THE SILVER INSTITUTE
888 16TH STREET, NW
SUITE 303
WASHINGTON, DC 20006
TEL: (202) 835-0185
FAX: (202) 835-0155
EMAIL: INFO@SILVERINSTITUTE.ORG
WWW.SILVERINSTITUTE.ORG

GFMS

WORLD SILVER SURVEY 2010

THE SILVER INSTITUTE

WORLD SILVER SURVEY

2010

GFMS

World Silver Survey 2010 has been kindly supported by the following companies

—MAJOR SPONSORS—

Coeur d'Alene Mines Corporation

Fresnillo Plc

Pan American Silver Corp.

Industrias Peñoles S.A.B. de C.V.

Silver Wheaton Corp.

—SPONSORS—

Barrick Gold Corporation

Compañia de Minas Buenaventura S.A.A.

Endeavour Silver Corp.

Hecla Mining Company

Silver Standard Resources Inc.

ScotiaMocatta

—CONTRIBUTORS—

CME Group
Diamond State Depository, LLC
Goldcorp Inc.
Johnson Matthey Inc.
Mitsui Global Precious Metals
Nyrstar Metals Pty Ltd.
Tanaka Kikinzoku Kogyo K.K.

About the Major Sponsors...

Coeur d'Alene Mines Corporation

Coeur d'Alene Mines Corporation is one of the world's leading silver companies and also a significant gold producer. Coeur is also a recognized leader in environmental stewardship and worker safety, with nine national and international awards earned over the past year. The Company's three new long-life mines include the San Bartolomé silver mine in Bolivia which began operations in 2008, the Palmarejo silver/gold mine in Mexico, which began operations in 2009, and the Kensington gold mine in Alaska, which is planned to begin operations in July. The Company also owns underground mines in southern Chile and Argentina and one surface mine in Nevada, and owns a non-operating interest in a low-cost mine in Australia. The Company conducts exploration activities in Alaska, Argentina, Chile and Mexico. Coeur common shares are traded on the New York Stock Exchange under the symbol CDE, and the Toronto Stock Exchange under the symbol CDM, and its CHESS Depositary Interests are traded on the Australian Securities Exchange under symbol CXC.

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 has four producing mines, all of them in Mexico – Fresnillo, Cienega, Herradura and Soledad-Dipolos; one development project – Saucito; and three exploration prospects – San Juan, San Julian, Orysivo, as well as a number of other long term exploration prospects and, in total, has mining concessions covering approximately 1.75 million hectares in Mexico. Fresnillo has a strong and long tradition of mining, a proven track record of mining development and reserves replacement, and a low cost of production, being in the lowest quartile of the cost curve for both silver and gold. Fresnillo's goal is to maintain the Group's position as the world's largest primary silver company, producing 65 million ounces of silver and over 400,000 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 Corp. was founded in 1994 with the mission to be the world's largest and lowest cost primary silver mining company and to achieve this by constantly increasing its low cost silver production and silver reserves. In 2009, Pan American commissioned the Manantial Espejo mine in Argentina and the San Vicente mine expansion in Bolivia. Today, Pan American owns eight silver mining operations in Mexico, Peru, Argentina and Bolivia. Pan American also owns the Navidad project, one of the largest undeveloped silver deposits in the world and is the operator of the La Preciosa silver joint-venture project. In 2009, the Company's 14th consecutive year of growth, Pan American produced a record 23 million ounces of silver and over 100,000 ounces of gold. In 2010, Pan American expects to produce 23.5 million ounces and 85,000 ounces of gold at its eight operating mines. Pan American also expects to finalize a resource definition and metallurgical testing program at the La Preciosa silver project, which will ultimately lead to a full feasibility report by the end of the year. Pan American is also conducting a comprehensive drilling and metallurgical testing program of the eight zones that comprise the Navidad deposit and the Company expects to produce a full feasibility report of this project in the first quarter of 2011. Pan American has a world-class portfolio of development projects and the second-largest silver resource in its sector.

Silver Wheaton Corp.

Established in 2004, Silver Wheaton has quickly positioned itself as the largest silver streaming company in the world. The company currently has thirteen silver purchase agreements and two precious metals agreements where, in exchange for an upfront payment, it has the right to purchase all or a portion of the silver production, at a low fixed cost, from high-quality mines located in politically stable regions around the world. Silver Wheaton's industry-leading growth profile is driven by a portfolio of world-class assets, including silver streams on Goldcorp's Peñasquito mine in Mexico and Barrick's Pascua-Lama project straddling the border of Chile and Argentina. With fixed cash costs and unhedged silver sales, the company is designed to create long-term shareholder value, providing strong upside potential with downside protection. Silver Wheaton's shares are traded under the symbol SLW on the Toronto Stock Exchange and the New York Stock Exchange.

World Silver Survey 2010

Produced for The Silver Institute
by GFMS Limited

By:

Philip Klapwijk, Executive Chairman

Paul Walker, Chief Executive Officer

Peter Ryan, Senior Consultant

Philip Newman, Research Director

Neil Meader, Research Director

William Tankard, Senior Metals Analyst

Matthew Piggott, Metals Analyst

Ayako Furuno, Metals Analyst

Junlu Liang, Metals Analyst

Ross Strachan, Metals Analyst

Oliver Heathman, Metals Analyst

Cameron Alexander, Senior Metals Analyst, Perth, Australia

Gargi Shah, Metals Analyst, Mumbai, India

Paul Burton, GFMS World Gold

Mark Fellows, GFMS Mine Economics

Consultants & Other Contributors:

Vitaly Borisovich, Moscow, Russia

Rhona O'Connell, GFMS Analytics

Richard Napier, Munich, Germany

Neil Buxton, GFMS Metals Consulting

GFMS Limited
Hedges House, 153-155 Regent Street
London W1B 4JE, United Kingdom
Telephone: +44 (0)20 7478 1777
Fax: +44 (0)20 7478 1779
info@gfms.co.uk
www.gfms.co.uk

The Silver Institute
888 16th Street, NW, Suite 303
Washington, D.C., 20006, USA
Telephone: +1 202 835-0185
Fax: +1 202 835-0155
info@silverinstitute.org
www.silverinstitute.org

THE SILVER INSTITUTE

(major funding companies)

Barrick Gold Corporation

Cia. de Minas Buenaventura, S.A.A.

Coeur d'Alene Mines Corporation

Fresnillo Plc

Hecla Mining Company

Industrias Peñoles, S.A.B. de C.V.

Pan American Silver Corp.

Silver Standard Resources Inc.

Silver Wheaton Corp.

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 GFMS at the address on the page overleaf.

ISSN: 1059-6992

ISBN: 978-1-880936-18-4

The data on which this report is based has been obtained by The Silver Institute and GFMS Limited from sources which are generally believed to be reliable. However, this does not guarantee complete accuracy in the information presented here. It is in the nature of the precious metals markets that estimates for a number of components must be made on the basis of incomplete information. A number of figures may have been revised from last year's World Silver Survey in the light of new information. The opinions expressed here represent those of the authors of the report at the time of writing.

Disclaimer

While every effort has been made to ensure the accuracy of the information in this document, The Silver Institute and GFMS Ltd cannot guarantee such accuracy. Furthermore, the material contained herewith has no regard to the specific investment objectives, financial situation or particular needs of any specific recipient or organization. It is published solely for informational purposes and is not to be construed as a solicitation or an offer to buy or sell any commodities, securities or related financial instruments. No representation or warranty, either express or implied, is provided in relation to the accuracy, completeness or reliability of the information contained herein. The Silver Institute and GFMS Ltd do not accept responsibility for any losses or damages arising directly, or indirectly, from the use of this document.

This is the sixteenth annual survey of the world silver market to be produced for The Silver Institute by GFMS Limited, the London-based analysts of global precious metals markets. The information contained here is based in part on the analysis of the GFMS 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 the GFMS team of analysts and consultants, which provide the essential data to allow the compilation of reliable estimates for world supply and demand.

GFMS 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.

GFMS Limited, London May, 2010
Hedges House, 153-155 Regent Street, London, W1B 4JE, UK
Tel: +44 (0)20 7478 1777**,** Fax: +44 (0)20 7478 1779
E-mail: info@gfms.co.uk, Web site: www.gfms.co.uk
Online shop: http://shop.gfms.co.uk

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

Tables

Focus Boxes

1. Summary and Outlook

Silver's status as a precious metal was unequivocally re-affirmed last year by investors who purchased it not only as a speculative commodity-play on economic recovery but also as a safe haven asset, particularly at a time when the global financial crisis was raging. Significantly, the white metal is currently riding high again as a sovereign debt crisis afflicts Europe and threatens to destabilize the still fragile world economy. Returning, however, to last year, the strength of investment can be seen in the table below in terms of both the huge increase in implied net investment - much of it due to the soaring demand for silver ETFs which added no less than 132.5 Moz (4,121 t) in 2009 - and the substantial rise recorded in global coin minting.

Had it not been for this growth in 'western' investment demand (and it was concentrated in Europe and North America) then the average silver price would surely have been far lower and intra-year gains would have been a good deal more modest than the stunning 53% recorded for the US dollar price. This conclusion is certain given the scale of losses recorded last year in fabrication demand, which dropped by nearly 12%, with its key industrial component alone down by over one-fifth. Of course, much of these losses occurred during the first few months of 2009 when orders for silver from fabricators virtually dried up. Thereafter, the picture gradually became somewhat brighter and by the end of the year fabrication demand was clearly recovering (and supporting the price), something very much confirmed during the first four months of 2010.

As regards the outlook for silver in 2010, prices should first of all be buoyed by another year of flat supply; although mine production is forecast to increase modestly this year, GFMS expect further reductions in scrap and government sales. When it comes to fabrication, there will be a solid gain in silver use this year, although the recovery in demand is expected to leave it still well short of 2008's level. Basis the evidence so far this year, the silver market surplus that results will be comfortably absorbed by investors. Indeed, the backdrop for silver

Table 1 - World Silver Supply and Demand (million ounces)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Supply										
Mine Production	591.0	606.2	593.9	596.6	613.0	636.8	640.9	664.4	684.7	709.6
Net Government Sales	60.3	63.0	59.2	88.7	61.9	65.9	78.2	42.5	27.6	13.7
Old Silver Scrap	180.7	182.7	187.5	183.9	183.7	186.0	188.0	181.8	176.0	165.7
Producer Hedging	-	18.9	-	-	9.6	27.6	-	-	-	-
Implied Net Disinvestment	87.1	-	12.6	-	-	-	-	-	-	-
Total Supply	**919.1**	**870.9**	**853.1**	**869.3**	**868.2**	**916.3**	**907.2**	**888.7**	**888.3**	**889.0**
Demand										
Fabrication										
Industrial Applications	374.2	335.6	340.1	350.8	367.6	407.0	427.0	456.1	443.4	352.2
Photography	218.3	213.1	204.3	192.9	178.8	160.3	142.4	124.8	104.9	82.9
Jewelry	170.6	174.3	168.9	179.2	174.8	173.8	166.3	163.5	158.3	156.6
Silverware	96.4	106.1	83.5	83.9	67.2	67.5	61.0	58.4	56.9	59.5
Coins & Medals	32.1	30.5	31.6	35.7	42.4	40.0	39.8	39.7	65.2	78.7
Total Fabrication	891.7	859.4	828.3	842.4	830.8	848.7	836.4	842.5	828.6	729.8
Producer De-Hedging	27.4	-	24.8	20.9	-	-	6.8	24.2	11.6	22.3
Implied Net Investment	-	11.4	-	6.0	37.4	67.6	64.0	22.0	48.2	136.9
Total Demand	**919.1**	**870.9**	**853.1**	**869.3**	**868.2**	**916.3**	**907.2**	**888.7**	**888.3**	**889.0**
Silver Price (London US$/oz)	4.953	4.370	4.599	4.879	6.658	7.312	11.549	13.384	14.989	14.674

