4 billion as silver prices rose.***

EQUITY, FIXED INCOME, & SILVER PERFORMANCE



Source: Thomson Reuters Eikon

OVERVIEW

Identifiable investment, which consists of physical bar investment, coins & medals purchases, and additions or drawdowns to ETP holdings, could not match the impressive level achieved in 2015 last year and decreased to 253.8 Moz (7,893 t) in 2016, a 7% fall. To put this in a broader context though this level of investment was still 23% higher than the average over the decade preceding 2015. The increase in value terms was due to the price rise, posting a 2% gain to $4.4 Bn.

Following the record high level of coin and bar investment of 290.7 Moz (9,042 t) in 2015 it was perhaps unsurprising that demand dropped last year by 29%. This decline masks a divergence across the year and between coins and bars. Coin purchases decreased by a more modest 9% and was still at the second highest level this century of 123.2 Moz (3,832 t). This decline was entirely focused on the second half of the year, with fabrication higher in the first half of 2016 as sales remained exceptionally strong across all regions despite prices rising from the low levels that had initially sparked this wave of purchasing. However, after a year of exceptionally high interest, coin fabrication tumbled in the middle of the year and it was only in November and December, when prices were noticeably softer again, that demand truly picked up.

Bar demand meanwhile weakened much more than coins, with offtake dropping by 46% to 83.6 Moz (2,600 t). However, even after this admittedly sharp drop bar demand was still only at a four year low and a significant multiple of demand in the years leading up to the global financial crisis. It is also noteworthy that the performance was far

WORLD IDENTIFIABLE INVESTMENT

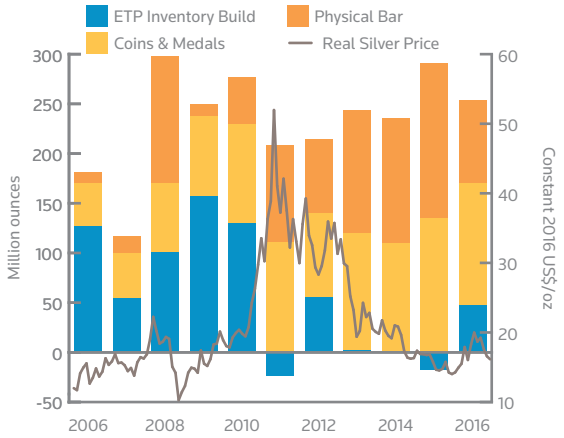
(million ounces)	2014	2015	2016
Physical Bar Investment	126.0	155.2	83.6
Coins & Medals	108.0	135.4	123.2
ETP Inventory Build	1.5	-17.7	47.0
Total Identifiable Investment*	**235.5**	**273.0**	**253.8**
Indicative Value US$(bn)**	**4.5**	**4.3**	**4.4**

* 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, Thomson Reuters

WORLD IDENTIFIABLE INVESTMENT



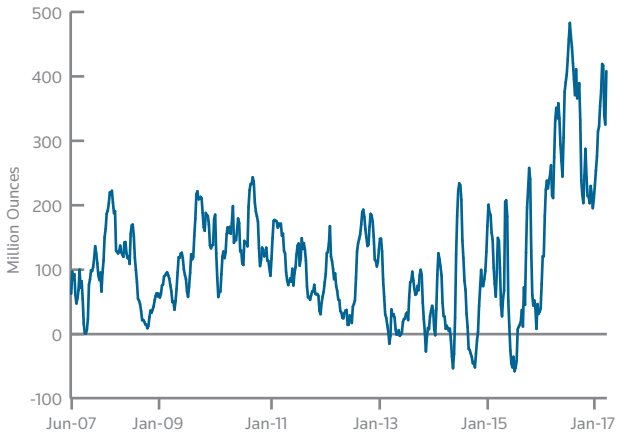
Source: GFMS, Thomson Reuters

from even across the globe. The decline was dominated by the particular characteristics of the Indian market, which had represented 53% of global bar demand in 2015. In 2016, Indian demand was down by two-thirds, representing almost four-fifths of the worldwide drop, and as discussed in more detail later in the chapter this was due to the combination of higher prices, government measures on unaccounted wealth and destocking. Elsewhere there were also significant declines in China and the United States. On a brighter note, there were increases in demand in Germany and the United Kingdom, the latter helped by post-Brexit uncertainty.

In contrast to physical coins and bars, investors in ETPs increased holdings by 47.0 Moz (1,461 t) last year. As a result ETP holdings totaled 664.8 Moz (20,678 t) by year-end, which was equivalent to about 70% of annual mine supply. Indeed, ETP holdings actually reached an all time high in late October before sales were recorded in the closing weeks of the year as the prospects for the U.S. economy were seen to strengthen following the election of President Trump.

Silver investment started 2016 in robust fashion; as touched on before this was the case in the coin market but it was also true in the paper market. In January there was substantial short covering as silver prices started to rally markedly and as we progressed into February there was also a significant increase in long positions held by investors. The rise in net longs in March was moderate, given two positive news events for silver during the month, namely Draghi's comments on the likely cessation of further easing measures and the implication from the FOMC meeting in March of a reduction in the number of rates rises in 2016. This denoted that investors might have already placed their positions before the events, anticipating the uptrend in silver prices.

LONG TERM INVESTORS POSITIONS



Source: GFMS, Thomson Reuters

Investor interest continued to edge higher in April before the net long dropped by 16% in May as short positions doubled and prices shot lower. It was noteworthy however, that despite prices plunging below $16 the net managed money position on COMEX was still more than nine times the level at the start of the year. This indicated that western investors remained positive towards silver even while weakness in bar demand from India was becoming increasingly apparent. By the end of October the net long managed money position reached a peak since that data series began in 2007.

Given this phenomenal level of western investor sentiment and the poor state of physical flows at that time it is unsurprising that investor interest in both paper and physical positions dropped back over the following months. Coin demand fell precipitously over the northern hemisphere summer and more short-term investors in the paper market also reduced positions. Interestingly though the bulk of that drop did not occur until October when the price fell back considerably. Indeed, despite some volatility investors' position ended the year at broadly the same level as at the end of October despite weaker prices.

In January and February 2017 investors were attracted to the prospects for silver, and this helped to spur silver prices from below $16 to over $18 per oz. This was represented by a steady accumulation in the net long managed money position on COMEX culminating in a doubling over the two month period. This was in contrast to coin investors who were discouraged from making purchases as prices rallied.

OTC MARKET

The challenge of presenting a reliable overview of the silver OTC stems from the fact that there is limited public data available. The transfers and turnover on the LBMA, however, present a good gauge of activity but only capture part of the whole story. They do not, for example, encompass activities in other OTC markets and neither differentiate between pure investment flows and other forms of activity, as they also capture other physical market movements.

LONDON BULLION MARKET ASSOCIATION AND COMEX TURNOVER

(daily averages)	LBMA No. of Transfers	Turnover Moz	COMEX Turnover Moz	LBMA/ COMEX Ratio
2010	380.6	87.3	254	0.3:1
2011	797.8	173.7	389	0.4:1
2012	811.1	134.5	264	0.5:1
2013	871.7	136.5	287	0.5:1
2014	777.6	144.4	272	0.5:1
2015	681.3	145.9	267	0.5:1
2016	754.3	218.1	361	0.6:1

Source: LBMA; COMEX

In order to gauge an overview of the silver OTC market we use the following methodology, starting by dissecting the LBMA clearing statistics, which refer to transfers in the market and not the overall volume. A broad rule of thumb is that LBMA loco London volumes are roughly twice the transfer numbers and that in order to estimate the global OTC volume we need to assume that loco London accounts for approximately 70% of the total. Interestingly, until only a few years ago loco London accounted for roughly 90% of the global OTC market, but the shifts in the geographical distribution of the market means that we are now looking at around 70%.

Using this methodology suggests that implied OTC traded annual silver volumes increased 26% last year, reaching 124 billion ounces. This represented approximately 8% of the global notional value of the gold OTC market that year. Compared to 1997 when global OTC transactions stood at approximately 166 Bn oz, we estimate that total OTC volumes represented approximately 75% of that total last year. The LBMA started making its daily transfer volumes available in 1997.

The value of global silver transfers, however, has followed an opposite trend, driven by a 7% Compound Annual Growth Rate (CAGR) of the silver price over the 1997-2016 period. The notional value of annual silver volumes in the OTC market started at $820 Bn in 1997 and peaked in 2011 at roughly US$ 3.4 Trn, which represents a 11% CAGR. Since then, the notional value of silver OTC transfers contracted for four consecutive years losing more than half of its value by the end of 2015 compared to the peak of 2011. Last year, however, that downtrend came to an end, and global silver transfers increased again surpassing the 100 Bn oz threshold convincingly for the first time since 1999, representing by far the highest level on record.

EXCHANGE TRADED PRODUCTS

Total holdings of silver exchange traded products (ETPs) increased 8%, or 47.0 Moz (1,461 t), from the end of 2015. At the end of 2016, total holdings of ETPs amounted to 664.8 Moz (20,678 t). In value terms, total holdings increased to $10.8 Bn, an increase of 26% year-on-year. The increase in the silver price early last year propelled investors back into the silver ETPs.

The largest silver ETP, iShares Silver Trust, recorded an increase of 7% to a total of 341.3Moz (10,617 t) by the end of 2016, and accounted for 51% of total silver ETP holdings. Meanwhile, ZKB registered inflows of 2.8 Moz (88 t) to a total of 71.9 Moz (2,236 t). ETF Securities various silver funds reported an overall increase of 21% year-on-year or 13.7 Moz (426 t). On the other hand, Royal Canadian Mint ETR, DB Physical Silver and iShare Silver Bullion ETF all recorded outflows during the year.

Despite an increase in the silver price, the year started with 9.55 Moz (297 t) of silver outflows in January. It took until February for the silver ETPs to register monthly net inflows again, after six consecutive months of net outflows. It was March that confirmed investor interest, with net inflow of 31.1 Moz (966 t) recorded during the month. It was also the largest monthly net inflows recorded in 2016. Net inflows continued in the second quarter with an increase of 15.6 Moz (486 t). Following the Brexit vote in late June, investors' interest in silver again returned, with monthly net inflows of 12.3 Moz (382 t) and 10.8 Moz (336 t) recorded in July and August respectively. Total holdings of silver ETPs peaked at 688.6 Moz (21,418 t) in late October just before the U.S. presidential election. However, after the election in early November, the financial markets became more optimistic towards the economy, and capital flowed from risk haven assets to riskier assets including base metals. Silver was sold off along with gold. In November, silver ETPs registered a total of 11.9 Moz (370t) net outflows. It was not only the largest monthly outflow recorded in 2016, but also the largest since December 2014. Gold and silver prices continued to plummet in December, and holdings of silver ETPs registered a decrease of 6.7 Moz (207 t) in the final month of the year.

In general, silver ETP investors, both institutional and retail who want exposure to precious metals, are prone to take a more medium to long-term investment approach than

INVESTMENT IN COMMODITIES

Commodities as an asset class languished in the doldrums in 2014 and 2015, not only underperforming other asset classes, but clocking up absolute losses per dollar invested. In 2015, the performance was particularly disastrous, with losses in the base metals, precious metals and energy complex all exceeding 20%.

In 2016, however, commodities appeared to have turned the corner, having hit a capitulation level in January. By the end of the year, the energy, base metals and precious metals complex had managed to reverse their distressing fortunes of the past and ended the year with handsome gains of 53%, 29% and 13% respectively, coming in at the top of the charts with respect to price returns by asset class. We attribute commodities' stellar performance in 2016 to three primary factors; China, Investors' Interest and Trump.

The slump in commodities prices in 2015 was due in part to waning demand from China, the world's largest commodity consumer, and this was not helped by excess capacity in manufacturing. The Chinese government came to the rescue in response, turning to solutions they knew best; fiscal stimulus, monetary easing and lifting restrictions on property purchases. Fixed Asset Investments (FAI) in real estate and utility projects saw a significant uptick in the first four months of 2016. The move managed to resuscitate the Chinese economy and boosted demand for commodities.

The Chinese government's efforts were not the only driver shaping commodities prices. In 2016 we saw the emergence of financial interest in commodities in China. Against a backdrop of a depreciating renminbi and unappealing returns in stocks and bonds, speculators have been prompted to search for higher yielding investments elsewhere. Trading curbs imposed by authorities in the wake of the equities market meltdown further encouraged speculators to turn their attention to lightly regulated markets. Commodities futures appeared to provide these speculators with the exact vehicle they were looking for.

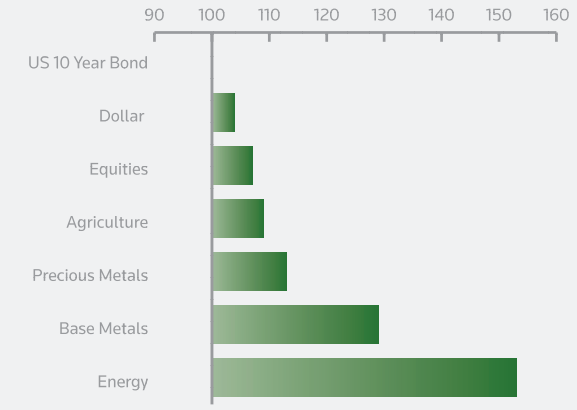
Investment interest in commodities was not confined to Chinese investors. Managed money positions, as reported by the CFTC, swung back to a substantial net long in 2016, driven particularly by net long positions in precious metals. We noticed a similar trend in ETPs too; of the top 25 commodities ETPs that we track, net assets as of end February 2017 had increased by $19bn compared to the beginning of 2016, with the increase mainly going into precious metals ETPs. That said, interest for precious metals ebbed towards year end, taking the sheen off its glory.

While China helped buttress commodity prices for a good part of the year, Trump's election victory in November helped provide tailwinds towards the year-end. The 'Trumpflation' trade - a bet on fiscal stimulus, faster rate of inflation and a more hawkish stance by the Fed was a key theme by the end of the year, benefiting the dollar, U.S. equities and industrial commodities. Precious metals, however, capitulated on the back of expectations of more aggressive rate rises in the horizon, offsetting impressive gains made earlier in the year in reaction to the Brexit referendum.

WHAT TO LOOK OUT FOR IN 2017?

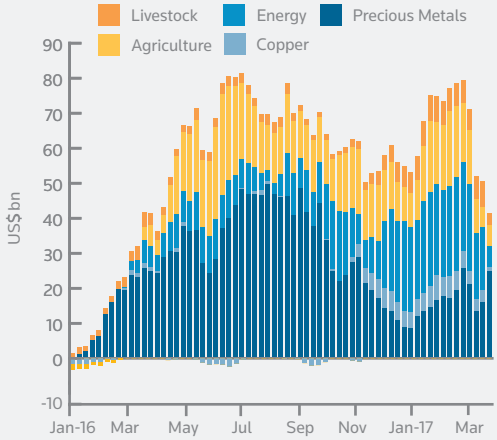
Interest in fiscal stimulus among developed economies is growing. Trump has been an avid supporter of such initiatives, vowing to raise infrastructure spending in the United States.

PRICE PERFORMANCE ACROSS VARIOUS ASSET CLASSES IN 2016



Source: GFMS, Thomson Reuters

NET POSITIONS IN KEY COMMODITY FUTURES



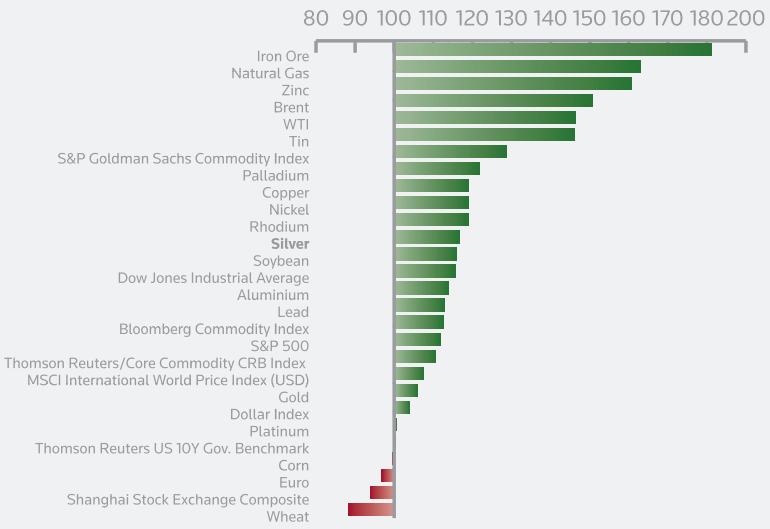
Source: CTFC

Meanwhile, the government of Japan has approved a host of fiscal measures to revive its economy, with infrastructure spending a key element. Should momentum in this area continue to build, it will translate into a source of demand for commodities. This is an area to watch in 2017.

While the global economic recovery is expected to continue in 2017, political developments around the world will be keenly watched. After a wave of anti-establishment voting in 2016, attention now shifts to elections that will take place in Europe this year. Having triggered Article 50, all eyes are on how Britain negotiates its exit from the European Union as it is another uncertainty for Britain as a nation and the cohesion of European Union in the future. Meanwhile, the policies of the new Trump administration, and how it engages with the rest of the world will also have clear implications on the U.S. economy and global trade at large. China will be holding its National Congress in the fall, an event that will see a reshuffling of top leadership positions. These events could introduce volatility into the markets in the short-term, while reshaping the political and economic landscape in the longer term.

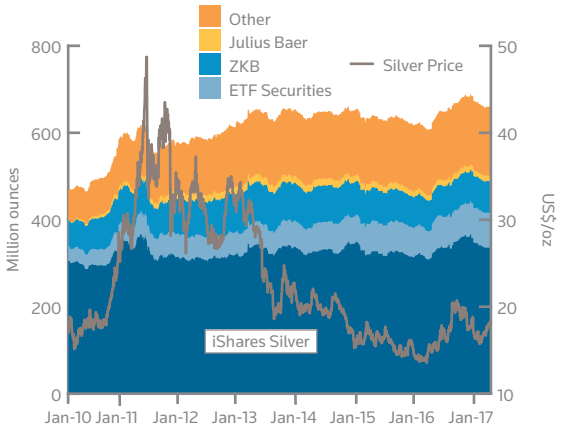
In the precious metals complex, the market was oversold at the moment following the Trump victory. However, there is a rebuild of momentum entering the New Year, despite a hiccup induced by the Fed rate hike in March. Considering all factors, we are mildly bullish on commodities' prospects in 2017. They could benefit from the "Great Rotation" on asset allocation, alongside potential fiscal stimulus, which could provide a further boost in demand for industrial commodities. Furthermore, as China is in a year of leadership changes, we expect the government to intervene to prevent a rapid slowdown if the situation calls for it.

INDEXED PERFORMANCE ACROSS ASSETS IN 2016 (JANUARY 4 2016 = 100)



Source: GFMS, Thomson Reuters

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-2015	**end-2016**
iShares Silver Trust	318.9	341.3
ETF Securities*	65.9	79.6
Central Fund of Canada	76.9	75.6
ZKB Silver ETF	69.1	71.9
Others**	87.0	96.3
Total	**617.8**	**664.8**

* 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

compared to speculators taking part in the futures markets. Therefore, the inflow or liquidation in silver holdings is not necessarily highly correlated with the spot price, but mostly a reflection on how investors believe the silver price will perform in the future. In addition, despite high correlations between gold and silver prices, the monthly change in silver ETP holdings does not always follow gold's. For example, despite a monthly increase of 3.3% in gold ETPs holdings in January 2016, silver ETPs registered a 1.5% net outflow. Indeed, gold ETPs only registered monthly net outflows for two months (November and December) last year, while silver ETPs recorded monthly net outflows in January, May, November and December.

Through these we may make two assumptions: 1) ETP investors in general preferred gold over silver in 2016 and 2) The bull market in precious metals is still at early stages because we often see investors' interest in silver trump gold towards the end of a bull cycle. We should also remember that the silver ETP constituency is more heavily weighted to retail than institutional and holdings therefore tend to be more sticky.

Turning to 2017, silver ETP holdings recorded another net outflow in January of 5.8 Moz (179 t). After a modest increase of 1.2 Moz (38 t) in February, total holdings decreased by another 4.1 Moz (128 t) in March, leaving total silver ETP holdings at 656.2 Moz (20,382 t) at the end of the first quarter, a loss of 3.1% since the end of 2016. However, silver prices actually appreciated by 11% during the same time period. Indeed, the U.S. Commodity Futures Trading Commission (CFTC) reports revealed that managed money positions have been increasing long positions in silver since the end of 2016. This arguably indicates a divergence of views on silver prices between investors in ETPs and speculators on future exchanges.

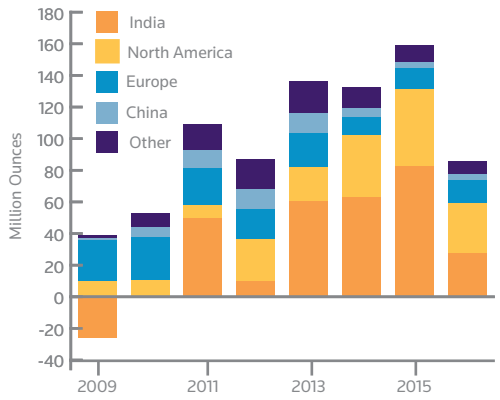
PHYSICAL BAR INVESTMENT

After reaching a record 155.2 Moz (4,829 t) in 2015, global physical bar investment fell 46% in 2016. The decline was particularly severe in Asia, driven lower by a slump in Indian demand especially in the middle of last year as investors who had opportunistically made purchases at low price levels this previous year took profits. On a brighter note European demand rose, with the sharpest increase occurring in the UK.

Indian investment bar demand declined 67% year-on-year to 27.4 Moz (852 t), the lowest in five years. The increase in domestic prices in the second and third quarter lead to heavy disinvestment after bargain hunting from April 2015 to January 2016. More importantly, with the price at deep discounts from the landed price, traders preferred to buy on spot and deliver it on the exchange and delivery to exchange hit record levels last year at 359 t. Buying by investors in the first quarter was lackluster which was more to do with poor farm output due to a below normal monsoon in 2016. However, on the evening following the demonetization announcement the silver price was trading at 50 to 70 cents over the landed price as cash hoarders quickly wanted to convert their cash into physical assets. A trend that is emerging in physical bars market is that investors are showing increased preference for minted bars rather than rough cut bars.

Following two consecutive years of growth, silver physical bar investment in the **United States** contracted 32% to 32.4 Moz (1,006 t). The hefty decline in physical silver bar demand was primarily a silver related story as demand for gold bars increased last year. That said, there was an intra-year growth slowdown of the appetite for precious metals investment products in the United States during last year and silver in particular felt the brunt of it. Field research suggested that demand is mainly for safe haven purposes and particularly attractive for those wanting a lower entry price point than gold. However, in 2016 the exceptionally strong level of investment in bars and coins in 2015 coupled with rising prices led some to argue that the market has become saturated and needed a huge amount of volatility in the price to attract new buyers.

PHYSICAL BAR INVESTMENT



Source: GFMS, Thomson Reuters

Last year physical bar investment in **Europe** rose for the second successive year by 14% to 14.5 Moz (450 t) with demand particularly strong in some key countries. The level of demand was consequently at a three-year high and hence at the strongest level since the increase in VAT in Germany on silver bullion at the start of 2014. Indeed, it is the substantial taxation across the region which continued to hinder volumes markedly for physical silver. The increase in 2016 was centered on two countries as a result; Germany and the United Kingdom. The former is clearly the largest market in the region for bar demand and rose robustly last year, with the recovery being strong year-on-year in the first half of 2016 as investors were attracted to the relatively low silver price and strong upward trajectory.

Demand also recovered in November and December as weaker prices were seen as an opportunity to increase holdings particularly as geopolitical uncertainty rose. Rising geopolitical tensions were also a factor in the United Kingdom and demand rose rapidly in that country. The referendum vote to leave the European Union not only encouraged investors concerned about economic and political uncertainty but it also caused sterling to hit 31-year lows and this sent silver prices sharply higher in local currency terms, which fueled further interest.

Chinese bar investment fell 17% year-on-year to 3.2 Moz (99 t) in 2016 which is the lowest level since 2010. Many Chinese investors were well aware that there was an abundance of physical silver supply in the country. The large increase in silver supplies raised investors' concerns about silver's future price performance, which motivated them to invest in gold instead.

COMMODITY EXCHANGES ACTIVITY

Turnover on the **Shanghai Futures Exchange** (SHFE) dropped for the second consecutive year in 2016, declining by 40% to a nominal 41,716 Moz (1,297,502 t). The exchange recorded the lowest turnover of the year in the first quarter, when speculators were still waiting on the sidelines for a clearer signal that silver was experiencing a major breakout. Trading volume peaked in July, resulting in 53,657,290 contracts (buy-sell combined) traded in the third quarter, still 30% lower than the previous year. Trading volume in the fourth quarter, while retreating 19% from the third quarter, was still 14% higher year-on-year.

SILVER TURNOVER ON MAJOR COMMODITY EXCHANGES

(total volume in nominal million ounce equivalents)

	2014	2015	2016	Change y-o-y
COMEX	69,485	67,272	90,638	35%
SHFE	93,296	69,825	41,716	-40%
SGE	8,024	12,935	19,711	52%
MCX	7,497	7,454	6,931	-7%
ICE FUTURES US	188	135	147	9%
TOCOM	28	20	20	-2%

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

Source: GFMS, Thomson Reuters; TOCOM, MCX, SGE and SHFE

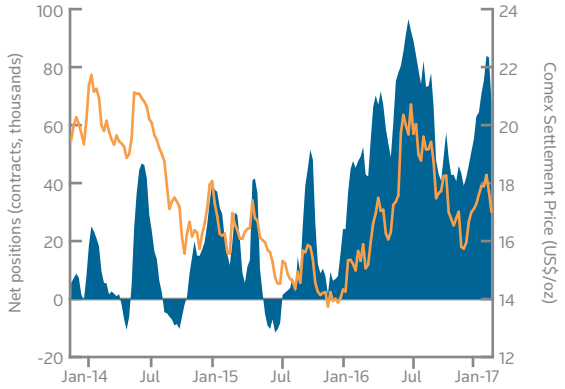
In contrast, the **Shanghai Gold Exchange** (SGE) continued its stellar growth, with volumes increasing by 52% year-on-year to a nominal 19,711 Moz (613,076 t). The SGE is eroding market share from the SHFE mainly due to two reasons: firstly the domestic banks are increasing their participation through the SGE. Secondly, unlike the trading rules at SHFE, there is an adjustment in the deferred interest rate of the Ag (T+D) contract from 0.020% to 0.018% at the SGE, meaning apart from fluctuations in silver prices, traders could potentially gain (or lose) further by receiving (or paying out) the deferred interest fee. This particular feature is quite attractive to many traders, and has attracted more investors and bigger trading volumes.

Turnover on the **Multi Commodity Exchange of India** (MCX) decreased by 7% in 2016, to a nominal 6,931 Moz (215,576 t). However, trading volume in July was the highest since December 2014. This is attributed to heavy discounts in the spot market as traders preferred to buy in spot and deliver at the exchange. Trading on this Indian exchange has seen a significant loss of interest among traders since the introduction of a commodity transaction tax with volumes mostly shifting to exchanges outside India.

Turnover on **COMEX** reversed from the downward trend in previous years, posting 35% year-on-year growth in 2016, to a nominal 90,638 Moz (2,819,135 t). Turnover peaked in November, which was equivalent to a daily average of 527 Moz (16,399 t), as the Trump victory in the presidential election saw capital flowing out from safe haven assets including silver, into riskier assets and base metals.

CFTC reports on managed money positions can be used as a proxy for investor activity on the exchange. The first seven months of 2016 were characterized by a steady rise

NET MONEY MANAGER POSITIONS ON COMEX



Source: CFTC

in long positions, mirroring the silver price and the market optimism towards silver. Managed net long peaked at the end of July, however, equivalent to 483 Moz (15,020 t). This was the highest level since records commenced in 2007. After that, as market attention returned to the Federal Reserve's interest rate timetable, managed money began trimming the long positions in silver. At the end of 2016, the managed net long recorded an equivalent of 217 Moz (6,743 t), an increase of 364%.

ICE Futures U.S. posted a year-on-year increase in turnover of 9%, but **TOCOM** continued posting an annual loss in turnover of 2% in 2016. Despite massive growth in trading activity on the COMEX and the SGE, total trading volume in equivalent tons across all major exchanges only grew one percent in 2016, mostly due to a 26% reduction in total trading volumes from China.

COINS AND MEDALS

Silver coin fabrication dropped by 9% in 2016 following the all time high achieved in 2015, to bring total coins and medals fabrication to 123.2 Moz (3,831 t). The decline should be put in context though as fabrication in 2016 was still the second highest on record. The level was only surpassed by 2015 when investors entered the market en masse to bargain hunt after the silver price hit multi-year lows in the second half of 2015. In fact, the approximate value of investment in this category, using annual averages, was just 0.6% lower year-on-year in 2016 at $2.1 Bn. Indeed, GFMS' proprietary quarterly bullion coin survey shows that silver coin sales started 2016 by holding firm from levels recorded at the end of 2015.

MANAGED MONEY NET POSITIONS IN COMEX FUTURES

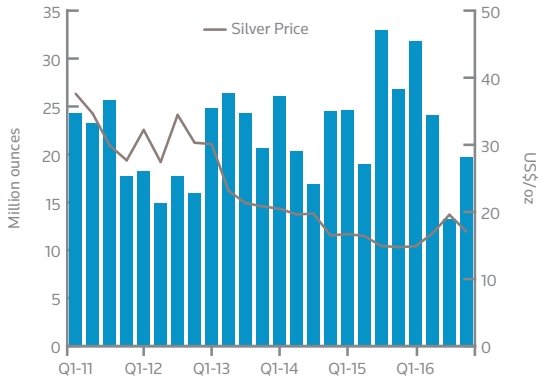
		Contracts	Moz	Price
2013		9,444	47.2	23.73
2014		9,613	48.1	19.07
2015		16,470	82.3	15.65
2016	Q1	34,141	157.1	14.87
	Q2	59,980	299.9	16.70
	Q3	83,089	415.2	19.64
	Q4	49,745	248.7	17.21

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

Silver bullion coin sales saw an impressive year-on-year increase in the first quarter of 2016, up by 29% in volume terms to reach their highest first quarter demand on record. In the first quarter of the year the silver price was on a positive trajectory, rising by 11% or $2/oz over the period. However, despite silver's price gains, demand for silver bullion coins soared, rising by 29% on a year-on-year basis and 18% on a quarter-on-quarter basis. Part of this can be attributed to seasonal factors: large bullion dealers generally restock for the year ahead and bullion manufacturers typically introduce newly minted coin series in the beginning of the year.

That said, the surge in demand was largely driven again by investors' desire to seek out safe haven assets, after the turbulent start to the year for the financial markets. Indeed demand for silver coins remained exceptionally strong in the second quarter of last year. However, the northern hemisphere summer saw a sharp drop in demand for silver coins. Given the stellar and unprecedented level of demand over the previous 12 months a slowdown was not a surprise,

SILVER BULLION COIN SALES



Source: GFMS, Thomson Reuters

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

(million ounces)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
United States	16.0	25.4	34.3	41.7	41.0	34.8	44.2	45.5	48.6	40.3
Canada	4.3	9.0	10.8	18.6	23.5	18.0	29.7	30.7	35.8	34.0
Australia	3.5	5.9	6.5	8.8	11.3	6.5	9.1	7.9	12.3	12.9
China	2.6	2.8	3.0	1.5	4.1	4.5	6.2	5.9	10.7	10.7
India	5.6	5.3	3.3	4.7	1.9	2.0	5.4	6.3	8.9	9.4
Germany	6.3	7.2	7.5	6.4	3.3	1.1	0.6	0.6	3.5	4.8
Austria	0.5	8.3	9.5	11.6	18.4	9.2	14.7	4.8	7.5	3.6
United Kingdom	0.5	0.5	0.5	0.5	1.0	0.7	2.2	1.9	3.2	3.2
Mexico	1.7	1.4	1.7	2.1	1.7	0.7	1.1	1.0	1.0	0.8
Hungary	0.0	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.6	0.7
Other Countries	4.1	3.5	3.6	4.6	4.1	7.6	3.7	3.4	3.3	2.8
World Total	**45.1**	**69.4**	**80.9**	**100.6**	**110.4**	**85.2**	**116.9**	**108.0**	**135.4**	**123.2**

but it was more abrupt than some had hoped. However, demand did pick up again in the closing months of the year spurred by the weaker prices.

Looking at trends on a regional basis and starting with the region with the largest fabrication, **North America**. Silver fabrication in the **United States** and **Canada** fell from the previous year's levels, declining 17% and 5% respectively, with combined bullion and numismatic coins recording 40.3 Moz (1,254 t) and 34.0 Moz (1,058 t) in 2016. In the case of Canada this still represented the second highest silver coin fabrication level in our records. Mexico saw silver coin sales decline by a fifth to 0.8 Moz (24 t).

Turning to the next largest market, **Asia**, the picture was brighter as coin fabrication was up 2% in 2016 to 21.5 Moz (669 t), an all time high for the region. The largest component of this fabrication was **Chinese** coins with fabrication at an estimated 10.7 Moz (333 t) up by 0.5%. While this growth was far slower than in recent years in the aftermath of the explosion in silver bullion coin demand in 2015 and higher prices it was an impressive performance. Indeed, silver coin fabrication has increased by more than sixfold in China in the past decade. This has been driven by an increase in interest for bullion coins as a means to store wealth, with silver seen as an alternative way of getting exposure to gold given its lower and more volatile price and offers a good entry point for smaller investors.

Meanwhile, efforts by China Gold Coin, in promotional activities, widening distribution channels, in addition to further diversifying silver coin designs in both traditional and modern patterns, has attracted further interest for silver coins for collection purposes. India, Asia's second largest silver coin fabricator again in 2016, produced 9.4 Moz (291 t). The 5% year-on-year growth was attributed to increased demand from the gifting segment, for both corporate and personal gifting, while investors hoarded the coins, expecting higher prices.

Australia, which is one of the of the key silver bullion coin producers in the world also saw growth last year, as fabrication rose by 5% to total 12.9 Moz (401 t), to exceed 400 tons for the first time in history.

Switching to **Europe**, bullion coin fabrication fell markedly, by 17% to 13.7 Moz (425 t), with declines in almost all countries in the region. The decline was especially severe at the largest, **Austria**, as fabrication more than halved to 3.6 Moz (112 t). Meanwhile the **UK**, which is the second largest fabricator in the region, saw only a negligible decline, aided by demand stemming from tensions around Brexit and the robust rally in sterling-denominated silver prices encouraging investment. Overall, the regional decline occurred entirely in the second half of the year as the demand weakness, especially in the July to September period, more than offset the strength earlier in 2016.

At the start of 2017, sales were much stronger than at the tail end of 2016. However, this was largely a function of the typical upturn in seasonal demand and demand was weaker year-on-year. What's more, as prices rallied through the early part of the year this has led to softer fabrication demand in February and March.

4. MINE SUPPLY

- **Global silver mine production declined by 0.6% in 2016, to a total of 885.8 Moz (27,551 t).**
- **Silver sourced from primary copper and gold operations recorded the largest variance, posting a 4% increase and a 9% decline year-on-year.**
- **Losses in Europe, North America and Oceania were partly offset by gains in Central & South America and Asia.**
- **On a co-product basis, cash costs with capex for 2016 averaged $11.38/oz, a 5% increase relative to 2015.**
- **In 2016, the delta-adjusted hedge book contracted by 18.4 Moz (572 t).**

MINE PRODUCTION

- ***Silver mine supply decreased by 5.0 Moz (157 t) in 2016, the first drop for fourteen years.***

Global mine production fell for the first time since 2002, registering a relatively modest 0.6% decline year-on-year. The fall at 5.0 Moz (157 t) was the smallest annual change since 2011, although in that year output actually increased by 5.3 Moz (165 t). At the regional level declines of roughly equal magnitude were recorded in Europe (6.7 Moz, 208 t), North America (4.6 Moz, 144 t) and Oceania (4.6 Moz, 142 t), for combined losses of 15.9 Moz (494 t). The fall in North America marked the second consecutive drop, while for Oceania it was the third straight year of decline. Offsetting the losses was higher output in Central & South America (4.2 Moz, 129 t), although the annual for the region was again short, and in Asia where output rose year-on-year by 7.7 Moz (241 t).

TOP 20 SILVER PRODUCING COUNTRIES

Rank 2015	Rank 2016	Country	Output (Moz) 2015	Output (Moz) 2016
1	1	Mexico	192.0	186.2
2	2	Peru	138.0	147.7
3	3	China	110.0	112.4
6	4	Chile	48.6	48.1
4	5	Russia	50.8	46.6
5	6	Australia	49.0	43.6
7	7	Bolivia	42.0	43.5
8	8	Poland	41.5	38.5
9	9	United States	35.0	35.4
10	10	Argentina	34.7	30.0
11	11	Guatemala	27.5	26.9
12	12	Kazakhstan	17.3	17.8
13	13	Sweden	15.9	16.4
15	14	India	12.0	14.0
14	15	Canada	12.2	13.0
16	16	Indonesia	10.0	11.2
17	17	Morocco	9.6	10.1
18	18	Turkey	5.5	5.6
20	19	Armenia	4.0	4.6
21	20	Iran	3.3	3.6
		Rest of the World	**31.9**	**30.5**
		World Total	**890.8**	**885.8**

Source: GFMS, Thomson Reuters

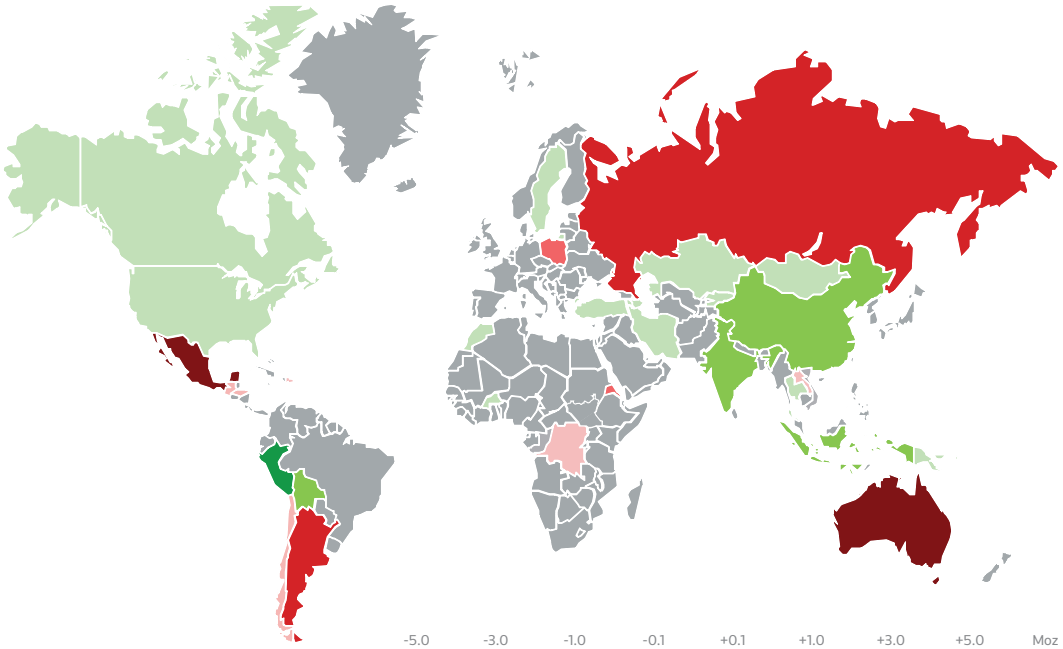
TOP 20 SILVER PRODUCING COMPANIES

Rank 2015	Rank 2016		Output (Moz) 2015	Output (Moz) 2016
1	1	Fresnillo plc. [1,2]	43.0	45.7
4	2	Glencore plc. [3]	36.6	39.1
2	3	KGHM Polska Miedź S.A. Group [4]	41.6	38.8
5	4	Polymetal International plc.	32.1	29.2
3	5	Goldcorp Inc.	40.4	28.1
6	6	Pan American Silver Corp. [2]	26.1	25.4
8	7	Cia. De Minas Buenaventura S.A.A. [3]	22.1	24.7
7	8	Volcan Cia. Minera S.A.A. [3]	24.8	22.0
10	9	Tahoe Resources Inc. [2]	20.4	21.3
9	10	Corp. Nacional del Cobre de Chile [5]	21.3	20.9
15	11	South 32 Ltd. [5]	13.9	18.2
13	12	Sumitomo Corp. [5]	15.8	18.1
14	13	Hochschild Mining plc. [6]	14.8	17.3
19	14	Hecla Mining Company [2]	11.6	17.2
17	15	Southern Copper Corp. [7]	13.3	16.2
12	16	Coeur Mining, Inc. [2]	15.9	14.8
16	17	Boliden A.B. [8]	13.5	14.4
18	18	Hindustan Zinc Ltd. [9]	12.0	14.0
20	19	Industrias Peñoles S.A.B. De C.V. [10]	11.5	12.4
21	20	First Majestic Silver Corp. [2]	11.1	11.9

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

Source: GFMS, Thomson Reuters

SILVER MINE PRODUCTION WINNERS AND LOSERS, 2016 VERSUS 2015

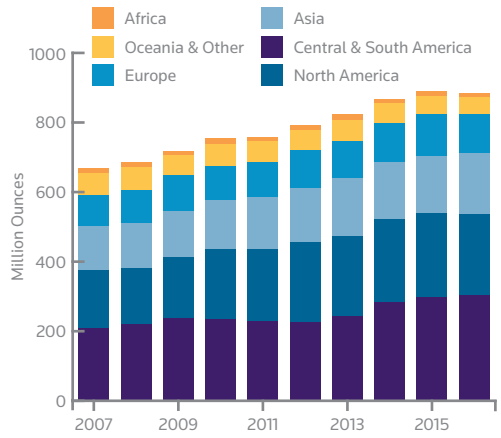


Source: GFMS, Thomson Reuters

NORTH AMERICA

Mine production in North America (Mexico, United States and Canada) continued to trend lower with an estimated year-on-year decline of 1.9% in 2016, or 4.6 Moz (144 t), compared to losses in 2015 of 0.9 Moz (29 t). Silver production in the region for 2016 amounted to 234.6 Moz (7,297 t), just over a quarter of the world total, down from a peak of over 28% of the share in 2012. North America's smaller global stake is chiefly due to strong growth in Central & South America rather than a reduction in its own production volumes. In 2016 Central & South America accounted for 34% of world output, its highest ever contribution.

