

**THE SILVER INSTITUTE**

**WORLD**

**SILVER SURVEY**

**2014**



**THOMSON REUTERS™**



THE SILVER INSTITUTE  
(major funding companies)

---

Barrick Gold Corp.  
Cia. de Minas Buenaventura, S.A.A.  
Coeur Mining, Inc.  
Endeavour Silver Corp.  
Fresnillo Plc  
Goldcorp, Inc.  
Hecla Mining Company  
Industrias Peñoles, S.A.B. de C.V.  
Johnson Matthey, Inc.  
Pan American Silver Corp.  
Silver Standard Resources Inc.  
Silver Wheaton Corp.

# World Silver Survey 2014

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

Rhona O'Connell, Head of Metals Research & Forecasts

William Tankard, Manager, Mining

Cameron Alexander, Manager, Regional Demand

Andrew Leyland, Manager, Regional Demand

Ross Strachan, Manager, Regional Demand

Matthew Piggott, Senior Analyst

Saida Litosh, Senior Analyst

Johann Wiebe, Senior Analyst

Ling Wong, Senior Analyst

Erica Rannestad, Senior Analyst

Samson Li, Senior Analyst

Sudheesh Nambiath, Analyst

Janette Tourney, Analyst

Ryan Cochrane, Analyst

Sara Zhao, Analyst

Natalie Scott-Gray, Analyst

Dante Aranda, Analyst

Gregory Rodwell, Analyst

## Other Contributors:

Bruce Alway, Manager, Mining (Base Metals)

Karen Norton, Senior Analyst (Base Metals)

Beverley Salmon, Customer Relationship Manager

Thomson Reuters  
The Thomson Reuters Building, 30 South Colonnade,  
London, E14 5EP, UK  
E-mail: [GFMS@thomsonreuters.com](mailto:GFMS@thomsonreuters.com)  
Web: [thomsonreuterseikon.com/markets/metal-trading/](http://thomsonreuterseikon.com/markets/metal-trading/)

The Silver Institute  
1400 I Street, NW, Suite 550  
Washington, D.C., 20005, USA  
Telephone: +1 202 835-0185  
Fax: +1 202 835-0155  
[info@silverinstitute.org](mailto:info@silverinstitute.org)  
[www.silverinstitute.org](http://www.silverinstitute.org)

# About the Major Sponsors of World Silver Survey 2014

## A-Mark Precious Metals, Inc.

Established in 1965, A-Mark Precious Metals, Inc. is a full service precious metals trading company with customers on six continents and revenues in excess of US\$7,000,000,000 yearly. Our counterparts and clientele include mines, refiners, mints, central banks, coin dealers, investment advisors and commodity brokerage houses. We are an authorized purchaser for the US Mint, the Royal Canadian Mint, Rand Refinery, the British Royal Mint, the Perth Mint and China Great Wall. Some of our services include financing, leasing, as well as hedging and risk management of metal positions.



## Coeur Mining, Inc.

Coeur Mining, Inc. is the largest U.S.-based primary silver producer and a significant gold producer. Coeur built and commenced production from three wholly-owned, long-lived mines between 2008 and 2010: the San Bartolomé silver mine in Bolivia, the Palmarejo silver-gold mine in Mexico and the Kensington gold mine in Alaska. Coeur's longest running mine is the Rochester silver-gold mine in Nevada which expanded production in 2013. The Company also owns a non-operating interest in a silver-base metal mine, Endeavor, in Australia in addition to net smelter royalties on the Cerro Bayo silver-gold mine in Chile, the El Gallo silver-gold complex in Mexico, and the Zaruma silver-gold mine in Ecuador. The Company has two feasibility stage projects, the Joaquin silver-gold project in Argentina and the recently acquired La Preciosa silver-gold project in Mexico. In addition, Coeur conducts ongoing exploration activities in Mexico, Argentina, Nevada, Alaska and Bolivia. The Company owns strategic minority investment positions in eight silver and gold development companies with projects in 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 Stock Exchange under the symbol FRES. Fresnillo plc has six operating mines, all of them in Mexico - Fresnillo, Saucito, Ciénega (including the San Ramón satellite mine), Herradura, Soledad and Noche Buena; two development projects - San Julián and Saucito II; and four advanced exploration prospects - Centauro Deep, Juanicipio, Orisyvo and Las Casas Rosario as well as a number of other long term exploration prospects. In total, Fresnillo plc has mining concessions covering approximately 2.1 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 both silver and gold. 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 and 500,000 ounces of gold by 2018.



## 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's mission is to be the world's pre-eminent silver producer, with a reputation for excellence in discovery, engineering, innovation and sustainable development. The Company was founded in 1994 with the intention to provide investors with the best vehicle to gain real exposure to silver. Pan American currently owns and operates seven mines in Mexico, Peru, Argentina and Bolivia and employs over 7,000 people worldwide. The Company also has several development-stage silver and gold projects in the USA, Mexico, Peru and Argentina. In 2013, the Company produced a record 26 million ounces of silver and 149,800 ounces of gold at All-in Sustaining Cost per Silver Ounce Sold ("AISCOS") of \$18.33. In addition, Pan American initiated the expansion of its La Colorada mine to increase the mine's production from 4.6 million ounces in 2013 to approximately 7.7 million ounces per year by 2018. In 2014, Pan American expects to produce 25.75 to 26.75 million ounces of silver and 155,000 to 165,000 ounces of gold.



## Silver Wheaton Corp.

Silver Wheaton is the largest precious metals streaming company in the world. **SILVER | WHEATON** The company has a number of agreements where, in exchange for an upfront payment, it has the right to purchase all or a portion of the silver and/or gold production, at a low fixed cost, from high quality mines located in politically stable regions around the globe. Silver Wheaton's growth profile is driven by the company's portfolio of low-cost and long-life assets, including precious metal and gold streams on Hudbay's Constancia project and Vale's Salobo and Sudbury mines. The company's unique business model creates significant shareholder value by providing leverage to increases in the price of silver and gold, while reducing the downside risks faced by traditional mining companies. Silver Wheaton's shares are traded under the symbol SLW on the Toronto Stock Exchange and New York Stock Exchange.

World Silver Survey 2014 has been kindly supported  
by the following companies

—MAJOR SPONSORS—



COEUR  
MINING®  
Coeur Mining, Inc.



Fresnillo Plc



PEÑOLES®

Industrias Peñoles S.A.B. de C.V.



Pan American Silver Corp.

SILVER | WHEATON

Silver Wheaton Corp.

—SPONSORS—



BARRICK

Barrick Gold Corporation



Compañía de Minas Buenaventura S.A.A.



Endeavour Silver Corp.

GOLDCORP

Goldcorp Inc.

Hecla  
MINING COMPANY

Hecla Mining Company

KGHM  
POLSKA MIEDŹ S.A.

KGHM Polska Miedź S.A.



Republic Metals Corporation



Scotiabank

SILVER  
STANDARD

Silver Standard Resources Inc.

—CONTRIBUTORS—

*CME Group*

*International Depository Services Group*

*Johnson Matthey Inc.*

*Mitsui Global Precious Metals*

*Tanaka Kikinzoku Kogyo K. K.*

*TD Bank*

*Valcambi sa*

The **World Silver Survey** has been published annually by The Silver Institute since 1990. Copies of previous editions can be obtained by contacting The Silver Institute at the address and telephone number on the opening page. For copies outside of North America, contact Thomson Reuters at the address on the page overleaf.

ISSN: 1059-6992 (Print)

ISSN: 2372-2312 (Online)

ISBN: 978-1-880936-22-1 (Print)

ISBN: 978-1-880936-23-8 (Online)

© Copyright May 2014. The Silver Institute and Thomson Reuters.

We (and where relevant, any identified contributors or co-authors) are the owner or the licensee of all intellectual property rights in this document. This document is protected by copyright laws and treaties around the world. All such rights are reserved.

No organization or individual is permitted to reproduce or transmit all or part of this document (including without limitation extracts such as tables and graphs), whether by photocopying or storing in any medium by electronic means or otherwise, without the written permission of The Silver Institute and Thomson Reuters. In cases where we have provided our document electronically, only the authorized subscriber, in respect of whom an individual user license has been granted, may download a copy of this document. Additional user licenses may be purchased on request.

Your reproduction, transmission, printing off, copying or downloading (where relevant) of all or part of this document in breach of these terms may result in civil or criminal actions against you.

While every effort has been made to ensure the accuracy of the information in this document, the content of this document is provided without any guarantees, conditions or warranties as to its accuracy, completeness or reliability. It is not to be construed as a solicitation or an offer to buy or sell precious metal, related products, commodities, securities or related financial instruments. To the extent permitted by law, we, other members of our group of companies and third parties connected to us hereby expressly exclude:

- All conditions, warranties and other terms which might otherwise be implied by statute, common law or the law of equity.
- Any liability for any direct, indirect or consequential loss or damage incurred by any person or organization reading or relying on this document including (without limitation) loss of income or revenue, loss of business, loss of profits or contracts, loss of anticipated savings, loss of goodwill and whether caused by tort (including negligence), breach of contract or otherwise, even if foreseeable.

This is the twentieth annual survey of the world silver market to be produced for The Silver Institute by the GFMS team at Thomson Reuters, the London-based analysts of global precious metals markets. The information contained here is based in part on the analysis of the GFMS, Thomson Reuters database of international trade statistics, company report data and other public-domain information. But more importantly, it is also based on a series of interviews with the industry's main players, carried out every year by our team of analysts and consultants, which provide the essential data to allow the compilation of reliable estimates for world supply and demand.

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.

Thomson Reuters, London  
The Thomson Reuters Building, 30 South Colonnade,  
London, E14 5EP, UK  
E-mail: GFMS@thomsonreuters.com

May, 2014

#### 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" refers to the US dollar unless otherwise stated.

Implied Net Investment = the residual from combining all other GFMS data on silver supply/demand as shown in Table 1. As such, it captures the net physical impact of all transactions not covered by the other supply/demand variables.

#### Prices:

Unless otherwise stated, US dollar prices are for the London Silver Market fixing.

#### Table Rounding:

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



# Table of Contents

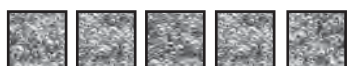
<b>1. Summary and Outlook</b>	<b>8</b>
<i>Methodology 9 • Supply in 2013 10 • Demand in 2013 10</i>	
<b>2. Silver Prices</b>	<b>12</b>
<i>Market Analysis 12</i>	
<b>3. Investment</b>	<b>17</b>
<i>Overview 17 • OTC Market 20 • Physical Bar Investment 22</i> <i>Commodity Exchanges Activity 22 • Coins and Medals 23</i>	
<b>4. Mine Supply</b>	<b>25</b>
<i>Mine Production 25 • Outlook 32 • By-product Analysis 32 • Production Costs 34</i> <i>Producer Hedging 35</i>	
<b>5. Supply from Above-ground Stocks</b>	<b>36</b>
<i>Overview 36 • Identifiable Bullion Stocks 37 • European Dealers' Stocks 37</i> <i>Comex Stocks 38 • Government Stocks 38 • Other Stocks 39 • Scrap 40</i>	
<b>6. Silver Bullion Trade</b>	<b>44</b>
<i>Europe 44 • The Americas 46 • Middle East and Indian Sub-Continent 47</i> <i>East Asia 48</i>	
<b>7. Fabrication Demand</b>	<b>50</b>
<i>Industrial Applications 51 • Photography 62 • Ethylene Oxide 65 • Jewelry 66</i> <i>Silverware 74</i>	
<b>8. Appendices</b>	<b>79</b>

## Tables

<i>World Silver Supply and Demand 8 • Coins and Medals 23 • Mine Production 28</i>
<i>Scrap Supply 42 • Total Fabrication 53 • Industrial Applications 55</i>
<i>Electrical and Electronics 61 • Brazing Alloys and Solders 61 • Photography 65</i>
<i>Jewelry &amp; Silverware 69 • Jewelry 72 • Silverware 75</i>

## Focus Boxes

<i>Silver and Other Commodity Prices 16 • Investment in Commodities 19</i>
<i>Exchange Traded Funds 21 • An Overview of Corporate Transactions in 2012 31</i>
<i>Deficits and Surpluses in the Silver Market 39 • The Main Uses of Silver 59</i>
<i>New Uses of Silver in Industrial Applications 62 • Global Photovoltaic Market 63</i>
<i>Digital Technology and the Photographic Market 66</i>



# 1. Summary and Outlook

Physical silver demand touched record levels in 2013 as investors took advantage of lower prices to increase coin and bar holdings in particular. Indeed, silver investors proved more loyal than those in the gold market and Exchange Traded Fund (ETF) holdings held on to record levels in spite of the significant move away from commodities as an asset class during 2013.

The 23.6% year-on-year decline in average prices also saw a fall in the amount of silver supplied to the market as modest gains in mine output were more than offset by a 24.1% decline in scrap supply. This led to the largest physical deficit in the silver market since 2008, as lower supply met both higher physical investment demand and a recovery in jewelry offtake.

Silver jewelry demand remained remarkably robust, growing at 9.6% year-on-year. The cost effectiveness and versatility of the metal make it popular at both the fashion end of the market, meeting the millennial generation's desire for affordable choice, while also continuing to sell well in high-end branded pieces.

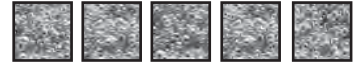
Indeed, silver's use in jewelry reached a record high in 2013, with 75% of that growth coming from China and India where consumption per capita statistics are still relatively low. In terms of industrial offtake the market remained relatively benign as improved economic conditions continued to be offset by limited substitution and thrifting. New applications for silver also remained firmly on the radar, with a steady stream of announcements in the glass, clothing and hygiene industries pointing to improved offtake in future years as the metals antimicrobial properties are developed.

Overall, price sensitive demand in the silver market has responded well to the fall in prices seen in 2013, and importantly, the market has also not only held on to, but grown in its status as an investment product. Looking forward, 2014 looks likely to be a year of consolidation for the silver market, with prices settling into a less volatile trading range, and many jewelry and silverware producers are looking to take advantage of this in order to boost production levels and move away from plated silver products.

Table 1 - World Silver Supply and Demand

© GFMS, Thomson Reuters / The Silver Institute

(million ounces)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>Supply</b>										
Mine Production	613.6	639.7	642.7	666.1	683.1	713.8	750.6	754.6	792.3	819.6
Net Government Sales	61.9	65.9	78.5	42.5	30.5	15.6	44.2	12.0	7.4	7.9
Scrap	198.6	202.5	206.0	202.9	200.7	199.7	225.5	258.7	252.6	191.8
Net Hedging Supply	-2.0	45.9	-11.6	-24.1	-8.7	-17.4	50.4	12.2	-47.0	-41.3
<b>Total Supply</b>	<b>872.0</b>	<b>954.1</b>	<b>915.6</b>	<b>887.3</b>	<b>905.7</b>	<b>911.7</b>	<b>1,070.7</b>	<b>1,037.6</b>	<b>1,005.3</b>	<b>978.1</b>
<b>Demand</b>										
Jewelry	187.1	187.9	176.0	183.2	178.2	177.3	190.6	183.4	181.4	198.8
Coins & Bars	53.0	51.5	48.7	51.2	187.7	87.9	146.1	212.6	139.3	245.6
Silverware	68.1	69.4	63.2	61.3	59.5	54.2	52.6	48.1	44.6	50.0
Industrial Fabrication	608.9	637.1	645.2	656.7	651.3	540.2	643.2	624.8	589.1	586.6
...of which Electrical & Electronics	191.8	211.1	223.1	239.8	245.5	203.1	272.6	260.6	237.0	233.9
...of which Brazing Alloys & Solders	48.9	52.4	54.4	58.1	61.3	53.3	60.6	62.4	60.3	62.4
...of which Photography	178.8	160.3	142.2	117.0	100.2	78.4	68.8	61.7	54.4	50.4
...of which Other Industrial	189.4	213.2	225.4	241.9	244.4	205.4	241.2	240.0	237.4	240.0
Physical Demand	917.1	945.9	933.1	952.3	1,076.7	859.5	1,032.6	1,068.9	954.4	1,081.1
Physical Surplus/ Deficit	-45.1	8.2	-17.5	-65.0	-171.0	52.2	38.1	-31.3	51.0	-103.0
ETF Inventory Build	0.0	0.0	157.8	54.8	101.3	153.8	132.6	-24.0	55.1	1.6
Exchange Inventory Build	-20.3	15.9	-9.0	21.5	-7.1	-15.3	-7.4	12.2	62.2	8.8
Net Balance	-24.8	-7.7	-166.3	-141.3	-265.2	-86.3	-87.1	-19.4	-66.3	-113.3
Silver Price (Average London US\$/oz)	6.658	7.312	11.549	13.384	14.989	14.674	20.193	35.119	31.150	23.790



## World Silver Survey: Supply and Demand Methodology

Physical surpluses and deficits in the silver market help to determine lead times, margins and premia and can also impact upon price direction. It is not always the key prices determinate, however, as unlike the purely industrial metals there is also significant demand for silver as an investment product. We estimate that in 2013, 23% of demand for new silver came from the physical coin and bar sector as investors increased holdings in both volume and value terms.

In addition to this silver has an active Over-the-Counter (OTC) market owing, primarily, to its role as an institutional investment product. OTC trade can have a large impact upon the silver market and in 2013 the volumes of silver transferred, as reported by London Bullion Market Association clearing members, totaled approximately 34,100 Moz (1.06 M t), with a value of \$814 billion. Even this figure does not represent the total value of global silver transactions. As a rule of thumb, the net-transfers are roughly one half of the total loco London market volume, which in turn is approximately 90% of the total going through the market. In 2013, therefore, total volume was of the order of 75,800 Moz (2.36 M t) with a value of \$1.8 trillion; this is equivalent to over 90 times 2013 silver mine production.

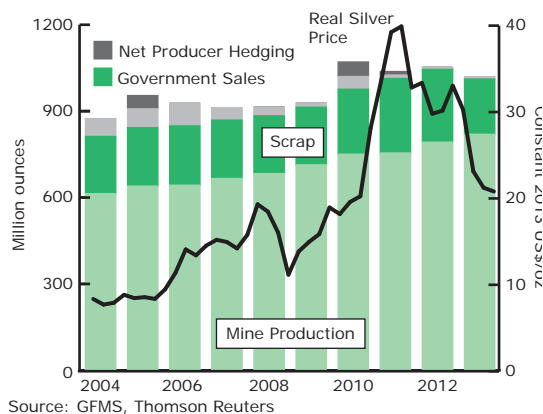
So while not as liquid as the gold market, there is a significant flow of transfers and trade that will also impact upon silver price movements. A good indication of institutional investor interest is provided in the Exchange Traded Fund (ETF) data that are released to the market and this highly visible data is also included in

our supply-demand balance along with published levels of physical inventory at silver futures exchanges. Our full assessment of the impact of investment flows on silver last year can be found in Chapter 3.

The final element that differentiates silver from purely industrial metals is that the metal is commonly recycled or held as an above-ground asset by private and institutional investors as well as by industry. Indeed, old jewelry scrap, coins and bars make up a significant part of the scrap pool (and they are arguably the only really price-sensitive elements in this market) as opposed to scrap collected from recycled electronics, for example.

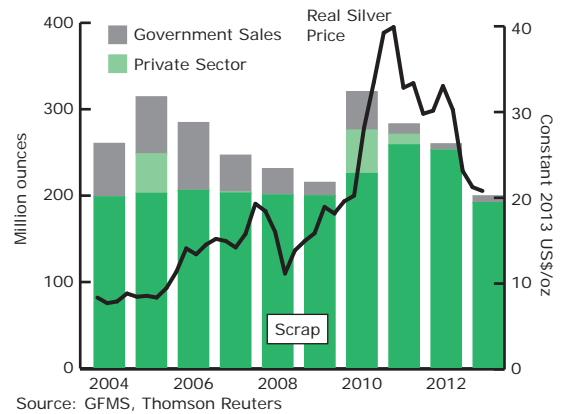
Thomson Reuters' supply and demand data are collected and collated by our team of research analysts based in Australia, China, Europe, India and the USA within an extensive field research program that involves interviewing stakeholders across the supply chain. In order to build up a picture of supply and demand in the silver market Thomson Reuters maintains individual demand databases for over 85 countries globally and for almost 600 mines and projects on the supply-side. As part of the primary research exercise, the Thomson Reuters analysts collect information on jewelry fabrication; coin fabrication; silverware; bar investment; industrial uses and the amount of old silver scrap entering the supply chain. In addition to this, on a global basis, Thomson Reuters also collects net government sales and purchases information and collates producer hedging and de-hedging levels.

World Silver Supply



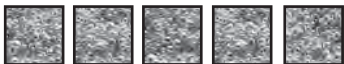
Source: GFMS, Thomson Reuters

Mobilization of Above-Ground Stocks



Source: GFMS, Thomson Reuters





### Supply in 2013

- **Silver mine production grew by 3.4% to reach a new record high of 819.6 Moz (25,494 t) in 2013.**
- **Old silver scrap supply meanwhile slipped by 24.1% to 191.8 Moz (5,966 t), the lowest level recorded since 2001.**

Global silver mine production increased for the eleventh consecutive year, surpassing the 800.0 Moz (24,883 t) mark. A large portion of the growth is attributable to the primary silver mining sector, which experienced strong growth from the start, or ramp up of operations which entered production in recent years. Saucito accounted for 4.5 Moz (141 t) of the rise, as mining exploited the high grade Jarillas vein. Elsewhere, the onset and ramp up of production at Escobal, Del Toro, Lucky Friday, Mally and Wonawinta added a combined 8.6 Moz (266 t).

We estimate that the copper by-product sector also posted a strong rise in output, with higher production from the South American copper industry. Primary silver miners' Total Cash costs remained broadly flat year-on-year, at \$9.27/oz, a 1% rise. This noteworthy outcome came despite a reduction in many of the prices of the main by-product credits for silver, namely zinc, copper and gold, indicating the degree to which producer's efforts to contain production cost escalation are bearing fruit in the face of a much lower silver price environment than 2011-12.

Silver scrap supply fell spectacularly in 2013, by 24% to 191.8 Moz (5,966 t). According to our records this drop was the largest since at least the 1980s and saw scrap at its lowest level since 2001. Crucial to this dramatic decline was, unsurprisingly, softer silver prices. However, there were also other factors which dragged scrap lower, including a tightening regulatory environment and also an exhaustion of "distressed" coin and jewelry recycling supply in industrialized economies as the economic picture improved.

As a proportion of total supply scrap dropped to under 20%, after averaging 25% of total supply in the previous two years. This rapid decline in supply was a defining feature of the market last year and a substantial contributor to the physical market deficit. Total Supply to the market meanwhile fell by 2% year-on-year to its lowest level since 2009.

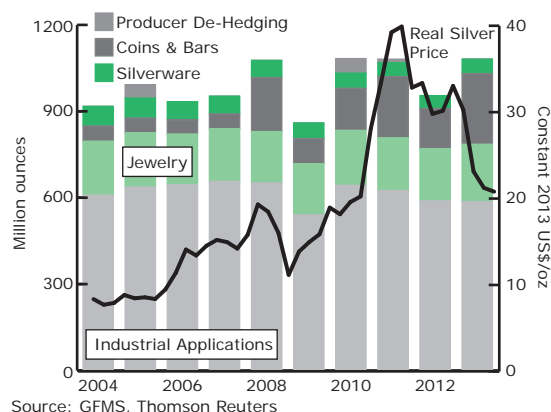
### Demand in 2013

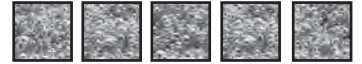
- **Total physical demand rose by 13% last year, driven by higher jewelry & silverware fabrication, along with a sharp increase in retail investment.**
- **Industrial fabrication dropped by less than 1%, marking the third consecutive year of decline.**
- **Jewelry demand grew by 10% to an all-time high of 198.8 Moz (6,185 t) in 2013, boosted by the improving economic outlook and a major drop in the silver price.**
- **Coins & medals fabrication surged by 38% to a new high of 118.5 Moz (3,684 t).**

Total physical demand grew by 13% to an all-time high of 1,081.1 Moz (33,624 t) in 2013. This was driven by the impressive 76% rebound in retail investment in bars and coins, and a strong recovery in jewelry and silverware fabrication, which rose by 10% and 15% respectively. By contrast, the largest component of total physical demand, industrial fabrication, was marginally lower year-on-year, as losses in electrical & electronics and photographic fabrication countered a modest recovery in other areas.

Global industrial demand declined for the third consecutive year, falling by less than 1% to 586.6 Moz (18,244 t) in 2013, in the process accounting for 54% of total physical demand. The uncertain macroeconomic environment, along with further substitution and thrifting, continued to play a major role in affecting industrial demand in 2013. All of the major regions, apart from Asia, recorded lower demand last year. European silver industrial demand fell by 3%, marking the third annual consecutive decline, as many countries suffered from

World Silver Demand





continued substitution and thrifting, further undermined by a weak economic performance. Despite a modest economic recovery, industrial fabrication in the United States slipped 7%, largely as a result of lower demand for silver paste in solar panels and thrifting in the electronics industry. By contrast, Asia was the only region to register a modest increase of 3% in silver industrial demand last year. This was primarily driven by the 9% rise in China, where a continued recovery in the electrical & electronics sector, along with strong gains in the ethylene oxide industry, took industrial offtake to a fresh high. While many other countries, including Japan, saw gains last year, Indian industrial demand declined due poor economic conditions and still elevated silver prices in rupee terms.

Silver jewelry fabrication in 2013 returned to growth for the first time in three years, rising by 10% year-on-year to a record high of 198.8 Moz (6,185 t). Last year's recovery was driven by the improved economic outlook in the industrialized world, which lifted consumer confidence and retail sales, and a marked decline in the silver price that saw a positive response from price-sensitive developing markets. Gains were led by India, where jewelry offtake increased by 29% to its highest level since the 2001 peak, driven by a 15% decline in the annual rupee price and the Indian government's restrictions in the gold jewelry market. China continued to see impressive growth in jewelry fabrication, recording another double-digit percentage rise in 2013. After two successive years of decline, European jewelry fabrication posted a modest recovery, driven by healthy gains in Turkey and a return to growth in Europe's largest jewelry fabricator, Italy.

Global silverware fabrication rose by 12% to a three-year high of 50.0 Moz (1,556 t) in 2013. Much of this increase was down to strong gains in India and China, which together contributed to 61% of global fabrication, compared to 37% a decade ago. Excluding these two countries from the global total, demand elsewhere dropped by 6%.

Total Identifiable Investment, which includes physical bar investment, coins & medals and ETF inventory build, rose by 27% to a three-year high of 247.2 Moz (7,688 t) last year, chiefly as a result of the 75% rise in purchases of bars and coins. Demand for physical bullion bars surged by 138%, led by gains in India, where bar investment reached a fresh high last year, boosted by lower prices in rupee terms and a series of government import restrictions and taxes in the gold market.

Buoyant investor interest was also evident in demand for coins & medals, which jumped by 38% in 2013, as investors took advantage of lower prices. By contrast, after a strong rebound in 2012, growth in silver ETF holdings slowed, rising by just 1.6 Moz (48 t), as bearish market sentiment towards gold, driven by a shift in US monetary policy, weighed heavily on investor interest in silver, particularly in the first half of the year.

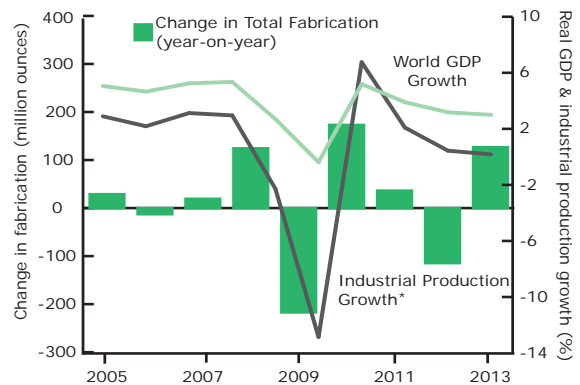
Producers continued to de-hedge in 2013, with miners closing out existing positions or delivering into contracts at maturity. At year-end, the delta-adjusted global hedge book stood at a mere 15.0 Moz (467 t), the lowest level since our annual series began, and representing a 34.3 Moz (1,065 t) reduction from 2012.

World Silver Fabrication Indices

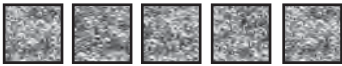


Source: GFMS, Thomson Reuters

Fabrication Demand & World Economic Indicators



\*Advanced economies only; Source: GFMS, Thomson Reuters; IMF



## 2. Silver Prices

- **Silver prices averaged \$23.79 in 2013, the third highest nominal annual average price on record, but down 24% from the previous year. This was the second consecutive double-digit decline and the strongest year-on-year percentage decrease in the annual average price since 1985, when silver fell by 25%.**
- **Silver prices chased gold prices lower throughout the year, falling from an annual peak of \$32.23 on January 23rd to a low of \$18.61 on June 27th. Silver traded mostly between \$19 and \$25 for the remainder of 2013.**

Silver prices trended lower in 2013, continuing a downward path that began after prices peaked at \$48.70 on April 28th 2011. In 2013, prices dropped 37% on an intra-year basis and moved in a \$13.62 price band. This compares to 2012, when prices rose 4% intra-year and moved in a \$10.56 price band. Last year's annual average price was the third highest in nominal terms and the seventh highest in real terms for the period 1940 through 2013. Silver found strong support at \$18 and

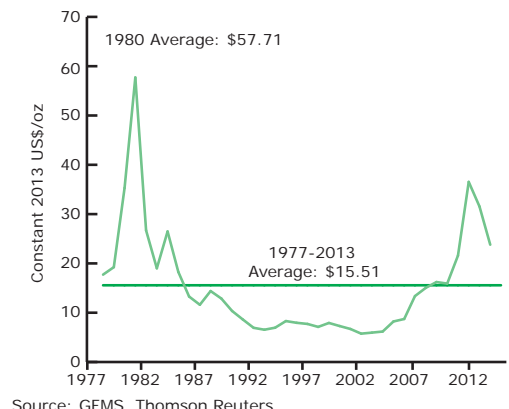
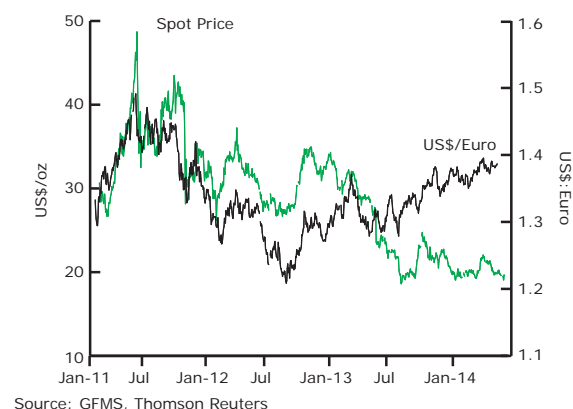
when prices headed towards this level, bargain buying pushed prices higher.

Silver began 2013 by moving higher, touching a peak for the year of \$32.23 on January 23rd, up 10% from the previous low of \$29.32 on January 4th. Prices subsequently trended lower, until bottoming out at \$18.61, down 42% from the annual peak, on June 27th. This was the lowest daily fix since August 2010. Prices moved sideways for several weeks thereafter, moving mostly between \$19 and \$20.50, throughout July. In August, silver rallied by 28% trough-to-peak, touching the high for that month of \$24.74 on August 28th. Prices fell from this level to a low of \$20.49 on October 15th, a 17% decrease from the high in August. From this low, prices moved higher to touch \$22.74 on October 30th. Silver traded lower through November to just below \$20 by the end of the month. In December, prices moved in a sideways fashion, mostly between \$19 and \$20.50 before ending the year at \$19.50.

While silver prices fell 37% in US dollar terms last year, prices dropped more significantly, on an intra-year basis,

US\$ Silver Price					The Silver Price in Other Currencies in 2013				
	1983	1993	2003	2013		Euro/kg	Rupee/kg	Yen/10g	Yuan/kg
Annual Average	11.32	4.31	4.88	23.79	Annual Average	576.44	49,291	742.6	4,709
Maximum	14.67	5.42	5.97	32.23	Maximum	778.19	59,700	963.4	6,443
Minimum	8.32	3.56	4.37	18.61	Minimum	450.59	34,376	586.6	3,679
Range:Average	56%	43%	33%	57%	Range:Average	57%	51%	51%	59%
Source: GFMS, Thomson Reuters					Source: GFMS, Thomson Reuters				

### The Silver Price and the US Dollar      Real Silver Prices

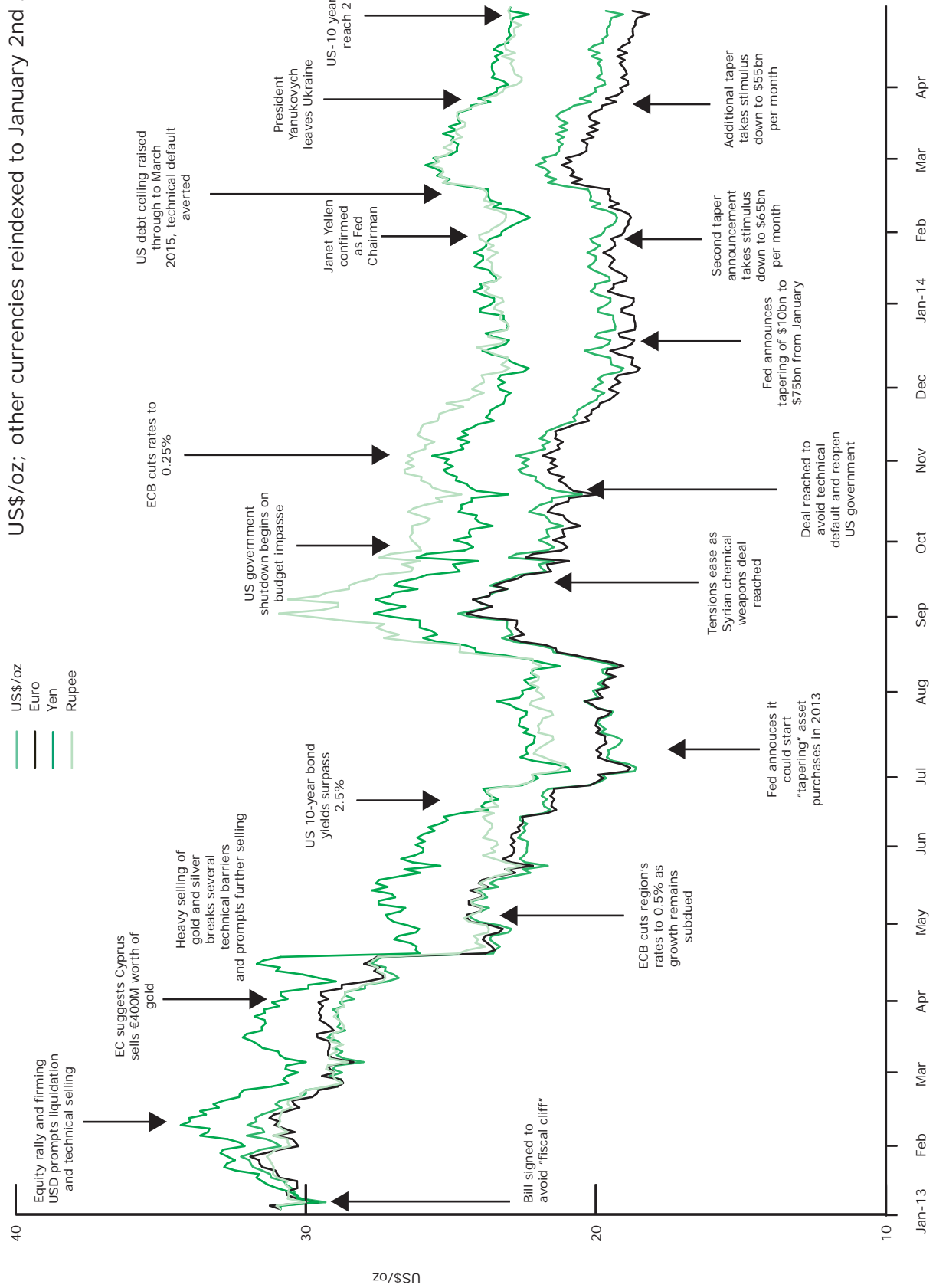






London Silver Market: Spot Price

US\$/oz; other currencies reindexed to January 2nd 2013



Source: GFMS, Thomson Reuters



in other major currencies such as the euro and the Chinese yuan. Silver traded 39% lower both in euro and yuan terms, as these currencies appreciated against the US dollar throughout the year. Silver traded 24% lower when priced in Japanese yen. The yen/US dollar rate moved from 87 to 105 from the beginning to the end of 2013, a 22% increase, driven by aggressive fiscal and monetary expansion policies and interventions in the country throughout the year. Silver prices also fell more modestly in India, by 25% as the rupee also depreciated against the US dollar. This depreciation was mostly driven by weak economic conditions within India.

The decline in silver prices last year was driven primarily by investor liquidations of silver futures and options positions on exchanges and large-scale sales from investors of physical inventories. Large non-commercial COMEX market participants increased their gross short positions in silver futures to a peak of 187.7 Moz on December 3rd of last year, the highest on record. Net long futures positions held by these market participants fell to a decade-long low of 4.2 Moz on June 25th, around the same time that the silver price fell to its lowest level in nearly four years. While silver held by investors in exchange traded funds were stable, sales of unreported investor inventories took place throughout the year. Investor bearishness about medium term price prospects led a portion of silver's investor base to book profits on silver assets accumulated in previous years.

The sale of silver from large investors' inventories last year was met with impressively strong annual physical demand, which helped keep prices well above \$18. Physical demand rose 13%, the strongest rate of

Volatility (US\$ Price)				
	2010	2011	2012	2013
Annual	32%	61%	29%	30%
	13.Q1	13.Q2	13.Q3	13.Q4
Quarterly	23%	42%	33%	22%

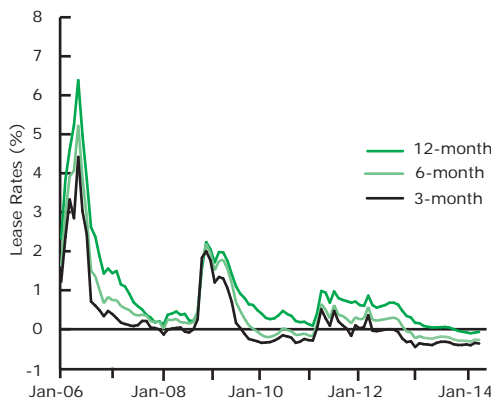
Source: GFMS, Thomson Reuters

growth since 2010, a recovery year. Lower silver prices stimulated increased buying among bargain hunters and boosted growth from the more price-sensitive sources of demand. Retail investment demand for coins and bars surged a remarkable 76% last year, mostly driven by surging demand for coins. The bulk of silver bullion coins are typically purchased by smaller investors whose investment horizons tend to be longer-term and so they are more sensitive to price opportunities. Jewelry demand rose a healthy 10% in 2013 after declining in the preceding two years. This was the strongest annual increase since 1999. Silverware demand also, surprisingly, rose last year, after falling for seven consecutive years.

Silver price volatility inched higher, to 30%, in 2013, from 29% the previous year. Monthly price volatility ranged from a high of 57% in April to a low of 15% in November. Volatility remained well below that seen in 2011, when the annual rate reached 61%. Silver prices are the most volatile of the precious metals and are among the most volatile across the commodities complex.

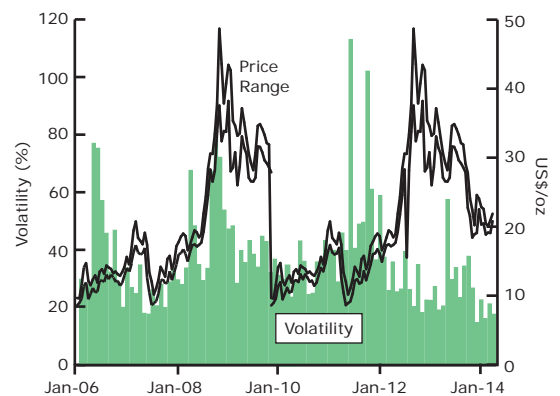
Implied silver lease rates, which are calculated as LIBOR less London Interbank Silver Forward Rates, fell into negative territory in 2013. Implied lease rates fell across

Silver Leasing Rates



Source: GFMS, Thomson Reuters

Daily Silver Price Volatility



Source: GFMS, Thomson Reuters



the board for terms between one month and 12 months. It should be noted that lease rates are not published, but are rates negotiated between counterparties. Typically, the agreed upon rate is grounded on LIBOR and silver forward rates. A real lease rate would not be negative, as this would suggest that a bank lessor (owner) is willing to pay the lessee (user) to use its unallocated metal.

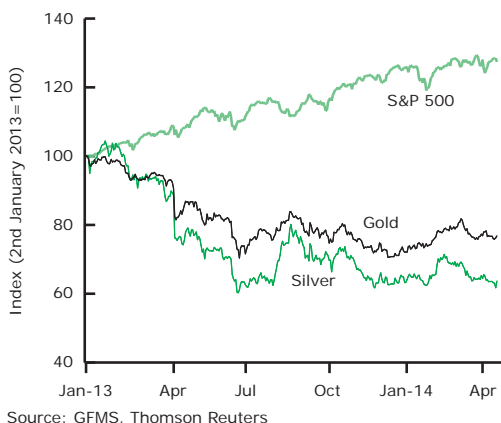
The implied silver lease rate declined largely because LIBOR rates were falling. The LIBOR rate, which has been under intense scrutiny since July 2012, has been dropping partially as a function of an improving economic environment. This reduction in LIBOR rates has thus made it cheaper to lend money between banks. The silver forward offered rate, which is the rate by which dealers are willing to lend silver on a swap basis against US dollars (sell spot silver and buy forward), was generally steady throughout 2013. This increased willingness to lease silver at lower rates suggests that sales of silver from investor inventories have provided ample supplies in the market, while the increase in market-ready metal is being held by banks, dealers, and other market participants who are seeking returns on these unallocated stocks.

While silver prices slumped in 2013, the S&P 500's performance was strong throughout the year. Investors buy silver based on two main approaches, the first being for its performance as a financial asset, similar to gold. These investors look at silver as a form of savings, a preservation of wealth, and a hedge against inflation. Investors will buy silver, and gold, in times of heightened economic, political, and financial distress.

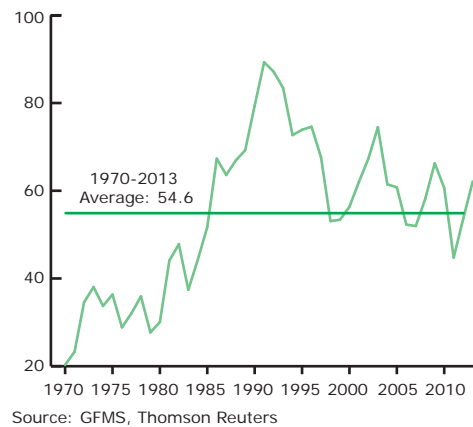
Investors will also buy silver by virtue of its use in industrial applications, which has accounted for an average 63% of physical demand over the past decade, based on their expectations for demand growth. The strong performance of the S&P 500 in 2013 was driven by improved economic conditions across the globe and an easing of investor concerns about economic, financial, and political issues. This weighed on investor interest in the metal as a financial asset. Although a portion of investors may buy silver due to cyclical strength in the economy, silver industrial demand itself actually fell, albeit modestly, in 2013, driven by thriftiness, namely in solar panels and some electronics applications. As such, both of these investor incentives to buy or hold silver were lackluster last year.

The gold/silver price ratio moved between 52 and 67 in 2013, compared with a range of 48 to 59 in 2012. The gold/silver ratio rose over much of the year, peaking at 67 on July 30, up from 54 at the beginning of the year. The ratio fell towards 58 by early September and then trended higher for the remaining months, ending the year at 62. Silver prices fell 37% while gold prices fell 28% last year, which pushed the ratio higher. Greater weakness in silver prices relative to gold prices can be attributed to silver's dual nature as discussed above, and its higher price volatility. Large investors holding silver inventories built up in prior years offloaded metal, mostly due to reduced concerns about economic and financial conditions, but also to book profits after silver's price peak. This change in investor attitudes toward silver caused some large investors to reduce their exposure and re-allocate capital towards higher yielding assets, such as equities.

Silver, Gold and the S&P 500



The Gold / Silver Price Ratio







## Silver and Other Commodity Prices

The GFMS team at Thomson Reuters believes that the examination of correlation coefficients is highly useful, not only as an indication of underlying themes that may influence the market, but also to support economic theory with empirical evidence. It must be noted, however, that the existence of either a positive or inverse correlation between two assets is not sufficient in itself to establish direct causality.

Silver's "hybrid" nature leads to links with gold, copper and the CRB Index that appear powerful, but these correlations can shift greatly from year to year. Gold and silver's closest relationship in 2013 came in the second quarter. During April, gold suffered a major sell-off, not least in the futures market. In general, silver is a less liquid and more volatile market compared to gold. On April 15th when gold dropped almost 9% and closed below the \$1,400 level, silver followed a similar fate, losing an even larger 14% that day. On the back of the US economic recovery, markets began to speculate on the timetable of the Fed's tapering, and this dampened investors' appetites for precious metals. Despite silver's wide adoption in various industrial applications, the increased investment pressure on gold pushed silver down in consequence. The price correlation between silver and gold decreased somewhat over the rest of the year, but remained relatively high, and both metals saw the lowest monthly average for the year in December.

In 2012, copper surpassed gold to become silver's most closely correlated asset. This strong relationship continued for the first three quarters of 2013, but by the

### Correlations of Changes in Daily Prices

(using log-returns in spot prices)

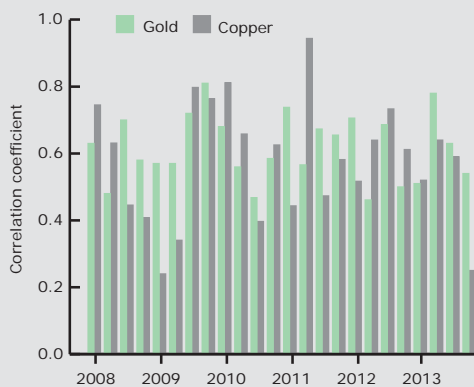
	12.Q4	13.Q1	13.Q2	13.Q3	13.Q4
Gold	0.50	0.51	0.78	0.63	0.54
US\$/Euro	0.31	0.24	0.35	0.37	0.42
Oil (WTI)	0.09	0.18	0.37	0.02	-0.02
CRB	0.25	0.05	0.46	0.29	0.12
GSCI	0.15	0.27	0.47	0.16	0.00
Copper	0.61	0.52	0.64	0.59	0.25
S&P 500	0.16	0.03	0.42	-0.09	-0.01

Source: GFMS, Thomson Reuters

fourth quarter, this correlation took a deep dive, as the market considered copper to be the main industrial metal and silver merely a safe haven bet.

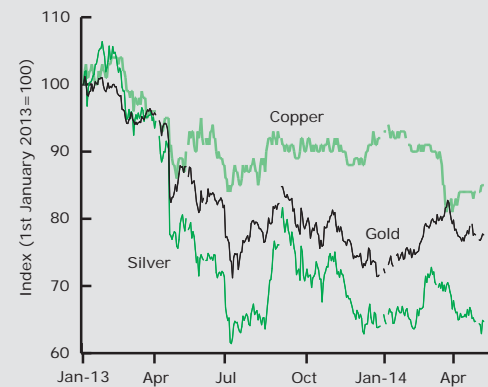
Silver's correlation with S&P 500 turned negative by the second half of last year, something not seen since the third quarter of 2011. After a heavy sell-off in the second quarter, both gold and silver rebounded somewhat, driven by strong physical buying from Asia, speculative short covering and worries about a potential US government shutdown. However, once the US debt-ceiling talks - the main stumbling block between the Democrats and the Republicans - reached a short term solution, the international investment community became increasingly optimistic about the local economy and in particular the US equity markets, with the S&P 500 continuing to register new highs up until year-end. Both gold and silver, on the other hand, had reversed their short-lived upturn and once again recorded annual lows in December. This emergence of a negative correlation was due to improved investor sentiment towards the economic outlook, effectively reducing safe haven demand.