Table 1b - Supply & Demand with Bar Hoarding

(million ounces)	2007	2008	2009
Supply			
Mine Production	664.4	684.7	709.6
Net Government Sales	42.5	27.6	13.7
Old Silver Scrap	181.8	176.0	165.7
Indian Bar Dishoarding	-	-	41.2
Implied Net Disinvestment	-	55.0	-
Total Supply	**888.7**	**943.4**	**930.2**
Demand			
Total Fabrication	842.5	828.6	729.8
Producer De-Hedging	24.2	11.6	22.3
Indian Bar Hoarding	10.7	103.2	-
Implied Net Investment	11.4	-	178.1
Total Demand	**888.7**	**943.4**	**930.2**

The table above recasts the main supply and demand balance with Indian bar hoarding as a separate series. This has been done as the scale of this element has grown to become material at the global level. This treatment also highlights that there was heavy disinvestment in the OTC market and on Comex in the second half of 2008, fuelled chiefly by deleveraging in the wake of Lehman Brothers' demise. As for 2009, we now see a notably higher implied figure, better illustrating the surge in western investment.

investment would appear to be highly positive given the scope for the sovereign debt crisis to widen and the probability that real interest rates will remain low or negative in all the major currencies for some time to come.

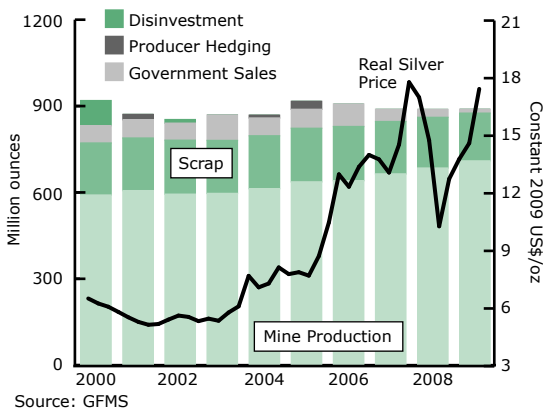
Supply in 2009

- ***Mine production in 2009 rose by 4% to achieve a record high of 709.6 Moz (22,072 t).***
- ***Global silver scrap supply fell 6% to a 13-year low of 165.7 Moz (5,155 t), chiefly as result of further declines from the photographic sector.***
- ***Net government sales continued to decline in 2009, falling by over 50% to 13.7 Moz (426 t).***

Silver **mine supply** grew in 2009 by 24.9 Moz (775 t), comfortably breaching the 700 Moz (21,780 t) level for the first time. Gains came mainly from net increases for the primary silver and gold sectors, as contributions from new projects, or those in their first full year of production, strongly bolstered the global total. Regionally, much of this growth came from Latin America, where silver output rose by 8%. Among the increases globally were full years of production at San Bartolome in Bolivia and Dolores in Mexico, with notable new starts including Palmarejo in Mexico, and Pirquitas and Manantial Espejo in Argentina. Additional weight came from expansions and ramp-ups at San Cristobal in Bolivia, Paracatu in Brazil and Peñasquito in Mexico. Chinese production increased by 8%, primarily a product of an increase in domestically produced lead/zinc concentrates. Lastly, Russian output grew by 6% thanks to the contribution of a full year of production at the gold/silver Kupol property and to further gains at the country's lead/zinc mines.

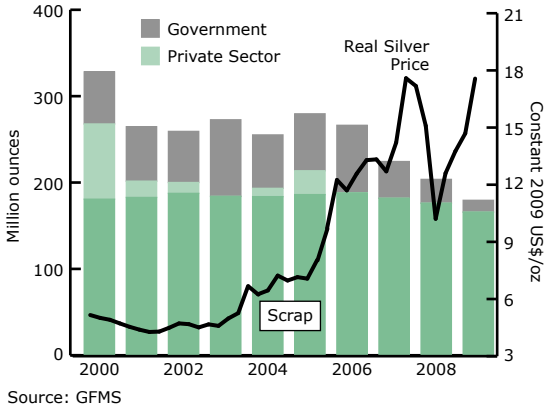
Severe decreases to production at the national level were scarce, with only production in Australia, Chile, Canada and the Democratic Republic of the Congo recording losses greater than 1.0 Moz (31 t).

World Silver Supply



Source: GFMS

Mobilization of Above-Ground Stocks



Source: GFMS

World **scrap** supply declined 5.9% in 2009 to a 13-year low of 165.7 Moz (5,155 t). A long term structural slowdown in recycling from consumer photographic film (a result of ongoing migration to digital applications), and to a lesser extent recovery of medical scrap, were again the primary drivers for the hefty fall last year. Jewelry and silverware remelt was estimated to have increased marginally, boosted primarily by India which reported a strong rise in recycling as silver prices, in rupee terms, recorded a 10% year-on-year gain. Price-inelastic western markets were also broadly higher. Elsewhere, recycling of industrial scrap was pushed higher in some regions by increased monitoring of environmental legislation, although these modest gains were outweighed by falls in disposals of ethylene oxide catalysts which were lower in the United States and South Korea.

Net government sales reached their lowest level in more than a decade. At just 13.7 Moz (426 t), the figure was down by more than a half year-on-year. The drop was mainly due to a major fall in Russian selling coupled with the continued absence of Indian and Chinese sales.

Demand in 2009

- ***Total fabrication fell a hefty 11.9% last year to a 17-year low of 729.8 Moz (22,700 t), chiefly as a result of lower industrial demand.***
- ***2009's global recession cut industrial offtake by 20.6% to a six-year low of 352.2 Moz (10,955 t).***
- ***Economic problems and structural losses meant an accelerated drop of 21.0% for photography.***
- ***Jewelry demand in 2009 only fell by 1.1% but the level was an 11-year low of 156.6 Moz (4,870 t).***
- ***Silverware reversed trend, rising 4.6% to 59.5 Moz (1,851 t) due to stock-related gains in India.***
- ***Implied net investment was a stellar 136.9 Moz (4,258 t), buoyed by safe haven concerns leading to increases in ETF holdings and physical investment.***
- ***Producer de-hedging rose substantially in 2009 as several large silver hedge books were wound up.***

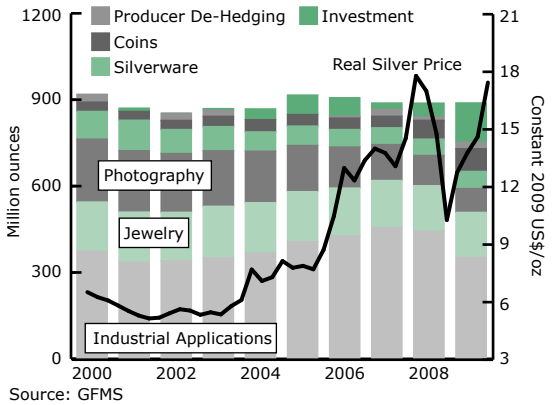
Total fabrication had been remarkably stable since the late 1990s but this abruptly changed last year when a sizable fall of 11.9% cut this to a 17-year low of 729.8 Moz (22,700 t). The bulk of the decline was attributable to industrial demand, although photographic and jewelry demand also fell. In contrast, coin and medal offtake rose strongly, while silverware managed to buck the trend of recent decades and post a rise of almost 5%.

Last year, **industrial offtake** suffered a 20.6% slide to a six-year low of 352.2 Moz (10,955 t), in the process cutting its share of total fabrication to 48% from 2008's 54%. The chief driver of losses was the global recession, which not only hit sales to final end-users but also caused heavy inventory cuts right down the supply pipeline. The influence of other factors, such as elevated prices and substitution, were in contrast limited. The explanation behind losses meant demand was weakest in the first quarter and improved as the year progressed. However, it seems that, even by the fourth quarter, demand (excluding India and its quasi-industrial areas) had yet to surpass an already depressed fourth quarter of 2008.

All regions bar the Indian Sub-Continent suffered double-digit losses, with the heaviest in percentage and absolute terms being East Asia's. That was mainly due to Japan's 44% slump but even China saw a fall (of 10%). The skew of these losses highlights the damage inflicted by the drop in export orders in such areas as consumer electronics or automobiles. Other key areas registering uncomfortable losses included residential construction and heating/ventilation equipment. In fact the only area to enjoy growth of substance was photo voltaic-related offtake, while more novel uses, such as medical applications, also saw rapid, if still small scale, gains.

Jewelry fabrication last year fell to an 11-year low of 156.6 Moz (4,870 t). The decline, however, was only of 1.1% and so far smaller than gold's 20% drop. The chief explanation for the fall was the dip in consumption in jewelry's core markets of the industrialized world and

World Silver Demand



Source: GFMS

heavy destocking at the trade level, both caused by the onset of recession. Some support emerged in the form of substitution from gold but this was usually to high value, branded items and so, while good for the value of sales, it did less for the fine weight consumed. These markets also suffered further losses from structural changes. At a country level, the greatest fabrication losses related to those dependent on supplying consumers in these markets, explaining the heavy falls in Thailand, Italy, Mexico and the United States. The chief outlier was India, where fabrication rose by 37% (and, if we exclude India, global fabrication fell by 4% last year). India's rise, however, was mainly caused by restocking at the trade level, with purchases by the final consumer up only modestly. China also saw decent gains, reflecting still strong GDP growth's boost to domestic consumption.

Silverware offtake reversed the trend of the last decade or so, rising 4.6% to 59.5 Moz (1,851 t). As with jewelry, much was linked to trade stock-related gains in India. If we again exclude that country, demand elsewhere fell by 16%, with those losses primarily driven by the recession and secular change in consumption patterns.

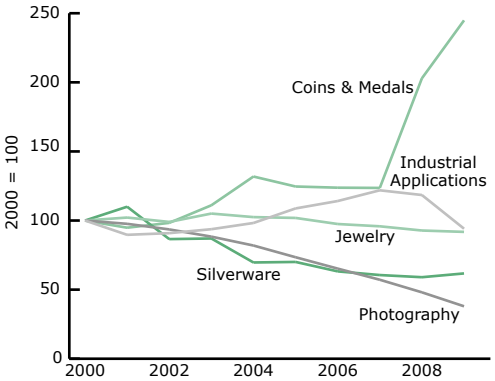
The recession also contributed to the above trend slide in **photographic** demand in 2009. In recent years there has been some offset from a robust motion picture industry, but this also succumbed to the downturn last year. That said, losses were mainly in the consumer film and paper sectors. Medical demand also fell, although the recession to a degree brought benefits by delaying the conversion of some hospitals to digital systems.