WORLD SILVER MINE PRODUCTION



Source: GFMS, Thomson Reuters

Mexico, North America's largest producer and accounting for 79% of the regional total, was responsible for the noted 1.9% year-on-year decline. The nation reported a 3% or 5.8 Moz (179 t) year-on-year contraction, compared to modest gains in the United States and Canada, respectively higher by 0.3 Moz (10 t) and 0.8 Moz (25 t).

The fall in Mexico, the first since 2003, brings an end to 12 years of uninterrupted growth which delivered a remarkable CAGR of 8%. Looking at some of the swings at the operational level, there were losses at Goldcorp's Peñasquito mine, Mexico's largest gold producer. The mine consists of two open pits, Peñasco and Chile Colorado, and produces gold, silver, lead and zinc. Mining activity last year and for the next two are expected to be focused on lower grade ore in the upper parts of Peñasco as the mine undergoes a significant stripping campaign. As a result silver output dropped by 35% or 9.5 Moz (295 t) in 2016. Substantial year-on-year losses were also reported at Primero Mining's San Dimas mine, where production was adversely impacted by enhanced ground support work, labor issues and a deviation from the mine plan. The result was a 36%, or 3.0 Moz (93 t) fall in silver output. New labor problems have recently resurfaced. The company gave notice on 15th February that workers had initiated strike action, resulting in the complete stoppage of activities on site.

TABLE 3 - WORLD SILVER MINE PRODUCTION

(million ounces)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Europe										
Russia	29.3	36.4	42.2	36.8	39.3	45.4	44.4	46.6	50.8	46.6
Poland	39.6	39.0	39.2	37.6	40.8	41.3	37.6	40.7	41.5	38.5
Sweden	9.4	8.4	8.7	9.2	9.1	9.8	10.8	12.7	15.9	16.4
Turkey	7.5	10.1	12.5	12.3	9.3	7.3	6.0	6.6	5.5	5.6
Portugal	0.9	1.3	0.7	0.7	1.0	1.1	1.4	1.7	2.4	2.3
Spain	0.1	0.1	0.1	0.7	1.1	1.2	1.3	1.3	1.3	1.3
Greece	1.1	1.1	0.9	0.9	0.8	1.0	0.9	0.9	1.0	1.0
Bulgaria	0.4	0.4	0.5	0.4	0.5	0.6	0.6	0.6	0.6	0.6
Macedonia	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4
Ireland	0.2	0.3	0.2	0.1	0.2	0.3	0.3	0.2	0.3	0.3
Romania	0.1	0.0	0.1	0.2	0.4	0.3	0.3	0.1	0.1	0.1
Finland	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
Other Countries	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Europe	**89.0**	**97.4**	**105.5**	**99.4**	**102.8**	**108.6**	**104.2**	**111.8**	**119.9**	**113.2**
North America										
Mexico	100.8	104.1	114.3	141.8	153.6	172.3	177.3	186.3	192.0	186.2
United States	40.5	36.0	40.2	41.2	36.0	34.1	33.4	37.9	35.0	35.4
Canada	26.7	21.5	19.6	18.4	18.7	22.0	20.6	15.9	12.2	13.0
Total North America	**168.0**	**161.6**	**174.0**	**201.4**	**208.3**	**228.4**	**231.3**	**240.2**	**239.3**	**234.6**
Central & South America										
Peru	113.8	120.2	127.7	118.7	111.7	114.0	120.7	122.9	138.0	147.7
Chile	62.3	45.2	41.8	41.4	41.5	38.4	39.2	50.6	48.6	48.1
Bolivia	16.9	35.8	42.6	40.5	39.0	38.8	41.2	43.2	42.0	43.5
Argentina	8.2	10.8	18.0	23.3	22.8	24.5	24.9	29.1	34.7	30.0
Guatemala	2.8	3.2	4.2	6.3	8.8	6.6	9.0	27.6	27.5	26.9
Dominican Republic	0.0	0.0	0.6	0.6	0.6	0.9	2.8	4.5	4.1	3.3
Nicaragua	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.6	0.6
Honduras	1.7	1.9	1.9	1.9	1.6	1.6	1.6	1.8	1.1	0.6
Ecuador	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.6
Brazil	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6
Colombia	0.3	0.3	0.3	0.5	0.8	0.6	0.4	0.4	0.5	0.5
Venezuela	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Other Countries	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1
Total C. & S. America	**207.1**	**218.5**	**238.2**	**234.4**	**228.0**	**226.9**	**241.5**	**281.9**	**298.3**	**302.5**
Asia										
China	79.3	84.0	86.7	94.6	102.6	109.3	113.5	112.5	110.0	112.4
Kazakhstan	22.8	20.2	19.7	17.6	17.6	17.5	19.6	19.0	17.3	17.8
India	5.7	6.8	6.2	8.2	7.5	9.0	10.7	8.4	12.0	14.0
Indonesia	8.6	8.0	7.7	6.7	6.1	5.3	8.2	7.3	10.0	11.2
Armenia	1.7	1.4	1.3	1.6	2.4	2.9	3.4	3.7	4.0	4.6
Iran	2.9	3.2	3.4	3.6	3.6	3.5	3.2	3.2	3.3	3.6
Mongolia	1.2	1.1	1.1	1.1	1.1	1.1	1.6	2.1	2.6	2.8
Uzbekistan	2.5	1.7	1.7	1.9	1.9	1.9	1.9	1.7	1.5	1.5
Thailand	0.4	0.4	0.7	0.7	0.8	1.2	1.2	1.1	0.9	1.4
Dem. Rep. of Laos	0.1	0.2	0.5	0.6	0.6	0.6	1.0	1.3	1.3	1.2
Philippines	0.9	0.5	1.1	1.4	1.4	1.5	1.5	0.9	0.9	0.9
North Korea	0.9	0.9	0.8	0.8	0.9	0.9	0.9	0.9	0.8	0.8
Saudi Arabia	0.3	0.4	0.4	0.4	0.3	0.3	0.6	0.7	0.7	0.8

TABLE 3 - WORLD SILVER MINE PRODUCTION

(million ounces)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Kyrgyzstan	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.4	0.6
Japan	0.4	0.4	0.4	0.3	0.5	0.6	0.5	0.5	0.5	0.5
Azerbaijan	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.2
Tajikistan	0.0	0.0	0.0	0.0	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	0.1	0.1	0.0	0.1
Total Asia	**128.2**	**129.7**	**132.2**	**140.2**	**147.9**	**156.2**	**168.4**	**163.7**	**166.7**	**174.4**
Africa										
Morocco	7.2	8.1	8.7	10.5	8.3	8.3	9.2	8.8	9.6	10.1
South Africa	2.2	2.4	2.5	2.6	2.4	2.2	2.2	1.2	1.5	1.6
Burkina Faso	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.7
Zambia	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Eritrea	0.0	0.0	0.0	0.0	0.1	0.7	0.8	1.5	2.3	0.4
Tanzania	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Botswana	0.1	0.2	0.2	0.2	0.1	0.2	0.3	0.3	0.2	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	0.0	0.0	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	2.3	1.1	0.0	0.2	0.4	0.4	2.0	0.3	0.2	0.0
Other Countries	0.3	0.3	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0
Total Africa	**13.1**	**12.9**	**12.4**	**14.6**	**12.6**	**13.3**	**15.9**	**13.9**	**15.4**	**14.3**
Oceania & Other										
Australia	60.4	61.9	52.4	60.4	55.5	55.5	59.2	53.9	49.0	43.6
Papua New Guinea	1.4	1.6	2.2	2.1	3.0	2.6	2.9	2.8	2.3	3.1
New Zealand	0.6	1.0	0.5	0.4	0.3	0.2	0.4	0.5	0.1	0.1
Other Countries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Oceania & Other	**62.4**	**64.6**	**55.0**	**63.0**	**58.7**	**58.3**	**62.4**	**57.2**	**51.4**	**46.9**
World Total	**667.7**	**684.7**	**717.3**	**753.0**	**758.3**	**791.7**	**823.7**	**868.6**	**890.8**	**885.8**

Silver production at Pan American Silver's Alamo Dorado declined by 37% or 1.1 Moz (34 t). Ironically, this was considered a 'good' outcome as the result was at the higher end of management guidance. Higher silver prices allowed the mine, which had been slated for closure mid-2016, to continue to process the remaining low grade surface stockpiles. Operations are now expected to cease in 2017.

Elsewhere in the country there were gains, at Fresnillo's new San Julián leaching plant, which has been in operation since August 2016, and produced 2.1 Moz (65 t) of silver. Phase II of the plan (commissioning Q2 2017) will take annual output to a planned average annual (life of mine) production of 10.3 Moz (320 t). Hecla Mining's San Sebastian mine (a past producer from 2001 to 2005 generating 11.6 Moz (361 t) from the high-grade Francine vein) recommenced mining ore in late 2015 and generated 4.3 Moz (134 t) of silver in 2016.

Output in the United States was higher, but not by much, posting a modest 1% increase year-on-year to reach 35.4 Moz (1,100 t). Talking to the positives, there were increases at Greens Creek, Lucky Friday and Bingham Canyon. Hecla Mining owns and operates both Greens Creek and Lucky Friday. The first reported a 9% gain in silver production in 2016 representing a 0.80 Moz (25 t) increase on the previous year, due to higher ore grades and improved silver recoveries. At Lucky Friday output increased by 19%, or 0.57 Moz (18 t) year-on-year to reach 3.6 Moz (112 t).

Higher ore grades once again explained the year-on-year improvement. Elsewhere, at Rio Tinto's copper-gold mine Bingham Canyon, silver output registered an impressive 33% or 0.46 Moz (14 t) gain versus 2015, with full year production at 1.9 Moz (59 t). The jump in output reflects

higher grades as the mine returns to normal operations following disruptions from cleanup and redevelopment of the east pit wall after a landslide in 2013. Lastly, to Canada, which contributed around 6% of total output in the region, and where production increased by 7%, or by 0.8 Moz (25 t) to reach 13 Moz (405 t). One of the contributors to the rise was Vale's Sudbury mines, where silver output improved by 30% or 0.5 Moz (16 t) to reach 2.2 Moz (68 t).

CENTRAL & SOUTH AMERICA

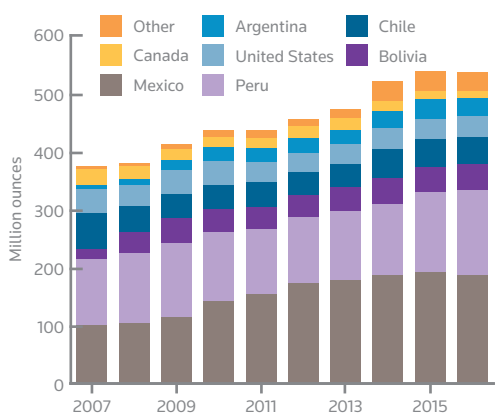
After three years of rapid growth (generating a CAGR of 15%) it was perhaps not surprising the pace slowed in Central & South America last year. Swings in the four largest producers in the region - Peru, Chile, Bolivia and Argentina - dictated the outcome for the region as a whole. On the plus side, Peru delivered another solid year of growth with a 7% increase year-on-year, or 9.7 Moz (302 t), while Bolivia recorded a decent 4%, or 1.5 Moz (47 t) increase. Losses meanwhile, were chalked up in Chile, down 1% or 0.5 Moz (14 t), and in Argentina, where output fell by 14%, or 4.7 Moz (147 t). On balance, production in the region inched up by 1% or 4.2 Moz (129 t), a result which took the year total to 302.5 Moz (9,407 t).

Peru, the region's number one producer, posted another strong performance with output up 7% year-on-year to 147.7 Moz (4,593 t). Ramped-up mines and expansions made decent contributions to the growth. Las Bambas, a large long-life copper mine, completed construction in the first quarter 2016 with commercial production achieved on 1st July 2016. Production at the mine was above initial guidance at 330 kt of copper and over 4.0 Moz (125 t) of silver. MMG, the operating company and holder of a 62.5% interest in the joint venture, expects to produce 420-460 kt of copper concentrate in 2017.

Inmaculada, Hochschild's 100% owned underground gold/silver mine in southern Peru, started commissioning in June 2015. Last year, and in its first full year of operation the mine produced 4.9 Moz (152 t). Elsewhere, Freeport-McMoRan's Cerro Verde open-pit copper mine benefited from the expansion project which started in September 2015 and achieved planned operating capacity rates during the first quarter 2016. Freeport reported 2016 silver sales from its South American operations at 3.7 Moz (115 t) compared to 2.0 Moz (62 t) in the previous year. Lastly, and further contributing to the country's rise, better grades pushed silver in concentrates at Antamina, a copper/zinc mine, to 20.1 Moz (625 t), representing a 13% or 2.3 Moz (72 t) increase year-on-year. At Buenaventura's Uchucchacua operation, output increased by 16% year-on-year, or 2.3 Moz (72 t), in this instance, higher throughput (+13%) and better grades (+3%) explained the rise.

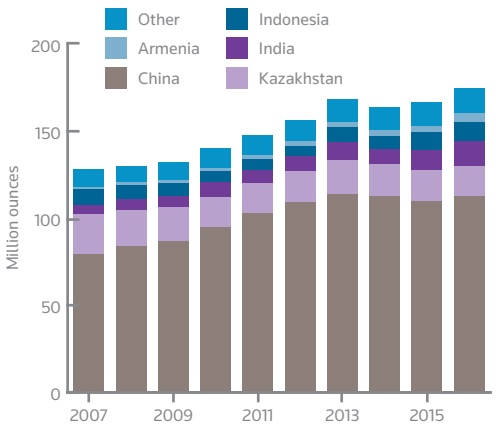
Unlike Peru, results in Argentina were biased to the downside so that combined losses in the country amounted to 4.7 Moz (147 t). Steep year-on-year losses were reported at Goldcorp's Cerro Negro mine where silver output dropped by 49% from 6.1 Moz (190 t) to 3.1 Moz (96 t). Lower output was explained by labor disputes related to planned retrenchments which resulted in lower mining rates and higher processing of low grade stockpiled ore. All mining operations ceased at Troy Resources' Casposo mine in mid-February 2016. In March the company reached an agreement for the sale of a majority stake in the mine to Austral Gold, and the operation was re-commissioned during the third quarter and for the full year generated

MINE PRODUCTION IN THE AMERICAS



Source: GFMS, Thomson Reuters

MINE PRODUCTION IN THE ASIA



Source: GFMS, Thomson Reuters

1.0 Moz (31 t) of silver compared to 3.1 Moz (96 t) in 2015. Silver production at Pan American Silver's open pit Manantial Espejo mine dropped by 12% year-on-year or by 0.45 Moz (14 t). The fall was a combination of lower grades (-9%) lower throughput (-3%), a result of harder ore and a two-week labor related work stoppage.

ASIA

Silver output in Asia climbed 7.7 Moz (241 t) compared to the previous year, a robust 5% improvement. The seven largest producers in the region in 2016 all posted year-on-year increases, although in absolute terms the gains were concentrated among three players: China, India and Indonesia.

China, the region's number one producer, made the largest contribution to the noted growth with a 2.4 Moz (75 t) increase, taking full year output to 112.4 Moz (3,613 t). The relatively modest 2% rise follows two years of production declines and prior to that a remarkable eleven year period of uninterrupted growth, a period from start to finish that saw silver output almost double from 58.8 Moz (1,890 t) in 2003 to 113.5 Moz (3,496 t) in 2013. The majority of silver mined in China is as by-product to copper, zinc and lead mining, so the fortunes of silver are tied to variance in the country's base metals output. Our assessment of year-on-year growth in silver production in China is consistent (if somewhat conservative) with recent figures released from the China Nonferrous Metals Industry Association (CNIA). They report domestic silver production from the country's largest smelters increased by close to 10% year-on-year.

Turning to the domestic production of base metals concentrates and based on reports from Antaike with reference to sources including China Customs and CNIA, China produced an estimated 2.26 million tons of lead concentrate, a 3.2% decline year-on-year. Traditional key production regions (Hunan, Gansu and Shaanxi) were adversely impacted by lower ore grade and the impact of environmental regulations. The losses here were greater than the contributions from new projects in Tibet and Qinghai provinces.

Domestic zinc concentrates production came in at a provisional 4.40 million tons, an increase of 3.5% year-on-year. Although some mature (and smaller) mines were impacted by environmental protection and rehabilitation orders, the losses were offset by new mines including the Guojiagou zinc mine in Gansu province, which was commissioned in 2016 and plans to hit nameplate capacity in 2017. The strong price performance also encouraged higher productivity at ongoing operations. Lastly, and again based on Antaike's assessment, domestic copper concentrate production was up by 3.3% to 1.61 million tons. Output in the fourth quarter was particularly strong, rising by a reported 8% year-on-year.

Drilling down into some of the detail, at Silvercorp's Ying Mining operations, which include the flagship Ying, Haopinggou, Tieluping and Longmeng mines, silver production increased by a noteworthy 27%, or 1.2 Moz (37 t) to reach 5.5 Moz (171 t). Higher throughput and grades explained the increase. On the flip side, structural damage caused by torrential rains and heavy flood waters impacted mining activities at China Polymetallic's Shizishan mine. Production collapsed from 0.3 Moz (9 t) in 2015 to 0.01 Moz (0.3 t) in 2016. Production at the smaller Dakuangshan mine was unaffected by rains, although silver output was 7% lower.

In India, the 17%, or 2.0 Moz (62 t) increase in the country was chiefly due to higher output at Hindustan Zinc, a large integrated producer of zinc-lead, a leading producer of silver, and the only primary zinc producer in India. The company's largest mine, Rampura Agucha, reported better volumes at the open pit operation, in line with the mine plan. And this was supplemented by the ongoing ramp-up underground, where the mine achieved a record production rate of over two million tons of ore per annum at the exit of the fourth quarter 2016. The main shaft sinking reached its planned depth of 995 meters. Ongoing expansion programs at Rajpura Dariba, Sindesar Khurd and the ramp-up at Kayad (ore treated at Rampura Agucha), should see silver production continue to rise in 2017, and which would be a fourth successive year of growth.

Production in Indonesia totaled an estimated 11.2 Moz (347 t) a 12%, or 1.2 Moz (37 t) increase year-on-year. Grasberg, a copper-gold mine, made a major contribution to the growth with silver sales reported by operator Freeport-McMoRan at 2.9 Moz (90 t) versus 2.1 Moz (65 t) in 2015. Prospects for further increases in silver output are likely. The highest silver grades in reserves at Grasberg are reported at the Big Gossan underground mine. Production restarted at Big Gossan in the fourth quarter of 2016, and is expected to ramp-up to

CORPORATE ACTIVITY

The biggest deal in the silver sector last year was the $249 M acquisition of Claude Resources by Silver Standard Resources. The purchase of gold producer Claude Resources and its core asset the Seebee Gold mine follows the company's April 2014 acquisition of the Marigold gold mine for $275 M. As a result 70% of Silver Standard's revenue now comes from gold, and the company announced on 27th March 2017 that the board had recommended changing the company's name to SSR Mining. In perhaps a similar case of 'financial alchemy', on 7th June 2016, Fortuna Silver Mines announced a deal to acquire Goldrock Mines ($86 million) for the company's principal asset, the gold heap leach Lindero project in Argentina. Silver currently accounts for over 50% of the company's revenue (with gold, lead and zinc making up the balance); post acquisition, and all other things being equal, by 2018 silver could drop to less than 30% of the group's revenue.

Other smaller deals in the sector include, most recently, Pan American Silver's announcement on 17th January 2017 of agreement to purchase Coeur Mining's Joaquin silver project, located in the Santa Cruz province of southern Argentina for $25 M. Earlier last year, on 24th May, Hecla Mining announced an agreement to acquire Mines Management ($46 M) to advance the evaluation programme of the Montanore silver and copper deposit in the United States. In Australia, meanwhile, Silver Mines Limited (SVL) announced on 3rd March 2016 its intention to acquire Silver Investments Holdings Australia Limited (SIHA) for an 85% interest of the Bowdens Silver project in New South Wales ($14 M). Bowdens mineral resource (measured and indicated) stands at 86.8 Moz (2,700 t) and according to the company is the largest undeveloped silver deposit in Australia. The Bowdens deal is core to SVL's strategy which they state is to "consolidate silver deposits in New South Wales and to form Australia's pre-eminent silver company".

Lastly, an honorable mention for some of the 'sub-$10 M' category deals. On 10th February 2016 Hunt Mining entered into agreement to buy the Martha Mine in Santa Cruz Province, Argentina from a subsidiary of Coeur Mining for total cash price of $3.0 M. Production restarted at the mine in January 2017 with first gold-silver concentrates shipment on 7th March 2017. On the 9th May 2016, Endeavour Silver announced it had entered into a definitive agreement to acquire Oro Silver Resources (a subsidiary of Canarc Resources) for $8.4 M. The principal asset is El Compas gold-silver mine property in Mexico and La Plata ore plant which has fully permitted crushing, grinding, flotation and tailings circuits. Later in the year, on 13th September 2016, Endeavour announced it had agreed to acquire SSR's 'non-core' Parral exploration properties in Mexico for $6.0 M.

7,000 tons of ore per day in 2022. Plans, however, could be upset. This year has not got off to a good start as production has been impacted by the suspension of concentrate exports and a temporary outage, since 19th January 2017, at its smelting facilities. As a result Freeport has reduced its production by around 60% from normal levels (to match available domestic smelting capacity) and while under the export ban, future investment at the mine has been shelved. The ban picks up from the events in January 2014 when the Indonesian government issued new regulations for the export of copper concentrates. During the negotiations, operations at Grasberg were pegged back while Batu Hijau, another major copper-gold and silver producer was put on care and maintenance. Exports resumed in August 2014. In a related development, Newmont completed the sale of its stake in Batu Hijau copper and gold mine in November 2016 in efforts to streamline their portfolio and focus on their core assets.

OCEANIA

Production declined in Oceania in 2016, falling 9% year-on-year or 4.6 Moz (142 t) to hit a 19-year low at 46.9 Moz (1,458 t). Australia, accounting for 93% of the region's total in 2016 was, of course, instrumental in the reported decline in the region. Silver output in Australia fell by 11% or 5.4 Moz (167 t).

The Cannington silver, lead and zinc mine is located in north-west Queensland and operated by South32. It is one of the world's largest silver producing mines and in 2016 reported a decline in payable silver production of 4.0 Moz (124 t) for a total of 18.2 Moz (566 t). The 18% year-on-year decline was explained by lower ore grades and recoveries, consistent with the mine plan. Production is expected to improve in the current year as silver and lead

AVERAGE PRICES OF SOURCE METALS

($/ton)	2012	2013	2014	2015	2016	Change y-o-y
Lead 3-Mth	2,074	2,157	2,113	1,795	1,874	4%
Zinc 3-Mth	1,964	1,940	2,167	1,938	2,100	8%
Copper 3-Mth	7,945	7,345	6,827	5,493	4,874	-11%
Gold ($/oz)	1,669	1,411	1,266	1,160	1,251	8%

Source: GFMS, Thomson Reuters; LME; ILZSG

WORLD MINE PRODUCTION OF SOURCE METALS

(Thousand tons)	2012	2013	2014	2015	2016	Change y-o-y
Lead	4,920	5,244	4,929	4,765	4,704	-1%
Zinc	12,898	13,047	13,525	13,202	13,241	0%
Copper	16,607	17,973	18,347	18,996	19,725	4%
Gold (tons)	2,883	3,077	3,172	3,209	3,222	0%

Source: GFMS, Thomson Reuters; ILZSG

grades are expected to increase significantly in June 2017 as a higher grade stope is scheduled for extraction.

In October 2015 Glencore announced plans to cut zinc mine production through suspension and operational reductions at George Fisher and Lady Loretta (part of Mount Isa) and at McArthur River. The reason given was "...to preserve the value of Glencore's reserves in the ground at a time of low zinc and lead prices, which do not correctly value the scarce nature of our resources..." Despite the part suspensions, silver output at Mount Isa actually recorded a 12%, or 0.8 Moz (25 t) increase year-on-year. At MacArthur River, in contrast, volumes fell by 18% or 0.3 Moz (9 t). Nevertheless, on a combined basis the mines generated 8.7 Moz (270 t) of silver in 2016, a 6% increase year-on-year, compared to a 35% decline in zinc and a 14% decline in lead concentrates.

EUROPE

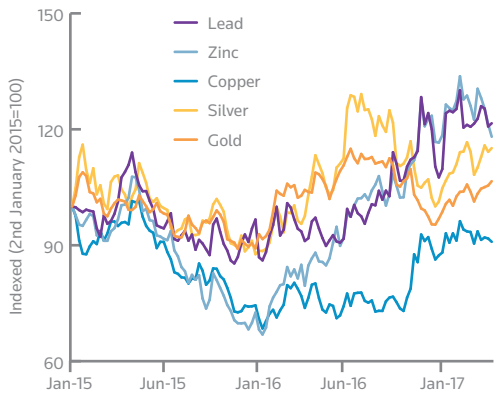
European silver production dropped by 6% in 2016 or by 6.7 Moz (208 t) to total 113.2 Moz (3,519 t). The result was explained by annual variances across the region's three largest producers, with substantial losses in Russia (-8%) and Poland (-7%), partly offset by an increase in Sweden (+3%).

Russian silver production dropped by 8%, or 4.2 Moz (131 t) in 2016 to reach 46.6 Moz (1,450 t), reversing most of the gains reported in the previous year. The Dukat hub is located in northeast of Magadan and includes Dukat, Lunnoye, Arylakh and Goltsovoye. Last year, mine operator Polymetal reported a 7%, or 2.0 Moz (62 t) fall in silver output, explained by a return to lower grades at Dukat (following the extraction of a high grade section in 2015) and declining grade profile at the maturing Goltsovoye mine. Elsewhere, at the company's Omolon hub, output dropped by 41%, or 1.4 Moz (44 t).

A three month shutdown of the smelter and refinery at KGHM Polska Miedź operations in Poland explained the 7%, or 3.0 Moz (92 t) decline in silver output in the country in 2016. KGHM Polska Miedź is an integrated copper and silver producer and has three underground mines: Polkowice-Sieroszowice, Rudna and Lubin. Silver is shipped in the form of bars and grains at the group's Głogów Copper Smelter and Refinery.

Results in Sweden partly offset the losses in Russia and Poland, the country recording a 3%, or 0.5 Moz (17 t) increase on the previous year. The Boliden Area mines, which include Renström, Kristineberg and Kankberg, and are operated by Boliden, reported a 31%, or 0.6 Moz (20 t) increase, chiefly due to higher throughput at the mill. Elsewhere, Lundin's Zinkgruvan mine reported a 15%, or 0.4 Moz (12 t) drop in silver production. The fall was largely a result of mining in areas with lower grades, and sequencing issues in some of the high grade zinc stopes in the fourth quarter of 2016.

INDEXED SILVER & BY-PRODUCT METAL PRICES



Source: GFMS, Thomson Reuters

SILVER OUTPUT BY SOURCE METAL

(million ounces)	2015 Output	% of Total	2016 Output	% of Total	Change y-o-y
Primary	262.4	29%	265.1	30%	1%
Gold	116.5	13%	105.5	12%	-9%
Lead/Zinc	314.3	35%	309.4	35%	-2%
Copper	192.8	22%	200.9	23%	4%
Other	4.9	1%	4.8	1%	0%

Source: GFMS, Thomson Reuters

BY-PRODUCT ANALYSIS & OUTLOOK

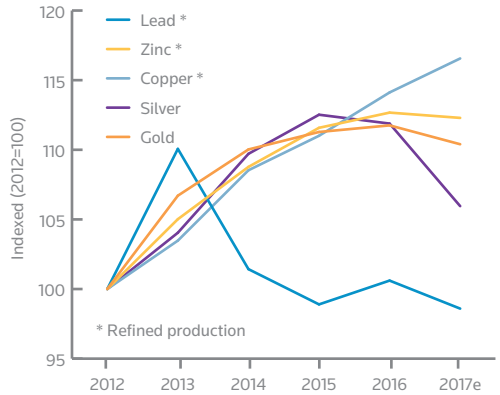
There was strong variance in the performance of source metals in 2016 underlying the 5.0 Moz (157 t) decline in world silver mine production. On the plus side, primary silver supply and silver from copper mines respectively increased by 1% and 4%. Silver from gold and lead/zinc mines, on the other hand, fell by 9% and 2%, respectively. The annual decline in output from gold mining was the first recorded in nine years. The changes outlined above resulted in modest shifts in the overall split of source metal, lead/zinc remained unchanged with a claim of 35% of world silver output, primary silver production increased its stake from 29% to 30%, copper's share nudged up from 22% to 23%, and gold fell from 13% to 12%.

Talking to last year's performance and the outlook of the major source metals, global gold mine production posted a modest 0.4% gain in 2016 to reach an all-time high of 104 Moz (3,222 t). On a regional basis, Asia, the largest gold producing region, registered a 1.5% decline. Losses in South America were more modest, falling by 0.7% year-on-year. Europe was essentially unchanged and there were increases in North America (+1.7%), Africa (+2%) and Oceania & Other (+3.1%). Despite these regional drops, output rose at the global level contrary to our expectation for 2016. Nevertheless, the slow-down in the annual growth rate confirms our view that supply is reaching a turning point, albeit in a 'turning circle' that is somewhat larger than we had anticipated and we maintain our near term forecast for gold output to decline in both 2017 and 2018.

Our provisional forecast for global refined copper production is for an increase of around 2.5% in 2016, compared to a slightly stronger gain of around 3% on the consumption side. This should leave the market in surplus in excess of 200,000 tons. By coincidence, last year's surplus is of similar magnitude to production estimated to have been lost to strikes and disputes at copper mines in the year-to-date (2017); losses that have helped sway the market into a more bullish mindset. It is worth noting that the shortfall so far this year equates to more than one-fifth of our allocated disruption allowance, which reduces the headroom in our base case forecast for any additional as yet unknown disruptions during the balance of the year that could peg back supply. Nevertheless, at this stage, we still currently see room for global copper mine output to grow in 2017, and while there is downside risk to our provisional forecast for growth in refined production of 2.1%, we still expected that it will be in positive ground.

Zinc's improving fundamentals will, in our view, be reflected in the transition from a tight concentrate market – evident in the decline in treatment charges to multi-year lows - to a tight refined market. We estimate that production of refined zinc in 2016 increased by a provisional 1% year-on-year, with current expectations for a modest 0.3% decline in 2017. A possible spoiler to this narrative would be a sharper than expected increase in mine production from China. A number of new projects commissioned in 2016 are ramping up and there are another 33 projects with total capacity of 998,000 tons scheduled for ramp up during 2017 and 2019, equating to approximately 8% of world zinc-in-concentrate output in 2016 according to Beijing General Research Institute of Mining and Metallurgy (BGRIMM). Lastly, and basis the latest assessment from the International Lead and Zinc Study group (ILZSG), global lead mine production decreased by 1.3% in 2016, while primary refined lead production registered a 1.7% increase year-on-year. We expect a tighter market in 2017 and for refined output to decline year-on-year.

INDEXED GLOBAL METAL MINE PRODUCTION



Source: GFMS, Thomson Reuters

PRODUCTION COSTS

- **On a co-product basis, cash costs with capex for 2016 averaged $11.38/oz, a 5% increase relative to 2015.**

Silver Total Cash Costs (TCC) net of by-product credits fell year-on-year from $-3.75/oz to $-4.12/oz led by higher production and by-product credits from Peru. The drop was partially offset by lower base metal production from KGHM Polska Miedź and Hindustan Zinc, shifting two of the world's lowest cost producers further up the cost curve. Over 2016, both operations averaged a TCC net of by-product credits of $-32.42/oz, a sharp contrast against $-42.17/oz in 2015.

If we exclude silver production from India and Poland, TCC net of by-product credits costs continued trending lower in 2016, averaging $1.45/oz, or 59% below the same period last year. This was driven by most countries including Peru, Argentina, Australia, United States, Russia and Mexico, where higher grades, lower fuel costs and direct mining costs expressed in U.S. dollars led to lower costs globally. Amongst the countries in the aforementioned group, Peru posted the largest drop in TCC net of by-product credits, falling from $4.57/oz to $-3.76/oz due to higher silver and copper production at Uchucchacua and El Brocal respectively.

As metal prices remained subdued over 2016, a common theme around costs-savings took shape in Peru. Lower contractor and supplier costs, coupled with falling freight costs and technical services paved the way for miners to secure lower fixed costs. The demands of local communities became more lax, and with businesses looking to rent their equipment at any price, significant savings materialised. The significant drop in cash costs follows the remarkable surge in Peruvian silver and copper production at the country level, up 7% and 38% in 2016.

Turning to the world's largest silver producer, cash costs in Mexico dropped by $0.38/oz to $1.48/oz, on the back of higher by-product credits at Dolores, and higher grades at Palmarejo, partially offset by lower silver production.

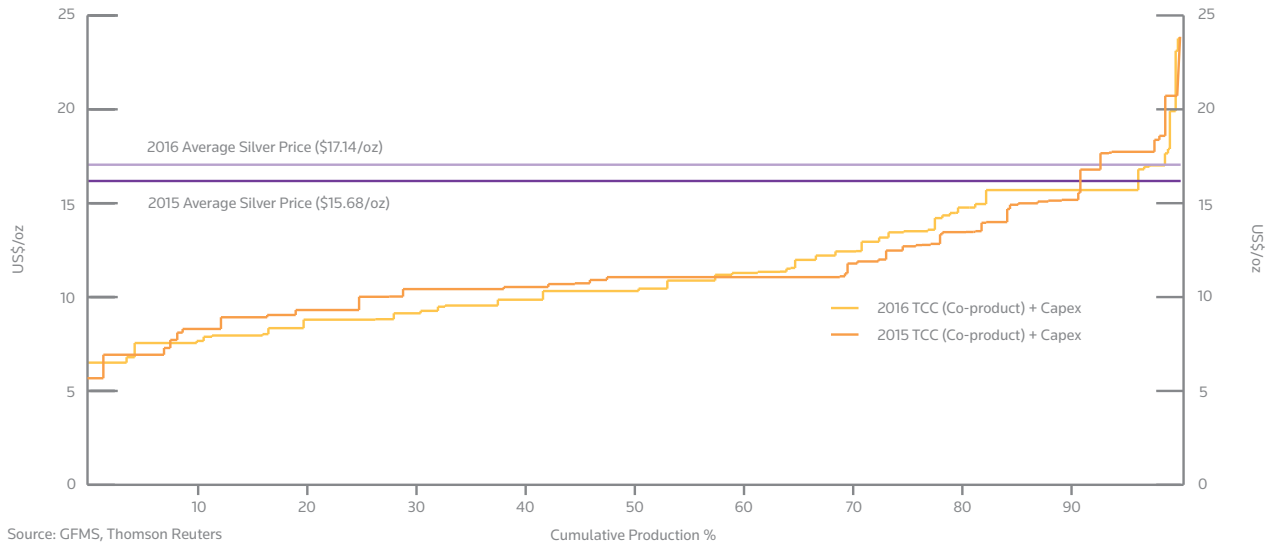
On a co-product accounting basis, TCC + capex in 2016 at the global level stood at $11.38/oz, up 5% from last year. The main driving force was a 13%, or 122 Moz drop in silver equivalent ounces, partially offset by a 6% contraction in capital expenditure to $2 billion. KGHM Polska Mieź accounted for nearly 50% of the drop in silver equivalent ounces, while Mexico saw the largest contraction in capex, followed by the United States and Argentina. Under this cost measure we note a change in trend following three years of downside pressure on costs.

SILVER MINE PRODUCTION COSTS

(US$/oz unless stated)	2015	2016
TCC (by-product)	-3.75	-4.12
TCC (co-product)	8.52	8.90
TCC (co-product) + Capex	10.80	11.38
Average Silver Price	15.68	17.14
Sample Size (Moz)	335.2	318.0

Source: GFMS, Thomson Reuters

SILVER MINING COSTS



Source: GFMS, Thomson Reuters

However, if we exclude silver production from India and Poland, the falling trend comfortably extends into 2016 with costs dropping by 2% to $11.22/oz, placing 5% of the silver industry 'underwater'. Under this smaller sample size, capex dropped by 10% year-on-year, partially offset by a less pronounced drop in silver equivalent ounces mostly explained by Penasquito. Contrary to this downward trend, costs at the second largest silver producing mine in Mexico jumped by 42% to $15.70/oz due to a 46% drop in gold production as result of lower ore grades (-30%) and throughput (16%). In addition, capex climbed 16% to $235 M as Penasquito's Pyrite Leach Project (PLP) gained company approval in July 2016. Goldcorp forecasts the PLP will add approximately 5 Moz per year commencing in 2019 by increasing overall silver recoveries stemming from the treatment of zinc tailings.