Quarterly Correlation of the Silver Price



Source: GFMS, Thomson Reuters

Gold, Silver and Copper Prices



Source: GFMS, Thomson Reuters



### 3. Investment

- **Total Identifiable Investment, which includes physical bar investment, coins & medals and ETF inventory build, rose by 27% to a three-year high of 247.2 Moz (7,688 t) in 2013.**
- **Last year's growth was driven primarily by a strong rise in retail purchases of bars and coins. By contrast, investors were net sellers in the futures market, while growth in ETF holdings showed only modest growth.**
- **In indicative value terms, Total Identifiable Investment fell by 2.9% to an estimated \$5.9 billion.**

#### Overview

As illustrated in the table below, key to the 27% rise in Identifiable Investment in silver last year was a surge in coin and bar demand, which jumped by 75% from the previous year to a fresh high of 245.6 Moz (7,640 t). Demand for physical bullion bars more than doubled last year, to reach a high of 127.2 Moz (3,956 t). This was led by strong gains in India, where the sharp decline in local silver prices in the second quarter of the year, along with the stringent policy measures introduced by the Indian government in the gold market, helped to boost demand for the white metal. Meanwhile, purchases of coins & medals posted a 38% year-on-year increase, reaching a record of 118.5 Moz (3,684 t). By contrast, after a strong rebound in 2012, growth in silver ETF holdings slowed

Silver Price and Investment Indicators			
	2012 Average	2013 Average	Change y-o-y
Silver Price \$/oz	31.15	23.79	-24%
Contango (3-mth annualized)	0.53%	0.64%	n/a
US\$ Libor (3-mth annualized)	0.43%	0.27%	n/a
S&P 500 Index	1,379	1,643	19%
CRB Index	487	472	-3%
XAU Index	172	109	-37%
World GDP Growth*	3.2%	3.0%	n/a
Chinese CPI	2.6%	2.6%	n/a
US CPI	2.1%	1.5%	n/a
Eurozone CPI	2.5%	1.3%	n/a

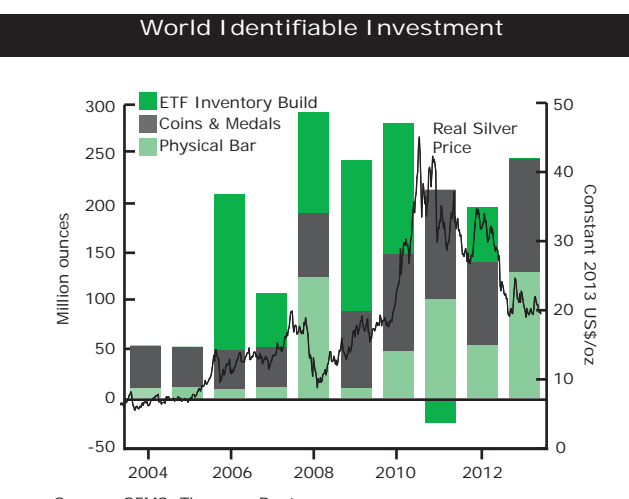
\*Annual rates; Source: GFMS, Thomson Reuters; IMF

considerably last year. Combined ETF holdings rose by just 1.6 Moz (48 t) for the full year, compared to a rise of some 55.1 Moz (1,714 t) a year before. Finally, last year witnessed a sharp decline in the net speculative investor positions as measured by the CFTC; as at the end of 2013 they were down by 45% or 102.8 Moz (3,198 t) from the end-2012 figure.

As with gold, one of the key elements that was driving market sentiment for silver last year was the outlook for US monetary policy. Growing speculation that the US Federal Reserve would move away from a highly accommodative stance and towards tapering significantly reduced precious metals' safe haven appeal. The weakness in the gold price in the first half of 2013 dragged silver down from an intra-day high of \$32.24/oz in January to below \$19/oz at end-June, for the first

World Identifiable Investment			
(million ounces)	2011	2012	2013
Physical Bar Investment	100.6	53.4	127.2
Coins & Medals	112.0	85.9	118.5
ETF Inventory Build	-24.0	55.1	1.6
Total Identifiable Investment	188.6	194.4	247.2
Indicative Value US\$(bn) **	6.6	6.1	5.9

\* Identifiable Investment is the sum of investment in physical bars, coins & medals as well as the build in ETF 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





**London Bullion Market (LBM) and Comex Turnover**

(daily averages)	LBM No. of Transfers	Turnover Moz	Comex Turnover Moz	LBM/ Comex Ratio
2007	462	114.4	135	0.8:1
2008	519	125.8	176	0.7:1
2009	340	97.3	159	0.6:1
2010	381	87.3	254	0.3:1
2011	798	173.7	389	0.4:1
2012	811	134.5	264	0.5:1
2013	872	136.5	287	0.5:1

Source: LBMA; Comex

time since August 2010. This period saw heavy investor selling on COMEX along with ETF outflows, particularly in the second quarter. With respect to the former, after a brief recovery at the start of the year the period from February to June saw a steady decline in net investor long positions, to reach a record low by end-June. The move was primarily driven by a sharp increase in short-side speculative positions, which jumped to a record high in the last week of June, some 155% higher than the end-2012 level.

Among the ETFs, while the first three months of 2013 saw decent buying, substantial outflows in the April to June period fully offset earlier gains, taking total holdings to their lowest level since December 2012. In addition to bearish investor sentiment towards gold (driven by a shift in US monetary policy and a return of risk appetite in the financial markets), a slowdown in economic activity in China further undermined investor interest in silver.

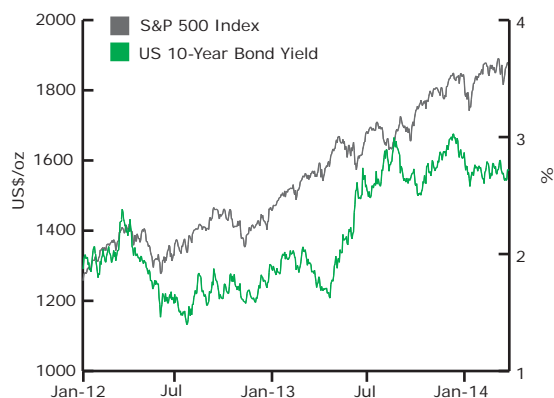
On the other hand, the physical market played a key role in supporting silver prices during this period. This

was particularly evident in bar investment demand in India, which exploded in the second quarter after the rupee price plunged in mid-April to its lowest level since February 2011. Similarly, the first six months of 2013 saw robust demand in China. This was illustrated by silver turnover on the Shanghai Gold Exchange, with a daily average of 51.0 Moz (1,586 t) in the first half of 2013, compared with only 27.6 Moz (858 t) for the full 2012. Additionally, sales of US Silver Eagles reached a record high of 25.0 Moz (779 t) in the first half of 2013.

In the second half of the year, silver gained from a slight improvement in investor sentiment towards gold, buoyed by the comments from US Federal Reserve Chairman Dr. Bernanke in his bi-annual testimony to Congress that highly accommodative monetary conditions would remain in place until the US economy returned to a healthy growth path. Moreover, the escalation of geopolitical tensions in Syria in August helped to boost precious metals' safe heaven appeal. In addition, silver benefited from the improving economic outlook in the second half of the year. A return of investor interest was particularly evident in fresh inflows into silver ETFs, which totalled 29.7 Moz (922 t) during the third quarter. Meanwhile, the net COMEX investor position jumped to 136.8 Moz (4,255 t) in early September, although the move was primarily driven by short-covering rather than fresh buy-side interest. This could be explained by nervousness about the prospects for US monetary policy, which deterred professional investors from expanding their long positions.

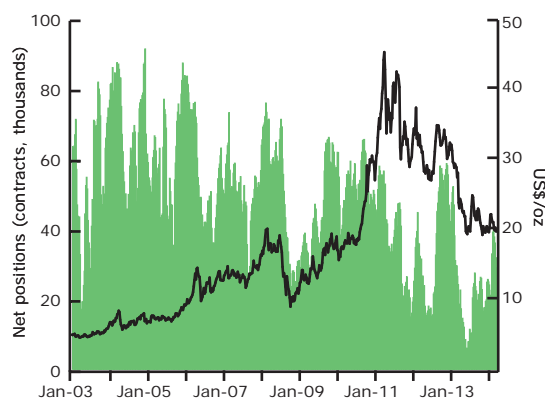
Investors remained cautious towards the whole precious metals complex in the closing months of the year. Silver

**S&P 500 vs US Bond Yield**

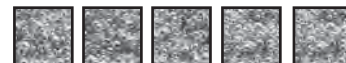


Source: GFMS, Thomson Reuters

**Net "Investor" Positions on Comex**



Source: CFTC



## Investment in Commodities

Investment in commodities, as illustrated by Commodity Futures and Trading Commission (CFTC) data, was lacklustre in 2013. A look at 22 commodities showed investment slumped in the second quarter of 2013 to \$41 billion before regaining some lost ground and ending the year at \$60 billion in the final quarter. From a silver-specific view, net-long positions took a huge plunge over the first half of the year, with the second quarter being the hardest hit falling by 78% to 4,093 contracts or \$0.4 billion, a historical low. From this low level however, net long positions made a robust rebound increasing by 153% or \$1.71 billion over the third quarter before continuing to increase towards the end of the year reach \$2.41 Bn.

Despite the Federal Open Market Committee (FOMC) increasing the amount of purchases from \$40 billion to \$85 billion per month beginning in January 2013, commodities in general did not gain strength following the commencement of QE3, unlike QE1 and QE2. In spite of patchy economic data and corporate earnings for most of the year, investors remained confident in the US recovery. Bullish technical signals pushed the US stock markets to new highs, thus making the commodities complex even less attractive as investment instruments. Commodity prices dramatically deteriorated in the second quarter of 2013, as the market speculated over the Fed's tapering timetable. Moreover, market worries about a slowdown in China's economic growth also hampered investment interest in the commodities sector. The metals markets were among the most affected, with the value of gold and silver net positions plunging to levels not seen for many years. Gold dropped below \$1,500 without resistance in April. Despite aggressive physical buying from China, the gold price did not regain this level.

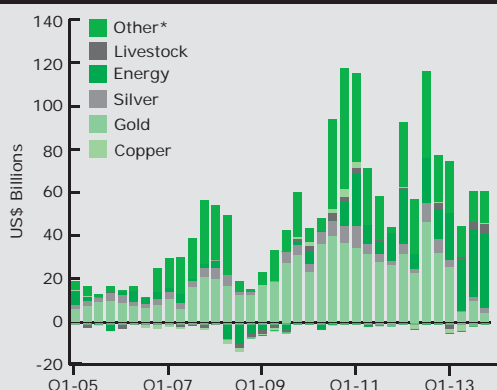
Investors continued to build large positions in the energy sector, as the US economic recovery gained traction, along with an extraordinarily cold winter in North America that spurred gas

usage. Geopolitical concerns lingering in the Middle East and Africa saw Brent crude trading at a premium to WTI for most of the year. Concerns over North Korea, as well as the increasing tension amongst Asian countries over sovereign rights in the South China Sea, also helped oil to outperform its other commodity peers. Elsewhere, investor interest among the soft commodities was mixed last year. While the price of cocoa rose by 26% year on year, corn and wheat fell dramatically, as supply recovered following the drought-related woes of 2012. Market interest in livestock grew in 2013, with the net investor long position gradually picking up over the course of the year, rising to \$5 billion in the fourth quarter.

Looking ahead, investors will continue to be wary of the commodities market, as emerging economies, particularly China, are likely to grow at a slower pace this year compared to the past decade. Concerns on the shadow banking and potential loan defaults in China will continue to hamper market confidence in China's growth story. The Chinese government is now addressing structural issues in its domestic economy. However, this will require the Chinese to bite the bullet and sacrifice short-term GDP growth for longer-term potential. Consequently, China's demand for raw materials, particularly industrial metals and energy, may be negatively affected during this reform period. Henceforth, without strong economic growth from the emerging markets, particularly China, interest in commodities is unlikely to recover strongly. Gold and silver are also likely to be less popular and continue to lose their "safe haven" appeal, as advanced economies continue to recover.

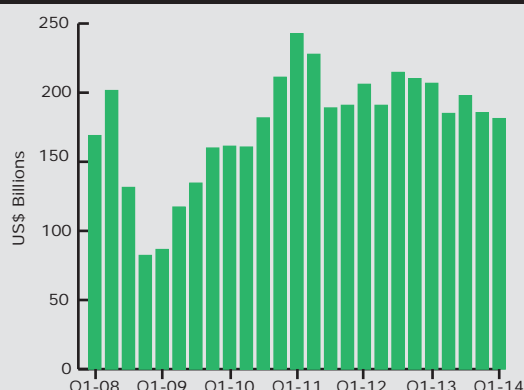
The changing of the US monetary policy will also act as a deterrent, and this will have a spill-over effect weighing down growth in emerging markets, potentially resulting in currency depreciation and credit starvation. However, it remains to be seen whether the US can successfully implement its exit strategy from QE as planned without growth stuttering.

**Value of Speculative Positions in 22 Commodity Futures** **Global Commodity Index Investors**



\* Other includes soft, agricultural and dairy commodities, platinum, palladium and copper

Source: GFMS, Thomson Reuters



Source: GFMS, Thomson Reuters





**Comex: Net "Investor" Positions**

		Contracts	Moz	Price
2010		52,720	264	19.93
2011		38,166	191	35.34
2012		34,091	170	31.13
2013	Q1	38,136	191	30.16
	Q2	12,440	62	23.28
	Q3	16,567	83	21.34
	Q4	20,283	101	20.73
(average non-commercial and non-reportable net futures positions, Moz equivalent and average Comex settlement price in \$/oz; Source: CFTC)				

was dragged down by the continued weakness in the gold market, particularly after the FOMC December meeting, where Dr. Bernanke announced the first round of QE-tapering, taking silver prices below the \$20/oz mark by the end of the year. ETF investors reduced their silver holdings by 23.0 Moz (714 t) during the October-December period, although total holdings at end-2013 were marginally up year-on-year. Despite a short-covering rally in the final weeks of the year, the net long on COMEX at end-2013 was almost half the level at the end of 2012. On the physical side, while investment demand eased somewhat from record high levels seen in the first half of the year, it continued to provide support.

In early 2014, silver remained under selling pressure on the back of mounting concerns over emerging market turmoil and China's slowing economy. The net COMEX investor long positions in early February were down by over 40% since the start of the year, before the escalation of the Ukrainian crisis saw the net long recover in early March. That said, selling resumed later in March on growing fears of global economic weakness.

**OTC Market**

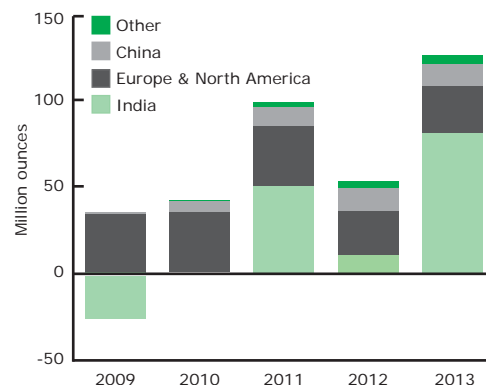
Due to the lack of meaningful publicly available data on activity in Over the Counter (OTC) products in silver, stemming from the absence of actual statistics on volumes and open interest, we cannot give a precise estimate of the impact of OTC activity on the underlying physical market. Although the clearing statistics from the London Bullion Market Association (LBMA) provide a gauge, these data are an imperfect reflection of investor activity. First, they do not capture the trends in other OTC markets and secondly, they fail to differentiate between pure investment flows and other forms of

activity. We therefore also use information collected through field research, which, in 2013, suggested that the OTC market experienced investor buying on a net basis.

This result may come as something of a surprise to some given the hefty price drop last year, driven in part by some hedge funds exiting both gold and silver positions in the second quarter of last year as they took the view that QE in the US would be ending sooner rather than later. What's more, there was a dramatic increase in the size of short positions, generally motivated by concerns that the monetary policy cycle was turning. And as in previous years, tightening regulations in the OTC market in both Europe and the United States meant there was pressure on investors to shift away from OTC products in favor of simple and standardized contracts, such as futures.

However, this was far from the totality of interest in the OTC market globally. Indeed, the sharp price drop, as well as subsequent moves lower, provided encouragement to some longer-term, and many smaller, investors who viewed prices below \$20/oz as an opportune time to buy. Supporting this are the LBMA clearing data, which show that activity in April 2014 was at its busiest since December 2011; plus the resilience of outright long positions as shown in the CFTC data. It should also be noted that there has been a substantial eastward shift in market activity and that viewing OTC activity from western investors alone would not provide an accurate overall view for 2013 as there has been a sharp increase in interest from Asia. In particular, both Chinese and Indian interest has shot higher with Chinese activity on the Shanghai Futures Exchange (SHFE) rising seven-fold to become the world's largest silver exchange.

**Physical Bar Investment**



Source: GFMS, Thomson Reuters



## Exchange Traded Funds

Following a significant increase in 2012, silver exchange traded funds (ETFs) posted a muted performance last year. Combined holdings of the ETFs increased by just 0.3% or 1.6 Moz (48 t) over the year, closing 2013 at 632.9 Moz (19,686 t). However, in value terms total holdings slumped to \$12.3 billion by year-end, down 35% from the figure recorded at end-December 2012. The fall in value of ETFs was in line with the decline in the silver price which stumbled by over \$10/oz to below \$20/oz from over \$30/oz a year earlier.

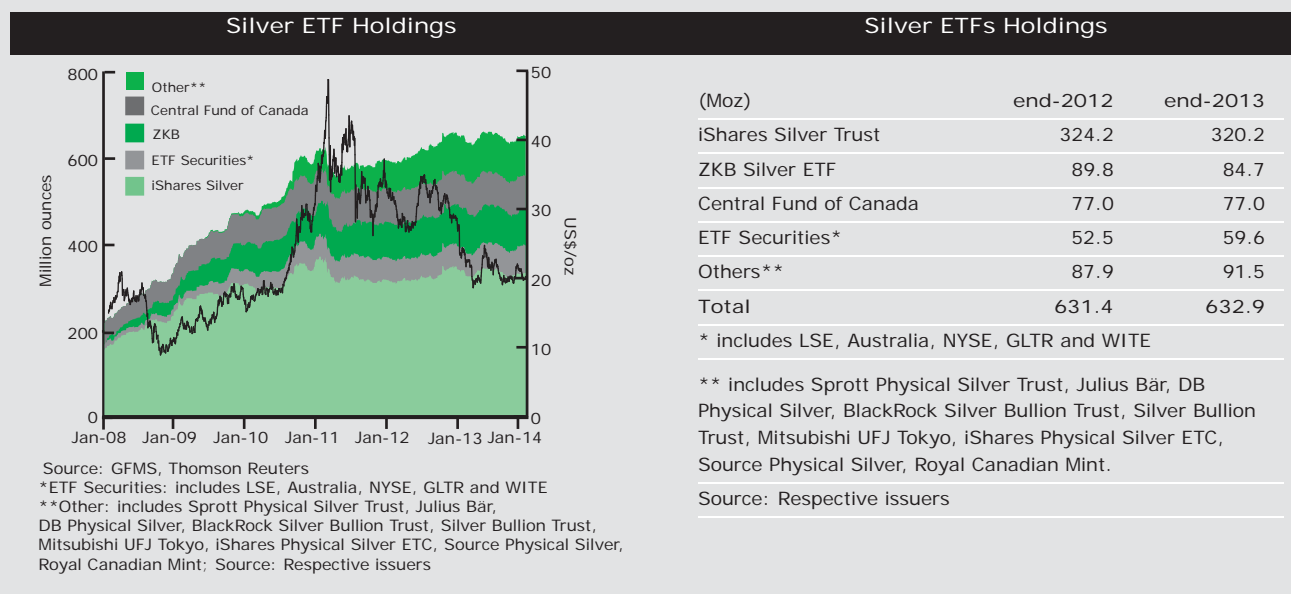
Interestingly, despite the fall in the silver price exceeding that of gold, which fell 28% over the year, silver ETF levels barely moved in comparison to the record redemptions registered for gold ETFs which plunged by 33%, or 28 Moz (880 t) by end-2013. For silver ETFs, the biggest inflow over the year took place in the established entity, ETF Securities, with total holdings rising by 5.9 Moz (182 t). However, despite ETF Securities holdings posting an annual increase, losses from the largest silver fund, iShares Silver Trust of 4.1 Moz (126 t), in addition to losses of from ZKB of 5.1 Moz (159 t) were recorded.

The start of 2013 saw demand for physically backed silver remain healthy from levels seen at end-2012, with first quarter inflows reaching 23 Moz (715 t), a 4% quarter-on-quarter increase. The growth witnessed highlighted the sentiment of investors towards silver's cyclical character as an industrial metal, over its use of an alternative currency or safe haven, as expectations towards the Fed potentially ending their asset purchasing program earlier than expected, positive US economic data and easing concerns over the Eurozone debt crisis pointed to an improving economic outlook. This was a stark difference to gold which saw heavy redemptions of 177 tons over the same period. By mid-April, news that

Cyprus may sell over 10 tons of its national gold reserves to help its fiscal situation saw gold investors sell the yellow metal with gold ETFs recording their largest quarterly decline (over 400 tons) since the launch of the first gold ETF in 2003. This in turn saw the gold price tumble by 25% over the quarter, dragging along with it the other precious metal prices. The annual average silver price fell by 10% resulting in ETF redemptions of 28 Moz (871 t), with iShares Silver Trust being fund suffering 93% of the total losses for this period.

Turning to the second half of the year, silver ETFs were seen to make a recovery increasing by 5% or 28 Moz (871 t) over the next two months to reach an historic high of 565.5 Moz (17,587 t) by August 27. The key driver behind the reverse to inflows was a result of an improving global economic outlook, with the Eurozone officially coming out of an 18 month recession alongside positive economic growth in China and heightened speculation over US tapering. However, by end-2013 silver ETF holdings were had fallen back to levels at the beginning of the year with redemptions of 23 Moz (715 t) resulting in a 3% fall in the final quarter of the year to an end figure of 632.9 Moz (19,685 t).

The start of this year has begun with silver ETFs posting three successive months of inflows, recording a 15% increase with total ETF holdings rising to 658 Moz (20,466 t) before receding to 646 Moz (20,093 t) by April 25. Concerns over weak US economic data at the start of year following the Fed announcement to reduce its asset purchasing program by US\$10 bn in January, consequently followed by currency concerns in emerging markets saw investors return to safe haven assets. The situation was further exacerbated throughout March on rising geopolitical tensions between Ukraine and Russia, with the largest inflows taken by ETF Securities.





## Physical Bar Investment

Physical bar investment hit a new record high in 2013 in both volume and value terms, with the increase largely coming from India. The market here was boosted by government restrictions on the import of gold that made silver an attractive alternative. We estimate that net-consumption of silver bars increased by 73.8 Moz (2,295 t) in 2013 to 127.2 Moz (3,956 t), a 138% year-on-year rise. This corresponds to almost \$4bn, beating the previous record set in 2008.

Indian bar investment surged last year to 80.7 Moz (2,510 t), the highest on record and eight times more than in 2012. In value terms bar investment was 12% higher than the previous record, achieved in 2011. The sharp increase reflects both fresh investment interest from newcomers to silver and also from more established participants taking advantage of lower prices. In rupee terms silver prices reached 38-month lows in July 2013, below Rs 45,000 per kilo, and this pushed local premia to 20 cents an ounce before reversing to a 30 cent discount as prices rallied 40% in just over a month. Silver also benefitted substantially from a range of government import restrictions and taxes targeting the gold market over the course of 2013. This made silver an attractive alternative for those wanting to invest in a physical asset.

Net bar demand in Europe was mixed in 2013 as a generally weak economy and sharp price falls undermined silver investment in the first six months of the year. Thereafter bargain hunting began to pick up with many smaller investors seeing silver bars as a decent purchase given recent price highs. The market also suffered from the first full year of 19% VAT in Germany on silver bars, especially as the level of VAT for coins remained at 7% until January 1st 2014. The move brings VAT on silver in Europe's biggest market in line with other major economies at close to, or above the 20% level. Indeed, even Estonia, the last EU-28 country not to charge VAT on coins, has now enacted a tax. Europe's bar investment is estimated to have increased by 11% in 2013, however this remains more than 20% lower than levels seen as recently as 2010, and interest is likely to be undermined by the tax moves.

Demand in the United States for small bars (100-ounce and below) is understood to have remained broadly flat in tonnage terms, but to have dropped in value terms. In

## Silver Turnover on Major Commodity Exchanges

(total volume in nominal million ounce equivalents)

	2011	2012	2013	Change y-o-y
SHFE	-	20,511	165,942	709%
COMEX	98,042	66,578	72,375	9%
MCX	32,598	24,155	15,646	-35%
SGE	7,924	6,731	13,824	105%
NYSE LIFFE*	1,779	704	500	-29%
TOCOM	120	39	31	-20%

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

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

general, silver coins and gold retail investment reacted better to the price falls and while silver bar demand remains high by historical standards 2013 was not a stellar year for the asset. Going forward silver prices close to the \$20/oz are seen by many as a good buying opportunity for many in the market and if prices fall below this level we would expect to see a pick-up in demand in the North American market. Any price-induced recovery could, however, be mitigated by the amount of investment going to coins at lower price levels, as these have so far proved to be more attractive to North American investors.

Chinese bar investment lost steam last year, growing by less than 1% from a 13% rise in 2012, to reach 12.8 Moz (399 t). The slowdown was exclusively credited to the solid performance of its neighboring metal, gold, whose price slumped in April and then in June, reviving the Chinese cultural frenzy for the yellow metal and posting a 45% increase in 2013. The price advantage of silver bars was overshadowed by the falling gold price, and a reverse trend would have been seen in silver investment demand were it not for the largely extended retail channels in commercial banks and retail stores.

## Commodity Exchanges Activity

Last year saw a dramatic rise in total turnover on the Shanghai Futures Exchange (SHFE), at 165,942 Moz (5,161,362 t), representing a 709% year-on-year increase and overtaking COMEX to become the largest silver exchange in the world. The exchange, which only launched its silver contract in May 2012, witnessed a growth spurt in July 2013 so that while the average daily turnover in the first half of 2013 was 142 Moz (4,421 t), in the second half it was a phenomenal 1,199 Moz (37,294 t). The primary reason for this huge increase

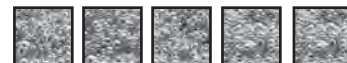


Table 2 - Silver Fabrication: Coins and Medals (including the use of scrap)

© GFMS, Thomson Reuters; The Silver Institute

(million ounces)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
United States	15.5	16.6	17.6	16.0	25.4	34.3	41.7	41.0	34.8	44.2
Canada	1.3	1.6	2.9	4.3	9.0	10.8	18.6	23.5	18.0	29.2
Austria	0.5	0.6	0.5	0.5	8.3	9.5	11.6	18.4	9.2	14.7
China	2.3	1.8	1.6	2.6	2.8	3.0	3.7	5.8	8.5	9.9
Australia	1.3	1.0	1.4	3.5	5.9	6.5	8.8	11.3	6.4	9.1
India	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	1.9	3.4
United Kingdom	0.5	0.5	0.4	0.5	0.5	0.5	0.5	1.0	0.7	2.1
Mexico	2.7	2.6	1.9	1.6	1.4	1.7	2.1	1.7	0.7	1.1
Japan	0.1	0.1	0.1	0.1	0.3	0.4	0.6	0.6	0.7	0.8
Russia	0.4	0.4	0.3	0.3	0.3	0.3	0.7	0.7	0.7	0.8
Germany	9.7	9.7	8.7	6.3	7.2	7.4	6.4	3.3	1.1	0.6
Spain	2.2	1.7	1.5	1.2	1.0	1.0	1.3	0.7	0.6	0.4
Other Countries	6.9	3.6	2.9	2.8	2.7	2.7	2.9	2.4	2.4	2.1
World Total	43.3	40.3	39.7	39.7	64.7	78.2	98.9	112.0	85.9	118.5

was the introduction of night-time trading in July, which added an extra five and a half hours to trading; this led to increased arbitrage opportunities between the SHFE and overseas exchanges. Likewise the Shanghai Gold Exchange (SGE) posted a 105% increase in turnover, meaning that it almost caught up with the MCX, which had the third largest turnover in 2013.

Following a poor 2012, turnover in silver futures on COMEX posted a modest 9% year on year increase last year. Volumes reached 14.5 million contracts, equivalent to an average daily turnover of 287.2 Moz (9,234 t). At the same time, open interest at 132,475 contracts by end-December was down 6% against end-2012.

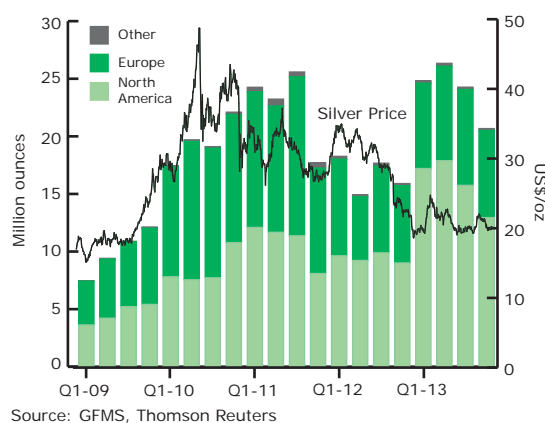
Data on the non-commercial and non-reportable net positions in COMEX futures and options provides a proxy for 'investor' activity on the exchange. Last year started on a positive note, with net investor longs rising 26% from the start of the year to 51,946 contracts (8,078 t) at the start of February. The rest of the year presented two quite different stories; non-commercial long holders held their nerve with only a slight decline to 34,616 contracts at the beginning of September from 37,257 at the start of the year. There was then a liquidation of positions to 29,357 contracts by end-September. From that low, the number of long contracts steadily increased, to stand at 45,957 contracts (7,713 t) in mid-April 2014. Over the same period, there was a tremendous rise in negative speculation from 6,588 contracts (1,025 t) at the beginning of February to 30,577 positions (4755 t) in mid-April. These positions ultimately paid off as the

price of silver dropped shortly. A spike in short positions, and a dip in long positions at the end of June, led to a net non-commercial position of only 837 contracts. Short positions stayed at around 30,000 contracts until end-August, where they almost halved on the news that the Federal Reserve might continue QE3. At the end of 2013 the net investor long position stood at 24,772 contracts (3,852 t).

## Coins and Medals

After a 23% year-on-year contraction in 2012, silver coin fabrication surged by a whopping 38% in 2013, bringing total coins and medals fabrication to 118.5 Moz (3,684 t), the highest level on record. In value terms however, total investment in coins and medals increased by a mere 5% to \$2.82 billion. The marginal increase in value invested was due to a 24% fall in the silver price over the period,

### Silver Bullion Coin Sales







which negated the effect of soaring coin fabrication levels. In contrast to the period between 2010 and 2011 where demand for silver coins was primarily driven by investors in search of safe haven assets to protect them from wealth erosion, the resurgence in investor interest in 2013 was driven by bargain hunting on the back of the silver price collapse in the second quarter to levels last seen in 2010. Silver coin investors entered the market in droves to take advantage of the lower price as its previously high level had priced many potential investors out of the market, or at least capped the volume of their purchases.

The trend was especially pronounced in North America, which saw annual silver coin fabrication in the US and Canada grow by 27% and 62% year-on-year respectively. Combining bullion and numismatic coins, we estimate that the US and Canada produced a total of 44.2 Moz and 29.2 Moz of silver coins respectively in 2013. In both countries, this was the highest level of silver coin fabrication ever recorded. Mexico also saw silver coin sales increase by 57% to reach 1.1 Moz.

In a similar vein, silver coin production in Europe saw an upward trend in aggregate, driven by strong sales in Austria, Europe's largest minting country, to 14.7 Moz. However, volume fabricated in Austria was lower than its 2011 record of 18.4 Moz. The UK, the region's second largest producer, saw silver coin fabrication increase three-fold from 0.7 Moz to a record 2.1 Moz.

In contrast, Germany, once Europe's second largest silver coin fabricator, continues to see its silver uptake for coin fabrication decline exponentially. Ten years ago, silver uptake for coin fabrication was 9.7 Moz; this had declined to 0.6 Moz in 2013. The chief reason behind the shrinkage is attributed to the German government's pricing model, which stipulates that the cost of silver content should match the face value of the commemorative coin. To meet this target, the purity of silver has been reduced from 92.5% to 62.5% since 2011, a development that shaved off a substantial amount of silver used in coin fabrication despite the same mintage levels. We expect silver uptake in Germany to remain depressed in the future as a result of this policy. Furthermore, investor demand for silver coins may be curtailed by the VAT hike on silver coins from 7% to 19% effective January 2014.

Moving on to Asia, silver coin fabrication continues to grow from strength to strength in China. Indeed, silver coin fabrication has increased by more than four-fold, from 2.3 Moz in 2004 to 9.9 Moz in 2013. While much of the fabrication increase was driven by larger volumes issued by the Chinese Mint (mintage size for Panda Coins increased ten-fold between 2010 and 2012), this was driven by a huge increase in interest for bullion coins as a means to store wealth, underpinned by fears of backlash from its credit bubble and a relative lack of alternative investment vehicles.

In India, silver coin fabrication has increased by 83% year-on-year. There is a growing interest for investment coins embossed with deities and celebrities and the issuance of these coins will help spur uptake in the future. Meanwhile in Australia, silver coin fabrication grew by a solid 42% year-on-year to 9.1 Moz.

Ranking of producers by country shows the US continuing to occupy the top of the list. Canada and Austria occupy the second and third spots respectively. China, Asia's largest coin fabricating country, currently ranks 4th. Strong silver coin demand from mints in India and the UK has seen their rankings pulled up to the 6th and 7th position respectively. An expansion of the issuance programs of commemorative coins, as evident in Japan's 47 Prefectures Coin Program in recent years has also seen the country entering the top ten. Nonetheless, the reduction of silver purity from 92.5% to 62.5% in commemorative coins in Germany has pushed the country's rankings out of the top ten.

Silver coin sales started 2014 with a bang, posting a robust first quarter performance. According to GFMS' proprietary silver coin survey, silver coin sales rose by 25% compared to the final quarter of 2013, and by 4.5% year-on-year. Depressed prices since the end of 2013 and regular dips below the all-important \$20/oz psychological level have created an opportune moment for speculators to enter the market. The relatively low entry point, in contrast to gold as an investment, has further facilitated bulk buying and thus expanded coin sales volume. Sustained buying interest would depend on silver's ability to break new psychological levels, otherwise satiation may develop amongst investors.



## 4. Mine Supply

- **Global silver mine production rose again last year, to a fresh record of 819.6 Moz (25,494 t).**
- **The increase was driven by stronger output from the primary silver mining sector, which gained 6%, and production as a by-product of copper.**
- **Geographically, silver production increased most notably in Peru, China and Guatemala, partly counteracted by lower production from Poland and Mexico.**
- **Primary silver total cash costs increased by just 1% in dollar terms, to \$9.27/oz.**
- **The producer silver hedge book was aggressively reduced last year, to stand at just 15.0 Moz (467 t) at end-2013 on a delta-adjusted basis.**

### Mine Production

- **Global mine production continued to increase last year, recording an 11th successive annual gain.**

Silver mine production rose by just over 3% to reach 819.6 Moz (25,494 t) in 2013. However, the rate of growth slowed, following a gain of 5% in 2012. The fall in the silver price last year placed the industry under cost pressure, with operations aggressively managed to help contain cost escalation. As a result, average Total Cash Costs increased by just 1% last year in dollar terms. Interestingly, and in a similar vein to the gold industry, operating mine closures in response to silver price movements last year were few in number.

In spite of the above cost challenges, development and commissioning of most advanced projects continued. Looking at production trends by sector, the primary silver

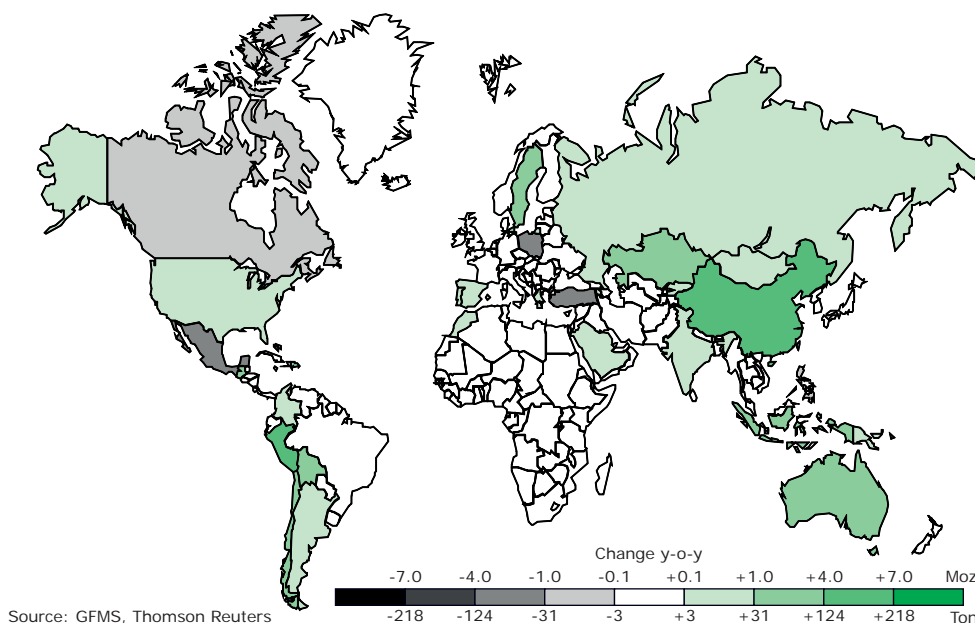
Top 20 Silver Producing Countries					Top 20 Silver Producing Companies				
Ranking			Output (Moz)		Ranking			Output (Moz)	
2012	2013	Country	2012	2013	2012	2013	2012	2013	
1	1	Mexico	172.3	169.7	3	1	Fresnillo plc. <sup>1</sup>	36.9	38.8
3	2	Peru	111.9	118.1	2	2	BHP Billiton plc.	39.0	37.6
2	3	China	113.1	118.0	1	3	KGHM Polska Miedź S.A. <sup>2</sup>	41.0	37.3
4	4	Australia	55.5	59.2	4	4	GlencoreXstrata plc. <sup>3,5</sup>	33.5	37.1
5	5	Russia	45.0	45.4	5	5	Goldcorp Inc.	30.5	30.3
7	6	Bolivia	39.7	41.2	6	6	Polymetal International plc.	26.5	27.2
8	7	Chile	37.0	39.2	7	7	Pan American Silver Corp <sup>1</sup>	25.1	26.0
6	8	Poland	41.3	37.6	8	8	Volcan Cia. Minera S.A.A. <sup>4</sup>	22.0	20.7
9	9	United States	34.1	35.0	9	9	Cia. de Minas Buenaventura S.A.A. <sup>4</sup>	18.3	18.9
10	10	Argentina	24.3	24.7	10	10	Coeur Mining <sup>1</sup>	18.0	17.0
11	11	Canada	21.3	20.8	13	11	Sumitomo Corp. <sup>5</sup>	13.0	13.8
12	12	Kazakhstan	17.5	19.8	12	12	Hochschild Mining plc.	13.6	13.6
13	13	India	11.9	12.1	11	13	Southern Copper Corp.	13.6	13.5
14	14	Sweden	9.8	10.8	14	14	Kazakhmys plc.	12.6	13.0
17	15	Guatemala	6.6	10.4	16	15	Teck Resources Ltd. <sup>5</sup>	10.6	11.4
15	16	Morocco	7.5	8.2	20	16	First Majestic Silver Corp. <sup>1</sup>	8.3	10.6
16	17	Turkey	7.3	6.0	17	17	Industrias Peñoles S.A.B. de C.V.	9.8	10.6
18	18	Indonesia	4.5	6.0	15	18	Kinross Gold Corp. <sup>6</sup>	10.7	9.0
22	19	Armenia	2.6	3.2	22	19	Hecla Mining Company	6.4	8.9
21	20	Papua New Guinea	2.6	2.9	18	20	Yamana Gold Inc.	9.0	8.4
		Rest of World	26.5	31.4					
		World Total	792.3	819.6					

Source: GFMS, Thomson Reuters

Source: GFMS, Thomson Reuters; Company Reports



Silver Mine Production Winners and Losers, 2013 versus 2012



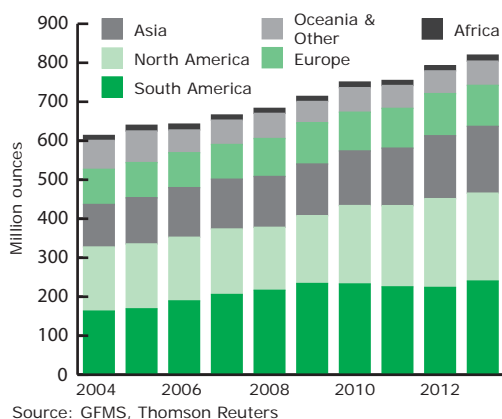
mining sector showed solid growth, increasing by 6% to 235.9 Moz (7,337 t), aided by the onset or ramp-up of several projects. These included new output from Escobal in Guatemala, the start of Del Toro and the continued ramp-up of Saucito in Mexico, and also the restart of Lucky Friday in the United States, following shaft remediation. Overall, such activities helped more than counteract lower output from the world's two largest primary mines, Cannington and Fresnillo. Similarly, the realization of a handful of major silver-yielding projects helped lift output of silver from the gold mining sector, notably from Pueblo Viejo in the Dominican Republic and from Martabe in Indonesia.

North America

North American mine production decreased by 1%, to total 225.5 Moz (7,013 t). The outcome was due to a strong contraction in Mexico and Canada, partially offset by an increase in production in the United States. An overall decline in output in the region had not been registered since 2008. In Mexico, official statistics from INEGI point to a reduction in output of 2.6 Moz (81 t) last year, to 169.7 Moz (5,277 t). A significant decrease came from the country's lead/zinc sector, where we estimate a 10.4 Moz (325 t) loss as output of these two metals tracked lower. Goldcorp's Peñasquito saw silver output contract by 1.5 Moz (47 t) due to a 13% reduction in processed silver grades, despite higher throughput. Among other operations to record losses, output at Nyrstar's Campo Morado fell by 0.6 Moz (18 t) last year, as the mine's activities were suspended temporarily in the first quarter, while a similar loss came from Francisco del Oro, where output fell by 30% from the prior year.

Partially offsetting the losses, the volume of silver recovered from the primary silver and gold sectors increased. Looking first at the former, the stand-out gain was at Fresnillo's Saucito, where annual silver production was up by 64%, or 4.5 Moz (141 t), due to the exploitation of the high grade Jarillas vein. Additional supply came from First Majestic Silver's recently commissioned Del Toro property, which added 1.5 Moz (46 t) as the mine enjoyed its first year of production,

World Silver Mine Production



Mine Supply



and increased output at Endeavour Silver's Bolañitos and Fortuna Silver Mines' San Jose, where higher throughput at each led to a combined 1.8 Moz (56 t) gain. There was one loss of note among the population, at Fresnillo's namesake operation, where production fell by 3.6 Moz (113 t) as a result of lower grades at the San Carlos vein.

Along with the country's gold production, which continued to grow last year, by-product silver from this sector also rose, by 2.9 Moz (91 t). Notable increases included an additional 0.9 Moz (28 t) from both Fresnillo's La Ciénega and Primero Mining's San Dimas, and additional supply from El Cubo.

Output from Canada decreased by 3% or 0.5 Moz (17 t) to 20.8 Moz (646 t). GlencoreXstrata's Perseverance and Brunswick operations, which accounted for 14% of total silver production in Canada in 2012, reached the end of their mine lives in June 2013, accounting for a decline of 1.7 Moz (53 t). Aggregate production from LaRonde and BelleKeno fell by 0.9 Moz (27 t) due to lower processed grades. On a positive note, a continued ramp-up at Canadian Malartic and New Afton added 0.7 Moz (21 t), while recently commissioned Detour Lake and Snow Lake added 0.3 Moz (8 t).

Mine supply from United States rose by 2.8% or 1.0 Moz (30 t), with strong gains in the primary silver sector, led by the resumption of production at Hecla's recently recommissioned Lucky Friday operation, accounting for 1.5 Moz (45 t). The company's Greens Creek property also saw output rise, by 1.1 Moz (33 t), as the mill processed ore at its highest throughput rate since it began operations. Rio Tinto's Bingham Canyon copper-gold operation put an end to a three year fall in

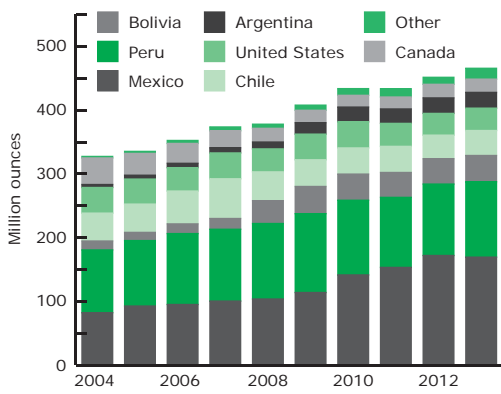
production, with a 0.8 Moz (25 t) increase. The result was driven by higher silver grades, though production was constrained by a major landslide on the north-east wall in April 2013. However, we estimate that, elsewhere, by-product output from the country's base metal mining industry fell in aggregate over 2013.

### South America

Following three years of falling production, South American mine supply rose by 7% in 2013, to 240.2 Moz (7,471 t). Contributing to the region's performance, increases were seen from almost all South American countries, and with production from the copper and primary silver sectors particularly strong, increasing by 22% and 8% respectively. Production from the gold and lead/zinc sectors also increased year-on-year.

The region's largest producer, Peru, saw output rise by 6% in 2013, to 118.1 Moz (3,674 t). At the primary silver mine Julcani, a recent plant expansion from 400 tpd to 500 tpd contributed to an 11% year-on-year increase in output as the expansion began to ramp up. Strong performances were seen from other primary silver producers including Huaron, Morococha and Pallancata. Huaron produced 3.3 Moz (103 t), a 14% increase, due to an increased rate of mechanized mining. Output from Morococha rose by 15%, to 2.4 Moz (75 t), due to higher processed grades and recovery rates. Higher grades also contributed to a 3% increase at Pallancata, which produced 7.6 Moz (237 t) in 2013. These gains were more than sufficient to outweigh losses at other operations such as Colquijirca, where lower production was largely due to a 25% decrease in throughput, and Cerro de Pasco, where open pit activities were suspended in 2013. Production from Pierina was also down, as closure activities were initiated at the mine last year.

Mine Production in the Americas



Source: GFMS, Thomson Reuters

Bolivia remains South America's second-largest silver producer, at 41.2 Moz (1,281 t) in 2013, a 4% year-on-year increase. At the country's largest silver producer, San Cristobal, production is estimated to have risen by approximately 1.0 Moz (31 t) in 2013, to around 12.5 Moz (389 t). Contributions also came from San Vicente, where higher throughput countered lower feed grade, and improved recoveries contributed to higher output from UMZ.