Last year **implied net investment** hit a record high in our 20-year data series, as it grew by 184% or 88.7 Moz (2,760 t) to 136.9 Moz (4,258 t). If we remove Indian bar dishoarding, the level reached in 2009 was a yet stronger 178.1 Moz (5,539 t), better reflecting the growth in 'western' investment. Fueling this interest was safe haven buying at the start of 2009, mainly in physical bullion or in ETF holdings at that time. Further aiding investment was some investors, especially hedge funds, seeing prices below $13 as an opportune time for increasing exposure to silver. Offsetting this, to some extent, were forced liquidations or redemptions by investors who were hit by credit constraints. Later in the year, the previously mentioned factors faded (but did not disappear), to be replaced by more of a focus on a weak dollar, a buoyant gold market, the start of the sovereign debt crisis and ongoing inflation fears. As a result, another wave of investment occurred from September onwards, which was more speculative in nature and centered to a large extent on the Comex.

Our other measure of investment, **World Investment** (implied net investment plus coins & medals) grew by 90% to 215.6 Moz (6,705 t). This rise was lower than implied net investment's due to its inclusion of coin's less heady gains. **Coin** demand rose 21% in 2009 to reach 78.7 Moz (2,447 t). This was due to strong investment demand, mainly in the United States and western Europe.

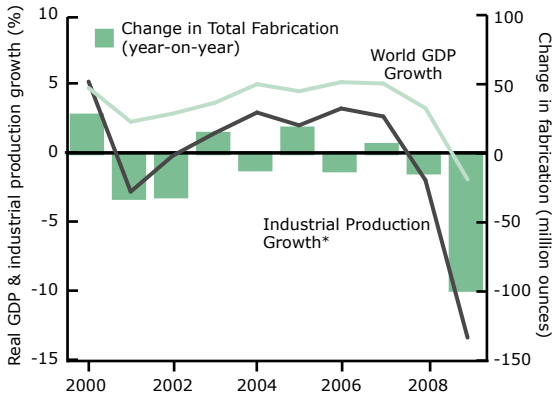
Mining companies collectively **de-hedged** 22.3 Moz (694 t) of silver contracts in delta-adjusted terms in 2009, up 93% on 2008. Central to this significant rise was the elimination of the hedge books of Barrick Gold and Apex Silver Mines. New hedging activity last year involved substantial downside price protection (bought put contracts), although the impact of these diminished over the year as prices improved.

World Silver Fabrication Indices



Source: GFMS

Fabrication Demand & World Economic Indicators



* Industrial countries only; Source: IMF, GFMS

2. Silver Prices

- ***Despite a strong rally during the year, the annual average price in 2009 fell for the first time since 2001, slipping 2% to $14.67.***

- ***Strong gains in investment, a recovery in industrial demand and the gold rally were the prime drivers of the 53% intra-year rise.***

The fact that silver's annual average price fell for the first time in eight years, if only by 2.1%, might be seen as disappointing. However, the level reached, $14.67, was still the second highest since 1980's $20.98. In addition, the modest slip was largely the product of late 2008's deep trough, from which silver made a valiant recovery, rising 53% intra-year. Despite this rally from a low in mid-January of $10.51 to a 17-month high of $19.18 in early December, these gains failed to compensate for that slow start and for early 2008's rally to $20.92.

Nonetheless, the dip in silver's annual average could be viewed as poor in comparison to gold's 12% rise. This divergence largely reflects the damage that the global recession exacted on silver's industrial base. The white metal's precious associations, however, meant it performed far better than copper and its 26% fall.

Silver's hybrid status also does much to explain why, unlike gold, it failed to post-fresh price highs last year as early 2008's surge in investment had the luxury of a firm industrial base. Similarly, despite both enjoying sizable gains in investment, the recovery in industrial silver demand during 2009 helped silver prices outperform gold, which rose 24% intra-year (although both lagged copper and its 139% intra-year rise). Unlike gold, silver was also not hindered by poor jewelry demand and surging scrap as these were both broadly stable year-on-year. This largely explains why the gold:silver ratio narrowed from almost 85 in November 2008 to below 60 by September last year. Despite the significance of the supply/demand fundamentals, we would still regard investment as the prime driver of silver prices last year, with the steady gains for the silver ETFs and the more volatile upward path in the net investor long on Comex both being critical.

US$ Silver Price

	1979	1989	1999	2009
Annual Average	11.068	5.500	5.218	14.674
Maximum	32.200	6.210	5.750	19.180
Minimum	5.935	5.045	4.880	10.510
Range:Average	237.3%	21.2%	16.7%	59.1%

Source: GFMS

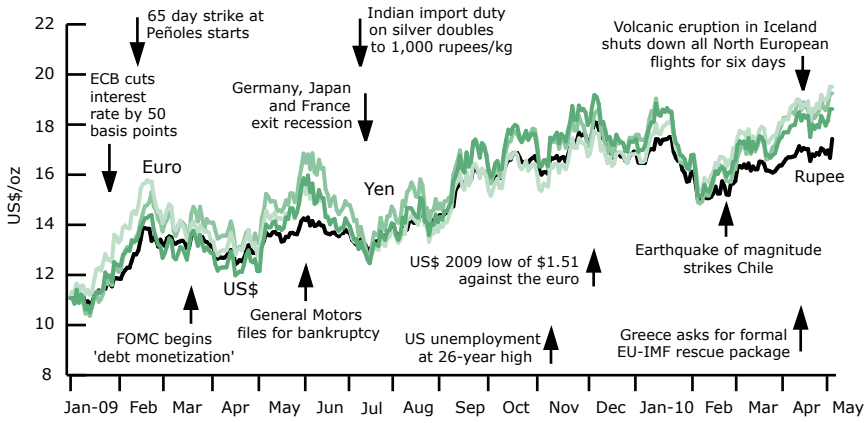
The Silver Price in Other Currencies in 2009

	Euro/kg	Rupee/kg	Yen/10g	Yuan/kg
Annual Average	337.0	23,815	439.9	3,230
Maximum	409.0	30,140	544.6	4,209
Minimum	255.0	17,920	303.2	2,310
Range:Average	45.7%	51.3%	54.9%	58.8%

Source: GFMS

London Silver Market: Spot Price

US$/oz; other currencies reindexed to 2nd January 2009



Source: GFMS

Given its less frothy high and more resilient low, it is unsurprising that volatility fell sharply from 2008's 53% to last year's 38%. However, that level remains fairly high historically, reflecting the price spikes seen in February and May/June together with the sustained rally from September.

If we look at prices in other currency terms, a quite different picture emerges. This is particularly the case for producing countries, with the annual silver price in Peruvian sol terms up 1%, in Canadian and Australian dollars up 6% and in Mexican peso terms up a hefty 20%. Intra-year gains, however, for all these countries, in particular Australia, were lower than the US dollar price's rise. The picture was less uniform on the consumer side, with the euro and rupee price rising 4% and 10% respectively, while the yen and yuan price fell by 12% and 4% respectively. These four, however, recorded broadly similar intra-year gains to the dollar price.

In real terms, the 2009 annual average looks impressive as, leaving aside 2008, you have to return to 1984 to see a higher figure. Nonetheless, that largely reflects the weakness of prices in the 1990s and early 2000s; prior to 1984, you have to return to the early 1970s to see a lower inflation adjusted price.

Having risen strongly in late 2008 mainly due to the surge in Indian bar hoarding, lease rates slid steadily during 2009. The mid-length tenures were the weakest, though all bar the 12-month rate had nominally gone negative before the year was out. This highlights poor fabricator borrowing demand, limited investor shorting and ample loco-London stocks, despite ongoing ETF gains.

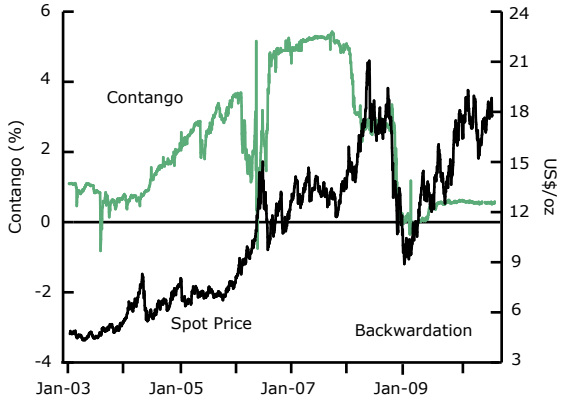
Market Analysis

The rally that had been in place since late October 2008 carried over into 2009 as the price rallied from a low for that year on January 15th of $10.51 to a six-month high of $14.39 by February 24th. While there were no doubt a fair few trend following investors entering the market, what was arguably of more importance was the surge in investment driven by safe haven motives at a time of heightened counterparty risk fears. This was evidenced by the price rise taking place at a time of dollar strength as broader risk aversion led to the dollar:euro rate narrowing from over $1.39 at the start of the year to around $1.27 at the time of the February price high.

The significance of the safe haven issue was also evidenced by the focus within investment; ETF holdings (typically viewed as essentially free of counterparty risk) experienced their most rapid rise at this point last year, growing by 15% in little more than a month up to the February price high. The net investor long on the Comex was also growing strongly, if in a more volatile way, at the time. There was little from the fundamentals then to support such a rapid move, although some had expressed concerns that depressed base metal prices could notably undermine silver by-product mine production.

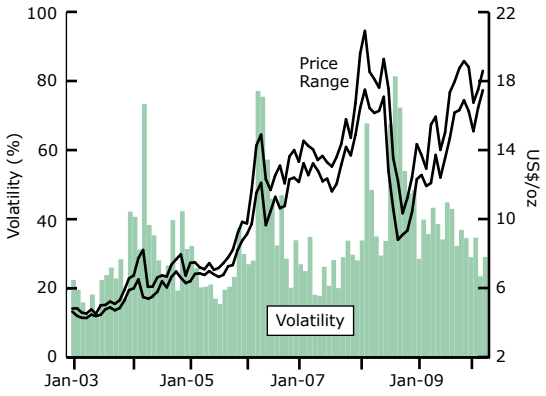
These heady price gains, however, proved hard to sustain and the price slunk back to just below $12 by mid-April. This was a clear incidence of when the fundamentals drove the market as burgeoning gold scrap supply and a slump in jewelry demand for the yellow metal brought about a steep correction in that market and this overspilled into silver, even though the white metal was

London Spot Price and 3-month Contango



Source: GFMS

Daily Silver Price Volatility



Source: GFMS

not being undermined by those two forces. The silver market also appeared disinterested in the outbreak of strike action and then swine-flu caused suspensions at some of Mexico's most important mines.

While the gold correction led to a bail-out by the more speculative participants in the silver market (as suggested by the net investor long on the Comex surrendering all the first two months' gains), more considered investors still maintained faith in precious metals investment at a time when inflation concerns were commonly aired. This was reflected in ETF holdings, which continued to grow, if more slowly, through to the mid-April price low.