Although U.S. based primary silver mines did not have the advantage of currency devaluation, as a group they succeeded in cutting costs by 22% to $11.47/oz largely thanks to higher production and lower capex. This was the case at Lucky Friday, where production rose by 0.6 Moz (19 t), while capex fell by 26%, or $14 M as the #4 Shaft, a key growth project, neared completion. Lower diesel prices and higher grades led to a $3.71/oz drop in costs on a TCC + capex co-product basis to $17.01/oz.

We expect global by-product costs to continue trending lower over 2017 as credits from gold and base metal operations materialize, albeit at a slower rate as grades and oil prices begin to exert upward pressure on direct mining costs. However, we believe silver costs on a co-product accounting basis will edge higher with cost of sales and capex following in the footsteps of the silver price.

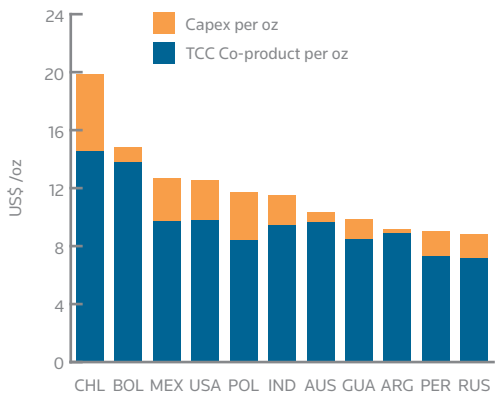
PRODUCER HEDGING

- ***In 2016, the delta-adjusted hedge book contracted by 18.4 Moz (572 t).***

Over the course of 2016, the delta-adjusted hedge book contracted by 18.4 Moz (572 t) as the settlement of option contracts by Industrias Peñoles offset fresh hedging from KGHM Polska Miedź and Minera Frisco. The composition of the hedge book stood near 2009 levels with forward sale contracts representing just over 70% of the total hedge book on a delta-adjusted basis. With the majority of these positions due to expire between 2017 and 2019, the proportion of the hedge book composed of option contracts, when measured by the nominal scale of the hedge book (number of contracts) rather than by option delta, fell from 69% at end-2015 to 67% at end-2016. This left the delta-adjusted position of the hedge book at end of the period at 20.6 Moz (640 t).

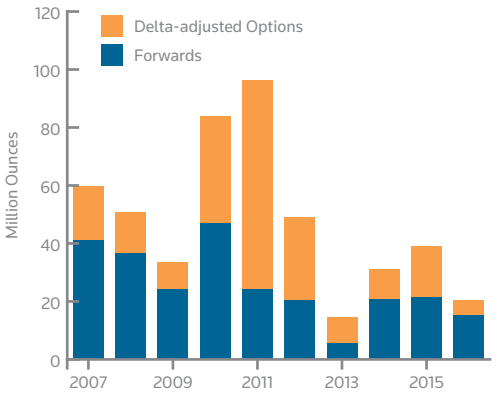
Activity in 2016 was most notably driven by Peñoles, which delivered into a series of zero-cost collars covering 20.6 Moz (641 t), while adding 12.4 Moz (387 t) of fresh hedging prior to year-end. With an average floor price of $15.20/oz, and a cap of $21.13/oz, the puts from Peñoles' collar structure sat out-of-the-money at end-2016. At end-2016, Peñoles' hedge book accounted for 25% of the global producer hedge book, down from 40% in 2015, with a delta-adjusted balance of 5.1 Moz (158 t). Turning to Minera Frisco, the Mexican silver producer hedged 7.4 Moz (231 t) of output at an average price of $17.82/oz for delivery in 2017. Finally, KGHM Polska Miedź hedged 2.7 Moz (84 t) using Asian Barrier Options also for delivery in 2017.

SILVER MINING COSTS: COUNTRY LEVEL



Source: GFMS, Thomson Reuters

PRODUCER HEDGING: OUTSTANDING POSITIONS



Source: GFMS, Thomson Reuters

5. SUPPLY FROM ABOVE-GROUND STOCKS

- ***Identifiable above-ground stocks increased 14% year-on-year to 2,590.9 Moz (78,067 t) by the end of last year. These inventories could cover 30 months' worth of physical demand, a 21-year peak.***

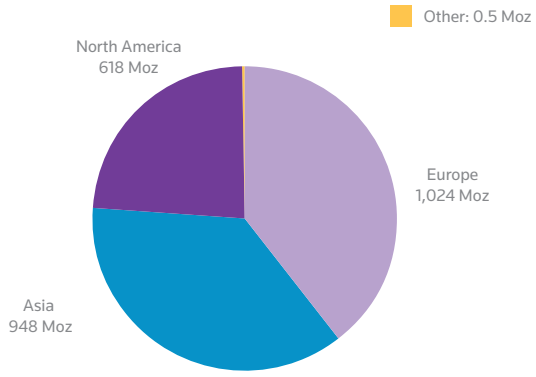
- ***In 2016 scrap receipts contributed 139.7 Moz (4,345 t) to total supply, 1% lower than in the previous year. Central to this decline was lower flows in Asia ensuring that scrap supply fell for the fifth consecutive year.***

OVERVIEW

The majority of silver produced remains above-ground and therefore is theoretically available to the market in various forms defined as above-ground stock. Above-ground refined stock is silver often stored in the form of coins, bars, doré, and grains in the case of industrial uses. These silver products are either held by governments, stockpiled by industry, stored at futures exchange warehouses, and held in custodian vaults (allocated inclusive of ETP holdings, or unallocated). Silver held in custodian vaults is estimated based on data collection of ETP silver holdings and other reported volumes, a confidential survey, and field research.

Our above-ground refined stock definition does not include silverware, jewelry or other fabricated products that are, in one form or another, available in the market place. Only when the silver fabricated products get recycled will they re-enter our calculations and be qualified as scrap, where they will often be refined back into an homogenous form, usually either bars, coins, doré or grains. This chapter covers the geographical locations and movements in above-ground refined stocks and additions to annual supply from scrap recycling.

BULLION STOCKS - REGIONAL BREAKDOWN IN 2016



Source: GFMS, Thomson Reuters

In order to derive insights into price movements and demand trends, a large portion of this above-ground stock is tracked by GFMS. The majority of bullion stocks are allocated to investors in ETPs, institutional and hedge fund investors, retail investors and other longer-term holders.

Above-ground silver from various fabricated sources, such as coins, bars, jewelry, silverware, e-waste, photographic papers and other "open-loop" sources of scrap is tracked by GFMS. While this newly recycled silver does not increase above-ground stocks directly, it can affect above-ground stock holdings if they are purchased and stored by one of the five categories outlined before.

IDENTIFIABLE BULLION STOCKS

Identifiable bullion stocks can be split into two categories: unreported GFMS stock estimates that are based on

IDENTIFIABLE ABOVE-GROUND SILVER BULLION STOCKS

(Moz)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Custodian Vaults*	736.5	615.6	846.6	834.8	943.1	814.1	1,008.4	1,168.0	1,379.2	1,571.2
ETPs	212.5	313.9	470.8	600.3	576.2	631.6	634.0	635.5	617.8	664.8
Exchange*	125.9	114.7	93.6	83.4	98.0	159.3	168.1	161.6	170.2	250.1
Government	206.7	176.2	160.5	116.4	104.3	97.0	89.1	89.1	89.1	89.1
Industry	11.8	17.3	14.4	18.5	17.7	18.3	15.5	13.8	14.7	15.7
Total	**1,293.4**	**1,237.6**	**1,585.9**	**1,653.3**	**1,739.4**	**1,720.2**	**1,915.2**	**2,068.0**	**2,271.0**	**2,590.9**
Months of Demand	16	14	22	19	19	21	20	22	24	30

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

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

confidential surveys and field research as well as stocks that are reported. Unreported stocks include the lion's share of our government category and our custodian vault category. Reported inventories are predominantly held in ETPs, 71% as of end-2016 data, but also include some of the government and industry stockpiles.

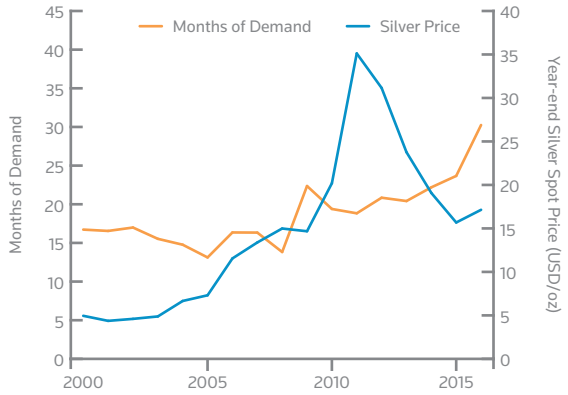
Reported stocks were 36% of total identifiable stocks in 2016, which was unchanged from 2015. At their peak in 2012, reported stocks accounted for 47% of total identifiable bullion stocks, which was well above the low recorded in 2000 of 12%. Following a couple years of no growth, the uptrend started in 2002 and can be mainly attributed to the growing emergence of ETPs. The more recent downtrend, however, is not attributable to ETP flows but chiefly a function of increased level of unreported above-ground stocks, accounted for in our custodian vaults category, in Asia and North America.

Total identifiable above-ground stocks were 2,590.9 Moz (78,067 t) at the end of 2016, up 14% year-on-year. Following years of decline between 2000-2005, total identifiable above-ground stocks had a strong uptrend over the 2005-2016 period, increasing by a CAGR of 9%. Since 2004, custodian vaulted stocks have almost always accounted for more than half the share of above-ground stocks in our estimates. The only significant exception was 2012, when its share briefly dipped to 47% due to drawdowns in Asia and Europe.

Last year, custodian stocks accounted for 61% of total identifiable above-ground bullion stocks; its highest on record. ETPs come second at 26% of the total, and despite the 8% increase compared to 2015, lost some market share to stocks held in exchanges. Indeed, exchange stocks rose sharply to be up 47% by the end of 2016 to 250.1 Moz (7,778 t) representing 10% of total identifiable above-ground stocks in 2016. This rise mainly occurred in Asia, where silver stocks held on the various exchanges, rose a whopping 163%, due to disappointing physical demand last year. North America also recorded an annual increase, but by a more modest 14%. Industry stocks also rose a healthy 7% while government-held silver stocks remained flat.

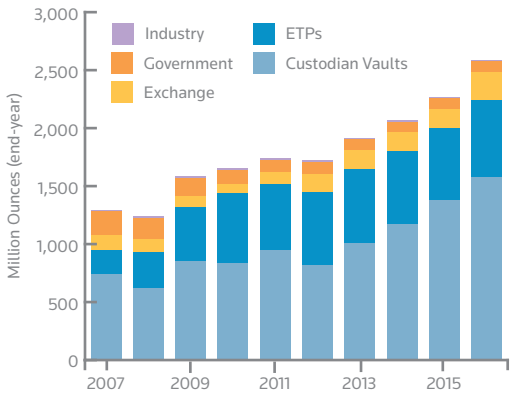
Total identifiable above-ground stocks including, bars, coins, grains and dore represented 30 months' worth of physical demand last year. This was up from a mere 16 months in 2007 and 24 months in 2015, primarily due to significant increases in custodian vaults and, particularly over the longer term, ETP holdings.

IDENTIFIABLE STOCKS EXPRESSED AS MONTHS OF DEMAND



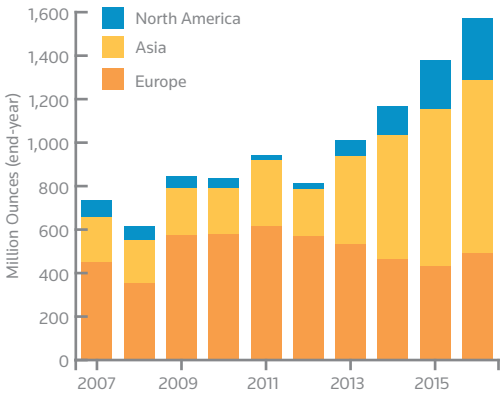
Source: GFMS, Thomson Reuters

IDENTIFIABLE ABOVE-GROUND SILVER INVENTORIES



Source: GFMS, Thomson Reuters; exchanges, ETF issuers, METI, USGS

CUSTODIAN VAULT STOCKS*



Source: GFMS, Thomson Reuters *Stocks exclude silver stocks allocated to ETFs

CUSTODIAN VAULT STOCKS

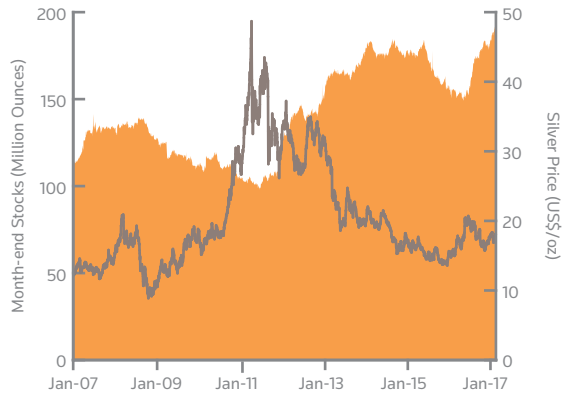
ETP holdings are not included in our custodian vault stock data, but it is important to note that most custodians of ETP silver stocks also store silver in vaults that are not allocated to ETPs. The same applies to futures exchange warehouses. Custodian vault stocks rose 14% (or 192.1 Moz 5,973 t) to 1,571.2 Moz (48,871 t) last year. At the start of the millennium, ETPs held in custodian vaults accounted for 1% of total vaulted stocks with only allocations reported in North America. Fast forward to the end of 2016 and that total has risen to more than a third of total custodian vaulted stocks, with 75% of the total custodian vaulted stocks allocated to ETPs held in Europe and 24% in North America. Asia makes up the balance of less than 1%.

In **Asia**, custodian vault stocks, excluding ETPs, rose by 71.9 Moz (2,237 t) or 10% last year. The bulk of these stocks are located in China, and reflects stocks held in vaults at banks. In previous years, rising stocks have been a function of increased leasing activities by Chinese banks. However, tighter supervision by the government last year resulted in reduced leasing activity. Other parts of Asia, such as **Singapore**, have been increasing in popularity for storage of bars and coins in recent years. We estimate that stocks have consequently risen by 40% there.

In contrast and following a strong performance in 2015, vaulted stocks in **India** fell 9% year-on-year, but that is not surprising given the strong rise recorded in the prior year. Silver stocks remained relatively elevated by historical standards, measured over the 2005-2015 period. The high annual carryover was on the back of floundering demand, following a combination of the introduction of the excise duty on gold and crackdown on unaccounted income that showed its ripple effects into the silver market. Many ships at the ports remained uncleared for a while, leaving India with excess supply that pushed the local market price into a discount. However, the start of the Free Trade Warehousing Facility in the second half of last year absorbed some of that material with global bullion banks increasingly seeking this location as a strategic point for silver vaulting in case the need arises. In a similar vein, stocks in Japan are also estimated to have declined last year.

In **North America**, growth in silver custodian vaulted stocks not allocated to ETPs added 59.6 Moz (1,854 t) or 26%, to the total. The annual increase was slower than in 2015 which in turn was a function of a drop in coin sales in North America last year. **European** vault stocks not allocated to ETPs, which accounted for 31% of total vaulted stocks, rose 14% to 488.7 Moz (15,201 t) in 2016, following a decline of 8% the year prior. The rise can be attributed to increased institutional investor interest in the region amid weaker currency values that boosted local silver prices. Indeed, European ETP holdings rose 10% in 2016.

COMEX WAREHOUSE STOCKS



Source: COMEX

FUTURES EXCHANGES

Silver is also likely to be stored in a vault if a futures exchange offers physical settlement. As a rule of thumb, only approximately 2% of futures contracts are settled in physical, so it is not necessary to hold metal that is equal to the total level of open interest.

Four exchanges report silver stocks; COMEX in the United States, the Tokyo Commodity Exchange (TOCOM), the Shanghai Futures Exchange (SHFE) and the Shanghai Gold Exchange. Total stocks held by exchanges rose 41% last year to 250.1 Moz (7,778 t). This strong performance was driven by a 163% increase in Asia, and in particular in China. Indeed, both the SHFE and the SGE posted whopping increases of 212% and 104% respectively to 59.7 Moz (1,857 t) and 32.1 Moz (999 t) respectively last year. Weak

SHFE SILVER STOCKS

(Million ounces; end period)

	Q1	Q2	Q3	Q4
2014	12.3	7.7	2.6	3.9
2015	9.2	12.1	10.2	19.2
2016	49.4	59.5	52.6	59.7

Source: SHFE

SILVER ETP HOLDINGS BY VAULT LOCATION

While we delve into greater detail with regard to silver ETP holdings in the investment chapter, this chapter's ETP focus centers on the investors' domicile and holdings by vault location. As recently as 2005 ETP holdings were only 3% of total identifiable above-ground stocks, whereas they now account for a quarter of known stocks with greater transparency providing detail and clarity. Indeed prior to the substantial growth in custodian vaults in the past five years ETPs actually peaked, on a year-end basis, at 37% of total identifiable above-ground stocks in 2012.

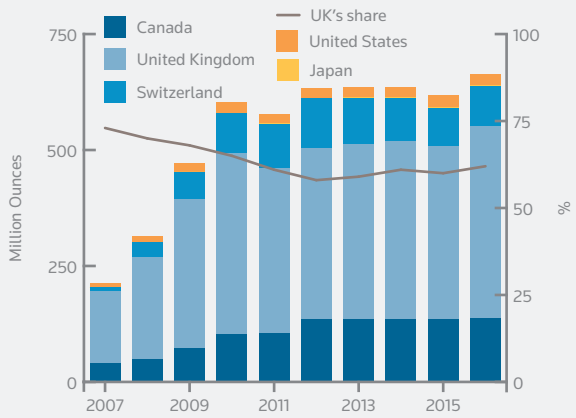
The United States remains the largest market for investors with 55% of ETP holdings (unchanged market share compared to a year earlier) originating from trade there, based on an ETP's primary exchange. Next in line is the silver ETPs traded on the Toronto Stock Exchange, which accounted for 21% of total holdings while those in the United Kingdom on the London Stock Exchange accounted for 11% of holdings by silver ETP investors. Interestingly, and despite United States investors dominating ETP trade, the vast bulk of global physical ETP holdings, at 62% last year, were held in the United Kingdom with holdings in the United States contributing only 4% of the global total. Switzerland was home to 13% of global ETP holdings, in line with its share of investor ownership. Similarly, Canada contributed 21% of total holdings, while Japanese ETP allocated inventories make up the balance at 0.4% of the global total.

As outlined above, London's share of total ETP holdings by vault location dominates the global total at 62% market share. While down from the peak of 72% recorded in 2007, the percentage of holdings has again been on the rise in recent years, increasing steadily from 58% in 2012 to the level last year. In fact, 88% of the increase in global silver ETP holdings during 2016 was in London. As a result, Canada, which had seen its market share increase in recent years dropped back from 22% to 21% last year. In a similar vein, despite holdings in Switzerland rising a touch their share also edged back a fraction to 12.7%.

A widespread false impression in the market historically was that selloffs of ETPs in a country led to a similar quantity of metal becoming available to the local or export market. However, the reality was quite different from this scenario, because most holdings of ETPs are vaulted in London. The clearest example of this was in 2011. In that year, investors in the United States sold 39.0 Moz (1,212 t) of silver ETPs but silver ETP vault stocks in the country barely changed, declining by just 2.5 Moz (76 t). Meanwhile, ETP stocks in London declined by 35.7 Moz (1,111 t). Any ETP sales are likely to result in the conversion of the metal in the vault from allocated to ETP shareholders to unallocated or other allocated holdings. That said, metal could still be shipped out of the vault and to overseas markets should demand elsewhere require it.

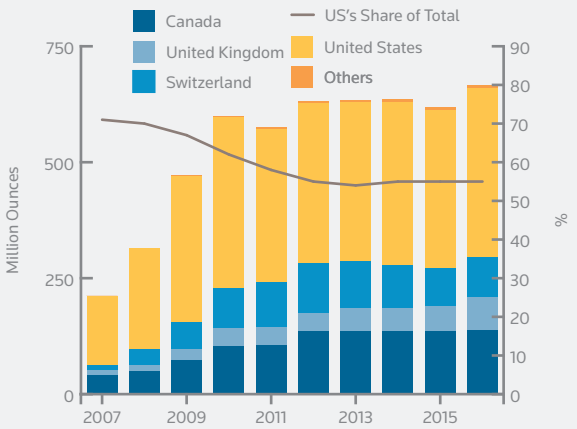
Several ETPs use multiple vaults in different countries. Consequently, assigning all holdings of each ETP to the exchange location or to a single location may lead to inaccuracies. Furthermore, eligible stocks reported by COMEX contain a portion that is allocated to ETPs. At the end of 2016 the portion of COMEX eligible stocks that was allocated to ETPs was around 16% of total COMEX eligible stocks. We alter our identifiable bullion stock figures for this nuance in order to avoid double-counting in our calculations.

SILVER ETP HOLDINGS BY VAULT LOCATION



* "Other" includes Japan, Australia and Hong Kong
Source: GFMS, Thomson Reuters; respective ETP issuers & custodians

SILVER ETP HOLDINGS BY INVESTOR DOMICILE



Source: GFMS, Thomson Reuters; respective ETP issuers & custodians

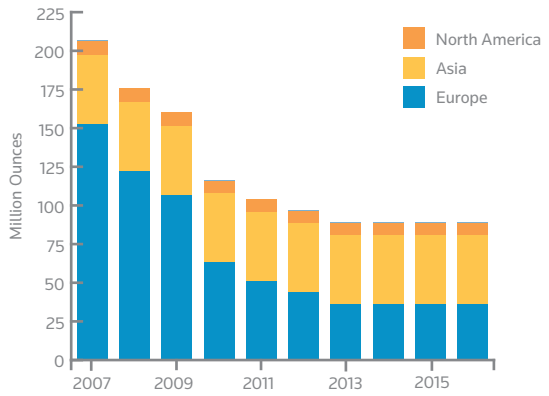
retail demand turned out to be the main driver behind the rise in exchange inventory. COMEX also recorded an increase of 14% to 183.5 Moz (5,706 t).

TOCOM inventories rose sharply, by 64% to 0.2 Moz (7 t) by the end of last year. The weaker yen-denominated silver price (the Japanese yen strengthened an average 11% against the U.S. dollar last year) did little to help investment demand, resulting in a rise of exchange-held silver inventories.

The rise in stocks reported on Asian exchanges was mimicked on COMEX where inventory rose 14% to 183.5 Moz (5,706 t) by year-end. COMEX inventories fell in the first half of 2016, but this was more than offset by increases in the second half. COMEX stocks in general consist of eligible and registered stocks. Eligible stocks are inventories in COMEX warehouses that meet the criteria for delivery via the exchange, but cannot be delivered. The bulk, approximately 88% by year-end, of COMEX held stocks fall under this category. Registered stocks are stocks that meet the criteria for delivery and can be delivered. Over the course of 2016, eligible stocks trended higher. Following a sharp drawdown in 2015, registered silver stocks slightly increased in 2016 albeit in an erratic fashion.

ETP silver stocks stored in the United States use eligible stocks reported by the COMEX. Accordingly, we adjust the "Exchange" stock data lower by the amount of ETP stocks vaulted in the United States. Excluding ETPs, total exchange stocks increased by 47% to 250.1 Moz (7,778 t) last year, driven by rising exchange inventory.

SILVER GOVERNMENT STOCKS



Source: GFMS, Thomson Reuters

GOVERNMENT STOCKS

There is little publicly available data on the level of government silver stocks and accordingly assessments of these are largely based on private information gathered during the course of our field research. There were only minimal sales in the early part of this decade and we estimate none at all have taken place in 2014, 2015 or 2016. While our field research indicates no activity at all, even if a small transaction did take place it would have been at an inconsequential level when compared to the previous fifteen years when disposals averaged 48 Moz (1,392 t) per annum over the 1999-2013 period. At end 2016, total government silver stocks amounted to 89.1 Moz (2,771 t).

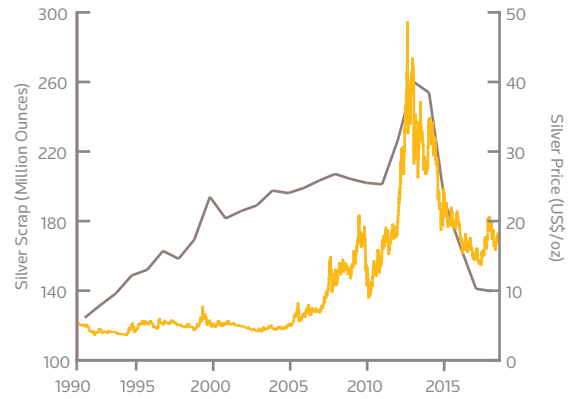
The most significant reason for this change is the absence of any Russian disposals in recent years. One key reason for this is that the country's silver stocks are far smaller than earlier this century. For instance, from 2004 to 2010, gross sales from Russia amounted to over 200 Moz (6,200 t).

Furthermore, the two other major sellers between the start of this century and 2007, China and India, (both of which used to be on the silver standard) remained on the sidelines. It is our understanding that following several years of heavy sales, Chinese silver stocks have been reduced significantly from "excessive" levels. The list of countries believed still to be in the possession of silver stocks is much less extensive than that of gold. We estimate that Europe has approximately 40% of total stockpiles whereas Asia accounts for half. North America and our Other category take up 9% and 1% respectively.

INDUSTRY

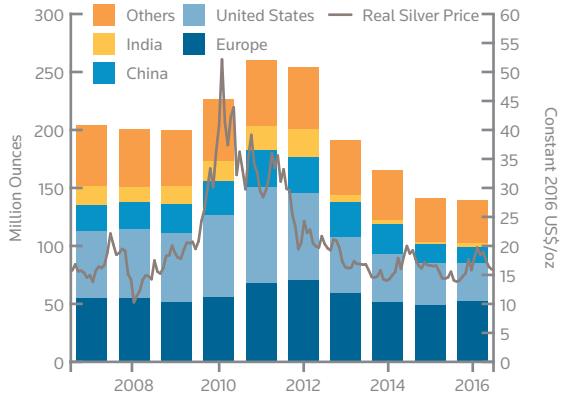
Our industry stocks data are derived from reported Japanese and United States figures. United States stocks consist of producer, consumer, and dealer stockpiles, while Japanese inventories include silver at producer and merchant facilities. At the end of 2016, industry stocks totaled 15.7 Moz (488 t), up 7% compared to a year earlier. The rise was a second consecutive annual increase. Japanese stocks rose an estimated 3% to 10.9 Moz (338 t). Stocks in the United States last year rose 5% to 4.8 Moz (150 t). These stocks do not include working stocks, which are not part of our identifiable bullion stock series.

WORLD SCRAP SUPPLY



Source: GFMS, Thomson Reuters

WORLD SCRAP SUPPLY



Source: GFMS, Thomson Reuters

SCRAP

- ***Silver scrap supply fell by 1% to 139.7 Moz (4,346 t), the lowest level in 20 years.***

- ***Higher local silver prices suppressed sales in various regions and also industrial generated scrap continued to decline.***

In 2016, **Europe** retained its role as the largest source of scrap supply for the second consecutive year, as European scrap supply rose by 7% to 52.1 Moz (1,620 t), a three-year high, in contrast to the decline in scrap flows in Asia.

The rise in European scrap flows is unsurprising as the combination of dollar-denominated silver price increases and U.S. dollar strength resulted in average local currency prices rising across the region. The largest increases in Europe were seen outside the Eurozone, as a sharply depreciating Turkish lira and the British Pound supported significantly higher scrap sales from both markets. Scrap surged by 15% and 35%, respectively. The upturn in flows in the United Kingdom was exceptionally strong in the immediate aftermath of the referendum vote, which saw sterling hit a 31-year low against the U.S. dollar. This led to some industry participants seeing twice the normal volume in July, although it was noted that the number of participants had also shrunk in recent years following earlier decline in precious metal scrap flows. Fewer scrap sellers resulted in an improvement in margins.

Another factor in Europe was higher volumes of e-scrap. Indeed, field research has highlighted that a number of players in various countries have been moving into this growing competitive area. It should be noted though that this metal content is dropping, due to falling volumes going into electrical applications earlier in the century. Refiners are processing increasing volumes of components while metal output is flat. While jewelry and silverware flows rose with higher prices, continued improvements in production processes minimized industrial scrap flows, in this case from open loop. These trends were central to the increase in scrap flows in Germany, at 2%, was smaller than in almost all other countries in the region due to the scale of its industrial sector and its continued productivity improvements.

The only major country in Europe to experience a fall in scrap last year was Russia. This is arguably surprising given the all-time high in Russian rouble silver prices. However, there continued to be a strong focus on gold scrap in that market last year, due to the higher margins in that area. Furthermore, the price declines in local currency terms during the year discouraged some participants, who were confident that prices would return to peaks recorded in the first quarter of 2016.

In **North America** scrap supply fell 8% to 33.6 Moz (1,045 t) last year. Scrap supplies have been in decline for a while in North America, with various refiners indicating increased competition for this source of feedstock. As a result, primary sourced metal, particularly for silver, has been on the rise. Considering the developments with regard to responsible material sourcing in recent years, efforts to source material competitively on the basis of proper due diligence have made it a more challenging exercise for refiners. Scrap supplies in North America tend to come

TABLE 4 - SUPPLY OF SILVER FROM THE RECYCLING OF SCRAP

(million ounces)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Europe										
Germany	15.1	14.6	12.6	14.9	16.7	21.6	17.3	14.3	14.9	15.3
United Kingdom	11.2	10.9	10.2	6.4	11.3	9.8	7.2	5.6	5.8	7.9
Russia	8.8	8.3	8.4	11.5	11.1	10.9	10.0	8.0	6.7	6.5
Italy	5.6	5.9	5.8	6.5	9.7	9.9	8.7	7.9	6.2	6.3
France	4.6	5.1	5.5	6.2	7.0	5.9	5.2	4.9	4.9	5.2
Turkey	1.0	1.1	1.1	1.0	1.2	1.0	1.0	1.5	1.7	2.0
Austria	1.2	1.2	1.1	1.1	1.2	1.2	1.2	1.1	1.1	1.2
Czech Republic	0.9	0.9	0.9	1.2	1.6	1.6	1.4	1.4	1.1	1.2
Poland	0.8	0.7	0.7	0.9	1.1	1.2	1.0	0.9	1.0	1.1
Netherlands	1.1	1.1	1.0	1.1	1.2	1.2	0.9	0.8	0.9	0.9
Spain	0.4	0.5	0.5	0.7	1.3	1.3	1.1	1.0	0.8	0.8
Belgium	0.6	0.6	0.6	0.6	0.7	0.7	0.5	0.5	0.5	0.5
Sweden	0.8	0.8	0.6	0.8	0.6	0.6	0.6	0.6	0.4	0.5
Denmark	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4
Portugal	0.4	0.4	0.4	0.4	0.4	0.2	0.3	0.3	0.3	0.3
Hungary	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.3	0.3
Slovakia	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
Finland	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3
Norway	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3
Other Countries	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.7	0.7	0.8
Total Europe	***54.9***	***54.4***	***51.6***	***56.0***	***67.9***	***70.1***	***58.7***	***51.0***	***48.5***	***52.1***
North America										
United States	53.6	55.4	54.4	64.8	76.4	68.9	46.9	40.3	35.3	32.5
Canada	1.6	1.7	1.5	1.6	1.8	1.6	1.1	1.0	0.9	0.8
Mexico	2.7	3.1	3.2	4.0	4.5	4.7	1.1	0.4	0.4	0.3
Total North America	***57.9***	***60.2***	***59.1***	***70.4***	***82.7***	***75.2***	***49.1***	***41.7***	***36.6***	***33.6***
South America										
Brazil	1.0	1.0	1.1	1.5	2.5	2.5	2.0	1.9	2.3	2.5
Venezuela	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.4
Uruguay	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4
Other Countries	1.7	1.6	1.4	1.8	2.2	2.1	1.5	1.0	1.0	1.2
Total South America	***3.2***	***3.0***	***2.9***	***3.9***	***5.5***	***5.4***	***4.2***	***3.6***	***4.1***	***4.5***
Asia										
Japan	25.7	23.7	21.3	20.9	23.0	21.3	20.0	19.6	17.4	16.2
China	22.5	22.7	25.3	29.2	31.9	30.9	30.1	26.7	16.1	13.8
S. Korea	7.8	7.7	8.4	9.4	10.0	9.1	8.4	6.9	4.1	4.4
Taiwan	2.9	3.1	3.6	4.1	4.5	4.3	3.6	3.1	2.7	3.0
India	16.1	13.8	15.0	17.9	20.6	24.8	5.4	3.0	2.5	2.7
Thailand	2.7	2.9	3.1	3.7	3.7	3.2	2.8	2.2	2.0	2.1
Saudi Arabia	1.9	1.0	1.9	2.2	2.1	1.5	1.6	1.7	1.5	1.6
Israel	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4
Singapore	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.4	0.4	0.4
Kazakhstan	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.3
Indonesia	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.3	0.3
Uzbekistan	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.3
Vietnam	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3
Hong Kong	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.2	0.2

TABLE 4 - SUPPLY OF SILVER FROM THE RECYCLING OF OLD SCRAP

(million ounces)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Other Countries	1.2	1.2	1.3	1.5	1.7	1.6	1.3	0.8	0.7	0.7
Total Asia	***83.4***	***78.7***	***82.3***	***92.0***	***100.6***	***99.7***	***75.9***	***66.4***	***49.3***	***46.8***
Africa										
Egypt	1.5	1.6	1.4	1.4	0.7	0.8	0.7	0.6	0.6	0.6
Morocco	0.5	0.4	0.5	0.5	0.5	0.5	0.6	0.4	0.4	0.4
Other Countries	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.6
Total Africa	***2.6***	***2.6***	***2.5***	***2.6***	***1.9***	***2.0***	***1.8***	***1.6***	***1.5***	***1.6***
Oceania										
Australia	1.7	1.6	1.6	1.6	1.6	1.4	1.3	1.2	1.1	1.1
Total Oceania	***1.7***	***1.6***	***1.6***	***1.6***	***1.6***	***1.4***	***1.3***	***1.2***	***1.1***	***1.1***
World Total	**203.7**	**200.4**	**200.1**	**226.4**	**260.1**	**253.8**	**191.0**	**165.3**	**141.1**	**139.7**

back from the market in a rather erratic fashion. In the first instance, a lot is dependent on the metal price. After that, however, high-grade jewelry and retail investment scrap flows can suddenly start to stutter as consumers tend to become greedy, anticipating higher prices. Silver is also found in electronic waste, but this source of supply is still relatively small compared to the high-grade sources and metal content typically is low and on a continued downward trend.

At 2.7 Moz (85 t), scrap supply in **India** remained steady compared to 2015, which was the lowest level in 15 years. But also electronic scrap from contacts, X-ray films and plated items remained elevated last year. Scrap from retail consumers was mainly in the form of like-for-like deals, where old jewelry was exchanged for new items. New sales were far and few between according to field research despite the fact that domestic prices were 13% higher on an annual basis. Sales of old brocades (fabric with raised patterns) with jari (gold and silver thread), however, continued to attract interest, with owners offering these items at competitive prices to generate cash. This was not necessarily a case of distress selling, but more a measure to clear out old stock. Sales of antique jewelry designs have dried up in recent years and were refurbished and reused for new designs due to a lack of desire for older designs.

Last year, silver scrap across East Asia (excluding Japan) fell by 6% to 24.8 Moz (771 t), the fifth annual decline in succession and the lowest level in nearly fifteen years. This outcome, while slightly counterintuitive given the higher U.S. dollar silver price, was largely driven by economic factors that influenced industrial fabrication volumes, which weighed on process remelt as stock levels were run down and liquidated. Old scrap from **China** slid by 15% in 2016 to a level not seen since 2003. A hefty fall in industrial demand impacted the recycling of process scrap while copper smelters hoarded material, waiting for higher prices, also reducing the available supply to the market. Despite soft industrial demand last year, recycling flows in **Taiwan** and **South Korea** were marginally stronger with recoveries benefiting from the rise in local prices to register gains of 10% and 7% respectively. Elsewhere, a stronger silver price was the chief catalyst for the increase in **Thailand** (+5%) and **Indonesia** (+10%) as the supply chain and consumers alike took advantage to recycle old and slow moving stock.

Japanese scrap volumes were weaker again in 2016, falling 7% to an estimated 16.2 Moz (504 t), the fifth decline in as many years. A stronger yen last year, particularly in the third quarter and partially as a result of the Brexit vote in the UK, saw the average domestic silver price decline by 2.3% on an annual basis. The price drop, combined with further falls in the collection of scrap collected from the photographic industry and process scrap from the industrial sectors pushed the total recovered to levels not seen for 26 years. One sector that has remained broadly constant has been X-ray scrap, which contains more silver than consumer film. Also, its availability is not dependent on price, but on medical facilities having kept the stock for the required length of time stipulated by statutory obligations though even this source was reportedly marginally weaker in 2016.

6. SILVER BULLION TRADE

- ***Swiss exports fell last year driven by considerably weaker demand in India, which only received 10% of total exports last year compared to 30% in 2015. This led to a rerouting of stocks to the United Kingdom for vaulting.***

- ***Silver imports in the United States rose 9% this year to 191.5 Moz (5,956 t). Flows rose from Eastern Europe and Asia but contracted slightly from Mexico and Canada.***

- ***South Korean exports rose 12% to 92.4 Moz (2,874 t). Almost all of its trade is export related with Japan taking half of the annual volume.***

- ***China remained a net-exporter of silver bullion in 2016 of 4.4 Moz (137 t); up 17% compared to 2015. Demand remained weak and an abundance of stocks persist.***

EUROPE

Europe (excluding Russia) is traditionally one of the world's main deficit regions as fabrication demand exceeds mine supply and locally generated scrap. However, if we include Russia this region is in a small surplus, which increased from 11.5 Moz (358 t) to 13.8 Moz (429 t) last year. Crucial for this was that fabrication of industrial items, jewelry, silverware and coins fell by 3% to 151.5 Moz (4,712 t), while scrap supply rose by 7%, although mine supply fell by 5% to a total of 65.0 Moz (2,022 t).

In 2016, **UK** official exports of bullion plummeted by 64% to 43.7 Moz (1,358 t). India remained the largest export partner despite an 81% drop year-on-year to the weakest level since 2009. The weakness of Indian demand was central to this dramatic drop. Shipments to that country in 2016 were 44% of all the silver exported from Britain. Flows to Canada rose by 80% to account for 36% of the total.

UK bullion imports were up 4% to 125.5 Moz (3,903 t), with most of the bullion coming from Kazakhstan, Germany, Poland, Switzerland and Sweden. Much of the increase in 2016 came from a partial recovery in flows from Switzerland, which more than doubled from the 2015 lows.