In Chile, the decrease in mine production seen in 2012 was reversed to some extent, with a 6% gain, bringing





## World Silver Mine Production

© GFMS, Thomson Reuters / The Silver Institute

(million ounces)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>Europe</b>										
Russia	30.3	32.5	31.3	29.3	36.4	42.2	36.8	38.5	45.0	45.4
Poland	43.8	40.5	40.5	39.6	39.0	39.2	37.6	40.8	41.3	37.6
Sweden	9.4	9.1	8.6	9.4	8.4	8.7	9.2	9.1	9.8	10.8
Turkey	4.0	5.2	6.0	7.5	10.1	12.5	12.3	9.3	7.3	6.0
Portugal	0.8	0.8	0.6	0.9	1.3	0.7	0.7	1.0	1.1	1.4
Spain	0.0	0.2	0.1	0.1	0.1	0.1	0.7	1.1	1.2	1.3
Greece	0.0	0.0	0.8	1.1	1.1	0.9	0.9	0.8	1.0	1.1
Bulgaria	0.6	0.7	0.6	0.4	0.4	0.5	0.4	0.5	0.6	0.6
Romania	0.9	0.9	0.5	0.1	0.0	0.1	0.2	0.5	0.4	0.4
Macedonia	0.1	0.2	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Ireland	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.1	0.0
Italy	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Countries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
<b>Total Europe</b>	<b>90.1</b>	<b>90.4</b>	<b>89.6</b>	<b>89.0</b>	<b>97.3</b>	<b>105.4</b>	<b>99.3</b>	<b>102.0</b>	<b>108.1</b>	<b>105.1</b>
<b>North America</b>										
Mexico	82.6	93.1	95.5	100.8	104.1	114.3	141.8	153.6	172.3	169.7
United States	40.2	39.2	36.7	40.5	36.0	40.2	40.8	36.0	34.1	35.0
Canada	41.6	34.2	31.2	26.7	21.5	19.5	18.4	18.7	21.3	20.8
<b>Total North America</b>	<b>164.4</b>	<b>166.5</b>	<b>163.3</b>	<b>168.0</b>	<b>161.6</b>	<b>174.0</b>	<b>201.1</b>	<b>208.3</b>	<b>227.7</b>	<b>225.5</b>
<b>South America</b>										
Peru	98.4	102.6	111.1	112.6	118.3	123.6	117.0	109.8	111.9	118.1
Bolivia	14.0	12.8	15.2	16.9	35.8	42.6	41.0	39.0	39.7	41.2
Chile	43.7	44.3	51.5	62.3	45.1	41.8	41.0	40.9	37.0	39.2
Argentina	4.6	6.0	6.8	8.1	10.7	17.9	23.2	22.6	24.3	24.7
Guatemala	0.0	0.3	1.6	2.8	3.2	4.2	6.3	8.8	6.6	10.4
Dominican Republic	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.9	2.8
Honduras	1.6	1.7	1.8	1.7	1.9	1.9	1.9	1.6	1.6	1.6
Colombia	0.3	0.2	0.3	0.3	0.3	0.3	0.5	0.8	0.5	0.6
Ecuador	0.0	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6
Brazil	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.5
Nicaragua	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3
Panama	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Other Countries	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
<b>Total South America</b>	<b>163.1</b>	<b>169.0</b>	<b>189.3</b>	<b>205.8</b>	<b>216.5</b>	<b>233.9</b>	<b>232.7</b>	<b>225.3</b>	<b>223.9</b>	<b>240.2</b>
<b>Asia</b>										
China	63.2	67.6	75.9	79.3	84.8	86.8	94.6	102.6	113.1	118.0
Kazakhstan	22.6	26.1	25.6	22.8	20.2	19.7	17.6	17.6	17.5	19.8
India	3.4	3.3	5.9	5.7	6.8	6.2	8.2	7.5	11.9	12.1
Indonesia	8.6	9.9	7.9	8.6	8.0	7.7	6.7	6.0	4.5	6.0
Armenia	1.3	1.2	1.3	1.2	1.3	1.6	1.7	2.4	2.6	3.2
Islamic Rep. Of Iran	2.7	2.9	3.2	2.9	3.2	3.4	3.4	3.3	3.1	2.7
Uzbekistan	1.9	2.1	2.1	2.5	1.7	1.7	1.9	1.9	1.9	1.9
Mongolia	1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.0	1.6
Philippines	0.3	0.6	0.8	0.9	0.5	1.1	1.3	1.5	1.6	1.3
Thailand	0.5	0.6	0.5	0.4	0.4	0.7	0.7	0.8	1.2	1.2
Dem. Rep. of Laos	0.1	0.2	0.2	0.1	0.2	0.5	0.6	0.6	0.6	0.9
North Korea	0.8	0.8	0.9	0.9	0.9	0.8	0.8	0.9	0.9	0.8



## World Silver Mine Production

© GFMS, Thomson Reuters / The Silver Institute

(million ounces)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Saudi Arabia	0.5	0.4	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.6
Japan	1.7	1.0	1.1	0.4	0.4	0.4	0.3	0.5	0.6	0.5
Kyrgyzstan	0.0	0.0	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3
Tajikistan	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Pakistan	0.0	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	0.2	0.2	0.2	0.1
<b>Total Asia</b>	<b>109.1</b>	<b>118.2</b>	<b>127.2</b>	<b>127.7</b>	<b>130.4</b>	<b>132.5</b>	<b>140.1</b>	<b>147.4</b>	<b>161.3</b>	<b>171.2</b>
<b>Africa</b>										
Morocco	7.2	7.9	7.6	6.9	7.8	8.9	9.9	8.0	7.5	8.2
South Africa	2.3	2.8	3.0	2.8	2.7	2.9	3.0	3.0	2.9	2.8
Dem. Rep. of the Congo	1.1	1.7	2.2	2.3	1.1	0.0	0.2	0.4	0.4	2.0
Eritrea	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	0.8
Zambia	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
Tanzania	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4
Botswana	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
Zimbabwe	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Ethiopia	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
Ghana	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Mali	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other Countries	1.0	1.0	1.1	0.3	0.3	0.0	0.0	0.1	0.1	0.1
<b>Total Africa</b>	<b>12.6</b>	<b>14.6</b>	<b>15.0</b>	<b>13.2</b>	<b>12.8</b>	<b>13.0</b>	<b>14.3</b>	<b>12.9</b>	<b>13.1</b>	<b>15.4</b>
<b>Oceania &amp; Other</b>										
Australia	71.5	77.4	55.6	60.4	61.9	52.4	60.4	55.5	55.5	59.2
Papua New Guinea	1.7	2.2	1.6	1.4	1.6	2.2	2.1	3.0	2.6	2.9
New Zealand	1.0	1.5	1.1	0.6	1.0	0.5	0.4	0.3	0.2	0.2
Other Countries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total Oceania</b>	<b>74.2</b>	<b>81.1</b>	<b>58.4</b>	<b>62.4</b>	<b>64.6</b>	<b>55.0</b>	<b>63.0</b>	<b>58.7</b>	<b>58.3</b>	<b>62.2</b>
<b>World Total</b>	<b>613.6</b>	<b>639.7</b>	<b>642.7</b>	<b>666.1</b>	<b>683.1</b>	<b>713.8</b>	<b>750.6</b>	<b>754.6</b>	<b>792.3</b>	<b>819.6</b>

the country total to 39.2 Moz (1,218 t). However, this still falls some way short of volumes in previous years, with output reaching as high as 62.3 Moz (1,937 t) in 2007. Last year increased supply came from the Escondida copper operation, on higher throughput, and there was also a modest increase in silver output from Codelco's properties. At the primary silver mine Cerro Bayo, higher throughput, grades and recoveries were all achieved following the implementation of a revised mine plan in 2012. Additional tonnage also came following completion of the ramp-up at the Delia NW mine in early 2013. An expansion of the facilities for treating historic tailings bore fruit at Minera Florida, where higher throughput led to increased silver output.

The most significant losses were seen from the gold sector, as planned mine sequencing led to lower grades, a reduction in ore mined and, consequently, reduced supply from El Peñón, Chile's largest silver producer. Further

losses came as a consequence of La Coipa being placed on care and maintenance in October 2013; output from the mine was 25% lower year-on-year.

Argentina's production was marginally up year-on-year, reaching 24.7 Moz (768 t). Behind the growth, higher throughput and grades were achieved at both Casposo and San Jose, respectively primary gold and silver operations. Losses were concentrated in the primary silver sector. Martha ceased operations in September 2012, and at the country's largest silver operation, Pirquitas, production fell by 5% year-on-year to 8.2 Moz (256 t). This was mainly due to an increase in the proportion of oxidized and transitional ore in the mill feed. Output from Manantial Espejo fell by 13% in 2013, owing to a 12% fall in grade and a 2% fall in throughput, which were partially offset by higher recovery rates. The lower than expected throughput was a consequence of equipment availability restrictions.



While the Dominican Republic remains a relatively minor silver producer, in percentage terms the country recorded South America's largest gain, more than tripling, taking annual production for the country to 2.8 Moz (87 t). This was mostly attributable to Pueblo Viejo, which continued to ramp up output last year. A smaller contribution also came from the Las Lagunas operation, which reprocesses tailings from the historic (1991- 1999) Pueblo Viejo mine, as the operators continue to work towards optimizing the Albion/CIL process plant.

Guatemala also saw a large increase in production of 58% year-on-year, with the country producing 10.4 Moz (324 t). Most of the increase was due to the start up of Escobal, a primary silver mine, which began commissioning activities in September 2013 and achieved commercial production in January 2014. Escobal produced over 2.0 Moz (62 t) last year, and is expected to overtake Marlin as Guatemala's largest silver producer. Output from Marlin, at over 7.0 Moz (219 t), saw a year-on-year increase thanks to a 4% rise in grade, which was due to normal mine sequencing.

### Asia

In Asia silver mine supply rose strongly, by 6%, driven by growth in base metal by-product output at the two largest producing countries within the region. We estimate that Chinese silver mine production rose for an eleventh consecutive year, to total 118.0 Moz (3,669 t). With an increase of 4.9 Moz (152 t), this was the second largest gain globally after Peru and the bulk of the increase is estimated to have come from the Chinese domestic lead/zinc smelting sector. With production of lead and zinc in-concentrate having risen by 9% and 4% respectively, we estimate that silver recovered from this part of the base metal smelting industry rose by 3.2 Moz (98 t). In addition, we estimate that the volume of silver recovered from China's gold and primary silver mining sectors grew by 1.0 Moz (32 t), due to growth in output at Ying and a continued increase in production at Wuping Zijin.

Domestic output from Kazakhstan also rose, by an estimated 2.3 Moz (72 t), to total 19.8 Moz (617 t). While government statistics on refined silver production indicate production was flat year-on-year, the two major producers within Kazakhstan, Kazakhmys and Kazzinc, both reported growth in output from own-sourced feedstocks. Kazakhmys benefited from a release of

metal-in-process and saw output rise significantly by 13%, or 1.7 Moz (53 t), despite a decline in mined silver, while Kazzinc saw a similarly strong 10%, or 0.5 Moz (15 t), rise in its output. Against these increases in domestically sourced silver production, we estimate that the volumes of imported silver-bearing concentrates fell year-on-year.

Elsewhere, Indonesian production rose by 1.4 Moz (45 t) as output as a by-product from the gold mining sector surged. The gain came from the commencement of operations and subsequent ramp-up of mining at Kasonga and Martabe, which together added 2.0 Moz (63 t) of production year-on-year. Copper by-product output increased slightly due to the recovery at Grasberg. Indian production was broadly flat year-on-year at 12.1 Moz (376 t), with only a slight rise from the estimated domestic production of Hindustan Zinc.

### Oceania

Production in Oceania increased by 7%, to 62.2 Moz (1,935 t), led by production growth in Australia, the region's largest producer. Output grew by 3.6 Moz (113 t), led by the lead/zinc sector, which saw by-product silver output rise by 31% or 5.7 Moz (177 t). MMG's Century, Australia's largest open-pit lead/zinc mine, saw silver output rise dramatically due to a combination of 31% higher throughput and a near-doubling of contained silver grades. We estimate that this led to a rise in silver output of approximately 2.1 Moz (66 t). A small increase was also seen from the country's gold sector, with incremental gains spread across several properties.

The country's primary silver sector did not fare so well, however. The heaviest fall was registered at Cannington, the country's largest silver producer and the world's largest primary silver mine, where production fell by 3.1 Moz (98 t) due to a 7% fall in silver grades, as mine sequencing moved mining activities to areas of ore with higher zinc grades. Some offset was provided by the ramp up of Cobar Consolidated Resources' Wonawinta. The mine declared commercial production during 2013 and contributed to a 1.0 Moz (32 t) year-on-year gain.

### Europe

European silver production fell in 2013, by 2.9 Moz (91 t). The principal driver of the loss was a reduction from the silver-bearing copper operations of KGHM Polska Miedź



## An Overview of Corporate Transactions in 2013

Compared to 2012, last year was very quiet in terms of M&A activity in the silver sector. As primary silver producers grappled with a 24% fall in average annual silver prices, and price falls in copper, gold and zinc by-products, assets were written down and the focus turned to cost containment. With some of the deals of 2012 and earlier now resulting in somewhat inflated asset and goodwill carrying values, companies recorded a number of impairments.

At the forefront, Goldcorp recorded a US\$2.4 billion dollar impairment at Peñasquito, principally related to changes in exploration potential due to the lower metal price environment, changes to the life of mine plan and the new Mexican mining duty. After acquiring the Dolores mine through the \$1.5 billion purchase of Minefinders Corp in early-2012, Pan American Silver recorded a write down of \$540 million last year, mainly related to the carrying value of the Dolores mine and associated goodwill. First Majestic Silver, Coeur Mining and Hochschild Mining also all recorded write-downs, with the largest being the \$642 million dollar impairment of Coeur's Palmarejo Mine in Mexico.

Talking to the M&A activity, Hecla Mining's acquisition of Aurizon Mines, and its gold-silver Casa Berardi property, for a consideration of approximately C\$514 million and 57 million shares, was the largest silver-related deal. In late-2012 First Majestic bid for Orko Silver Corp., but by February 2013 Coeur Mining had made a superior offer. With First Majestic not countering, Coeur acquired Orko, and its La Preciosa silver-gold project in Mexico, in a deal which included cash, stock and warrants for a total purchase price of \$296 million. Coeur also completed an acquisition of Global Royalty Corp. in December, for a purchase price of \$26 million. Another significant deal last year saw Hochschild Mining enter into an agreement in October to acquire International Minerals Corp., consolidating its ownership of the remaining 40% of the Pallancata mine and Inmaculada project for \$271 million in cash.

Turning to this year, little M&A activity in the primary silver sector has yet emerged, with most corporate activity related to refinancing activities.

in Poland, which pushed the country's output down to 37.6 Moz (1,171 t), a three year low. This 3.6 Moz (113 t) decline was a consequence of lower processed silver grades. Extending the losses, we estimate that Turkish output fell by 1.3 Moz (40 t) as output fell from the primary silver Gümüşköy mine, where throughput remained constrained last year from pre-2012 levels. Outside the primary silver sector, output rose slightly as a product of growth in the country's gold mining industry.

In the region's largest producer, Russia, results across the various metal mining sectors were mixed, leaving output broadly flat; up by just 0.4 Moz (12 t). Primary silver supply was up strongly, by 2.9 Moz (90 t), attributable almost exclusively to the Dukat complex. A 9% increase in throughput and 6% increase in processed grade were recorded as the Dukat mine shifted to underground processing, and a near doubling of mined volumes from the satellite Goltsovoye mine.

In contrast, the country's gold mining sector saw reduced volumes of silver, due to reductions at Khakanjinskoye and Kupol, where output fell by a combined 2.7 Moz (83 t). At Khakanjinskoye, silver grade fell by a significant 47% due to a change in feed source from the main Khakanja mine to lower silver grade ores from the Ozerny and Avlayakan open pits. At Kupol, output also contracted as a result of a significant fall in processed

silver grade. Silver volumes from Russia's base metal mining industry are estimated to have remained flat.

Similar to last year, it was the smaller producing countries that softened the regional decline, with two in particular contributing meaningful gains. Portugal saw a 0.3 Moz (11 t) increase as output due to significantly higher throughput at Neves-Corvo, while output in Sweden rose by 1.0 Moz (32 t), a 10% increase, as output rose at Boliden's three silver producing operations, Aitik, Boliden Area and Garpenberg.

### Africa

In Africa, increases in both the primary and copper by-product sectors led to a 2.3 Moz (72 t) gain. In the former, output at Africa's largest silver producing mine, Imiter in Morocco, grew by 0.7 Moz (23 t) as, despite a 16% drop in processed grade, a 42% increase in throughput (from what was a constrained 2012 due to civil unrest). Elsewhere, in the Democratic Republic of the Congo, copper by-product silver production rose as output at the Dikulushi mine grew almost fivefold to 1.9 Moz (60 t). Behind this remarkable result, owner Mawson West commenced a limited period of open pit mining of high grade areas of the pit bottom, ran high grade stockpiled material through the plant and commenced underground pillar mining to extend the life of the operation.





Average Prices of Source Metals							World Mine Production of Source Metals						
(\$/ton)						Change	(Thousand tons)					Change	
	2009	2010	2011	2012	2013	y-o-y	2009	2010	2011	2012	2013	y-o-y	
Lead 3-Mth	1,741	2,172	2,390	2,073	2,157	4%	Lead	3,833	4,161	4,636	5,007	5,403	8%
Zinc 3-Mth	1,686	2,185	2,210	1,964	1,940	-1%	Zinc	11,608	12,354	12,644	13,130	13,263	1%
Copper 3-Mth	5,185	7,555	8,825	7,946	7,346	-8%	Copper	15,831	15,929	16,009	16,561	17,832	8%
Gold (\$/oz)	972	1,225	1,572	1,669	1,411	-15%	Gold (tons)	2,613	2,741	2,839	2,861	3,022	6%

Source: GFMS, Thomson Reuters; LME; ILZSG

## Outlook

• **Silver mine supply is expected to increase slightly in 2014, with support mainly coming from the gold and primary silver sectors.**

The GFMS team at Thomson Reuters thinks that silver mine supply will continue to grow this year, but estimates that the rate of this growth will decelerate compared to 2013. Much of the increase is expected to come from the primary silver and gold sectors, with a lesser contribution from the base metal by-product sectors.

The largest individual increase in output is expected to come from the ramp up in production at Escobal, where 2014 production is forecast at 18-21 Moz (560-653 t). Other primary silver mines expected to increase supply in 2014 include Lucky Friday, which will ramp up further after its recent re-start. Gold miners are expected to maintain production close to 2013's record levels, with a consequent supportive effect on silver supply from the ramp up of several properties. Outside the precious metals, we expect output from lead/zinc mines to be broadly flat and for silver from the copper sector to grow slightly, based on a recovery in output at several large copper mines such as Bingham Canyon and Grasberg.

However, the silver price fell by 24% in 2013, and this deterioration is already having an effect on the outlook. For example, Aurcana's Shafter was placed on care and maintenance in late 2013 and expansion plans for Allied Nevada Gold's Hycroft mine were shelved. With prices expected to continue to fall, other projects may suffer similar fates, countering the increases in supply from the operations described above. Given that the primary silver and gold sectors are currently responsible for 29% and 13% of global silver supply respectively, continued declines in precious metal prices have the potential to impact production to a growing extent. There is therefore a risk that silver mine supply growth will slow this year.

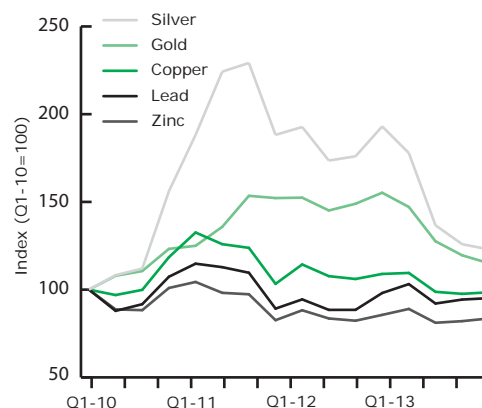
## By-Product Analysis

• **Production from the primary silver sector rose strongly last year, by 6%.**  
 • **Silver produced as a by-product of other metals also rose last year, albeit at a slower pace than the primary mining industry.**

Primary silver production rose last year by a significant 13.6 Moz (422 t), despite a reduction in output at the two largest primary silver operations in the world, Fresnillo and Cannington, which fell by a combined 6.8 Moz (210 t). Behind the overall rise, strong performers in 2013 in terms of output were GlencoreXstrata (+3.6 Moz, 112 t), Hecla Mining (+2.5 Moz, 78 t) and First Majestic Silver (+2.4 Moz, 74 t). At the mine level, top gains came from a ramp up at Fresnillo's Saucito shafts in Mexico (+4.5 Moz, 141 t), the start of Tahoe Resources' Escobal in Guatemala (+3.4 Moz, 105 t) and greatly increased throughput and grades at Polymetal's Dukat in Russia (+2.9 Moz, 90 t).

The GFMS team at Thomson Reuters calculates that global gold output grew strongly, by 6% last year, despite the decline in gold price seen over the year. Correspondingly, output of silver from the gold mining

## Indexed Silver & By-product Metal Prices



Source: LME, Thomson Reuters



Silver Output by Source Metal					
(million ounces)					
	2012 Output	% of Total	2013 Output	% of Total	Change y-o-y
Primary	222.3	28%	235.9	29%	6%
Gold	102.7	13%	105.4	13%	3%
Lead/Zinc	308.0	39%	307.4	38%	0%
Copper	155.9	20%	167.0	20%	7%
Other	3.5	0%	3.9	0%	13%

Source: GFMS, Thomson Reuters

sector is also estimated to have risen, albeit by a more muted 3%, primarily due to the onset of several new gold operations globally. Much of this can be attributed to the ramp up of operations at two properties in particular; Barrick's Pueblo Viejo in the Dominican Republic, which added 1.6 Moz (51 t), and G-Resources' Martabe in Indonesia, which added 1.3 Moz (40 t).

Concerns over slower demand in top consumer China and the timing of Federal Reserve tapering weighed on sentiment in the base metals complex, and therefore prices, in 2013. In contrast with 2012, the copper price ranked as one of the weaker performers last year, outdone only by nickel and aluminium, both of which continued to struggle with vast inventory overhangs. Against this backdrop, LME copper three month prices averaged \$7,346/ton in 2013, down 8% from 2012 levels. Zinc prices meanwhile fell by a more modest 1% to \$1,940/ton, while lead prices managed a 4% increase over the period to \$2,157/ton as supply and demand remained more or less in balance.

The GFMS team calculates that global copper mine output surged last year by almost 8%, or 1.3 million tons, to reach 17.8 million tons. Higher productivity at some of the world's biggest mines combined with the start (and subsequent ramp up) of new projects facilitated the sharp increase. As a consequence, the volume of silver recovered from this sector expanded last year, by a significant 20%, or 11.1 Moz (345 t), with the key regions for this growth being South America and Africa.

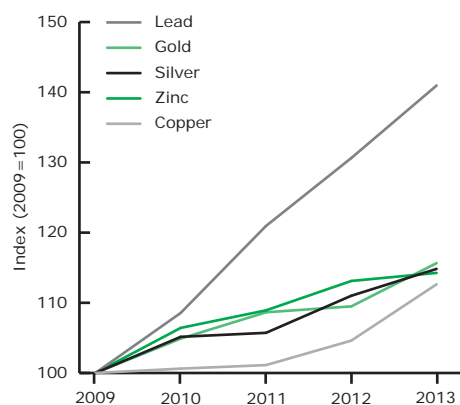
Chilean copper output rose by 6% in 2013, to a new record of 5.8 million tons. Correspondingly, silver output also rose, with incremental gains at a number of properties. Silver recovered from the copper industry in Peru also rose strongly, with growth from Antamina and Tintaya among others. In Africa, copper mine production

grew by an impressive 54% last year in the Democratic Republic of the Congo as a number of projects rapidly ramped up. The most significant of these for silver was the temporary resumption of open-pit mining (and start of underground activities) at Dikulushi, referred to earlier.

Output of silver from the lead/zinc sector came in broadly flat, mirroring global trends in the mined supply of these metals. Global zinc mine output growth was constrained to less than 1% last year, which took it to 13.2 million tons, according to the International Lead and Zinc Study Group (ILZSG). Increases in Asia were largely offset by losses from mine closures and other mines nearing depletion. In top producer China, zinc mine output rose by around 4% last year, while India reversed 2012's decline and emerged as the world's third largest producer, at almost 800,000 tons, due to further expansion by Hindustan Zinc. Conversely, in Canada, the closure of GlencoreXstrata's Perseverance and Brunswick mines led to a one-third decline in mine output to 426,000 tons. In Australia, MMG's Century mine, which is nearing the end of its life, produced 488,000 tons of contained zinc; 5% less than in 2012.

In contrast to zinc, ILZSG figures indicate global lead mine output rose by almost 8% last year, driven largely by continued growth in China, with Chinese miners incentivized to boost output as smelters shunned higher-priced imports. We estimate the silver contribution from this growth to have been more muted. Outside China, closures and depletions at lead-zinc mines had a less marked impact on the overall picture on lead production. MMG's Century mine managed to boost output, helped by higher grades and a sustained improvement in lead recovery.

### Indexed Global Metal Mine Production



Source: GFMS, Thomson Reuters; ILZSG



## Production Costs

• **Silver Total Cash Costs for 2013 averaged \$9.27/oz, a 1% rise from a revised figure of \$9.16 for the prior year.**

With the average annual silver price falling by 24% last year to \$23.79/oz, silver miners saw their average simple cash margins contract sharply, by 34% year-on-year, to \$14.52/oz. Last year's 61% simple cash margin was the lowest recorded in our historical series, and while this figure may still appear attractive, it should be noted that our analysis excludes sustaining capital expenditure, exploration expenses and corporate overheads, which collectively made up approximately 30% of the incurred cash expenses for primary silver mining.

In 2013, 29% of global mine supply came from the primary silver sector and our costed data capture of 179.0 Moz (5,568 t) represented 76% of global primary silver mine supply. This sector typically benefits from revenues generated from the sale of by-product metals such as gold, lead and zinc, which are recovered alongside silver. Last year's 15% fall in the average annual gold price had a negative effect on by-product revenues, while a 1% fall in the price of zinc was more or less offset by a 4% rise in the average price for lead, leading to little effect on revenues from these two metals. Had gold prices remained at levels seen in 2012, Total Cash Costs for primary silver miners would certainly have fallen year-on-year. With regard to energy inputs, the average WTI oil price was 4% higher than 2012.

In a similar strategy to that seen in the primary gold mining sector last year, primary silver producers sought

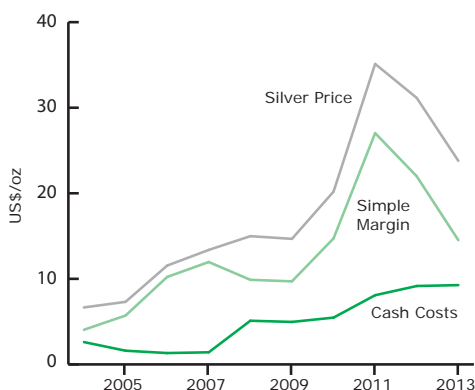
Silver Mine Production Costs			
(US\$/oz unless stated)	2011	2012	2013
Total Cash Costs	8.09	9.16	9.27
Average Silver Fix Price	35.12	31.15	23.79
Sample Size (Moz)	164.7	167.4	179.0
Global Primary Production (Moz)	219.8	222.3	235.9

Source: GFMS, Thomson Reuters

aggressively to control cost escalation. The slowing of cost escalation last year was related to producers' implementation of operational efficiencies along with the optimal use of consumables, new ramp ups and higher ore throughput (and production) at a number of operations as a means to offset the cost pressures driven by declining ore grades and above inflation increases in contractor, energy, consumables and labor costs.

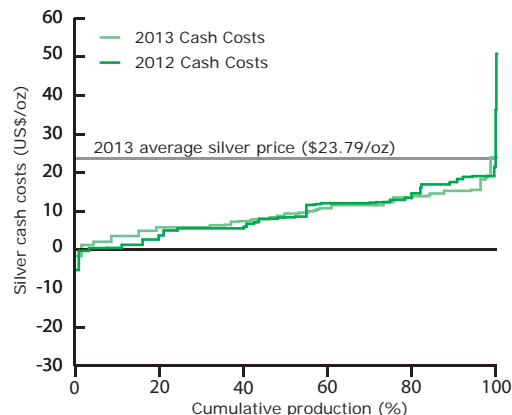
Of the key producing countries, Mexico saw significant 20% cost escalation, as the Mexican peso strengthened 3% and a number of its mines (e.g. Saucito, Guanajuato) received lower by-product credits from gold and processed lower grade ore (Fresnillo mine, Alamo Dorado). Similarly, cash costs in the United States rose as gold and zinc prices affected by-product revenues at Greens Creek. Somewhat offsetting this, Peru saw a 10% decrease in cash costs with a favorable, 2%, fall in the nuevo sol lowering costs somewhat. In addition, Arcata processed higher volumes of low cost material while at Huaron, unit costs were lowered through increased throughput and production. Russian cash costs decreased 4% as the rouble weakened by 3%, helping to keep locally priced input costs under control. At Dukat, higher ore grades and recoveries resulted in a 15% increase in production, which more than offset the increased costs of a complete switch to underground mining.

Historical Silver Cash Costs



Source: GFMS, Thomson Reuters

Silver Mine Cash Costs



Source: GFMS, Thomson Reuters



## Producer Hedging

• **In 2013, the delta-adjusted hedge book fell by 34.3 Moz (1,065 t).**

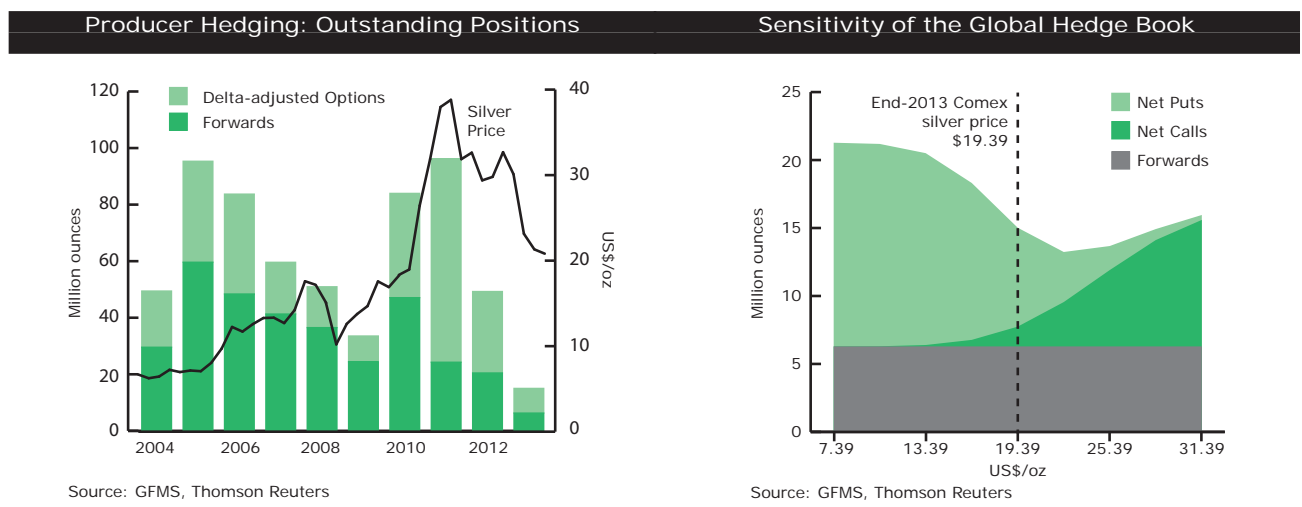
Producers continued to de-hedge in 2013, with miners closing out existing positions or delivering into contracts at maturity. At year-end, the delta-adjusted global hedge book stood at a mere 15.0 Moz (467 t), the lowest level for more than a decade, and representing a 34.3 Moz (1,065 t) reduction from 2012. The cut was largely attributable to the accelerated closure of options positions, and to a smaller extent with the reduction of forward sales, with the nominal (number of contracts) hedge book falling by a record 164.6 Moz (5,120 t). When adjusted for option delta, which represents the true draw on the silver market from these positions, the fall in the level of options hedging was lower, at 20.1 Moz (624 t). The number of outstanding forward sales also fell significantly, with a 14.2 Moz (441 t) cut.

During 2013, Barrick Gold closed out its existing silver hedge book that had consisted of 65 Moz of collar structures set to mature over the period to 2018, for net proceeds of \$190 million. On a nominal basis, this de-hedge represented 79% of the global hedge book reductions last year. Similarly, in the second quarter, KGHM Polska Miedź took the opportunity to close out an existing in-the-money seagull option structure which was due to mature in the second half of the year. Minera Frisco delivered into scheduled silver collar structures. In terms of forwards, the largest reduction came from Minera Volcan which cut over 10 Moz (316 t) of outstanding forwards and scaling contracts. Additional reductions were made by Discovery Metals and Straits

Resources; the latter settling its prepayment facility against Mt. Muro as the asset was placed on care and maintenance.

There were few additions to the global hedge book last year with the most significant activity coming from Peñoles. Talking to the details, the company added to its existing set of collar structures and forward sale positions for a combined 13.3 Moz (412 t) of hedged production by year-end. In the middle of the year Coeur Mining hedged downside price risk through bought put options covering 5 Moz (156 t) of production, by end-2013 the outstanding nominal volume was 3.75 Moz (117 t). Aside from Peñoles which added to its forward sales position, few companies sold production forward. Codelco added to its forward contracts with over 1.8 Moz (56 t) of forwards by year-end, while Hecla Mining sold forward 0.67 Moz (21 t) at an average strike price of \$19.5/oz.

The GFMS team at Thomson Reuters calculates the delta-adjusted global hedge book volume from market data and using proprietary tools from Thomson Reuters Eikon. The chart below plots the sensitivity of the hedge book with respect to changes in the silver price, assuming all other market factors remain equal, and shows that the hedge book was more sensitive to a potential fall in the silver price; if prices were \$3/oz lower at end-2013, the volume of silver delta-hedged against the options book would have risen by 3.3 Moz (102 t). However if prices had been \$3/oz higher, the delta-adjusted hedge book would have fallen by 1.8 Moz (56 t). Much more pronounced sensitivity to the downside is because producers' bought put options, on balance, were closer to being in-the-money than the deeply out-of-the-money sold calls.





## 5. Supply from Above-Ground Stocks

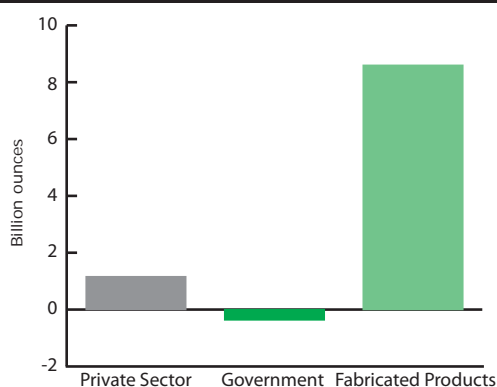
- **Supply from above-ground stocks eased by 23.2% to 199.7 Moz (6,212 t) in 2013.**
- **The fall was driven by a large decline in scrap supply, only modest government sales and a continued absence of net producer hedging or ETF drawdowns.**
- **Net government sales increased only slightly to 7.9 Moz (245 t), after reaching a 15-year low of 7.4 Moz (229 t) in 2012.**
- **Old silver scrap supply slipped by 24.1% to 191.8 Moz (5,966 t) its lowest level since 2001.**

### Overview

The supply of silver to the market can be divided into two categories, namely flows from new mine production and flows from above-ground stocks. The latter can either be sourced from the recycling of fabricated products or from the mobilization of bullion stocks owned by private individuals, institutions or by governments. As illustrated in the accompanying table overall supply from above-ground stocks dropped 23.2% or 60.2 Moz (1,874 t) in 2013, to 199.7 Moz (6,212 t). By contrast, global mine production grew for the eleventh year in a row, as it rose by over 27 Moz (850 t) in 2013. Above-ground stocks' contribution to total visible silver supply therefore eased to 19.6% in 2013 from 24.7% in 2012.

Scrap clearly remains the most important source of supply from above ground stocks and for the past decade

Changes in Above-ground Stocks (2004-2013)



Source: GFMS, Thomson Reuters

Visible Supply of Silver to the Market

(Moz)	2011	2012	2013
Mine Production	754.6	792.3	819.6
Above Ground Stocks	307.0	260.0	199.7
...of which scrap	258.7	252.6	191.8
...of which hedging supply	12.2	-	-
...of which ETF drawdown	24.0	-	-
...of which Govt Sales	12.0	7.4	7.9
<b>Total Visible Supply</b>	<b>1,061.6</b>	<b>1,052.3</b>	<b>1,019.4</b>

Source: GFMS, Thomson Reuters

Note: This is "visible supply", therefore the withdrawal of metal via ETF and futures exchange additions or de-hedging is treated as zero.

it has ranged between 19% and 25% of total supply to the market. Much of this supply is also price insensitive in the form of recovery from e-waste and recycling associated with industrial processes. There is a smaller price sensitive aspect, however, in terms of jewelry returning to the market and also with respect to coin and bar holdings. This type of supply can increase for a number of reasons, but most commonly distressed selling in times of economic hardship as well as when prices are at historically high levels.

Indeed, when poor economic growth combined with plus \$30/oz average annual silver prices in 2011 and 2012 scraps proportion of total supply increased from 21-22% in previous years to 25%. To a large extent this was the drawdown of stockpiles of coins and surplus jewelry, particularly in Europe and North America.

As such, when the economy in developed markets began to turn a corner in 2013 and as the silver price fell the amount of scrap coming onto the market declined rapidly, falling by 24% year-on-year to total just 19.5% of total supply. As such, therefore, reductions changes in supply from above ground stocks were a major contributing factor to the physical deficit seen in the market 2013.

Apart from scrap there are a number of potential sources of supply, and these are reviewed in the following pages. As shown on the table overleaf, and within the net identifiable stock change table on page 38, the net impact of these has been limited in the past couple of years.





## Identifiable Bullion Stocks

The analysis of identifiable bullion stocks by the GFMS team at Thomson Reuters includes inventories for which sufficient evidence is available to form a statistical picture. In contrast, silver bullion held in depositories on which information is not available, as well as in private investors' vaults, is excluded from our figures. Besides noting the existence of additional stocks of silver, this caveat has implications for the interpretation of changes in our estimates of identifiable bullion stocks. Specifically, in addition to such changes being driven by the absorption of surpluses or the filling of deficits, they could in theory be explained by metal flowing out of unidentifiable stocks and into identifiable areas or vice versa.

As illustrated in the table on the next page, identifiable bullion stocks have been broadly increasing for most of the past ten years. This has been driven in part by increases in allocated ETF fund holdings, but also by an increase in stocks held by commodity futures exchanges as volumes have risen. These stocks peaked in 2012 at 1,395 Moz (43,388 t), the highest level in volume terms since 1995, and a new record on a value basis. Last year saw a reversal however as price declines prompted a number of institutions to reduce the amount of silver that was being held, indeed, with the exception of COMEX, all of the headline categories that we track saw declines over the course of 2013.

The net-change in identifiable stock levels in 2013 was a decline of 125.1 Moz (3,892 t) to a level of 1,270 Moz (39,496 t), a level that is still higher than 2011, but a

noticeable change of trend and equivalent to 14 months' global silver demand at 2013 rates (this excludes ETFs and Over the Counter interest). On a value basis the decline is even stronger and this will impact on the economics of storing silver, which takes up a lot more space than its counterpart gold, but is still valuable enough to require secure vaulting.

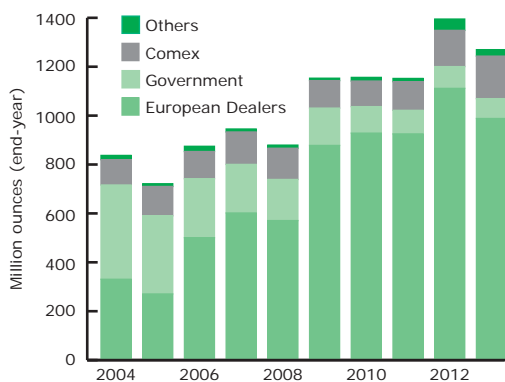
Turning to the breakdown of identifiable bullion stocks, European dealers' inventories accounted for the bulk of the decrease in 2013, reflecting both higher storage cost to value and a slight reduction in institutional interest. As noted COMEX inventories increased by 25.7 Moz (800 t) while Tocom, Shanghai Futures Exchange and Japanese producer and merchants stocks all fell in tonnage terms. Government stockpiles also continues their long term decline, but the amounts involved are no longer as significant to the market. Indeed we estimate that total government holdings are now lower than net government sales in the peak disinvestment years of 1999 and 2003.

## European Dealers' Stocks

Since 1996, GFMS, Thomson Reuters has tracked and estimated bullion stocks held in European dealers' vaults via a confidential survey. We then report an aggregate end-year total for these in the World Silver Survey. At the end of 2013, European dealers' silver stocks were 988.2 Moz (30,796 t), down from an all-time high of 1,111.4 Moz (34,568 t) at the end of 2012.

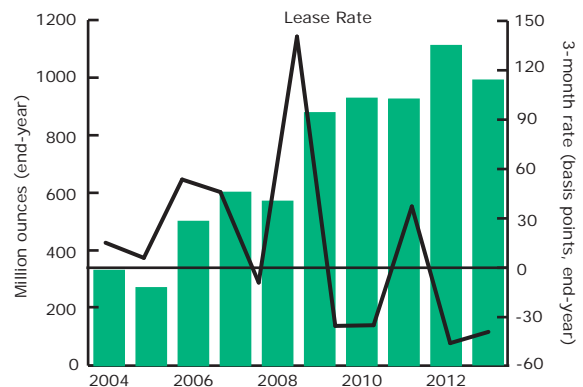
A good portion of this increase last year was related to a major rebound in net inflows into silver ETFs (discussed in the relevant focus box in Chapter 3). Elsewhere, the

Identifiable Bullion Stocks



Source: GFMS, Thomson Reuters

Bullion Stocks in Dealers' Vaults in Europe



Source: GFMS, Thomson Reuters



Identifiable Bullion Stocks			Comex Silver Stocks				
(Million ounces)			(Million ounces; end period)				
	end-2012	end-2013	Q1	Q2	Q3	Q4	
European Dealers	1,111.4	988.2	2009	125.4	117.6	115.4	112.5
Comex	148.2	173.9	2010	116.6	114.0	111.1	104.6
Government	89.1	81.2	2011	105.4	98.7	108.0	117.3
Other Stocks	46.3	26.5	2012	137.1	146.5	141.4	148.2
<b>Total</b>	<b>1,395.0</b>	<b>1,269.8</b>	2013	164.2	164.5	165.2	174.5
Source: GFMS, Thomson Reuters			Source: COMEX				

47.0 Moz (1,460 t) decline in the global producer hedge book in 2012 also contributed to the increase in dealers' inventories. In addition, the rise in stocks should be viewed in the context of a growing fundamental surplus in the silver market, the bulk of which has been absorbed by private and institutional investors. For instance, steady fabrication demand along with a 31% increase in local scrap supply resulted in a hefty decline in Indian bullion imports in 2012. As the country tends to source metal from dealers located in Europe, this provided an additional boost to the stock levels discussed above.

stockpiles at COMEX since the start of 2012 has been softening physical demand from both industrial end users and private investors in the US market in conjunction with the ongoing strength of silver mine production. Inventory increases were widespread across most of the individual depository vaults last year. As of the end of April 2014, the JP Morgan vault was the largest, with 45.2 Moz (1,406 t), followed by HSBC at 43.4 Moz (1,351 t). The other vaults are controlled by Scotia Mocatta, Brink's, CNT Depository and Delaware Depository.

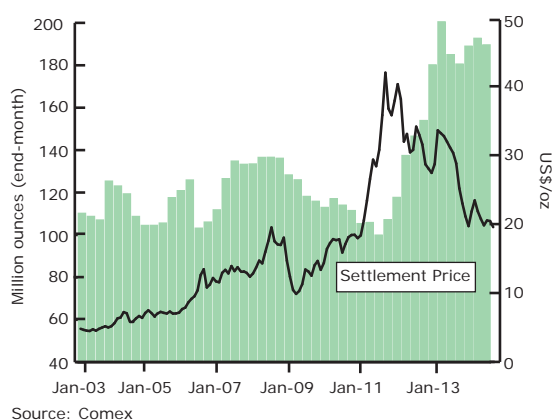
### COMEX Stocks

Silver stocks held at COMEX depositories grew marginally in the first quarter of 2013, rising 12% to 164.5 Moz (5,116 t) by end June, a level last seen in 1995. After a quiet spring, COMEX stocks started to grow strongly in the second half of the year, closing 2013 at 174.5 Moz (5,428 t). There was notable growth in the first quarter of 2014, with total inventories amounting to 179.8 Moz (5,592 t) at end March. April has so far seen a modest fall in warehouse stocks. Central to the build-up in

### Government Stocks

The estimates by the GFMS team at Thomson Reuters for changes in silver bullion stocks held by governments are largely based on private information that we have gleaned during the course of our field research, as there is little publicly available data on levels of, and changes in, government silver stocks. This is a particularly important point when it comes to assessing the outstanding level of government stocks, with respect to which our numbers are at the conservative end of the spectrum. Nevertheless, we are far more confident when it comes to measuring the annual changes in stocks, as shown in our government sales data.

Comex Warehouse Stocks



After considerable falls in both 2011 and 2012, net government sales are estimated to have risen slightly to 7.9 Moz (246 t) in 2013. However, this is still a very low level when compared to the previous decade when disposals averaged 43.0 Moz (1,337 t) per annum over 2002-11 period. At end-2013, total government silver stocks amounted to just over 80 Moz (2,500 t).

Last year's increase was due to Russian disposals recovering a touch from a decade low in 2012. In fact, the level of sales in 2013 was still, by a considerable



## Deficits and Surpluses in the Physical Silver Market

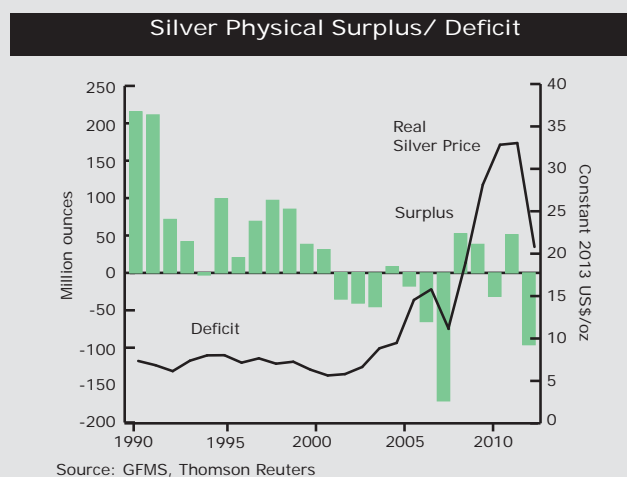
This year has seen us change the methodology of the supply and demand balance to reflect more accurately the surpluses and deficits in the physical market. Demand for physical silver now includes fabrication of jewelry, coins, silverware and industrial uses (including electronics, brazings alloys and solders, photographic uses and other industrial uses such as photovoltaics and ethylene oxide). In addition to this we include a net consumption figure for bar purchases in order to include the pull this market has on available silver supply. The supply side of our equation is made up of mine production, scrap, net government stockpile sales and net hedging supply.