From that point, silver rallied strongly through to an early June peak of almost $16. This was largely tied up with a marked weakening in the dollar, which fed through to a surge in investor interest (mainly in the futures market) in silver that was reinforced by a similarly driven rally in the gold market. It was of note that, during the course of this rally, the gold:silver ratio narrowed substantially from around 73 to 62. It might be tempting to assume that this was mainly due to the start of a turnaround in silver's industrially-focused fabrication demand. That did occur but April-June's quarter-on-quarter gain in silver fabrication looks unlikely to have much exceeded 10 Moz (300 t) and the gold market in the second quarter returned to a small positive for jewelry demand less scrap from the first quarter's disastrous negative. As a result, much of silver's superior gains looks to have stemmed from its more limited liquidity.

A theory, dubbed the greenshoots argument, surfaced in the first half of 2009, which claimed that macroeconomic

Volatility (US$ Price)

	2006	2007	2008	2009
Annual	45%	26%	53%	38%
	09.Q1	**09.Q2**	**09.Q3**	**09.Q4**
Quarterly	39%	40%	40%	33%

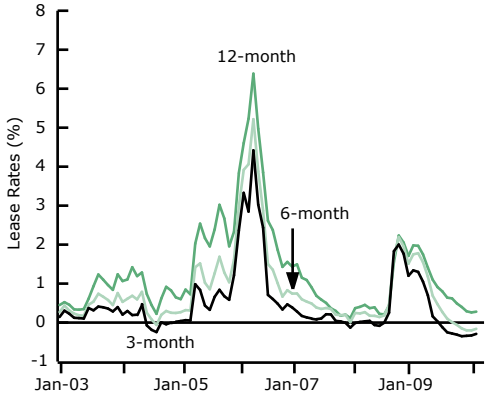
Source: GFMS

news at the time proved the worst was already over or would be by the late spring/early summer. However, whatever benefit might have accrued to silver's industrial base was outweighed by the overspill from the marked fall in gold investment that this theory caused. Indeed, silver's descent to below $12.50 by mid-July was steeper than gold's, illustrating the limited scale of its price responsive scrap and fabrication elements. Other factors driving the price retreat were the end to the sustained slide in the dollar and louder voices claiming inflation was never likely to emerge as a major threat.

Over the rest of the summer however, silver behaved in a far more 'industrial' manner as it rallied strongly to just over $15 by mid-August, at a time when the dollar: euro and gold prices slumbered rangebound. Silver at the time had more in common with copper, whose price was also rallying strongly, even if that metal's gains were due in large part to supply disruptions rather than just a recovery in industrial offtake. Silver during this period saw strong gains for the net investor long on Comex, while the rise in ETF holdings was far more muted.

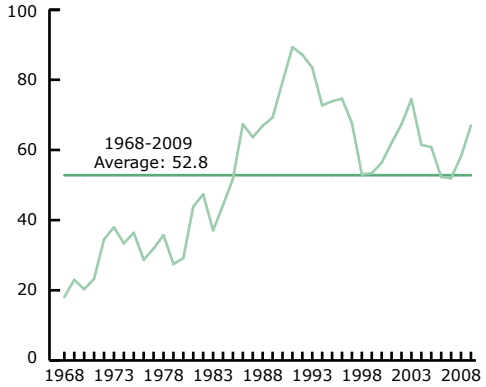
After a steep correction to $13.59 on August 19th, silver rocketed up to a 14-month high of just over $17 in mid-September. Further gains were to follow, although the

Silver Leasing Rates



Source: GFMS

The Gold / Silver Price Ratio



Source: GFMS

path became more volatile, with silver finally topping out at a 17-month high of $19.18 on December 2nd. The speed of the move is highly suggestive of investment as the main driver. What statistics there are support this view as the net investor long on Comex grew strongly in September while ETF holdings rose rapidly in November. There were some general macroeconomic factors behind this pick up in investor interest, with the dollar:euro, for example, sliding during the course of this rally, but the scale of the fall (from around $1.43 to $1.51) was hardly that great. Some also took the decision by the Australian central bank to raise interest rates as the first sign that inflation could be around the corner but such moves singularly failed to be replicated, or even hinted at, in the United States or the Eurozone.

Instead, it does seem that the overwhelming driver of investment and thus the rally was silver just shadowing strength in the gold market (and to a more limited extent, copper, which in early October awoke from rangebound conditions). The gold:silver ratio in fact ended the rally at broadly the same level it had begun (although it did narrow and then widen during the course of the ascent). This was in a sense remarkable as the gains that the yellow metal was enjoying were in large measure driven by gold specific events, such as Barrick's rapid de-hedging and India's purchase of IMF gold.

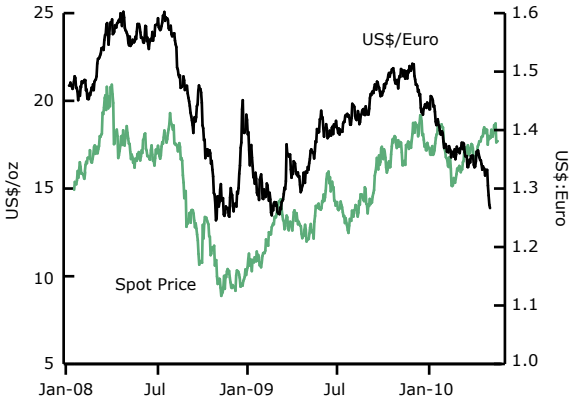
The year ended with a steep correction to just below $17. This was largely attributable to a turnaround in the dollar (partly as the first act of the Greek debt drama began), coupled with year-end profit taking, trend following long liquidation and further shadowing of the gold market, which was also in full retreat.

As noted earlier, it would be wrong to ascribe too much of the intra-year rally to improvements in total fabrication as the quarter-on-quarter gains appear more restrained than commonly envisaged and that for October-December looks fairly limited. This was partly due to the price responsive sectors of Indian demand trending in the opposite direction to most other elements of fabrication. However, India does not play such a decisive role in silver, as it does in gold. This is shown by the fact that global fabrication less India still shows quarter-on-quarter gains of insufficient heft to have a marked price impact.

The contribution of the remaining elements of the supply/demand balance were also generally limited. Scrap, for instance, fell but this was largely due to the predictable losses stemming from the ongoing retreat of conventional photography. The drop in government sales was also of substance but this again was easily within the spectrum of market expectations. Developments in the mining industry were, however, supportive at the margin as mine production, while higher, grew less than expected and de-hedging rose strongly to near-material volumes.

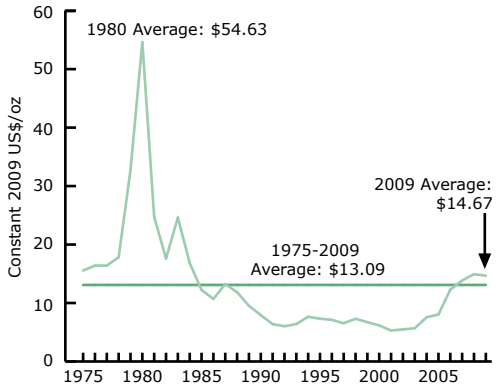
Of some substance however, was India's dishoarding at over 41 Moz (1,280 t). This looks to have grown during the course of 2009 and in the fourth quarter it might even have been larger than the quarter-on-quarter rise in global fabrication. The impact of this on the international silver price stemmed mainly from any suppression it caused to bullion imports as few bars were sold back onto the world market. They were instead overwhelmingly transformed into jewelry and silverware, although the low margins on these products mean the market is not that insulated from the possible trade remelt of these pieces.

The Silver Price and the US Dollar



Source: Thomson Reuters

Real Silver Prices



Source: GFMS

Silver and Other Commodity Prices

GFMS believe 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 confirm 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.

The statistics in the opposite table illustrate the long standing positive relationships between the price of silver and other assets. As can be seen in the table, the link between silver and gold saw a substantial increase over the year. GFMS have often discussed the relationship that exists between the two metals' prices, largely fueled by investors trading silver on the back of changes in the gold price and expectations thereof. Indeed, it is interesting to note the strength of the correlation seen in the last quarter of 2009 when the whole precious metals complex went through an impressive investor-driven rally, on the back of a weaker dollar.

Regarding the correlation that often exists between the silver price and the US dollar, it is our understanding that this is primarily indirect in nature. More specifically, it is largely fuelled by the aforementioned link between the white metal and gold, and the correlation between the gold price and the greenback.

Turning to the correlation between silver and other commodities (proxied by the CRB index), it remained relatively weak in the first half of last year. While silver felt the spill over from gold during that period, investor interest in commodities in general remained limited due to the bleak economic outlook. The second half, in contrast, saw the coefficient jumping to its highest level since the third quarter of 2007. In part, this is because the improvement in the world economy boosted investor confidence regarding commodity demand. Furthermore, a return of risk appetite encouraged a massive dollar carry trade, with investors shifting back to riskier assets such as commodity basket products.

In addition, if one were to limit this analysis to prices of base metals which share relatively similar fundamentals with silver, the implied link would be markedly stronger. For instance, the coefficients between the price of silver and copper were often significantly higher than that with the CRB Index. However, the coefficients for the DJ-AIG Industrial Metals Index were on occasions lower than those for the CRB Index. We would also caution that the correlation between silver and copper prices is much less consistent over time than that between the price of the white metal and gold.

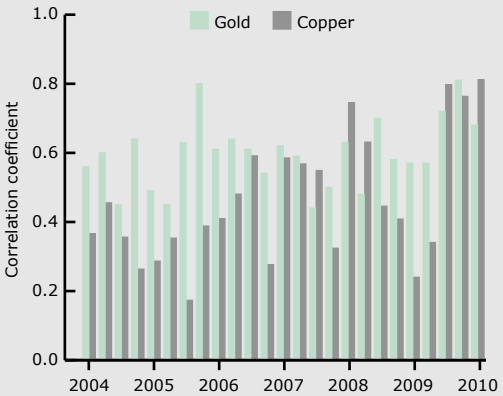
Correlations of Changes in Daily Prices

(using log-returns in spot prices)

	2009 Q1	2009 Q2	2009 Q3	2009 Q4	2010 Q1
Gold	0.57	0.57	0.72	0.81	0.68
US$/Euro	0.19	0.38	0.52	0.50	0.42
Oil (WTI)	0.11	0.11	0.31	0.22	0.47
CRB	0.19	0.24	0.42	0.34	0.44
DJ-AIG	0.09	0.14	0.55	0.45	0.39
Industrial Metals					
Copper	0.24	0.34	0.80	0.76	0.81

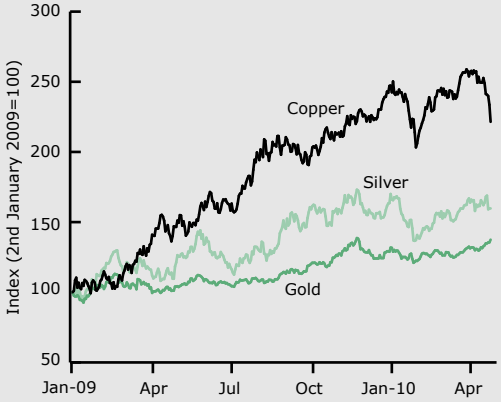
Source: GFMS

Quarterly Correlation of the Silver Price



Source: GFMS, Thomson Reuters

Gold, Silver and Copper Prices



Source: Thomson Reuters

3. Investment

- ***Implied net investment recorded its highest level in our 20-year data series, motivated by safe haven purchases and 'bargain hunting' early in the year. In the fall, silver shadowed gold prices higher on the back of further investor interest.***

- ***ETFs and retail investment were key vehicles for silver investment in the first quarter of the year, the rally in the latter part of 2009 being more focused on the Comex.***

Overview

Throughout the rally in the silver bull market, investor activity has played a pivotal role in determining both the direction and scale of price movements and in this regard 2009 was no different. Indeed, last year saw investors' influence on the supply/demand balance increase to a new high, as shown by our implied net investment total surging to almost 137 Moz (4,260 t). This represents not only a 184% increase on the level in the prior year but also a record high in our 20-year data series.