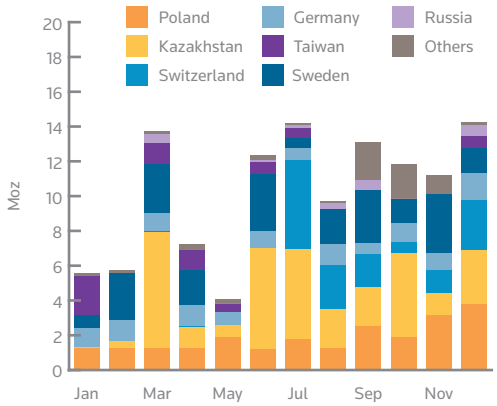
Swiss silver bullion flows last year were a complete contrast to those of 2014 and 2015. If these two years were recognized for severe inventory drawdown due to the surge in demand among key consuming countries, then 2016 was the complete opposite with flows reversed, leading to higher imports for converting to good delivery bars. Imports in 2016 increased by 31% to 27.3 Moz (850 t) rebounding from a 33-year low touched in 2015. The largest contributor to the increase was shipments from Hong Kong which constituted almost 70% of the total increase in volume, with the bulk of the shipments coming in September and October. In a similar vein, supplies from Russia, Turkey and the UAE were other major contributors to the increase. Turkey, which used to be one of the largest source of imports prior to 2013, is now increasingly exporting to Singapore and to India, pushing Switzerland to third spot. Imports from some of the major mining countries were notably stronger, specifically from the United States, Argentina, Chile, Serbia, and Saudi Arabia. Of note was the

2016 UNITED KINGDOM BULLION IMPORTS

125.5 Moz (3,903 t)

Source: GFMS, Thomson Reuters; HMRC

2016 MONTHLY UNITED KINGDOM BULLION IMPORTS



Source: GFMS, Thomson Reuters; HMRC

flows from Argentina which increased to the highest level in four years to approximately 1.7 Moz (52 t). Although exports from Chile increased, the bulk of shipments were to refiners in the United States with less than 10% to Swiss refiners.

Switzerland exported 45.3 Moz (1,408 t) in 2016, a decline of 33% year-on-year. The fall was largely attributed to weaker demand from India which last year received only 10% of total exports against 28% of all exports in 2015. Indeed, the biggest setback for the trade was a 75% year-on-year decline in total imports by India; this had a cascading effect which led to the rerouting of stocks to the UK for vaulting as much of the non-good delivery silver imported by India was being sent to Zurich for conversion. This was then exported to the UK from where it was vaulted at various shipping locations across Europe. The result of this was the share of exports to the UK increased to 35% as against 12% the year earlier. More interestingly, Germany's share of total exports from Switzerland surged from 3% to 18% with total volumes rising by 284% year-on-year. The vast majority of silver that is exported to the UAE and Nepal is often unofficially bound for India and the weakness in Indian demand last year helps explain the 95% drop in exports to the UAE. In the case of Nepal, the reasons were a little different as the central bank restricted imports following information that most of the imported silver was being smuggled into India.

Official **German** figures showed that bullion imports decreased by 49% in 2016 (to around 9.4 Moz (292 t)), an acceleration in the decline of the previous year. Sweden continued to be the largest supplier at 2.7 Moz (85 t) but flows were down by 42%. Shipments from Argentina dropped back even more sharply, by 65%, having risen sharply the previous year, which was likely to be doré. While those from Peru and Canada, which were virtually non-existent previously, rose to be the fourth and fifth largest sources of supply. Meanwhile shipments from Switzerland returned to being the third largest source and more than doubled year-on-year, although this still left imports at less than half the level recorded in 2014.

Germany's exports showed a 14% increase to 50.5 Moz (1,571 t) last year. Just over half of the bullion went to the UK, as exports to this market were up 14% compared to 2015. The destination for the other half changed appreciably, with flows to India and Turkey both rising by over 1,000% to become the second and third largest respectively. In the case of the latter, this dramatic increase was helped by entities expanding their operations in Germany in an effort to source more bullion from German refiners for the Turkish market. Meanwhile the sharp reduction in demand in Austria for investment products was key to the 64% drop in exports to that country. Other countries that took up silver bullion from Germany last year were Switzerland, the United States, and France.

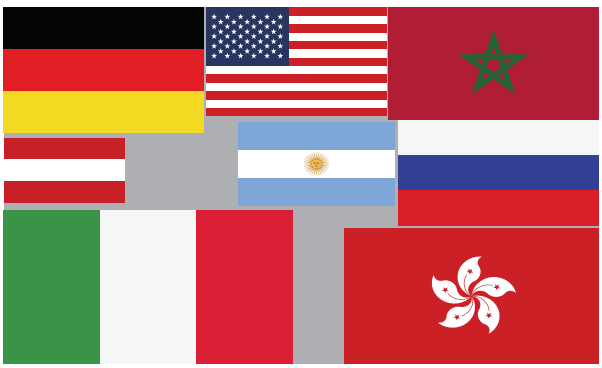
For the second successive year silver bullion imports into **Italy** fell appreciably, by 20% in 2016, to 21.7 Moz (675 t), back to levels seen in 2012. Germany remained the largest exporter, and its share of Italy's total silver imports recovered last year, to 42% from 37% a year earlier. On the other hand, the Swiss share slumped to 10% last year, from 17% in 2015. It is also noteworthy that imports from Morocco, Belgium and Peru, the fifth, sixth and seventh largest sources in 2015, saw an almost complete cessation of flows to Italy. Meanwhile, Italy's silver exports rebounded last year, by 26%, to 11.8 Moz (367 t), with gains to most key

2016 SWISS SILVER EXPORTS

45.3 Moz (1,408 t)

Source: GFMS, Thomson Reuters; Swiss Impex

2016 SWISS SILVER IMPORTS



27.3 Moz (850 t)

Source: GFMS, Thomson Reuters; Swiss Impex

export destinations. Shipments to Switzerland rose even more sharply last year, by 42%, to account for over half of total exports, as opposed to just 10% as recently as 2014.

In 2016, **Russian** silver bullion exports slumped by 45%, to 15.6 Moz (485 t), driven by India, as shipments to that destination tumbled by 61% which was only partially offset by increased flows to the UK and Switzerland. Meanwhile, silver bullion imports also dropped sharply, by 36%, as shipments from Italy fell by 37%. Despite the steep decline in flows from Italy that country still accounted for 88% of total Russian silver imports of bullion.

THE AMERICAS

Last year, the **United States** imports for silver bullion and doré increased by 9% to 191.5 Moz (5,956 t). The rate of growth was slightly lower than the strong increase recorded in the prior year but nevertheless a second consecutive year of a record high. Growth was mainly recorded from Peru, Poland and South Korea, although combined these countries only account for 14% of annual silver bullion and doré imports in the United States.

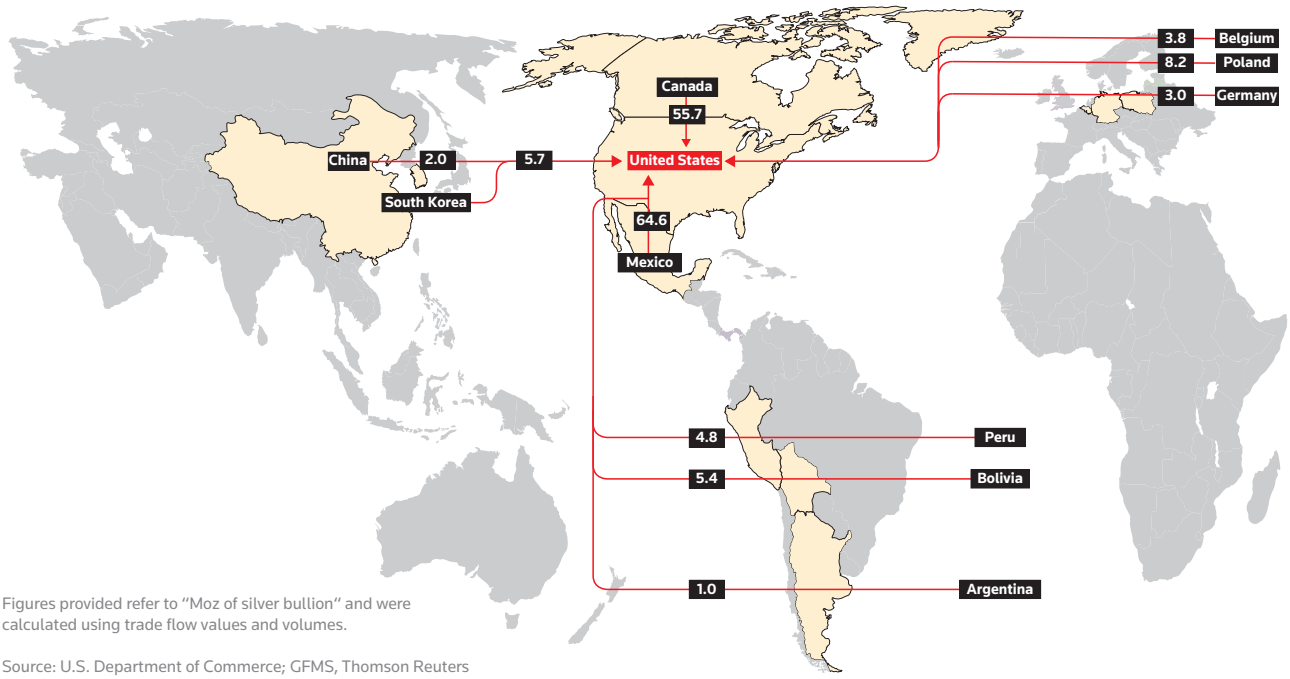
Bullion imports from China and Hong Kong also rose strongly last year supporting the rise in the global total and offsetting the small declines recorded in the main countries responsible for 73% of United States imports, Mexico and Canada. Since scrap availability has become rather tight in recent years, refiners in North America have been forced to increase their supply from primary sources.

The sourcing of feedstock for refiners in the United States has become more challenging following the stronger enforcement of due diligence measures. In order to "know-your-customer" further down the value chain encourages the sourcing of feedstock closer at home or in markets where transparency in order to comply with the stricter due diligence standards is greater. We would therefore not be surprised if bullion and doré flows will concentrate more towards the countries where the informal circuit is less present, which could mean that imports from some countries in South America could well come under pressure in the coming years.

MIDDLE EAST AND INDIAN SUB-CONTINENT

United Arab Emirates (UAE) market size for the silver trade is estimated to be approximately 5.8 Moz (180 t). A large part of this supply originates as secondary metal refined from copper concentrates and the rest is a by-product from refining gold doré within the UAE. With the steep discount in the Indian market it was not profitable to export to India by air, thus it wasn't that surprising to see that 25% of the

MAJOR TRADE FLOWS IN SILVER BULLION TO THE UNITED STATES IN 2016



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

Source: U.S. Department of Commerce; GFMS, Thomson Reuters

1.3 Moz (40 tons) exported to India were for re-exporting as value added products. The demand shortfall from India led to exports being directed to Switzerland and the United States, with each of these countries importing seven and five tons respectively as against nil in 2015. Poor demand was reflected in the discount in the local market which in July slipped to 60 cents below the LBMA price. This explains why imports from the UK was nil while from Russia and Turkey it fell by 85% and 50% year-on-year to 0.2 Moz (6 t) and 0.1 Moz (3 t) respectively.

Bullion imports (which include fine silver, scrap and mined doré) to **Turkey** rose 1% to 9.3 Moz (289 t) last year. Flows from Belgium, responsible for 35% of total imports, increased considerably to 3.2 Moz (100 t) last year followed by Morocco and Germany. For the majority of those inflows, the metal was (further) refined into finished investment grade products in Turkey and mainly sold to various export markets. Demand for silver bars and coins in Turkey remains at a relatively low level compared to the longstanding significant interest in gold. Turkey is known to have a competitive refining industry internationally, which has a comparative advantage due to lower labor costs (compared to refiners in North America and Europe). As a result, exports rose last year by an impressive 31% reaching 5.0 Moz (156 t). Flows to Singapore, good for 60% of Turkey's exports in 2016, were particularly strong last year, increasing by 344% to 3.0 Moz (93 t).

Indian silver bullion imports were down by 65% year-on-year to 89.8 Moz (2,793 t) last year. This was in sharp contrast to the surge to record volumes the previous year when lower prices motivated fabricators and investors to build inventories, whereas last year it was destocking

INDIAN BULLION IMPORTS

Moz	2012	2013	2014	2015	2016
Total Imports	**61.8**	**187.1**	**220.0**	**255.7**	**89.8**
Spot Price/kilogram	57,085	49,331	42,374	36,500	40,639

** Includes duty free and duty paid imports

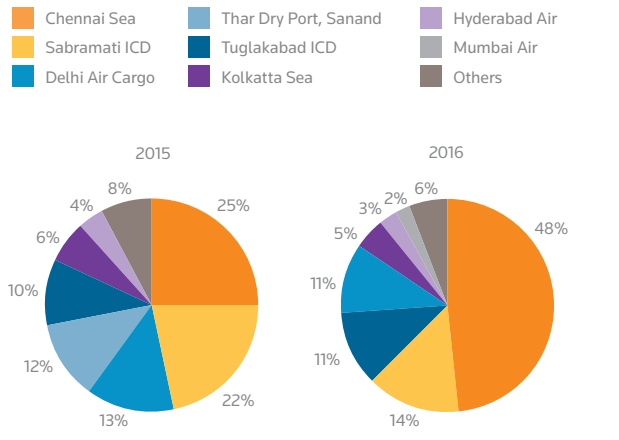
Source: GFMS, Thomson Reuters; Indian Ministry of Commerce

that shaped the market. The average price increased 13% year-on-year in 2016, but that wasn't the sole driver for the destocking which was also influenced by a change in book keeping practice across the industry. Imports were at the lowest in five years after three consecutive years of records.

Taking a look at the silver imports on a monthly basis reveals volumes were the highest in April at 19.9 Moz (620 t), with deliveries in the first half averaging 11.2 Moz (348 t) per month but in the second half just 3.4 Moz (106 t). Moreover, volumes were the lowest in May at 1.0 Moz (30 t) and again weak in August at 1.5 Moz (48 t). It was little surprise that imports were so low given that the market was in steep discount, slumping to 100 cents from the landed price in July. From February until mid-October the market was in a discount, before moving to parity towards diwali with a premia occurring following a jump in demand during demonetization.

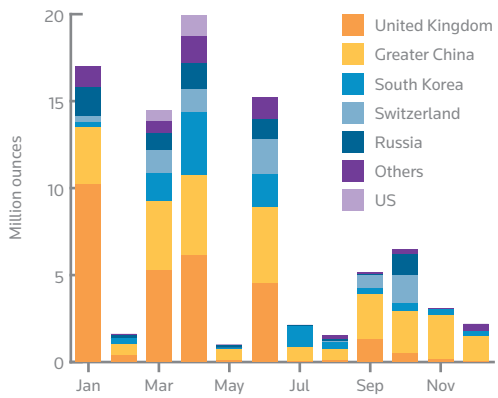
Last year 23 firms imported 89.8 Moz (2,793 t) of silver, of which 3.4 Moz (105 t) were duty free to make value-added products and for re-export; this included jewelry manufacturers, and fabricators of products for industrial use. For domestic consumption six banks and eight nominated agencies imported the remaining volume, and it took only the top five suppliers to contribute 80% of total volumes. Similarly, while supplies originated from

2016 INDIAN SILVER IMPORTS- REGIONAL DELIVERIES



Source: GFMS, Thomson Reuters

2016 MONTHLY INDIAN SILVER IMPORTS



Source: GFMS, Thomson Reuters

23 countries, it took only five countries to contribute to 80% of the imported volumes.

In addition to imports in the form of bullion and grain, we estimate that approximately 2.9 Moz (90 t) of silver was supplied from the refining gold and silver doré sourced from 15 countries, with the largest contribution coming from the Dominican Republic, Laos, Mexico and Peru. In addition, supply from domestically mined silver and imported copper concentrates at 16 Moz (498 t) last year, was a record level according to data published by the Ministry of Mines.

EAST ASIA

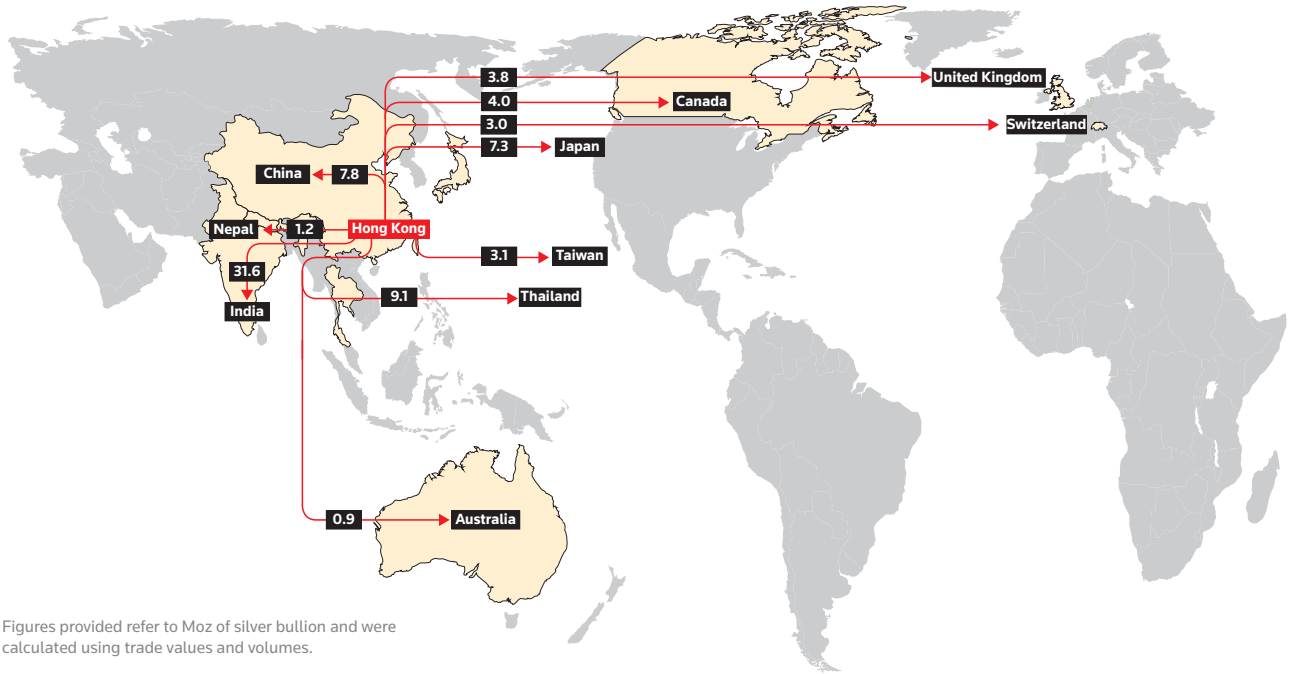
The imports of silver to **China** discussed are focused on bullion form. Meanwhile, base metal concentrates imports increased by 9% to 262 Moz (8,149 t) of contained silver. After rising substantially in 2015, Chinese imports of silver bullion declined by 29% year-on-year to a calculated volume of 19.9 Moz (620 t). Imports from Hong Kong and China's Free Trade Zone continued to be the major sources of supply, but these dropped 29% and 34% respectively. When combined, their market share dropped from 77% of total silver bullion imports in 2015 to 63% in 2016. Meanwhile, shipments from South Korea surged 240% last year to 2.1 Moz (65 t). Shipments from Australia and Switzerland, China's two largest sources of silver bullion in 2014, continued to slide in the standings.

Looking at bullion exports, after an increase of 50% in outflows in 2015, Chinese silver bullion exports dropped 3%, to 64.3 Moz (2,000 t). Hong Kong remained the largest destination, receiving 99% of total exports from the mainland. For comparison purposes, previous export volumes, particularly between 2006 and 2009, exceeded 128 Moz (4,981 t). On the other hand, exports to India, which were nonexistent before 2016, recorded 0.7 Moz (22 t) of shipments from China last year.

China remained a net exporter of silver bullion in 2016, with net exports of 4.4 Moz (137 t), an increase of 17% from a year earlier. The increase in net exports may be a reflection of the status of the domestic economy, as demand remained weak but with abundant stockpiles.

Due to the Value Added Tax (VAT) structure in China, various parties have tried to exploit loopholes, aiming to profit from arbitrage opportunities. While the Chinese silver price quoted on local exchanges is always trading at higher levels compared to the international benchmark, the local silver price is actually 17% VAT inclusive. Without the VAT, the Chinese silver price is actually lower than the international quotation. Combined with differences

MAJOR TRADE FLOWS IN SILVER BULLION FROM HONG KONG IN 2016



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

Source: Hong Kong Census & Statistics Department; GFMS, Thomson Reuters

between the yuan on-shore and off-shore rates, and cheaper silver could be had without official tax invoices, all these have encouraged silver (and other metals) to be smuggled in and out of the country, to take advantage of the price differentials.

Based on official trade statistics, silver bullion imports into **Hong Kong** decreased by 21% in 2016, to an estimated 21.2 Moz (659 t). China continued to be Hong Kong's largest bullion supplier, though volumes decreased by 11%, to 17 Moz (529 t). Imports from Japan, Turkey, the United States and the United Kingdom all surged, albeit from a low base. Meanwhile, exports increased 4% last year, to 77.1 Moz (2,398 t). Shipments to India decreased from 52% of total exports in 2015 to 41% a year later, while exports to Japan and Canada both rose substantially.

After falling 84% in 2015, **Taiwan's** total silver bullion imports fell 13% last year, to an estimated 4.2 Moz (131 t). While China remained Taiwan's biggest silver supplier, total shipments from this source fell 29%. China's market share has continued to fall, from 83% and 66% in 2014 and 2015 respectively, down to 54% in 2016. On the other hand, silver exports increased 34%, to 0.4 Moz (12 t). Exports to Hong Kong, Switzerland and Malaysia all rose.

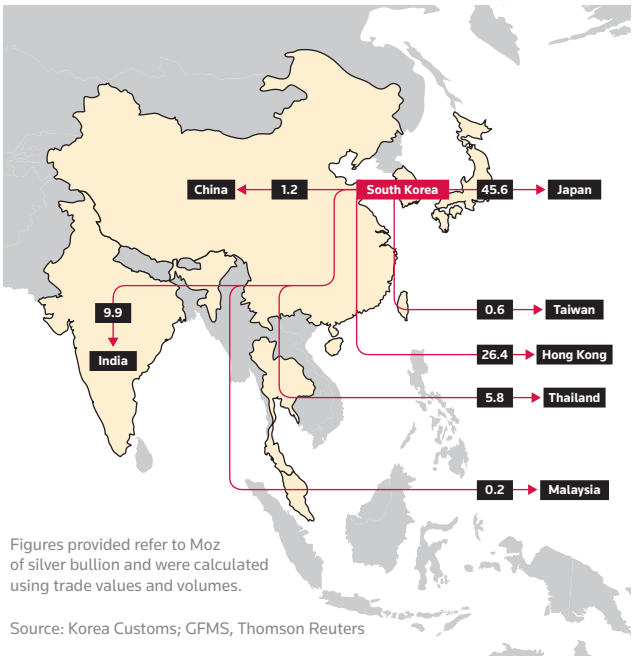
Singapore imports last year are thought to have increased by 3% to an estimated 5.0 Moz (156 t). The bulk, at around 80% of the total, was derived from inflows from Indonesia which jumped more than 20% year-on-year. This impressive rise in shipments offsetting substantive falls elsewhere, most notably Hong Kong, the United States, and Japan. Bullion exports were dominated by flows to India which more than doubled last year while flows to Thailand recorded a material fall.

South Korea's silver imports dropped marginally in 2016 by 0.7%, to an estimated 1 Moz (31 t). China remained the dominant supplier, but shipments fell by 28% year-on-year. China's market share also retreated from 94% in 2015, to 68% last year. Meanwhile, imports from Hong Kong, United Arab Emirates, Philippines and Taiwan all took market share from the dominant supplier. The country's silver exports, driven by its refining industry, rose 12% to 92.4 Moz (2,874 t). Japan remained the country's largest silver bullion buyer, with 50% market share. South Korea remained a net exporter of silver bullion last year, with net outflows rising 12% to 91.4 Moz (2,844 t).

Silver bullion imports into **Japan** rose a healthy 18% last year to a six-year high 58.9 Moz (1,833 t), with increased shipments from South Korea, which accounts for the vast bulk of deliveries, rising 23% year-on-year. Shipments from Thailand re-emerged last year making it the second largest source of supply while shipments from Hong Kong and China were broadly steady. Japan's silver exports fell heavily last year, by 37%, to an estimated 1.3 Moz (41 t). Shipments to India were weaker while exports to Vietnam were marginally stronger. In a reflection of the stronger solar industry Japan's silver powder exports surged 47% year-on-year on a calculated basis, with a significant increase in flows to Taiwan, South Korea, and China.

A weaker fabrication sector saw **Thailand's** silver bullion imports decline 18% last year to estimated 24.5 Moz (763 t). The sizeable fall, to the lowest level since 2012, was principally a function of a weaker jewelry fabrication sector. Imports from Hong Kong and China again dominated supply with combined shipments falling by almost 20% year-on-year, giving up some market share to Belgium which emerged as a new source of supply taking 20% market share. Switzerland, which had been dominating supply in recent years, saw flows slump over 50% in 2016 while shipments from Indonesia also recorded a material fall. Turning briefly to exports, reported bullion exports were down sharply last year, retreating by almost 50%, with a material decline in deliveries to India the chief architect for the fall.

MAJOR TRADE FLOWS IN BULLION FROM SOUTH KOREA IN 2016



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

Source: Korea Customs; GFMS, Thomson Reuters

7. INDUSTRIAL FABRICATION

- ***Global industrial fabrication totaled 561.9 Moz (17,478 t) in 2016, a 1% decline from the previous year. A 34% surge in demand from the solar sector was offset by falls within the electronics, brazing alloys and solders, and photographic sectors, all of which were weaker last year.***

- ***Photovoltaic (PV) demand for silver totaled 76.6 Moz (2,382 t) in 2016, a 34% surge from the previous year. This marks the second consecutive year of increases in this sector, and was driven by a 49% increase in global solar panel installations.***

- ***Brazing alloy and solder silver fabrication fell by 10% in 2016, to an estimated 55.4 Moz (1,722 t). The fall in demand was dominated by weakness stemming from China where demand fell heavily for the second year in a row.***

- ***Demand for silver from the ethylene oxide (EO) industry rose only at the margin last year but in so doing reached a record high 10.2 Moz (317 t).***

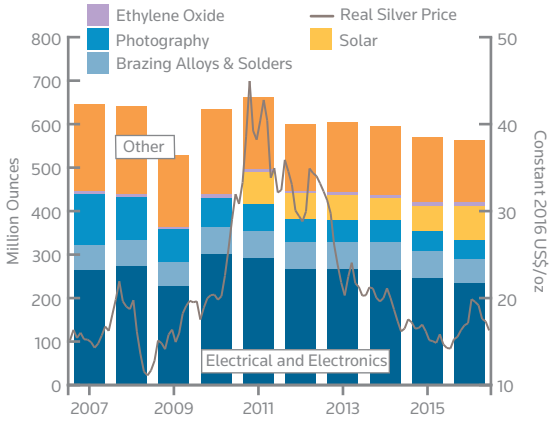
- ***Declines in demand from electronics, photography, brazing alloys and solders and other miscellaneous applications amounted to 27.1 Moz (843 t), outweighing the 19.4 Moz (603 t) increase in PV and EO demand.***

Following a 4% fall in 2015, industrial manufacturers consumed 561.9 Moz (17,478 t) of silver last year, a drop of just over 1% or 7.7 Moz (239 t). Another year of significant expansion from the photovoltaic sector was offset by falls across most other industry segments. The demand for ethylene oxide (EO) was stable, but electrical and electronic and brazing alloys and solders were all victims of weaker economic conditions which dragged down silver consumption. Photographic demand continued the long-term downtrend though the rate of attrition is now easing and appears close to stabilizing. The United States recorded another healthy rise, the second in succession, jumping 9% over 2015 volumes on an improved economic performance and outlook while a surge in silver powder production accounted for the 6% annual rise in Japan. Elsewhere the outcome was less impressive with sizeable decreases in demand from China, and South East Asia more broadly, while Africa, South America, and to a lesser degree Europe, all pulled fabrication offtake lower.

The macroeconomic outlook still played a central role in industrial fabrication offtake last year with the lack of a clear recovery in key markets impacting on investment, and at the consumer level, the willingness by consumers to spend in an uncertain economic environment. The global economy expanded by just 2.2% in 2016, the lowest rate of growth since 2008. Given industrial production expanded by an estimated 1.6% in 2016, also an eight-year low, it is not that surprising that industrial demand for silver remained under pressure.

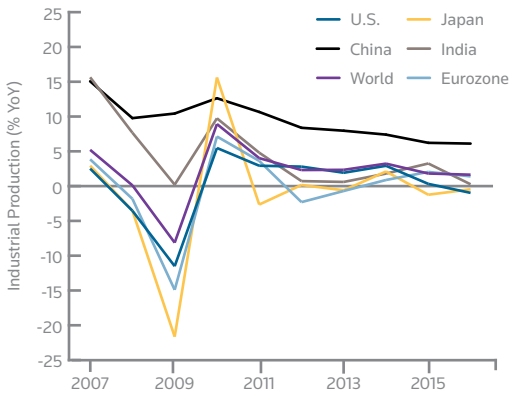
Aside from the obvious economic factors there remained pressure from ongoing thrifting and substitution in several sectors, most notably in the area of photovoltaics where the

INDUSTRIAL SILVER FABRICATION (BY CATEGORY)



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

INDUSTRIAL PRODUCTION IN KEY SILVER-USING COUNTRIES



Source: GFMS, Thomson Reuters; Oxford Economics

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

(million ounces)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Europe										
Germany	27.6	27.4	20.3	26.5	25.4	21.7	21.3	20.9	20.9	21.5
United Kingdom	23.8	22.0	17.7	20.6	20.8	19.0	17.9	17.6	17.5	17.4
Russia	22.2	21.9	18.7	20.3	19.4	19.1	19.2	18.2	16.6	15.6
Belgium	27.7	24.4	19.4	18.3	16.4	15.4	14.3	14.2	14.0	14.1
Italy	11.3	11.2	9.0	9.9	9.2	8.6	8.4	8.4	8.1	7.7
France	10.7	10.8	7.5	8.8	8.0	7.2	7.0	6.8	6.9	6.8
Switzerland	2.5	2.5	2.2	2.4	2.4	2.3	2.3	2.3	2.3	2.3
Czech Republic	1.6	1.7	1.3	1.5	1.6	1.8	1.9	1.9	1.9	1.8
Turkey	1.6	1.6	1.3	1.4	1.5	1.4	1.5	1.5	1.6	1.6
Netherlands	1.6	1.6	1.3	1.5	1.5	1.4	1.4	1.4	1.4	1.4
Spain	1.9	1.9	1.7	1.8	1.4	1.2	1.1	1.1	1.2	1.2
Poland	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8
Austria	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Norway	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Other Countries	2.1	2.2	0.3	0.5	2.0	2.1	2.2	2.3	2.2	2.2
Total Europe	**136.3**	**131.0**	**102.3**	**115.1**	**111.2**	**102.7**	**100.1**	**98.3**	**96.1**	**95.2**
North America										
United States	149.0	149.5	124.4	151.2	166.4	132.7	127.4	123.8	126.9	138.6
Mexico	3.3	3.1	3.1	4.8	6.0	6.6	6.6	6.7	7.9	8.0
Canada	2.7	2.4	1.3	1.9	1.8	1.8	1.9	1.8	1.7	1.8
Total North America	**155.0**	**155.0**	**128.8**	**157.9**	**174.2**	**141.1**	**135.9**	**132.3**	**136.5**	**148.4**
Central & South America										
Brazil	5.4	5.2	4.6	5.7	5.4	5.3	4.7	4.5	4.1	3.9
Argentina	1.4	1.0	0.8	0.9	0.9	0.9	0.9	0.8	0.8	0.8
Colombia	0.2	0.2	0.1	0.1	0.1	0.1	0.3	0.6	0.6	0.5
Other Countries	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Total C. & S. America	**7.4**	**6.8**	**5.9**	**7.2**	**6.9**	**6.8**	**6.3**	**6.4**	**5.9**	**5.6**
Asia										
China	127.7	145.5	136.7	156.8	164.1	165.4	179.7	185.9	168.6	143.6
Japan	123.9	103.2	65.5	94.2	101.2	89.0	90.0	83.8	82.0	87.1
India	31.5	32.6	31.9	35.1	38.6	36.3	35.1	33.5	31.8	31.9
Taiwan	16.7	16.6	12.3	15.1	15.8	14.3	14.6	15.1	14.4	14.6
South Korea	24.1	25.9	19.7	24.5	24.5	23.6	22.3	20.4	14.4	12.2
Iran	2.7	3.4	1.8	1.9	1.8	1.8	1.7	1.8	1.8	4.3
Hong Kong	7.1	6.9	5.5	6.4	6.4	6.2	5.8	4.9	4.4	4.0
Saudi Arabia	1.4	0.2	5.3	5.1	2.0	0.5	0.5	0.5	0.5	2.4
Kazakhstan	1.9	1.9	1.6	1.8	1.7	1.7	1.7	1.7	1.5	1.5
Uzbekistan	1.9	1.9	1.6	1.8	1.7	1.7	1.7	1.7	1.5	1.5
Thailand	0.9	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.2
Singapore	0.0	0.0	0.1	1.8	1.9	0.5	0.7	0.8	1.6	1.0
Indonesia	0.6	0.6	0.5	0.8	0.8	0.9	0.8	0.9	0.9	1.0
Other Countries	1.2	3.4	2.5	1.7	2.0	1.0	1.0	1.1	1.1	1.1
Total Asia	**341.5**	**343.2**	**286.0**	**348.1**	**363.5**	**343.8**	**356.7**	**353.1**	**325.6**	**307.3**
Oceania										
Australia	5.0	5.1	4.5	4.9	5.0	5.0	4.8	5.0	4.8	4.8
Africa										
Morocco	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
South Africa	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

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

(million ounces)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
continued										
Other Countries	0.3	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	**646.0**	**641.8**	**528.2**	**633.8**	**661.4**	**600.0**	**604.5**	**595.7**	**569.6**	**561.9**

use of silver per cell is estimated to have been reduced a further 5% on the level seen in 2015. This is on top of even larger reductions in previous years, with silver loadings lower on average by 9% per year between 2012-15 as the industry tries to lower costs while maintaining efficiency. Elsewhere, the market segments are more mature and the bulk of substitution has already taken place. Nonetheless, silver's use in industrial application is always under pressure as fabricators strive to reduce unit cost by using cheaper alternatives.

PV demand registered a 34% increase to a new record high and in so doing took this individual segment's share of total industrial demand to almost 14%. This significant increase, on the back of a near 49% surge in global solar panel installations, followed a healthy 28% rise in 2015. Ethylene oxide (EO) demand was the bright spot in 2015, with demand more than doubling but demand last year increased only at the margin. Nonetheless demand from this sector reached an all time high. The photography sector continued its secular decline in silver demand for photographic film and papers. The 3% fall, however, was the slowest rate of decline since 2002. Silver demand in electrical applications recorded its sixth successive year of decline, returning to demand levels last recorded in 2009. Demand for brazing alloys and solders also fell in 2016, by 10%, also a seven-year low.

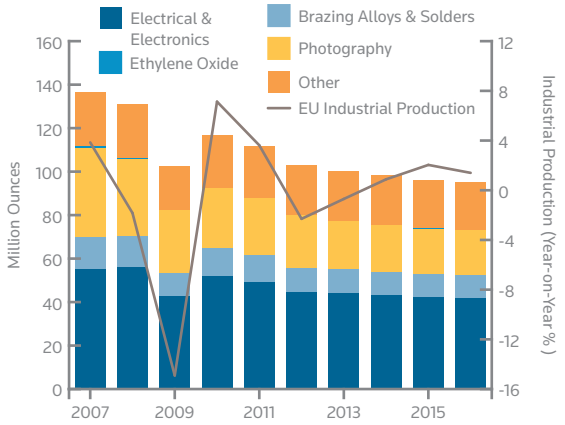
EUROPE

European silver industrial demand edged lower, by just 1%, last year to 95.2 Moz (2,960 t), posting a sixth consecutive annual fall. The drop was the best performance since the rebound in offtake in 2010 when many economies started to recover from the immediate turmoil of the global financial crisis. Indeed, the only segment of industrial fabrication of silver to see a sharper decline last year was that for ethylene oxide, the smallest component of industrial demand in Europe. Ethylene oxide demand dropped by 38% year-on-year in Europe as less new capacity was built, particularly in Russia, which had accounted for two-thirds of silver demand from this sector in 2015.

Industrial demand from major Original Equipment Manufacturers (OEMs) in Europe started 2016 slowly whether for low, medium or high voltage applications. We believe this was largely a function of destocking. By the middle of the year demand had picked up strongly, but the relative dearth of infrastructure projects continued to be a drag on overall offtake in this area, particularly in France. One unusual characteristic in 2016 was the strength of demand for brazing alloys over the summer months when demand for this sector typically slows appreciably.

German industrial fabrication, which is the largest user in the region, climbed by 3% in 2016. Central to this was the increased electrification of automobiles requiring an increased number of connectors for example. There is also a gradual shift from gold to silver (or in some cases palladium) in these applications. However, the pace of this shift is often limited as manufacturers are hesitant to shift until they have fully tested the reliability that will exist over the lifetime of the vehicle under a wide variety of weather conditions.

EUROPE INDUSTRIAL FABRICATION



Source: GFMS,Thomson Reuters; Oxford Economics

That said, the long term pressures on the industry remain ever present, not least the increased move to "design to cost". This approach, which is often stressed by global manufacturers to contain costs, puts severe downward pressure on silver usage across applications. Indeed, we are aware of applications where the latest versions can have 40% less silver than in earlier models. Further, there were some indications when silver prices peaked, that consumers were switching to lower silver content options in the middle of the year.

Meanwhile industrial demand in **Belgium**, which has been on a long term downtrend as its offtake is predominantly for the photographic sector, rose for the first time since 2006, albeit by a negligible amount.

Overall, **Russian** industrial fabrication of silver dropped by 6% in 2016. While this was the weakest performance in the region, it did at least represent an improvement on the 9% fall in 2015. Crucial to both the weakness of industrial fabrication and silver's relative improvement is the state of the underlying economy in Russia which remains in recession but as energy prices have started to climb again the pace of economic deterioration has abated somewhat.

NORTH AMERICA

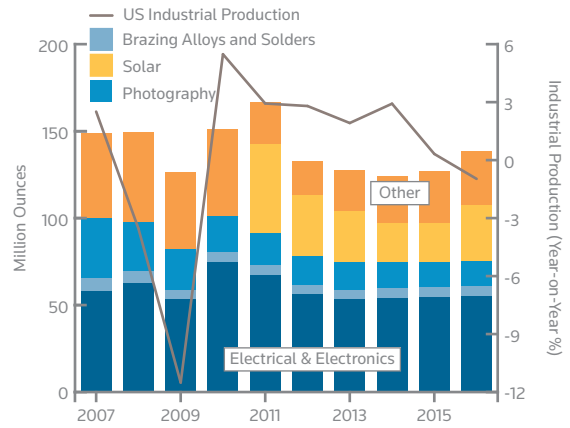
United States industrial silver fabrication increased a healthy 9% to 138.6 Moz (4,311 t) in 2016. The increase is the second consecutive annual rise. All end use sectors recorded improvements except for photography. The slump in photography, where silver is used in graphic arts and X-rays, started years ago and has been driven by the rapid emergence of digital photography. At current levels of demand it accounts for 10% of silver used in industrial fabrication, considerably less than the 42% market share it had at the start of the millennium.

The biggest driver of the healthy gains in industrial silver fabrication has been the solar industry which recorded an impressive 44% increase to 32.0 Moz (995 t). The solar sector, or silver powder production used in photovoltaic's (PV), surpassed our Other Fabrication category, which covers a multitude of applications, last year and now accounts for 23% of total industrial fabrication in the United States.