The result as shown in the supply and demand balance on page 8, and overleaf, shows that the market was adding to inventory for most of the 1990s and early 2000s when the silver price traded between \$5-10/oz in real 2013 terms.

The change came in 2004 with the beginning of the commodities boom and the subsequent secular rise in prices. This attracted a large increase in investment into the sector, both in terms of new physical bar demand but also a net pull on silver in the Over the Counter market. An indication of this can be seen in the amount of silver that was added to ETF holdings between 2006 and 2010, namely some 600Moz (18,670 t), which we should point

out is not included in the below chart. The market was still pulled into a multi-year deficit, however, driven particularly by strong Asian industrial demand growth.

With price rises, however, came constrained demand growth in the jewelry and silverware market, along with thrifting and substitution in industrial uses. This defined the trend over the past ten years as underlying markets grew but the amount of silver consumed remained relatively constant. Indeed, 2013 has been the first year when price sensitive markets have truly recovered, while thrifting in many industrial uses continues.



Source: GFMS, Thomson Reuters

margin, the second lowest in over a decade, which is partly due to the fact that the country's silver stocks are now far smaller than they were a decade ago. For instance, from 2004 to 2010, gross sales from Russia amounted to over 200 Moz (6,200 t). That said, given the high degree of uncertainty over the size of remaining state stocks, it is probably unwise to rule out a return to higher sales levels from Russia in the future. Elsewhere, interest in offloading silver bullion stocks remained tame in 2013, with most of the sales believed to have been related to disposals of old coin stocks by a handful of countries.

Finally, China and India, each of which had been major sellers over the past decade, were both absent from the market in 2013. As far as China is concerned, it

is our understanding that, following several years of heavy sales, silver stocks have already been reduced significantly from "excessive" levels, and remaining stocks will play a small part in diversifying its reserves portfolio away from US dollars.

### Other Stocks

In addition to the stocks outlined above, we also track those registered on the Tokyo Commodity Exchange, the Shanghai Futures Exchange (SHFE) and Japanese trade stocks, as reported by the country's Ministry of Economy, Trade and Industry. Since these only account for a small portion of the overall figure, we have aggregated them under the "Other Stocks" category in the chart on page 40 and the table on page 38.



These stocks fell substantially in 2013 from 46.3 Moz (1,439 t) to 26.5 Moz (824 t), a decline of 42.% year-on-year. While all components of the figure fell, the largest contributor was a 16.9 Moz (525 t) decline at the Shanghai Futures Exchange bringing the total to 14.4 Moz (447 t) after a 54% annual decrease. Japanese producers and merchant stock also fell to their lowest year-end level since 2009 at 12 Moz (373 t), an 18.9% decline year-on-year.

## Scrap

• **Old silver scrap supply slipped by 24.1% to 191.8 Moz (5,966 t), the lowest level recorded since 2001.**

Silver scrap supply fell spectacularly in 2013, by 24% to 191.8 Moz (5,966 t). According to our records this drop was the largest since at least the 1980s and saw scrap at its lowest level since 2001. Crucial to this dramatic decline was, unsurprisingly, softer silver prices. However, there were also other factors which dragged scrap lower, including a tightening regulatory environment and also an exhaustion of “distressed” coin and jewelry recycling supply in industrialized economies as the economic picture improved.

As a proportion of total supply scrap dropped to under 20%, after averaging 25% of total supply in the previous two years. This rapid decline in supply was a defining feature of the market last year and a substantial contributor to the physical market deficit. The largest tonnage and percentage decline came in India, where recycling of jewelry, silverware and coinage fell dramatically. By contrast China, Japan and South Korea

witnessed a more modest decline as industrial processes, that are less price sensitive, generate the majority of the scrap supply.

Segmenting the scrap decline by source, it is apparent that jewelry and coin scrap suffered the largest declines, especially in developed markets as received prices were lower and many held off on sales. The amount of jewelry entering the supply chain in pawn shops has also fallen with the economic improvement and the closure of a number of retail outlets that purchased precious metals for scrap.

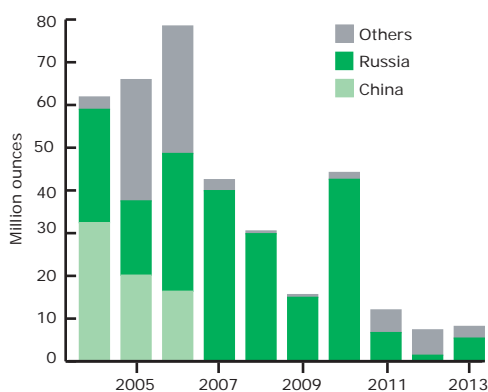
We understand that the majority of precious metals refineries struggled to source scrap in 2013 and declines of over 30% were not uncommon. Indeed, the impact was not limited to silver, as gold volumes also fell, an important factor as a decline in gold supply will often lead to more silver being recycled.

Some areas did managed increased flows however, especially in electronic scrap (E-scrap) and in the recycling of spent ethylene oxide (EO) catalysts, which also account for a large slice of industrial silver scrap. This latter sector has seen a mixed outcome in recent years, with a post-recession surge in 2010 (which benefited from change-outs postponed from the previous year) giving way to a reduction in recycling in 2011 and a mixed performance in 2012. The general trend however was for more competition in recycling across the precious metals with e-scrap being the focus of attention for any participants planning on growing, or indeed sustaining volumes.

Perhaps surprisingly, the recovery from old photographic materials, which until the late 2000's was the largest contributor to scrap supply, was only moderately lower in 2013, with the steady flow of old X-ray film offsetting a significant drop in the treatment of liquids and consumer products. Importantly, the rate of X-ray recycling is one area that remains completely price inelastic as their release to the market is often driven by health regulations that control the tenure or holding of archived X-rays.

European silver scrap fell by 17% last year to 55.5 Moz (1,728 t), following the global trend, albeit by a lower amount. Marked price drops in both silver and gold badly hit scrap collectors and processors, significantly reducing supply and putting a number out of business. Added

Net Government Stock Sales



Source: GFMS, Thomson Reuters



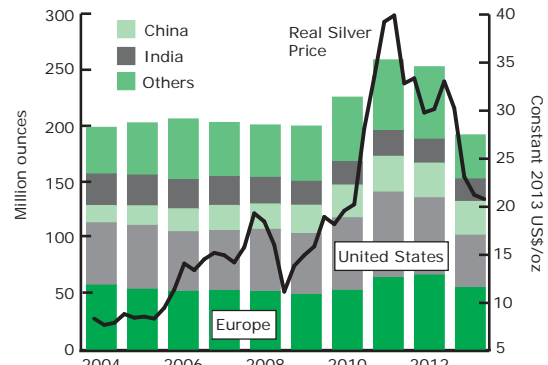
to this some refiners processed increased volumes of lower grade doré from South America, which meant that although higher volumes of material were processed, less silver was actually produced. However, we should add a note of caution; a substantial and possibly higher percentage of metal recovered was from material imported from outside Europe, and scrap is allocated by country of generation, not of refining.

Although silver scrap supply was down, the decline was far less pronounced than for gold scrap. There are several explanations for this, one of which is that some market participants decided that 2013 was a good time to sell silver and were unconcerned by the price fall. Coupled with this, some scrap suppliers, who had not got around to selling in 2012, did sell in 2013. Due to the huge increase in gold scrap in previous years, many refiners were uninterested in silver and actually turned down the business; this was not the case in 2013, where refiners and collectors were only too happy to take silver. Indeed many collectors and processors needed to maintain business volumes and were willing to take lower grade scrap silver in order to try and maintain throughput as much as possible.

The picture across the continent and within various other source areas, however, was far from uniform. Field research indicates that scrap was down particularly strongly in the United Kingdom, and that scrap from electronic and industrial sources was more stable. Meanwhile, the contribution from photographic scrap continues to fall, as the silver yield of old X-rays continues to slide. The number of photo archives available for liquidation, especially in hospitals, has dropped off due to both the digitizing of photographs and the availability of scans. Having said that, legislation in several countries, including France and Belgium, means that hospital photo archives will continue to exist, thus remaining a source of silver in the coming years.

Silver recycled from scrap material collected in the United States fell to 46.9 Moz (1,457 t). This was the second consecutive annual decline in scrap supply from the country. The decline in silver prices was a large factor behind this steep drop, as lower prices reduced the flow of high-grade material such as jewelry, silverware, and coins. Improved economic conditions in the country also reduced jewelry scrap sales, as households' disposable incomes rose. Scrapped photographic material flows also

### World Scrap Supply



Source: GFMS, Thomson Reuters

fell in line with the decline of the industry. While high-grade material accounts for the bulk of scrap generated in the United States, scrap flows from lower-grade material has been rising in recent years. Electronic waste feedstock has been rising at a healthy pace, but the silver recycled from these increased feedstock volumes has mostly been flat due to thrifting of precious metals in mobile devices and computers. Silver recycled from clothing, and other textiles that use silver to reduce odors has also been on the rise in the country.

In India, scrap supply declined sharply to 5.4 Moz (169 t) compared to 24.8 Moz (771 t) in 2012. That said, the 2012 number has been downwardly revised from the initial estimate of 27.1 Moz (842 t). The decline last year was largely a result of the sustained decline in prices from the beginning of the year. Carat jewelry scrap was also largely absent after the price moved below Rs. 55,000 in March and only came back in low volumes during late August. Much of the contribution we understand has emerged from the electrical and electronic industry, which would include plating and oil refineries.

Last year, silver scrap across East Asia fell by 6% to 71.0 Moz (2,208 t), the first decline since the recessionary impact of 2008. Despite the sizable drop, scrap supply for the region remained the second highest on record as strong growth in industrial fabrication (chiefly China) in recent years has delivered an uptick in the level of recycling.

Elsewhere across Asia, scrap volumes were weaker almost across the board as the 24 % drop in the dollar silver price helped reduce recycling. China saw its silver recovery decline for the second year in succession,





Table 4 - Supply of Silver from the Recycling of Old Scrap

© GFMS, Thomson Reuters /The Silver Institute

(million ounces)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>Europe</b>										
Germany	19.2	17.6	15.1	15.1	14.6	12.6	14.9	16.7	21.6	17.3
Russia	10.4	8.6	8.4	8.8	8.3	8.4	11.5	11.1	10.9	10.0
Italy	3.3	4.3	5.5	5.6	5.9	5.8	6.5	9.7	9.9	8.7
UK	12.4	11.6	10.9	11.2	10.9	10.2	6.4	11.3	9.8	7.2
France	3.8	4.1	4.5	4.6	5.1	5.5	6.2	7.0	5.9	5.2
Austria	1.6	1.3	1.3	1.2	1.2	1.1	1.1	1.2	1.2	1.2
Spain	0.4	0.4	0.4	0.4	0.5	0.5	0.7	1.3	1.3	1.1
Turkey	1.5	1.3	1.1	1.0	1.1	1.1	1.0	1.2	1.0	1.0
Netherlands	1.4	1.4	1.3	1.1	1.1	1.0	1.1	1.2	1.2	0.9
Sweden	1.0	1.0	0.9	0.9	0.9	0.8	0.8	0.9	0.9	0.7
Belgium	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.6
Denmark	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4
Portugal	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Finland	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.3
Norway	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Greece	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3
Czech Republic	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2
Poland	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.2
Switzerland	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Other Countries	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.5
<b>Total Europe</b>	<b>59.3</b>	<b>55.5</b>	<b>53.4</b>	<b>53.8</b>	<b>53.3</b>	<b>50.5</b>	<b>54.1</b>	<b>65.6</b>	<b>67.9</b>	<b>56.6</b>
<b>North America</b>										
United States	55.6	57.0	53.2	53.6	55.4	54.4	64.8	76.4	68.9	46.9
Mexico	1.9	2.1	2.3	2.7	3.1	3.2	4.0	4.5	4.7	3.5
Canada	1.4	1.5	1.4	1.6	1.7	1.5	1.6	1.8	1.6	1.1
<b>Total North America</b>	<b>58.9</b>	<b>60.5</b>	<b>57.0</b>	<b>57.9</b>	<b>60.2</b>	<b>59.1</b>	<b>70.4</b>	<b>82.7</b>	<b>75.2</b>	<b>51.4</b>
<b>South America</b>										
Brazil	1.0	1.0	1.0	1.0	1.0	1.1	1.5	2.5	2.5	2.1
Argentina	0.6	0.6	0.8	0.6	0.5	0.4	0.6	0.7	0.7	0.6
Chile	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.6	0.5
Other Countries	0.6	0.8	0.9	0.8	0.8	0.7	1.0	1.3	1.2	1.0
<b>Total South America</b>	<b>2.7</b>	<b>2.9</b>	<b>3.2</b>	<b>3.0</b>	<b>2.8</b>	<b>2.7</b>	<b>3.6</b>	<b>5.2</b>	<b>5.1</b>	<b>4.3</b>
<b>Asia</b>										
China	15.2	17.5	20.4	22.5	22.7	25.3	29.2	31.9	30.9	30.1
Japan	28.3	27.4	26.0	25.7	23.7	21.3	20.9	23.0	21.3	20.0
South Korea	7.2	7.3	7.7	7.8	7.7	8.4	9.4	10.0	9.1	8.4
India	11.7	17.2	22.7	16.1	13.8	15.0	17.9	20.6	24.8	5.4
Taiwan	2.7	2.7	2.8	2.9	3.1	3.6	4.1	4.5	4.3	3.6
Thailand	2.4	2.2	2.6	2.7	2.9	3.1	3.7	3.7	3.2	2.8
Saudi Arabia	1.3	1.6	1.8	1.9	1.9	1.9	2.2	2.3	2.2	2.0
Singapore	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5
Hong Kong	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.4
Israel	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4
Indonesia	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4
Pakistan	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.6	0.6	0.4
Egypt	1.4	1.4	1.5	1.5	1.7	1.8	2.0	0.9	0.8	0.4
Vietnam	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3



Table 4 - Supply of Silver from the Recycling of Old Scrap

© GFMS, Thomson Reuters /The Silver Institute

(million ounces)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Oman	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Other Countries	1.3	1.2	1.3	1.4	1.3	1.4	1.7	1.8	1.8	1.5
<b>Total Asia</b>	<b>73.7</b>	<b>80.8</b>	<b>89.3</b>	<b>85.0</b>	<b>81.3</b>	<b>84.2</b>	<b>94.1</b>	<b>101.9</b>	<b>101.2</b>	<b>76.8</b>
Africa										
Morocco	1.3	0.6	0.9	0.9	0.9	1.0	1.0	1.1	1.1	1.0
Other Countries	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.5
<b>Total Africa</b>	<b>1.8</b>	<b>1.2</b>	<b>1.5</b>	<b>1.5</b>	<b>1.5</b>	<b>1.6</b>	<b>1.7</b>	<b>1.8</b>	<b>1.8</b>	<b>1.5</b>
Oceania										
Australia	2.0	1.8	1.7	1.7	1.6	1.6	1.6	1.6	1.4	1.3
<b>Total Oceania</b>	<b>2.0</b>	<b>1.8</b>	<b>1.7</b>	<b>1.7</b>	<b>1.6</b>	<b>1.6</b>	<b>1.6</b>	<b>1.6</b>	<b>1.4</b>	<b>1.3</b>

easing 3%, as industry held onto working inventory and industrial scrap in the lower price environment; the exception was ethylene oxide (EO) change-outs which increased by double-digits on the previous year.

This outcome was broadly repeated across South East Asia, with the lower price profile and disappointing economic conditions for much of the region impacting consumer spending and limiting the purchase or replacement of new electrical or electronics household appliances. This, in turn impacting on scrapping of old or expired inventory; limiting the supply of this potential metal into the supply chain. Singapore and South Korean silver scrap receipts both declined by 7% last year. Larger falls were witnessed in Thailand (12%) and Taiwan (15%), the former as a result of a sizable drop in working inventory remelt and the latter a drop in industrial collection.

Scrap supply in Japan retreated by 6% to 20.0 Moz (623 t). This marks the third successive decline and remains a function of weaker electronic scrap collection as consumers held on to old appliances in a uncertain economic environment and weaker yen silver prices. As was the case in 2013, silver recovered from old X-ray films held up well, field research finding that volumes actually increased marginally, thanks to government regulations that stimulate that personal records must be archived for a certain period before being recycled and, in addition, field research last year found there was some market share gains from recyclers abroad.



## 6. Silver Bullion Trade

- **The United Kingdom is a major trading and clearing center for silver and its net trade figures are therefore important for the market. Net UK bullion imports narrowed to approximately 114.5 Moz (3,561 t) in 2013.**
- **North American bullion imports continued its downward trend, partly due to a decline in jewelry fabrication demand from the United States. However global demand for official silver minted coins was also stronger last year.**
- **Indian silver bullion imports reached a new record high of 187.1 Moz (5,819 t), three times the level of imports in 2012 and 15% higher from previous record attained in 2008. This was despite import duty rising (in two phases) from 6% to 10% by year-end.**
- **Demand from East Asia rebounded due to higher industrial fabrication demand from China and Japan. China remained in oversupply, however. Silver bullion imports declined by 17% and exports jumped 45%.**

### Europe

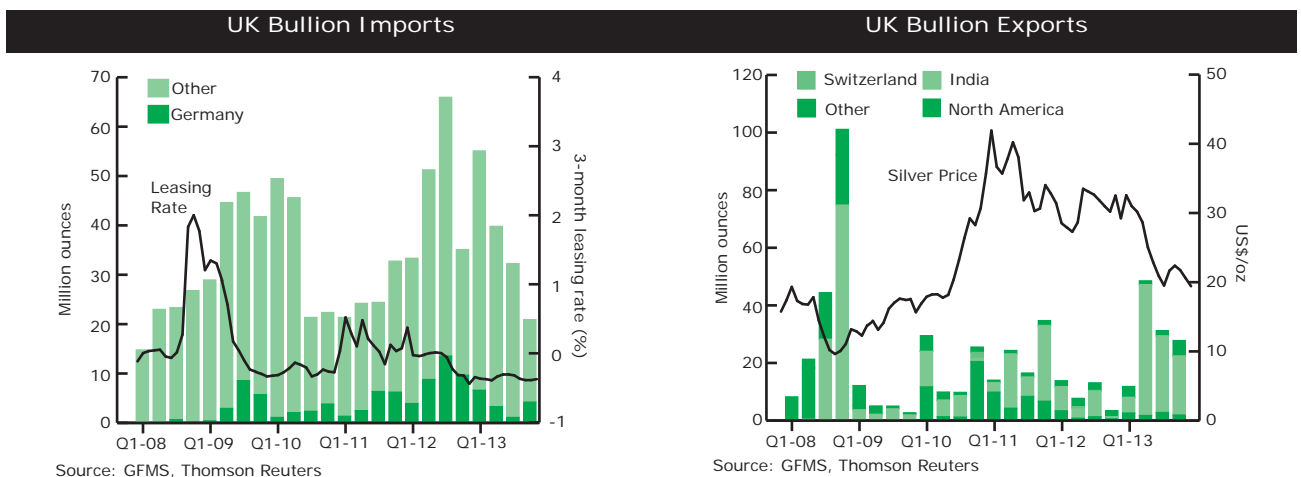
Europe (excluding Russia) is traditionally one of the world's main deficit regions as fabrication demand exceeds mine supply and locally generated scrap, and this deficit expanded in 2013. Fabrication rose by less than 2% to 159.3 Moz (4,955 t), while mine and scrap supply decreased by 5% and 18% respectively, to a total

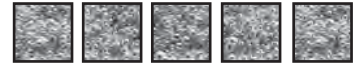
of 106.3 Moz (3,306 t). Europe's fundamental deficit widened to 25.7 Moz (799 t), compared to a modest deficit of 9.0 Moz (280 t) in 2012. The decrease in mine output and scrap supply were due primarily to the lower silver price, which dropped 35% in 2013. Part of this resultant gap was covered by imported scrap, but that still left room for imports of refined bullion, doré and concentrates.

In 2013, UK exports of bullion rose by 228% to 119.3 Moz (3,711 t), mainly driven by the surge of demand from India (shipments to India increased by 363% to 97.8 Moz (3,041 t), representing 81.9% of the total exports), as a lack of availability of gold prompted many traders and investors in India to turn to silver. Exports to Canada also saw a 40% increase to 8 Moz (252 t), partly driven by higher demand and issued volume on official silver coins, which rose by over 60% last year.

UK bullion imports registered a 23% increase to 233.8 Moz (7,272 t) in 2013, predominantly driven by Switzerland, Russia, and China. Imports from Switzerland surged by 381% to 61.9 Moz (1,925 t), making Switzerland the largest source with 26% of the total silver imports. The second largest origin, Taiwan, recorded a substantial rise of 61% to 37.4 Moz (1,164 t), or 16% of the total imports. The large import volumes were mainly associated with operations by big commercial banks, and were attributed to increased jewelry exports.

As reported by country of origin, Swiss bullion imports in





2013 declined by 32% to 47.0 Moz (1,461 t). Kazakhstan remained the largest supplier, with a 14% increase in shipments to 18.6 Moz (578 t), representing close to 40% of the total imports. Most of the Latin American countries also contributed to the decline, probably due to a lower mine output. As not all origins report outflows, we believe that the true level of imports might have been somewhat higher though.

Swiss exports, as reported by country of origin, surged by almost 200% to 91.2 Moz (2,836 t), predominantly driven by the United Kingdom, as flows recorded to that destination surged by over 380% to 61.9 Moz (1,925 t). On the other hand, exports to India also increased by over 260% to 8.3 Moz (257 t), as a limited availability of physical gold prompted the local investors to switch to silver. However, we are led to believe that this figure (and, therefore, the above assembled Swiss total) understates the true scale of these flows.

Official German figures showed that bullion imports increased by over 30% in 2013 to around 17.3 Moz (539 t). Sweden was the largest exporter of silver to Germany, registering close to 25% of the total imports. Shipments from Turkey, Austria, the United Kingdom, Poland, and the Czech Republic all grew substantially, while imports from Switzerland fell by 16%. The strong increase in silver imports was in conjunction with Germany's silver jewelry exports for the year, where about half of the total were being exported to the United Kingdom, Italy, and France.

Germany's export figures showed a 23% decline in 2013 to 41.6 Moz (1,294 t). However, when we add data for those destinations recording inflows from Germany that

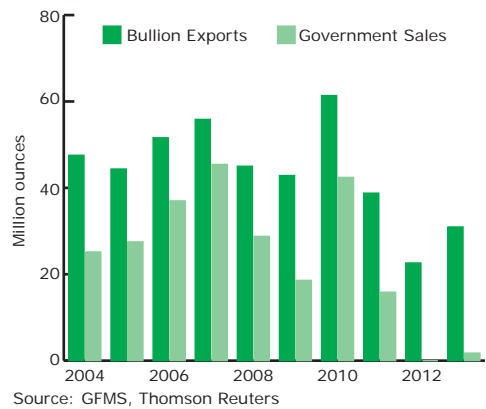
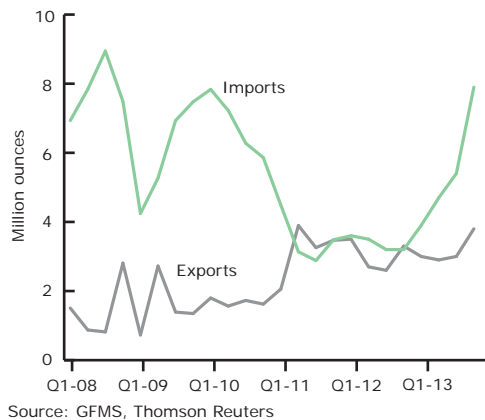
are missing in the latter's statistics, true exports were around 56.5 Moz (1,756 t); this was only 3% lower compared to the previous year. The vast bulk of silver were exported to Italy, Austria, and the United Kingdom, representing over two-thirds of the total exports. The decline in exports was mainly driven by reduced shipments to the United Kingdom and Switzerland, which fell by 67% and 60% respectively.

Silver bullion imports into Italy jumped by over 62% last year to 21.8 Moz (679 t), with Germany being the largest exporter, shipping over 68% of Italy's total silver imports. Meanwhile, Italy's silver exports increased by 4% to 12.7 Moz (396 t), with shipments to Switzerland decreasing by 27% to 4 Moz (128 t); shipments to Spain, instead, grew by over 1,460% to 2.8 Moz (86 t). The net imports of 9.1 Moz (283 t) were clearly insufficient to cover a fabrication demand of 26.6 Moz (828 t). With a 12% decline in domestically generated scrap, the gap was mainly filled by imported material, which rose by 8% to 208 Moz (6,470 t), while over 28% of the total emanated from the United States.

Turning to Russia, estimates pointed to a double-digit increase in silver bullion imports last year, mostly from EU countries. Imports from India and the United States also doubled. Meanwhile, silver exports also increased, predominantly driven by India, as flows recorded to that destination increased by over 100% to 11.2 Moz (348 t).

Exports from Kazakhstan remained flat last year, with Switzerland purchasing over 60% of the total exports, up from a 52% market share in 2012.

**Official Italian Bullion Imports & Exports**      **Russia Bullion Exports & Russian Government Sales**





### The Americas

During 2013, silver bullion imports into the United States decreased by less than 5% to 123.3 Moz (3,835 t). This represented a 27% contraction from the record levels of 168.9 Moz (5,253 t) witnessed in 2011. The primary reason behind the decline was a decline of over 15% in jewelry fabrication.

In 2011, the number of countries shipping metal to the United States grew markedly on the back of higher fabrication and the absence of shipments from the lead/zinc smelter, La Oroya, in Peru. This resulted in a general shortage of loco-United States silver in high purity form to feed demand. However, although this situation unwound somewhat in 2012, the operation at the La Oroya smelter continued to be plagued by environmental issues, as well as seeking additional capital and business restructuring. Imports from Peru decreased by 14% last year. Meanwhile, Mexico remained the largest silver exporter to the United States, but shipment volumes fell by over 15% year-on-year.

Exports from the United States fell last year, mainly driven by reduced shipments to EU countries and Canada. On the other hand, exports to India and Italy rose substantially, where the demand for silver jewelry surged.

In Canada, imports continued to fall for the second consecutive year. The drop stood at 24%, or 6.9 Moz (214 t), and was the result of a lower industrial fabrication. The main cut was from the United States, which fell by 48%, or 4 Moz (126 t), while imports from the United Kingdom surged by 70%, or 1.7 Moz (52 t). At the same time, exports increased by less than 3%, with the United States being the main destination (over 95% of the total).

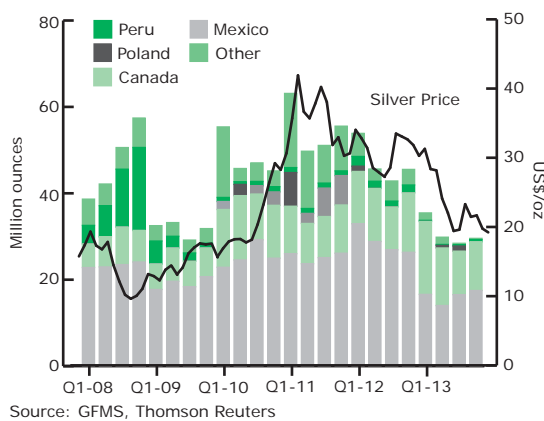
Mexican exports fell by 16% in 2013; this is mainly attributed to a decline in shipments to North American countries. Exports to other Latin American countries, namely Brazil and Colombia, increased. Exports to Hong Kong rose substantially from 0.03 Moz (1t) in 2012 to 0.6 Moz (20t) in 2013.

### Middle East and Indian Sub-Continent

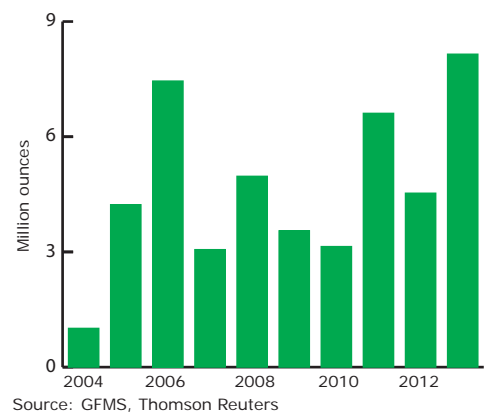
Silver bullion imports into the United Arab Emirates (UAE) recorded a significant increase in 2013, surging by more than 80% year-on-year as increased demand from India saw several banks and traders use Dubai as a regional entrepôt to supply this key market. Imports from Switzerland and Russia accounted for the bulk of the rise (these countries combined adding over 90%) offsetting a sizable drop in supply from Hong Kong and the UK, with the latter falling by almost 100% year-on-year as bullion was shipped directly to India rather than being transshipped or vaulted via Dubai.

Being home now to three LBMA-accredited refineries, Turkey continued to see rapid silver bullion inflows last year. We estimate bullion imports (a combination of fine silver, scrap, and mined doré) reached its highest since 2004, to almost 8.0 Moz (250 t), a year-on-year increase of 32%. Imports were dominated by flows from Switzerland, which stood at more than half of the total. Inflows were also boosted by a material rise in supply from the Czech Republic, China, and Bulgaria. Exports declined by 2% to an estimated 6.7 Moz (207 t), also being dominated by large bar shipments to Germany at an estimated 3 Moz (94 t), or 45% of the total. Direct shipments to India also increased by 18% to 1.8 Moz (55 t), while exports to the United Kingdom fell sharply. Indian bullion imports reached a new record high of

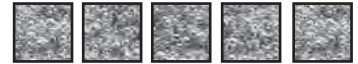
US Bullion Imports



UAE Bullion Imports







187.1 Moz (5,819 t), three times the level of imports in 2012 and 15% higher from previous record attained in 2008. In January 2013, import duty on silver was increased to 6% from 4% and was later increased straight to 10% in August; whereas duty in gold was increased to 8% in June. These higher duties eventually pushed the premium of white metal to London price to as high as 14% in November, as locals stocking up on physical silver.

Looking at the shipments from top five origins, UK was the largest exporter contributing to 37% of the supplies, up from 20% in 2012. This was followed by exports from Greater China (including China, Hong Kong and Taiwan) which was 32%. The growth of exports from UK and China was at the cost of supplies from Russia and South Korea, as their share in market fell from 8% to 6% and 12% to 6% respectively. However, Switzerland retained its status as the fifth largest supplier with a market share of 5%.

Silver in granular form with purity of four 9's and three 9's saw good offtake last year, with our information from sources suggesting a total supply of about 26 Moz (800 t). And top five origin of silver in granular form was the UK, Greater China, South Korea, Turkey and Singapore. At about 14% of the total imports, key reason was attributed to its lower pricing compared to bars and fabricators preferred in this form due to convenience in usage.

Last year notable volumes came via sea route and the LBMA accredited bars were being supplied to India at just 8 cents as the landed price as against norm of 11 cents. That said, sources revealed that large stocks from the vaults of three large bullion banks were being cleared

**Indian Bullion Imports**

Moz	2009	2010	2011	2012	2013
OGL <sup>^</sup>	39.8	93.8	131.0	59.6	181.7
Others <sup>**</sup>	1.2	1.8	1.4	2.2	5.4
<b>Total Imports</b>	<b>41.0</b>	<b>95.6</b>	<b>132.4</b>	<b>61.8</b>	<b>187.1</b>
Local Premium <sup>*</sup>	4.3%	7.8%	5.8%	7.3%	11.0%

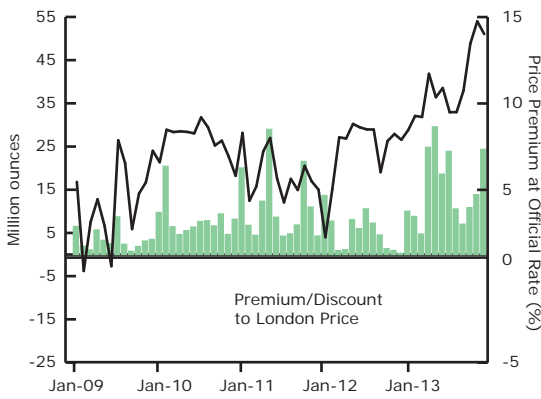
<sup>^</sup>Open general licence  
<sup>\*</sup> average percentage above London price at the official exchange rate (including all local duties and taxes)  
<sup>\*\*</sup> includes Direct Imports, Non-Resident Indians, Special Import Licence, and Replenishment Imports (i.e. Imports of silver bullion for manufacture and re-export).

Source: GFMS, Thomson Reuters

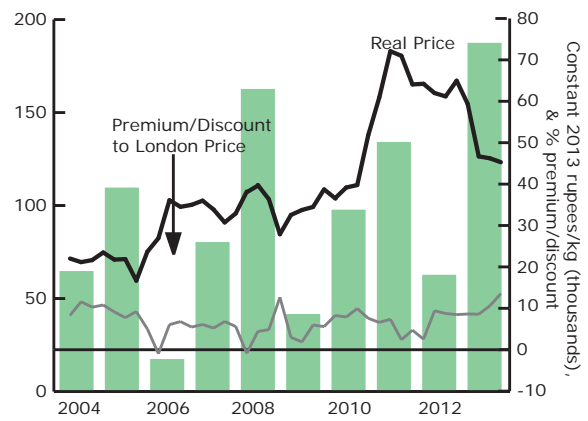
and had made its way to India at far lower margins. And the offtake in India was good for the reason that the arbitrage on the landed price to futures helped earn an annualized return of at least 13%. Further looking at domestic stock movements, imports were highest to New Delhi absorbing near 40% of the market share of total imports. That said, according to our sources more than 41.8 Moz (1,300 t) were consumed within the neighborhood district of Agra; the place famous for silver jewelry manufacturing and trading. This was followed by Ahmedabad from where again most if it was directed to Rajkot, another key fabricating region.

The supply of total refined silver from the Hindustan Zinc Ltd (Vedanta Resources) in 2013 rose by 6% to 12.2 Moz (376 t). Looking forward, local supply is likely to grow by single digit in 2014.

**Gross Monthly Indian Bullion Imports      Indian Bullion Imports**



Source: GFMS, Thomson Reuters





## East Asia

The imports of silver from China discussed here consist of metal inflows derived from base metal concentrates as well as the import of silver in bullion form. Almost 93% of the silver arriving in China in 2013 was in the form of concentrates, the import of which rose marginally last year by 2.6% to a new historical high of 166.7 Moz (5,186 t) of contained silver. This augmented level of concentrates imports was in line with a long-term upward trend that has seen volumes swell five-fold over the last decade. Growth in base metal demand as well as a growing refining capacity were the key drivers behind these higher imports, but the marginal growth rate reflected a slowing economy.

Imports of silver bullion declined last year by 17% to a calculated volume of approximately 5 Moz (155 t). Imports from Switzerland and Taiwan continued to decline, while imports from Japan and Australia increased last year.

Looking at bullion exports, official trade statistics reversed the downward trend, with the Chinese outflow increasing by 45% last year to 39 Moz (1,214 t). However, this is still a far cry from the historical high in 2006, when exports were recorded at 156 Moz (4,850 t). On the other hand, previous export volumes, particularly between 2006 and 2009, when average exports exceeded 128.5 Moz (4,000 t), had likely been inflated by round tripping between China and Hong Kong (designed to claim the VAT rebate on exports from China). Silver round tripping appears to have abated in the past two years due to the absence of export tax rebates and weaker silver prices. Not surprisingly, Hong Kong continued to be the main destination for China's silver exports, with 80% of the metal being shipped there. Outflows to Thailand and Taiwan also increased by 60% and 38% respectively.

An improving housing market (higher demand for household electronics) and the continued development of the solar power industry spurred silver demand in China. With solar-panel prices falling and government ramped up subsidies, China became world's biggest solar market last year, after a two-year slump for manufacturers in the industry. In 2013, China installed a record 13 GW of solar power, doubling its rate of solar installations and taking the record for any one country's installation in one year (the previous China high was 8GW). With Chinese government officials concerned about high levels

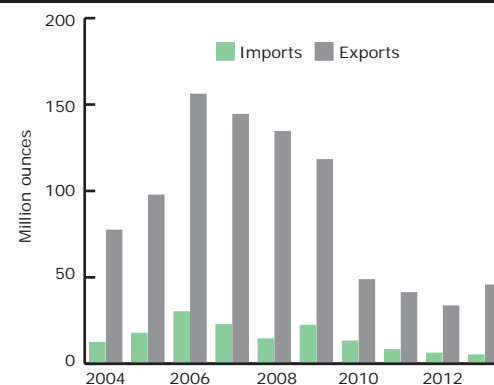
of air pollution which plague many of China's cities, we expect continued rapid development of renewable energy. The Chinese government is targeting up to 14 GW of additional solar capacity this year, and raised its target for solar generating capacity from 21 GW to 35 GW by 2015. A typical photovoltaic solar panel uses roughly 20 grams of silver.

Having said that, there is still an oversupply of silver in China. With the local economy, export growth and manufacturing industries all slowing down, China's appetite for import silver may continue to wane in 2014.

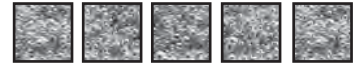
According to official import statistics, silver bullion imports into Hong Kong increased marginally to 30.5 Moz (948 t). China continued to be the largest supplier, constituting over half of the total supply. Shipments rose by 16% to 17.6 Moz (548 t), still a far cry from the level of around 128 Moz (4,400 t) witnessed in 2006 but, as explained above, this was partly due to round tripping. The largest origin outside China remained South Korea, which saw deliveries decline by 24% to 6.5 Moz (203 t), accounting for a fifth of the total imports. Flows from Kazakhstan, Mexico, Australia, Singapore, and South Africa all recorded material gains. On the other hand, bullion inflows from Taiwan, Japan, Indonesia, and Canada all posted notable falls.

Exports declined by 6% last year, chiefly as the bullion flows to Taiwan shrunk by half to 26.7 Moz (830 t). In contrast, exports to India rebounded substantially, from 13.3 Moz (414 t) in 2012 to over 42 Moz (1,300 t) in 2013, reflecting strong fabrication demand. Elsewhere, shipments to Japan and Singapore were significantly

### Chinese Official Bullion Imports and Exports



Source: GFMS, Thomson Reuters



stronger, while flows to the United Kingdom and Thailand declined.

Last year, Taiwan's silver imports fell by 55% to 27 Moz (840 t), the lowest level since 2008. The decline can be contributed to a lackluster demand of silver from the electronics and jewelry sectors, which fell 46% and 50% respectively. Taiwan imported over 75% of its silver from China, while shipment volumes fell 38% year-on-year. Import volumes from Hong Kong also decreased by 86%.

On the other hand, Taiwan's silver exports rose substantially, jumping from 0.2 Moz (7 t) in 2012 to 0.8 Moz (24 t) in 2013. This might reflect the sluggish environment of the industrial sectors in Taiwan, and hence less demand for silver.

Singapore's imports rose by 8% to an estimated 4.1 Moz (127 t) last year. Imports from Indonesia jumped from 1.0 Moz (27 t) in 2012 to 2.6 Moz (81 t) in 2013, representing over half of the total imports. However, imports from South Korea and Germany declined by an estimated 70% and 30% respectively. Bullion exports were more than doubled in 2013, mainly driven by flows to India, Taiwan, and Malaysia.

In 2013, silver bullion imports into Thailand rose by over 13%, to an estimated 21.6 Moz (671 t), primarily as a result of stronger demand from the jewelry fabrication sector. However, last year's imports figure is still the second lowest in the last 23 years.

Combined imports from Hong Kong and the Chinese Mainland still dominated bullion imports, although the

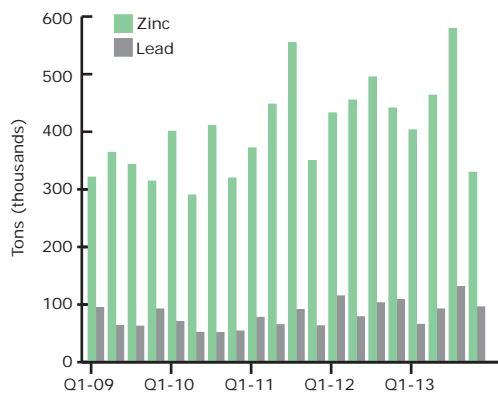
total share dropped to 44% last year. Shipments from Germany were more than doubled, while imports from South Korea also surged by 47%.

Meanwhile, Thailand's exports declined by over 40% year-on-year, with reduced in shipment volumes to Japan, Malaysia, Hong Kong, Italy, Taiwan and Singapore. Only shipments to Indonesia and Vietnam increased, but not enough to reverse the decline.

Following the peak of 9.2 Moz (286 t) in 2006, South Korean imports remained flat last year at approximately 1.1 Moz (33 t). Imports from Kazakhstan dominated the inflow (76% of the total), while shipments from China rebounded. Exports, on the other hand, fell by 8% to 69.2 Moz (2,151 t). This decline can be mainly attributed to a fall in shipments to Singapore, the United Kingdom, and China, which fell by 90%, 86%, and 27% respectively. Exports to Hong Kong more than doubled.

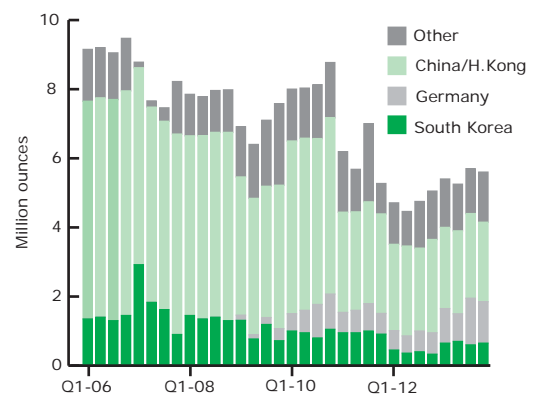
Japan's silver bullion imports increased by 8% to reach 54.3 Moz (1,688 t) last year. Imports from South Korea rose by 25% and constituted close to 90% of the total imports. Imports from the United States also increased by close to 50%. On the other hand, imports from Mexico dropped by 50% to 5 Moz (156 t). Turning to exports, the total outflow dropped by 69% to 3.5 Moz (108 t). Despite total shipments to the United Kingdom declining by 76%, the UK still absorbed 68% of the total outflow from Japan last year.

Korean Lead and Zinc Concentrate Imports



Source: WBMS

Thai Bullion Imports



Source: GFMS, Thomson Reuters



## 7. Fabrication Demand

- **World physical demand increased 13% in 2013 to a record high, taking the total to 1,081.1 Moz (33,624 t).**
- **Industrial fabrication slipped by less than 1% in 2013, the third fall in succession, to 586.6 Moz (18,244 t) as benign economic growth and further substitution and shifting losses impacted demand.**
- **Jewelry offtake rebounded 10% to a record high of 198.8 Moz (6,185 t) as lower prices and an improving global economic climate boosted consumption.**
- **Silverware fabrication jumped 12% last year to a three-year high with developing world again offsetting a decline in most western markets.**
- **Silver used in photographic fabrication saw further substantial losses last year, declining 7% to 50.4 Moz (1,567 t)**
- **Following a drop in offtake in 2012, coin minting surged 38% last year to a record level (based on our data series) of 118.5 Moz (3,684 t).**

In 2013, total physical demand, which under our new methodology also includes net consumption of investment bars, increased 13% last year to a record high of 1081.1 Moz (33,624 t). Using the old methodology, and excluding private investment, last year delivered

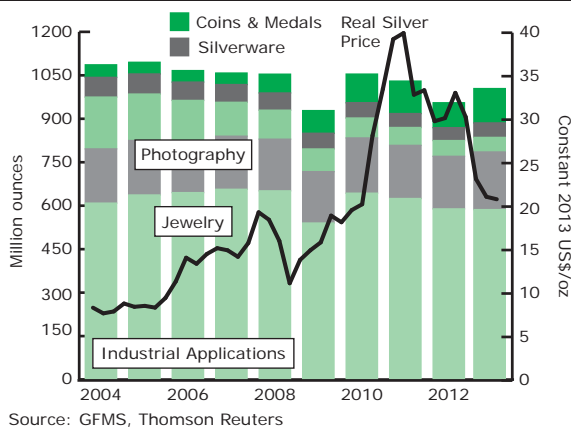
a 5% annual rise, returning to growth after a 7% fall in 2012; however, offtake remained 8% or 90.7 Moz (2,822 t) below the peak recorded in 2005. The uncertain macroeconomic environment was again central in influencing industrial demand in 2013. Despite signs of a US led recovery, Europe remained moribund by virtue of its fragile economy, while China also witnessed a drop in GDP expansion. This dragged down industrial demand, which slipped marginally to 586.6 Moz (18,244 t).

Despite a return to production growth last year, demand for silver used in photovoltaic cell fabrication suffered a further fall last year, a casualty of improved technology that has seen the silver loadings per cell reduced. The largest percentage gain in 2013 was recorded in the combined coin minting and investment bar segment, which surged by over 76% year-on-year.

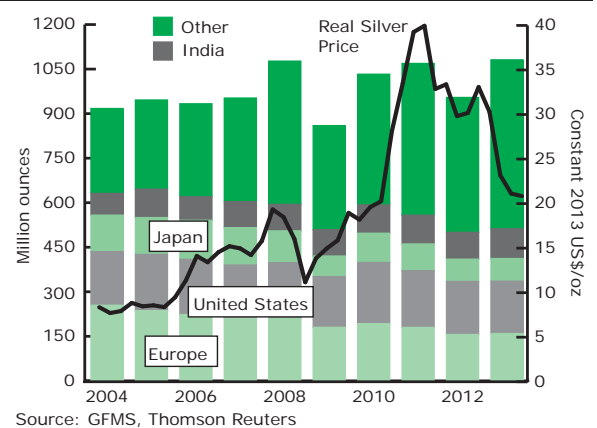
Elsewhere, jewelry fabrication returned to growth in 2013, jumping 10% year-on-year to a record high of 198.8 Moz (6,184 t). The annual rise, the first in three years, was assisted by an improving economic environment in the industrialized world, coupled with a price driven recovery from the developing world.

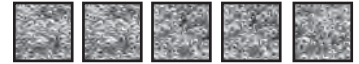
Silverware demand also returned to growth (for the first time in eight years), rising by 12% year-on-year to 50 Moz (1,556 t), with most of the growth attributed to rising demand from India and China which together contributed over 60% of the global total.

World Silver Fabrication (by category)



World Silver Fabrication (by region)





## Industrial Applications

- **Industrial demand in 2013 declined for the third year in succession, easing 0.4% to 586.6 Moz (18,244 t), largely as a result of the benign economic performance in Europe, though falls were recorded in most key markets.**
- **A 9% rise in Chinese demand and a modest lift from Japan failed to offset weaker demand from key western markets, with North America and Europe slipping by 7% and 3% respectively.**

Global industrial offtake fell by less than 1% in 2013 to an estimated 586.6 Moz (18,244). While last year's fall was only at the margin it signified the third successive annual fall which left demand 11% or 70.1 Moz (2,181 t) below the peak recorded in 2007 prior to the financial crisis. The macroeconomic outlook still played a central role in industrial fabrication offtake last year with the lack of clear recovery impacting on industry investment, and, at a consumer level, the willingness to spend in an uncertain economic environment.

While the US economic recovery was at best modest, it did provide the platform for improved consumer sentiment and a notable rise in retail spending. However, the same could not be said for parts of Europe which remained moribund due to the regions minimal growth, high unemployment, and on-going debt crisis. An economic slowdown in China last year also impacted on demand, while fabrication demand across South East Asia was also impacted by soft domestic economic growth. Aside from the economic factors there remained pressures from ongoing thrifting and substitution.