At the start of the year, investment continued in much the same vein as at the end of 2008, with the surge in investor interest in silver following the collapse of Lehman Brothers sustained throughout much of the first quarter of 2009. The interest was aided by plunging economic activity and global financial crisis, which caused widespread fear and panic about the potential value of non-hard assets. Therefore, investors were drawn to the white metal (albeit less so than for gold) as fears about the security of their bank deposits and the global economy were rife. In particular, this encouraged investment in physical silver, whether in physically backed ETFs or bullion. In the first quarter of 2009, ETF holdings grew by around 64 Moz (2,000 t), or 24%. During this period, retail investment was also at its peak, perhaps unsurprisingly given the aforementioned backdrop, in both the key traditional markets, namely North America and the German-speaking countries of Europe.

Furthermore, some investors, particularly certain hedge funds also saw prices below $12/oz in the first quarter of 2009 as an opportunity for bargain hunting. This was due in part to dramatic industrial destocking, leading to heavily depressed industrial demand, which would have to draw to a close as the supply chain was becoming increasingly empty. Accordingly, it was viewed as a promising time by some longer term investors to increase

Silver Price and Investment Indicators

	2008 Average	2009 Average	Change y-o-y
Silver Price $/oz	14.989	14.674	-2.1%
Contango (3-mth annualized)	2.45%	0.33%	n/a
US$ Libor (3-mth annualized)	2.93%	0.69%	n/a
S&P 500 Index	1,220	948	-22%
CRB Index	426	361	-15%
XAU Index	154	147	-5%
World GDP Growth*	3.2%	-2.0%	n/a
Advanced Countries CPI*	3.4%	-0.1%	n/a

*Annual rates; Source: IMF World Economic Outlook, April 2010; GFMS

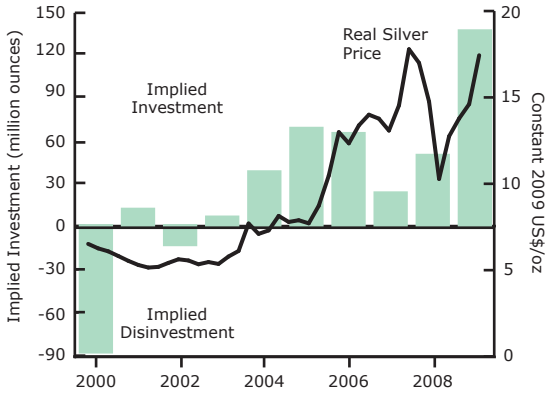
World Investment (Moz)

	2007	2008	2009
Implied Net Investment*	22.0	48.2	136.9
of which, Indian Bar Hoarding	*10.7*	*103.2*	*-41.2*
Coins & Medals	39.7	65.2	78.7
World Investment	**61.7**	**113.4**	**215.6**
Indicative Value US$(bn)**	**0.8**	**1.7**	**3.2**

* Implied Net Investment is the residual from combining all the other GFMS data on supply/demand as shown in Table 1. By definition, it therefore captures the net physical market impact of all transactions not covered by the other supply/demand variables.

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

Implied Net Investment



Source: GFMS

London Bullion Market (LBM) and Comex Turnover

(daily averages)

	LBM No. of Transfers	Turnover Moz	Comex Turnover Moz	LBM/ Comex Ratio
2003	233	92	82	1.1:1
2004	326	104	101	1.0:1
2005	331	110	110	1.0:1
2006	447	147	109	1.3:1
2007	462	114	135	0.8:1
2008	519	126	176	0.7:1
2009	340	97	159	0.6:1

Source: LBMA, Comex

their exposure to silver in advance of industrial demand improving. Offsetting this interest to some extent, at least through the first couple of months of 2009, was selling from index investors. It is worth noting that while on occasion this was through choice, in many other cases it was forced by redemptions, as investors were hit by credit constraints.

From April onwards, the safe haven appeal of silver started to ebb away in investors' rationale and while it did not disappear at any stage, it was clearly much less prominent throughout the remainder of 2009. Instead, there was a shift in investment emphasis from viewing silver as predominantly a precious metal to increasingly behaving like an industrial metal. However, this did not prevent bouts of silver interest linked to gold.

After something of a lull, investment picked up again from late July through to end-October with Comex being the chief vehicle for fresh silver investment. In fact, the net 'investor' long on Comex grew by almost 80% in this relatively short period and the silver price climbed by over $3 to in excess of $17/oz. In contrast to the early part of last year, this rally was fuelled by marked weakness in the US dollar, coupled with positive sentiment towards the world economy, with silver, other commodities and stocks a major beneficiary of this trend. Additionally, gold was rallying very strongly through the fall and this was providing support, despite some of the developments being specific to gold e.g. IMF gold sales.

Briefly in late November/early December there was also a return of strong ETF buying, with approximately 30 Moz (930 t) added to holdings in just over three weeks, as prices rallied to their 2009 high. Subsequently, though, investors liquidated sizable positions in December.

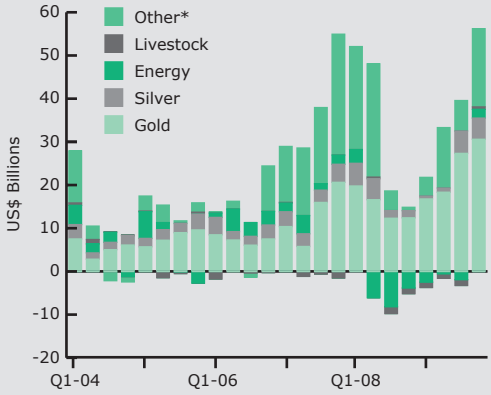
Investment in Commodities

Commodity investments had an outstanding year in 2009, in contrast to the disastrous events of late 2008. Indeed, the combined net-long for the 22 commodities for which we show futures end-quarter observations in the graph below, fell in late 2008 to levels unseen since the end of 2004 (on an end-quarter basis). Nevertheless, investor sentiment began to improve from early 2009, but risk aversion was still elevated and liquidity was constrained, so this only translated into fresh inflows into the sector from March. The unprecedented response of the authorities to the crisis, coupled with signs that conditions had stopped deteriorating, gave investors enough confidence to once again focus on the longer-term fundamentals. Compounding these views, concerns over inflation and a weakening US currency as well as an explosion of liquidity, which saw the dollar become the new carry trade currency, were also encouraging investors to buy commodities.

CFTC data shows that aggregate positions across commodities reached new peaks in the fourth quarter of 2009, surpassing those seen in mid-2008. The sharp downturn in investor positions and prices in the second half of 2008 saw the build up of a notable level of short positions in some commodities. Many of these shorts were then closed in the first half of 2009, as prices rebounded strongly, particularly in the second quarter.

The nature of commodities investment has also altered. One example is a growing interest in actively managed funds, which include products designed to outperform an index by being more flexible on allocations as well as more straightforward managed strategies, both long-only and long-short. Many managers were "overweight" in industrial commodities last year, especially on the back of expectations of industrial production growth, largely due to the Chinese fiscal stimulus. Silver also benefited from a weaker dollar over much of the year as long silver:short dollar strategies were favoured by some.

Value of Speculative Positions in 22 Commodity Futures



* Other includes soft, agricultural and dairy commodities

Source: Various

While this partly took place on Comex, more significant volumes were sold in the OTC market. Contributing to this subdued end to the year were a reversal of the prior trend of a weakening US dollar, as well as a degree of year-end profit taking, particularly on long silver/short US dollar positions.

A consideration for some investors this past year is the fact that, unlike gold, silver currently remains far short of its rally-to date high of $20.92 seen in March 2008. This is likely to result in some preference, at the margin, from more speculative investors for the white metal. Indeed, some investors, including a number of high profile names highlight that it remains more than 60% below its all-time nominal high, in stark contrast to gold, consequently implying the greater upside potential for silver than gold.

An alternative way of subdividing the total investment cake is shown for the first time on page 17. This shows our estimates of World Investment for silver, consisting of implied net investment (including Indian bar hoarding) and demand for coins and medals. In aggregate, World Investment using this definition rose to 215.6 Moz (6,700 t) or approximately $3.2 bn in value terms, almost twice the level achieved in 2008.

The only area to see a significant year-on-year decline in physical investment was India. Whereas 2008 saw more than 100 Moz (3,200 t) of investment, 2009 saw net dishoarding throughout the year, to the tune of 41 Moz (1,280 t). Initially this was the consequence of the conversion of bars acquired in 2008 into jewelry and silverware. In the second half of the year sales were encouraged by higher prices. In contrast, global coin demand in 2009 achieved a record level for the second successive year, at almost 79 Moz (2,450 t), boosted by growth in the United States.

Thus far in 2010, silver investment has been notably lower year-on-year. However, ETF holdings have shown some resilience, dipping a modest 12.0 Moz (374 t) in the first four months of this year. However, the overall drop in investment is chiefly a reflection of the stellar levels of net interest a year ago. More recently, at the margin, some limited increase in silver investment has been seen following the dramatic events in Greece and the potential for contagion spreading to other European countries.

Looking ahead, investor interest in silver is set to remain positive, bolstered by the sovereign debt crisis. This may continue to trigger "shocks", which should attract safe haven investing. Industrial demand should also continue improving, which should further boost silver investment.

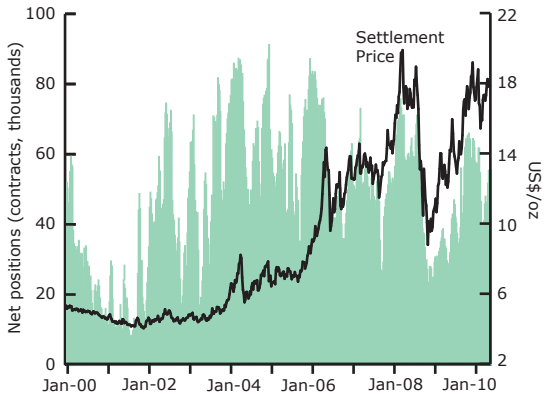
Net "Investor" Position on Comex

		Contracts	Moz	Price
2005		59,450	297	7.30
2006		56,912	279	11.55
2007		55,879	249	13.38
2008		51,193	256	14.91
2009	Q1	33,781	169	12.63
	Q2	37,106	186	13.75
	Q3	46,401	232	14.74
	Q4	61,508	308	17.55
2010	Q1	48,051	240	16.93

(average non-commercial and non-reportable net futures positions, Moz equivalent and average Comex settlement price in $/oz; Source: CFTC)

Comex: Net "Investor" Positions

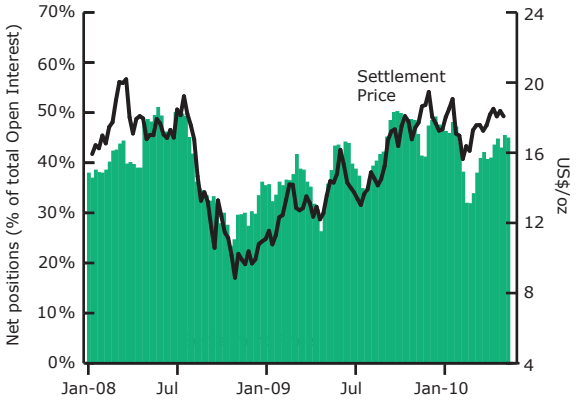
Non-Commercial & Non-Reportable Net Futures Positions & Price



Source: CFTC

Comex: Net "Investor" Positions

Weekly Net Futures Positions as a Percentage of Total Open Interest



Source: CFTC

OTC Market

Due to the lack of meaningful publicly available data on activity in over-the-counter (OTC) products in silver (as there exists no actual data on volumes and open interest), GFMS cannot give a precise estimate of the impact of OTC activity on the physical market. Although the clearing statistics from the London Bullion Market do provide a gauge, this data however is an imperfect reflection of investor activity. Firstly, it does not capture the trends in other OTC markets and secondly, it fails to differentiate between pure investment flows and other forms of activity. Therefore, GFMS rely on information collected through extensive field research, which in 2009, suggested that the OTC market experienced net selling.