Most of the silver powder and other electrical applications in the United States is shipped to Taiwan, South Korea and China, where it is converted into paste and manufactured into electrical components. Silver powder exports rose 12%, which was mainly due to Taiwan where shipments rose 27% year-on-year. Other destinations in Asia, such as China and Japan, posted a drop of 6% and 9% respectively.

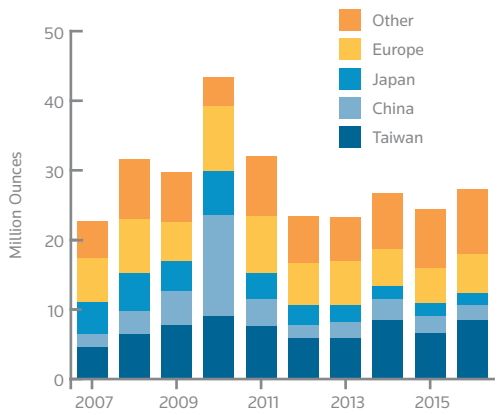
The United States was good for approximately 15% of PV installations last year, accounting for around 10% of total PV global capacity last year. Capacity is expected to double in the next 2-3 years. So far solar applications have been mainly utilized in suburban areas covering roofs in order to generate energy. Current rolled out applications will allow solar energy generation to be more widely used in dense urban areas. Higher efficiency thin film will be integrated in roof elements, windows coated with transparent organic or inorganic thin film and façade elements coated with thin film modules in all different colors.

US INDUSTRIAL FABRICATION



Note: Photovoltaic in "Other" category prior to 2011
Source: GFMS, Thomson Reuters; Oxford Economics

US SILVER POWDER EXPORTS



Source: U.S. Dept of Commerce; GFMS, Thomson Reuters

The largest source of industrial fabrication comes from the electronics and electrical sector, which made up 42% of the total in 2016. Demand used to be strong from computer applications, which peaked in 2011. Since then it has remained rather stable and has found a more widespread base of end-use applications. The continued electrification in automotives has played a significant positive role for silver demand from this sector and is continuing to do so. Also providing a boost to the United States is the fact that major OEMs are rolling out various electric vehicle models themselves.

EAST ASIA

Chinese silver industrial demand dropped 15% in 2016, to 143.6 Moz (4,468 t). This was the second consecutive annual decline, and the lowest level since 2009. Despite China's official GDP growth of 6.7% in 2016, the impact on the ground failed to reflect this robust performance. The strength of the Chinese economy took a notable downturn since 2015, and the downward momentum continued into 2016, though sentiment showed signs of improvement in the second half of the year.

The official manufacturing Purchasing Managers' Index (PMI), which tracks manufacturing activities of the larger sized enterprises in China, saw monthly ratings below 50.0 recorded in three months in 2016. When the PMI is below 50.0 this indicates that the manufacturing sector is declining and a value above 50.0 indicates expansion. The official manufacturing PMI was stronger in the final quarter, with average monthly readings above 51.0. However, if we look at the Caixin manufacturing PMI, which tracks orders of the middle and smaller sized companies, things looked less rosy, with monthly readings below 50.0 for six months last year, all during the first half. Both readings were implying that although manufacturing activities started to pick up, the sector was pretty mediocre for the most of the year, and hence its continual decline for silver demand.

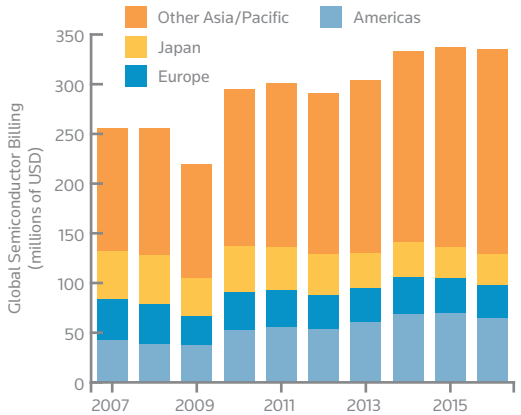
The problems and challenges in the Chinese manufacturing sector can be classified as both external and internal. Externally, overseas orders were relatively weak, particularly during the first half of 2016. Other than the United States, many other regions were in obvious trouble economically, especially Japan and the EU. While the external factors are important, what have been hindering the country's manufacturing sector are internal problems.

Internally, there has been an obvious over-capacity across different industries. While the government has been pushing to close down plants and capacities that were deemed as having low efficiency, the progress has been slow. Secondly, most of the domestic manufacturers remained at the lower end of the spectrum compared to those overseas, in terms of technology and efficiency. Part of the reason for this is that many of these manufacturers over expanded their capacity with debt, and now that sentiment has soured, they lack sufficient capital to upgrade their facilities. Thirdly, as the government has been evaluating the standards that manufacturers must obey for environmental protection in recent years, costs have escalated. As a result, some manufacturers that focus on high-end technologies have moved operations to developed countries, while some at the lower-end moved to the Southeast Asia regions where costs are typically lower.

Fortunately, manufacturing activities seemed to pick up in the final quarter. Indeed, concerns surrounding the return of haze and pollution across the country last year indicated that the manufacturing sector, including coal fired plants, were slowly picking up. While both the official and the Caixin manufacturing PMI indices managed to stay above a 51.0 reading in the first two months of 2017, with some good growth momentum in February and manufacturers signaling the strongest degree of optimism towards future output growth since May 2015, it remains to be seen whether the sector as a whole can take advantage of this current sentiment.

While the electrical and electronics sector remained the largest area of silver industry demand, silver use from

GLOBAL SEMI-CONDUCTOR BILLINGS



Source: SIA

this sector declined 16% last year, to 59 Moz (1,836 t). A slowdown in growth in the global economy, particularly in the first half of last year, resulted in softer demand for electronics products. A migration wave that saw some companies reallocating their manufacturing base to Southeast Asia have also negatively impacted the country's demand for silver. In terms of electronics, Chinese manufactured smart phones is probably the only bright spot in the field. According to estimates by Counterpoint Technology Market Research, global shipments of the Chinese manufactured smart phones grew 6% year-on-year in 2016, and made up about one-third of global shipments.

Turning to silver brazing alloys and solder, demand fell 19% to 27.2 Moz (845 t) in 2016. While sales improved for home appliances in 2016, thanks to a rebound in the property market, the problem for the sector is that there was an overhang of inventories. For example, according to the State Information Center of China, there were an estimated 48 million units of unsold air conditioner inventories towards the end of 2015, enough to satisfy one-year's sales demand based on monthly sales in 2015. Indeed, sales of air conditioners remained lackluster throughout the first five months in 2016, but began to pick up in June and July. Despite strong sales growth in these two months, manufacturers were focused on working through surplus inventories, and thus production volume remained low.

Due to an increase in costs of raw materials, many manufacturers raised the selling prices of their home appliances products in the fourth quarter last year, but sales continued to grow strongly. Looking into 2017, with most of the inventories overhang now gone, we believe the production of home appliances should pick up, and so too the demand for silver.

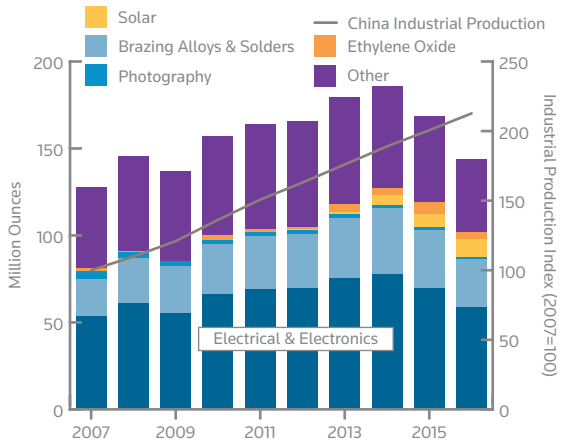
Silver usage in the Chinese ethylene oxide (EO) industry decreased by 36% to 4.3 Moz (134 t). Within the total demand, we estimate replacement demand actually increased 46% to 0.2 Moz (5 t), but demand from newly installed EO capacities fell 37% to 4.1 Moz (129 t). While there were seven new EO plants commissioned in China in 2015, there were only two in 2016, and hence the drop off in newly installed demand. China's demand for the EO derivative product Mono Ethylene Glycol (MEG) far exceeds its domestic supply; therefore it has been importing MEG. The country's strong demand for MEG has driven the rapid development of EO capacity in the country, particularly within the past decade. Therefore, we expect the pace of building new EO plants will slow down in China in the next decade, and as a result, the drawn down of fresh silver from this industry.

Japanese industrial demand rebounded in 2016 recording a healthy 6% year-on-year increase to 87.1 Moz (2,800 t), a three-year high. The annual rise may surprise given the state of the Japanese and global economy last year but the gain was entirely the result of significant gains in the production of silver powder and masks the fact that all other industry segments were materially weaker. Despite a recovery in exports towards year-end, helped by a weaker yen, the domestic economy expanded at a slightly slower than expected 1.0% annual pace in 2016, a little lower than the 2015 growth rate of 1.2%.

Economic output has oscillated between expansion and contraction in recent years, with a number of stimulus programs failing to produce sustained growth. In June last year Prime Minster Abe announced he would delay a planned increase in the national sales tax then in August the government detailed another package of financial measures that it said was worth 28 trillion yen, or $274 billion, equal to more than 5% of Japan's gross domestic product after the economy again stalled in the first half of the year, stymied by a stronger currency which severely impacted exports.

In 2016, exports by Japanese electronics and IT companies appear to have declined 9% year-on-year according to the Japan Electronics and information Technology Industries Association (JEITA), mainly attributable to the erosion

CHINESE INDUSTRIAL FABRICATION



Source: GFMS, Thomson Reuters; Oxford Economics

due to exchange rates and the slowing global demand for personal computers and flatscreen televisions. While there was a notable uptick in trade flows in the final months of the year, full year data was weaker, dragged lower by falls across the board. Consumer electronics equipment experienced a difficult year, slumping almost 12% in value terms, while double-digit declines were the norm for most sectors. This disappointing outcome comes on the heels of a 6% drop in exports of consumer electronics in 2015 and a 14% fall in 2014.

Turning to individual sectors' performance, the electrical and electronics sector declined by 3% in 2016 to an estimated 29.5 Moz (918 t), the lowest level since 2010. Demand for silver, excluding the photographic industry, saw a 30% fall last year, according to Japan's Agency of Natural Resources and Energy (ANRE), despite stronger automobile demand, offset by a sizeable drop in other industrial applications. Indeed, according the ANRE data silver demand fell in most industrial applications last year with exports weaker by 11% year-on-year. Offtake in the brazing alloys and solders sector also declined last year by an estimated 3% to 2.3 Moz (73 t) as weaker domestic demand coupled with a cooling export sector dragged silver consumed lower in these segments. Elsewhere, silver used as a catalyst during the production of ethylene oxide was unchanged with no new installations.

One area of Japanese industrial demand that moved against trend and has enjoyed rapid growth in recent years, while other segments have remained moribund by the lack of economic growth, has been silver consumption in powder production, used predominately in the photovoltaic

JAPANESE NON-PHOTOGRAPHIC NITRATE & CONTACT PRODUCTION

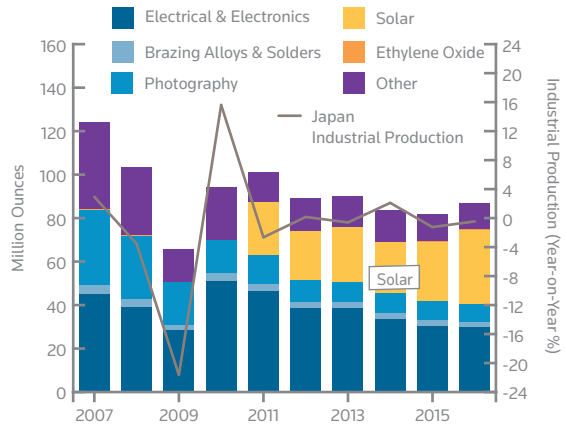
(million ounces)	2012	2013	2014	2015	2016
Non-Photo Nitrates	1.2	1.1	1.1	1.2	0.9
Contacts	3.4	3.9	2.1	2.2	1.9

Source: GFMS, Thomson Reuters

industry. Japanese production accounts for roughly 45% of the global total and at 34.5 Moz (1,072 t) last year jumped 26% over 2015 volumes to a new record level. The result last year was even more impressive when considering that there was an explosion and fatalities at the DOWA plant early in 2016 which effectively shut down production for a number of weeks. This industry segment has surged by almost 50% since 2012 and now accounts for 39% of total Japanese industrial production, driven higher by demand expansion for solar cell production, both on the domestic front and from the export sector. Powder exports have been buoyed by significant increases in flows to Taiwan, South Korea and China, with the latter surging by 166% last year while shipments to Hong Kong (also largely destined for the mainland) jumping by more than threefold.

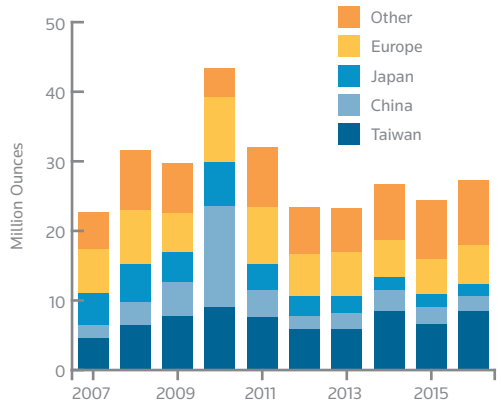
The outlook for industrial demand this year is brighter with the Nikkei Flash Japan Manufacturing PMI reaching 52.6 in March, down from 53.3 in February. However, the PMI has now been above the no-change level for seven successive months, and the average reading over the first quarter is the highest since the first quarter of 2014, indicating solid growth. Stronger export demand has been supported by a relatively weak yen. However, the appreciation of the yen, up 5% against the U.S. dollar so far this year, may provide less of a competitive advantage if it persists.

JAPANESE INDUSTRIAL FABRICATION



Note: Photovoltaic in "Other" category prior to 2011
Source: GFMS, Thomson Reuters; Oxford Economics

JAPANESE SILVER POWDER EXPORTS



Source: GFMS, Thomson Reuters

Industrial fabrication in **Hong Kong** is estimated to have eased 9% in 2016 to 4 Moz (125 t), in part due to high production costs in Hong Kong with many producers having already relocated to other Asian regions. Hong Kong's electronics industry is the largest merchandise export earner for the territory, accounting for 66% of Hong Kong's total exports last year. A substantial portion of such exports, largely re-export business, are regarded as high-tech products, including telecommunications equipment, semiconductors and computer items. In value terms, Hong Kong's total electronics exports increased by 3% in 2016, but mostly due to the growth in the re-exports business. Indeed, if counting domestic exports this category alone fell 9% year-on-year in value terms.

The bulk of electronic exports, at 63% of the total, were destined for mainland China with flows 2% stronger last year. Meanwhile, exports to the EU region registered a more healthy growth of 7%, but shipments to the United States fell 1%. One of the main developments has been in digital imaging, in particular smart TVs as well as the ultra-high definition TVs with display resolution of 4k (meaning resolution is four times that of a high definition TV) or higher. Some players are also keen to promote their 3D printers in the market in view of falling printing and other material costs.

South Korean industrial offtake fell another 15% in 2016 to an estimated 12.2 Moz (378 t), the lowest level this century. Indeed, the South Korean economy has been suffering and taken a notable downturn since 2015. Last year, other than weaker demand from overseas, the Korean economy suffered from mostly internal conflicts, including a wide scale labor strike in the auto industry, the decision to restructure the domestic ship building industry, and last but not least, the scandals and drama surrounding President Park, which ended up in her impeachment and arrest. The South Korea Nikkei Markit Manufacturing PMI, saw monthly ratings below 50.0 recorded in eight months throughout 2016 – indicating the Korean industrial sector was in a poor shape and contracting. It is even more worrying that PMI readings for the first two months of this year were also below 50.0. Another signal of the weakness of South Korea's economy can be seen in its export volumes. For the full year 2016, Korean exports fell 5.9%, largely due to a drop in global demand and weak oil

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

(million ounces)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
China	53.6	60.9	55.4	66.2	69.1	69.5	75.3	77.8	69.9	59.0
United States	57.7	62.2	53.4	74.6	67.0	56.1	53.1	53.8	54.2	54.9
Japan	44.8	38.7	28.2	51.1	46.2	38.4	38.3	33.6	30.4	29.5
Germany	21.4	21.7	15.7	21.3	20.3	17.2	17.0	16.7	16.7	17.2
India	14.1	15.0	16.1	17.1	17.2	17.6	15.1	16.1	14.5	14.6
Taiwan	11.7	12.3	9.9	12.1	12.7	11.3	11.8	12.3	11.7	12.0
Russia	12.1	12.1	10.3	11.3	10.9	10.7	10.9	10.1	9.2	8.6
South Korea	14.7	15.9	12.5	16.1	16.0	15.5	14.6	13.3	9.1	8.0
Mexico	2.1	2.1	2.2	3.8	5.0	5.7	5.7	5.8	6.9	6.9
France	8.5	8.6	5.7	6.9	6.1	5.3	5.3	5.1	5.2	5.1
United Kingdom	4.5	4.7	3.4	3.9	4.0	3.9	3.9	4.0	4.1	4.1
Italy	3.9	4.1	3.4	3.9	3.3	2.8	2.5	2.4	2.3	2.2
Hong Kong	3.5	3.3	2.7	3.1	3.1	3.0	2.8	2.3	2.1	1.9
Czech Republic	1.1	1.3	1.0	1.2	1.3	1.4	1.4	1.5	1.4	1.4
Brazil	1.5	1.5	1.2	1.6	1.6	1.6	1.5	1.5	1.3	1.2
Turkey	1.1	1.1	0.9	0.9	1.0	0.9	0.9	1.0	1.0	1.0
Kazakhstan	1.1	1.1	1.0	1.1	1.0	1.0	1.0	1.0	0.9	0.9
Uzbekistan	1.1	1.1	1.0	1.1	1.0	1.0	1.0	1.0	0.9	0.9
Singapore	0.0	0.0	0.0	0.2	0.3	0.3	0.5	0.6	0.7	0.7
Other Countries	4.0	4.0	3.3	3.8	3.6	3.5	3.5	3.5	3.5	3.5
World Total	**262.5**	**271.7**	**227.4**	**301.2**	**290.8**	**266.7**	**266.0**	**263.4**	**245.9**	**233.6**

prices. It is also the first time in 58 years that South Korea's exports finished with negative growth for two years in a row. All key exporting items except for personal computers posted declines in exports last year, though orders from the semi-conductor segment began to pick up during the second half of last year.

Indeed, there seems to be a pickup in global demand for Korean goods, evident by South Korea's improving exports, rising for the fifth straight month in March 2017, and up 13.7% year-on-year for the month. However, it may still be too early to call the Korean's economy back on track. For one, the next president (and the management team) will definitely have a lot of work to do, and will make its first priority restoring the country's political stability. Economic measures may not be the initial focus for the new regime. Secondly, despite protest from China, South Korea agreed to host a U.S. missile defense system (Terminal High-Altitude Area Defense/Thaad), which led to a range of economic sanctions from China. Events featuring South Korean popular culture artists in China were cancelled, and domestic travel agencies were told to halt sales of package tours to South Korea. Some have been advocating a boycott on products from South Korea. For a country's economy that heavily relies on China, South Korea's economic outlook does not bode well.

Taiwan's industrial use of silver is estimated to have posted a 1% increase last year, to 14.6 Moz (456 t), and 12% below the peak seen in 2007. Indeed, Taiwan's economic status fared much better in 2016, reporting a 1.4% year-on-year growth in GDP, compared to just 0.7% in 2015. The economic growth was particularly strong during the fourth quarter of last year, when the island economy grew 2.6% year-on-year, with strong growth in exports of goods and services (+5.3%). The manufacturing sector also grew 1.8% during the final quarter of last year. We estimate that demand for silver from the local electrical and electronics industry increased by 2% to 12 Moz (372 t).

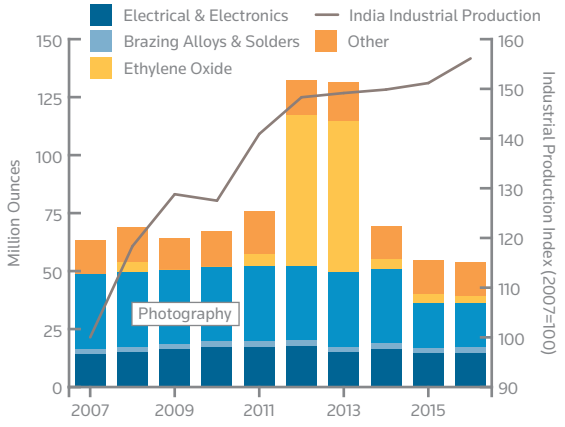
The strong momentum seen in Taiwan's economy during the fourth quarter carried forward into 2017. The island's exports in February 2017 increased by 28% year-on-year. However, the manufacturing composite indicator saw a downward correction in February, a second consecutive monthly decrease. While Taiwan's economy is on the rise, one potential risk is how America's trade policy will eventually play out.

Indian industrial fabrication was steady compared to 2015 at 31.9 Moz (994 t) as a revival in the economy helped clear inventory backlog. That said, Indian GDP grew at a faster pace last year, rising 7.1% year-on-year, but the Index of Industrial Production (IIP) paints a different story with negative growth of 0.2%, albeit the fact that IIP measures different components than GDP.

Before we explain the factors that were driving demand last year, it is important to note that we have revised downward historical demand series on industrial fabrication. The sub-segments that were revised are electroplating, and decorative after an in depth analysis.

Demand for silver in both electrical and electronics industry and by the brazing and solder manufacturers was steady last year. That said, demand from electrical and electronics industry still remains at the lower end of the range comparing data since 2009, whereas the brazing market is holding in the mid-range. The factors driving demand haven't changed much and the contacts industry continued to face competition from imported products, albeit at volumes that are of less significance in the LV (low voltage) switchgear market. Domestic demand is primarily dependent on LV switchgear sector, given the scope of increase in residential and commercial projects. The improving lifestyle, increased safety concerns and improving consumer level brand awareness in the LV switchgear market is seen shifting large volume of business to organised players. Government projects such as "housing for all by 2022", a mission intended to provide 20 million housing units, may not drive much growth for silver contacts market due to usage of low quality products,

INDIAN INDUSTRIAL FABRICATION



Source: GFMS, Thomson Reuters; Oxford Economics

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 used every day. In the last decade, global EO capacity expanded at a 4.9% compound rate per annum. Demand for ethylene oxide is generally tied to the global economy. However, in recent years demand has been more closely linked to growth in emerging economies, where rapid improvement in living standards has been driving increased demand for EO-derived products like textiles, detergents, plastic bottles and cosmetics.

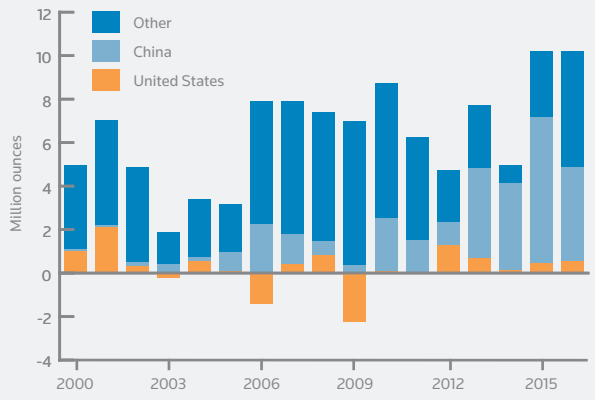
EO is produced from polyethylene grade ethylene. The manufacturing process involves mixing ethylene and oxygen in the presence of a silver catalyst at a temperature between 200 and 300 degrees Celsius. Silver acts as the reaction site, enabling ethylene to react with oxygen. While it is not consumed in the reaction process, the silver does need to be recycled (around 2% of silver is lost during the recovery process), and the cycle varies from 18 to 36 months depending on the technology uses and capacity utilization at the plant. 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.

Ethylene glycols constituted by far the single largest EO derivative, making up over 60% of EO's industrial application. Monoethylene glycol (MEG) is the primary glycol which is used mainly to make polyester, but also is used to make automotive antifreeze. Polyester is mostly used to produce polyester fibre in the textile industry, as well as bottle polyester resin. Other major end uses of EO include ethoxylates (detergents, surfactants), diethylene glycol (unsaturated polyester resins, plasticizers), ethanol amines (soap, detergents, purification of natural gas), glycol ethers (blake fluids, solvents) and polyethylene glycols (perfumes, cosmetics, pharmaceuticals).

Polyester fiber, which is used in textile products like apparel and carpeting, accounts for an estimated 36% of ethylene oxide demand at present, making it the largest source of end product demand for EO. This share has been growing, as polyester's share of textile demand has increased significantly over the long term. Polyester's share has grown as changing consumer preferences have favored the fiber's water resistant and durable characteristics. Additionally, polyester is very cost competitive against its peers like cotton and is highly recyclable. According to the Lenzing Group, oil-based synthetic fibers had a market share of over 60% of global fiber consumption in 2016. However, growth in global fiber consumption has slowed down in recent years, with total consumption up only 1.5% last year based on their estimate.

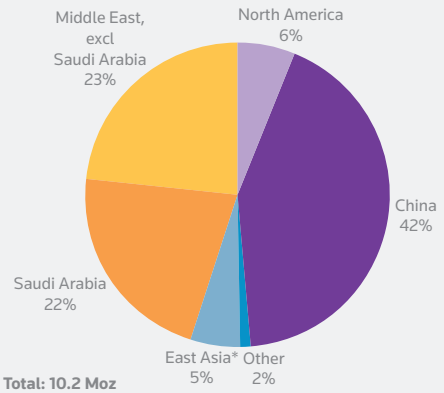
Last year was a record high for silver demand from this sector. Demand from the EO industry was slightly higher (0.1%) than the previous year, at 10.2 Moz (317 t), after more than doubling in 2015. Of the 10.2 Moz, 10% was replacement demand for existing capacity. China accounted for the largest share, making up 42% of demand last year. GFMS estimates that EO capacity globally rose by 6.0% in 2016. While we expect global EO capacity to continue to climb, by 3.8% in 2017, this pace is slower than the strong pace last year and hence this will likely cause demand for silver to soften. This slowdown in new capacity is a result of falling capacity utilization in the last six years, as a result of competition from newly installed plants.

GLOBAL SILVER EO DEMAND



Source: ICIS via Eikon; GFMS, Thomson Reuters

LOCATION OF SILVER INSTALLED IN EO FACILITIES IN 2016



World Total: 10.2 Moz
*excl China
Source: GFMS, Thomson Reuters

NEW AND GROWING SOURCES OF DEMAND FOR SILVER

Silver fabricators have benefited from the growth of many relatively new industries, of which solar modules manufacturing is an eminent one (see page 64). To stay ahead, many silver fabricators are exploring niche markets, which previously would have been dismissed as too small compared to traditional core sectors. Nevertheless, silver's attributes, namely its high conductivity and antimicrobial properties could offer solutions to the many technical challenges faced by many up-and-coming new applications.

In transparent conductor applications, indium tin oxide (ITO) is the incumbent technology. New developments in this application, however, require similar attributes found in ITO to be applicable to large-area touch and flexible surfaces, where the incumbent technology has its limits. Metal mesh and silver nanowires are emerging as a viable alternative. Should demand for such applications in transparent conductors materialize, there might be a case for silver nanowires uptake.

An example of silver nanowires use in transparent conductor applications is in Organic Light Emitting Diodes (OLED), where the top electrode is made of a transparent conductor and plays an important role in light transmission and efficiency. OLEDs provide lighting in a form factor that needs to be bent, curved or flexed, which calls for flexible transparent conductors, and a material that needs to be highly transparent, thin and lightweight. In this case, silver nanowires are a superior alternative to ITO, which is relatively thick and brittle.

Silver can also be found in electrical conductive adhesives (ECA), where it is used as metal filler held within a polymeric resin. ECAs are a safe and environmentally-friendly alternative to traditional tin-lead solder. ECAs are found in applications such as photovoltaic modules, LCD and OLED displays, touch panels, LEDs and radio-frequency identification chips.

Silver is also finding its way into the wearables market, an area that potentially bridges two of silver's largest uses: electronics and jewelry. While watches and fitness trackers are the dominant wearables available commercially today, smart jewelry are making inroads too. Smart jewelry consists of pieces that also offer features found in other electronic gadgets, such as fitness tracking, notification alerts and mobile payments. In this respect, silver is not only used in jewelry finishing, but also in the electronic circuitry and sensors.

The "Internet of Things" concept, a technology where physical objects are connected through internet connectivity is another trend which could benefit silver uptake, as these objects are embedded with sensors and circuitry that requires high conductivity. Silver use in sensors has the most promising growth potential in applications for building automation, environmental monitoring, healthcare and smart lighting.

Silver's high conductivity and antimicrobial properties make it a good material for new applications such as e-textiles and smart clothing. While growth in sporting and fitness activity is a main driver for e-textiles and smart clothing, materials choices remain diverse, with little consolidation so far. Washability, printability, stretchability, conductivity and costs are key requirements to material selection. This segment is still considered a niche market relative to mainstream wearables like smartwatches and until the trend gains momentum, it remains to be seen which material will emerge a winner and achieve meaningful volumes.

Silver nanoparticles serve as a basis in cream treatments for anemia and sunburns, wound healing bandages and respiratory masks. Silver's antimicrobial properties are well-understood and developed in these applications, but there are still vast areas under research and development in nano polymer technology. The Fraunhofer Institute for Manufacturing Technology and Advanced Materials (IFAM), in Germany, has come up with a new dental implant coating that uses silver ions to prevent bacterial growth. To eliminate the risk of bacteria preventing the implant from adhering, researchers integrated silver nanoparticles into the thin plasma polymer coating, where silver concentration and thickness of layers can be adjusted. The Chinese Academy of Sciences (CAS) in Beijing found a way of using silver-circuit polymer in contact lenses by injecting droplets of silver ink into the lens polymer, producing a conductive mesh of tiny wires that measure one micrometer in width. Apart from contact lenses, the silver-circuited polymer can be used in other wearable devices such as artificial skin that can measure temperature and perspiration. Such applications are useful as wearable medical and healthcare devices for monitoring and treatment purposes.

Developments in applications mentioned above are still in their infancy and sizeable volumes are not expected in the immediate-term. But what is clear is the versatility of silver's use across a range of industries beyond traditional core sectors could offer fresh scope for uptake and future growth.

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

(million ounces)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
China	21.3	25.9	26.6	28.6	30.5	31.4	34.7	37.6	33.3	27.2
United States	7.7	7.2	5.2	5.9	6.0	5.3	5.7	5.8	6.0	6.1
India	2.2	2.2	2.2	2.6	2.7	2.4	2.1	2.6	2.5	2.5
Japan	4.2	3.9	2.5	3.7	3.5	3.0	2.8	2.5	2.4	2.3
United Kingdom	2.4	2.3	1.8	2.3	2.4	2.2	2.1	2.2	2.2	2.2
Germany	3.6	3.4	2.3	2.8	2.8	2.3	2.2	2.1	2.1	2.1
Canada	2.4	2.2	1.1	1.7	1.7	1.6	1.6	1.6	1.5	1.5
Russia	2.0	2.0	1.7	1.9	1.8	1.8	1.8	1.8	1.6	1.5
South Korea	2.4	2.6	2.1	2.3	2.4	2.2	2.1	1.9	1.5	1.4
Italy	2.5	2.4	1.7	1.8	1.7	1.6	1.5	1.5	1.5	1.4
Switzerland	1.4	1.4	1.2	1.3	1.3	1.3	1.2	1.3	1.3	1.3
Taiwan	1.3	1.2	1.0	1.2	1.3	1.2	1.2	1.1	1.1	1.1
Brazil	0.8	0.8	0.9	1.0	1.0	1.0	1.0	0.9	0.8	0.8
Mexico	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.7
France	0.9	0.8	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.5
Australia	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.5	0.5
Belgium	0.6	0.6	0.6	0.6	0.7	0.7	0.5	0.5	0.5	0.5
Spain	0.6	0.6	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.4
Other Countries	1.1	1.2	1.0	1.3	1.3	1.4	1.4	1.4	1.4	1.4
World Total	**58.6**	**61.8**	**53.8**	**61.2**	**63.2**	**61.1**	**63.7**	**66.7**	**61.5**	**55.4**

but these could drive demand in the power infrastructure sector.

Last year transmission lines were commissioned at a monthly average rate of 2,150 circuit kilometers which, though lower than previous year, achieved the planned target. Growth is likely to be further driven from the fast execution of various infrastructure projects related to power and transmission sectors ahead of the 2019 assembly elections. In the exports market the core competitiveness are said to be in the earth leakage circuit breakers, high rupturing capacity cartridge fuses, miniature circuit breakers and air circuit breakers which are large users of silver contacts or bi-metallic contacts. And with western economies limping back to growth and developing economies spending more on infrastructure projects, the residential electricity industry is also getting a boost in the overseas market; helping exports of these products get back to normalcy.

Silver nitrate production posted strong growth last year albeit large volumes were primarily for exports. This has been one of the high growth segments for fabricators due to growing demand from the pharmaceutical industry.

The decorative segment has seen strong growth with substitution effect from gold to silver jari which are plated with gold. Similarly its usage in the food industry continued to remain strong on lower prices and increased awareness of low-quality substitutes.

Turning to other miscellaneous silver based products, where imports were stronger or at worst steady, these were led by silver targets used in the glass industry, fine silver strips and silver paste for manufacturing solar panels. The latter is likely to see much stronger growth given the push it has been getting as it is one of the pet projects of the government. In the 2015-16 financial year 3 GW of solar power capacity was added and in 2016-17 as of March end about 10 GW is estimated to have been added against a target of 12 GW. On the other hand, the fall in solar power tariffs is becoming a concern for the manufacturers.

PHOTOGRAPHY

- ***Demand for silver used in photographic applications declined by 3% last year to an estimated 45.2 Moz (1,405 t).***

Photographic fabrication demand for silver retreated by just 3% in 2016, slipping to 45.2 Moz (1,405 t), which amounted to 20% of the volume recorded at its peak in 1999. Although this marked the lowest total recorded in GFMS'

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

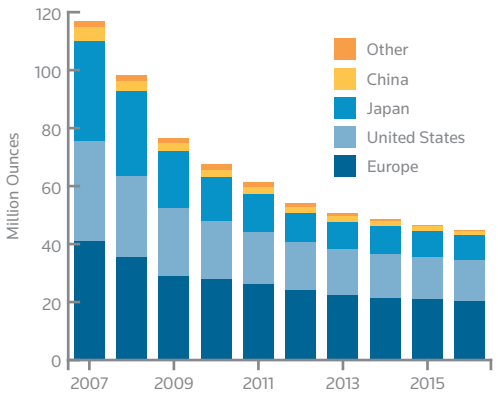
(million ounces)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
United States	34.4	28.1	23.4	20.2	17.9	16.8	16.0	15.3	14.8	14.2
Belgium	26.9	23.5	18.6	17.4	15.5	14.4	13.6	13.5	13.3	13.3
Japan	34.7	29.2	19.6	15.0	13.2	9.7	9.5	9.3	8.8	8.4
United Kingdom	11.8	9.9	8.6	9.0	9.4	8.4	7.4	6.7	6.5	6.2
China	4.6	3.7	3.1	2.6	2.4	2.2	1.9	1.8	1.6	1.5
Russia	2.1	1.8	1.5	1.4	1.2	1.2	1.1	1.1	1.0	1.0
Brazil	1.4	1.3	1.0	1.4	1.2	1.1	0.5	0.3	0.2	0.2
India	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2
Czech Republic	0.2	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	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
World Total	**117.0**	**98.2**	**76.4**	**67.5**	**61.2**	**54.2**	**50.5**	**48.5**	**46.6**	**45.2**

data series, it was nonetheless the lowest percentage decline seen since 2004. Indeed, after averaging a 15% annual decline between 2007 and 2011 it would appear that demand has now largely stabilized; this suggests that the bulk of structural change in the photography market may now be behind us and that current fabrication volumes may be largely sustainable looking forward. Moreover, fabrication demand in the last five years has retreated by an average 6% per annum with the last three years slipping less than 4% annually. In 2016, photography's share of total silver physical demand stood at just 4%, compared to 12% in 2007, with photography's share at the start of the millennium amounting to 22% of the total.

The material fall since the peak has been entirely due to the digital revolution and the rapid migration away from the use of silver halide technology to digital processing applications across an array of industry segments, from consumer cameras and paper to lithography and medical applications (X-ray). While demand for consumer photographic film and paper continued to experience considerable contraction in 2016, demand from the healthcare system was more robust, with only a moderate fall on an annual basis. The high costs of advanced diagnostic tools have held the X-ray market back in emerging regions and this has delayed the migration to digital alternatives.

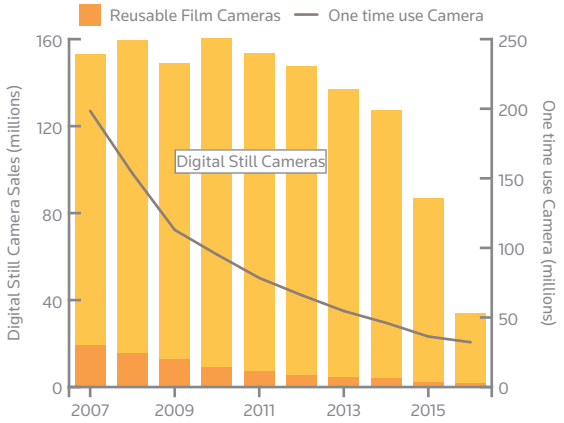
The increasing prevalence of socialized or universal healthcare programs is also driving an effort to cut costs, which has kept the demand for advanced X-ray systems stable. Wet chemical or analogue X-ray systems now account for less than 30% of the global total, but the rate of decline has eased since the initial surge following the introduction of the technology in the mid 1980s.

WORLD PHOTOGRAPHIC FABRICATION



Source: GFMS, Thomson Reuters

DIGITAL AND FILM CAMERA SALES



Source: Photofinishing News Inc.; GFMS, Thomson Reuters

While these traditional areas of demand have succumbed to the introduction of digital technology, there have been areas within the segment that are set to provide growth in the coming years. One area in particular is the rapidly expanding demand for touch screen flexible mesh technology where silver is increasingly being used. Currently, touch screen devices mainly rely on electrodes made from indium tin oxide (ITO), a material that is expensive to source, expensive to process, and very brittle. In recent years touch panels have been mostly employed for applications with relatively small screens, such as smart phones, tablet PCs, notebook PCs, and car navigation systems. More recently, touch user interface (UI) is now being introduced to devices with larger screens, such as all-in-one (AIO) PCs, electronic boards, and large notebook PCs. As screens get larger and more flexible, the resistance of transparent electrode becomes more important. Reflecting such trends, non-ITO film is forecast to make up more than a third of the total transparent conductive film market in 2017, which will be positive for silver demand.

In **Japan**, photographic demand retreated 5% in 2016 to reach 8.4 Moz (261 t), a similar decline to that of the previous year. It would seem the worst is now over with demand contraction in the last four years easing to an annual average of 4% compared to the previous four years when demand tumbled by an average 24%. Demand for traditional consumer film and paper continued to fall, but this was partially offset by growth for instant film cameras such as Fujifilm's Instax camera, which has rapidly gained popularity among the youth demographic. Robust sales in the United States and Europe have further supported export demand from this segment.

In the **United States** photographic demand fell by just 4% to reach 14.2 Moz (443 t) last year, the fifth successive year of moderate single digit declines. According to Photofinishing news, demand for both photographic film and color negative paper continued to retreat in 2016, by 24% and 14% respectively, with these losses partially offset by a less severe contraction in the medical sector.