This is most notable in the area of PV, where new technologies are reducing the volumes of silver consumed in this application. Furthermore, silver is also being substituted in other areas, though the process is more gradual and is limited by the sheer difficulty in finding a suitable replacement that can offer the same quality of output as the white metal. While some segments of industrial demand have waned in recent years there has been some very strong gains in other fields, most notably in ethylene oxide catalysts and also by use within the automobile industry.

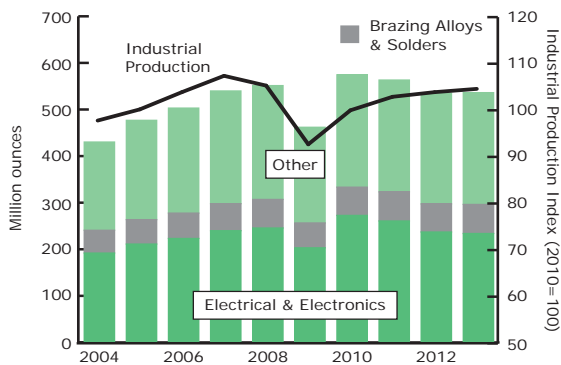
On a regional level, fabrication was strongest in Asia, bolstered by the 9% growth in China. Removing the Asian giant from the mix delivers a more accurate assessment of the region, which eased 2%. Elsewhere, Europe retreated by 3% in 2013, while offtake in North America declined by 7% year-on-year to a four-year low.

### Europe

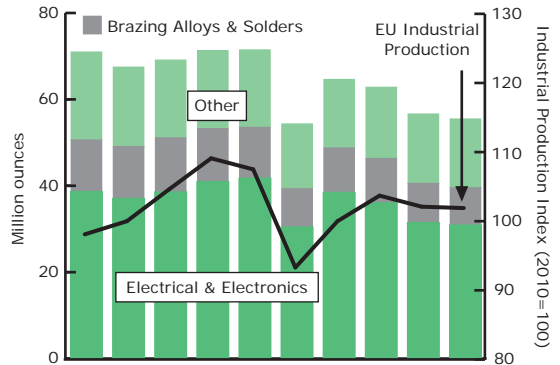
European silver industrial demand fell by 3% last year to 94.8 Moz (2,949 t), posting a third annual consecutive fall, with declines witnessed particularly across the western-based countries. Although the drop was somewhat slower compared to the previous year, all countries in the region continued to suffer from the same main factors that has been a drag on demand for years in a row.

Most manufacturers surveyed continued to state that the weak economic progress in the region continued to hamper their growth prospects and influence their willingness towards significant investment commitments as further cost reduction pressures persist. However,

## Components of Industrial Applications      EU Industrial Fabrication



Source: GFMS, Thomson Reuters; OECD



Source: GFMS, Thomson Reuters; OECD





not only has the private sector has been affected by this condition, in the public sector budget constraints are also hampering investment decisions with hospitals postponing their conversion from analogue to digital equipment.

The second and third factors impacting industrial demand find their derivation from the already outlined cost cutting exercise surrounding continued substitution and thrifting. Indeed, across the whole industry as well as the various applications in which silver is used, the pressure to reduce the amount of metal per unit continued last year with various levels of success. The rate of decline decreased last year, driven in part by a reduction in the ability to reduce silver content without starting to compromise on quality and functionality on the various products. Substitution also continued as well, with various cheaper base metals (e.g. copper), finding their inroads in solar cells and other applications. Moreover, certain threshold levels in various applications were reached, as many other metals simply don't share the same attributes that silver has, in turn reducing manufacturers' ability to cut costs further without any significant compromising effects.

The above developments had a negative impact on parts of the industry. Indeed, Europe has already witnessed a string of solar cell related bankruptcies due to overcapacity in the industry and competition from China, resulting in a significant re-allocation of production capacity for silver-containing products. In addition, photographic fabrication has been in decline for over a decade and has forced companies to centralize their production facilities with little prospects for improvement. The drive towards new applications that could revive the usage of silver in industrial applications is strong, but so

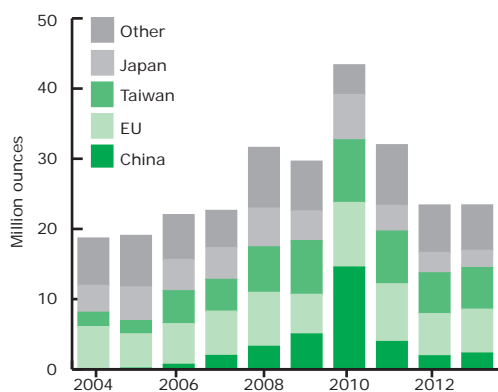
far no real breakthrough has been established. Various promising technologies are on the horizon, of which one is related to LED applications that could find a reasonable wide adoption and have some kind of a positive impact. But that is not to speak of a regional wide revival, as at present this is only going to stall the declining trend in Europe.

### North America

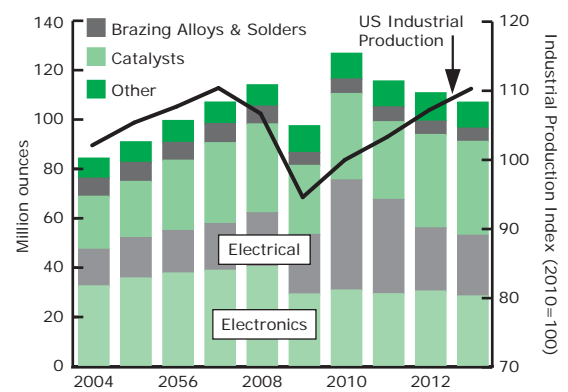
Industrial silver fabrication in the United States fell by 7% to 122.9 Moz (3,823 t). This decline was driven by lower demand for silver paste in solar panels, reduced demand for silver in computers, and thrifting in the electronics industry. Solar panels produced in the United States used an estimated one million ounces of silver last year, down 23% from the previous year. This was largely due to aggressive thrifting of the per-unit content of silver in solar cells as production of solar panels actually increased. The United States is a major producer of silver powder and pastes used in solar panels, actually producing more silver powder and paste than is used domestically for solar panel fabrication. As such, some trade data on silver powder help to support our estimate for the decline in silver fabrication for industrial uses last year. Silver powder exports fell 24%, based on the gross weight of the product, following a steeper 35% drop in 2012.

Demand for silver for use in ethylene oxide catalysts at domestic manufacturing sites was flat last year at an estimated 130,000 ounces. This was solely a function of replacement demand, as no new ethylene oxide production capacity was installed in the country last year. This metal was used to replace silver losses in the refining process. The United States is a significant

## US Silver Powder Exports      US Industrial Fabrication



Source: GFMS, Thomson Reuters



Source: GFMS, Thomson Reuters; OECD



World Silver Fabrication (including the use of scrap) © GFMS, Thomson Reuters / The Silver Institute										
(million ounces)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>Europe</b>										
Russia	24.2	25.6	26.6	29.0	29.9	27.4	30.3	27.8	27.2	27.3
Italy	55.3	50.7	46.6	43.9	39.6	35.2	35.9	28.7	26.2	26.6
Germany	40.4	40.5	41.0	40.2	40.9	33.0	38.3	33.8	27.5	26.3
UK	51.6	42.8	32.6	25.1	23.3	18.9	20.4	22.3	20.3	20.5
Austria	1.1	1.1	1.1	1.1	8.9	10.0	12.1	18.9	9.7	15.2
Belgium	29.0	27.2	29.6	28.2	24.7	19.7	17.9	14.6	13.5	12.2
France	12.8	12.2	12.5	12.9	12.9	9.6	11.1	10.5	9.6	8.9
Turkey	10.3	9.9	8.9	8.0	8.4	7.1	6.5	5.8	5.9	6.7
Poland	4.3	4.7	4.8	4.4	4.2	3.5	3.6	3.1	3.0	3.0
Switzerland	3.0	3.2	3.0	3.0	3.0	2.8	3.0	3.0	2.9	2.8
Spain	6.3	5.6	5.0	4.5	4.2	4.0	4.3	3.3	2.8	2.4
Netherlands	3.3	2.6	2.2	2.3	2.1	1.9	2.0	2.0	2.0	1.9
Greece	2.8	2.6	2.5	2.3	2.2	1.8	1.5	1.3	1.1	1.0
Norway	2.0	1.7	1.7	1.3	1.3	1.0	1.0	1.0	1.0	0.9
Sweden	1.2	1.2	1.2	1.1	1.1	0.9	1.2	0.9	0.9	0.9
Denmark	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.5
Portugal	3.8	1.5	1.2	1.0	0.8	0.8	0.8	0.5	0.4	0.4
Czech Republic	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3
Hungary	0.4	0.4	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
Finland	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1
Romania	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other Countries	1.0	1.0	1.0	1.1	1.1	0.9	1.0	0.9	0.9	0.8
<b>Total Europe</b>	<b>254.5</b>	<b>236.2</b>	<b>223.2</b>	<b>210.9</b>	<b>210.3</b>	<b>180.1</b>	<b>192.5</b>	<b>179.8</b>	<b>156.1</b>	<b>159.3</b>
<b>North America</b>										
United States	180.5	189.5	185.9	179.0	187.7	170.7	205.9	191.1	178.6	176.3
Canada	5.9	6.3	7.1	8.6	13.1	14.8	24.3	30.3	25.5	36.7
Mexico	19.6	20.0	17.5	17.9	16.8	14.4	15.0	13.3	11.5	15.8
Other Countries	0.42	0.55	0.61	0.64	0.90	1.48	1.35	0.92	0.95	1.21
<b>Total North America</b>	<b>206.4</b>	<b>216.4</b>	<b>211.1</b>	<b>206.2</b>	<b>218.5</b>	<b>201.4</b>	<b>246.6</b>	<b>235.7</b>	<b>216.6</b>	<b>230.1</b>
<b>South America</b>										
Brazil	5.6	5.3	3.8	5.6	5.4	5.2	6.1	5.4	5.4	4.6
Other Countries	1.3	1.2	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.3
Argentina	2.5	2.6	1.9	1.7	1.6	1.4	1.4	1.3	1.2	1.3
Peru	0.6	0.5	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.8
Colombia	0.7	0.7	0.7	0.8	0.7	0.6	0.6	0.6	0.6	0.6
<b>Total South America</b>	<b>10.7</b>	<b>10.4</b>	<b>8.4</b>	<b>10.0</b>	<b>9.6</b>	<b>9.0</b>	<b>10.1</b>	<b>9.1</b>	<b>9.0</b>	<b>8.6</b>
<b>Asia</b>										
China	125.9	138.5	151.5	173.7	193.1	186.6	214.5	232.6	239.2	262.5
India	73.0	95.6	79.2	87.7	89.0	88.6	95.2	96.8	90.4	100.1
Japan	123.0	124.1	131.7	125.8	107.1	69.6	98.7	90.1	75.0	76.3
South Korea	23.6	25.5	27.1	29.0	30.7	24.5	29.9	30.3	29.8	28.7
Thailand	37.0	37.0	37.9	37.3	33.8	31.1	30.8	25.2	21.0	21.9
Taiwan	11.2	12.2	14.1	17.2	17.1	12.8	15.6	16.4	14.9	15.1
Indonesia	5.8	5.1	5.7	5.5	5.4	5.4	6.2	6.9	7.5	7.7
Hong Kong	7.4	7.6	8.2	8.7	8.5	7.1	8.2	8.4	8.2	7.7
Saudi Arabia	1.4	3.1	2.1	2.1	0.9	6.1	6.2	3.1	1.8	1.9
Israel	2.6	2.7	2.8	2.7	2.6	2.2	2.1	1.7	1.6	1.8
Vietnam	1.0	1.0	1.1	1.2	1.3	1.3	1.4	1.6	1.6	1.6



World Silver Fabrication (including the use of scrap) © GFMS, Thomson Reuters / The Silver Institute										
(million ounces)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Iran	1.7	1.6	2.6	2.5	3.3	1.5	1.7	1.4	1.3	1.3
Malaysia	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.9
UAE	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.8	0.8
Singapore	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1
Other Countries	8.7	6.1	5.8	6.5	6.5	6.6	7.0	8.6	10.7	10.4
<b>Total Asia</b>	<b>423.7</b>	<b>461.6</b>	<b>471.0</b>	<b>501.2</b>	<b>500.6</b>	<b>444.6</b>	<b>518.9</b>	<b>524.6</b>	<b>504.7</b>	<b>538.8</b>
<b>Africa</b>										
Egypt	2.0	1.8	1.7	1.7	1.6	1.4	1.4	0.6	0.9	0.9
Other Countries	0.5	0.5	0.6	0.6	0.6	0.5	0.6	0.5	0.5	0.4
Morocco	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3
Tunisia	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Algeria	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
South Africa	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
<b>Total Africa</b>	<b>3.5</b>	<b>3.3</b>	<b>3.2</b>	<b>3.3</b>	<b>3.2</b>	<b>2.9</b>	<b>2.9</b>	<b>2.1</b>	<b>2.3</b>	<b>2.2</b>
<b>Oceania</b>										
Australia	8.7	6.7	7.2	9.3	11.6	11.8	14.4	17.1	12.2	14.9
Other Countries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total Oceania</b>	<b>8.7</b>	<b>6.7</b>	<b>7.2</b>	<b>9.3</b>	<b>11.6</b>	<b>11.8</b>	<b>14.4</b>	<b>17.1</b>	<b>12.2</b>	<b>14.9</b>
Net Consumption of Bars*	9.6	11.3	9.0	11.5	122.9	9.7	47.2	100.6	53.4	127.2
World Total	917.1	945.9	933.1	952.3	1,076.7	859.5	1,032.6	1,068.9	954.4	1,081.1

\*Includes all industrial uses, jewelry, silverware and coin fabrication. Net consumption of silver bars is added on a global basis.

producer of silver nitrates and silver oxide. Global silver EO demand increased by an estimated 68% last year, or 2.6 Moz (81.5 t), which likely benefitted US silver nitrate and silver oxide producers last year.

Demand for silver used in electrical contacts rose last year, helping to offset declines in total industrial demand. However, demand for silver used in some electronics products fell, which outweighed growth in demand for use in electrical contacts. Silver used in computers fell as a result of two factors. First, continued thrifting of silver used in computers weighed on demand. Second, shifting consumer demand for smaller devices, notably tablets, has been effectively reducing computer demand. Tablets have been replacing the use of and need for computers.

Silver demand in automobiles rose slightly last year, backed by a 5% increase in automobile production in

United States Industrial Production					
(Index, 2010 = 100)					
	2009	2010	2011	2012	2013
	94.6	100.0	103.3	107.2	110.3

Source: OECD

the country. Silver is used in sensors, such as the fuel level sensor, as well as a variety of other applications in the vehicle. Silver use also rose for brazing alloys and solders as the housing market recovered throughout the year. New housing starts increased 19% in 2013, which helped boost demand from this use. However, it should be noted that growth from this source slowed in 2013 relative to growth seen in 2012.

### India

Last year, Indian industrial silver fabrication declined by 5% from 2012 to 47.2 Moz (1468 t). This, though, is to be viewed against downward revisions to historical series, which has been brought down by an average of 15% over the ten year period. As such this is not a reflection of the industry's performance in previous years but is an outcome of an effort to establish higher accuracy in silver usage per segment. Also these revisions are relevant in sectors dominated by regional players largely seen in the 'other industry' category under our classification. For instance, usages in electroplating, jari, food and foils have undergone downward revision over the last ten years, whereas numbers for electrical, electronics, brazing and soldering were revised downwards only 2011 and 2012.



## Silver Fabrication: Industrial Applications (including the use of scrap)

© GFMS, Thomson Reuters / The Silver Institute

(million ounces)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>Europe</b>										
Germany	23.5	23.9	25.5	27.4	27.5	20.2	26.5	25.4	21.7	21.3
Russia	20.2	20.7	21.7	22.2	21.9	18.7	20.3	19.4	19.1	19.2
UK	49.6	40.9	30.8	23.8	22.0	17.7	19.2	20.7	19.0	17.9
Belgium	28.0	26.6	29.2	27.8	24.3	19.4	17.6	14.3	13.2	11.9
Italy	11.5	10.9	10.9	11.3	11.2	9.0	9.9	9.2	8.6	8.4
France	10.3	10.2	10.4	10.7	10.8	7.5	8.8	8.0	7.2	7.0
Switzerland	2.4	2.6	2.5	2.5	2.5	2.2	2.4	2.4	2.3	2.3
Turkey	1.5	1.5	1.6	1.6	1.6	1.3	1.4	1.5	1.4	1.5
Netherlands	1.6	1.6	1.6	1.6	1.6	1.3	1.5	1.5	1.4	1.4
Spain	2.1	1.9	1.9	1.9	1.9	1.7	1.8	1.4	1.2	1.1
Poland	0.7	0.7	0.7	0.8	0.8	0.7	0.7	0.7	0.7	0.7
Austria	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Norway	0.8	0.7	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4
Sweden	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Czech Republic	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.2
Hungary	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Portugal	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Romania	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Denmark	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other Countries	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
<b>Total Europe</b>	<b>154.3</b>	<b>144.4</b>	<b>139.2</b>	<b>133.8</b>	<b>128.4</b>	<b>101.7</b>	<b>112.1</b>	<b>106.5</b>	<b>97.8</b>	<b>94.8</b>
<b>North America</b>										
United States	149.6	157.2	153.3	148.8	149.3	124.8	151.3	138.2	132.7	122.9
Canada	3.0	3.2	3.1	3.3	3.1	3.1	4.8	6.0	6.6	6.6
Mexico	0.6	1.0	1.7	2.7	2.4	1.3	1.9	1.9	1.8	1.9
<b>Total North America</b>	<b>153.2</b>	<b>161.5</b>	<b>158.1</b>	<b>154.8</b>	<b>154.8</b>	<b>129.2</b>	<b>158.0</b>	<b>146.1</b>	<b>141.2</b>	<b>131.4</b>
<b>South America</b>										
Brazil	4.2	3.7	2.1	3.9	3.7	3.4	4.1	3.8	3.8	2.9
Argentina	2.2	2.2	1.5	1.4	1.0	0.8	0.9	0.9	0.9	0.8
Colombia	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
Other Countries	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
<b>Total South America</b>	<b>7.0</b>	<b>6.5</b>	<b>4.2</b>	<b>5.8</b>	<b>5.3</b>	<b>4.6</b>	<b>5.5</b>	<b>5.3</b>	<b>5.2</b>	<b>4.2</b>
<b>Asia</b>										
China	93.3	102.7	111.1	127.7	145.5	136.7	156.8	164.1	165.4	179.7
Japan	121.1	122.0	129.7	123.6	104.8	67.1	95.8	87.3	71.9	73.1
India	29.4	46.1	44.5	47.0	47.7	46.0	50.7	53.9	49.9	47.2
South Korea	19.0	20.8	22.3	24.1	25.9	19.7	24.5	24.5	23.9	22.7
Taiwan	10.9	11.8	13.6	16.7	16.6	12.3	15.1	15.8	14.3	14.6
Hong Kong	6.1	6.2	6.7	7.1	6.9	5.5	6.4	6.4	6.2	5.8
Indonesia	0.6	0.6	0.6	0.6	0.6	0.5	0.8	0.8	0.9	0.8
Israel	0.7	0.7	0.8	0.8	0.7	0.6	0.7	0.7	0.6	0.7
Saudi Arabia	0.8	2.5	1.4	1.4	0.2	5.3	5.1	2.0	0.5	0.5
Thailand	0.0	0.0	0.9	0.6	0.3	0.5	0.2	0.2	0.2	0.2
Iran	0.2	0.0	1.0	0.9	1.7	0.1	0.3	0.1	0.1	0.1
Malaysia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
UAE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Singapore	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



Silver Fabrication: Industrial Applications (including the use of scrap)

© GFMS, Thomson Reuters / The Silver Institute

(million ounces)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Other Countries	5.0	5.4	5.3	5.8	5.8	5.0	5.5	5.4	5.3	5.2
<b>Total Asia</b>	<b>287.1</b>	<b>319.0</b>	<b>337.8</b>	<b>356.5</b>	<b>357.0</b>	<b>299.4</b>	<b>361.9</b>	<b>361.2</b>	<b>339.2</b>	<b>350.6</b>
<b>Africa</b>										
Morocco	0.3	0.3	0.3	0.3	0.3	0.2	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
Algeria	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Countries	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2
<b>Total Africa</b>	<b>0.7</b>	<b>0.7</b>	<b>0.7</b>	<b>0.7</b>	<b>0.7</b>	<b>0.7</b>	<b>0.7</b>	<b>0.7</b>	<b>0.7</b>	<b>0.7</b>
<b>Oceania</b>										
Australia	6.7	5.0	5.1	5.1	5.1	4.6	4.9	5.1	5.0	5.0
<b>Total Oceania</b>	<b>6.7</b>	<b>5.0</b>	<b>5.1</b>	<b>5.1</b>	<b>5.1</b>	<b>4.6</b>	<b>4.9</b>	<b>5.1</b>	<b>5.0</b>	<b>5.0</b>
<b>World Total</b>	<b>608.9</b>	<b>637.1</b>	<b>645.2</b>	<b>656.7</b>	<b>651.3</b>	<b>540.2</b>	<b>643.2</b>	<b>624.8</b>	<b>589.1</b>	<b>586.6</b>

The decline in demand is chiefly related to a stall in planned infrastructure, commercial and residential projects. The last three years have been the most challenging over the decade with growth beginning to decelerate since 2011. Challenging economic conditions due to poorly managed foreign debt, stalled infrastructure projects and the surge in rupee-dominated silver prices, constrained growth in major end consumption markets. This is best illustrated by reviewing a graph of the index of industrial production; after rising consistently through 2004, it turned lower and has remained sideways since mid-2011. Similarly, the automotive sector has remained flat to lower during same time period. Not the least, silver prices in rupee denominated terms had its contribution in price sensitive segments as annualized average prices from 2011 to 2013 was higher by 70% from the 2010 average price.

Silver use in the electrical and electronic segment declined 14% last year compared to 2012. Meanwhile demand for silver in brazing alloy and solders declined by 13% year-on-year to 2.1 Moz (65 t). The decline in both of these segments can be attributed to a slowdown in approval and implementations of key power transmission and distribution projects following a series of reports on corruption and scams in other related government departments and private companies, eventually leading to

slowdown in demand for LV switchgears. That said, signs of recovery emerged towards end of the fourth quarter with the implementation of key utilities projects, plus efforts to accelerate the processes of rural electrification. Additionally, sales of residential and commercial spaces slowed due to higher prices, higher cost of capital and an uncertain economic horizon. Additionally the need to be ROHS (Restriction of Hazardous Substances) and Europe REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) compliant since June 2013 will see more number of fabricators catering to the export market. In the electrical contact industry, for instance, in an effort to be compliant, cadmium oxide would be phased out, along with products such as silver tungsten and silver tin oxide. Meanwhile, silver mould plates are expected to expand silver usage as infrastructural spending for the twelfth five year plan 2012-17 is projected to be at least 10% of the GDP over the next three years.

In the price sensitive areas, demand recovered in response to the fall in price to the lowest level since 2010. Demand for silver in manufacturing of jari (mix of gold, silver and silk thread used in garments) gained by 22% as against a 55% decline in 2012. There was definitely a greater interest in buying silver in advance as prices declined sharply during last July.

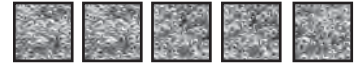
Indian Vehicle Production\*

(units, 000s)	2009	2010	2011	2012	2013
	2,464	3,247	3,600	3,791	4,094
*Summation of passenger cars and light trucks.					
Source: IHS					

East Asia

Industrial silver fabrication in Japan reached 73.1 Moz (2,273 t) last year, some 2% higher than 2012 volumes, returning to growth after two consecutive years of falls. Despite the modest rise demand remained over 40%





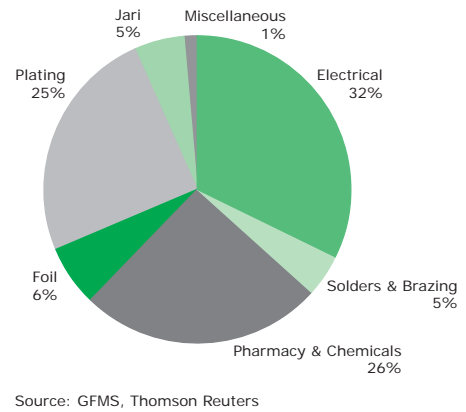
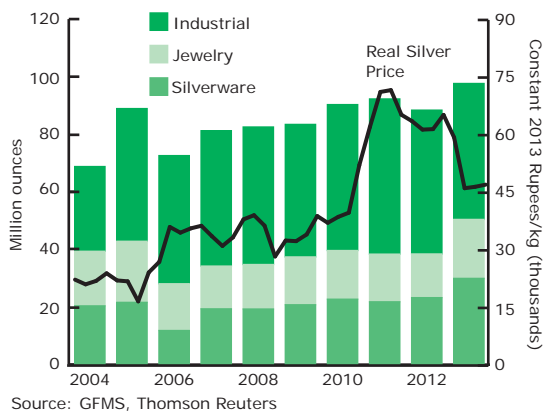
below the peak seen in 2006, impacted thereafter by the global financial crisis, an underperforming domestic economy, and then the major supply chain disruptions in the aftermath of the earthquake and tsunami. It should be noted that this year we have changed our methodology to include silver consumed within the photographic industry as part of our industrial series. In an attempt to turn around the ailing economy the Japanese government, headed by newly elected Prime Minister Shinzo Abe, announced a stimulus package of 10.3 trillion Yen (roughly \$116bn US\$) less than a month after winning the election. The program is aimed at building GDP growth through disaster recovery projects, public works, and financial aid to boost small business. This in turn lifted consumer sentiment and encouraged greater investment spending on the domestic front while the yen fell to a five-year low, which significantly benefitted the export trade.

However, demand growth was by no means buoyant across all industrial sectors in 2013, with weakness in some industrial segments dragging down the annual total. This was chiefly led by a decline in silver consumed in the photovoltaic (PV) sector, the second decline in as many years. Indeed, the fall last year was chiefly a function of an estimated 30% drop in silver loadings per cell as fabricators have looked to lower the volume of precious metal consumed while maintaining performance. To this end cell production actually rose by 7.4% in 2013 on the back of sizable gains in installations domestically – Japan moved into second place globally last year with around 6.9 KW additional capacity added in 2013 (a result of the generous feed-in-tariffs first introduced in July 2012) - and a recovery abroad, though fine silver used during fabrication declined on an annual basis.

Among the individual sectors' performances, the electrical and electronics sector remained steady at 39.2 Moz (1,219 t). Healthy gains in demand for silver consumed in the automobile industry (where silver's heat conductivity is utilized in windscreen heating systems or in signal relays, for example) returned to growth last year, boosted by a rise in domestic demand and strong offtake from the Chinese market in particular. These gains, combined with an improving electronics sector – which was bolstered partly as a function of healthier domestic demand, coupled with a weaker currency which boosted foreign orders - and an improving western economic outlook, where offset by falls elsewhere.

Mention has been made of the drop in silver used in PV production, but brazing alloys was another sector in decline. The GFMS team at Thomson Reuters estimates that demand in this industry segment slipped 8% year-on-year to 2.3 Moz (70.9 t). In this instance the decline was largely driven by weaker export demand and ongoing thrifting that has seen a reduction in the percentage of silver within the alloy, one global fabricator releasing a new product range last year that claimed to reduce the silver content by 10% without impacting on performance. These falls were partially offset by a rise in domestic construction, linked to the government's stimulus package, which boosted offtake for refrigeration and air conditioning units. Demand for silver used in the production of ethylene oxide catalysts at domestic manufacturing facilities were largely unchanged in 2013 at an estimated 47,000 ounces. This was solely a function of replacement demand, as no new ethylene oxide production capacity was installed across the country last year. This metal was used to replace silver losses in the refining process.

**Indian Fabrication** **Indian Industrial Fabrication, 2013**





Japanese Industrial Production						Japanese Non-Photographic Nitrate & Contact Production				
(Index, 2010 = 100)						(million ounces)				
	2009	2010	2011	2012	2013		2010	2011	2012	2013
	87.0	100.0	97.1	97.7	96.9	Non-Photo Nitrates	6.7	5.1	1.2	1.1
						Contacts	4.7	4.0	3.4	3.9
Source: OECD						Source: GFMS, Thomson Reuters				

Chinese silver industrial demand rose for the fourth consecutive year in 2013, rising by 9% to 179.7 Moz (5,590 t), a record high.

The electrical and electronics sector recovered from the post-2011 slowdown by ramping up to 43.9 Moz (1,365 t) in 2013, remaining the largest area of silver industry demand. As in previous years this resulted largely from the outstanding performance of the personal electronic products sector. Smartphone and tablet markets had a stellar year, soaring 23% and 45% respectively, offsetting the slippage in the more traditional electronic sector such as personal computer and 2G cell phone, leading to a 10% increase in total semiconductor production. Looking at the electrical sector, a 16% rise in floor space under construction, bolstered the usage of silver conductors, contacts, switches and fuses application in real estate.

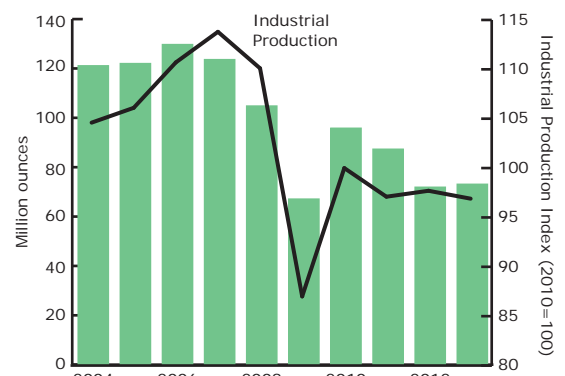
Meanwhile, total sales by the Chinese automobile industry surged by 15% to a record high of 22 million units in 2013. In addition, this sector saw an increasing silver usage in a growing range of automobile applications such as wireless connectivity, in-vehicle infotainment, security systems and sensors.

Turning to silver brazing alloys and solder, demand grew by 11%, the highest percentage rise since 2008, to 34.7 Moz (1,079 t) in 2013. The uptick is partially attributable to the increase in completed floor space in China which fueled the domestic large household appliance demand. According to China Household Electrical Appliances Association, production of refrigerators and air conditioners increased by 11% and 12% respectively, which explains the more than 5% increase in refrigeration compressors which is the primary application of silver in home appliances. The automobile industry also contributed to silver brazing alloy and solder offtake by the vehicle refrigeration compressor installation. Meanwhile, the consistent strong growth in the railway sector, with 5,586 kilometers of new railroad construction last year, pushed demand from this sector higher.

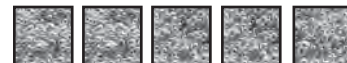
Chinese photovoltaic industry improved considerably last year, with a deal finally reached with Europe quashing the prior uncertainty, and government policy of subsidy, tax rebate, and capital support buoyed domestic demand and production. Solar cell production reached 23 GW in 2013, maintaining the leading position (60%) in the global market, and polycrystalline silicon raised 18.3% to 84,000 t. It is important to point out that the reliance on export for the solar industry has eased significantly, from almost 90% in 2010 to less than 60% in 2013, and new domestic installation rose by 12GW. Although Chinese silver paste fabrication heavily depends on imports of silver powder, mainly from United States and Japan, domestic production of silver powder for the photovoltaic industry did pick up owing to advancing technology of the local silver semis manufacturers as well as the attraction of a promising market outlook.

Silver usage in the ethylene oxide industry soared in 2013 to be more than 2.5 times that of the previous year, reaching 4.5 Moz (141 t). The industry saw almost 800,000 t of ethylene oxide production capacity added in 2013, resulting in more competition and causing price reductions and the industry reaching a tipping point from deficit to capacity surplus. That said, the ethylene oxide industry has been rapidly growing in complexity over recent years with ethylene glycol, ethanolamine,

### Japanese Industrial Fabrication



Source: GFMS, Thomson Reuters; OECD



## The Main Uses of Silver

Silver's unique properties include its strength, malleability and ductility, its electrical and thermal conductivity, its sensitivity to and high reflectance of light and, despite being classed as a precious metal, its reactivity, which is the basis for its use in catalysts and photographic applications. This versatility means that there are few substitute metals in most applications, particularly in high-tech uses in which reliability, precision and safety are critical.

### Industrial

Silver possesses a number of technological qualities that make it ideal for a range of industrial applications. In particular, silver is the pre-eminent electrical and thermal conductor of all metals, which makes it essential in many electrical applications, including conductors, switches, contacts and fuses. This includes the use of silver in electronics in the preparation of thick-film pastes, including silver-palladium for use as silk-screened circuit paths, in multi-layer ceramic capacitors, in the manufacture of membrane switches, silvered film in electrically heated automobile windshields and in conductive adhesives.

Contacts provide junctions between two conductors that can be separated and through which a current can flow, and also accounts for a sizable proportion of electrical demand. Silver provides both exceptional conductivity and ease of electro-deposition from a double-alkali metal cyanide, such as potassium or silver cyanide, or by using silver anodes, at relatively low cost. Silver is also widely used as a coating material in optical data storage media, including DVDs. Conductive silver inks, made from silver paste, are printed onto a variety of devices, including photo voltaic cells, solid state lighting devices, sensors, radio frequency identification tags and plasma display panels.

Batteries, both rechargeable and non-rechargeable, are manufactured with silver alloys (increasingly silver-zinc) as the cathode and are regarded as a rapid growth area. Although expensive, silver cells have superior power-to-weight characteristics over their competitors. The most common of these batteries is the small button shaped silver oxide cell (approximately 35% silver by weight) used in watches, cameras and electrical products, although demand from laptop and automotive industries is growing rapidly. The unique optical reflectivity of silver, virtually 100% reflective property polishing, allows it to be used both in mirrors and glass coatings, cellophane or metals.

Silver is also employed as a bactericide and algicide in an ever increasing number of applications, including water purification

systems, surface treatments and disinfectants. Silver, usually in the form of mesh screens but also as crystals, is also used as a catalyst in numerous chemical reactions. For example, silver is used in formaldehyde catalysts for the manufacture of plastics and, to an even greater extent, in ethylene oxide catalysts for the petrochemical industry. The joining of materials (called brazing if done at temperatures above 600° Celsius and soldering when below) is facilitated by silver's fluidity and strength. Silver brazing alloys are used widely in applications ranging from air conditioning and refrigeration equipment to power distribution equipment in the electrical engineering and automobile industries.

### Photography

The photographic process is based on the presence of light-sensitive silver halide crystals, prepared by mixing a solution of soluble silver, chiefly silver nitrate, with a soluble alkali metal halide such as sodium chloride or potassium bromide. These grains are then suspended in the unexposed film. The effect of light on the silver halide interrupts the structure of this compound, rendering it selectively reducible to metallic silver by reducing agents called developers. The resulting negative image is converted to the positive by repeating the process under specific conditions. Photographic film is used in radiography, the graphic arts and in consumer photography.

### Jewelry and Silverware

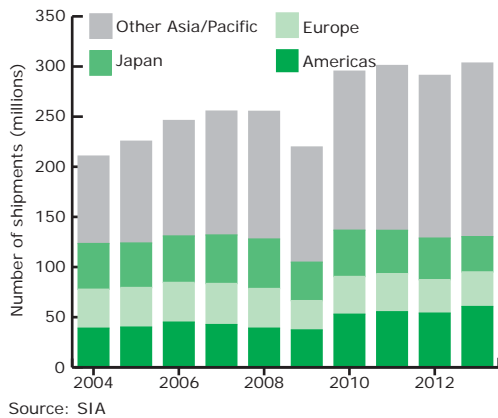
Silver possesses working qualities similar to gold, enjoys greater reflectivity and can achieve the most brilliant polish of any metal. Consequently, the silversmith's objective has always been to enhance the play of light on silver's already bright surface. Pure silver (999 fineness) does not tarnish easily, but to make it durable for jewelry it is often alloyed with small amounts of copper. It is also widely used with base metals in gold alloys. Sterling silver, at a fineness of 925, has been the standard of silverware since the 14th century, particularly in the manufacture of "hollow-ware" and "flatware". Plated silverware usually has a coating of 20-30 microns, while jewelry plating is only 3-5 microns.

### Coins

Historically, silver was more widely used in coinage than gold, being in greater supply and of lower value, thus being practical for everyday payments. Most nations were on a silver standard until the late 19th century with silver coin forming the main circulating currency. But after the gold rushes, the silver standard increasingly gave way to gold. Silver was gradually phased out of regular coinage, although it is still used in some circulating coins and especially in American, Australian, Canadian, Austrian and Mexican bullion coins for investors.



**Global Semi-conductor Billings**



and healthcare sterilant taking around 90% share of the market, and a growing number of other applications, which would underpin the growth of the new capacity installation this year.

Industrial fabrication in Hong Kong is estimated to have eased by 7% in 2013 to reach 5.8 Moz (180 t), in part due to some relocation of production to the Chinese mainland. Hong Kong's electronics exports rose by 7% in 2013 in value terms, with exports of semiconductors and telecommunications equipment up marginally and shipments of IT and AV equipment/parts down on 2012 levels. However, exports to the Chinese mainland, which accounted for about two-thirds of the total electronics trade, grew by 8% year-on-year. Exports of electronic parts and components (which constitute the bulk of Hong Kong's electronics exports to the mainland) increased steadily on the back of continued expansion of the mainland's outward processing production. Elsewhere in Asia, exports to ASEAN, were constituted mainly of parts and components, were sluggish, while exports to Japan declined by 9% for the period.

South Korean industrial offtake slipped 5% in 2013 to estimated 22.7 Moz (705 t), the lowest level in three years, although this represents only 13% or 3.2 Moz (99 t) below the record level achieved in 2008. The modest drop last year was a combination of weaker offtake across all industrial segments as a sluggish domestic economy and a slowdown in exports to China in some sectors tempered fabrication volumes. However, offsetting some of this weakness was improved trade from Europe and North American as economic recovery in these regions gathered momentum.

Looking at individual sectors in detail reveals a modest drop across a myriad of applications, with the decline relatively evenly distributed across the year. Indeed, it is estimated that demand for the key electronics and contacts industry retreated almost 6% to 14.9 Moz (464 t), while demand for solder and brazing alloys saw a similar 5% fall, slipping to a four year low of 2.1 Moz (64.1t) as softer domestic consumption and market share lost to China impacted fabrication demand. Silver fabrication was well supported by an expanding automobile sector. Moreover, South Korea's automobile exports reached a new high of \$48.7 billion in 2013, with exports to China up 13%, according to the South Korea's Ministry of Trade, Industry and Energy. Similarly, exports of semiconductors to China rose 21% in 2013 to US\$47.58 billion while LCD panels, and to a lesser extent cell phones exports, were reported as weaker year-on-year. Finally, demand for fresh silver used in ethylene oxide change-out remained on par with 2012 volumes with no new capacity added last year.

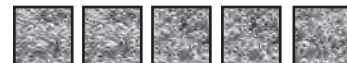
Taiwan's industrial use of silver is estimated to have increased by almost 2% last year to 14.6 Moz (453 t); almost 13% below the peak seen in 2007 though 19% stronger than the recessionary conditions witnessed the following year. Demand last year was weaker across most major industrial segments, although the bulk of the drop was due to losses within electrical and electronics though a slowdown was also recorded in chemical and manufacturing segments. Brazing alloys and silver solder demand was also weaker (dropping by 5%) as a result of a soft domestic economy and market share loss to Chinese fabricators. In 2013, Taiwan's exports maintained moderate growth although they were affected by the slower-than-expected recovery of the global economy and weak demand from the US and the EU.

It was not all negative, however, with modest gains in the electrical and electronics sector and from the automotive components industry (again led by higher demand

**Global Billings**

	(semi-conductor shipments per year, millions)				
	World	Americas	Europe	Japan	Other Asia
2012	291.1	54.0	33.4	41.4	162.3
2013	303.4	60.6	34.6	35.1	173.1
Change	12.3	6.6	1.2	-6.3	10.8
Change %	4%	12%	4%	-15%	7%

Source: SIA



## Silver Fabrication: Electrical and Electronics (including the use of scrap)

© GFMS, Thomson Reuters / The Silver Institute

(million ounces)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
United States	47.4	52.1	55.0	57.7	62.2	53.4	74.6	67.0	56.1	53.1
China	21.6	24.0	26.4	32.2	36.1	32.0	39.1	40.6	40.7	43.9
Japan	38.0	43.7	46.0	44.8	38.7	28.2	51.1	46.2	39.0	39.2
Germany	17.7	18.3	19.7	21.4	21.7	15.7	21.3	20.3	17.2	17.0
India	5.7	10.2	10.8	14.1	15.0	16.1	17.1	17.2	17.6	15.1
South Korea	11.6	12.9	13.8	14.7	15.9	12.5	16.1	16.0	15.8	14.9
Taiwan	8.4	9.4	10.3	11.7	12.3	9.9	12.1	12.7	11.3	11.8
Russia	10.5	10.9	11.5	12.1	12.1	10.3	11.3	10.9	10.7	10.9
Mexico	1.8	2.1	2.0	2.1	2.1	2.2	3.8	5.0	5.7	5.8
France	8.1	8.0	8.2	8.5	8.6	5.7	6.9	6.1	5.3	5.3
UK	6.1	4.5	4.4	4.5	4.7	3.4	3.9	4.0	3.9	3.9
Hong Kong	3.0	3.0	3.3	3.5	3.3	2.7	3.1	3.1	3.0	2.8
Italy	3.8	3.5	3.6	3.9	4.1	3.4	3.9	3.3	2.8	2.5
Brazil	1.3	1.5	1.2	1.6	1.6	1.5	1.7	1.7	1.6	1.5
Turkey	1.0	1.0	1.0	1.1	1.1	0.9	0.9	1.0	0.9	0.9
Australia	0.7	0.7	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.7
Netherlands	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5
Switzerland	0.5	0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.5	0.4
Norway	0.8	0.7	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4
Other Countries	4.8	4.8	4.8	4.9	4.9	4.1	4.6	4.4	4.3	4.3
World Total	191.9	211.2	223.2	239.9	245.7	203.2	272.7	260.8	237.1	233.9

## Silver Fabrication: Brazing Alloys and Solders (including the use of scrap)

© GFMS, Thomson Reuters / The Silver Institute

(million ounces)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
China	16.5	18.5	19.4	21.3	25.9	26.6	28.6	30.5	31.4	34.7
United States	7.3	7.7	7.2	7.7	7.2	5.2	5.9	6.0	5.3	5.4
Japan	3.7	3.8	3.9	4.0	3.7	2.3	3.4	3.0	2.5	2.3
Germany	3.2	3.2	3.4	3.6	3.4	2.3	2.8	2.8	2.3	2.2
UK	3.0	2.9	3.1	2.4	2.3	1.8	2.3	2.4	2.2	2.1
India	2.2	2.4	2.3	2.2	2.2	2.2	2.6	2.7	2.4	2.1
South Korea	1.6	1.9	2.0	2.4	2.6	2.1	2.3	2.4	2.2	2.1
Russia	1.8	1.8	1.9	2.0	2.0	1.7	1.9	1.8	1.8	1.8
Canada	0.4	0.8	1.5	2.4	2.2	1.1	1.7	1.7	1.6	1.6
Italy	2.0	2.2	2.4	2.5	2.4	1.7	1.8	1.7	1.6	1.5
Switzerland	1.4	1.5	1.4	1.4	1.4	1.2	1.3	1.3	1.3	1.2
Taiwan	1.1	1.1	1.2	1.3	1.2	1.0	1.2	1.3	1.2	1.2
Brazil	0.7	0.8	0.8	0.8	0.8	0.9	1.0	1.0	1.0	0.9
Australia	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6
France	0.7	0.8	0.8	0.9	0.8	0.5	0.6	0.6	0.5	0.5
Belgium	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.5
Spain	0.8	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.4	0.4
Mexico	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.3
Other Countries	0.7	0.7	0.8	0.8	0.9	0.8	1.1	1.0	1.0	1.1
World Total	48.9	52.4	54.4	58.1	61.3	53.3	60.6	62.4	60.3	62.4





## New Uses of Silver in Industrial Applications

The myriad of well established industrial applications using silver have been outlined elsewhere in this chapter. There are, however, a significant number of emerging uses for silver that, while perhaps still in their development stage or period of early adoption and yet to impact markedly on silver demand, hold the potential to become significant end-users of the metal in future years. It is important to note that, while the silver consumption per unit may be small in each application, their collective use may, over time, amount to substantial volumes.

Silver's main uses, both new and established, are often focused on utilizing its biocidal or conductive properties. Looking firstly at potential biocidal applications, silver use in antimicrobials has been rising exponentially over the past decade; however the volume in use is small as only trace amounts of silver are used in these applications. The global antimicrobial coatings market is around \$1.5 bln annually and is expected to increase at a double-digit pace in the long term. Antimicrobials containing silver are used in textiles for odor and discoloration prevention, bandages, hygienic plastic, and a host of other applications. The newest and possibly fastest growing antimicrobial application is antimicrobial glass used in touchscreen applications. Only one cover glass producer, Corning, is offering antimicrobial cover glass to the market at this time.

Utilizing silver's conductive properties, batteries are already an established end-user. Silver oxide batteries have a longer shelf life and higher energy/weight ratio than alternatives and are commonly used in small button-cell battery found in

electronic items. Due to environmental and safety concerns, silver oxide batteries are also beginning to replace lithium ion batteries in mobile devices and laptop computers. Potential growth sectors stemming from silver's conductive properties include Solid State Lighting (SSL), where silver electrodes can be employed and touchscreen technology, where silver is used in conductive inks to improve resistance of glass, another rising source of the demand given the proliferation of mobile device demand. Radio Frequency Identification Devices (RFID), where the potential widespread implementation of such devices in inventory management could be a boost to silver demand, especially as silver use in this technology is difficult to recycle. Silver's natural low resistance to electrical current makes it a good candidate as a superconductor. The widespread use of silver in these technologies depends on broad acceptance of these developments and silver's ability to compete against cheaper substitutes.

'Nanosilver is also gaining increased commercial recognition, appearing in a wide range of products including textiles, food packaging and medical uses. The main difference between 'nanosilver' and 'ordinary' silver is particle size: nanosilver typically measures between 1-100 nanometers. Nanosilver essentially replicates silver's established properties, but often performs them using a far smaller quantity of metal, owing to the greater surface area of each silver particle, which enhances its potency. In some of the applications outlined above, nanosilver, in time, may become a substitute for ordinary silver.

from China) and additional photovoltaic capacity added last year; driven by the boom in the Japanese market, notably for residential rooftop markets in which Taiwanese producers' higher quality and performance products are in high demand. The inventory glut that was a feature of the market in 2012 appears to have dissipated somewhat in the second half of last year and has led to several of Taiwan's larger fabricators cautiously planning further incremental production capacity expansions.

## Photography

- ***Demand for silver in photographic applications fell by 7% last year, posting the slowest percentage decline seen in nine years***

Photographic fabrication in 2013 dropped by 7% to 50.4 Moz (1,567 t), the smallest annual decline since 2004. Having said that, last year's fabrication was just 28% of

the volume recorded a decade ago. The dramatic decline is entirely due to the digital revolution in the photographic industry, which saw silver halide technology displaced by digital processing. Photography's share of total silver physical demand stood at 5% last year, compared to 20% in 2004. The bulk of structural changes in the photography market have now passed, as can be seen in the slower decline. Indeed, in absolute terms, last year's drop of 4 Moz (124 t) is small compared to the 21.7 Moz (676 t) decline in 2009. Most of that drop, 2.2 Moz (67 t), comes from Europe, where fabricator woes linger, which saw considerable declines, though from a low base.