Last year began in a similar style to the end of 2008, with a shift from derivatives and other 'paper' products, which carry a high level of counterparty risk, towards physical products. The increase in holdings of silver ETFs during the first quarter of 2009 was a prime example, as part of the reduction in long positions in the OTC market reflected investors' moving their positions into physically-backed silver ETFs. Therefore, despite the strong interest in physical silver at that time, the OTC market, especially after accounting for some forced liquidations, was a net seller. Another key factor causing this was index funds liquidating positions at the beginning of the year. Thereafter, OTC interest in silver was aided by the view that industrial demand had bottomed.

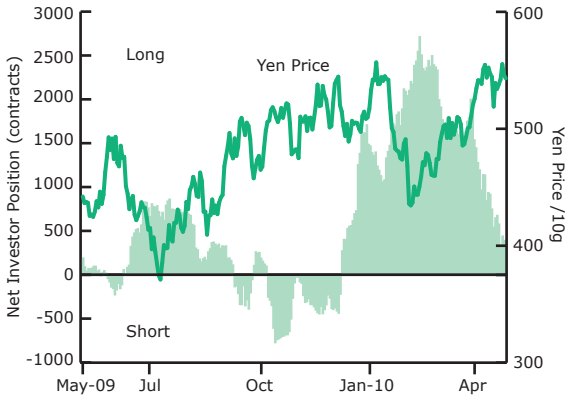
That said, during the second phase of heightened interest in silver investment in fall 2009, we understand that buy-side activity by investors on the OTC market did not grow to the same extent as it did on Comex. A substantial part of the OTC demand was motivated by longer-term considerations such as renewed signs of economic recovery, although more immediate concerns including the outlook for the US dollar also played a role. For other investors, purchases were prompted by prospects of short-term price gains. However, after the price peak in early December, a degree of liquidation occurred, as some investors took profits prior by year-end, especially as the US dollar started to appreciate. OTC interest has been positive so far in 2010, despite some investors closing out their positions in late January and early February. This is partially due to allocations at the start of the year and more latterly, fresh buying encouraged by the uncertainty over Greece.

Physical Investment

In 2009 investment in physical bullion was at very high levels, especially at the start of the year. Fueling the surge in interest were similar drivers to gold, as the grave prognosis for the global economy and the financial sector in particular drove investors towards hard assets, and wherever possible to minimise (or preferably eradicate) burgeoning counterparty risk. Further boosting physical investment during the first quarter of 2009 was the fact that due to physical shortages of gold in some locations some investors chose to buy silver as an alternative that they could quickly obtain. In turn, this temporarily led to some shortage of retail investment products and drove up premiums and delivery times.

From April 2009 onwards, as the world economy appeared to be past the worst, this driver for physical silver demand undoubtedly became less important, although it remained in the background throughout the year. As is typically the case for silver, much of the physical investment last year took place in North America and in the German-speaking parts of Europe. That said, some other European countries also saw a substantial increase in investment activity, albeit from low levels. Crucial to the relatively low levels of physical investment in Europe is the continued payment of VAT on silver investment, which disadvantages this metal against VAT free gold. Chiefly the increase in physical bar demand has been in the form of kilobars, although sales of five kilobar pieces are also increasing. Turning to 2010, demand in both the European and North American markets is appreciably below the level a year ago, despite turmoil in Greece sparking occasional interest.

Tocom: Net "Investor" Positions



Source: Tocom

Investment

Exchange Traded Funds

Silver ETFs enjoyed yet another robust year in 2009. Total holdings rose by nearly half or 132.5 Moz (4,121 t) over the course of 2009, ending the year at 397.8 Moz (12,374 t). The increase was the product of rising holdings of all of the three funds that were active at the beginning of the year and, at the margin, the launch of new silver ETFs in Australia and the United States last year.

Looking at the intra-year development, it is of note that the impressive growth last year was heavily skewed to the first quarter, with inflows over the first three months reaching nearly 63.7 Moz (1,982 t). This result should not be surprising given the importance and scale of safe haven buying seen in early 2009, driven by fears about financial stability, especially in light of the then very poor economic outlook.

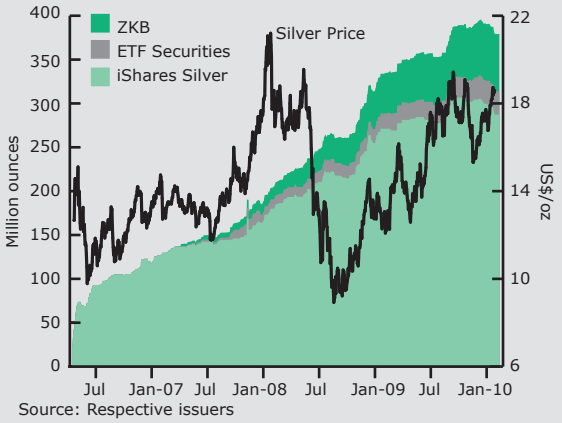
Indeed, given a sharp fall in fabrication demand and only a modest recovery in investor interest in other areas of silver investment (with the exception of physical bullion), it is evident that strong demand for silver ETFs was the primary driver of the silver price in the first quarter of the year, which climbed by over $3/oz to breach the $14/oz mark by mid-February.

Thereafter, the rate of inflows into silver ETFs slowed significantly, with combined ETF holdings growing by just above 30 Moz (960 t) or 9% from April to September. This is in sharp contrast to the investment demand in the futures market, which saw net investor longs almost double over the same period. Behind this change was a reduction in systemic financial risk following the stabilization of the global financial system. As such, a rapid return of risk appetite to pre-Lehman Brothers levels had encouraged investors to move into those silver contracts traded in the futures and OTC market that bear higher risk.

Nevertheless, it should be noted that demand for silver ETFs remained resilient in late 2009 and in the first four months of this year, with any decline in total holdings proving to be only temporary and not on a particularly large scale. In part, this is because the majority of demand for silver ETFs came from investors that have a reasonably long-term strategic interest in the metal. Furthermore, even though on a much smaller scale than is the case for gold, growing concerns that inflation will soar in future on the back of the massive stimulus packages and accommodative monetary policies pursued by the major economies encouraged some investors to purchase silver as a safe haven asset.

Turning to individual products' performance, the iShare Silver Trust once again accounted for the bulk of the overall increase, with its silver holdings rising by 87.5 Moz (2,721 t) over the year to 305.9 Moz (9,514 t) at end-2009. Elsewhere, holdings of the second largest ETF, ZKB Silver, managed by the Zürcher Kantonalbank, also enjoyed strong growth. At year-end, the product's holdings stood at 59.0 Moz (1,835 t), up by more than 80% year-on-year. Finally, silver stocks held in the ETF Securities product (listed on the LSE) grew by 9.1 Moz (284 t) to 23.4 Moz (727 t) by end-December 2009. It is also worth noting that the popularity of silver ETFs has resulted in the company launching similar products in Australia and the United States in January and July last year, which attracted inflows of 0.4 Moz (13 t) and 9.2 Moz (286 t) respectively.

Silver ETFs Holdings



Source: Respective issuers

Silver ETFs Holdings

(Moz)

	end-2008	end-2009
iShares Silver Trust	218.4	305.9
ZKB Silver ETF	32.7	59.0
ETF Securities	14.2	23.4
ETF Securities Australia	-	0.4
ETF Securities NYSE	-	9.2
Total	**265.3**	**397.8**

Source: Respective issuers

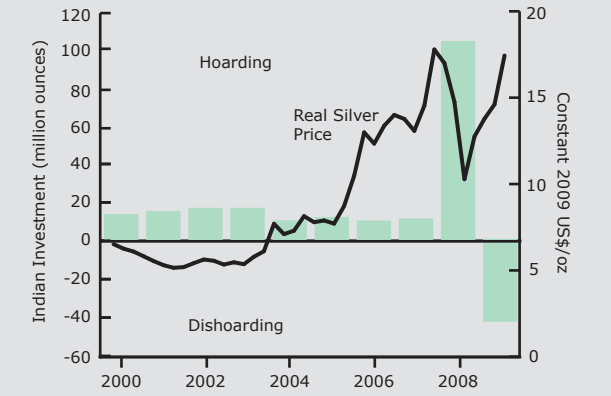
Indian Physical Investment

In 2009, the Indian market saw net disinvestment of around 41 Moz (1,280 t). This was the first time net dishoarding has been recorded in GFMS' twenty year data series, and followed a price-driven boom in 2008 which saw an estimated 103 Moz (3,210 t) of net hoarding.

Although investment in the Indian market is usually dictated by price, last year saw a departure from the norm. Indeed, the pattern of dishoarding was spread throughout the year, despite the fact that until July, the average year-on-year price was some 7% lower. Our view is that disinvestment in the first half of the year was not price-related, but was rather a consequence of the conversion of bars acquired by the trade the year before into jewelry and silverware (GFMS measure fabrication demand when bar is converted into a manufactured product). We estimate this reached around 17 Moz (536 t) and was the result of the trade deeming the timing to be right to convert bars into saleable finished products.

Towards the latter part of the year, disinvestment took a more conventional form; that of investors taking profits on escalating prices. In the last four months of 2009 the price more than doubled year-on-year, rising to above Rps 30,000/kg. Such direct net disinvestment is estimated to have reached around 24 Moz (750 t). The high level of locally available metal, combined with the extensive use of previously stocked bars by the trade, a legacy from the high level of imports in 2008, quashed the need for fresh metal and curbed imports by some 50% in 2009. The fact that the rupee silver price traded at a substantial discount to the dollar price for much of the year was a clear indication that local supplies of metal were plentiful.

Indian Physical Investment



Source: GFMS

Silver Futures Trading

(total volume in nominal million ounce equivalents)

	2007	2008	2009	Change y-o-y
Comex	34,036	44,586	40,001	-10%
CME*	8,018	3,601	1,187	-67%
Tocom	518	287	106	-63%
MCX	10,551	12,659	13,871	10%

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

Source: Comex, CME Group (previously CBOT) & NYSE Euronext, Tocom, Multi Commodity Exchange of India.