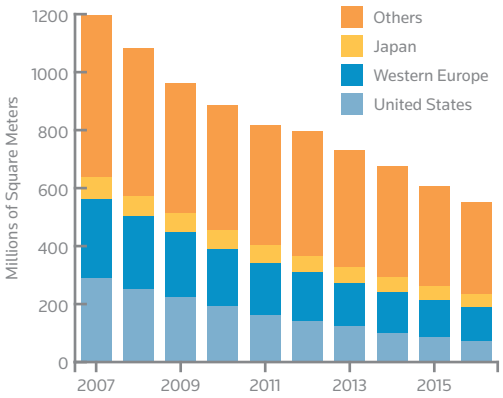
European demand was also marginally weaker in 2016, declining 2% year-on-year to an estimated 20.6 Moz (640 t). In recent years, the region has been hit with a number of factory closures as demand for traditional consumer photographic products as continued its decline. Indeed, the Kodak Alaris facility in the UK was another casualty last year, announcing it would wind down production of it color photographic papers operations. As a bloc, demand for 24 exposure rolls of film fell by another 31% according to Photofinishing News. The bulk of European production is now centered in Belgium, producing mainly X-ray film for the healthcare sector. This market flatlined in 2016 as migration to digital radiography has been hindered by economic pressures.

PHOTOVOLTAIC

- ***Silver demand from the photovoltaic (PV) industry rose to a fresh record high of 76.6 Moz (2,382 t) in 2016, up 34% from the previous year. This growth was the strongest since 2010 and was driven by a 49% increase in global solar panel installations.***

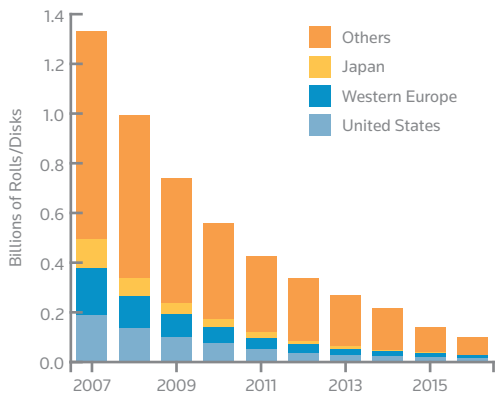
In 2016, silver demand from the PV industry increased more strongly than expected, largely due to a doubling of annual

WORLD COLOR PHOTOGRAPHIC PAPER CONSUMPTION



Source: Photofinishing News Inc.

CONSUMER FILM SALES



Source: Photofinishing News Inc.

solar panel installations in China and the United States. World installations are estimated to have increased to 76.1 GW, up 49% from 2015. Installations in China and the United States rose to 34.2 GW and 14.6 GW, respectively, up 126% and 95% year-on-year. The surge in the United States is partly owed to the 20% decline in system prices, which was the biggest annual drop on record according to GTM Research. The strong growth is also attributed to an uptick in utility-scale projects (facilities that feed a sizeable amount of power directly into the grid through purchase agreements with a utility) that came online in the second half of the year.

For China, strong growth in annual installations last year was in pursuit of the National Energy Administration's goal to add more than 110 GW of capacity between 2016 and 2020. The country is expected to invest 2.5 trillion yuan into renewable energy development in the period as well in support of this goal, with a target of increasing renewable's share of power generation from 11% at present to 20%.

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 host of factors, namely to account for lead times, cell breakage, and overproduction to maintain cost competitiveness. Cell breakage is when cells break during fabrication or module assembly. It is uncertain if these broken cells are getting recycled for materials value at present. Solar cell production was estimated at 80.7 GW last year, roughly 6% higher than installations. This margin compares to 11% in 2015.

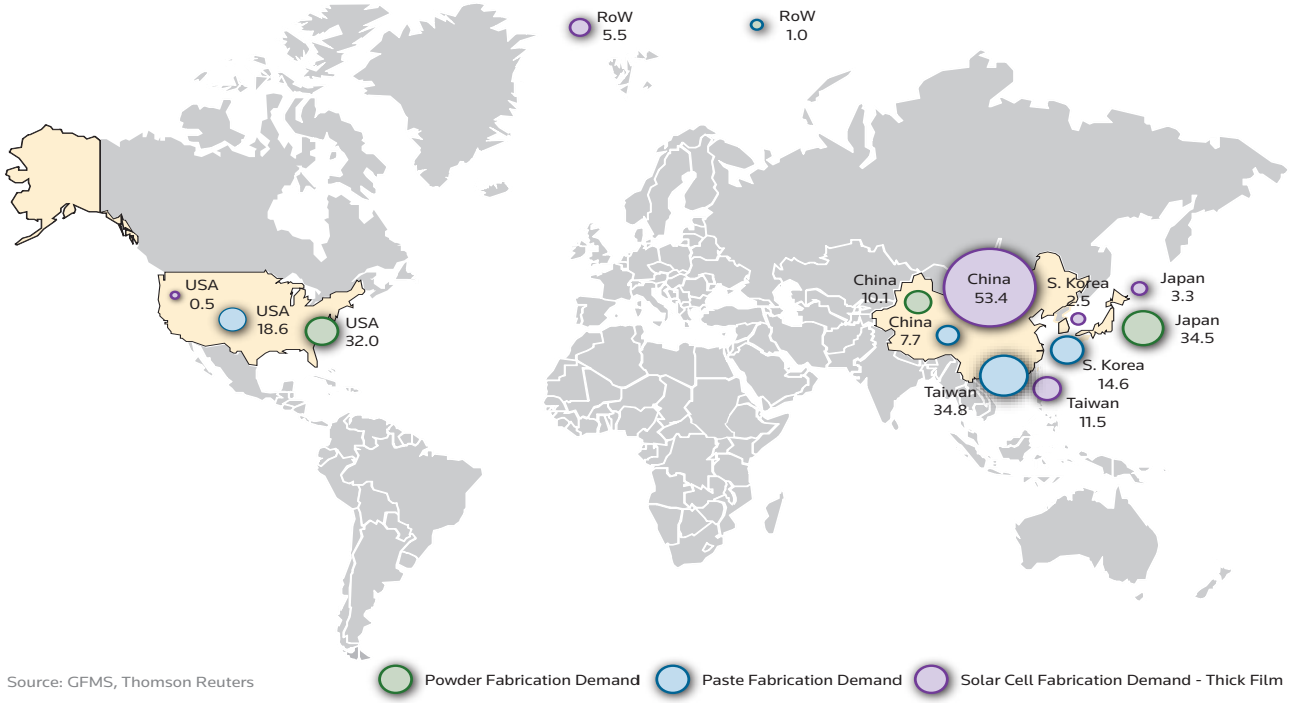
Silver is mainly used in the form of paste on the front and back contact within a solar cell. Last year, an estimated 81% of silver demand was used in frontside paste while the balance was used in backside paste. This allocation compares to around a 50/50 split in the 2010 – 2012 period and a 75/25 split in 2015. In terms of silver's content in front and back pastes, upwards of 90% of the gross weight of frontside paste is silver while upwards of 60% of the gross weight of backside paste is silver. Much

ESTIMATED SILVER POWDER PRODUCTION FOR PV BY COUNTRY

(million ounces)	2012	2013	2014	2015	2016
Japan	22.7	25.2	23.3	27.5	34.5
United States	34.9	29.1	22.3	22.3	32.0
China	0.6	1.7	6.2	7.4	10.1
World Total	**58.2**	**55.9**	**51.8**	**57.2**	**76.6**
..of which Frontside	34.9	36.3	36.3	42.9	61.9
..of which Backside	23.3	19.6	15.5	14.3	14.7

Source: GFMS, Thomson Reuters

SILVER SUPPLY CHAIN IN GLOBAL PV INDUSTRY IN 2016 (MOZ)



Source: GFMS, Thomson Reuters

of the silver reduction in back side pastes has come from thrifting or partial aluminum substitution. Additionally, some manufacturers have removed backside silver paste altogether, employing a new technology called PERC, or passivated emitter and rear cell, or using pure aluminum backside paste. Silver removal or thrifting will continue to be a threat in the long-term.

Last year, production-weighted average silver loadings per cell are estimated to have declined by 5% to 0.13 grams. It should be noted that we revised our estimate for silver loadings per cell downward from last year's survey for the years 2012 to 2015 due to new information and data obtained to inform our statistics. On average, we reduced loadings estimates by 9% for each year in the period. We also weighted loadings according to country share of production starting in 2016, whereas previously we only estimated a simple global average. The International Technology Roadmap for Photovoltaic (a German based organization) ITRPV forecasts that silver loadings will need to decline from a median of 0.095 grams per cell for best-in-class technology to 0.07 grams per cell by 2020, a 26% reduction in a four-year period.

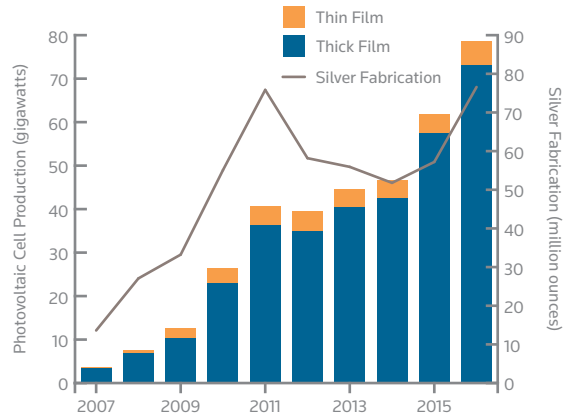
In the long-term, commercial-scale adoption of heterojunction technology could pose a threat to silver use in the solar industry. This technology has the potential to use copper instead of silver. Current heterojunction technologies do not use copper; however research and development efforts to substitute for copper are underway. Heterojunction technology offers a competitive advantage because its cells are transparent, which makes them stackable, meaning less space per unit of energy production is required. Switching to heterojunction technology requires changes to production lines, which is a barrier to entry at present.

GFMS measures country-level silver demand from the PV industry at the first point of transformation, when silver is fabricated to make silver powder. Silver powder is then used to make silver paste, which in turn is loaded onto the silver cell. Over the past few years, as solar cell production has exponentially grown in China, silver paste, and to a lesser extent silver powder, production has migrated to China and Taiwan, where a combined 85% of solar cells are produced. The migration of silver powder has been relatively sluggish, due to difficulty in producing competitive quality powder.

Last year, Japan, the United States and China accounted for 45%, 42%, and 13% of total silver powder fabrication, respectively. Japan lost three percentage points in market share, due to reduced operating capacity for a short period of time. Most of this market share loss shifted to the U.S.

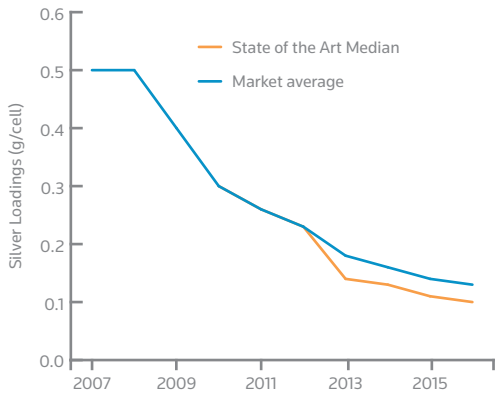
Silver paste used by the PV industry is mainly made in Taiwan, the United States, South Korea, and China. Most of China's frontside silver paste requirements are imported, while Chinese paste producers account for around 75% to 90% of domestic backside paste needs. It is expected that a significant portion of paste production will be transferred to China from Taiwan and the United States over the next few years, in order to reside closer to solar cell production facilities. At present, Taiwan and the United States account for a combined 70% of silver paste production while China accounts for 10%. China accounted for 70% of solar cell production last year.

SILVER PHOTOVOLTAIC FABRICATION



Source: Solarbuzz; Earth Policy Institute; ITRPV; GFMS, Thomson Reuters

SILVER LOADINGS IN PHOTOVOLTAIC CELLS



Source: Market Average - GFMS, Thomson Reuters;
State of the Art Median - ITRPV

8. JEWELRY & SILVERWARE

JEWELRY

- ***Global silver jewelry fabrication retreated 9% in 2016 to 207 Moz (6,438 t) as higher prices and uncertain economic conditions dragged consumption lower in key markets.***
- ***Indian jewelry fabrication fell 14% after reaching record levels in 2015, due to the introduction of an excise duty on gold jewelry, which had a cascading effect across the jewelry industry.***
- ***Chinese fabrication saw another sizeable fall in 2016, slipping by 17% to 28.1 Moz (875 t), driven lower by a moribund economy and an oversupply of inventory.***

Global silver jewelry fabrication in 2016 declined by 9% to 207 Moz (6,438 t). The fall followed three consecutive annual increases that produced a new record set each year. The drop in demand last year saw fabrication volumes give up these gains, retreating to levels not seen since 2012. The biggest falls were in price sensitive markets, with both China and India recording double-digit declines as higher silver prices, a build-up of stocks, and in the case of India the introduction of an excise duty on gold which had a spillover effect, all dragging consumption rates lower. Thailand was weaker last year due to a drop in exports, while Indonesia and Vietnam moved against trend to register healthy gains. Demand in the industrialized world also suffered with offtake in North America slipping 2% year-on-year, with healthy U.S. demand dragged lower by falls in Mexico and Canada.

EUROPE

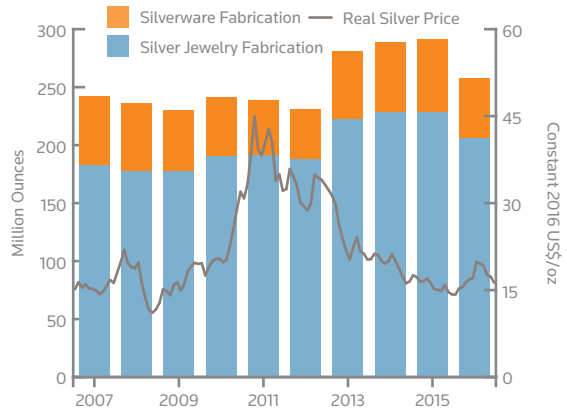
European jewelry fabrication slid by 3% last year, to an estimated 33.2 Moz (1,031 t). This was a three-year low and was hit by a combination of higher silver prices, strong imports, particularly of branded jewelry, and weak exports.

Jewelry fabrication in **Italy**, the largest fabricating country in this region, was down by just 2% in 2016, to 18.1 Moz (561 t), which was still the second highest level since 2010. Last year's decline was driven by weaker exports while local consumption remained lackluster.

As illustrated on the chart on the next page, Italian jewelry exports registered a modest decrease in 2016, with most of the key regions posting losses. Shipments to the United States, Italy's single largest export destination, fell by 5% in 2016. This was largely thanks to higher silver prices. It is worth stressing that this decline in Italian silver jewelry exports to the United States was less than the increase in the previous year. As such, the value of the silver jewelry exports rose compared to the prior year.

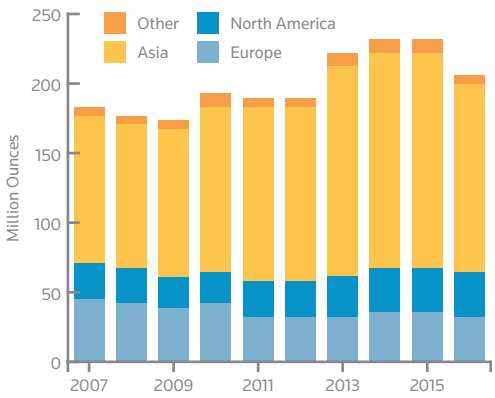
One destination which saw a particularly steep decline was **Turkey**, where the weakness of the Turkish lira detracted from demand for typically higher cost imports from Italy. Consequently imports fell by 18%. Indeed exports to the Middle East struggled; shipments from Italy to the United Arab Emirates (UAE) fell by 3%. Given the UAE's cultural affinity for gold and its role as a trading hub for India, the Middle East and North Africa, it is more likely to be a

WORLD JEWELRY AND SILVERWARE FABRICATION



Source: GFMS, Thomson Reuters

WORLD JEWELRY FABRICATION



Source: GFMS, Thomson Reuters

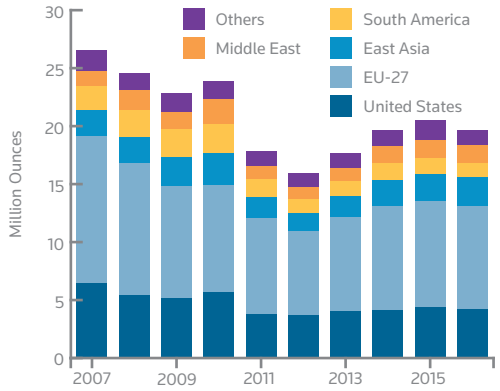
reflection of demand for silver jewelry in these regions. Given the weakness of Indian demand this performance was arguably encouraging as exports from Italy directly to India dropped by almost a quarter.

Exports to Europe were down by 2% with softness in demand from most countries as higher prices acted as a drag. After the more than halving of exports to **Russia** in 2015 they slipped by a further 10% last year. To some extent this was due to a shift towards domestically produced jewelry, as opposed to imported, which tends to be branded and more expensive, as is the case with Italian exports.

Meanwhile the weakness of demand from South and Central America was exemplified by the drop in exports to Panama, which often acts as an entrepot for such flows to this region. Exports to this country from Italy dropped by 21% compared to 2015.

Turning to silver jewelry demand in Italy, it is worth noting that while it remained lackluster overall this still represented an outperformance compared to gold where demand slipped back. Central to this is that silver continued to benefit from substitution at the expense of gold at the lower end of the market, and anecdotal evidence suggests that a shift away from non-precious jewelry towards silver has also been evident recently. Affordability, as well as growing popularity among younger consumers, driven by fashion trends, has seen jewelry manufacturers introduce silver jewelry collections in their shops.

ITALIAN JEWELRY EXPORTS



Source: GFMS, Thomson Reuters

In **Germany** silver jewelry fabrication contracted last year by 6% last year, falling to 3.1 Moz (96 t). Domestic demand remained weak, hampered by competition for alternative materials and discretionary spending elsewhere, such as electronic gadgets. German fabricators, however, have witnessed increased competitive imports, particularly Thailand, which nearly quadrupled shipments since 2011.

Turkish silver jewelry fabrication recorded a 3% drop to 4.3 Moz (133 t) last year driven by, among other things, a challenging macroeconomic environment. This combined with the weakness of the Turkish lira, leading to Turkish fabricators struggling to maintain sales volumes. On a brighter note, however, a partial turnaround in the economy in the closing portion of the year helped to alleviate some of the pressures in this sector.

Silver jewelry fabrication in **Russia** dropped by 13% in 2016, to an estimated 2.0 Moz (63 t). This decline marked a turnaround in fortunes for Russian silver demand. When the Russian economy entered recession and sanctions started this initially led to silver jewelry benefiting from substitution away from gold, particularly at the lower tier of the market, in light of poor economic conditions and high gold prices in rouble terms. However, last year the view changed in the Russian industry with lighter weight gold items becoming more popular at the expense of silver. This, coupled with the continued contraction in the Russian economy and reduced level of disposable income led to a marked weakness in fabrication.

In 2016 jewelry fabrication in the **United Kingdom** dropped by 11% to 0.3 Moz (9 t). In the first half of the year, this was not reflective of consumption in the country though, which continued to recover, albeit modestly. Instead, there was continued growth in demand for imported branded silver, of which a higher proportion is now hallmarked overseas. However, following the vote on 23 June for Brexit, led to 31-year lows for sterling leading to high raw material costs. This eventually fed through into prices so that by the end of 2016 demand was very weak. This is a pattern that has continued throughout the first quarter of this year.

We estimate that silver jewelry fabrication in **France** contracted by just 1%, its smallest decline since 2010. However, this still meant that fabrication has slipped to its lowest level since 2008 although there were indications that demand was higher year-on-year at the tail end of

2016. Taking the year as a whole, it is also interesting to note that the value of silver jewelry fabrication rose last year as did the number of pieces. The latter highlights the fall in the average size of pieces.

NORTH AMERICA

North American jewelry fabrication fell 2% to 31.1 Moz (967 t) in 2016. The United States accounts for the largest share (52%) and witnessed a considerable revival in 2016 of around 12%. Closely followed is Mexico, which accounted for approximately 46% of total jewelry fabrication in North America last year. In contrast to buoyant growth in the United States, we estimate that jewelry fabrication in Mexico and Canada fell by 14% and 10% to 14.3 Moz (445 t) and 0.6 Moz (19 t) respectively. The United States and Mexican jewelry fabrication industries are heavily interwoven, driven by lower labor costs in the latter and growing consumption in the former. Silver jewelry imports from Mexico to the United States fell by 23% last year explaining some of the decline in Mexican jewelry fabrication.

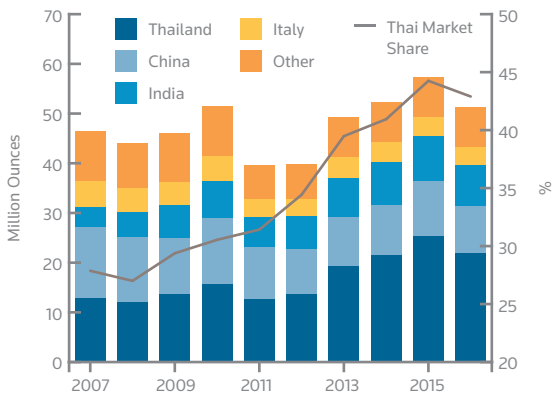
United States silver jewelry imports in general switched from two consecutive years of growth in 2014 and 2015 to a 10% year-on-year drop last year. Jewelry imports from Asia, accounting for 77% of imports last year, fell on average by 13% between Thailand, China and India last year. Exports, on the other hand, rose by a considerable 59% with shipments to Hong Kong more than tripling on an annual basis. Field research leads us to believe that demand for domestically fabricated jewelry in China became saturated last year, and wholesalers and retailers are importing foreign brands to differentiate their products from their local competitors. The poor demand sentiment led to some Chinese fabricators giving up the traditional silver jewelry and focusing more on premium products.

In the United States, silver's relatively large share of consumption is sourced from foreign manufacturers, and this is due to the following factors: silver pieces are generally self-purchased for daily wear and/or low-price costume jewelry. Therefore, silver jewelry is mostly mass produced. Given relatively cheaper manufacturing costs offshore, the United States has struggled to remain competitive. The bulk of the domestically-made silver pieces are high-end, luxury, and specialty pieces like Tiffany's, which produces nearly all of its silver jewelry on United States soil. Very little silver jewelry is custom-made, simply because most custom-made jewelry in the United States is wedding-related. Wedding-related jewelry is mostly made of gold or platinum.

Domestic jewelry consumption in the United States recorded a slightly less strong uptick compared to fabrication last year, increasing by approximately 4%. The positive sentiment in the country was also supported by the silver jewelry retail 2016 sales report published by the Silver Institute. Of the 160 respondents, consisting mainly of owners of retail jewelry stores, 62% reported higher silver jewelry sales in 2016, and also indicated they increased their inventories. Silver jewelry also accounted for the best margins during the holiday period for almost half of the respondents, performing significantly better than other categories such as diamond, bridal, gold or platinum jewelry.

Pandora shared this optimistic sentiment in the Americas, reporting a 6% increase in revenue generated in the region in 2016. However, at the same time it also decided to close 650 multi-branded stores and around 50 shop-in-shops in North America due to the success of its online eSTORE as well as the addition of 27 new concept stores. Tiffany's, one of the United States' largest jewelry fabricators, reported a 5% drop in sales in the Americas, mainly attributed to lower sales in Tiffany's New York flagship store.

US OFFICIAL SILVER JEWELRY IMPORTS



Source: GFMS, Thomson Reuters

SILVER JEWELRY – A CHANGING LANDSCAPE

Silver jewelry demand in the industrialized world was largely unchanged last year, retreating less than one percent, although this benign outcome masks some considerable weakness across several key markets. What it does do is highlight the impact economic expansion and particularly the role consumer sentiment has on demand in these markets. While demand in the United States enjoyed robust growth of 12% in 2016 to an all-time high on the back of a healthier economic outlook and rise in retail sales, demand across Europe (which fell 3% last year) and other industrialized nations remained moribund by weak domestic economies and drop in consumer spending.

In such an environment the supply chain has to adapt. This may mean offering lower ticketed items to attract a new customer base or alternatively offering more high-end products that afford retailers higher margin to offset lower sales volumes. Silver jewelry, especially branded and gemset items, offer superior margin to that of the other precious metals and this is increasingly having an impact on the product mix of retailers as they look to higher margin products to offset a drop in footfall traffic. Indeed, according to a survey commissioned by the Silver Institute's Silver Promotion Service, almost 50% of respondents suggested that silver provided the strongest margins during the holiday season in 2016, against just 10% for gold and 21% for diamond jewelry.

Higher margin items are more likely to be gemset, or for plain items, sold under the name of a recognized brand or fashion label. In recent years there has been a shift away from large bold items, such as silver cuffs or oversized pendants and rings. Moreover, consumer tastes have returned to smaller more delicate and intricately designed jewelry styles that may use less silver per piece but carry greater mark-up potential.

The lower end of the market is still the mainstay of the industry in terms of sheer volume as the low sticker price of fashion jewelry is attractive to a wider demographic. Demand for this segment has been augmented by the success of e-commerce platforms and TV sales. According to the U.S. Census Bureau, total U.S. e-commerce sales for 2016 increased 15.1% from 2015, while total retail sales in 2016 increased only 2.9% in the same time period.

Clockwise from top: Diamond earrings by **Drukker**, Sterling silver bubbles necklace by **Kelim**, Pendant in sterling silver by **Frederic Duclos**, Heart shaped USB flash drive in silver with rhinestones by **Vladmore Krnetic.**

AFRICA

Egypt's jewelry fabrication slumped 16% in 2016 to an estimated 0.7 Moz (21 t), a level not seen since 2011. The country's currency crisis in early November that saw the pound lose 48% following the de-pegging from the dollar, resulted in an almost doubling in the local silver price which severely impacted retail sales. There was some migration to silver from gold as prices for the yellow metal also soared to an all-time-high, but the overall weak consumer sentiment held back spending.

ASIA

China's silver jewelry fabrication registered another down year in 2016, though in percentage terms the decline was much smaller compared to 2014 and 2015. Cautious consumer sentiment and a lack of interest in silver contributed to the weakness. The GFMS team at Thomson Reuters estimates that Chinese silver jewelry fabrication retreated to 28.1 Moz (874 t) last year, a year-on-year decline of 17% and a drop of 34.7 Moz (1,080 t) from the record levels of 2013.

Despite the Chinese economy growing at a reported 6.7% in 2016, the true impact on the ground failed to reflect this robust performance. A deteriorating domestic economy led to more cautious consumption sentiment and purchasing activity. Therefore, many jewelry retailers have been suffering from heavy losses in terms of sales volumes. In order to survive, those retailers have amended their strategies from selling large volumes in the past to chasing

margins instead. They have focused on pushing out high margin products, including gem sets and 18-carat gold pieces, as the gross margin for these products are usually over 100%. As a result, silver jewelry, generally viewed as a relatively low margin product and targeted at consumers looking for non-luxury items, suffered.

As we have outlined in the past there was an overcapacity of silver jewelry fabrication in the Chinese market. This glut, coupled with weak consumer demand and banks withdrawing their support on credit lines, resulted in significant failures and bankruptcies of fabricators across the country. Fabrication fees for normal silver jewelry pieces continued to fall, to a level that is already lower than the breakeven point for some fabricators.

The whole supply chain from fabricators to retailers was already sitting on high level of inventories. Therefore many industry participants were in destocking mode. Feedback from some wholesalers stated that orders were very spasmodic even during periods when seasonal demand was supposed to pick up and their downstream customers were supposed to re-stock inventories. Indeed, inventory levels were so high that some fabricators actually either halted their production for a long period or switched to produce other higher margin products.

During the market downturn, fabricators are looking for ways to survive. One market trend to emerge in China in recent years has been the notable increase in the purity of the silver being offered. While 925 sterling silver pieces were dominant within the sector, there are increasing number of fabricators working on 990, 999 and 9999 purities. Meanwhile, fabricators also began working on high value items with more sophisticated designs and in higher qualities that were sold by piece rather than by weight.

The industry has been trying to evaluate the status of silver jewelry, by combining high-end materials like pearls and crystals with silver in order to attract the more sophisticated tastes of certain consumer groups. Some fabricators also emphasized that a certain line of their products are being manufactured by machine instead of hand made by traditional methods (and hence a higher fabrication fee), while some even introduced a series of silver jewelry with an outer coating in gold, targeting consumers who want to purchase gold jewelry on a smaller budget.

Looking at this year, industry participants remain cautious towards the market outlook, with many believing that the bottom has yet to set in. The increase in silver price did offer some relief to them in terms of asset appreciation, especially for those who are sitting on high levels of inventories. The two-child policy should also help the demand for silver jewelry, as many seniors purchase silver jewelry for new born babies in the family. However this positive element is more likely a progressive reinforcement rather than an immediate help overnight.

Indian jewelry fabrication declined last year by 14% year-on-year to 62.1 Moz (1,930 t), the lowest in three years and ending four years of consecutive growth. The decline was primarily a result of the cascading effect following the implementation of excise duty on gold jewelry; the impact was seen across the entire gem and jewelry sector. Retail consumption declined by 13%, attributed to drought in 2015 which had curtailed consumption expenditure to a greater extent. While there was hope for a revival in demand during the fourth quarter following a normal monsoon in 2016, retail consumption failed to take off as demonetization delayed payments to farmers and postponed their purchases towards the first quarter of 2017.

One of the key themes last year was destocking by retailers. From jewelry retailers to manufacturers, gold has been their primary means of funding the business. Forcing an excise duty on gold jewelry that led to a slow down across all categories, with even silver having to accept its share in absorbing the stress as cash generated through jewelry sales was being diversified to other business or invested in physical assets in India or abroad instead of replenishing with fresh stock. Thus, retailers who had built up inventory in 2015 at lower prices were not replenishing the stock in 2016 and as a result fabrication demand was also reduced. This was evident during our visits and discussions with wholesalers who were sitting on high inventory levels and fabricators with under utilized capacity. Additionally the increase in the average price also led to the exchange of old jewelry for new; this was approximately 60 to 65% of the total sales of payals (leg chains/anklets) bought for daily wear which was otherwise less than 40% in 2015.

Jewelry consumption volumes are largely driven by leg chains for cultural reasons, which have created a base load demand. The weight per piece can vary from 30 grams to 100 grams and given that it is subject to wear

and tear, these are normally exchanged each year against new jewelry or a fresh piece is bought, depending on the income levels. That said, for a newborn it is largely a purchase of a fresh piece. The consumption of value added products increases with age as it would involve more intricate design and labor. In our various trips and visits to production centers, we noticed that silver jewelry designs of late have caught up with the younger urban population more strongly than ever and this is largely attributed to the popularity of online stores. The designs, which until early this decade were confined to rural India and tribal populations is now considered trendy and 'cool' by the urban class. Tribal designs specifically have become a trend with casual wearers and these are primarily heavy pieces but with purity at just 70% or less.

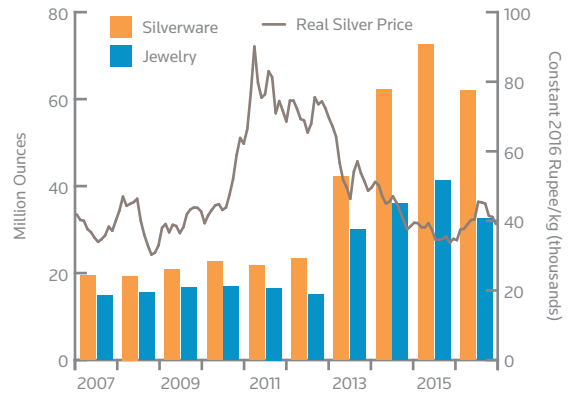
Also was interesting to note the migration to earrings like juhumkas (drops), which require a lot of intricate work. The safety consideration while wearing gold jewelry, in addition to its price, has seen a strong lift in sales of silver wedding jewelry sets, which are electroplated with 24-carat gold. This jewelry is generally priced at one-tenth the price of a similar set of 22-carat gold jewelry. Retailers have indicated that consumers often purchase the item, wear it for three occasions, and then exchange against a different design.

Thailand's silver jewelry fabrication retreated 6% last year to an estimated 23.0 Moz (715 t). The modest decline followed a healthy 13% increase in 2015 but unfortunately these gains could not be sustained with certain segments of the industry under severe pressure to survive in a market that is rapidly evolving. Technology advancements, competition from China and other South East Asian countries, and changing consumer tastes have all impacted demand in recent years. This is not to say that all segments of the market are suffering, however. Indeed far from it, as the larger fabricators producing branded and more high-end jewelry have managed to maintain growth and in some cases continue to win market share.

While many smaller family run operations have fallen by the wayside or continue to see their businesses under stress due to a shrinking market share, the very top end of the market is doing well. In the last few years the Thai market has been supported by the rapid expansion of Danish company Pandora which fabricates the bulk of its product range in Thailand, is easily the largest consumer of silver in the country and now accounts for a significant proportion of the export trade. Pandora has expanded its production facility in Bangkok and recently opened a new state-of-the-art factory in Lamphun in the north of Thailand that could potentially double its output by the end of 2019. Pandora's growth last year, as well as a handful of other branded producers, masks the true state of the remaining market with heavy losses dragging the country's total fabrication volumes lower for 2016.

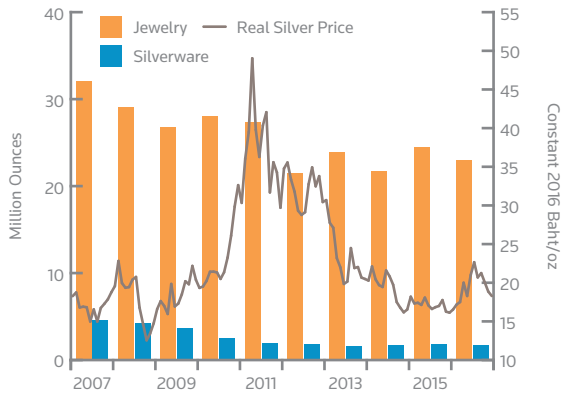
For most Thai jewelry fabricators (excluding Pandora) the first half of 2016 was weak with export demand well down on the previous year with demand only picking up with any vigor in the final quarter of the year. According to our industry contacts, pre-Christmas orders were surprisingly robust, especially in the United States, which for much of the year had been underwhelming. Sales to online and television promotional platforms also gathered momentum in the final months of 2016, offsetting earlier

INDIAN JEWELRY AND SILVERWARE FABRICATION



Source: GFMS, Thomson Reuters

THAI JEWELRY AND SILVERWARE FABRICATION



Source: GFMS, Thomson Reuters

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

(million ounces)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Europe										
Italy	25.8	22.6	21.3	21.8	16.5	15.1	15.9	17.8	18.4	18.1
Turkey	4.1	4.5	3.9	3.4	3.1	3.4	4.0	4.8	4.4	4.3
Germany	3.9	3.9	3.7	3.8	3.7	3.6	3.4	3.3	3.3	3.1
Russia	2.3	2.5	3.0	3.3	2.7	2.6	2.6	2.8	2.3	2.0
France	1.7	1.6	1.7	1.9	2.2	2.0	1.7	1.6	1.6	1.6
Spain	1.1	1.1	1.2	1.1	1.1	1.0	0.9	0.9	0.9	0.9
Poland	1.9	1.9	1.5	1.3	0.8	0.6	0.6	0.6	0.5	0.5
Greece	1.0	1.2	1.0	0.9	0.7	0.6	0.5	0.5	0.5	0.5
Sweden	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
UK	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3
Portugal	0.7	0.6	0.6	0.6	0.4	0.2	0.2	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
Denmark	0.3	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
Norway	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other Countries	0.8	0.8	0.6	0.6	0.6	0.6	0.5	0.6	0.5	0.5
Total Europe	***44.9***	***42.3***	***40.1***	***40.3***	***33.2***	***31.1***	***31.8***	***34.7***	***34.2***	***33.2***
North America										
United States	12.9	12.0	10.7	12.0	11.1	10.3	12.4	13.8	14.4	16.1
Mexico	12.2	11.8	10.5	10.4	13.9	13.3	15.2	16.3	16.7	14.3
Canada	0.9	0.8	0.8	0.8	0.8	0.8	0.7	0.6	0.7	0.6
Total North America	***26.0***	***24.6***	***22.0***	***23.2***	***25.8***	***24.3***	***28.3***	***30.7***	***31.8***	***31.1***
Central & South America										
Brazil	1.5	1.5	1.7	1.9	1.5	1.5	3.0	2.8	2.2	1.8
Dominican Republic	0.6	0.9	1.5	1.4	0.9	0.9	1.3	1.4	1.5	1.4
Peru	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.5
Colombia	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.3	0.3
Other Countries	1.1	1.3	1.4	1.6	1.3	1.3	1.7	1.6	1.5	1.3
Total C. & S. America	***3.8***	***4.4***	***5.3***	***5.6***	***4.4***	***4.5***	***6.8***	***6.8***	***6.0***	***5.4***
Asia										
India	19.4	19.3	20.8	22.7	21.8	23.3	42.3	62.2	72.5	62.1
China	34.3	36.1	40.0	46.4	54.4	56.6	62.9	46.7	33.9	28.1
Thailand	32.0	29.1	26.7	28.0	27.3	21.4	23.9	21.7	24.4	23.0
Indonesia	4.2	4.2	4.2	4.7	5.5	6.2	6.5	6.2	6.5	7.0
South Korea	4.2	4.1	4.2	4.7	5.2	5.4	5.5	5.0	4.8	3.8
Japan	2.1	2.0	2.1	2.2	2.2	2.3	2.4	2.2	2.2	2.2
Vietnam	1.1	1.2	1.2	1.4	1.4	1.4	1.4	1.5	1.6	1.8
Nepal	1.1	1.1	1.2	1.1	1.1	1.2	0.7	0.7	0.8	0.8
Bangladesh	0.7	0.7	0.8	0.8	0.8	0.8	0.5	0.6	1.1	0.8
Cambodia	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.7	0.8	0.7
Saudi Arabia	0.6	0.6	0.6	0.7	0.8	0.8	0.9	0.8	0.8	0.7
UAE	0.5	0.5	0.5	0.5	0.6	0.7	0.7	0.8	0.7	0.7
Malaysia	0.6	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.7	0.7
UAE	0.5	0.5	0.5	0.6	0.7	0.7	0.8	0.7	0.7	0.4
Israel	0.5	0.5	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4
Pakistan	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.5	0.3
Iran	0.2	0.2	0.2	0.2	0.2	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	0.2	0.2

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

(million ounces)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Taiwan	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2
Hong Kong	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2
Kazakhstan	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Uzbekistan	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Bahrain	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Other Countries	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.6	0.6
Total Asia	***104.7***	***103.4***	***106.8***	***118.1***	***125.9***	***125.1***	***152.4***	***153.0***	***153.7***	***134.9***
Africa										
Egypt	1.4	1.3	1.2	1.1	0.5	0.7	0.8	0.9	0.8	0.7
Morocco	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	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	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4
Total Africa	**2.3**	**2.3**	**2.0**	**2.0**	**1.4**	**1.6**	**1.7**	**1.8**	**1.7**	**1.6**
Oceania										
Total Oceania	***0.7***	***0.7***	***0.7***	***0.7***	***0.8***	***0.8***	***0.8***	***0.8***	***0.9***	***0.9***
World Total	**182.3**	**177.6**	**176.9**	**190.0**	**191.5**	**187.4**	**221.8**	**227.9**	**228.3**	**207.0**

losses and lifting expectations for a stronger 2017. The weakest segment across the industry remains at the low-end which historically has been the engine room for the country's production. Rising costs (the average wage for skilled workers increased again last year), competition from foreign countries, and a drop in demand for low-end fashion jewelry all combined to drive production lower. At the domestic level, retail sales were heavily impacted by the death of the beloved Thai king in mid-October which led to a year-long period of mourning, bearing substantial consequences for the nation's luxury and fashion sectors.