Not all areas were uniformly weak. End use in the medical sector (primarily X-rays) held up fairly well, in part because of constrained funding for digital switch-overs. Some countries also saw robust demand from the instant photo sector. This all stood in sharp contrast to the consumer film sector, which continued to suffer



## Global Photovoltaic Market

Demand for silver in the photovoltaic (PV) industry has been driven by a tremendous increase in the uptake of renewable energy over the last decade. The push towards solar energy has been driven largely by the introduction of government subsidies and feed-in-tariffs aimed at incentivizing the growth and subsequent flourish of the industry. Such developments have lent to the proliferation of solar module production, a development largely in favor of silver consumption. We estimate that silver use in PV industry has grown by a compound annual growth rate of 20% in the past decade.

The rise of silver use in PV industry was not without hindrance, however. Solar cell production grew exponentially in the past decade by an average growth rate of 58% per annum, peaking at 113% in 2010. The meteoric rise of solar cell production without ensuing growth in demand however, saw a massive build up of excess capacity in the industry, resulting in insolvencies and closures. High profile bankruptcies provoked trade tensions between China, the US and the European Union, leading to anti-dumping tariffs on China-made solar modules. As such, production contracted marginally in 2012. Production growth resumed in 2013, albeit at a more sustainable annual growth rate of 10% as the market digested the excesses of the previous years.

Overcapacity in the industry, alongside the need to remain competitive against other fuel sources, saw solar cell producers undercutting each other to sustain their profit margins. Production costs were thus subjected to substantial downward pressure to catch up with ever-falling selling price. Manufacturers sought to lower costs through two methods 1) improving solar cell efficiency and 2) reducing production costs. In the first case, higher efficiency solar cells are favored as they have the potential to reduce total costs per watt of electricity generated. Therefore, thick-film technology, once under threat from the lower cost thin-film technology, is regaining market share thanks to its relatively high efficiency and stability. After reaching a nadir of 82% market share in 2009, we expect thick-film technologies to reclaim its market share of 91%. This is a favorable development to silver use as silver paste is used both in the front and rear side of each thick-film cell compared to thin-film cells, where silver is only used in trace amounts.

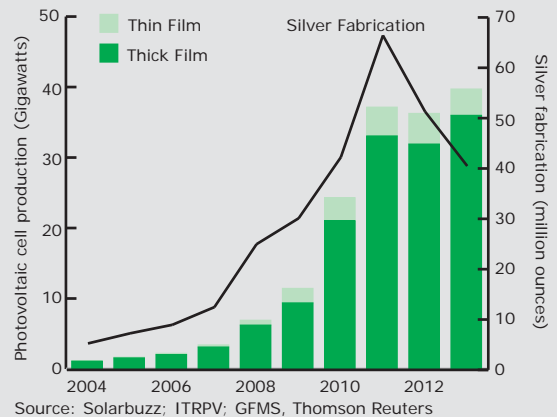
PV producers are also seeking to lower cost of production by reducing the cost of raw materials. Silver usage is a casualty to such developments as metallization pastes are relatively expensive materials used in cell technologies. Reductions on silver have thus increased substantially and we estimate that silver loadings per cell have reduced from 0.6g/cell in 2004 to a mere 0.14g/cell currently, a 77% decline over a decade.

The economization of silver will continue in the coming years as cheaper substitution such as copper gains traction. While copper loadings in thick film cells are expected to increase eventually, the introduction of copper into mass production is not expected to start in the near term as advancement in screen printing technologies remains a widespread metallization technology. This will temporarily thwart the uptake of copper use in PV cells, which is still struggling with issues related to reliability and adhesion.

Meanwhile, some other trends are countering the hemorrhage of silver use in PV industry. In Japan, authorities want to cut the nation's dependence on nuclear energy and switch towards renewable energy post Fukushima incident. Generous feed-in-tariffs proposed by the Japanese government would be a huge boost to solar panel production in the future. China, the world's largest solar PV producer, continues to benefit from its government's policy aim to install 35GW of solar capacity by 2015. These plans have propelled these two countries to the top two spots in terms of annual installations.

The GFMS team at Thomson Reuters has revised its silver uptake estimate from the PV sector based on new estimates of thick-film vs. thin-film share in the market and a much more aggressive thrifting trajectory than originally estimated. We have trimmed our 2012 silver use downwards by 2 Moz to 51.3 Moz (1,595 t) while 2013 demand was 40. Despite a 10% annual increase in solar module production in 2013, the reduction in silver loadings from 0.2 g/cell to 0.14 g/cell has seen a drastic reduction in silver consumption to 40.5 Moz (1,260 t), a 21% y-o-y decline. Following this argument, we expect silver uptake from the solar industry will continue to face downward pressure from thrifting, although increased solar cell production will somewhat alleviate the trend.

### Photovoltaic Production





double-digit percentage losses, due to such changes as internet photo sharing and laser photo printing. We should, however, point out that there remains a small dedicated following for traditional photographic processes and film cinematography.

European demand fell by 10% last year, continuing many years of consecutive losses, and just under the 11% average decline for the preceding four years. The 2013 figure was just 26% of the 1998 peak, as a result, European photographic manufacturers continue to struggle. Fabrication is largely for the medical sector, where transition to digital radiography has been restricted due to budget constraints and so traditional film X-rays remains widely used. Meanwhile fabrication of 24 exposure rolls, which is used by amateurs and professionals alike, fell by 24% year-on-year\*, so that sales were just 3%\* of the total for the peak in 2000.

Sales of 24 exposure rolls in the United States fell at less steep pace last year, at 22%\*. It had been expected for some time that the pace of decline, driven by the swap to digital photography would drop off, and it has indeed done so, as the average decline for the previous five years was 28%\*. However, camera film is ceasing to be of importance, with sales of these rolls equal to just 3%\* of their peak in 2001.

In contrast, silver's end use in both the motion picture industry and in the medical sector was far more robust, in part as financing to effect conversion to digital remains constrained. As a result, we estimate that US photographic demand slipped by a relatively restrained 5% to 16.0 Moz (498 t). Changes in the photographic industry were reflected in the bankruptcy of Eastman Kodak in 2012 and its subsequent reorganization as a

digital imaging company in September 2013. (\*source: Photofinishing News)

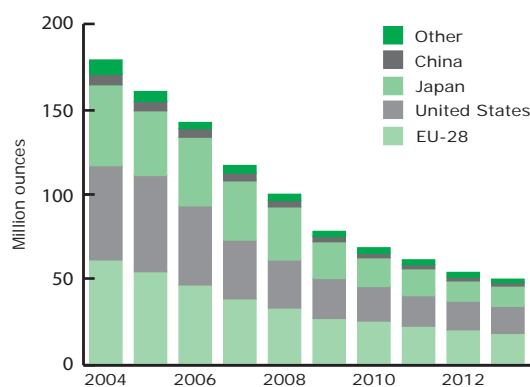
Demand for silver in photographic applications in Japan fell by only 1% last year, in sharp contrast to the average 19% fall witnessed over the proceeding five years. To place the industry decline into perspective it is worth noting that last year's offtake of 11.8 Moz (367 t) was almost 75% or over 35.7 Moz (1,100 t) below that recorded ten years earlier. Although offtake declined from all three of the main areas of demand (photographic film, and paper, X-ray, and graphic arts), there were a number of factors which cushioned the fall.

Declining demand for X-ray film from the domestic market and across the industrialized world (which has been falling rapidly due to migration to digital imaging) has been bolstered by offtake from developing world markets where costs of digital systems remain prohibitive, with growth still seen in halide X-rays across Africa and South East Asian countries in particular.

Consumer film and paper continued to lose ground to digital applications, as did silver used in the graphic arts field. One area that is expanding has been silver used in touch screen glass, in which silver is increasingly used as a cheaper alternative to indium. Still in its relative infancy, this segment is growing rapidly, led largely by exports to Taiwan and China used in the assembly of smart phones and tablets. Demand also expanding in the area of environmental glass (E Glass) where silver is applied to glass to limit heat loss.

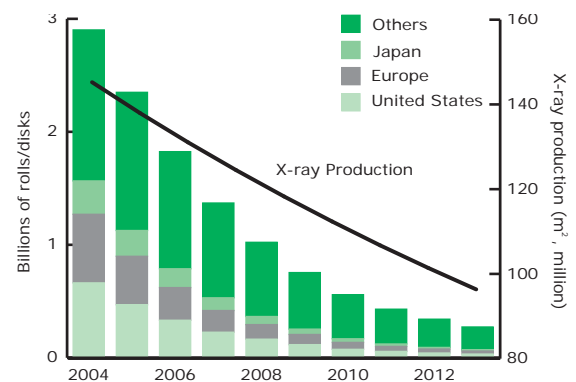
Silver offtake in Chinese photographic demand registered a 14% drop to 1.9 Moz (61 t) in 2013, the 9th consecutive year of decline. The growing popularity of

World Photographic Fabrication

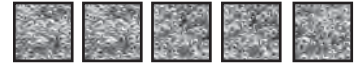


Source: GFMS, Thomson Reuters

Consumer Film Sales & X-ray Production

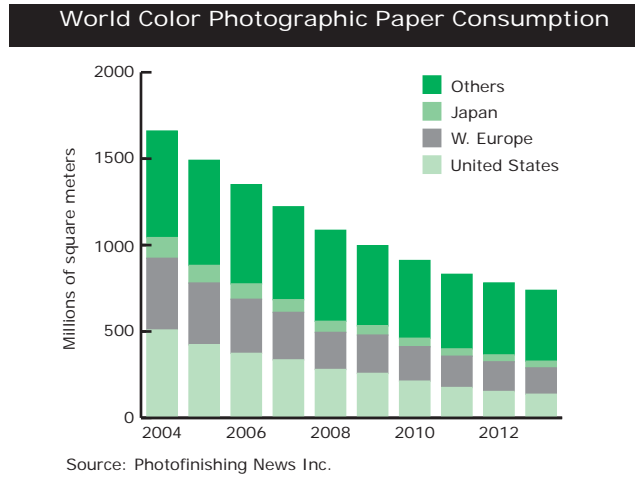


Source: Photofinishing News Inc.



Silver Fabrication: Photographic Use (including the use of scrap)										
© GFMS, Thomson Reuters / The Silver Institute										
(million ounces)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>Europe</b>										
EU-28	61.8	54.8	47.1	38.9	33.6	27.4	25.9	22.9	20.8	18.7
Russia	2.7	2.6	2.4	2.1	1.8	1.5	1.4	1.2	1.2	1.1
<b>Total Europe</b>	<b>64.4</b>	<b>57.4</b>	<b>49.5</b>	<b>41.0</b>	<b>35.4</b>	<b>28.9</b>	<b>27.2</b>	<b>24.1</b>	<b>22.0</b>	<b>19.8</b>
<b>North America</b>										
United States	55.2	56.4	46.4	34.4	28.1	23.4	20.2	17.9	16.8	16.0
<b>Total North America</b>	<b>55.2</b>	<b>56.4</b>	<b>46.4</b>	<b>34.4</b>	<b>28.1</b>	<b>23.4</b>	<b>20.2</b>	<b>17.9</b>	<b>16.8</b>	<b>16.0</b>
<b>South America</b>										
Brazil	2.2	1.4	0.0	1.4	1.3	1.0	1.4	1.2	1.1	0.5
Argentina	1.5	1.3	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total South America</b>	<b>3.7</b>	<b>2.7</b>	<b>0.5</b>	<b>1.7</b>	<b>1.3</b>	<b>1.0</b>	<b>1.4</b>	<b>1.2</b>	<b>1.1</b>	<b>0.5</b>
<b>Asia</b>										
Japan	47.4	38.0	40.2	34.7	31.1	21.5	16.9	15.8	11.9	11.8
China	6.1	5.4	5.0	4.6	3.7	3.1	2.6	2.4	2.2	1.9
India	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Sri Lanka	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
<b>Total Asia</b>	<b>54.0</b>	<b>43.8</b>	<b>45.7</b>	<b>39.8</b>	<b>35.3</b>	<b>24.9</b>	<b>19.8</b>	<b>18.5</b>	<b>14.4</b>	<b>14.1</b>
<b>Oceania</b>										
Australia	1.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
<b>Total Oceania</b>	<b>1.5</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>
<b>World Total</b>	<b>178.8</b>	<b>160.3</b>	<b>142.2</b>	<b>117.0</b>	<b>100.2</b>	<b>78.4</b>	<b>68.8</b>	<b>61.7</b>	<b>54.4</b>	<b>50.4</b>

digital technologies in camera demand for consumers, and technology upgrade in cinema screen and medical film industry, fueled a 20% reduction in total film production, which is the key reason for the decrease. One sector against this trend is the prevalence of lomography which attracted the interest of the younger generation by its unique retro feature. The film used in the medical sector also helped to offset the decline by the penetration of conventional X-rays used in rural areas, though it couldn't compare to the digitalization in hospitals in larger cities.



### Ethylene Oxide

• **Silver consumed in Ethylene Oxide production surged by 68% last year to 6.5 Moz (201.7 t).**

Silver is used as a catalyst that oxidizes ethylene thereby producing the chemical building block ethylene oxide (EO). EO is a precursor to numerous chemicals, the most common being ethylene glycol. Some everyday products that use or are made with a chemical made from ethylene oxide are polyester fibers, textiles, and PET packaging. Silver use, in the form of silver oxide, from the source takes two forms. The first is demand for newly installed EO production capacity. This new capacity would require new catalyst to be fitted to the manufacturing equipment. The second form would be replacement demand. The

Film & Paper Consumption & Photographic Fabrication					
	2010	2011	2012	2013	yoy %
Film**	559	430	342	273	-20.15%
Paper^	911	831	781	738	-5.47%
Fabrication*	69	62	54	50	-7.32%

\*\*Million of rolls, ^millions square meters, \*Moz  
Source: Photofinishing News Inc.; GFMS, Thomson Reuters

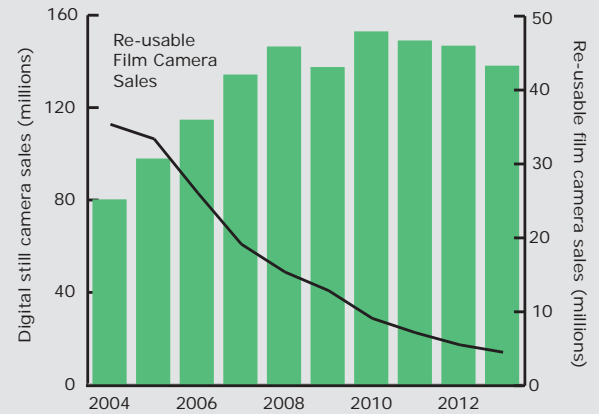


## Digital Technology and the Photographic Market

Since its peak in 1999, demand for silver in photographic applications has experienced a period of uninterrupted losses and 2013 saw a drop of 7%. To put this all into perspective, demand has contracted by over 75% between 1999 and 2013, to its lowest point of 50.4 Moz (1,567 t) last year. The main driver of this downward trajectory has been the rapid penetration of digital technology in all photo-related areas. Figures from Photofinishing News show that sales of re-usable digital cameras were down to just over 4.5 million units in 2013 from 35 million a decade ago. However the picture is not quite rosy for sales of digital still cameras (DSCs); having reached peak sales in 2010 at 152 million units, sales dropped off to 137 million in 2013. This can be explained by the increasing popularity of smartphones and significant improvements in smartphone and tablet cameras. Indeed, over one billion smartphones were sold in 2013, compared to 245 million in 2010 - according to industry analysts GfK, the vast majority of which have

cameras. The stagnation of DSC sales therefore represents no alleviation of pressure on conventional silver halide demand.

Digital and Film Camera Sales



Source: Photofinishing News Inc.; GFMS, Thomson Reuters

catalysts periodically must be recycled and in this process, there is a small percentage loss of silver that must be replenished.

In 2013, silver demand from EO producers rose 68% to 6.5 Moz (202 t). This increased demand came mostly from China, which has been rapidly building up its EO capacity since around 2006. Replacement demand rose to 2.1 Moz (67 t), a 5% increase, making up 33% of total demand. Newly installed capacity required an estimated 4.3 Moz (135 t) of silver last year. In 2013, Saudi Arabia had the largest installed base of EO production capacity, with 24.5 Moz of silver estimated to be tied up in catalyst. China has 21.7 Moz (675 t) of silver in installed EO

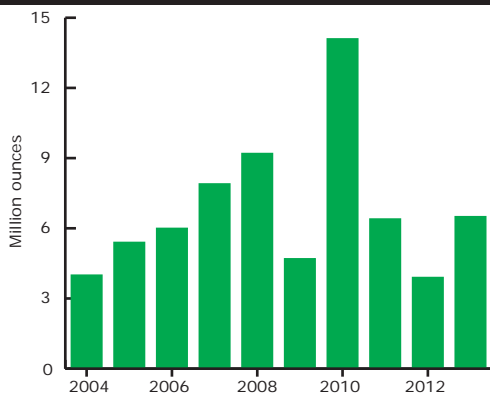
production catalyst. These two countries also accounted for the largest portion of fresh annual demand in 2013, using a combined 5.0 Moz (156 t) of silver. As of the end of 2013, an estimated 113.3 Moz (3,524 t) of silver was in EO catalysts.

## Jewelry

**• Jewelry fabrication posted a new all time high of 198.8 Moz (6,184 t) in 2013, with an improved economic outlook and lower silver prices accounting for most of the gains.**

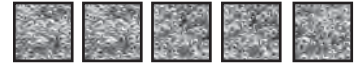
Global jewelry fabrication returned to growth in 2013, jumping 10% year-on-year to a record high of 198.8 Moz (6,184 t). The annual rise, the first in three years, was largely a function of an improving economic environment in the industrialized world that lifted consumer sentiment and in turn retail sales, coupled with a price driven recovery from developing world markets, with India leading the way, increasing by an estimated 29% last year over 2012 volumes. Elsewhere, China continued to see impressive fabrication growth, recording another double-digit rise and in so doing setting a new record for the Asian giant. Meanwhile Thailand, the world's third largest fabricating nation rose 6% last year as several key western export markets recovered from their economic doldrums.

Global Silver EO Demand



Source: GFMS, Thomson Reuters





## Europe

European jewelry fabrication increased by 2%, reaching 33.2 Moz (1,033 t) last year, driven by healthy gains in Italy and Turkey (Turkey and Russia, as part of our new methodology, now defined as part of Europe). For the remaining countries, reported losses were the norm, with particularly large declines in the French, Portuguese and British markets.

After falling for two years in a row, Italian jewelry fabrication registered a 6% rise last year to 15.9 Moz (495 t). While this level keeps the country in fourth place globally, it is worth noting that last year's volumes were down by nearly 60% from the high recorded at the start of the millennium. This was due to continued losses from 2001 to 2009, caused by a drop in shipments to Italy's key export destinations, and a further decline in offtake in 2011 and 2012. The latter was a result of weaker domestic consumption and a fall in export demand.

The 6% rise in Italian jewelry fabrication last year was largely driven by a rebound in exports, which we estimate at around 8% compared to a modest decline in the previous year. Silver jewelry shipments to the United States, Italy's largest single market, were up by approximately 10%, as the improving state of the US economy, along with the 24% drop in the US dollar silver price, allowed for healthy growth in local consumption. It is worth noting, however, that last year's rise in Italy's jewelry shipments undershot US consumption gains, which implies continued market share loss.

Another region to see gains last year was the EU, where deliveries from Italy are estimated to have risen by 6%. While the majority of countries here registered

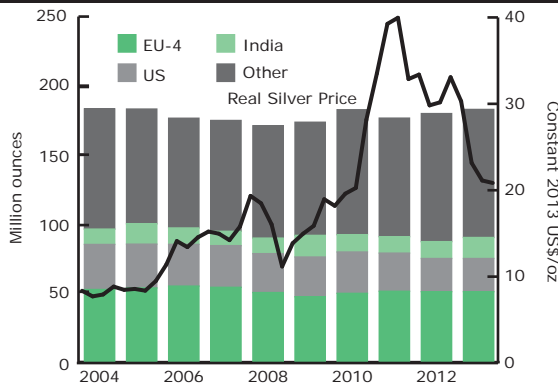
gains, helped by an overall economic recovery and the 26% decline in the euro silver price, exports to several EU countries fell in 2013. In particular, exports to Europe's third largest fabricator, Germany, dropped by an estimated 6%, due to weaker domestic consumption. Softer economic environment, coupled with the ongoing shift from plain to gemset pieces, helped to explain a drop in Italian exports to France.

Elsewhere, Italian shipments to East Asia and the Middle East posted double-digit percentage growth last year. The rise for Hong Kong explained the bulk of the increase for the former, while higher shipments to the United Arab Emirates (UAE) accounted for much of the growth in the Middle East.

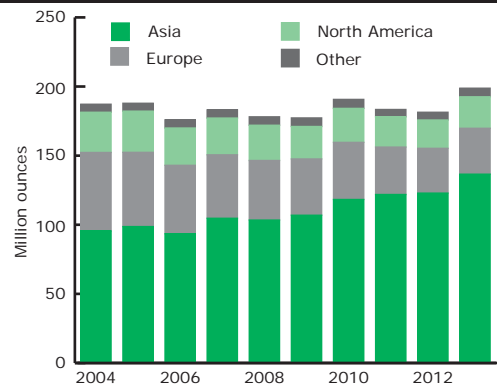
Silver jewelry consumption within Italy remained weak last year. While silver continued to benefit from substitution gains at the expense of gold karat jewelry, this was more relevant for the top end of the silver market. On the contrary, sales at the bottom end of the market continued to suffer from costume jewelry penetration and substitution to non-precious jewelry, in particular brass and bronze. In addition, weak economic conditions and ongoing structural change (such as a shift to branded or gemset) helped to explain last year's weakness.

Europe's third largest fabricator, Germany, witnessed a 7% decline to 3.4 Moz (104 t). The price awareness of the typical German jewelry shopper has increased in recent years, resulting in a lower price acceptance and a preference towards lower valued jewelry. This has been particularly prominent in the gold jewelry market, which to a certain extent has benefitted the popularity

## World Jewelry Consumption and World Jewelry Fabrication



\*Germany, Italy, UK, France;  
Source: GFMS, Thomson Reuters



Source: GFMS, Thomson Reuters



of silver jewelry, particularly among younger generations who don't have the capital to spend, but have a keen interest in matching jewelry. Trade data confirm the weak domestic consumer sentiment as the increases in fabrication boosted exports by 30% last year, whereas imports of silver jewellery witnessed a marginal decline of 1%.

Turkish jewelry fabrication recovered by 18% in 2013 to 4.0 Moz (124 t) posting its second year of growth after rising by 11% in 2012. As with other markets the recovery was price driven, and a large proportion of jewelry was exported with the United State remaining the largest market by volume and value terms. Elsewhere export markets were mixed however there were noticeable increases to both Libya and Kyrgyzstan. If prices, in both US dollars and the Turkish lira allow the trend away from plated products and lighter pieces to continue then 2014 is expected to be another year of growth in both the export and domestic market. At 4.0 Moz (124 t), total fabrication remains 33% lower than decade ago. We do not expect a return to volumes seen ten years ago without a significant silver price correction.

After two consecutive years of decline, silver jewelry fabrication in Russia posted a marginal recovery in 2013, with offtake rising to 2.6 Moz (82 t), up by 2% from the 2012 level. Last year's outcome was largely a result of a stronger domestic consumption in response to the 22% drop in the local silver price. In addition, slowing economic activity last year led to some substitution gains at the expense of 14-karat gold, particularly among young consumers and the bottom-end market. French silver jewelry fabrication declined for the second

consecutive year to 1.7 Moz (53 t). This downward trend started in 2012 and continued last year following five consecutive years of gains. Much of the drop was driven by general softness in the gold jewelry market as well as due to a continued shift from plain to gemset pieces. The soft economic environment also continued to play its part and some feel that France's adoption of 9-carat gold jewelry was also to blame.

Despite lower prices UK jewelry consumption fell for the third successive year in 2013, by 11%. However, this drop overall masks two positive trends. Unlike prior years, field research indicates that there appears to have been a cessation in the growing proportion of items falling below the minimum weight threshold and hence consumption was closer to matching the hallmarking statistics. Second, as the economy improved in the second half of the year and the decline in silver prices gradually fed through to retail prices consumption started to recover; a trend which has accelerated in early 2014.

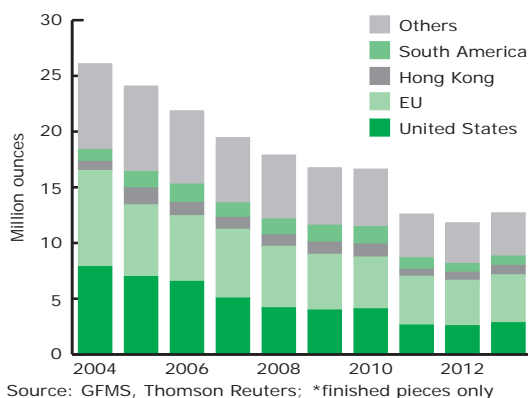
### North America

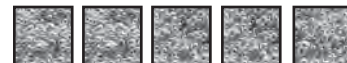
North American jewelry manufactures produced 22.8 Moz (709 t) of silver jewelry in 2013, up 11% from the previous year. This increase, the first annual rise since 2010, was driven solely by increased fabrication in Mexico, while production declined in the United States and Canada. Lower silver prices boosted fabrication in the region, which was largely a response to stronger retail sales of precious metals jewelry. Growth was curbed by a growing consumer preference for yellow metal in the United States, however.

United States manufacturers used 8.6 Moz (268 t) of silver to make jewelry in 2013, down 17% from the previous year. Even though US manufacturers benefitted from better margins last year and have been somewhat successful in innovating jewelry production processes to reduce costs over the past several years in order to remain competitive in the global market, these factors did not translate to higher production in 2013. Instead, consumer preference for yellow metal weighed on local fabrication.

This predominant preference for yellow metal led local manufacturers to focus on increasing gold jewelry production, which produces better profit margins. Indeed, while local use of silver in jewelry fell 17%, imports of silver jewelry rose 21% in 2013. The rising

Official Italian Jewelry Exports\*





## Silver Fabrication: Jewelry and Silverware (including the use of scrap)

© GFMS, Thomson Reuters / The Silver Institute

(million ounces)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>Europe</b>										
Italy	43.4	39.5	35.4	32.3	28.1	25.9	25.8	19.3	17.4	18.0
Russia	3.6	4.4	4.6	6.6	7.8	8.5	9.3	7.7	7.3	7.2
Turkey	8.7	8.3	7.2	6.2	6.7	5.6	4.9	4.3	4.5	5.2
Germany	7.3	6.8	6.8	6.5	6.2	5.3	5.4	5.1	4.7	4.3
Poland	3.1	3.4	3.6	3.2	3.1	2.4	2.5	1.9	2.0	2.1
France	2.2	1.8	1.8	1.9	1.8	1.9	2.1	2.3	2.1	1.8
Greece	2.8	2.6	2.5	2.3	2.2	1.8	1.5	1.3	1.1	1.0
Spain	2.0	2.0	1.7	1.4	1.3	1.3	1.2	1.2	1.0	0.9
Other Countries	7.3	6.7	6.5	5.4	5.2	4.5	4.6	4.2	3.9	3.6
<b>Total Europe</b>	<b>80.3</b>	<b>75.6</b>	<b>70.0</b>	<b>65.8</b>	<b>62.3</b>	<b>57.3</b>	<b>57.3</b>	<b>47.3</b>	<b>44.1</b>	<b>44.2</b>
<b>North America</b>										
Mexico	15.2	15.5	13.4	13.6	12.9	11.4	11.2	9.9	9.1	12.9
United States	16.4	16.6	15.5	14.2	13.1	11.6	12.7	11.7	10.8	9.2
Canada	1.6	1.4	1.2	1.1	1.0	0.9	0.9	0.9	0.9	0.8
Other Countries	0.4	0.5	0.6	0.6	0.9	1.5	1.4	0.9	0.9	1.2
<b>Total North America</b>	<b>33.6</b>	<b>34.1</b>	<b>30.7</b>	<b>29.5</b>	<b>27.8</b>	<b>25.4</b>	<b>26.2</b>	<b>23.4</b>	<b>21.8</b>	<b>24.1</b>
<b>South America</b>										
Brazil	1.4	1.6	1.7	1.7	1.7	1.8	2.0	1.6	1.6	1.7
Peru	0.6	0.5	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.8
Other Countries	1.7	1.7	1.9	1.8	2.0	1.8	1.8	1.6	1.6	1.9
<b>Total South America</b>	<b>3.7</b>	<b>3.9</b>	<b>4.2</b>	<b>4.2</b>	<b>4.3</b>	<b>4.4</b>	<b>4.6</b>	<b>3.8</b>	<b>3.9</b>	<b>4.4</b>
<b>Asia</b>										
China	30.3	33.9	38.8	43.4	44.8	46.9	54.0	62.8	65.2	72.9
India	39.4	42.9	28.1	34.2	34.8	37.4	39.6	38.4	38.5	50.4
Thailand	36.9	36.8	36.8	36.5	33.3	30.4	30.5	24.8	20.7	21.6
Indonesia	5.2	4.5	5.1	4.8	4.8	4.8	5.4	6.1	6.7	6.9
South Korea	4.7	4.7	4.8	4.9	4.8	4.8	5.4	5.8	5.9	6.0
Japan	1.8	2.1	2.0	2.1	2.0	2.1	2.3	2.2	2.3	2.4
Vietnam	1.0	1.0	1.1	1.2	1.3	1.3	1.4	1.6	1.6	1.6
Myanmar, Laos & Cambodia	2.0	1.8	1.8	1.7	1.7	1.6	1.7	1.6	1.5	1.4
Iran	1.5	1.6	1.6	1.6	1.5	1.4	1.4	1.3	1.2	1.2
Israel	1.8	1.9	2.0	1.9	1.8	1.5	1.4	1.0	0.9	1.1
Bangladesh	1.7	1.5	1.5	1.5	1.5	1.4	1.4	1.3	1.3	0.9
Saudi Arabia	0.6	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.9	0.9
Cambodia	0.9	0.9	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9
Malaysia	0.7	0.7	0.7	0.6	0.6	0.6	0.7	0.7	0.8	0.8
UAE	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.8
Other Countries	4.9	4.9	4.9	4.9	4.9	4.9	4.8	4.6	4.5	3.8
<b>Total Asia</b>	<b>133.9</b>	<b>140.4</b>	<b>131.0</b>	<b>141.5</b>	<b>139.9</b>	<b>141.3</b>	<b>152.2</b>	<b>154.6</b>	<b>153.7</b>	<b>173.6</b>
<b>Africa</b>										
Egypt	1.9	1.7	1.6	1.6	1.5	1.3	1.3	0.6	0.8	0.8
Other Countries	1.2	1.2	1.2	1.3	1.3	1.1	1.2	1.1	1.2	1.1
<b>Total Africa</b>	<b>3.1</b>	<b>2.9</b>	<b>2.8</b>	<b>2.9</b>	<b>2.7</b>	<b>2.5</b>	<b>2.4</b>	<b>1.7</b>	<b>1.9</b>	<b>1.9</b>
<b>Oceania</b>										
Australia	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8
<b>Total Oceania</b>	<b>0.7</b>	<b>0.7</b>	<b>0.7</b>	<b>0.7</b>	<b>0.7</b>	<b>0.7</b>	<b>0.7</b>	<b>0.8</b>	<b>0.8</b>	<b>0.8</b>
<b>World Total</b>	<b>255.4</b>	<b>257.5</b>	<b>239.4</b>	<b>244.6</b>	<b>237.8</b>	<b>231.6</b>	<b>243.4</b>	<b>231.6</b>	<b>226.1</b>	<b>249.0</b>



preference for yellow jewelry resulted in a 16% increase in gold jewelry retail sales, while silver jewelry retail sales grew a slower 12% in 2013.

Canada used 0.7 Moz (23 t) of silver for jewelry fabrication last year, down a modest 2% year-on-year. Canadian jewelry production has been declining for over a decade. In fact, offshoring of silver jewelry fabrication to more low cost production centers has been weighing on silver use in jewelry in Canada and the United States for over fifteen years. While silver demand for jewelry fabrication in North America has fallen at a compound annual rate of 2% over the past ten years, the compound annual rate of growth in East Asia was a healthy 5%, above global growth of 0.6% for the period.

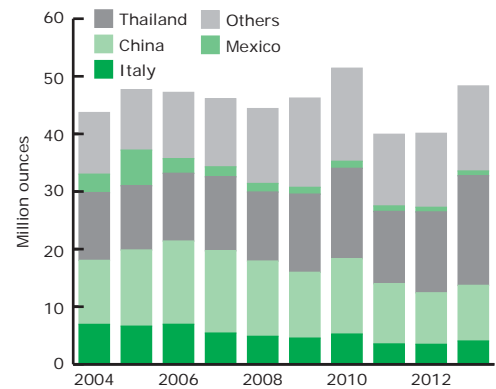
Mexico used 12.2 Moz (381 t) of silver to produce jewelry last year, up a sharp 45% from 2012. This was the first annual increase since 2007. The country's domestic production surpassed that of the United States in 2013, becoming the largest producer of the three countries for the first time on record. Mexico's ample stocks of newly locally mined silver and relatively cheaper labor have been benefitting manufacturers compared to regional peers over the past decade or so. Mexican fabrication reached the highest level in 2013 since 2007, after trending lower since peaking at 14.0 Moz (434 t) in 2005. Mexico accounted for 54% of North American fabrication last year, compared to 41% in 2012.

Growth in fabrication was largely driven by increased domestic retail demand as silver jewelry exports rose a more modest 9% last year. Export demand rose an estimated 9% to 2.7 Moz, accounting for 22% of domestically produced silver jewelry last year. The decline in silver prices was a significant contributor to the strong growth in domestic retail demand, which in turn boosted fabrication. Mexican silver jewelry manufacturers also benefited from their proximity to newly mined silver stocks and lower labor costs, which benefitted margins. Consumers in Mexico also generally prefer white jewelry and have lower disposable incomes in absolute terms relative to US and Canadian consumers, which further supported growth in local demand.

### Africa

Egypt's political turmoil in the second half of the year partially offset healthy gains in the first six months of the year, with annual fabrication estimated to have risen

### US Official Silver Jewelry Imports



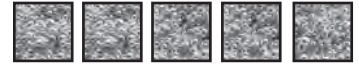
Source: GFMS, Thomson Reuters

almost 13% to 0.8 Moz (24 t). The market was showing signs of a reasonable recovery before the unrest again disrupted production which generated a rise in imported product – predominantly from the UAE. Saudi Arabian demand, which is a similar market size, remained largely unchanged in 2013 as consumers were influenced by the lower gold price environment and where budgets allowed, shifted focus at the lower end to small gold items.

### Asia

Chinese silver jewelry demand maintained its extraordinary growth rate last year, led higher by impressive GDP expansion and rising disposable incomes, which drove total retail sales of consumer goods up by a double digit increase. The GFMS team at Thomson Reuters estimates Chinese silver jewelry fabrication reached 62.9 Moz (1,955 t) in 2013, an 11% year-on-year increase to maintain over twenty years of uninterrupted growth. In just the last decade Chinese fabrication has soared 162% or a 38.8 Moz (1,208 t).

The robust jewelry demand stemmed partially from the growing consumer base in urban areas, benefiting from its affordability and rising consumer awareness of fashion, in tandem with maturing technology that has enabled a closer resemblance to the appearance and styles of other white precious metals. Silver jewelry attracts the interests of younger generations in particular, who are often attracted by its affordability and style above other priorities. Another reason for the expansion of jewelry market is its deeper penetration in rural areas. Over the last few years there has been a significant amount of new silver jewelry stores opening in the less developed region of China, attributed to both the rising household wealth



and the relatively low cost of establishing a retail silver jewelry shop front.

It is worth noting that the lowered price level of silver last year didn't have much influence on jewelry demand at the consumer level. In contrast to gold, the metal's already low price level makes the jewelry easily affordable to an extensive market, pushing the attention to other factors like design. There were reports that some demand may have been redirected to gold, given the frenzy witnessed in the first half last year, though this was not a major issue at the lower end of the market which dominates offtake.

Turning to the country's external trade, jewelry exports dropped a mere 2% to an estimated 8.7 Moz (270 t) last year. Although this represents the lowest level seen since 2001, it was an improvement on the 28% decline recorded in 2012, aided by the improving global macroeconomic environment. On a country level, United States and Hong Kong remained the two key trading partners of China, posting 3% and 9% dip respectively.

Looking at this year, the silver jewelry market in the first quarter saw another solid performance. Field research suggesting a rise of around 10%, with stabilizing GDP growth and the non-manufacturing PMI rate indicating optimistic consumer sentiment for the period. Setting up the potential for further growth in the coming year.

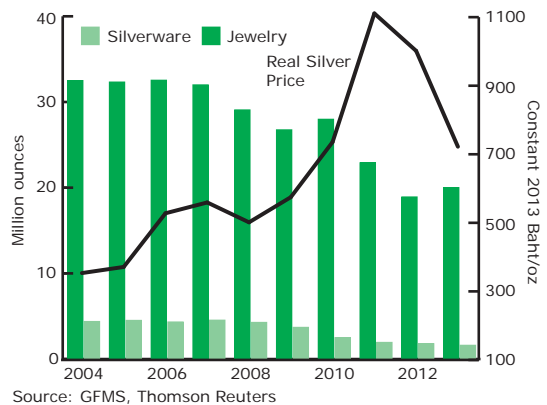
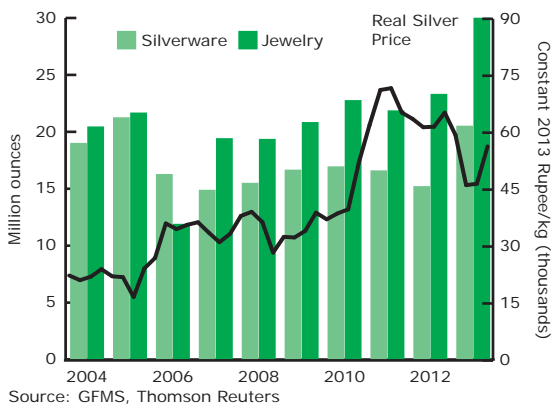
Indian jewelry fabrication in 2013 increased by 29% from 2012 to 30.0 Moz (932 t), the highest ever recorded since the 2001 peak of 33.2 Moz (1032 t). Like gold, silver generally saw hysteric buying during sharp falls in prices, similarly volatile movements at higher price range

had refrained fabricators from building up stocks. This is because unlike holding a bar, which one can liquidate easily, fabricated jewelry has a higher value addition and thus higher margins, and is also unlike plain gold jewelry. Our numbers which reveals that fabrication on an annual average basis has grown at a rate of 4% from 2010 to 2012 while consumption grew at 10% during the same period. And it was during the same time period prices averaged 103% higher than the annual average price of 2009 in rupee terms.

Field research to the jewelry fabrication centers in the north, west and south of India, fabricators said they had stocked up with silver and had full orders for six months ahead when contacted in July and August last year. Fall in price below Rs.45,000/kilo is said to have built confidence to restock and largely traders were of the consensus that price will hold near Rs. 38,000 for over a year.

Looking at consumption trends, discussion with retailers revealed that store sales had increased by about 17%. The rise in rural household income was critical in lifting demand, thanks to better farm yields compared to losses in 2012. Jewelry with more than 90% purity continues to drive the volumes and sterling jewelry is fast catching up in urban sales. However, one of the major competitions for Indian fabricators has emerged from imports of jewelry from Thailand, Hong Kong and Malaysia. The trade was beneficial as jewellers directly procured material from overseas at just one fifth of the domestic price (price charged by Indian fabricator). These pieces are imported to India with a maximum retail price tag and are then directly sold to consumers, thereby netting high margins. That said, most of these are low value

**Indian Jewelry and Silverware Fabrication      Thai Jewelry and Silverware Fabrication**



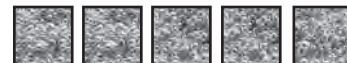




## Silver Fabrication: Jewelry (including the use of scrap)

© GFMS, Thomson Reuters / The Silver Institute

(million ounces)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>Europe</b>										
Italy	34.2	31.5	28.2	25.8	22.6	21.3	21.8	16.5	15.1	15.9
Turkey	6.0	5.7	4.8	4.1	4.5	3.9	3.4	3.1	3.4	4.0
Germany	3.7	3.8	3.8	3.9	3.9	3.7	3.8	3.7	3.6	3.4
Russia	1.2	1.5	1.6	2.3	2.5	3.0	3.3	2.7	2.6	2.6
Poland	3.0	3.3	3.5	3.2	3.0	2.4	2.4	1.9	1.9	2.0
France	2.0	1.5	1.6	1.7	1.6	1.7	1.9	2.2	2.0	1.7
Spain	1.4	1.4	1.3	1.1	1.1	1.2	1.1	1.1	1.0	0.9
Greece	1.0	1.1	1.1	1.0	1.2	1.0	0.9	0.8	0.7	0.6
Sweden	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3
UK	1.2	1.0	1.0	0.5	0.4	0.4	0.4	0.4	0.3	0.3
Portugal	1.2	1.0	0.9	0.7	0.6	0.6	0.6	0.4	0.2	0.2
Switzerland	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Denmark	0.3	0.3	0.3	0.3	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	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Cyprus	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
Belgium	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other Countries	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.3
<b>Total Europe</b>	<b>56.9</b>	<b>53.9</b>	<b>49.7</b>	<b>46.1</b>	<b>43.3</b>	<b>40.9</b>	<b>41.4</b>	<b>34.4</b>	<b>32.6</b>	<b>33.3</b>
<b>North America</b>										
Mexico	13.6	14.0	12.0	12.2	11.8	10.5	10.4	9.1	8.5	12.2
United States	13.8	14.1	13.5	12.9	12.0	10.7	12.0	11.1	10.3	8.6
Canada	1.4	1.2	1.0	0.9	0.8	0.8	0.8	0.8	0.8	0.7
Other Countries	0.4	0.5	0.6	0.6	0.9	1.5	1.4	0.9	0.9	1.2
<b>Total North America</b>	<b>29.1</b>	<b>29.8</b>	<b>27.0</b>	<b>26.6</b>	<b>25.5</b>	<b>23.5</b>	<b>24.6</b>	<b>21.9</b>	<b>20.5</b>	<b>22.8</b>
<b>South America</b>										
Brazil	1.3	1.4	1.5	1.5	1.5	1.7	1.9	1.5	1.5	1.7
Peru	0.3	0.3	0.4	0.3	0.4	0.5	0.5	0.5	0.5	0.7
Argentina	0.2	0.2	0.3	0.2	0.4	0.5	0.4	0.3	0.3	0.4
Colombia	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3
Other Countries	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.8
<b>Total South America</b>	<b>2.6</b>	<b>2.7</b>	<b>3.0</b>	<b>2.9</b>	<b>3.3</b>	<b>3.5</b>	<b>3.8</b>	<b>3.1</b>	<b>3.2</b>	<b>3.8</b>
<b>Asia</b>										
China	24.0	26.7	30.3	34.3	36.1	40.0	46.4	54.4	56.6	62.9
India	20.4	21.6	11.9	19.4	19.3	20.8	22.7	21.8	23.3	30.0
Thailand	32.5	32.3	32.5	32.0	29.1	26.7	28.0	22.9	18.9	20.0
Indonesia	4.5	3.7	4.4	4.2	4.2	4.2	4.7	5.5	6.2	6.5
South Korea	4.0	3.9	4.0	4.2	4.1	4.2	4.7	5.2	5.4	5.5
Japan	1.8	2.0	1.9	2.1	2.0	2.1	2.2	2.2	2.3	2.4
Vietnam	0.9	0.9	1.0	1.1	1.2	1.2	1.4	1.5	1.5	1.5
Saudi Arabia	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.8	0.8	0.8
Malaysia	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.8
Cambodia	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.8	0.8
Myanmar, Laos & Cambodia	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.8	0.8
UAE	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.7
Nepal	1.2	1.1	1.0	1.1	1.1	1.2	1.1	1.1	1.2	0.7
Bangladesh	0.8	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.5



## Silver Fabrication: Jewelry (including the use of scrap)

© GFMS, Thomson Reuters / The Silver Institute

(million ounces)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Sri Lanka	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4
Israel	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.3	0.3	0.4
Taiwan	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Hong Kong	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Pakistan	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3
Iran	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	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
Bahrain	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
Syria	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1
Singapore	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other Countries	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
<b>Total Asia</b>	<b>95.5</b>	<b>98.7</b>	<b>93.5</b>	<b>104.7</b>	<b>103.4</b>	<b>106.9</b>	<b>118.3</b>	<b>121.9</b>	<b>122.9</b>	<b>136.6</b>
<b>Africa</b>										
Egypt	1.5	1.4	1.3	1.4	1.3	1.2	1.1	0.5	0.7	0.8
Morocco	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3
Tunisia	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Other Countries	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.4
<b>Total Africa</b>	<b>2.5</b>	<b>2.3</b>	<b>2.2</b>	<b>2.3</b>	<b>2.2</b>	<b>2.0</b>	<b>2.0</b>	<b>1.4</b>	<b>1.6</b>	<b>1.6</b>
<b>Oceania</b>										
Australia	0.7	0.7	0.6	0.6	0.6	0.6	0.7	0.7	0.8	0.8
<b>Total Oceania</b>	<b>0.7</b>	<b>0.7</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.7</b>	<b>0.7</b>	<b>0.8</b>	<b>0.8</b>
<b>World Total</b>	<b>187.1</b>	<b>187.9</b>	<b>176.0</b>	<b>183.2</b>	<b>178.2</b>	<b>177.3</b>	<b>190.6</b>	<b>183.4</b>	<b>181.4</b>	<b>198.8</b>

items with prices largely below Rs. 10,000.

Smuggling of silver is less publicly discussed than that of gold, but field trips to the north have revealed the smuggling of silver jewelry manufactured in East Asian countries making inroads through land borders. This has been driven by the price differential that emerges from the 10% duty and high domestic manufacturing costs.

Thailand's silver jewelry fabrication rose 5% last year to an estimated 20.0 Moz (622 t). This marks the first increase in two years for this once dominant market. Last year Thailand's jewelry offtake was just 10% of global fabrication, down from 17% a decade earlier when it easily maintained the second rung on the global table, second only to Italy. While China and India have been trending higher in recent years, Thai fabrication has suffered significantly due primarily to market share losses (especially to China) and a significant slowdown in export orders from economically impacted western markets.

In the last decade the amount of silver consumed in jewelry fabrication has declined almost 40% or 12.5 Moz (388 t) and now places Thailand comfortably in third position globally.

While the annual rise in fabrication demand may point to a healthy market last year this was certainly not the case across the board as rising costs impacted severely on profitability. The government-mandated 65% rise in the minimum wage at the start of the year to 300 baht per day (less than \$10) had a telling impact on many family run fabricators. Previously there was a difference in wages paid between city workers and those in rural areas, which encouraged factories to set up rurally to provide work for the region while benefiting from the lower labor costs. The new wages policy provided no such incentive with rural workers enjoying a substantial increase in earnings to match their city counterparts. As a result many small factories closed down last year owing to the additional cost burden. A further impact on profitability last year was due to the weaker baht as labor costs are often priced in US dollars or euro, with this mainly a first half issue.

As has been the case for several years those fabricators producing light weight low-end fashion jewelry (the backbone of the Thai industry) suffered at the hands of stiff competition from China and other fabricating regions.



After several annual declines demand stabilized in 2013 with several reporting a modest uptick in output as a result of the improving global economic outlook and the sizable fall in the silver price. The demand growth within the branded segment was stronger in parts, though some markets were actually softer last year as some attention was drawn to gold due to the lower price environment. However, significant fabrication growth from global brand Pandora (which is fabricated in Thailand) helped to offset some of these falls. According to customs data, jewelry exports picked up in 2013, boosted by impressive gains to Germany US, Australia, and Russia, while deliveries to parts of Europe were marginally weaker. There was no discernible change in jewelry styles last year though traders indicated that they had lowered average weights and were using more stones. White mother of pearl, classic simple designs, the antique look, cubic zirconia and colored stones were all popular.