Commodity Exchanges Activity

Trading volume in Comex silver futures fell by 10% in 2009. At just over 8.0 million contracts, this was equivalent to an average daily turnover of 159 Moz (4,937 t). The fall was largely due to weaker demand in the first half, particularly compared with the same period in 2008, when record levels of investor activity sent the silver price to multi-decade highs. Nevertheless, from August onwards, investor interest rebounded strongly. By end-2009, open interest stood at around 125,000 contracts, up by 45% from the end-2008 figure.

Analysis of the data published by the CFTC in its weekly reports, on non-commercial and non-reportable net positions in Comex futures and options, provides a proxy for investor activity on the exchange. Despite several periods of liquidations in 2009, the data confirms that investors were generally bullish last year. Looking at the trend over the year in more detail, following a massive sell-off in the latter part of 2008, bargain hunters were lured back by silver's oversold conditions, as evidenced by a rapid accumulation of long positions on Comex in early 2009, which helped to push silver higher. Although the rally soon ran out of steam, investors remained firmly on the buy-side of the market. After a summer lull, the growth in investor positions accelerated from September onwards, with the net investor long jumping by more than half in September and reaching a 15-month high of 66,004 contracts on October 20th. Key to this was silver benefiting from a general recovery in commodity prices.

Furthermore, improving sentiment regarding the economic outlook has lately been supportive of silver investment, due to its message of better prospects for industrial demand. Despite a modest decline thereafter, investor interest remained relatively highly, with net longs staying above 56,000 contracts at end-April 2010.

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

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
United States	13.4	12.3	15.3	14.5	15.5	16.6	17.6	16.0	25.1	33.9
Canada	1.0	0.9	1.0	0.3	1.3	1.6	2.9	4.3	9.0	10.8
Austria	0.2	0.3	0.4	0.4	0.5	0.6	0.5	0.5	8.3	9.5
Germany	8.8	8.1	6.0	9.7	9.7	9.7	8.7	6.3	7.2	7.5
Australia	1.0	0.8	0.6	1.3	1.3	1.0	1.4	3.5	5.9	6.5
China	1.2	1.5	2.1	2.3	2.3	1.8	1.6	2.6	2.8	3.0
Mexico	0.7	1.1	1.1	1.5	2.7	2.6	1.9	1.6	1.4	1.7
Spain	1.8	1.8	1.5	1.1	2.2	1.7	1.5	1.2	1.1	1.0
Other Countries	4.1	3.7	3.5	4.5	6.8	4.3	3.7	3.7	4.5	4.8
World Total	**32.1**	**30.5**	**31.6**	**35.7**	**42.4**	**40.0**	**39.8**	**39.7**	**65.2**	**78.7**

Coins and Medals

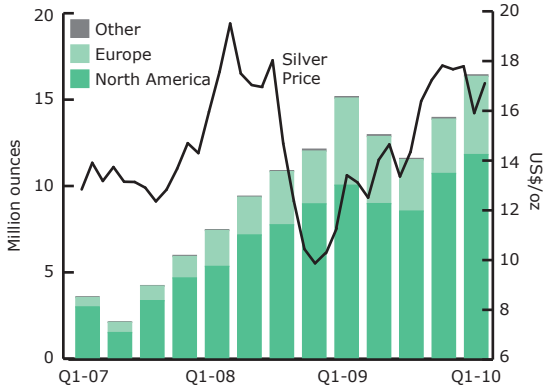
Last year, global coins and medals fabrication rose by 21% to a new record of 78.7 Moz (2,447 t), driven by a jump in retail demand, principally in the United States, although western European demand was also stronger in 2009. In contrast to gold, where bullion coin demand had surged following the collapse of Lehman Brothers in September 2008, there was a far less discernible spike in silver bullion coin sales, demand for which had first risen strongly in early 2008.

GFMS' proprietary silver bullion coin survey, charted below, reveals the far more even nature of demand over this time. The survey, covering the leading bullion coins (and accounting for 68% of global coin minting in 2009), also confirms the dominance of the US market, which accounted for over 70% of silver bullion coin sales last year, with Europe consuming close to 30%. Focusing on the **US** market, the jump in the country's bullion coin sales was accompanied by a surge in bar demand, discussed on page 20, although it appears as though coin sales outnumbered bullion demand, in volume terms, by approximately 2:1 in 2009. The ratio was more skewed in 2008, but a greater availability of bars in 2009, combined with a shortage of coin blanks towards the end of 2008 and at times in 2009, saw bullion coins account for a smaller share of US retail demand last year.

Nevertheless, every leading producer of bullion coins saw their total minting rise last year. The US Mint led the way, with an 8.8 Moz (274 t) rise. In two years, US coin production has more than doubled, with minting of the Eagle one-ounce bullion coin comfortably setting a record high (to put last year's performance into context, over the 1986-2008 period Eagle minting averaged 7.7 Moz or 240 t per annum). **Canada** achieved a similar growth rate over the past two years, although 2009 saw a smaller rise in the country's total of "just" 1.8 Moz (56 t). In terms of the other principal bullion coin minters, namely **Austria** and **Australia**, both registered healthy gains last year, with Austria in particular continuing to benefit from its recently launched Philharmoniker coin.

Elsewhere, **German** coin fabrication was little changed in 2009. In contrast to the United States, bar demand is less popular in Germany, mainly because of the higher 19% sales tax, compared with only 7% levied on a number of bullion coins. This has contributed to the long standing popularity of what are effectively commemorative coins, but which, over the past 13 years (since the purity was increased from 625 to 925) have been increasingly purchased as an investment vehicle. Augmenting this were sales of the main bullion coins which, for Europe as a whole, are estimated to have jumped by around 50% to 15.0 Moz (468 t) in 2009.

Silver Bullion Coin Sales



Source: GFMS Quarterly Bullion Coin Survey

4. Mine Supply

- ***Mine production expanded by almost 4% to achieve a fresh high of 709.6 Moz (22,072 t).***

- ***Primary silver mine supply was significantly higher in 2009, although supply growth from base metal sources was, on balance, minimal.***

- ***Silver produced as a by-product of gold mining however was, once again, the sector that increased most, rising 15.2 Moz (474 t) or 21% year-on-year.***

- ***Primary silver total cash costs in dollar terms remained relatively stable year-on-year, as local currency depreciation in some key producer currencies helped offset inflationary pressures.***

- ***Producer de-hedging of silver contracts increased significantly, creating 22.3 Moz (694 t) of demand last year.***

Mine Production

- ***Global mine production rose again last year, by almost 4%, its seventh straight annual increase to reach a record high of 709.6 Moz (22,072 t).***

- ***Output was driven higher by strong production increases in several Latin American countries as mining projects, many of which are primary silver producers, came to fruition, and by higher output in Asia, principally from China and Turkey.***

Strong growth in Latin America and Asia pushed global mine production to a new high last year, decisively breaching the 700 Moz (21,800 t) level for the first time. In Bolivia, the progression towards design capacity at both Coeur d'Alene Mines' San Bartolomé and Sumitomo Corp's San Cristóbal saw the nation's output expand by 6.8 Moz (212 t). Similarly, Argentinean production

Top 20 Silver Producing Countries

Ranking			Output (Moz)	
2008	2009	Country	2008	2009
1	1	Peru	118.3	123.9
2	2	Mexico	104.2	104.7
3	3	China	82.9	89.1
4	4	Australia	61.9	52.6
9	5	Bolivia	35.8	42.6
6	6	Russia	39.6	42.2
5	7	Chile	44.9	41.8
8	8	United States	36.0	39.8
7	9	Poland	38.9	39.2
11	10	Kazakhstan	20.2	21.7
10	11	Canada	21.5	19.6
12	12	Argentina	10.3	17.1
13	13	Turkey	10.1	14.0
14	14	Sweden	8.4	8.7
16	15	Morocco	7.7	8.3
15	16	Indonesia	8.0	7.7
17	17	India	6.8	7.3
18	18	Guatemala	3.2	4.2
19	19	Iran	3.2	3.5
20	20	South Africa	2.7	2.6
		Rest of World	20.0	19.0
		World Total	**684.7**	**709.6**

Source: GFMS

Top 20 Silver Producing Companies

Ranking			Output (Moz)	
2008	2009		2008	2009
1	1	BHP Billiton	42.3	42.0
2	2	KGHM Polska Miedź	38.4	38.7
3	3	Fresnillo plc [1]	34.8	37.9
5	4	Pan American Silver Corp. [1]	18.7	23.0
4	5	Cia. Minera Volcan [2,3]	23.0	21.2
8	6	Hochschild Mining	16.9	18.8
12	7	Coeur d'Alene Mines Corp. [1]	12.0	17.7
-	8	Sumitomo Corp. [3]	5.8	17.6
6	9	JSC Polymetal	17.2	17.3
9	10	Kazakhmys plc	15.6	16.9
7	11	Cia. de Minas Buenaventura	17.2	16.0
13	12	Kinross Gold Corp. [4]	11.8	14.0
11	13	Southern Copper Corp.	12.3	13.2
14	14	Teck Resources	11.6	13.0
18	15	Goldcorp Inc.	9.7	12.8
10	16	Xstrata Zinc	15.4	12.7
15	17	Industrias Peñoles	11.2	11.8
20	18	Eti Gümüş A.Ş. [3]	9.0	11.2
21	19	Hecla Mining [1]	8.7	11.0
17	20	Yamana Gold	10.2	10.5

1 Primary silver producer.
2 Includes production from minority subsidiaries.
3 Estimate 4 Reported Sales

Source: Company Reports; GFMS

almost doubled as Pan American Silver's Manantial Espejo and Silver Standard Resources' Pirquitas projects delivered first production last year. In Asia, Chinese output was lifted by 8%, principally due to an increase in domestically produced silver-bearing lead/zinc concentrate. Turkish production benefited from a large increase in output at the primary silver Gümüşköy mine operated by Eti Gümüş; the country's total production consequently grew by 39% to 14.0 Moz (436 t).

Severe decreases to production at the national level were relatively scarce and geographically dispersed, with only Australia, Chile, Canada and the Democratic Republic of the Congo posting losses of more than 1.0 Moz (31 t). In the latter three countries, the mothballing of depleted or loss-making mines was a factor in some of the losses, while Australia's fall in output was attributable to widespread drops in production at large, ongoing operations across the primary silver and by-product sectors.

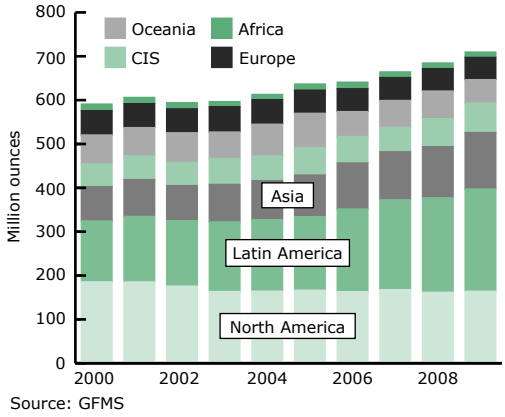
North America

North American mine production recovered slightly in 2009. Output increased by 1% to 164.1 Moz (5,104 t), as increases in the United States and Mexico overcame the continuing year-on-year trend of declining production in Canada.