Silver jewelry exports last year reflected the overall state of the market, retreating 9% on a calculated weight basis. The United States remains the largest market for Thai fabricators, taking a third of the total volume with shipments to this key market declining by a double-digit percentage last year while deliveries to Germany and the UK were also materially weaker. Flows to Australia and Hong Kong were largely unchanged while direct shipments to China jumped by more than 60% year-on-year.

Jewelry fabrication in **South Korea** registered a 23% drop to a total of 3.8 Moz (117 t) in 2016. The major consumers of this segment are mostly younger generations in their early 20s. The deteriorating domestic economy has definitely had a negative effect on consumption across the country. The domestic jewelry industry continued to contract, with the total number of the Korean manufacturers decreasing by 3-5% last year. In order to stimulate sales, fabricators introduced more fashionable designs with lower price tags per piece. In addition, given the youth demographic are more focused on design than purity some fabricators have shifted to lower purity silver in order to save on production costs.

Jewelry fabrication demand in **Indonesia** saw solid gains for the second year running, increasing by 7% last year to 7.0 Moz (218 t), an all time high. Continued expansion of standalone silver stores in major urban centers has help lift the profile of silver among the younger generation, aided by the expansion of international brands such as Pandora which has a strong following. Silver also benefited last year from the 7% rise in the domestic gold price with the yellow metal hitting an all-time-high in July with the lower sticker prices providing a more affordable option. In recent years, several large fabricators have emerged who are aimed purely at the export sector and these are now making inroads in developing their end markets. Annual customs data is not available for the full year; the limited data that is, coupled with anecdotal evidence gathered from our field research, points to a stronger sector, with shipments to the United States in particular providing the catalyst for robust growth.

SILVERWARE

- ***Global silverware fabrication retreated for the first time in four years, declining by 17% to an estimated 52.1 Moz (1,621 t) with an acute fall in demand from India and China the chief catalyst for the fall.***

Following three consecutive annual increases global silverware fabrication declined 17% in 2016 to an estimated 52.1 Moz (1,621 t), retreating to levels last seen in 2012. Higher silver prices accounted for the bulk of the fall, most notably in price sensitive markets where weaker domestic currencies accentuated the 9.3% rise in the dollar price. The largest falls were seen in Asia with India and China both recording an acute decline. In the former, higher prices were the chief architect for the fall while the continued anticorruption crackdown on gifting and the weaker economy accounted for the material falls in China. Elsewhere, North American demand was an outlier, rising to a six-year-high on the back of stronger exports and improved economic environment.

EUROPE

European silverware fabrication continued its downtrend in 2016 to 9.5 Moz (294 t), representing a drop of 5% year-on-year, a touch faster than in the previous year as prices rose. To put this in perspective, the long-running decline had seen silverware offtake drop to only 47% of the total market size a decade earlier. Much of the decline was due to a structural shift in societal habits such as the fall in gifting of silverware for family and religious holidays, which itself was a function of weak economic conditions and increasing competition from other consumer goods.

The largest silverware fabricator in the region, **Russia**, saw offtake continue to decline in 2016, falling by 6% to 3.9 Moz (120 t), the lowest since 2006. In addition to the continued structural shift in gifting culture away from traditional and heavyweight silverware towards other consumer goods, the economy and affordability issues played a paramount role last year as silver prices in rouble terms rose. However the pace of the economic decline slowed and this meant that despite higher silver prices in local currency terms the fall in offtake last year was a fraction less than in 2015.

In **Italy**, silverware fabrication continued to suffer, registering a 7% drop in 2016, to 1.6 Moz (48 t). This was mainly due to the continued shift in gifting culture away from silverware towards other consumer goods such as branded accessories and technological gadgets. The continued underperformance of the Italian economy was also a drag, as was weak exports. Meanwhile, one of the best performing economies, **Germany**, saw fabrication there drop by a more modest 3% to 0.9 Moz (27 t) in 2016. Unlike in 2015 when strong exports saw **Turkish** silverware fabrication rise, fabrication in that market dropped back by 5% to 1.4 Moz (44 t) last year. This turnaround was largely a function of high silver prices in Turkish Lira terms as high international silver prices combined with currency weakness hindered offtake in Turkey.

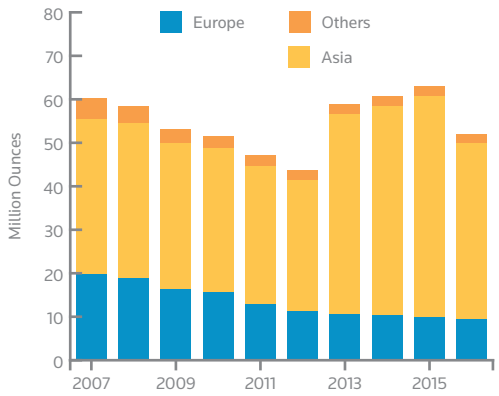
NORTH AMERICA

Silverware fabrication in the United States rose a considerable 23% last year to 0.8 Moz (25 t). The increase was mainly on the back of an improved economic sentiment in the country which stimulated demand from some high-end hotels and the likes to order more silverware. At the same time, exports also rose particularly to Canada, Japan and parts of South America. Silverware fabrication in Canada and Mexico followed a similar positive trend, expanding at a slightly more modest 7% and 3% increase to 0.1 Moz (4 t) and 0.6 Moz (18 t) respectively.

ASIA

Indian silverware fabrication declined by 21% to 32.6 Moz (1,015 t), falling to the lowest level in three years. This is primarily attributed to inventory building at the wholesale and retail level in 2015 at the lower prices and

WORLD SILVERWARE FABRICATION



Source: GFMS, Thomson Reuters

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

(million ounces)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Europe										
Russia	4.3	5.2	5.5	6.0	5.0	4.8	4.6	4.4	4.1	3.9
Italy	6.6	5.5	4.6	4.0	2.8	2.3	2.0	1.9	1.8	1.6
Turkey	2.1	2.2	1.8	1.5	1.3	1.1	1.2	1.4	1.5	1.4
Germany	2.7	2.3	1.6	1.6	1.4	1.1	0.9	0.9	0.9	0.9
Norway	0.6	0.7	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4
Sweden	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Greece	1.2	1.0	0.8	0.6	0.5	0.3	0.3	0.3	0.3	0.2
Denmark	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2
UK	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2
France	0.2	0.3	0.2	0.2	0.2	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	0.8	0.7	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2
Total Europe	***19.7***	***19.0***	***16.3***	***15.7***	***12.8***	***11.3***	***10.6***	***10.3***	***10.0***	***9.5***
North America										
United States	1.4	1.0	0.9	0.8	0.8	0.7	0.7	0.7	0.7	0.8
Mexico	1.4	1.2	0.9	0.7	0.5	0.5	0.6	0.6	0.6	0.6
Canada	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total North America	***2.9***	***2.3***	***1.9***	***1.6***	***1.4***	***1.3***	***1.3***	***1.3***	***1.4***	***1.5***
Central & South America										
Colombia	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
Peru	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Other Countries	0.7	0.7	0.6	0.5	0.4	0.4	0.4	0.3	0.2	0.2
Total C. & S. America	***1.3***	***1.2***	***1.0***	***0.9***	***0.8***	***0.8***	***0.7***	***0.6***	***0.5***	***0.4***
Asia										
India	14.9	15.5	16.6	16.9	16.6	15.2	30.0	36.1	41.3	32.6
China	9.1	8.7	6.9	7.6	8.3	8.6	10.0	6.1	3.4	2.4
Thailand	4.5	4.3	3.7	2.5	1.9	1.8	1.6	1.7	1.8	1.7
Israel	1.4	1.3	1.1	1.0	0.7	0.6	0.7	0.8	0.9	0.8
Iran	1.4	1.4	1.2	1.2	1.0	0.9	0.9	0.8	0.8	0.8
Bangladesh	0.7	0.7	0.7	0.6	0.6	0.5	0.4	0.4	0.5	0.4
Indonesia	0.6	0.6	0.7	0.7	0.6	0.5	0.4	0.4	0.4	0.4
Pakistan	0.6	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0.4	0.3
South Korea	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.4	0.3	0.3
Cambodia	0.2	0.2	0.2	0.2	0.2	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	1.3	1.3	1.1	1.1	1.0	0.9	0.8	0.8	0.8	0.5
Total Asia	***35.7***	***35.5***	***33.5***	***32.9***	***31.9***	***30.0***	***45.9***	***48.1***	***50.8***	***40.4***
Africa										
Africa	0.5	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3
Total Africa	***0.5***	***0.5***	***0.5***	***0.4***	***0.3***	***0.3***	***0.3***	***0.3***	***0.3***	***0.3***
Oceania										
Australia	0.04	0.04	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02
Total Oceania	**0.04**	**0.04**	**0.03**	**0.03**	**0.03**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**
World Total	**60.2**	**58.4**	**53.2**	**51.6**	**47.2**	**43.7**	**58.8**	**60.7**	**62.9**	**52.1**

reduced restocking by gold jewelry retailers who also sold silverware. The exclusive silverware retailers were less affected from the normal course of business, to the extent that they are more bullish about growth in the silverware market. Indeed, some of these retailers are considering expanding stores across major metropolitan regions, spotting a growth opportunity by retailing exclusively. This should eventually increase the tonnage sold per store.

While it was subdued through most part of the year, retail consumption sentiment improved towards the last quarter following stronger wedding season demand. Demonetization was in fact a blessing in disguise for the industry as consumers considered the purchase of silver articles with hard currency that were demonetized. With silver prices at a premium of 50% over the landed price on the 8th and 9th November, it was a steal for retailers accepting cash.

Taking a look at the purity front, there is a gradual shift developed towards products of higher purity of over 90% with more complex designs. That said, we are noticing some voluntary efforts by fabricators to hallmark their products but according to the Bureau of Indian Standards, hallmarking standards are still officially left to the discretion of manufacturers.

Chinese silverware fabrication fell 29% to an estimated 2.4 Moz (76 t) in 2016, after already recording a 43% annual decline in 2015. Silverware was one of the more popular gifting items and this particular sector has been hit hard since the middle of 2013 when the government tightened up its anti-corruption policy. However, with the suppression of the gifting culture, fabricators switched their production focus to silver teapots, cups and chopsticks, and marketing it as a healthier lifestyle. Unfortunately whenever there is success, products are imitated quickly by competitors, and consumer interest quickly waned for any particular products due to an oversupply. Inventory levels remained high across the industry. In order to survive, silverware fabricators have been aggressive in marketing their products to banks, which could act as gifts to their clients. The opening of Disney in Shanghai has also facilitated a new set of silverware products.

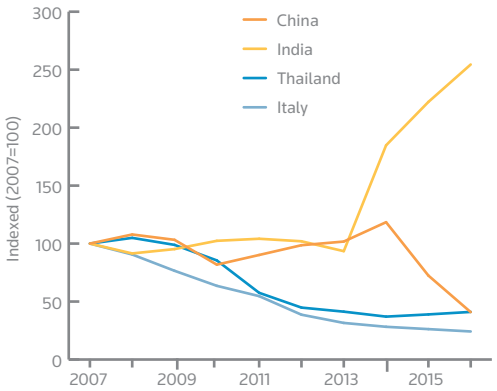
Following two consecutive annual increases **Thailand's** silverware fabrication slipped 6% in 2016 to an estimated 1.7 Moz (52 t). The increase in the silver price was certainly a factor last year though a challenging economic environment and changing societal trends in key export markets also dragged offtake lower. In domestic currency terms, the average silver price jumped nearly 13% last year which had a negative impact on retail sales.

Demand in the fourth quarter, typically the peak tourism period and the months that retailers enjoy the strongest sales, was significantly impacted by the death of the long reigning king with many retailers cancelling all promotions and activities in October and November and this, not surprisingly, had a severe impact on demand. According to official trade statistics, Thailand's exports were again moderately stronger for the full year, with a healthy rise in shipments to Denmark, Brunei, and Hong Kong offsetting a fall in shipments to the UK and the United States.

Silverware production in **Israel** declined 5% last year to an estimated 0.8 Moz (26 t). This marks the first decline since 2012 as the domestic market had been in a solid recovery phase following the financial crisis. It is likely however, that fabrication volumes would indeed have maintained this growth trend last year (or come close to it) if not for a fire at one of the largest producers of Judaic products that saw the production facility out of commission for almost a month.

The U.S. market (chiefly the east coast), is easily the largest export destination and while demand was only marginally stronger last year there were good signs towards year end with strong demand in the lead up to Hanukkah in December.

MAIN GLOBAL SILVERWARE FABRICATORS



Source: GFMS, Thomson Reuters

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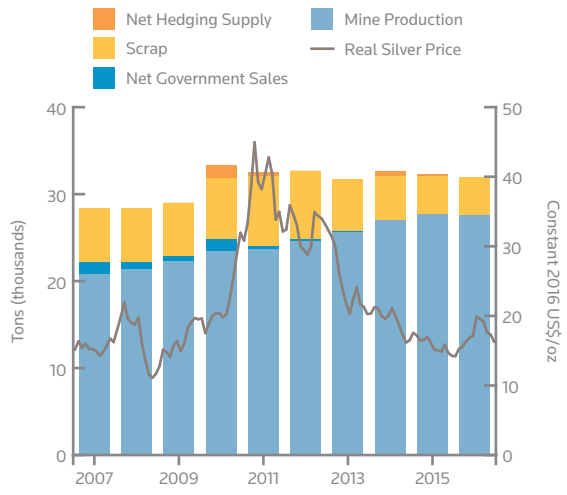
APPENDIX 1

WORLD SILVER SUPPLY AND DEMAND

(tons)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Supply										
Mine Production	20,769	21,297	22,312	23,422	23,587	24,625	25,621	27,016	27,708	27,551
Net Government Sales	1,322	949	486	1,375	374	229	245	-	-	-
Old Silver Scrap	6,335	6,233	6,223	7,042	8,090	7,893	5,941	5,142	4,387	4,346
Net Hedging Supply	-750	-269	-541	1,569	381	-1,464	-1,081	521	244	-572
Total Supply	**27,677**	**28,210**	**28,479**	**33,407**	**32,432**	**31,283**	**30,726**	**32,679**	**32,339**	**31,324**
Demand										
Jewelry	5,670	5,524	5,502	5,909	5,956	5,828	6,899	7,088	7,100	6,438
Coins & Bars	1,917	6,116	2,890	4,594	6,483	4,950	7,485	7,279	9,042	6,431
Silverware	1,873	1,818	1,654	1,606	1,467	1,359	1,830	1,887	1,956	1,621
Industrial Fabrication	20,093	19,962	16,427	19,715	20,573	18,662	18,802	18,529	17,718	17,478
...of which Electrical & Electronics	8,165	8,451	7,072	9,367	9,044	8,295	8,274	8,192	7,648	7,266
...of which Brazing Alloys & Solders	1,823	1,924	1,674	1,905	1,965	1,900	1,981	2,073	1,912	1,722
...of which Photography	3,638	3,054	2,377	2,098	1,905	1,687	1,569	1,508	1,448	1,405
...of which Photovoltaic*	-	-	-	-	2,359	1,809	1,739	1,611	1,779	2,382
...of which Ethylene Oxide	245	231	148	272	194	148	239	154	317	317
...of which Other Industrial	6,222	6,304	5,156	6,073	5,105	4,822	5,000	4,991	4,614	4,386
Physical Demand	**29,553**	**33,420**	**26,473**	**31,823**	**34,478**	**30,799**	**35,015**	**34,782**	**35,816**	**31,968**
Physical Surplus/ Deficit	**-1,877**	**-5,210**	**2,006**	**1,584**	**-2,047**	**484**	**-4,290**	**-2,103**	**-3,477**	**-644**
ETP Inventory Build	1,704	3,152	4,880	4,027	-747	1,720	77	46	-549	1,461
Exchange Inventory Build	669	-222	-475	-231	378	1,934	273	-166	392	2,482
Net Balance	**-4,249**	**-8,140**	**-2,400**	**-2,213**	**-1,678**	**-3,170**	**-4,640**	**-1,984**	**-3,319**	**-4,587**
Silver Price (London US$/oz)	**13.38**	**14.99**	**14.67**	**20.19**	**35.12**	**31.15**	**23.79**	**19.08**	**15.68**	**17.14**

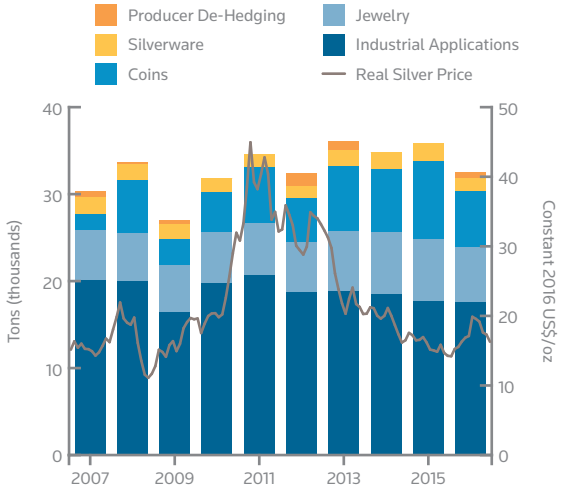
*Photovoltaic demand included in "Other Industrial" prior to 2011

WORLD SILVER SUPPLY



Source: GFMS, Thomson Reuters

WORLD SILVER DEMAND



Source: GFMS, Thomson Reuters

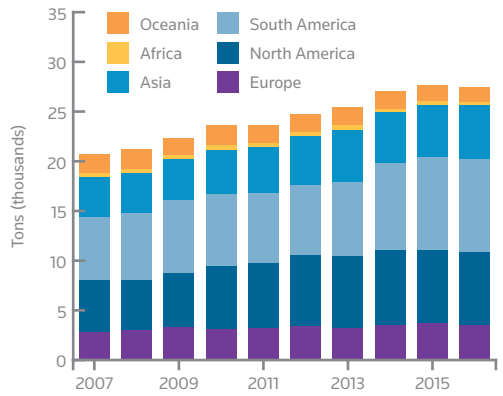
WORLD SILVER MINE PRODUCTION

(tons)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Europe										
Russia	910	1,132	1,312	1,145	1,221	1,412	1,381	1,448	1,581	1,450
Poland	1,233	1,212	1,220	1,171	1,270	1,284	1,170	1,264	1,291	1,198
Sweden	294	263	270	285	283	306	337	396	494	511
Turkey	235	314	389	384	288	228	188	205	172	175
Portugal	28	41	22	23	31	34	45	54	74	71
Spain	2	2	5	23	33	37	41	40	40	39
Greece	35	35	29	27	25	30	29	27	32	31
Bulgaria	14	11	15	13	17	19	19	18	19	18
Macedonia	8	9	9	9	9	10	11	10	11	11
Ireland	5	8	5	4	6	9	8	6	8	8
Romania	3	-	3	7	12	9	9	3	3	3
Finland	-	-	-	-	-	-	3	2	2	2
Other Countries	2	1	1	2	2	1	1	1	1	1
Total Europe	**2,769**	**3,030**	**3,281**	**3,092**	**3,198**	**3,378**	**3,240**	**3,476**	**3,727**	**3,519**
North America										
Mexico	3,135	3,236	3,554	4,411	4,778	5,358	5,513	5,796	5,972	5,793
United States	1,260	1,120	1,250	1,280	1,120	1,060	1,040	1,180	1,090	1,100
Canada	829	669	609	573	582	685	640	495	380	405
Total North America	**5,225**	**5,026**	**5,412**	**6,264**	**6,480**	**7,104**	**7,193**	**7,471**	**7,442**	**7,297**
Central & South America										
Peru	3,539	3,739	3,971	3,691	3,473	3,547	3,754	3,821	4,291	4,593
Chile	1,936	1,405	1,301	1,287	1,291	1,195	1,218	1,574	1,511	1,497
Bolivia	525	1,114	1,326	1,259	1,214	1,206	1,281	1,345	1,306	1,353
Argentina	255	337	560	726	708	762	774	906	1,080	932
Guatemala	88	100	129	195	273	205	281	858	856	838
Dominican Republic	-	0	18	19	19	27	87	141	127	104
Nicaragua	3	3	4	7	8	10	14	17	18	18
Honduras	54	59	58	58	49	51	51	57	35	18
Ecuador	13	13	13	15	16	17	16	18	18	17
Brazil	11	11	12	12	12	12	15	15	17	17
Colombia	10	9	11	15	24	19	14	12	16	16
Venezuela	1	1	1	1	1	1	1	1	2	2
Other Countries	5	4	4	4	3	6	5	3	3	2
Total C. & S. America	**6,441**	**6,797**	**7,408**	**7,290**	**7,091**	**7,057**	**7,511**	**8,768**	**9,278**	**9,407**
Asia										
China	2,466	2,613	2,698	2,942	3,192	3,401	3,529	3,499	3,421	3,496
Kazakhstan	708	629	614	548	547	545	611	590	538	554
India	178	212	193	255	234	280	333	261	374	436
Indonesia	268	248	240	209	190	165	255	227	310	347
Armenia	52	43	41	51	74	90	105	115	124	143
Iran	90	98	107	112	112	110	99	98	104	111
Mongolia	37	36	35	34	33	33	49	64	82	86
Uzbekistan	79	53	52	59	59	59	60	54	47	47
Thailand	13	13	21	23	24	38	36	34	27	42
Laos	4	7	15	17	18	20	32	40	41	38
Philippines	28	14	35	42	43	48	47	27	29	27

WORLD SILVER MINE PRODUCTION

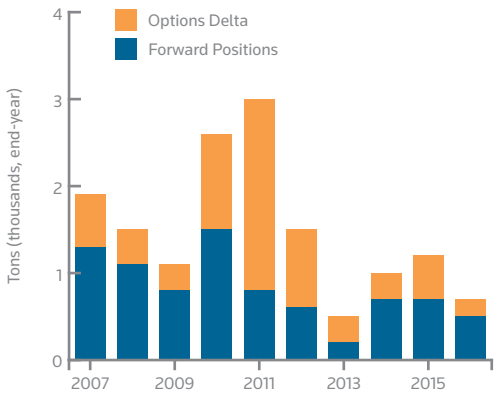
(tons)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
North Korea	29	29	25	26	27	27	28	28	26	26
Saudi Arabia	9	12	12	12	9	11	19	22	23	24
Kyrgyzstan	6	10	9	10	10	6	11	10	12	17
Japan	14	12	12	11	17	17	15	15	16	16
Azerbaijan	-	-	-	1	4	3	1	1	1	5
Tajikistan	1	1	1	1	2	2	3	3	4	4
Other Countries	4	4	4	7	5	5	4	4	4	4
Total Asia	**3,986**	**4,034**	**4,112**	**4,360**	**4,601**	**4,858**	**5,239**	**5,092**	**5,183**	**5,424**
Africa										
Morocco	224	251	270	326	257	260	285	274	298	313
South Africa	70	75	78	79	73	67	69	37	47	50
Burkina Faso	-	-	-	-	0	1	1	13	12	22
Zambia	11	12	14	15	15	15	16	15	15	15
Eritrea	-	-	-	0	4	23	25	47	70	13
Tanzania	11	9	11	12	13	13	12	12	12	12
Botswana	4	5	5	5	5	7	10	10	5	5
Zimbabwe	2	2	2	3	3	4	4	4	4	4
Ethiopia	1	1	2	2	3	3	3	3	3	3
Mali	3	2	3	2	2	3	3	2	3	3
Ghana	2	2	2	2	2	2	3	3	2	2
Dem. Rep. of the Congo	70	34	1	7	11	14	62	8	5	1
Other Countries	8	8	1	1	2	2	2	2	2	1
Total Africa	**406**	**403**	**386**	**455**	**392**	**414**	**494**	**431**	**478**	**445**
Oceania & Other										
Australia	1,879	1,926	1,631	1,880	1,725	1,727	1,840	1,675	1,525	1,357
Papua New Guinea	44	50	67	67	92	82	91	87	71	98
New Zealand	19	32	14	13	8	6	11	16	4	3
Total Oceania	**1,942**	**2,009**	**1,712**	**1,960**	**1,826**	**1,814**	**1,942**	**1,778**	**1,600**	**1,458**
World Total	**20,769**	**21,297**	**22,312**	**23,422**	**23,587**	**24,625**	**25,621**	**27,016**	**27,708**	**27,551**

WORLD SILVER MINE PRODUCTION



Source: GFMS, Thomson Reuters

SILVER PRODUCER HEDGING: OUTSTANDING POSITIONS



Source: GFMS, Thomson Reuters

SILVER FABRICATION: COINS AND MEDALS INCLUDING THE USE OF SCRAP

(tons)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
United States	497	790	1,067	1,296	1,276	1,084	1,374	1,417	1,513	1,254
Canada	133	281	336	579	729	561	925	953	1,112	1,058
Australia	110	182	201	272	350	201	283	245	384	401
China	81	88	94	46	128	141	193	185	331	333
India	174	166	103	146	58	61	169	195	278	291
Germany	195	223	232	200	102	35	20	20	110	150
Austria	17	259	296	360	571	285	458	149	233	112
United Kingdom	14	16	17	16	31	22	68	60	98	98
Mexico	51	43	52	64	52	23	34	31	30	24
Hungary	3	5	4	4	4	4	0	1	18	23
Other Countries	127	108	113	145	132	232	112	104	106	88
World Total	**1,402**	**2,160**	**2,516**	**3,129**	**3,433**	**2,650**	**3,635**	**3,360**	**4,213**	**3,831**

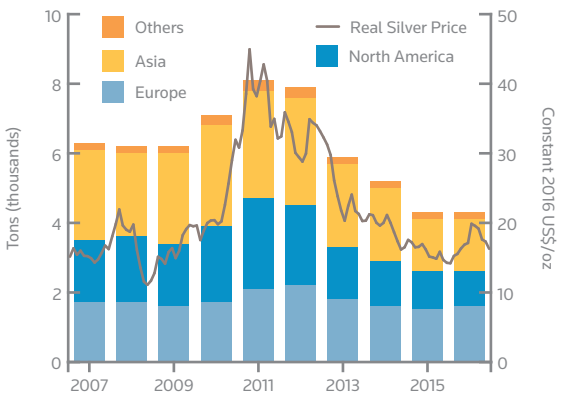
SUPPLY OF SILVER FROM THE RECYCLING OF SCRAP

(tons)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Europe										
Germany	471	455	391	465	519	672	537	446	464	475
United Kingdom	348	340	316	198	350	305	223	173	182	245
Russia	274	258	261	356	346	340	311	249	208	203
Italy	175	183	181	203	303	309	270	245	193	197
France	142	158	170	193	217	182	161	153	151	160
Turkey	30	36	33	32	36	32	32	46	53	61
Austria	38	36	33	35	38	37	36	34	35	39
Czech Republic	27	27	28	37	48	51	45	42	33	37
Poland	23	22	23	28	35	36	31	29	31	33
Netherlands	35	34	32	35	38	39	27	25	27	29
Spain	12	14	16	23	40	41	35	32	25	26
Belgium	20	19	18	20	21	22	15	15	14	15
Sweden	25	24	19	26	19	19	19	20	13	14
Denmark	16	15	14	16	17	16	13	12	12	13
Portugal	13	12	12	12	14	8	8	10	10	11
Hungary	6	6	6	8	11	11	10	9	9	10
Slovakia	6	5	6	7	10	11	9	8	10	10
Bulgaria	15	14	13	13	13	13	11	10	9	10
Finland	11	10	10	10	11	11	9	8	8	9
Other Countries	22	23	24	25	26	26	22	20	20	22
Total Europe	**1,708**	**1,691**	**1,606**	**1,742**	**2,112**	**2,181**	**1,825**	**1,585**	**1,508**	**1,620**
North America										
Mexico	1,656	1,666	1,724	1,692	2,015	2,375	2,143	1,457	1,252	1,099
United States	44	50	52	48	51	56	51	34	30	27
Canada	72	84	95	98	123	140	145	35	14	14
Total North America	**1,800**	**1,871**	**1,838**	**2,189**	**2,571**	**2,339**	**1,526**	**1,296**	**1,139**	**1,045**
Central & South America										
Brazil	32	32	34	46	78	79	62	59	72	77
Venezuela	8	8	8	10	11	10	12	11	13	14

SUPPLY OF SILVER FROM THE RECYCLING OF SCRAP

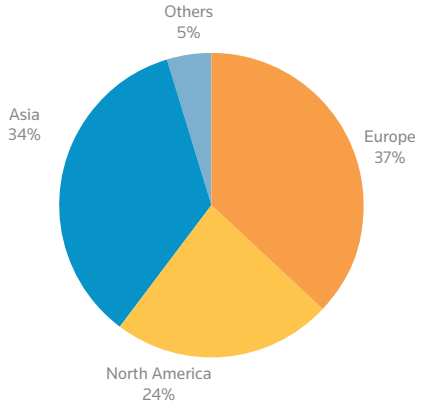
(tons)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Uruguay	6	6	5	8	13	12	11	11	12	12
Other Countries	52	48	44	58	68	66	45	30	32	36
Total C.&S. America	**98**	**94**	**91**	**122**	**170**	**167**	**131**	**111**	**128**	**139**
Asia										
Japan	800	736	662	649	714	662	623	609	542	504
China	700	705	787	909	992	962	935	830	501	428
South Korea	242	240	262	294	310	281	262	215	126	135
Taiwan	91	97	111	129	140	133	113	97	85	94
India	502	429	465	558	642	771	169	92	79	85
Thailand	85	91	96	115	116	99	87	69	62	65
Saudi Arabia	58	32	60	69	65	48	50	54	47	49
Israel	13	13	13	16	17	16	13	14	13	14
Singapore	16	15	15	17	18	17	16	14	12	13
Kazakhstan	7	7	7	9	9	9	8	8	10	11
Indonesia	12	12	12	13	15	14	13	11	9	10
Uzbekistan	7	7	7	9	9	9	8	8	9	10
Vietnam	12	12	11	12	12	11	10	9	8	8
Other Countries	50	50	53	61	69	66	53	36	29	29
Total Asia	**2,594**	**2,446**	**2,561**	**2,861**	**3,129**	**3,100**	**2,361**	**2,065**	**1,532**	**1,456**
Africa										
Egypt	**48**	**48**	**43**	**43**	**21**	**23**	**21**	**20**	**18**	**20**
Morocco	16	13	16	16	16	16	17	11	11	12
Libya	4	4	4	5	5	5	5	5	4	5
Other Countries	14	14	14	16	17	16	14	13	14	15
Total Africa	**82**	**80**	**77**	**80**	**59**	**61**	**57**	**48**	**47**	**51**
Oceania										
Australia	52	51	49	49	49	45	41	37	33	35
Total Oceania	52	51	49	49	49	45	41	37	33	35
World Total	**6,335**	**6,233**	**6,223**	**7,042**	**8,090**	**7,893**	**5,941**	**5,142**	**4,387**	**4,346**

WORLD SILVER SCRAP SUPPLY



Source: GFMS, Thomson Reuters

WORLD SCRAP SUPPLY, 2016



Source: GFMS, Thomson Reuters

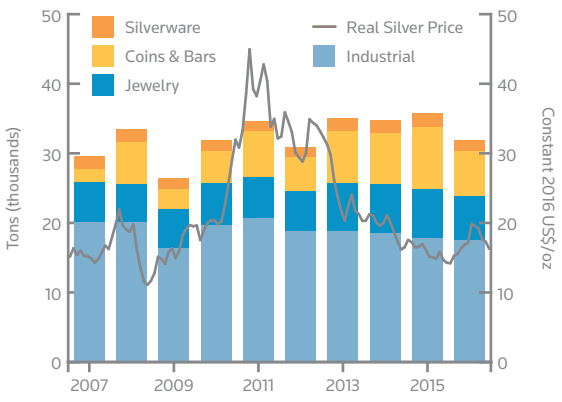
WORLD SILVER FABRICATION INCLUDING THE USE OF SCRAP

(tons)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Europe										
Germany	1,348	1,546	1,503	1,690	1,488	1,204	1,205	1,003	1,114	1,220
Italy	1,359	1,226	1,088	1,109	886	808	820	875	878	854
Russia	902	930	854	944	864	845	832	793	724	671
United Kingdom	779	725	588	677	698	631	641	623	660	654
Belgium	413	465	597	633	697	633	544	551	415	446
France	465	597	633	697	633	544	551	415	446	439
Turkey	247	262	221	201	181	184	209	241	234	227
Austria	38	279	315	380	591	304	476	168	251	130
Switzerland	94	94	86	92	92	89	88	86	85	85
Spain	141	118	112	109	96	83	76	81	80	80
Czech Republic	57	61	48	56	58	61	64	65	63	61
Netherlands	70	66	58	63	61	61	62	56	55	55
Poland	92	97	99	82	77	58	48	48	49	48
Norway	40	40	30	33	34	34	32	30	28	28
Greece	70	68	56	46	36	28	24	25	24	23
Hungary	3	5	4	4	4	4	0	1	18	23
Sweden	25	24	21	29	19	19	18	19	18	18
Denmark	18	17	15	16	16	15	14	15	15	14
Portugal	25	18	19	18	12	8	7	9	9	9
Other Countries	94	98	33	39	81	84	83	84	83	81
Total Europe	**6,747**	**7,041**	**6,378**	**6,857**	**6,427**	**5,541**	**5,699**	**5,084**	**5,273**	**5,161**
North America										
United States	5,575	6,100	5,602	6,709	7,068	6,363	6,399	6,916	7,418	7,097
Canada	250	386	404	667	813	644	1,031	1,061	1,227	1,160
Mexico	576	545	504	556	689	657	729	763	811	737
Total North America	**6,401**	**7,030**	**6,511**	**7,933**	**8,570**	**7,664**	**8,158**	**8,740**	**9,456**	**8,994**
Central & South America										
Brazil	223	223	219	319	345	349	416	379	358	298
Dominican Republic	20	28	46	42	28	29	42	45	47	46
Argentina	56	43	34	39	39	38	40	39	36	34
Colombia	21	19	17	18	17	17	24	35	32	31
Peru	21	23	25	26	22	22	23	24	23	23
Other Countries	48	57	57	61	51	52	55	54	49	46
Total C. & S. America	**389**	**393**	**399**	**504**	**503**	**509**	**601**	**576**	**547**	**478**
Asia										
China	5,402	6,013	5,843	6,792	7,534	7,710	8,446	7,801	6,855	5,851
India	2,576	5,469	1,457	2,486	4,001	2,697	5,379	6,247	7,374	5,081
Japan	3,921	3,280	2,113	3,020	3,234	2,864	2,901	2,700	2,640	2,800
Thailand	1,168	1,074	982	984	945	759	829	763	852	807
South Korea	903	955	763	929	941	928	895	820	628	516
Taiwan	534	533	397	486	510	463	471	488	467	471
Indonesia	170	168	166	199	225	245	254	243	254	268
Iran	132	154	98	102	95	92	91	89	88	167
Hong Kong	233	224	182	210	211	300	192	162	145	132
Saudi Arabia	64	29	190	192	98	56	61	55	56	113
Israel	87	82	69	67	55	50	57	62	64	62

WORLD SILVER FABRICATION INCLUDING THE USE OF SCRAP

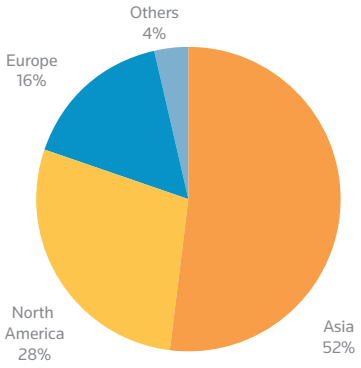
(tons)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Vietnam	37	39	40	45	46	46	45	49	51	56
Kazakhstan	72	72	61	66	63	62	62	61	55	53
Uzbekistan	72	72	61	66	63	62	62	61	55	53
Other Countries	245	317	297	337	353	282	259	262	304	243
Total Asia	**15,616**	**18,483**	**12,722**	**15,980**	**18,373**	**16,616**	**20,004**	**19,862**	**19,888**	**16,672**
Africa										
Egypt	53	49	44	43	19	27	29	32	29	24
Morocco	20	19	17	18	18	18	18	19	18	18
Tunisia	11	11	10	11	10	10	11	11	11	10
Mali	9	10	9	9	9	9	9	9	9	9
South Africa	8	8	8	8	8	8	8	8	8	8
Algeria	6	6	6	6	5	5	6	6	6	5
Other Countries	5	5	4	5	4	4	4	4	4	4
Total Africa	**112**	**109**	**98**	**99**	**74**	**81**	**85**	**89**	**85**	**79**
Oceania										
Australia	288	362	364	450	531	387	467	430	566	583
Other Countries	1	1	1	1	1	2	2	2	2	2
Total Oceania	**289**	**363**	**365**	**452**	**532**	**388**	**468**	**432**	**568**	**585**
World Total	**29,553**	**33,420**	**26,473**	**31,823**	**34,478**	**30,799**	**35,015**	**34,782**	**35,816**	**31,968**

WORLD SILVER FABRICATION



Source: GFMS, Thomson Reuters

WORLD SILVER FABRICATION, 2016



Source: GFMS, Thomson Reuters

SILVER FABRICATION: INDUSTRIAL APPLICATIONS INCLUDING THE USE OF SCRAP

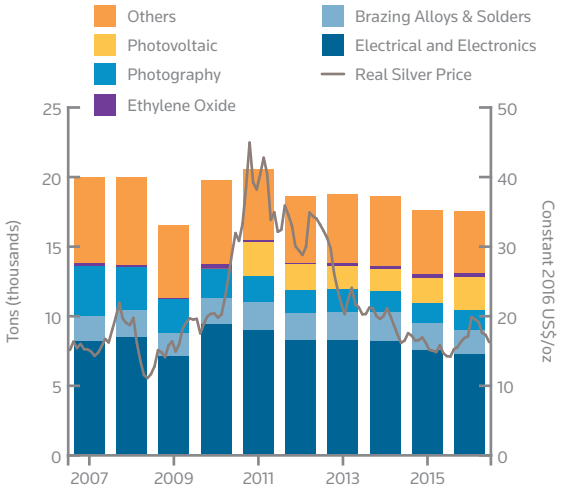
(tons)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Europe										
Germany	859	853	632	824	791	673	664	651	651	667
United Kingdom	739	686	550	640	647	591	557	546	545	541
Russia	689	681	582	630	602	593	599	565	515	484
Belgium	863	758	603	568	510	478	444	443	435	437
Italy	352	350	281	307	287	267	261	260	250	241
France	334	336	232	274	248	223	218	211	213	210
Czech Republic	67	76	83	64	76	82	88	93	97	95
Switzerland	77	76	69	75	74	71	70	72	71	71
Czech Republic	49	53	41	48	51	55	58	60	59	57
Turkey	50	51	42	44	46	45	46	48	50	49
Netherlands	49	49	40	47	46	45	44	45	44	45
Spain	59	58	53	55	45	38	35	36	36	37
Poland	24	25	21	23	22	22	22	23	24	24
Austria	17	17	15	16	16	16	16	15	16	16
Norway	16	15	11	13	12	12	12	12	12	12
Slovakia	3	3	2	2	0	3	3	3	3	3
Finland	1	1	1	1	1	1	1	1	1	1
Other Countries	61	64	6	14	60	62	65	67	66	65
Total Europe	**4,425**	**4,241**	**4,074**	**3,214**	**3,620**	**3,458**	**3,195**	**3,114**	**3,056**	**2,990**
North America										
United States	4,636	4,649	3,868	4,702	5,175	4,126	3,963	3,851	3,948	4,310
Mexico	102	97	97	148	187	206	205	209	245	250
Canada	83	75	40	60	57	56	59	56	53	55
Total North America	**4,821**	**4,821**	**4,006**	**4,910**	**5,419**	**4,388**	**4,227**	**4,115**	**4,245**	**4,616**
Central & South America										
Brazil	169	161	142	177	168	165	148	140	128	121
Argentina	42	31	24	28	28	27	27	26	25	24
Colombia	5	5	4	5	4	4	9	19	17	17
Other Countries	14	14	13	14	13	13	13	13	13	13
Total C. & S. America	**230**	**211**	**183**	**223**	**214**	**210**	**196**	**198**	**183**	**174**
Asia										
China	3,972	4,525	4,251	4,876	5,104	5,145	5,589	5,782	5,244	4,468
Japan	3,853	3,209	2,036	2,931	3,147	2,769	2,801	2,607	2,550	2,709
India	979	1,013	992	1,093	1,200	1,128	1,091	1,041	990	993
Taiwan	518	518	382	470	492	445	453	471	449	456
South Korea	750	806	612	762	761	733	694	636	447	378
Iran	83	106	55	59	55	55	54	55	55	132
Hong Kong	222	213	171	199	199	193	180	152	137	125
Saudi Arabia	43	7	164	159	62	15	15	16	17	75
Kazakhstan	60	60	51	56	54	53	54	52	48	46