The macro economic impact again played a central role in 2013, with shipments to most western countries picking up in line with the improved economic outlook, with the United States, which remains the largest market for Thai fabricators (at over 40% of total exports), rising by one-third. Turning briefly to domestic demand, sales of silver jewelry recovered some lost ground after declining in 2012 as a result of severe flooding experienced across much of the south of the country. However, there was also some degree of consumers trading back to gold as prices eased which on dragged on consumption. So too did the political unrest that re-emerged in December, which again impacted on the vital tourist trade.

Jewelry fabrication in South Korea rose for the fifth consecutive year to an estimated 5.5 Moz (172 t); the highest level in our data series, although the annual rate of growth of just 2% was the lowest of recent gains. With gross exports of silver jewelry falling almost 20% last year domestic consumption was largely responsible for the modest annual growth. The expansion in this jewelry segment in recent years has encouraged several fabricators to switch production from karat gold (a market in decline) to silver fashion jewelry, a segment that has grown significantly among the youth demographic and has seen retailers allocate a greater percentage of shelf space to this market. A weaker economic environment curtailed consumer spending to some degree though this was not such a factor at the lower of the market, where fashion jewelry attracted those on a tight budget

who may have previously purchased 14-carat white gold. Branded silver is also becoming popular (sold predominantly at high-end department stores) with offtake in this segment augmented by the tourist trade.

GFMS, Thomson Reuters estimates that Indonesian silver jewelry fabrication increased 5% in 2013, reaching a new record level of 6.5 Moz (201 t). This was predominantly driven by a rise in export focused fabrication - especially in the Bandung area of Java where several new fabricators have entered the market. Trade to Europe and the US remained weaker in 2013 though Australia and South East Asia provided growth for this market. Domestic consumption was slightly weaker in 2013, tempered by the lower gold price and the surge in demand that followed the acute price drop in the second quarter. Indeed, some consumers that may have turned to silver due to its costs advantage returned to the yellow metal (especially at the low-end of the market and particularly the low carat segment) to restock previously liquidated items. Dedicated silver retail outlets have been expanding in shopping malls as the market has matured, while retailers are converting at least part of their shelf space to silver to meet demand in traditional gold shops.

## Silverware

- ***Global silverware fabrication reached the highest level in three years, thereby bringing to an end seven consecutive years of decline, an outcome of the market's price-elastic response over the year.***

Global silverware fabrication gained by 12% year-on-year to 50 Moz (1,556 t). Much of the increase can be attributed to demand from India and China, which together contributed to 61% of the global fabrication demand vs 53% in 2012. This was largely an outcome of re-stocking following the sharp price decline in mid year. Higher value addition and margins were a point of concern for fabricators to build up fresh stocks when prices hovered at levels seen in 2011 and 2012, as the sharp price decline was expected to dent their profit margins.

## Europe

Silverware fabrication continued to decline in 2013, but at a lower rate than recent years, to 10.9 Moz (337 t), representing a 6% year-on-year decline and only 46% of the total a decade earlier. Much of the historic decline



## Silver Fabrication: Silverware (including the use of scrap )

© GFMS, Thomson Reuters / The Silver Institute

(million ounces)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>Europe</b>										
Russia	2.4	2.9	3.0	4.3	5.2	5.5	6.0	5.0	4.8	4.6
Italy	9.1	8.0	7.2	6.6	5.5	4.6	4.0	2.8	2.3	2.0
Turkey	2.8	2.6	2.4	2.1	2.2	1.8	1.5	1.3	1.1	1.2
Germany	3.5	3.0	2.9	2.7	2.3	1.6	1.6	1.4	1.1	0.9
Norway	1.0	0.9	0.9	0.6	0.7	0.5	0.5	0.4	0.4	0.4
Greece	1.7	1.5	1.4	1.2	1.0	0.8	0.6	0.5	0.4	0.4
Sweden	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3
Denmark	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2
UK	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2
France	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.1
Finland	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
Other Countries	1.2	1.1	0.9	0.8	0.7	0.5	0.5	0.4	0.4	0.4
<b>Total Europe</b>	<b>23.4</b>	<b>21.7</b>	<b>20.4</b>	<b>19.7</b>	<b>19.0</b>	<b>16.4</b>	<b>15.9</b>	<b>12.9</b>	<b>11.5</b>	<b>10.9</b>
<b>North America</b>										
United States	1.6	1.5	1.4	1.4	1.0	0.9	0.8	0.8	0.7	0.7
Mexico	2.6	2.5	2.0	1.4	1.2	0.9	0.7	0.5	0.5	0.6
Canada	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
<b>Total North America</b>	<b>4.5</b>	<b>4.3</b>	<b>3.6</b>	<b>2.9</b>	<b>2.3</b>	<b>1.9</b>	<b>1.6</b>	<b>1.4</b>	<b>1.3</b>	<b>1.3</b>
<b>South America</b>										
Colombia	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2
Peru	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1
Other Countries	0.5	0.6	0.6	0.6	0.6	0.5	0.4	0.3	0.3	0.3
<b>Total South America</b>	<b>1.1</b>	<b>1.1</b>	<b>1.2</b>	<b>1.2</b>	<b>1.1</b>	<b>0.9</b>	<b>0.8</b>	<b>0.7</b>	<b>0.7</b>	<b>0.6</b>
<b>Asia</b>										
India	19.0	21.2	16.2	14.9	15.5	16.6	16.9	16.6	15.2	20.5
China	6.3	7.2	8.4	9.1	8.7	6.9	7.6	8.3	8.6	10.0
Thailand	4.4	4.5	4.3	4.5	4.3	3.7	2.5	1.9	1.8	1.6
Iran	1.3	1.4	1.4	1.4	1.4	1.2	1.2	1.0	0.9	0.9
Israel	1.4	1.5	1.5	1.4	1.3	1.1	1.0	0.7	0.6	0.7
Nepal	1.4	1.2	1.1	1.1	1.1	1.0	1.0	0.8	0.8	0.6
South Korea	0.7	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.5	0.5
Indonesia	0.8	0.8	0.7	0.6	0.6	0.7	0.7	0.6	0.5	0.4
Bangladesh	0.9	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.5	0.4
Pakistan	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.3
Sri Lanka	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.2
Cambodia	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	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	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.7	0.6	0.6
<b>Total Asia</b>	<b>38.4</b>	<b>41.7</b>	<b>37.5</b>	<b>36.8</b>	<b>36.5</b>	<b>34.4</b>	<b>33.9</b>	<b>32.7</b>	<b>30.8</b>	<b>37.0</b>
<b>Africa</b>										
Africa	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.3	0.3	0.3
<b>Total Africa</b>	<b>0.6</b>	<b>0.6</b>	<b>0.5</b>	<b>0.5</b>	<b>0.5</b>	<b>0.5</b>	<b>0.4</b>	<b>0.3</b>	<b>0.3</b>	<b>0.3</b>
<b>Oceania</b>										
Australia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total Oceania</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
<b>World Total</b>	<b>68.1</b>	<b>69.4</b>	<b>63.2</b>	<b>61.3</b>	<b>59.5</b>	<b>54.2</b>	<b>52.6</b>	<b>48.1</b>	<b>44.6</b>	<b>50.0</b>



was driven by societal changes, such as the drop in formal dining or gifting of silverware at weddings and christenings. While price declines have made pieces more affordable in the past couple of years, the desirability of such items is no longer quite as widespread. Having said that, the top end of the market remained robust; as did the market for thinner items. The market for traditional heavy flatware remained on the back foot, as has the market for photo frames.

Russian silverware fabrication continued to decline for the third year in a row, falling to 4.6 Moz (144 t) in 2013, its lowest level since 2007. A major contributor to this remained weaker domestic consumption, as a result of the ongoing shift away from heavyweight items, such as tableware and cutlery, and lower demand for giftware and ceremonial pieces. A significant drop in the rouble silver price, however, helped to mitigate some losses last year.

Fabricators in Italy continued to suffer, with an 11% year-on-year decline in production, due to consumers having lower disposable income and a faltering economy. As supported by trade data, the United Kingdom showed signs of benefitting from increasing exports to the more resilient Middle Eastern market. This is reflected by the smaller decline in British silverware fabrication, although this is also related to the British economy starting to pick up more rapidly than the European norm. Exports from Germany were down substantially, although it should be noted that this overstates the weakness in domestic output as much of the trade is in old silverware being shipped out for refining, and scrap declined significantly in 2013.

Turkey has benefitted from familiar trends in 2013 with a move back toward fine silver. While we estimate an 12% recovery in fabrication in 2013, the recovery continued to be hampered by tough export market conditions and the secular decline in silverware usage. Last year's fabrication of 1.2 Moz (38 t) is still some way off pre-financial crisis levels and it will be interesting to see if the market recovers significantly in 2014 as the full impact of price declines in 2013 filters through to the market.

### North America

US silverware demand fell 3% in 2013, continuing the structural decline that began over a decade ago. Offshoring to less expensive manufacturing locations combined with the continued decrease in consumer

interest in flatware contributed to this drop. Foreign demand for U.S. silverware, on the contrary, rose slightly as indicated by a 5% increase in exports in gross weight terms.

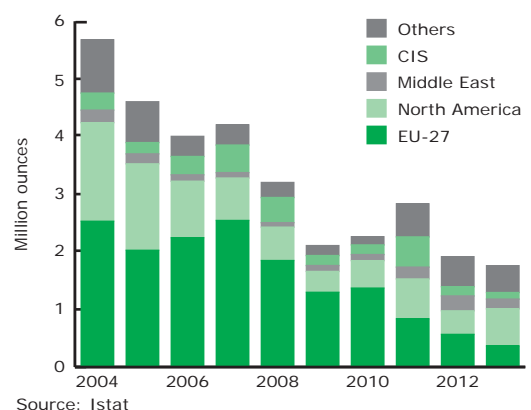
### Asia

Indian silverware fabrication rebounded last year, ending two consecutive years of decline. At 20.5 Moz (637 t) it was 35% higher than 2012 and also the highest since 2006. The fall in silver prices was the key driver leading to replenishment of stocks which otherwise had taken a backseat due to an elevated and volatile price environment during 2011 and 2012. It wasn't just fabrication growth, as end user consumption also recovered by an average 18% last year, basis feedback received from retailers across key consumption regions; this is in contrast to a compounded annual growth rate of 6% from 2010 to 2012.

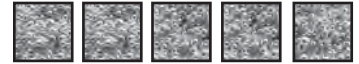
Domestic demand largely emerged from the second half of the year as an outcome of increase in gifting related purchases towards the wedding season, and more so as an alternative to gold. Discussions revealed rapidly growing market share for silverware with purity more than 90%, to an extent some even offering with 95% purity. That said, a segment that continued to foster growth was in the category of high end products priced at more than Rs. 200,000. These are primarily living room show pieces or those given the form of a deity.

Export demand also played a significant role in improving volumes to an extent that many large fabricators reporting year on year growth in exports of over 50%.

Italian Silverware Exports



Source: Istat



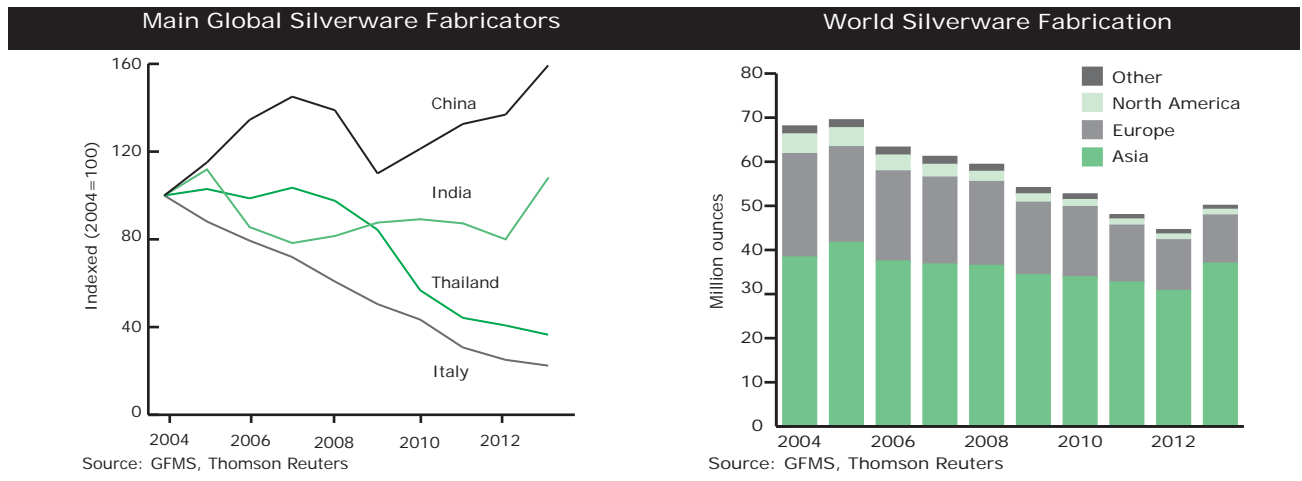
However, these exports were largely to cater the Indian Diaspora and those with inclination to Indian culture.

Chinese silverware fabrication outperformed the global market again in 2013, posting a 16% increase to 10.0 Moz (311 t) against a global growth rate of 12%. The volume exceeded the 2007 record of 9.1 Moz for the first time, setting a new record in silverware offtake. The healthy domestic demand was spurred by increasing household demand for tableware and decorative items, with elevated disposable incomes of growing middle class while credited to the solid silverware performance. Another factor that contributed to the increase is the weaker silver price, the average of which dropped 24% compared to 2012. In addition, unlike gold, silverware gifting was only slightly impacted by the anti-corruption policy released by the Chinese government last year. On the export front, silverware exports also benefited from the recovery of some western countries economies, especially the United States and Europe.

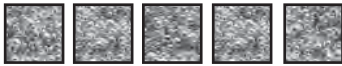
Thailand's silverware fabrication is believed to have declined by just over 10% last year to an estimated 1.6 Moz (50 t). The annual decline was the sixth in succession and has seen this industry segment suffer losses of more than 60% in just the last five years. Higher prices have provided unwanted headwinds to an industry that is already battling societal and consumer trend changes in key export markets. Indeed, it has been the decline in fabrication for the export sector that has the greatest impact, with many family-run traders closing down as trade as declined. Last year, gross exports of silverware fell by 13% according to customs data, with an uptick in shipments to European destinations offset by a sizable drop in deliveries to North America. On the

domestic scene, sales were more robust (particularly at the lower end of the market) as the tourist trade took advantage of the lower price environment; household items such as candle stick holders, photo frames, and tableware remained the mainstay of sales while traditional ceremonial bowls and ornaments were popular with the souvenir trade.

After a steady decline for six years Israel's silverware fabrication turned a corner in 2013, increasing from 0.6 Moz (19 t) to 0.7 Moz (23 t), a 20% year-on-year rise. Furthermore, the impact of the economic recovery in the United States, and a steady 3.4% GDP growth rate within Israel, is seeing both a move back to heavier pieces, and away from plating. While plated material still occupies significant shelf space fine silverware is making a comeback and the fall in silver prices has seen many fine pieces increase in weight anything from 10-50%. The impact of a reversal of previous year's thrifting and substitution is yet to be felt fully in the fabrication statistics, however, and a continued recovery is expected.



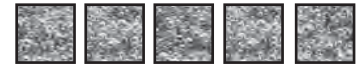




## 8. Appendices

### Contents

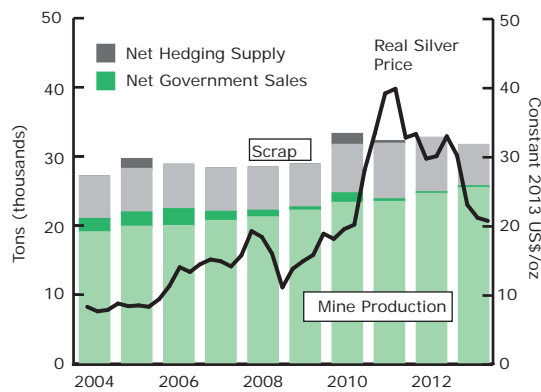
		Page
Appendix 1	World Silver Supply and Demand (tons)	79
	World Silver Mine Production (tons)	80
	Silver Fabrication: Coins and Medals (tons)	82
	Supply of Silver from the Recycling of Old Scrap (tons)	82
	World Silver Fabrication Including the Use of Scrap (tons)	84
	Silver Fabrication: Industrial Applications (tons)	86
	Silver Fabrication: Electrical and Electronics (tons)	88
	Silver Fabrication: Brazing Alloys and Solders (tons)	88
	Silver Fabrication: Photographic Use (tons)	89
	Silver Fabrication: Jewelry and Silverware (tons)	90
	Silver Fabrication: Jewelry (tons)	92
	Silver Fabrication: Silverware (tons)	94
	Supply and Demand with Bar Investment (tons)	95
	Appendix 2	Nominal Silver Prices, 1979 - 2013
Appendix 3	Real Silver Prices, 1979 - 2013	97
Appendix 4	Silver Prices, in US\$ per ounce (London and COMEX)	98
	US Prices in 2013 (monthly)	98
	Leasing Rates in 2013	98
Appendix 5	Leading Primary Silver Mines	99
	Silver Mine Production by Source Metal	99
	Silver Mine Production by Main Region and Source Metal	99
Appendix 6	Comex and London Bullion Market Turnover	100
	Quarterly ETF Holdings and Value	100



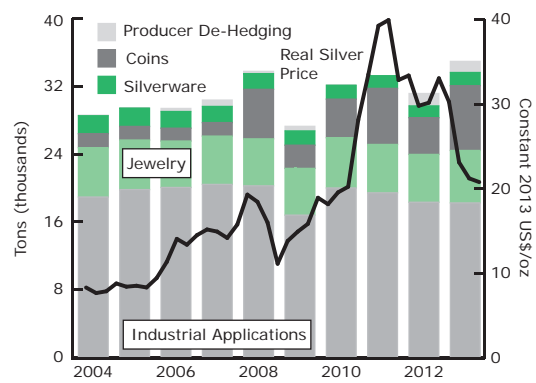
# Appendix 1

World Silver Supply and Demand		© GFMS, Thomson Reuters / The Silver Institute									
(tons)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
<b>Supply</b>											
Mine Production	19,085	19,898	19,990	20,717	21,247	22,201	23,345	23,471	24,644	25,494	
Net Government Sales	1,924	2,051	2,441	1,322	949	486	1,375	374	229	245	
Old Silver Scrap	6,176	6,300	6,408	6,310	6,242	6,211	7,013	8,047	7,857	5,966	
Net Hedging Supply	-62	1,427	-362	-750	-269	-541	1,569	381	-1,460	-1,065	
<b>Total Supply</b>	<b>27,122</b>	<b>29,676</b>	<b>28,478</b>	<b>27,599</b>	<b>28,169</b>	<b>28,356</b>	<b>33,301</b>	<b>32,273</b>	<b>31,269</b>	<b>30,640</b>	
<b>Demand</b>											
Jewelry	5,821	5,846	5,474	5,697	5,542	5,514	5,930	5,703	5,641	6,185	
Coins & Bars	1,648	1,603	1,515	1,593	5,838	2,733	4,545	6,613	4,333	7,640	
Silverware	2,117	2,157	1,967	1,906	1,851	1,685	1,636	1,495	1,387	1,556	
Industrial Fabrication	18,939	19,815	20,067	20,426	20,259	16,802	20,006	19,434	18,323	18,244	
...of which Electrical & Electronics	5,965	6,566	6,939	7,458	7,637	6,317	8,478	8,107	7,372	7,274	
...of which Brazing Alloys & Solders	1,521	1,631	1,693	1,806	1,906	1,658	1,886	1,942	1,874	1,940	
...of which Photography	5,563	4,987	4,424	3,639	3,115	2,439	2,140	1,920	1,691	1,567	
...of which Other Industrial	5,890	6,630	7,011	7,523	7,600	6,388	7,502	7,465	7,385	7,463	
<b>Physical Demand</b>	<b>28,524</b>	<b>29,421</b>	<b>29,022</b>	<b>29,621</b>	<b>33,489</b>	<b>26,734</b>	<b>32,116</b>	<b>33,246</b>	<b>29,684</b>	<b>33,624</b>	
<b>Physical Surplus/ Deficit</b>	<b>-1,402</b>	<b>255</b>	<b>-544</b>	<b>-2,022</b>	<b>-5,320</b>	<b>1,623</b>	<b>1,185</b>	<b>-972</b>	<b>1,586</b>	<b>-2,984</b>	
ETF Inventory Build	0	0	4,907	1,704	3,152	4,783	4,125	-747	1,714	48	
Exchange Inventory Build	-631	494	-279	669	-222	-475	-231	378	1,934	273	
<b>Net Balance</b>	<b>-771</b>	<b>-239</b>	<b>-5,173</b>	<b>-4,394</b>	<b>-8,249</b>	<b>-2,685</b>	<b>-2,709</b>	<b>-604</b>	<b>-2,062</b>	<b>-3,306</b>	
<b>Silver Price (London US\$/oz)</b>	<b>6.66</b>	<b>7.31</b>	<b>11.55</b>	<b>13.38</b>	<b>14.99</b>	<b>14.67</b>	<b>20.19</b>	<b>35.12</b>	<b>31.15</b>	<b>23.79</b>	

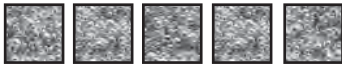
## World Silver Supply      World Silver Demand



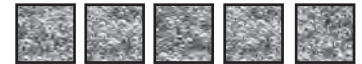
Source: GFMS, Thomson Reuters



Source: GFMS, Thomson Reuters

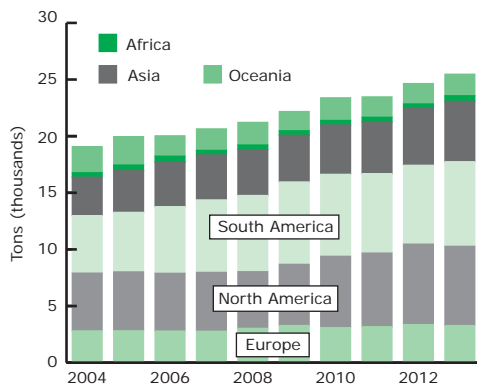


World Silver Mine Production		© GFMS, Thomson Reuters / The Silver Institute									
(tons)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
<b>Europe</b>											
Russia	941	1,010	972	910	1,132	1,312	1,145	1,198	1,400	1,412	
Poland	1,362	1,261	1,260	1,233	1,212	1,220	1,171	1,270	1,284	1,171	
Sweden	291	284	266	294	263	270	285	283	306	337	
Turkey	126	162	187	235	314	389	384	288	228	188	
Portugal	25	24	20	28	41	22	23	31	34	45	
Spain	0	5	2	2	2	5	23	33	37	41	
Greece	0	0	25	35	35	29	27	25	30	34	
Bulgaria	19	21	18	14	11	15	13	17	19	18	
Romania	28	27	15	3	0	3	7	16	12	12	
Macedonia	3	7	11	8	9	9	9	9	9	9	
Ireland	7	7	5	5	5	3	1	1	2	1	
Italy	0	3	3	1	0	0	0	0	0	0	
Other Countries	1	1	1	1	1	1	1	2	1	2	
<b>Total Europe</b>	<b>2,802</b>	<b>2,812</b>	<b>2,786</b>	<b>2,769</b>	<b>3,027</b>	<b>3,278</b>	<b>3,089</b>	<b>3,173</b>	<b>3,361</b>	<b>3,270</b>	
<b>North America</b>											
Mexico	2,569	2,894	2,970	3,135	3,236	3,554	4,411	4,778	5,358	5,277	
United States	1,250	1,220	1,140	1,260	1,120	1,250	1,270	1,120	1,060	1,090	
Canada	1,295	1,063	969	829	669	608	573	582	663	646	
<b>Total North America</b>	<b>5,114</b>	<b>5,177</b>	<b>5,079</b>	<b>5,225</b>	<b>5,026</b>	<b>5,412</b>	<b>6,254</b>	<b>6,480</b>	<b>7,081</b>	<b>7,013</b>	
<b>South America</b>											
Peru	3,060	3,191	3,456	3,501	3,681	3,844	3,640	3,414	3,481	3,674	
Bolivia	434	399	472	525	1,114	1,326	1,274	1,214	1,235	1,281	
Chile	1,360	1,379	1,602	1,936	1,404	1,301	1,276	1,273	1,151	1,218	
Argentina	145	187	211	252	333	555	721	703	755	768	
Guatemala	0	10	50	88	100	129	195	273	205	324	
Dominican Republic	0	0	0	0	0	18	19	19	27	87	
Honduras	50	54	56	54	59	58	58	49	51	51	
Colombia	9	7	8	10	9	11	15	24	15	20	
Ecuador	1	11	13	13	13	13	15	16	17	18	
Brazil	8	9	10	11	11	11	12	12	12	14	
Nicaragua	3	2	3	3	3	4	7	7	8	9	
Panama	0	0	0	0	0	0	0	1	3	2	
Other Countries	3	6	6	6	5	5	6	3	4	4	
<b>Total South America</b>	<b>5,073</b>	<b>5,256</b>	<b>5,887</b>	<b>6,400</b>	<b>6,733</b>	<b>7,275</b>	<b>7,239</b>	<b>7,007</b>	<b>6,963</b>	<b>7,471</b>	
<b>Asia</b>											
China	1,967	2,102	2,361	2,466	2,638	2,699	2,942	3,191	3,516	3,669	
Kazakhstan	703	812	796	708	629	614	548	547	545	617	
India	105	102	183	178	212	193	255	234	369	376	
Indonesia	266	308	246	268	248	240	209	186	141	186	
Armenia	40	37	39	37	40	49	54	74	81	98	
Islamic Rep. Of Iran	84	90	100	90	98	106	106	101	96	85	
Uzbekistan	60	65	64	79	53	52	59	59	59	60	
Mongolia	36	36	37	36	35	34	34	33	32	48	
Philippines	9	19	24	28	14	34	41	46	49	40	
Thailand	16	20	17	13	13	21	23	24	38	38	
Dem. Rep. of Laos	3	6	6	4	7	15	17	18	20	29	
North Korea	25	25	29	29	29	25	26	27	27	26	

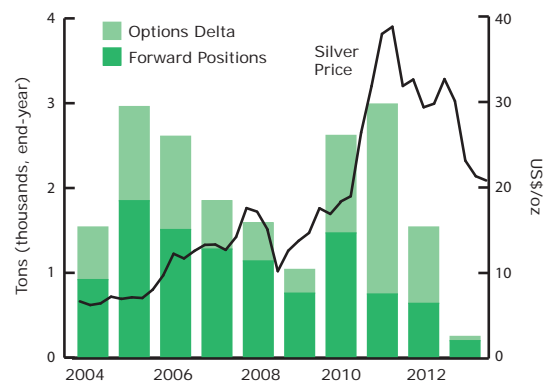


World Silver Mine Production		© GFMS, Thomson Reuters / The Silver Institute									
(tons)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
Saudi Arabia	15	13	9	9	12	12	12	9	11	20	
Japan	54	32	34	14	12	12	11	17	17	15	
Kyrgyzstan	1	1	6	6	10	9	10	10	6	11	
Tajikistan	4	1	1	1	1	1	1	2	2	4	
Pakistan	2	2	2	2	2	2	3	3	3	3	
Other Countries	3	2	2	2	2	2	6	6	6	3	
<b>Total Asia</b>	<b>3,393</b>	<b>3,675</b>	<b>3,955</b>	<b>3,971</b>	<b>4,055</b>	<b>4,120</b>	<b>4,357</b>	<b>4,586</b>	<b>5,018</b>	<b>5,326</b>	
<b>Africa</b>											
Morocco	225	247	237	215	242	276	307	250	232	256	
South Africa	71	88	93	86	84	92	93	92	90	88	
Dem. Rep. of the Congo	34	54	68	70	34	1	7	11	14	62	
Eritrea	0	0	0	0	0	0	0	4	23	25	
Zambia	8	10	9	8	9	12	13	12	12	13	
Tanzania	13	13	12	11	9	11	12	13	13	12	
Botswana	4	4	4	4	5	5	5	5	7	7	
Zimbabwe	4	4	3	2	2	2	3	3	4	4	
Ethiopia	2	1	1	1	1	2	2	3	3	3	
Ghana	1	2	2	2	2	2	2	2	2	3	
Mali	2	2	3	3	2	3	2	2	3	2	
Other Countries	30	32	35	8	8	0	1	2	3	3	
<b>Total Africa</b>	<b>393</b>	<b>455</b>	<b>467</b>	<b>411</b>	<b>399</b>	<b>404</b>	<b>446</b>	<b>400</b>	<b>406</b>	<b>478</b>	
<b>Oceania &amp; Other</b>											
Australia	2222	2407	1728	1879	1926	1631	1880	1725	1727	1840	
Papua New Guinea	54	68	51	44	50	67	67	92	82	90	
New Zealand	30	46	35	19	32	14	13	8	6	5	
Other Countries	2	1	1	0	0	0	0	0	0	0	
<b>Total Oceania</b>	<b>2,308</b>	<b>2,521</b>	<b>1,815</b>	<b>1,942</b>	<b>2,009</b>	<b>1,712</b>	<b>1,960</b>	<b>1,826</b>	<b>1,814</b>	<b>1,935</b>	
<b>World Total</b>	<b>19,085</b>	<b>19,898</b>	<b>19,990</b>	<b>20,717</b>	<b>21,247</b>	<b>22,201</b>	<b>23,345</b>	<b>23,471</b>	<b>24,644</b>	<b>25,494</b>	

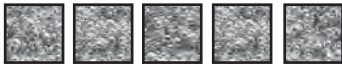
World Silver Mine Production      Silver Producer Hedging: Outstanding Positions



Source: GFMS, Thomson Reuters



Source: GFMS, Thomson Reuters


**Silver Fabrication: Coins and Medals Including the Use of Scrap**

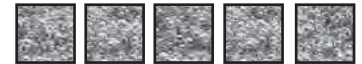
© GFMS, Thomson Reuters / The Silver Institute

(tons)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
United States	483	517	548	497	790	1,067	1,296	1,276	1,084	1,374
Canada	40	51	89	133	281	336	579	729	561	909
Austria	15	18	16	16	259	296	360	571	285	458
China	72	57	50	81	88	94	116	180	265	307
Australia	40	32	43	109	182	201	272	350	200	283
India	-	-	-	-	-	-	-	58	58	106
United Kingdom	14	14	13	14	16	17	16	30	22	66
Mexico	85	81	58	51	43	52	64	52	23	34
Japan	2	2	2	2	9	12	19	19	23	25
Russia	11	12	8	9	8	9	23	22	23	25
Germany	301	303	271	195	223	232	200	101	35	20
Spain	69	53	45	37	32	31	40	21	18	12
Other Countries	215	113	90	88	83	83	91	73	75	65
<b>World Total</b>	<b>1,348</b>	<b>1,253</b>	<b>1,235</b>	<b>1,235</b>	<b>2,013</b>	<b>2,431</b>	<b>3,077</b>	<b>3,484</b>	<b>2,672</b>	<b>3,684</b>

**Supply of Silver from the Recycling of Old Scrap**

© GFMS, Thomson Reuters / The Silver Institute

(tons)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>Europe</b>										
Germany	598	546	470	471	455	390	465	519	672	537
Russia	323	266	262	274	258	261	356	346	340	311
Italy	104	133	170	175	183	181	203	303	309	270
UK	386	360	340	348	340	316	198	350	305	223
France	117	127	139	142	158	170	193	217	182	161
Turkey	47	41	35	30	36	33	32	36	32	32
Austria	50	40	40	38	36	33	35	38	37	37
Spain	13	13	13	12	14	16	23	40	41	35
Netherlands	45	42	40	35	34	32	34	38	38	27
Sweden	32	31	29	28	27	26	26	28	28	22
Belgium	20	20	20	20	19	18	20	21	22	19
Denmark	17	16	16	16	15	14	16	17	16	13
Portugal	14	13	13	13	12	12	12	13	14	11
Finland	12	12	11	11	10	10	10	11	11	9
Norway	10	9	9	8	9	9	10	10	10	8
Greece	4	4	4	6	6	7	8	9	9	8
Czech Republic	9	9	9	9	9	8	9	9	9	7
Poland	9	9	8	8	8	7	7	8	8	6
Switzerland	10	10	8	8	8	7	7	7	7	6
Other Countries	25	23	22	22	21	19	19	20	20	16
<b>Total Europe</b>	<b>1,846</b>	<b>1,725</b>	<b>1,660</b>	<b>1,674</b>	<b>1,657</b>	<b>1,570</b>	<b>1,684</b>	<b>2,041</b>	<b>2,111</b>	<b>1,760</b>
<b>North America</b>										
United States	1,728	1,772	1,656	1,666	1,724	1,692	2,015	2,375	2,143	1,457
Mexico	60	64	72	84	95	98	123	140	145	107
Canada	44	46	44	50	52	48	51	56	51	34
<b>Total North America</b>	<b>1,832</b>	<b>1,882</b>	<b>1,772</b>	<b>1,800</b>	<b>1,871</b>	<b>1,838</b>	<b>2,189</b>	<b>2,571</b>	<b>2,339</b>	<b>1,598</b>
<b>South America</b>										
Brazil	32	32	32	32	32	34	46	78	79	67
Argentina	20	20	24	20	16	13	19	22	22	19

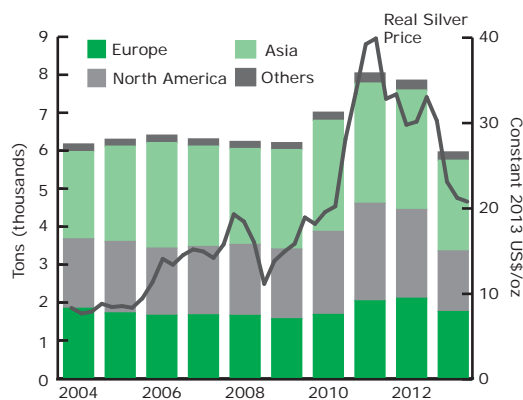


**Supply of Silver from the Recycling of Old Scrap**

© GFMS, Thomson Reuters / The Silver Institute

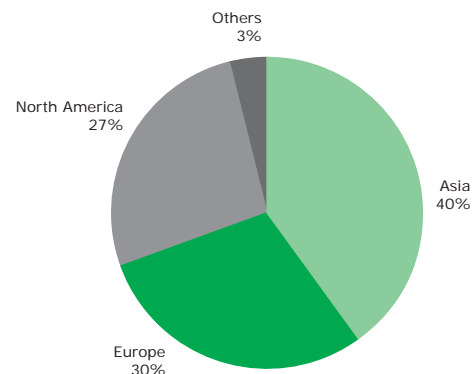
(tons)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Chile	12	14	16	16	16	14	18	20	19	14
<b>Total South America</b>	<b>84</b>	<b>90</b>	<b>99</b>	<b>92</b>	<b>87</b>	<b>85</b>	<b>113</b>	<b>160</b>	<b>158</b>	<b>133</b>
<b>Asia</b>										
China	473	544	636	700	705	787	909	992	962	935
Japan	880	852	810	800	736	662	649	714	662	623
South Korea	225	226	240	242	240	262	294	310	281	262
India	363	535	705	502	429	465	558	642	771	169
Taiwan	85	84	88	91	97	111	129	140	133	113
Thailand	74	69	80	85	91	96	115	116	99	87
Saudi Arabia	40	50	56	58	59	60	69	73	68	64
Singapore	14	14	16	16	15	15	17	18	17	16
Hong Kong	12	13	14	14	14	14	15	16	15	13
Israel	14	12	12	13	13	13	16	17	16	13
Indonesia	11	11	12	12	12	12	13	15	14	13
Pakistan	9	10	10	10	10	12	16	19	18	12
Egypt	42	43	46	48	51	55	62	27	23	12
Vietnam	10	11	11	12	12	11	12	13	11	10
Oman	5	5	6	6	6	6	6	7	7	6
Other Countries	41	38	42	43	42	44	53	57	55	47
<b>Total Asia</b>	<b>2,293</b>	<b>2,512</b>	<b>2,778</b>	<b>2,644</b>	<b>2,528</b>	<b>2,619</b>	<b>2,927</b>	<b>3,168</b>	<b>3,148</b>	<b>2,389</b>
<b>Africa</b>										
Morocco	40	19	29	28	29	31	32	35	35	31
Other Countries	17	17	18	18	18	18	20	21	21	14
<b>Total Africa</b>	<b>57</b>	<b>36</b>	<b>47</b>	<b>46</b>	<b>47</b>	<b>50</b>	<b>52</b>	<b>57</b>	<b>56</b>	<b>46</b>
<b>Oceania</b>										
Australia	64	55	53	52	51	49	49	49	45	41
<b>Total Oceania</b>	<b>64</b>	<b>55</b>	<b>53</b>	<b>52</b>	<b>51</b>	<b>49</b>	<b>49</b>	<b>49</b>	<b>45</b>	<b>41</b>
<b>World Total</b>	<b>6,176</b>	<b>6,300</b>	<b>6,408</b>	<b>6,309</b>	<b>6,242</b>	<b>6,211</b>	<b>7,013</b>	<b>8,047</b>	<b>7,857</b>	<b>5,966</b>

**World Silver Scrap Supply**



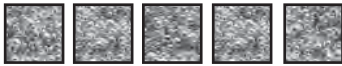
Source: GFMS, Thomson Reuters

**World Scrap Supply, 2013**



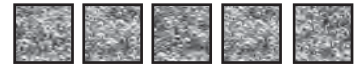
Source: GFMS, Thomson Reuters




**World Silver Fabrication Including the Use of Scrap**

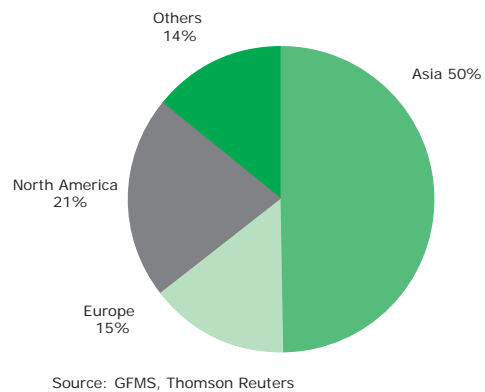
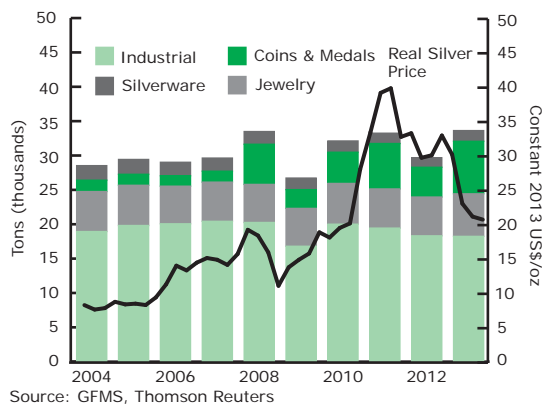
© GFMS, Thomson Reuters / The Silver Institute

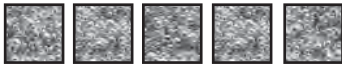
(tons)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>Europe</b>										
Russia	752	795	826	902	930	854	944	864	845	849
Italy	1,720	1,577	1,449	1,366	1,233	1,095	1,117	894	815	828
Germany	1,257	1,259	1,275	1,249	1,271	1,028	1,193	1,052	856	818
UK	1,604	1,330	1,013	780	725	588	634	694	631	639
Austria	35	36	33	33	276	312	376	587	300	473
Belgium	900	846	920	876	767	614	556	453	419	378
France	397	380	387	401	400	299	346	325	298	277
Turkey	321	309	276	247	262	221	201	181	184	209
Poland	134	145	149	135	132	109	112	95	92	93
Switzerland	93	98	94	94	94	86	92	92	89	88
Spain	197	174	155	140	131	125	132	103	88	76
Netherlands	101	81	69	70	66	58	63	61	61	60
Greece	86	82	77	70	68	56	46	40	34	31
Norway	63	54	52	40	40	30	33	30	30	28
Sweden	38	38	37	35	34	29	39	28	28	27
Denmark	21	21	21	21	20	18	19	18	18	16
Portugal	120	48	39	31	25	25	25	17	12	11
Czech Republic	15	14	15	14	14	12	13	12	12	11
Hungary	13	12	7	7	9	8	8	8	8	8
Finland	8	8	9	7	7	5	5	5	5	5
Romania	8	8	8	4	4	3	4	4	4	4
Other Countries	31	32	33	33	33	28	30	28	28	26
<b>Total Europe</b>	<b>7,914</b>	<b>7,348</b>	<b>6,943</b>	<b>6,559</b>	<b>6,541</b>	<b>5,602</b>	<b>5,986</b>	<b>5,591</b>	<b>4,856</b>	<b>4,954</b>
<b>North America</b>										
United States	5,614	5,895	5,782	5,568	5,837	5,309	6,403	5,945	5,555	5,485
Canada	183	196	220	269	408	461	756	943	794	1,140
Mexico	608	623	545	557	522	447	468	413	358	493
Other Countries	13	17	19	20	28	46	42	28	29	38
<b>Total North America</b>	<b>6,419</b>	<b>6,731</b>	<b>6,566</b>	<b>6,414</b>	<b>6,795</b>	<b>6,264</b>	<b>7,669</b>	<b>7,330</b>	<b>6,736</b>	<b>7,156</b>
<b>South America</b>										
Brazil	175	166	118	175	169	162	191	169	167	144
Argentina	77	79	60	53	49	42	44	39	39	39
Peru	18	16	19	18	19	22	23	19	19	26
Colombia	23	22	23	24	21	18	20	19	19	19
Other Countries	40	38	40	40	40	36	38	37	37	40
<b>Total South America</b>	<b>334</b>	<b>322</b>	<b>261</b>	<b>310</b>	<b>299</b>	<b>281</b>	<b>315</b>	<b>283</b>	<b>281</b>	<b>268</b>
<b>Asia</b>										
China	3,917	4,307	4,711	5,402	6,005	5,803	6,672	7,236	7,439	8,163
India	2,272	2,974	2,463	2,727	2,767	2,755	2,961	3,010	2,812	3,114
Japan	3,826	3,860	4,097	3,912	3,332	2,165	3,070	2,804	2,333	2,373
South Korea	735	794	842	903	955	763	929	941	925	891
Thailand	1,151	1,150	1,178	1,159	1,051	967	957	782	654	682
Taiwan	349	380	438	534	533	397	486	510	463	471
Indonesia	181	159	178	170	168	166	193	216	234	241
Hong Kong	229	236	254	270	264	222	255	260	256	241
Saudi Arabia	43	98	64	64	29	190	192	98	55	59
Israel	81	84	86	85	80	68	66	53	49	57
Vietnam	30	32	35	37	39	40	45	49	50	49



World Silver Fabrication Including the Use of Scrap										
© GFMS, Thomson Reuters / The Silver Institute										
(tons)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Iran	54	50	80	78	102	45	51	43	40	39
Malaysia	23	22	22	21	21	21	22	24	26	27
UAE	16	17	18	18	19	19	21	23	25	26
Singapore	3	3	3	3	3	3	4	4	5	4
Other Countries	270	191	181	203	201	205	217	266	332	323
<b>Total Asia</b>	<b>13,179</b>	<b>14,357</b>	<b>14,649</b>	<b>15,588</b>	<b>15,569</b>	<b>13,829</b>	<b>16,140</b>	<b>16,318</b>	<b>15,697</b>	<b>16,759</b>
<b>Africa</b>										
Egypt	61	55	52	53	49	44	43	19	27	27
Morocco	11	11	11	11	11	9	10	10	10	10
Tunisia	10	10	9	10	10	10	10	9	9	10
Algeria	6	6	6	6	6	6	6	6	5	6
South Africa	4	4	4	4	4	4	4	4	4	4
Other Countries	16	17	17	18	18	16	18	16	16	12
<b>Total Africa</b>	<b>108</b>	<b>103</b>	<b>99</b>	<b>103</b>	<b>99</b>	<b>90</b>	<b>90</b>	<b>64</b>	<b>72</b>	<b>69</b>
<b>Oceania</b>										
Australia	270	209	223	290	360	366	448	531	381	463
Other Countries	0	0	1	0	1	0	0	1	0	0
<b>Total Oceania</b>	<b>270</b>	<b>209</b>	<b>224</b>	<b>290</b>	<b>361</b>	<b>366</b>	<b>448</b>	<b>532</b>	<b>381</b>	<b>463</b>
<b>World Total</b>	<b>28,524</b>	<b>29,420</b>	<b>29,022</b>	<b>29,621</b>	<b>33,488</b>	<b>26,733</b>	<b>32,116</b>	<b>33,245</b>	<b>29,683</b>	<b>33,624</b>

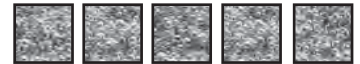
World Silver Fabrication      World Silver Fabrication, 2013\*




**Silver Fabrication: Industrial Applications Including the Use of Scrap**

© GFMS, Thomson Reuters / The Silver Institute

(tons)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>Europe</b>										
Germany	730	744	793	851	856	630	823	791	674	664
Russia	629	645	674	689	681	582	630	602	593	598
UK	1,542	1,273	960	740	686	550	596	643	591	557
Belgium	872	828	908	864	757	604	546	444	410	369
Italy	357	338	340	352	350	281	307	286	267	261
France	320	317	322	334	335	232	274	248	223	218
Switzerland	76	81	77	77	76	68	74	74	71	70
Turkey	45	47	48	50	51	42	44	46	45	46
Netherlands	48	49	49	49	49	40	47	46	45	44
Spain	65	60	58	59	58	53	55	44	38	35
Poland	22	22	23	24	25	21	23	22	22	22
Austria	13	13	13	13	13	12	13	13	13	13
Norway	26	22	17	16	15	11	13	12	12	12
Sweden	10	10	10	11	11	8	10	9	9	9
Czech Republic	10	10	10	9	9	7	8	7	7	7
Hungary	8	8	3	3	3	3	3	3	3	3
Portugal	4	3	3	3	3	2	3	3	3	3
Romania	7	7	7	2	2	2	2	2	2	2
Denmark	2	2	3	3	3	2	2	2	2	2
Other Countries	12	12	13	13	13	11	13	12	12	12
<b>Total Europe</b>	<b>4,799</b>	<b>4,492</b>	<b>4,331</b>	<b>4,161</b>	<b>3,995</b>	<b>3,163</b>	<b>3,487</b>	<b>3,312</b>	<b>3,042</b>	<b>2,947</b>
<b>North America</b>										
United States	4,653	4,891	4,769	4,629	4,643	3,880	4,707	4,299	4,129	3,823
Canada	93	101	95	102	97	97	148	187	206	204
Mexico	19	31	53	83	75	40	60	59	56	60
<b>Total North America</b>	<b>4,765</b>	<b>5,023</b>	<b>4,917</b>	<b>4,814</b>	<b>4,815</b>	<b>4,018</b>	<b>4,915</b>	<b>4,545</b>	<b>4,391</b>	<b>4,088</b>
<b>South America</b>										
Brazil	131	116	64	121	115	105	127	119	117	90
Argentina	68	68	48	42	31	24	28	28	27	25
Colombia	6	5	5	5	5	4	5	4	4	4
Other Countries	13	13	13	12	12	11	12	12	12	12
<b>Total South America</b>	<b>218</b>	<b>202</b>	<b>130</b>	<b>180</b>	<b>164</b>	<b>144</b>	<b>171</b>	<b>164</b>	<b>161</b>	<b>130</b>
<b>Asia</b>										
China	2,902	3,195	3,455	3,972	4,525	4,251	4,876	5,104	5,145	5,590
Japan	3,767	3,795	4,034	3,844	3,261	2,088	2,981	2,716	2,237	2,273
India	915	1,433	1,384	1,462	1,485	1,431	1,576	1,676	1,553	1,468
South Korea	589	647	694	750	806	612	762	761	742	705
Taiwan	338	367	423	518	518	382	470	492	445	453
Hong Kong	189	193	208	222	213	171	199	199	193	180
Indonesia	18	19	19	20	19	17	24	26	27	26
Israel	22	23	24	24	23	20	21	21	20	21
Saudi Arabia	24	77	43	43	7	164	159	62	14	15
Thailand	-	-	28	19	10	16	5	5	5	5
Iran	6	0	31	29	53	2	8	3	3	3
Malaysia	1	1	1	1	1	1	1	1	1	1