GFMS, Thomson Reuters / The Silver Institute

SILVER FABRICATION: INDUSTRIAL APPLICATIONS INCLUDING THE USE OF SCRAP

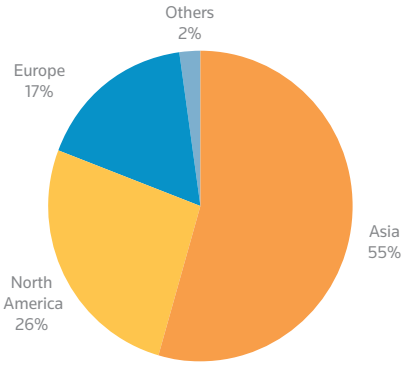
(tons)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Uzbekistan	60	60	51	56	54	53	54	52	47	46
Other Countries	56	125	100	134	148	73	78	88	113	95
Total Asia	**10,623**	**10,675**	**8,897**	**10,826**	**11,307**	**10,692**	**11,094**	**10,983**	**10,129**	**9,559**
Africa										
Morocco	9	9	8	7	8	8	8	8	8	9
South Africa	4	4	4	4	4	4	4	4	4	4
Other Countries	10	10	11	9	11	9	9	9	9	9
Total Africa	**22**	**23**	**23**	**20**	**23**	**21**	**21**	**21**	**22**	**22**
Oceania										
Australia	156	158	140	154	154	157	150	154	150	149
Total Oceania	**156**	**158**	**140**	**154**	**154**	**157**	**150**	**154**	**150**	**149**
World Total	**20,093**	**19,962**	**16,427**	**19,715**	**20,573**	**18,662**	**18,802**	**18,529**	**17,718**	**17,478**

COMPONENTS OF INDUSTRIAL DEMAND



Source: GFMS, Thomson Reuters

WORLD SILVER INDUSTRIAL FABRICATION, 2016



Source: GFMS, Thomson Reuters

SILVER FABRICATION: ELECTRICAL AND ELECTRONICS INCLUDING THE USE OF SCRAP

(tons)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
China	1,667	1,893	1,722	2,058	2,148	2,161	2,343	2,419	2,173	1,836
United States	1,796	1,935	1,660	2,320	2,085	1,745	1,651	1,672	1,685	1,708
Japan	1,394	1,204	877	1,588	1,438	1,194	1,190	1,044	945	918
Germany	665	674	488	664	631	534	529	521	519	536
India	440	468	502	531	534	547	470	501	451	453
Taiwan	363	384	309	377	395	353	367	384	365	372
Russia	375	375	321	353	339	334	338	315	285	266
South Korea	456	495	390	500	499	481	453	415	282	250
Mexico	65	64	69	118	157	177	176	179	213	213
France	264	269	178	215	189	166	164	159	161	159
United Kingdom	139	145	107	120	125	122	121	125	127	128
Italy	121	127	107	121	103	86	78	75	72	69
Hong Kong	108	104	83	97	97	94	87	72	66	59
Czech Republic	35	39	30	36	39	42	45	46	45	44
Brazil	48	46	37	50	49	48	47	45	42	38
Turkey	33	34	28	29	31	29	29	30	31	31
Kazakhstan	36	36	31	34	32	32	32	31	29	27
Uzbekistan	36	36	31	34	32	32	32	31	29	27
Other Countries	125	125	103	123	122	119	123	128	128	129
World Total	**8,165**	**8,451**	**7,072**	**9,367**	**9,044**	**8,295**	**8,274**	**8,192**	**7,648**	**7,266**

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

(tons)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
China	664	805	826	890	949	975	1,079	1,169	1,037	845
United States	240	225	162	182	187	166	178	182	187	191
India	68	67	68	80	83	75	65	82	77	77
Japan	132	122	78	115	108	93	87	79	75	73
United Kingdom	76	72	57	72	76	67	66	68	69	70
Germany	112	107	71	87	86	70	68	66	65	65
Canada	76	68	34	53	53	49	49	48	47	48
Russia	62	62	54	59	56	56	56	55	51	48
South Korea	74	81	64	72	73	68	64	59	45	45
Italy	78	75	52	57	54	50	48	47	45	44
Switzerland	44	42	38	41	41	39	39	40	39	39
Taiwan	39	39	31	38	39	38	36	35	34	34
Brazil	26	25	27	30	31	30	30	29	26	24
Mexico	16	14	12	13	12	12	12	12	14	20
France	27	26	17	20	19	17	16	16	16	16
Australia	17	17	15	16	18	18	17	17	16	15
Belgium	20	19	18	20	21	22	15	15	14	14
Spain	20	20	18	18	16	13	11	11	11	12
Other Countries	33	38	32	41	42	43	44	44	42	42
World Total	**1,823**	**1,924**	**1,674**	**1,905**	**1,965**	**1,900**	**1,981**	**2,073**	**1,912**	**1,722**

SILVER FABRICATION: PHOTOGRAPHIC USE INCLUDING THE USE OF SCRAP

(tons)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
United States	1,071	875	728	630	556	521	498	476	459	443
Belgium	836	730	580	540	482	448	423	420	415	415
Japan	1,080	908	610	465	410	303	295	290	275	261
United Kingdom	368	308	268	280	292	260	229	207	201	192
China	143	115	95	81	74	69	60	56	49	46
Russia	64	56	47	42	38	37	36	34	32	30
Brazil	45	40	32	45	37	35	14	10	8	7
India	10	10	10	10	10	10	10	10	6	6
Czech Republic	5	4	4	3	3	3	2	2	2	2
Australia	4	3	3	3	2	2	2	2	2	2
Other Countries	12	4	-	-	-	-	-	-		
World Total	**3,638**	**3,054**	**2,377**	**2,098**	**1,905**	**1,687**	**1,569**	**1,508**	**1,448**	**1,405**

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

(tons)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
China	44	20	11	76	46	33	129	125	209	134
Iran	29	52	1	6	1	1	0	1	2	72
Saudi Arabia	39	0	162	153	53	7	5	0	11	69
United States	12	25	-69	2	1	39	22	3	13	17
Thailand	20	4	12	0	2	0	0	0	6	10
Canada	1	1	1	3	0	2	6	3	1	3
Taiwan	74	41	3	2	11	13	3	1	3	2
Belgium	0	2	0	2	0	2	0	2	0	2
Singapore	0	0	0	46	45	0	1	0	23	2
South Korea	1	63	37	0	3	1	49	6	37	1
Kuwait	0	8	16	24	33	0	0	3	0	1
Germany	29	0	1	1	1	1	1	0	2	1
Canada	2	1	1	1	3	-	2	6	3	1
Japan	1	2	-4	2	0	2	0	2	1	1
India	-7	1	-16	-1	2	20	20	1	1	1
Other Countries	2	11	-6	-43	-4	26	3	7	7	2
World Total	**245**	**231**	**148**	**272**	**194**	**148**	**239**	**154**	**317**	**317**

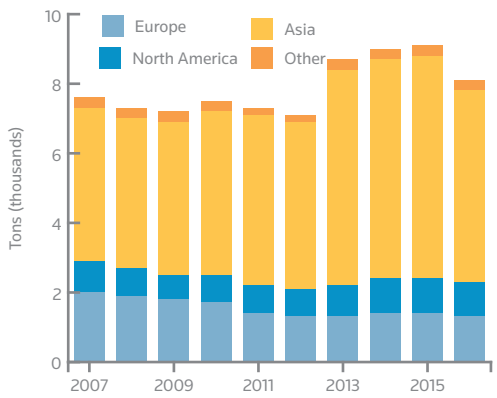
SILVER FABRICATION: JEWELRY AND SILVERWARE INCLUDING THE USE OF SCRAP

(tons)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Europe										
Italy	1,006	875	806	802	599	540	559	614	627	612
Russia	205	241	263	291	240	228	225	223	199	183
Turkey	194	207	175	153	134	139	162	192	184	177
Germany	203	193	166	169	159	147	134	131	130	123
France	59	57	59	64	73	67	56	54	53	52
Spain	44	41	41	37	37	32	29	30	29	30
Greece	70	68	56	46	36	28	24	25	24	23
Sweden	24	22	20	20	19	19	18	18	18	18
Poland	62	62	49	41	24	19	20	19	17	17
United Kingdom	26	23	21	21	20	18	16	17	17	15
Norway	25	26	19	20	18	18	16	17	16	15
Denmark	18	17	15	16	16	15	14	15	15	14
Portugal	21	17	18	18	12	8	7	8	9	9
Netherlands	8	8	8	8	7	7	7	7	7	7
Switzerland	7	7	7	7	7	7	7	7	7	7
Bulgaria	8	9	9	7	5	4	4	4	4	4
Belgium	5	5	4	4	4	4	4	4	4	4
Finland	7	7	5	5	5	5	4	3	3	3
Czech Republic	5	5	4	5	4	3	4	4	3	3
Austria	4	4	3	3	3	3	3	3	3	3
Cyprus	6	5	3	3	3	2	1	2	2	2
Serbia	2	2	2	2	2	2	2	2	1	1
Other Countries	-	-	-	-	-	-	-	-	-	-
Total Europe	**2,008**	**1,904**	**1,754**	**1,744**	**1,429**	**1,317**	**1,318**	**1,401**	**1,373**	**1,325**
North America										
Mexico	442	404	362	400	370	342	405	449	468	527
United States	423	404	355	344	450	428	490	523	537	463
Canada	34	30	28	28	27	26	26	23	26	24
Total North America	**899**	**838**	**745**	**772**	**847**	**797**	**921**	**996**	**1,031**	**1,014**
Central & South America										
Brazil	54	54	57	64	50	50	95	90	67	57
Dominican Republic	20	28	46	42	28	29	41	43	46	44
Peru	18	19	22	23	19	19	21	21	20	20
Colombia	16	14	13	14	13	13	15	16	15	14
Chile	12	14	12	10	11	11	11	13	13	12
Argentina	14	12	10	11	11	11	13	13	12	10
Ecuador	10	10	7	7	7	7	9	10	9	9
Bolivia	7	14	16	14	9	9	10	9	9	8
Other Countries	9	11	13	17	14	14	16	15	12	11
Total C. & S. America	**157**	**173**	**195**	**202**	**161**	**163**	**231**	**229**	**200**	**183**
Asia										
India	1,065	1,082	1,164	1,233	1,194	1,196	2,248	3,058	3,539	2,945
China	1,348	1,392	1,457	1,681	1,952	2,029	2,266	1,642	1,160	951
Thailand	1,136	1,037	946	947	908	722	792	726	815	766
Indonesia	151	149	150	168	190	207	215	206	215	230
South Korea	149	153	149	150	167	179	183	186	167	185
Japan	61	65	62	65	70	69	72	75	70	69

SILVER FABRICATION: JEWELRY AND SILVERWARE INCLUDING THE USE OF SCRAP

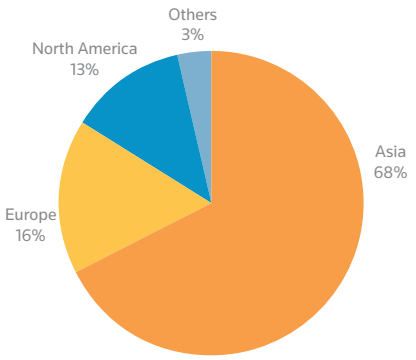
(tons)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Vietnam	35	37	39	40	45	46	46	45	49	51
Israel	59	55	46	42	32	29	34	37	39	37
Bangladesh	45	45	46	45	43	41	40	28	30	50
Iran	49	48	44	43	40	37	37	34	33	34
Cambodia	26	26	26	27	28	28	28	27	27	27
Nepal	34	36	37	36	36	37	23	22	25	27
Saudi Arabia	22	22	23	24	26	29	29	27	26	25
Malaysia	20	20	20	21	23	24	25	25	22	22
Pakistan	32	32	31	28	24	23	20	20	26	20
UAE	18	18	19	21	23	25	26	24	23	14
Taiwan	12	12	11	12	13	12	13	12	12	9
Philippines	8	8	8	8	8	9	9	9	9	9
Kazakhstan	12	12	10	10	9	8	9	9	8	7
Uzbekistan	12	12	10	10	9	8	9	9	8	7
Hong Kong	11	11	11	12	12	13	12	10	8	7
Bahrain	5	5	5	5	6	6	6	6	6	6
Sri Lanka	28	29	28	26	23	22	19	21	13	5
Other Countries	67	68	67	63	66	65	63	62	61	58
Total Asia	**4,039**	**4,368**	**4,319**	**4,362**	**4,698**	**4,799**	**4,764**	**6,067**	**6,163**	**6,312**
Africa										
Egypt	50	46	42	39	17	24	27	29	27	23
Morocco	11	11	9	10	10	10	10	10	10	10
Tunisia	10	10	10	10	9	9	10	10	10	9
Other Countries	18	18	17	17	16	17	17	18	17	16
Total Africa	**89**	**86**	**78**	**75**	**53**	**60**	**64**	**67**	**64**	**58**
Oceania										
Australia	24	24	23	23	25	26	27	28	28	29
Total Oceania	**22**	**22**	**22**	**23**	**25**	**26**	**26**	**27**	**27**	**28**
World Total	**7,543**	**7,342**	**7,156**	**7,515**	**7,423**	**7,187**	**8,728**	**8,975**	**9,056**	**8,059**

WORLD JEWELRY & SILVERWARE FABRICATION



Source: GFMS, Thomson Reuters

WORLD JEWELRY & SILVERWARE FABRICATION, 2016



Source: GFMS, Thomson Reuters

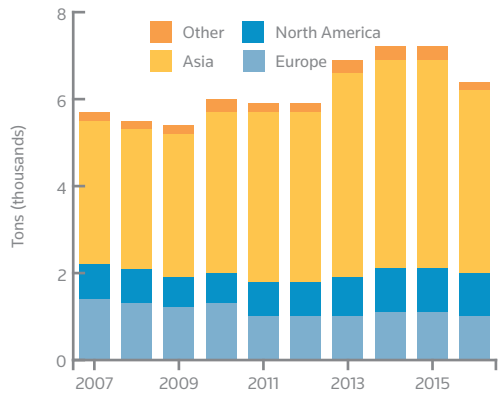
SILVER FABRICATION: JEWELRY INCLUDING THE USE OF SCRAP

(tons)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Europe										
Italy	802	703	663	679	512	469	495	555	572	561
Turkey	127	139	120	105	95	105	124	149	137	133
Germany	120	122	115	118	115	112	104	103	102	96
Russia	70	79	92	104	84	80	82	87	72	63
France	51	49	53	59	68	63	53	51	50	49
Spain	35	35	38	34	35	30	27	28	27	28
Poland	60	64	48	41	23	18	19	19	17	17
Greece	32	36	32	28	22	18	16	17	16	15
Sweden	11	10	9	10	9	10	10	10	10	10
United Kingdom	16	17	12	13	12	10	9	10	10	9
Portugal	21	17	18	18	12	8	7	8	9	9
Switzerland	7	7	7	7	7	7	7	7	7	7
Denmark	8	8	7	7	7	7	7	7	7	7
Netherlands	7	7	7	7	6	7	6	6	6	6
Norway	5	4	5	5	5	5	5	5	4	4
Other Countries	24	25	20	20	18	17	16	17	16	16
Total Europe	**1,397**	**1,315**	**1,246**	**1,254**	**1,032**	**966**	**988**	**1,080**	**1,063**	**1,031**
North America										
United States	400	372	334	374	346	321	385	429	447	502
Mexico	380	368	327	323	433	412	472	505	520	445
Canada	28	26	24	25	24	23	23	20	22	20
Total North America	**808**	**766**	**685**	**722**	**803**	**757**	**880**	**954**	**988**	**966**
Central & South America										
Brazil	48	48	52	60	47	47	92	88	67	57
Dominican Republic	20	28	46	42	28	29	41	43	46	44
Peru	10	13	16	17	14	15	17	18	17	17
Colombia	6	6	7	7	7	7	10	12	10	10
Chile	6	6	7	7	7	7	10	10	10	10
Other Countries	27	35	37	41	33	34	41	40	35	32
Total C. & S. America	**117**	**136**	**165**	**174**	**137**	**140**	**210**	**211**	**186**	**169**
Asia										
India	603	601	647	707	679	724	1,315	1,936	2,254	1,930
China	1,065	1,121	1,243	1,444	1,693	1,762	1,955	1,452	1,053	875
Thailand	995	904	832	870	848	667	742	674	760	715
Indonesia	131	129	129	146	172	192	201	192	203	218
South Korea	130	127	131	147	162	168	172	154	151	117
Japan	64	61	64	69	68	71	74	70	68	69
Vietnam	34	36	37	42	44	44	43	47	50	55
Nepal	33	35	36	35	35	37	22	21	25	26
Bangladesh	22	23	24	23	23	24	16	17	33	23
Cambodia	19	19	19	22	23	24	24	23	23	23
Saudi Arabia	18	18	20	21	23	26	26	25	24	23
Malaysia	18	19	19	20	21	23	24	24	21	21
UAE	15	15	16	18	20	22	24	22	21	13
Israel	14	14	12	13	10	10	11	13	12	12
Pakistan	13	13	14	13	11	11	10	10	15	10
Iran	6	6	6	7	8	8	9	9	8	9

SILVER FABRICATION: JEWELRY INCLUDING THE USE OF SCRAP

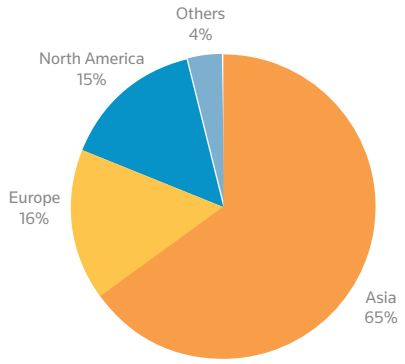
(tons)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Philippines	6	6	6	6	7	7	7	7	8	8
Taiwan	9	8	8	9	10	10	10	9	10	7
Hong Kong	8	8	8	9	10	11	10	8	7	6
Kazakhstan	9	9	8	7	7	6	6	7	6	6
Uzbekistan	9	9	8	7	7	6	6	7	6	6
Bahrain	4	4	4	5	5	5	6	5	6	5
Other Countries	30	30	31	32	31	30	27	28	18	18
Total Asia	**3,256**	**3,217**	**3,322**	**3,674**	**3,917**	**3,890**	**4,741**	**4,760**	**4,781**	**4,195**
Africa										
Egypt	43	40	36	34	15	22	24	27	25	21
Morocco	9	8	7	8	8	8	8	8	8	8
Tunisia	7	7	7	7	7	7	7	7	7	7
Other Countries	14	15	14	14	13	14	14	15	14	14
Total Africa	**72**	**70**	**64**	**62**	**43**	**50**	**54**	**57**	**54**	**49**
Oceania										
Total Oceania	**21**	**20**	**21**	**22**	**24**	**25**	**26**	**26**	**27**	**27**
World Total	**5,670**	**5,524**	**5,502**	**5,909**	**5,956**	**5,828**	**6,899**	**7,088**	**7,100**	**6,438**

WORLD JEWELRY FABRICATION



Source: GFMS, Thomson Reuters

WORLD JEWELRY FABRICATION, 2016

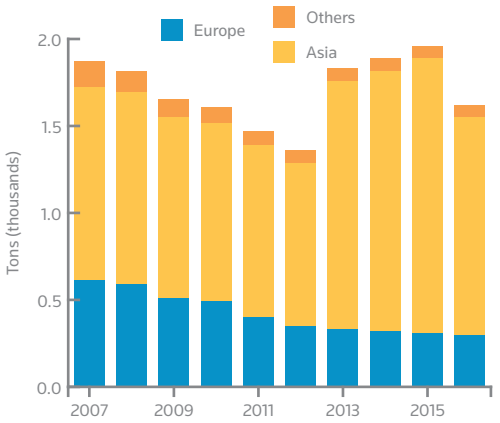


Source: GFMS, Thomson Reuters

SILVER FABRICATION: SILVERWARE INCLUDING THE USE OF SCRAP

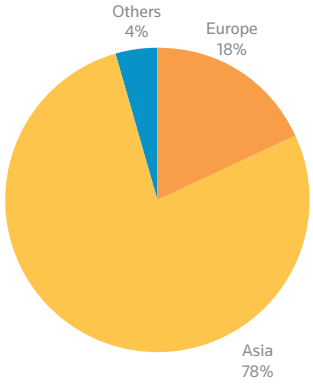
(tons)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Europe										
Russia	134	162	171	187	156	148	144	136	127	120
Italy	204	172	143	123	87	71	64	59	54	51
Turkey	67	68	55	48	39	34	38	43	46	44
Germany	83	71	51	51	44	34	30	29	28	27
Norway	20	21	14	15	14	14	12	12	12	11
Sweden	12	12	10	10	9	9	8	8	8	8
Greece	38	32	24	18	14	10	8	8	8	8
Denmark	10	10	9	9	9	8	7	7	7	7
United Kingdom	10	10	9	8	8	7	6	7	6	6
France	8	8	6	5	5	4	3	3	3	3
Austria	3	3	3	3	2	2	2	2	2	2
Other Countries	23	21	14	13	10	9	8	7	7	6
Total Europe	**612**	**589**	**508**	**490**	**397**	**350**	**330**	**322**	**310**	**294**
North America										
United States	42	32	28	26	24	21	20	21	21	26
Mexico	43	36	28	21	17	16	18	18	18	18
Canada	6	4	4	3	3	3	3	3	4	4
Total North America	**91**	**72**	**60**	**51**	**45**	**40**	**41**	**42**	**42**	**48**
Central & South America										
Colombia	10	8	7	7	6	6	5	5	4	4
Peru	8	6	6	6	4	4	4	3	3	3
Other Countries	23	22	17	15	13	13	11	10	7	7
Total C. & S. America	**41**	**36**	**30**	**27**	**24**	**23**	**21**	**18**	**14**	**14**
Asia										
India	462	481	517	526	515	472	933	1122	1285	1015
China	283	271	215	237	259	267	311	190	107	76
Thailand	141	133	115	77	60	55	50	52	55	52
Israel	45	41	34	30	22	19	23	24	27	26
Iran	43	42	37	36	32	29	28	26	25	25
Bangladesh	23	23	21	20	17	16	13	12	17	12
Indonesia	20	20	21	22	18	15	14	14	12	12
Pakistan	20	19	17	15	13	11	10	10	11	10
South Korea	23	22	20	19	17	15	14	12	11	9
Cambodia	7	7	6	6	5	4	4	4	4	3
Saudi Arabia	4	3	3	3	3	3	3	2	2	2
Other Countries	42	41	36	34	30	27	25	25	24	14
Total Asia	**1,112**	**1,103**	**1,041**	**1,024**	**992**	**934**	**1,427**	**1,495**	**1,580**	**1,256**
Africa										
Africa	17	16	14	13	9	10	10	10	9	9
Total Africa	**17**	**16**	**14**	**13**	**9**	**10**	**10**	**10**	**9**	**9**
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	**1,873**	**1,818**	**1,654**	**1,606**	**1,467**	**1,359**	**1,830**	**1,887**	**1,956**	**1,621**

WORLD SILVERWARE FABRICATION



Source: GFMS, Thomson Reuters

WORLD SILVERWARE FABRICATION, 2016



Source: GFMS, Thomson Reuters

TOP 20 SILVER PRODUCING COUNTRIES

Rank 2015	Rank 2016	Country	Output (tons) 2015	Output (tons) 2016
1	1	Mexico	5,972	5,793
2	2	Peru	4,291	4,593
3	3	China	3,421	3,496
6	4	Chile	1,511	1,497
4	5	Russia	1,581	1,450
5	6	Australia	1,525	1,357
7	7	Bolivia	1,306	1,353
8	8	Poland	1,291	1,198
9	9	United States	1,090	1,100
10	10	Argentina	1,080	932
11	11	Guatemala	856	838
12	12	Kazakhstan	538	554
13	13	Sweden	494	511
15	14	India	374	436
14	15	Canada	380	405
16	16	Indonesia	310	347
17	17	Morocco	298	313
18	18	Turkey	172	175
20	19	Armenia	124	143
21	20	Iran	104	111
		Rest of World	**992**	**948**
		World Total	**27,708**	**27,551**

Source: GFMS, Thomson Reuters

TOP 20 SILVER PRODUCING COMPANIES

Rank 2015	Rank 2016		Output (tons) 2015	Output (tons) 2016
1	1	Fresnillo plc. [1, 2]	1,338	1,421
4	2	Glencore plc. [3]	1,138	1,215
2	3	KGHM Polska Miedź S.A. Group [4]	1,293	1,207
5	4	Polymetal International plc.	998	908
3	5	Goldcorp Inc.	1,257	874
6	6	Pan American Silver Corp. [2]	812	791
8	7	Cia. De Minas Buenaventura S.A.A. [3]	688	767
7	8	Volcan Cia. Minera S.A.A. [3]	771	684
10	9	Tahoe Resources Inc. [2]	635	661
9	10	Corp. Nacional del Cobre de Chile [5]	663	650
15	11	South 32 Ltd. [5]	434	567
13	12	Sumitomo Corp. [5]	493	564
14	13	Hochschild Mining plc. [6]	459	538
19	14	Hecla Mining Company [2]	361	534
17	15	Southern Copper Corp. [7]	413	503
12	16	Coeur Mining, Inc. [2]	495	461
16	17	Boliden A.B. [8]	418	447
18	18	Hindustan Zinc Ltd. [9]	373	436
20	19	Industrias Peñoles S.A.B. De C.V. [10]	358	385
21	20	First Majestic Silver Corp. [2]	347	369

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

Source: GFMS, Thomson Reuters

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
1982	7.922	2,675	182.21	634.4	1,862	482	316	0.45
1983	11.415	3,435	262.89	873.8	2,851	726	479	1.37
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

* 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 2016 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
1982	19.77	33,705	475.4	761.9	6,542	2,717	523.1	337.1
1983	27.60	38,863	661.8	1,029.0	9,682	4,012	766.9	514.6
1984	18.88	36,556	479.8	716.8	7,008	3,267	596.4	309.4
1985	13.72	38,304	405.0	531.2	5,558	2,783	453.3	226.0
1986	12.01	37,206	343.6	332.4	4,883	2,725	298.5	257.4
1987	14.86	42,701	421.4	365.8	5,679	3,518	317.1	321.2
1988	13.30	47,577	371.2	299.8	4,388	2,759	285.1	230.4
1989	10.68	50,212	301.3	265.7	3,209	1,986	249.5	175.0
1990	8.91	45,884	249.2	237.7	2,737	2,150	183.9	138.7
1991	7.17	41,689	197.2	179.8	2,178	1,940	167.8	101.9
1992	6.77	40,375	183.3	164.5	2,123	1,839	146.0	88.0
1993	7.19	30,815	193.3	153.2	2,277	1,833	161.6	88.2
1994	8.59	31,118	224.2	176.6	2,628	2,704	189.3	109.5
1995	8.21	28,296	206.2	160.0	2,374	2,204	161.5	151.6
1996	7.98	27,564	198.5	185.2	2,361	2,026	167.1	133.7
1997	7.35	24,747	218.9	190.7	2,518	1,851	178.1	108.7
1998	8.18	25,000	302.7	232.2	3,906	2,111	203.3	122.5
1999	7.54	23,866	259.9	190.8	3,093	2,015	198.5	103.5
2000	6.93	22,883	283.9	172.5	2,731	1,907	214.1	88.7
2001	5.94	20,466	273.1	173.1	2,644	1,671	191.0	72.7
2002	6.16	20,985	276.0	189.6	2,624	1,772	187.8	75.3
2003	6.39	20,713	277.7	186.5	2,561	1,858	164.8	85.4
2004	8.49	26,053	355.4	237.5	3,243	2,441	201.2	116.4
2005	9.02	26,107	375.7	267.3	3,099	2,606	217.4	118.7
2006	13.80	39,566	533.9	444.4	4,463	3,945	335.1	181.0
2007	15.54	39,206	551.6	521.0	4,909	4,167	347.7	202.3
2008	16.77	41,628	565.3	505.3	6,229	4,027	353.8	219.5
2009	16.47	41,337	574.8	453.9	6,877	3,903	364.8	247.8
2010	22.30	49,611	708.2	589.4	8,324	5,150	520.6	306.1
2011	37.60	79,191	1,138.7	933.9	13,334	8,113	845.6	506.2
2012	32.67	74,356	999.7	829.3	11,671	6,834	794.1	451.8
2013	24.60	57,089	739.1	767.7	8,607	4,964	579.7	325.8
2014	19.41	46,152	581.6	650.8	6,557	3,910	462.1	268.2
2015	15.93	38,864	538.2	609.5	5,760	3,232	560.8	255.9
2016	17.138	40,639	604.5	595.6	6,369	3,662	498	318.00

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

** CPI Source: National Bureau of Statistics of the People's Republic of China

APPENDIX 4

SILVER PRICES IN US$ PER OUNCE

	London Silver Market Fix*			COMEX Settlement Price		
	High	Low	Average	High	Low	Average
1991	4.5710	3.5475	4.0566	4.5450	3.5080	4.0355
1992	4.3350	3.6475	3.9464	4.3180	3.6400	3.9353
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

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

US PRICES IN 2016

COMEX Settlement

US$ per ounce	High	Low	Average
January	14.5440	13.7370	14.0726
February	15.7890	14.2760	15.1294
March	16.0220	14.7330	15.4158
April	17.7890	14.9420	16.3215
May	17.6560	15.9720	16.8961
June	18.5820	15.9060	17.2588
July	20.3700	19.5440	19.9673
August	20.6660	18.4780	19.5141
September	20.0490	18.7810	19.2896
October	18.7950	17.2880	17.6032
November	18.7160	16.3830	17.3563
December	17.2030	15.7040	16.4110

Source: COMEX

LEASE RATES, 2016

Quarterly Averages

Average	3-month	6-month	12-month
Q1 2016	0.03%	0.23%	0.11%
Q2 2016	-0.12%	0.11%	0.10%
Q3 2016	-0.19%	0.14%	0.12%
Q4 2016	-0.16%	0.13%	0.11%

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, Thomson Reuters

APPENDIX 5

LEADING PRIMARY SILVER MINES

Rank	Mine Name	Country	Company	2015 Moz	2016 Moz
1	Saucito	Mexico	Fresnillo plc.	22.0	21.9
2	Escobal	Guatemala	Tahoe Resources Inc.	20.4	21.2
3	Dukat	Russia	Polymetal International plc. [1]	22.3	19.8
4	Cannington	Australia	South 32 Ltd. [2]	22.2	18.2
5	Uchucchacua	Peru	Compañía de Minas Buenaventura S.A.A.	13.9	16.2
6	Fresnillo Mine	Mexico	Fresnillo plc.	15.6	15.9
7	Pirquitas	Argentina	Silver Standard Resources	10.3	10.4
8	Greens Creek	United States	Hecla Mining Company	8.5	9.3
9	Imiter	Morocco	Société Métallurgique d'Imiter	6.7	7.1
10	San José	Argentina	Hochschild Mining plc./ McEwen Mining Inc.	6.7	6.7
11	Arcata	Peru	Hochschild Mining plc.	5.6	6.3
12	San Jose	Mexico	Fortuna Silver Mines Inc. [3]	4.9	6.1
13	La Colorada	Mexico	Pan American Silver Corp.	5.3	5.8
14	Lunnoye	Russia	Polymetal International plc.	5.0	5.6
15	Ying Mining District	China	Silvercorp Metals Inc. [4]	4.4	5.5

[1] including Goltsovoye; [2] reported payable metal in concentrate; [3] estimate; [4] Ying Mining District includes mines: SGX, TLP, HPG, LM, BCG and HZG

SILVER MINE PRODUCTION BY SOURCE METAL

(million ounces)	2012	2013	2014	2015	2016
Primary					
Mexico	77.0	82.1	85.6	88.5	89.9
Peru	30.3	32.8	34.1	35.3	39.3
Russia	19.5	22.4	24.3	27.6	25.7
Other	97.4	98.4	113.0	111.0	110.2
Total	**224.2**	**235.8**	**257.0**	**262.4**	**265.1**
Gold					
Mexico	23.0	25.4	25.7	30.0	29.0
Peru	6.0	7.5	7.7	11.7	11.6
Russia	15.9	13.0	11.6	12.4	11.3
Other	53.4	58.0	63.9	62.5	53.6
Total	**98.2**	**103.9**	**108.9**	**116.5**	**105.5**
Copper					
Chile	23.3	25.4	37.4	37.3	39.7
Peru	21.3	24.9	24.0	35.0	39.6
Poland	41.0	37.3	40.4	41.2	38.3
Other	74.7	82.6	78.0	79.2	83.4
Total	**160.3**	**170.3**	**179.7**	**192.8**	**200.9**
Lead/Zinc					
China	77.0	80.3	77.8	76.8	79.2
Mexico	66.0	63.3	68.4	67.1	58.5
Peru	53.7	54.5	56.4	55.5	56.6
Other	106.1	110.6	115.5	114.9	115.0
Total	**302.8**	**308.8**	**318.2**	**314.3**	**309.4**
Other	**6.2**	**4.9**	**4.8**	**4.9**	**4.8**
World Total	**791.7**	**823.7**	**868.6**	**890.8**	**885.8**

Source: GFMS, Thomson Reuters; Company Reports

SILVER MINE PRODUCTION BY MAIN REGION AND SOURCE METAL

(million ounces)	2012	2013	2014	2015	2016
North America					
Primary	90.6	98.4	102.2	106.1	109.0
Lead/Zinc	82.9	76.0	80.2	75.6	67.0
Copper	18.8	18.7	18.7	15.8	19.6
Gold	34.2	35.8	36.6	39.0	36.5
Other	1.8	2.4	2.5	2.8	2.6
Total	**228.4**	**231.3**	**240.2**	**239.3**	**234.6**
Central & South America					
Primary	61.5	65.6	86.4	88.2	92.7
Lead/Zinc	83.8	86.8	91.4	88.9	90.3
Copper	46.6	53.1	63.4	74.0	81.0
Gold	32.2	35.1	39.9	46.8	37.8
Other	2.8	0.9	0.7	0.5	0.6
Total	**226.9**	**241.5**	**281.9**	**298.3**	**302.5**
Asia					
Primary	7.3	7.2	7.2	6.4	7.1
Lead/Zinc	95.8	103.0	99.6	99.6	105.4
Copper	40.9	45.0	42.5	46.4	47.2
Gold	10.5	11.7	12.7	12.6	13.1
Other	1.6	1.6	1.6	1.6	1.6
Total	**156.2**	**168.4**	**163.7**	**166.7**	**174.4**
Rest of the World					
Primary	64.8	64.6	61.1	61.7	56.4
Lead/Zinc	40.2	43.2	46.9	50.2	46.6
Copper	53.9	53.5	55.1	56.6	53.2
Gold	21.3	21.3	19.7	18.2	18.1
Other	0.0	0.0	0.0	0.0	0.0
Total	**180.2**	**182.5**	**182.8**	**186.6**	**174.3**
World Total	**791.7**	**823.7**	**868.6**	**890.8**	**885.8**

APPENDIX 6

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

		Comex Number of Contracts				LBMA Clearing Turnover [3]		
		Futures		Options		Ounces transferred	Value	Number of
		Turnover [1]	Open Interest [2]	Turnover [1]	Open Interest [2]	(millions)	(US$bn)	transfers
2015	Jan	979,506	163,955	166,782	198,539	145.5	2.5	710
	Feb	1,195,969	160,735	96,286	168,559	142.6	2.4	663
	Mar	875,819	171,077	95,656	173,472	149.7	2.4	697
	Apr	1,431,363	179,953	97,002	166,305	112.9	1.8	620
	May	886,343	178,002	103,569	185,094	148.3	2.5	684
	Jun	1,499,551	198,023	123,818	149,190	134.3	2.2	623
	Jul	988,399	186,246	121,351	164,289	155.2	2.3	644
	Aug	1,510,998	157,520	102,749	148,064	142.2	2.1	712
	Sep	822,288	158,046	77,955	146,191	163.4	2.4	691
	Oct	1,107,547	169,495	90,876	150,301	136.4	2.1	686
	Nov	1,291,748	162,326	84,249	94,670	154.6	2.2	714
	Dec	864,875	168,442	64,371	94,193	166.1	2.3	732
2016	Jan	960,457	158,711	73,091	100,572	156.0	2.2	676
	Feb	1,694,167	163,623	130,102	106,479	140.9	2.1	674
	Mar	1,212,488	177,267	108,157	117,244	135.1	2.1	695
	Apr	1,974,067	201,872	154,422	131,206	175.4	2.9	798.
	May	1,183,591	198,844	101,348	133,697	182.2	3.1	690
	Jun	1,828,292	212,393	98,847	149,190	165.5	2.8	672
	Jul	1,458,746	224,453	121,351	131,943	178.5	3.6	881
	Aug	1,939,332	189,839	125,379	128,889	179.8	3.5	757
	Sep	1,290,090	202,973	135,144	131,932	179.2	3.5	691
	Oct	1,327,617	194,016	105,337	137,363	193.6	3.4	708
	Nov	2,214,364	160,161	129,032	101,204	157.6	2.7	783
	Dec	1,135,529	164,943	80,152	104,888	218.1	3.6	1,027

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

SILVER ETP HOLDINGS

(Moz, end-period)		iShares Silver Trust	ETF Securities*	ZKB	Central Fund of Canada	Other**	Total	Value US$ Bn***
2015	Q1	327.3	69.1	75.4	77.0	89.6	637.2	10.58
	Q2	325.2	69.7	74.2	77.0	90.2	635.0	9.97
	Q3	318.5	69.3	71.6	77.0	90.8	626.0	9.17
	Q4	318.9	65.9	69.1	77.0	88.2	617.8	8.54
2016	Q1	332.6	73.7	69.7	77.0	88.1	640.0	9.84
	Q2	333.5	75.2	71.4	75.6	100.6	655.6	12.04
	Q3	360.3	74.8	71.9	75.6	100.1	682.7	13.21
	Q4	341.3	79.6	71.9	75.6	96.3	664.8	10.80

*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, Thomson Reuters

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