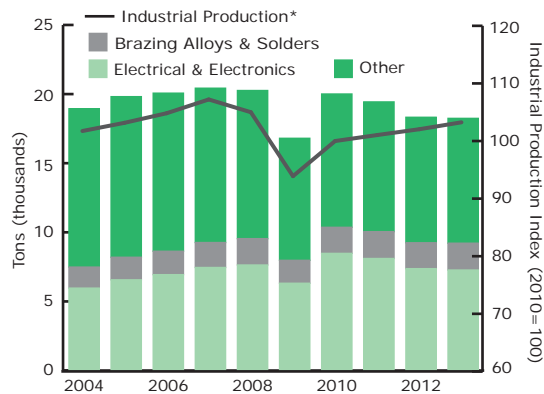


**Silver Fabrication: Industrial Applications Including the Use of Scrap**

© GFMS, Thomson Reuters / The Silver Institute

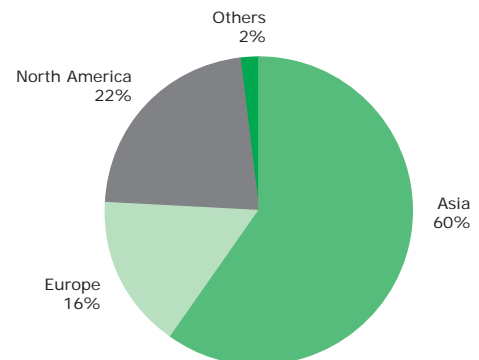
(tons)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
UAE	1	1	1	1	1	1	1	1	1	1
Other Countries	156	168	164	181	181	155	172	167	165	162
<b>Total Asia</b>	<b>8,929</b>	<b>9,921</b>	<b>10,508</b>	<b>11,087</b>	<b>11,104</b>	<b>9,312</b>	<b>11,255</b>	<b>11,234</b>	<b>10,551</b>	<b>10,904</b>
<b>Africa</b>										
Morocco	8	8	9	9	8	7	8	8	8	8
South Africa	4	4	4	4	4	4	4	4	4	4
Algeria	1	1	1	1	1	1	1	1	1	1
Other Countries	8	8	8	9	9	8	9	8	8	7
<b>Total Africa</b>	<b>21</b>	<b>22</b>	<b>22</b>	<b>23</b>	<b>23</b>	<b>20</b>	<b>23</b>	<b>21</b>	<b>21</b>	<b>20</b>
<b>Oceania</b>										
Australia	207	155	159	160	158	144	154	158	157	155
<b>Total Oceania</b>	<b>207</b>	<b>155</b>	<b>159</b>	<b>160</b>	<b>158</b>	<b>144</b>	<b>154</b>	<b>158</b>	<b>157</b>	<b>155</b>
<b>World Total</b>	<b>18,938</b>	<b>19,814</b>	<b>20,067</b>	<b>20,425</b>	<b>20,258</b>	<b>16,802</b>	<b>20,006</b>	<b>19,434</b>	<b>18,322</b>	<b>18,244</b>

**Components of Industrial Demand**

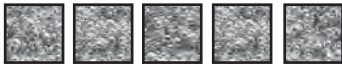


Source: GFMS, Thomson Reuters; OECD;  
\*Industrialized economies

**World Silver Industrial Fabrication, 2013**



Source: GFMS, Thomson Reuters


**Silver Fabrication: Electrical and Electronics Including the Use of Scrap**

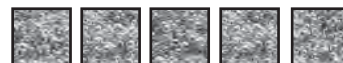
© GFMS, Thomson Reuters / The Silver Institute

(tons)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
United States	1,474	1,622	1,710	1,796	1,935	1,660	2,320	2,085	1,745	1,651
China	672	748	821	1,001	1,122	994	1,216	1,263	1,265	1,365
Japan	1,181	1,360	1,432	1,394	1,204	877	1,588	1,438	1,213	1,219
Germany	551	569	613	664	673	488	664	631	534	529
India	177	318	335	440	468	502	531	534	547	470
South Korea	360	400	430	456	495	390	500	499	491	464
Taiwan	260	293	320	363	384	309	377	395	353	367
Russia	328	339	359	375	375	321	353	339	334	338
Mexico	56	64	61	65	64	69	118	157	177	179
France	252	248	254	264	269	178	215	189	165	164
UK	190	141	138	139	145	106	120	125	122	121
Hong Kong	92	94	101	108	104	83	97	97	94	87
Italy	118	108	111	121	127	107	121	103	86	78
Brazil	40	48	38	50	50	46	52	52	51	47
Turkey	31	31	32	33	34	28	29	31	29	29
Australia	21	22	23	23	22	20	21	22	21	21
Netherlands	16	17	17	17	17	13	16	15	15	14
Other Countries	151	149	149	152	153	128	144	137	133	134
<b>World Total</b>	<b>5,969</b>	<b>6,570</b>	<b>6,943</b>	<b>7,462</b>	<b>7,641</b>	<b>6,320</b>	<b>8,481</b>	<b>8,110</b>	<b>7,375</b>	<b>7,276</b>

**Silver Fabrication: Brazing Alloys and Solders Including the Use of Scrap**

© GFMS, Thomson Reuters / The Silver Institute

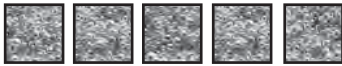
(tons)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
China	512	574	604	664	805	826	890	949	975	1,079
United States	228	240	224	240	225	162	182	187	166	167
Japan	116	119	122	123	114	70	105	94	77	71
Germany	100	98	105	111	107	71	86	86	70	68
UK	92	90	95	75	72	57	71	76	67	66
India	67	75	70	68	67	68	80	83	75	65
South Korea	49	59	64	74	81	64	72	73	68	64
Russia	55	56	60	62	62	54	59	56	56	56
Canada	12	24	46	76	68	34	53	53	49	50
Italy	63	67	74	77	74	51	57	54	49	48
Switzerland	42	48	44	44	42	38	41	41	39	39
Taiwan	34	36	39	39	39	31	38	39	38	36
Brazil	23	25	26	26	25	27	30	31	30	28
Australia	20	16	17	17	17	15	16	18	18	17
France	22	25	26	27	26	17	20	19	17	16
Belgium	20	20	20	20	19	18	20	21	22	15
Spain	25	20	20	20	19	18	18	16	13	11
Mexico	16	16	15	16	14	12	13	12	12	10
Other Countries	23	23	24	24	29	24	33	32	33	33
<b>World Total</b>	<b>1,521</b>	<b>1,631</b>	<b>1,693</b>	<b>1,806</b>	<b>1,906</b>	<b>1,658</b>	<b>1,886</b>	<b>1,942</b>	<b>1,874</b>	<b>1,940</b>


**Silver Fabrication: Photographic Use Including the Use of Scrap**

© GFMS, Thomson Reuters / The Silver Institute

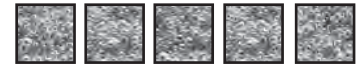
(tons)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>Europe</b>										
EU-28	1,921	1,705	1,464	1,211	1,044	853	805	713	646	580
Russia	83	80	76	64	56	47	42	38	36	36
<b>Total Europe</b>	<b>2,004</b>	<b>1,785</b>	<b>1,539</b>	<b>1,275</b>	<b>1,100</b>	<b>900</b>	<b>847</b>	<b>751</b>	<b>683</b>	<b>616</b>
<b>North America</b>										
United States	1,716	1,753	1,442	1,071	875	728	630	556	521	498
<b>Total North America</b>	<b>1,716</b>	<b>1,753</b>	<b>1,442</b>	<b>1,071</b>	<b>875</b>	<b>728</b>	<b>630</b>	<b>556</b>	<b>521</b>	<b>498</b>
<b>South America</b>										
Brazil	68	43	0	45	40	32	45	37	35	14
Argentina	48	40	16	8	-	-	-	-	-	-
<b>Total South America</b>	<b>116</b>	<b>83</b>	<b>16</b>	<b>53</b>	<b>40</b>	<b>32</b>	<b>45</b>	<b>37</b>	<b>35</b>	<b>14</b>
<b>Asia</b>										
Japan	1,476	1,180	1,251	1,080	968	670	525	490	371	367
China	190	167	157	143	115	95	81	74	69	60
India	10	10	10	10	10	10	10	10	10	10
Sri Lanka	4	4	4	4	4	-	-	-	-	-
<b>Total Asia</b>	<b>1,680</b>	<b>1,362</b>	<b>1,422</b>	<b>1,237</b>	<b>1,097</b>	<b>775</b>	<b>616</b>	<b>574</b>	<b>449</b>	<b>438</b>
<b>Oceania</b>										
Australia	47	4	4	4	3	3	3	2	2	2
<b>Total Oceania</b>	<b>47</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>World Total</b>	<b>5,562</b>	<b>4,987</b>	<b>4,423</b>	<b>3,639</b>	<b>3,115</b>	<b>2,439</b>	<b>2,140</b>	<b>1,920</b>	<b>1,691</b>	<b>1,567</b>




**Silver Fabrication: Jewelry and Silverware Including the Use of Scrap**

© GFMS, Thomson Reuters / The Silver Institute

(tons)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>Europe</b>										
Italy	1,348	1,230	1,101	1,006	875	806	802	599	540	558
Russia	112	138	144	205	241	263	291	240	228	225
Turkey	272	258	224	194	207	175	153	134	139	162
Germany	226	213	210	203	193	166	169	159	147	134
Poland	95	105	111	101	95	76	77	61	62	66
France	69	55	57	59	57	59	64	73	67	56
Greece	86	82	77	70	68	56	46	40	34	31
Spain	63	61	52	44	41	41	37	37	32	29
Sweden	27	27	26	24	22	20	20	19	19	18
Norway	37	32	34	25	26	19	20	18	18	16
UK	48	43	41	26	23	21	21	20	18	16
Denmark	18	18	18	18	17	15	16	16	15	14
Portugal	41	35	31	24	21	22	21	14	9	8
Netherlands	8	8	8	8	8	8	8	7	7	7
Switzerland	7	7	7	7	7	7	7	7	7	7
Cyprus	9	9	9	9	9	8	8	7	7	6
Finland	9	9	10	7	7	5	5	5	5	4
Belgium	5	4	4	4	4	4	4	4	4	4
Austria	7	5	4	4	4	3	3	3	3	3
Serbia	2	2	2	2	2	2	2	2	2	2
Croatia	2	2	2	2	2	2	2	2	2	2
Czech Republic	2	2	2	2	2	2	2	2	2	2
Other Countries	4	4	4	5	5	4	4	4	4	4
<b>Total Europe</b>	<b>2,492</b>	<b>2,345</b>	<b>2,173</b>	<b>2,043</b>	<b>1,933</b>	<b>1,778</b>	<b>1,777</b>	<b>1,468</b>	<b>1,366</b>	<b>1,370</b>
<b>North America</b>										
Mexico	504	511	434	423	404	355	344	301	279	398
United States	479	487	465	442	404	362	400	370	342	288
Canada	50	44	36	34	30	28	28	27	26	26
Other Countries	13	17	19	20	28	46	42	28	29	38
<b>Total North America</b>	<b>1,046</b>	<b>1,059</b>	<b>954</b>	<b>919</b>	<b>866</b>	<b>791</b>	<b>814</b>	<b>727</b>	<b>677</b>	<b>751</b>
<b>South America</b>										
Brazil	44	50	54	54	54	57	64	50	50	54
Peru	18	16	19	18	19	22	23	19	19	26
Argentina	9	11	12	11	17	18	17	11	11	14
Colombia	17	17	18	19	16	14	15	14	14	15
Ecuador	10	9	10	10	10	10	10	9	9	11
Bolivia	7	7	7	7	7	8	8	8	8	9
Chile	10	9	10	10	10	7	7	6	7	8
<b>Total South America</b>	<b>116</b>	<b>120</b>	<b>131</b>	<b>129</b>	<b>134</b>	<b>136</b>	<b>144</b>	<b>119</b>	<b>120</b>	<b>137</b>
<b>Asia</b>										
China	942	1,054	1,206	1,348	1,392	1,457	1,681	1,952	2,029	2,266
India	1,225	1,333	874	1,065	1,082	1,164	1,233	1,194	1,196	1,569
Thailand	1,146	1,145	1,146	1,136	1,037	946	947	772	643	672
Indonesia	162	140	158	151	149	150	168	190	207	215
South Korea	145	147	149	153	149	150	167	179	183	186
Japan	56	64	61	65	62	65	70	69	72	75
Vietnam	30	32	35	37	39	40	45	49	50	49
Nepal	79	70	68	68	69	67	65	61	61	41



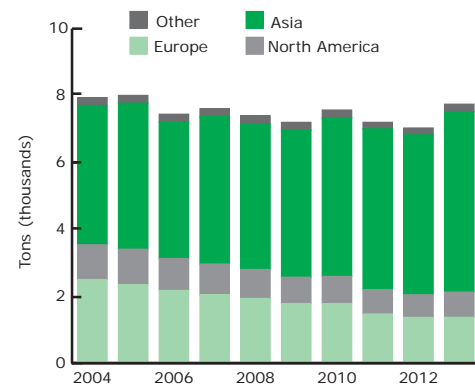
**Silver Fabrication: Jewelry and Silverware Including the Use of Scrap**

© GFMS, Thomson Reuters / The Silver Institute

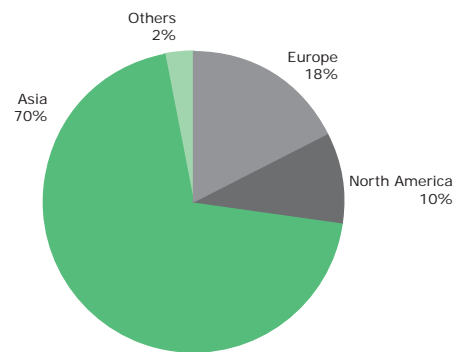
(tons)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Iran	47	50	49	49	48	44	43	40	37	37
Israel	57	59	61	59	55	46	42	32	29	34
Bangladesh	53	46	45	45	46	45	43	41	40	28
Saudi Arabia	19	20	21	22	22	23	24	26	28	28
Malaysia	22	21	20	20	20	20	21	23	24	25
UAE	16	16	17	17	18	18	20	22	24	25
Croatia	49	48	45	45	45	45	49	51	52	51
Pakistan	31	32	32	32	32	31	28	24	23	20
Sri Lanka	27	28	28	28	29	28	26	23	22	19
Taiwan	12	13	12	12	12	11	12	13	12	13
Hong Kong	10	10	11	11	11	11	12	12	13	12
Philippines	8	8	8	8	8	8	8	8	9	9
Bahrain	4	4	5	5	5	5	5	6	6	6
Other Countries	24	24	23	24	23	21	22	22	20	19
<b>Total Asia</b>	<b>4,165</b>	<b>4,365</b>	<b>4,075</b>	<b>4,401</b>	<b>4,353</b>	<b>4,396</b>	<b>4,733</b>	<b>4,809</b>	<b>4,781</b>	<b>5,398</b>
<b>Africa</b>										
Egypt	58	52	48	50	46	42	39	17	24	26
Morocco	8	8	8	9	8	7	8	8	8	8
Tunisia	10	10	9	10	10	10	10	9	9	10
Other Countries	17	18	18	18	18	17	17	17	17	14
<b>Total Africa</b>	<b>96</b>	<b>91</b>	<b>86</b>	<b>90</b>	<b>85</b>	<b>77</b>	<b>75</b>	<b>53</b>	<b>60</b>	<b>59</b>
<b>Oceania</b>										
Australia	23	22	21	21	20	20	22	23	24	25
<b>Total Oceania</b>	<b>23</b>	<b>22</b>	<b>21</b>	<b>21</b>	<b>21</b>	<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>
<b>World Total</b>	<b>7,938</b>	<b>8,003</b>	<b>7,441</b>	<b>7,603</b>	<b>7,393</b>	<b>7,198</b>	<b>7,566</b>	<b>7,199</b>	<b>7,028</b>	<b>7,740</b>

**World Jewelry & Silverware Fabrication**

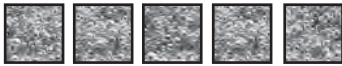
**World Jewelry & Silverware Fabrication, 2013**



Source: GFMS, Thomson Reuters

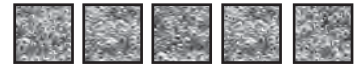


Source: GFMS, Thomson Reuters


**Silver Fabrication: Jewelry Including the Use of Scrap**

© GFMS, Thomson Reuters / The Silver Institute

(tons)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>Europe</b>										
Italy	1,065	980	876	802	703	663	679	512	469	495
Turkey	185	176	150	127	139	120	105	95	105	124
Germany	116	118	119	120	122	115	118	115	112	104
Russia	38	47	51	70	79	92	104	84	80	82
Poland	92	102	108	98	92	73	74	58	59	63
France	62	48	49	51	49	53	59	68	63	53
Spain	42	44	40	35	35	38	34	35	30	27
Greece	32	34	33	32	36	32	28	25	21	19
Sweden	12	12	12	11	10	9	10	9	10	10
UK	36	32	30	16	14	12	13	12	10	9
Portugal	37	31	27	21	17	18	18	12	8	7
Switzerland	7	7	7	7	7	7	7	7	7	7
Denmark	8	8	8	8	8	7	7	7	7	7
Netherlands	7	7	7	7	7	7	7	6	7	6
Norway	6	5	5	5	4	5	5	5	5	5
Other Countries	25	23	23	24	24	20	20	20	20	18
<b>Total Europe</b>	<b>1,765</b>	<b>1,671</b>	<b>1,540</b>	<b>1,429</b>	<b>1,341</b>	<b>1,267</b>	<b>1,284</b>	<b>1,066</b>	<b>1,008</b>	<b>1,033</b>
<b>North America</b>										
Mexico	423	434	372	380	368	327	323	284	263	380
United States	428	440	420	400	372	334	374	346	321	268
Canada	42	36	30	28	26	24	25	24	23	23
Other Countries	13	17	19	20	28	46	42	28	29	38
<b>Total North America</b>	<b>906</b>	<b>927</b>	<b>841</b>	<b>828</b>	<b>794</b>	<b>731</b>	<b>764</b>	<b>682</b>	<b>637</b>	<b>709</b>
<b>South America</b>										
Brazil	40	45	48	48	48	52	60	47	47	52
Peru	9	8	11	10	13	16	17	14	15	21
Argentina	6	7	8	6	13	15	14	9	9	12
Colombia	7	7	8	9	8	7	8	8	8	9
Other Countries	18	18	19	19	19	18	20	19	20	25
<b>Total South America</b>	<b>81</b>	<b>85</b>	<b>94</b>	<b>92</b>	<b>101</b>	<b>109</b>	<b>119</b>	<b>98</b>	<b>99</b>	<b>119</b>
<b>Asia</b>										
China	747	829	943	1,065	1,121	1,243	1,444	1,693	1,762	1,955
India	635	673	369	603	601	647	707	679	724	932
Thailand	1,010	1,005	1,012	995	904	832	870	712	588	622
Indonesia	139	117	137	131	129	129	146	172	192	201
South Korea	123	122	126	130	127	131	147	162	168	172
Japan	55	63	60	64	61	64	69	68	71	74
Vietnam	27	29	33	34	37	38	42	47	48	47
Saudi Arabia	16	17	18	18	18	20	21	23	25	26
Malaysia	20	19	19	18	19	19	20	21	23	24
Cambodia	20	20	19	19	19	19	22	23	24	24
Myanmar, Laos & Cambodia	20	20	19	19	19	19	22	23	24	24
UAE	13	14	14	15	15	15	18	20	22	23
Nepal	36	33	33	33	35	36	35	35	37	22
Bangladesh	24	22	22	22	23	24	23	23	24	16
Sri Lanka	14	15	15	15	16	17	16	14	14	12
Israel	13	14	13	14	14	12	13	10	10	11

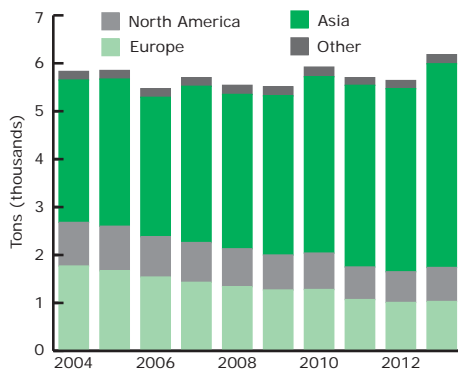


**Silver Fabrication: Jewelry Including the Use of Scrap**

© GFMS, Thomson Reuters / The Silver Institute

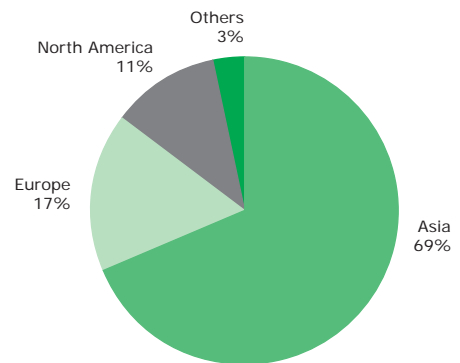
(tons)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Taiwan	8	9	9	9	8	8	9	10	10	10
Hong Kong	7	7	8	8	8	8	9	10	11	10
Pakistan	12	12	12	13	13	14	13	11	11	10
Iran	5	6	6	6	6	6	7	8	8	9
Philippines	6	6	6	6	6	6	6	7	7	7
Bahrain	4	4	4	4	4	4	5	5	5	6
Syria	6	6	6	6	6	6	7	6	5	4
Other Countries	8	8	8	8	7	7	8	8	9	9
<b>Total Asia</b>	<b>2,970</b>	<b>3,070</b>	<b>2,910</b>	<b>3,256</b>	<b>3,216</b>	<b>3,324</b>	<b>3,679</b>	<b>3,791</b>	<b>3,823</b>	<b>4,249</b>
<b>Africa</b>										
Egypt	48	43	41	43	40	36	34	15	22	24
Morocco	8	8	8	9	8	7	8	8	8	8
Tunisia	7	7	6	7	7	7	7	7	7	7
Other Countries	14	14	14	15	14	13	14	14	14	11
<b>Total Africa</b>	<b>77</b>	<b>73</b>	<b>69</b>	<b>73</b>	<b>70</b>	<b>63</b>	<b>62</b>	<b>43</b>	<b>50</b>	<b>50</b>
<b>Oceania</b>										
<b>Total Oceania</b>	<b>22</b>	<b>21</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>21</b>	<b>23</b>	<b>24</b>	<b>25</b>
<b>World Total</b>	<b>5,821</b>	<b>5,846</b>	<b>5,474</b>	<b>5,697</b>	<b>5,542</b>	<b>5,514</b>	<b>5,930</b>	<b>5,703</b>	<b>5,641</b>	<b>6,185</b>

**World Jewelry Fabrication**

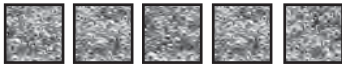


Source: GFMS, Thomson Reuters

**World Jewelry Fabrication, 2013**

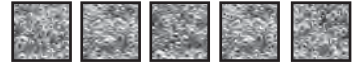


Source: GFMS, Thomson Reuters

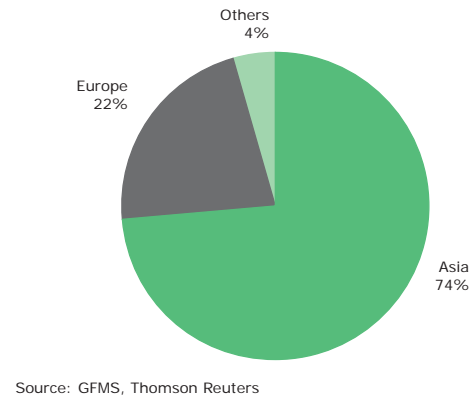
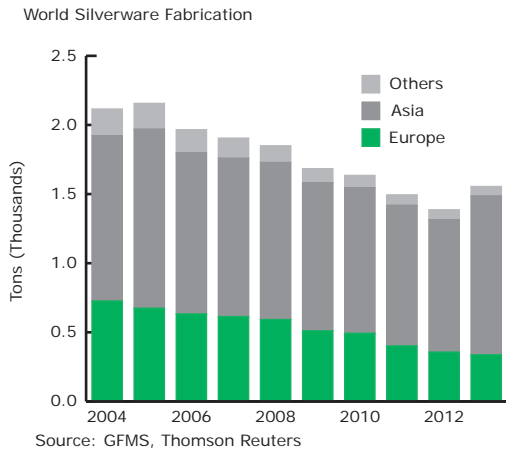

**Silver Fabrication: Silverware Including the Use of Scrap (tons)**

© GFMS, Thomson Reuters / The Silver Institute

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>Europe</b>										
Russia	73	90	93	134	162	171	187	156	148	144
Italy	283	250	225	204	172	143	123	87	71	63
Turkey	87	82	74	67	68	55	48	39	34	38
Germany	110	94	91	83	71	51	51	44	34	29
Norway	31	27	29	20	21	14	15	14	14	12
Greece	54	48	44	38	32	24	18	15	13	11
Sweden	15	15	14	12	12	10	10	9	9	8
Denmark	10	10	10	10	10	9	9	9	8	7
UK	12	11	11	10	10	8	8	8	7	6
France	7	7	7	8	8	5	5	5	4	3
Finland	6	6	7	5	5	3	3	3	3	3
Other Countries	39	33	28	24	22	16	16	14	13	12
<b>Total Europe</b>	<b>727</b>	<b>675</b>	<b>633</b>	<b>614</b>	<b>592</b>	<b>511</b>	<b>493</b>	<b>402</b>	<b>357</b>	<b>337</b>
<b>North America</b>										
United States	51	47	45	42	32	28	26	24	21	20
Mexico	81	77	62	43	36	28	21	17	16	18
Canada	8	8	6	6	4	4	3	3	3	3
<b>Total North America</b>	<b>140</b>	<b>132</b>	<b>113</b>	<b>91</b>	<b>72</b>	<b>60</b>	<b>51</b>	<b>45</b>	<b>40</b>	<b>41</b>
<b>South America</b>										
Colombia	10	10	10	10	8	7	7	6	6	5
Peru	9	8	8	8	6	6	6	4	4	4
Other Countries	16	18	19	20	19	14	12	11	10	9
<b>Total South America</b>	<b>35</b>	<b>36</b>	<b>37</b>	<b>38</b>	<b>33</b>	<b>27</b>	<b>25</b>	<b>21</b>	<b>21</b>	<b>18</b>
<b>Asia</b>										
India	590	660	505	462	481	517	526	515	472	637
China	195	224	262	283	271	215	237	259	267	311
Thailand	136	140	134	141	133	115	77	60	55	50
Iran	42	44	43	43	42	37	36	32	29	28
Israel	44	45	48	45	41	34	30	22	19	23
Nepal	43	36	35	35	34	31	30	26	24	19
South Korea	22	25	23	23	22	20	19	17	15	14
Indonesia	23	23	21	20	20	21	22	18	15	14
Bangladesh	29	24	23	23	23	21	20	17	16	13
Pakistan	19	20	20	20	19	17	15	13	11	10
Sri Lanka	13	13	13	13	13	11	10	9	8	7
Other Countries	39	40	38	39	38	33	32	29	26	25
<b>Total East Asia</b>	<b>1,195</b>	<b>1,295</b>	<b>1,165</b>	<b>1,146</b>	<b>1,136</b>	<b>1,071</b>	<b>1,053</b>	<b>1,017</b>	<b>958</b>	<b>1,149</b>
<b>Africa</b>										
Africa	20	18	17	17	16	14	13	9	10	9
<b>Total Africa</b>	<b>20</b>	<b>18</b>	<b>17</b>	<b>17</b>	<b>16</b>	<b>14</b>	<b>13</b>	<b>9</b>	<b>10</b>	<b>9</b>
<b>Oceania</b>										
Australia	1	1	1	1	1	1	1	1	1	1
<b>Total Oceania</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
<b>World Total</b>	<b>2,117</b>	<b>2,157</b>	<b>1,967</b>	<b>1,906</b>	<b>1,851</b>	<b>1,685</b>	<b>1,636</b>	<b>1,495</b>	<b>1,387</b>	<b>1,556</b>



**World Silverware Fabrication** **World Silverware Fabrication, 2013**

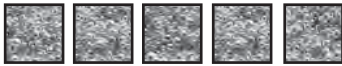


**Supply & Demand with Bar Investment**

(tons)	2011	2012	2013
<b>Supply</b>			
Mine Production	23,471	24,644	25,494
Net Government Sales	374	229	245
Old Silver Scrap	8,047	7,857	5,966
Producer Hedging	381	-	-
Physical Bar Disinvestment	-	-	-
<b>Total Supply</b>	<b>32,273</b>	<b>31,269</b>	<b>30,640</b>
<b>Demand</b>			
Total Fabrication	26,633	25,351	25,984
Producer De-Hedging	-	-1,460	1,065
Physical Bar Investment	3,128	1,661	3,956
<b>Total Demand</b>	<b>33,246</b>	<b>29,684</b>	<b>33,624</b>

GFMS, Thomson Reuters / The Silver Institute





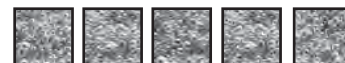
## Appendix 2

### 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 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
1979	11.068	1,896	225.99	780	1,722	N/a	333	0.25
1980	20.984	2,783	429.67	1,530	4,098	1,011	628	0.48
1981	10.487	2,650	228.83	744	2,296	575	390	0.26
1982	7.922	2,675	182.21	634	1,862	482	316	0.45
1983	11.430	3,435	262.89	873	2,851	726	479	1.37
1984	8.145	3,514	192.53	622	2,111	608	382	1.37
1985	6.132	3,880	166.54	470	1,715	579	296	1.58
1986	5.465	4,105	143.71	296	1,549	607	195	3.34
1987	7.016	5,124	180.46	326	1,855	840	208	9.67
1988	6.532	6,231	165.23	269	1,536	782	189	14.85
1989	5.500	6,803	141.36	244	1,187	666	170	13.54
1990	4.832	6,779	123.62	225	1,099	743	129	13.59
1991	4.057	6,993	103.51	176	956	694	111	12.24
1992	3.946	7,580	100.24	161	991	700	101	12.21
1993	4.313	6,163	109.20	154	1,113	799	117	13.44
1994	5.285	6,846	132.92	174	1,365	1,465	141	17.84
1995	5.197	6,864	129.49	157	1,289	1,395	122	33.36
1996	5.199	7,291	131.77	182	1,345	1,390	128	39.51
1997	4.897	7,009	153.60	191	1,498	1,305	139	38.78
1998	5.544	8,016	229.30	233	2,498	1,476	160	50.65
1999	5.218	8,022	197.38	191	1,994	1,389	158	49.90
2000	4.951	8,002	198.61	172	1,800	1,318	172	46.82
2001	4.370	7,420	194.15	171	1,814	1,163	157	40.82
2002	4.599	7,934	197.57	185	1,850	1,224	156	44.41
2003	4.879	8,138	202.39	182	1,869	1,298	139	52.64
2004	6.658	10,606	267.79	232	2,452	1,772	172	75.14
2005	7.312	11,083	294.07	259	2,407	1,926	189	79.68
2006	11.549	17,843	437.51	432	3,545	2,958	296	125.88
2007	13.384	18,794	461.98	507	3,999	3,273	314	146.26
2008	14.989	21,620	499.34	498	5,311	3,349	328	166.82
2009	14.674	23,815	503.12	441	6,024	3,223	339	198.30
2010	20.193	32,007	640.59	570	7,507	4,393	489	255.16
2011	35.119	55,638	1069.25	900	12,508	7,296	811	436.30
2012	31.150	57,086	967.03	799	11,187	6,309	777	405.47
2013	23.793	48,618	730.53	743	8,366	4,709	576	303.52

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



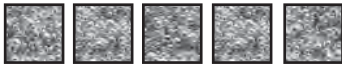
## Appendix 3

### Real Silver Prices in Various Currencies (CPI deflated - constant 2013 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
1979	35.762	28,705	773.21	1,090	7,718	N/A	754	373.17
1980	59.738	37,862	1,304.30	1,983	15,134	5,696	1,348	556.54
1981	27.063	31,892	660.27	919	7,911	3,157	787	186.95
1982	19.257	29,794	506.49	763	6,203	2,595	607	160.95
1983	26.921	34,268	724.89	1,031	9,285	3,832	890	298.87
1984	18.389	32,355	518.62	718	6,709	3,120	692	188.66
1985	13.368	33,792	440.25	532	5,307	2,658	526	116.73
1986	11.696	32,948	370.82	333	4,650	2,603	346	106.87
1987	14.487	37,748	448.47	366	5,199	3,360	368	144.33
1988	12.953	41,972	389.44	300	4,073	2,635	331	184.70
1989	10.405	42,785	314.72	266	2,899	1,889	290	132.95
1990	8.672	39,125	260.36	238	2,455	2,045	213	108.80
1991	6.987	35,444	209.35	180	2,011	1,845	176	84.87
1992	6.598	34,368	196.23	162	1,987	1,749	156	77.14
1993	7.002	26,272	203.51	153	2,101	1,743	174	79.34
1994	8.366	26,479	234.08	172	2,467	2,573	204	78.02
1995	8.000	24,086	215.52	156	2,219	2,094	173	108.59
1996	7.774	23,477	207.64	180	2,218	1,925	177	106.61
1997	7.158	21,060	224.12	185	2,297	1,759	190	90.26
1998	7.979	21,271	333.64	225	3,801	2,004	216	101.12
1999	7.347	20,338	282.69	185	2,967	1,914	210	90.99
2000	6.745	19,504	279.89	167	2,574	1,809	225	80.25
2001	5.788	17,429	271.72	168	2,523	1,585	200	66.62
2002	5.997	17,866	271.61	184	2,486	1,681	195	69.32
2003	6.220	17,655	270.76	181	2,425	1,762	170	78.49
2004	8.268	22,173	342.70	230	3,095	2,314	206	107.75
2005	8.782	22,227	359.64	258	2,973	2,471	221	110.26
2006	13.439	33,702	523.33	429	4,270	3,740	339	167.54
2007	15.142	33,371	523.95	503	4,601	3,950	352	185.17
2008	16.331	35,430	571.22	488	5,947	3,816	356	200.58
2009	16.045	35,208	557.27	438	6,553	3,698	368	228.92
2010	21.723	42,243	683.51	570	7,850	4,879	522	284.85
2011	36.625	67,462	1,107.50	903	12,800	7,686	842	467.83
2012	31.635	63,293	980.20	802	11,301	6,475	787	418.83
2013	23.793	48,618	730.53	743	8,366	4,709	576	303.52

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



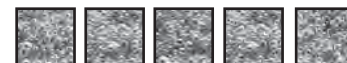
# Appendix 4

Silver Prices in US\$ per ounce						
	London Silver Market - Spot			Comex Spot Settlement		
	High	Low	Average	High	Low	Average
1988	7.8215	6.0500	6.5324	7.8270	5.9980	6.5335
1989	6.2100	5.0450	5.4999	6.1940	5.0300	5.4931
1990	5.3560	3.9500	4.8316	5.3320	3.9370	4.8174
1991	4.5710	3.5475	4.0566	4.5450	3.5080	4.0355
1992	4.3350	3.6475	3.9464	4.3180	3.6400	3.9348
1993	5.4200	3.5600	4.3130	5.4430	3.5230	4.3082
1994	5.7475	4.6400	5.2851	5.7810	4.5730	5.2803
1995	6.0375	4.4160	5.1971	6.1020	4.3750	5.1871
1996	5.8275	4.7100	5.1995	5.8190	4.6760	5.1777
1997	6.2675	4.2235	4.8972	6.3070	4.1550	4.8773
1998	7.8100	4.6900	5.5398	7.2600	4.6180	5.4914
1999	5.7900	4.8800	5.2188	5.7600	4.8720	5.2149
2000	5.4475	4.5700	4.9526	5.5470	4.5630	4.9662
2001	4.8200	4.0500	4.3702	4.8570	4.0280	4.3603
2002	5.0975	4.2350	4.5990	5.1250	4.2230	4.5967
2003	5.9650	4.3700	4.8787	5.9930	4.3460	4.8806
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	11.5473
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	20.3127
2011	48.7000	26.1600	35.1192	48.5840	26.8110	35.1961
2012	37.2300	26.6700	31.1496	37.1400	26.2470	31.0907
2013	32.2300	18.6100	23.7928	32.4090	18.5330	23.7469

US Prices in 2013				Leasing Rates in 2013			
Comex Settlement				Monthly Averages			
US\$ per ounce	High	Low	Average	Average	3-month	6-month	12-month
January	32.409	29.896	31.144	January	-0.36%	-0.18%	0.15%
February	31.942	28.395	30.203	February	-0.38%	-0.22%	0.08%
March	29.179	28.292	28.747	March	-0.39%	-0.23%	0.06%
April	27.913	22.813	25.186	April	-0.41%	-0.24%	0.04%
May	23.975	22.180	23.036	May	-0.35%	-0.21%	0.05%
June	22.715	18.533	21.067	June	-0.32%	-0.19%	0.05%
July	20.498	18.726	19.640	July	-0.32%	-0.20%	0.06%
August	24.649	19.498	22.094	August	-0.33%	-0.21%	0.04%
September	24.382	21.514	22.450	September	-0.38%	-0.26%	0.00%
October	22.946	21.124	22.013	October	-0.40%	-0.29%	-0.04%
November	21.804	19.633	20.677	November	-0.40%	-0.29%	-0.06%
December	20.298	19.008	19.629	December	-0.39%	-0.30%	-0.08%

Source: Comex

Source: GFMS, Thomson Reuters; LBMA



## Appendix 5

### Leading Primary Silver Mines

Rank	Mine Name	Country	Company	2012 Moz	2013 Moz
1	Cannington <sup>1</sup>	Australia	BHP Billiton plc.	32.23	29.09
2	Fresnillo Mine	Mexico	Fresnillo plc.	26.38	22.76
3	Dukat <sup>2</sup>	Russia	Polymetal International plc.	15.50	18.30
4	Saucito	Mexico	Fresnillo plc.	7.05	11.58
5	Uchucchacua	Peru	Compañía de Minas Buenaventura S.A.A	11.26	11.44
6	Pirquitas	Argentina	Silver Standard Resources Inc.	8.62	8.22
7	Pallancata	Peru	Hochschild Mining	7.44	7.63
8	Palmarejo	Mexico	Coeur Mining	8.24	7.60
9	Greens Creek	United States	Hecla Mining Co.	6.39	7.45
10	San José	Argentina	Hochschild Mining plc. / McEwen Mining Inc.	5.95	6.36
11	Imiter	Morocco	Société Métallurgique d'Imiter	5.48	6.24
12	San Bartolomé	Bolivia	Coeur d'Alene Mines Corp.	5.93	5.94
13	Alamo Dorado	Mexico	Pan American Silver Corp.	5.35	5.04
14	Gümüşköy <sup>3</sup>	Turkey	Eti Gümüş A.Ş.	6.43	5.00
15	Arcata	Peru	Hochschild Mining plc.	5.53	4.98

1 reported payable metal in concentrate; 2 including Goltsovoye; 3 estimate

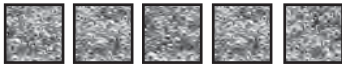
### Silver Mine Production by Source Metal

(million ounces)	2010	2011	2012	2013
<b>Primary</b>				
Mexico	68.7	72.7	72.3	77.2
Peru	36.4	32.4	33.1	35.3
Australia	38.6	32.5	33.4	30.8
Other	81.8	82.2	83.5	92.6
<b>Total</b>	<b>225.5</b>	<b>219.8</b>	<b>222.3</b>	<b>235.9</b>
<b>Gold</b>				
Mexico	20.5	24.5	27.2	30.1
Russia	11.5	11.8	15.9	13.0
Chile	14.3	13.9	12.1	10.4
Other	45.5	47.7	47.6	51.9
<b>Total</b>	<b>91.9</b>	<b>97.9</b>	<b>102.7</b>	<b>105.4</b>
<b>Copper</b>				
Poland	37.3	40.5	41.0	37.3
Chile	26.6	25.7	21.9	25.4
Peru	22.5	17.6	19.0	24.0
Other	74.9	73.7	74.0	80.2
<b>Total</b>	<b>161.4</b>	<b>157.5</b>	<b>155.9</b>	<b>167.0</b>
<b>Lead/Zinc</b>				
China	66.7	73.6	79.3	82.4
Mexico	49.0	50.7	66.4	55.9
Peru	48.4	51.8	53.0	52.9
Other	104.9	99.9	109.3	116.2
<b>Total</b>	<b>268.9</b>	<b>276.0</b>	<b>308.0</b>	<b>307.4</b>
Other	2.9	3.5	3.5	3.9
<b>World Total</b>	<b>750.6</b>	<b>754.6</b>	<b>792.3</b>	<b>819.6</b>

Source: GFMS, Thomson Reuters

### Silver Mine Production by Main Region and Source Metal

(million ounces)	2010	2011	2012	2013
<b>North America</b>				
primary	83.6	87.9	86.0	93.8
lead/zinc	65.1	65.2	83.2	69.0
copper	19.0	18.9	18.5	19.6
gold	32.1	34.4	38.1	40.8
other	1.3	1.9	1.9	2.3
<b>Total</b>	<b>201.1</b>	<b>208.3</b>	<b>227.7</b>	<b>225.5</b>
<b>South America</b>				
primary	63.4	61.6	64.2	69.4
lead/zinc	81.0	81.8	84.2	85.3
copper	51.2	44.8	42.7	51.9
gold	37.1	37.1	32.7	33.5
other	0.0	0.0	0.0	0.0
<b>Total</b>	<b>232.7</b>	<b>225.3</b>	<b>223.9</b>	<b>240.2</b>
<b>Asia</b>				
primary	6.3	6.1	7.3	8.1
lead/zinc	82.3	89.9	100.7	106.3
copper	42.3	40.8	41.2	43.3
gold	7.7	9.1	10.6	11.9
other	1.6	1.6	1.6	1.6
<b>Total</b>	<b>140.1</b>	<b>147.4</b>	<b>161.3</b>	<b>171.2</b>
<b>Rest of the World</b>				
primary	72.2	64.2	64.8	64.6
lead/zinc	40.6	39.1	39.8	46.8
copper	48.9	52.9	53.5	52.2
gold	15.0	17.4	21.3	19.2
other	0.0	0.0	0.0	0.0
<b>Total</b>	<b>176.7</b>	<b>173.6</b>	<b>179.5</b>	<b>182.7</b>
<b>World Total</b>	<b>750.6</b>	<b>754.6</b>	<b>792.3</b>	<b>819.6</b>



## Appendix 6

### Comex Futures and Options Turnover and Open Interest, and London Bullion Market (LBMA) Turnover

	Comex Number of Contracts				LBMA Clearing Turnover <sup>3</sup>		
	Futures		Options		Ounces transferred (millions)	Value (US\$bn)	Number of transfers
	Turnover <sup>1</sup>	Open Interest <sup>2</sup>	Turnover <sup>1</sup>	Open Interest <sup>2</sup>			
Jan-12	826,872	101,747	100,656	184,130	149.2	4.6	795
Feb	1,478,663	114,827	153,188	184,115	160	5.5	841
Mar	1,120,138	109,693	174,431	205,377	157.2	5.2	927
Apr	1,224,119	111,953	113,020	174,363	141.1	4.5	715
May	1,028,181	118,102	162,613	207,186	135.3	3.9	796
Jun	1,416,761	123,965	143,547	172,119	149.4	4.2	912
Jul	804,457	121,809	111,687	183,181	141.5	3.9	755
Aug	1,231,893	117,546	123,441	171,517	119.5	3.4	732
Sep	1,068,783	137,402	177,719	214,081	124.3	4.2	967
Oct	874,240	139,243	116,906	233,672	98.1	3.3	757
Nov	1,437,347	145,560	147,958	175,695	104.4	3.4	721
Dec	804,195	141,489	160,363	200,482	134.1	4.3	815
Jan-13	1,021,718	149,854	150,591	205,369	168.0	3.3	828
Feb	1,346,410	144,813	175,827	177,993	110.5	2.3	764
Mar	780,310	153,912	117,518	182,828	110.1	2.4	769
Apr	1,980,453	143,477	238,760	194,244	137.4	3.1	902
May	1,172,026	145,316	185,830	209,317	122.4	2.7	1096
Jun	1,555,352	138,472	176,432	201,546	122.7	2.4	862
Jul	932,287	133,980	154,336	223,012	153.3	3.2	900
Aug	1,651,965	117,915	238,275	224,173	142.6	3.3	1027
Sep	958,149	113,065	161,582	237,221	165.2	4.2	1007
Oct	948,432	118,494	167,893	244,475	132.5	3.8	765
Nov	1,270,262	132,752	154,576	174,004	122.0	3.7	776
Dec	857,717	132,475	122,368	174,426	151.7	4.7	76

1 Monthly total; 2 Month-end; 3 Daily average; Source: LBMA, Comex

### Silver ETF Holdings

(Moz, end-period)	iShares Silver Trust	ETF Securities*	ZKB	Sprott Silver Trust	Other**	Total	Value US\$ Bn***
2012 Q1	313.0	52.9	81.0	32.9	110.2	589.9	19.13
Q2	315.8	50.7	82.7	32.9	113.4	595.4	16.12
Q3	319.1	52.1	87.9	40.5	116.0	615.6	21.33
Q4	324.2	52.5	89.8	49.3	115.5	631.4	18.91
2013 Q1	344.1	53.2	90.9	49.3	116.6	654.1	18.73
Q2	318.5	51.9	89.5	49.3	117.1	626.2	11.81
Q3	341.8	58.2	87.3	49.3	119.2	655.9	14.22
Q4	320.2	59.6	84.7	49.3	119.2	632.9	12.34

\*Includes ETF Securities LSE, Australia, NYSE, GLTR and WITE

\*\*Other: includes Julius Bär, DB Physical Silver, iShares Silver Bullion ETF, Silver Bullion Trust, Mitsubishi UFJ Tokyo, iShares Physical Silver ETC, Central Fund of Canada, Source Physical Silver, Royal Canadian Mint ETR

\*\*\*Using the quarter-end London price

Source: Respective issuers; GFMS, Thomson Reuters





**THE SILVER INSTITUTE**

**1400 I STREET, NW  
SUITE 550**

**WASHINGTON, DC 20005**

**TEL: (202) 835-0185**

**FAX: (202) 835-0155**

**EMAIL: [INFO@SILVERINSTITUTE.ORG](mailto:INFO@SILVERINSTITUTE.ORG)**

**[WWW.SILVERINSTITUTE.ORG](http://WWW.SILVERINSTITUTE.ORG)**



**THOMSON REUTERS™**