The **United States** was the principal driver in North America's revival, as output rose 11% to 39.8 Moz (1,239 t), falling just short of 2007's 40.5 Moz (1,260 t). Improvements were achieved at several of the country's largest producers. Hecla Mining's operations contributed a combined 0.9 Moz (27 t) of growth, as output at Lucky Friday grew by 23% to its highest level for ten years, due to improved grade control and increased mill throughput, and Greens Creek produced 3% more silver, partly linked to improvements in the stoping cycle. At Teck Resources' Red Dog zinc operation silver output rose by 10% to just short of its 2007 high. The most significant year-on-year increase came from Rio Tinto's vast Bingham Canyon mine, where silver production rose 1.5 Moz (45 t), due to a combination of increased mill throughput and the fact that mine plan focused on zones with higher copper, gold and silver grades, due to lower molybdenum prices.

Elsewhere, a ramp up in production at US Silver's Galena Mine in Idaho added 0.7 Moz (22 t). Following the major slump in 2008, losses in the United States in 2009 were

World Silver Mine Production



Source: GFMS

limited. Output at Coeur d'Alene Mines' Rochester fell 0.9 Moz (26 t), with residual leaching ongoing following the conclusion of mining during 2007. In addition, a combined loss of 0.7 Moz (21 t) arose from the closure of the Sunshine and Montana Tunnels operations, whose recent restarts proved untenable, with mining subsequently suspended in September 2008 and April 2009 respectively.

Mexican output only increased modestly last year to 104.7 Moz (3,256 t), following a period of strong uninterrupted growth from 2004 through 2008. In 2009, the most significant gain came from commissioning production at Coeur d'Alene Mines' Palmarejo, where the first pour took place in March, with output totalling 3.0 Moz (95 t) by the end of the year. At Fresnillo's namesake operation, the world's largest producing silver mine last year, output rose 5% to a reach a record high of 35.4 Moz (1,102 t) on the back of improved plant availability. Additional growth came as Minefinders' Dolores, Goldcorp's Penasquito and Farallon Resources' Campo Morado operations which all recorded their first full year of production.

Offsetting much of these gains, losses from lead/zinc operations were coupled with numerous smaller reductions in silver output across the mining sector. At Pan American Silver's operations production fell by a combined 1.2 Moz (39 t), with lower silver grades at Alamo Dorado primarily responsible. Elsewhere, decreases totalling 0.6 Moz (19 t) were reported at Gammon Gold's operations: At El Cubo a seven week union strike in the first half of the year contributed to the company's shortfall. Ocampo's output also fell modestly

Table 3 - World Silver Mine Production (million ounces)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Europe										
Poland	36.7	38.0	38.9	44.2	43.8	40.5	40.5	39.6	38.9	39.2
Sweden	9.5	8.8	9.4	9.9	9.4	9.1	8.6	9.4	8.4	8.7
Greece	1.0	2.0	2.4	0.1	0.0	0.0	0.8	1.1	1.1	0.9
Portugal	0.7	0.7	0.6	0.7	0.8	0.8	0.6	0.9	1.3	0.8
Bulgaria	0.6	0.8	0.8	0.7	0.6	0.7	0.6	0.4	0.4	0.3
Spain	3.7	1.8	0.4	0.1	0.0	0.2	0.1	0.1	0.1	0.2
Macedonia	0.8	0.5	0.4	0.2	0.1	0.2	0.4	0.4	0.4	0.1
Romania	1.1	1.2	1.0	0.9	0.9	0.9	0.4	0.1	0.1	0.1
Serbia and Montenegro	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1
Ireland	0.5	0.3	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1
Italy	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0
Other Countries	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Europe	**55.0**	**54.7**	**54.5**	**57.2**	**55.8**	**52.7**	**52.2**	**52.3**	**51.0**	**50.7**
North America										
Mexico	84.3	88.7	88.3	82.6	82.6	93.1	95.5	100.8	104.2	104.7
United States	63.7	55.9	43.4	39.9	40.2	39.2	36.7	40.5	36.0	39.8
Canada	37.7	40.7	44.1	41.0	41.6	34.2	31.2	26.7	21.5	19.6
Total North America	**185.7**	**185.3**	**175.9**	**163.5**	**164.4**	**166.5**	**163.3**	**168.0**	**161.8**	**164.1**
Latin America										
Peru	78.4	86.0	88.8	93.9	98.4	102.6	111.1	112.6	118.3	123.9
Bolivia	14.9	12.2	14.9	15.8	14.0	12.8	15.2	16.9	35.8	42.6
Chile	39.9	43.4	38.9	42.2	43.7	44.3	51.5	62.0	44.9	41.8
Argentina	3.3	5.6	4.1	4.4	4.6	5.0	6.2	7.8	10.3	17.1
Guatemala	0.0	0.0	0.0	0.0	0.0	0.3	1.6	2.8	3.2	4.2
Honduras	1.7	1.6	1.8	1.7	1.6	1.8	1.9	1.8	1.9	1.9
Dominican Republic	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6
Brazil	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4
Colombia	0.3	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.3
Nicaragua	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Uruguay	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
Other Countries	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
Total Latin America	**138.8**	**149.5**	**149.1**	**158.7**	**163.1**	**167.7**	**188.3**	**204.9**	**215.5**	**233.3**
Asia										
China	51.3	55.6	52.9	58.8	63.2	67.0	75.3	78.7	82.9	89.1
Turkey	3.5	3.7	3.7	3.6	4.0	5.2	6.0	7.5	10.1	14.0
Indonesia	10.0	12.0	10.7	9.6	8.6	9.9	7.9	8.6	8.0	7.7
India	1.8	1.7	2.2	2.9	3.4	3.3	5.9	5.7	6.8	7.3
Iran	2.7	2.6	2.6	2.6	2.7	3.0	3.2	2.9	3.2	3.5
Papua New Guinea	2.4	2.2	2.1	2.0	1.7	1.5	1.6	1.4	1.7	2.1
Mongolia	1.0	1.2	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.1
Philippines	0.7	1.1	0.3	0.3	0.3	0.6	0.8	0.9	0.5	1.1
North Korea	0.7	0.6	0.7	0.8	0.8	0.8	0.9	0.9	0.9	0.8
Thailand	0.2	0.2	0.7	0.6	0.5	0.6	0.5	0.4	0.4	0.7
Dem. Rep. of Laos	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.2	0.5
Japan	3.5	2.7	2.7	2.7	1.7	1.0	1.1	0.4	0.4	0.4
Saudi Arabia	0.3	0.3	0.3	0.6	0.5	0.4	0.3	0.3	0.3	0.2
Other Countries	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Asia	**78.2**	**84.0**	**80.2**	**85.7**	**88.9**	**94.9**	**105.1**	**109.4**	**116.6**	**128.7**

Table 3 - World Silver Mine Production (million ounces)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Africa										
Morocco	9.3	9.1	8.5	6.2	6.7	7.4	7.6	6.8	7.7	8.3
South Africa	4.6	3.5	3.6	2.8	2.3	2.8	2.8	2.5	2.7	2.6
Zambia	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.4
Tanzania	0.1	0.2	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4
Botswana	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Mali	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Ghana	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1
Dem. Rep. of the Congo	0.0	0.0	0.1	1.2	1.1	1.7	2.2	2.3	1.1	0.0
Namibia	0.5	0.6	0.6	0.9	0.9	1.0	1.1	0.3	0.2	0.0
Other Countries	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1
Total Africa	**15.3**	**14.3**	**13.8**	**12.2**	**12.1**	**14.1**	**14.9**	**13.0**	**12.9**	**12.2**
Oceania										
Australia	65.1	63.3	66.8	59.9	71.5	77.4	55.6	60.4	61.9	52.6
New Zealand	0.7	0.9	0.9	1.0	1.0	1.5	1.1	0.6	1.0	0.6
Fiji	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Oceania	**65.8**	**64.3**	**67.8**	**60.9**	**72.5**	**78.9**	**56.7**	**61.0**	**63.0**	**53.2**
CIS										
Russia	20.2	20.9	22.5	29.5	30.3	32.5	31.3	29.3	39.6	42.2
Kazakhstan	28.6	30.2	27.3	25.8	22.6	26.1	25.6	22.7	20.2	21.7
Uzbekistan	2.0	1.7	1.6	1.7	1.9	2.0	2.0	2.5	2.4	2.0
Armenia	1.1	1.2	1.3	1.3	1.3	1.2	1.3	1.2	1.3	1.3
Kyrgyzstan	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.3
Tajikistan	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total CIS	**52.1**	**54.2**	**52.8**	**58.5**	**56.2**	**62.0**	**60.4**	**55.9**	**64.0**	**67.5**
World Total	**591.0**	**606.2**	**593.9**	**596.6**	**613.0**	**636.8**	**640.9**	**664.4**	**684.7**	**709.6**

as the proportion of ore sourced from the high grade underground section of the mine declined. Refined silver output (as opposed to mine production) from Industrias Peñoles declined 36% in 2009, as a 65-day strike at the start of the year impacted the company's production of refined gold, silver and lead from the Met-Mex processing complex.

Canadian output continued to decline, down 9% to 19.6 Moz (609 t) in 2009. Gains in the country were limited, with the only noteworthy contributions coming from Xstrata Zinc's new Perseverance mine in Quebec, which recorded its first full year of production, and commissioning at Xstrata Nickel's Nickel Rim South project near Sudbury. Losses on the other hand were prevalent, the most notable being Vale Inco's Sudbury (nickel) complex, where output declined by 1.1 Moz (33 t), as strike action initiated in July continues at the time of writing. Other loses came as struggling base metal operations were placed on care-and-maintenance in late 2008. Those of importance to silver supply were Blue Note Mining's Caribou and Restigouche lead/zinc operations where mining was halted in October 2008 after nine months of commercial production, contributing to a year-on-year loss of 0.8 Moz (25 t), and the suspension of activities at Breakwater Resources' Langlois zinc-copper mine in November 2008. The closure of Barrick's depleted Eskay Creek in the first quarter of 2009 also contributed modestly to the country's losses.

Latin America

In 2009, Latin American production increased by 8% to 233.3 Moz (7,255 t), representing the strongest regional gain by some margin, as three of the world's top four country gains came from Latin America.

Mine supply from **Peru**, the world's leading silver producer, continued its upward trend, climbing 5% to

123.9 Moz (3,854 t). This 5.6 Moz (173 t) increase in production can mainly be attributed to two operations. At Hochschild's Pallancata, production more-than doubled to reach 8.4 Moz (262 t), after the completion of a mill expansion in the second half of 2008. Secondly, output at the Antamina copper/zinc joint venture, the country's largest silver producer, expanded by 25%, exceeding 15.7 Moz (489 t). Peruvian losses of note were relatively limited, but foremost was Hochschild's Selene, which ceased production in May 2009, due to the high level of capital expenditure required to sustain activities. Declines at continuing operations included Buenaventura's Uchucchacua, the country's largest primary silver operation, and Hochschild's Ares mine, where output fell as ore grades declined.

Bolivian output surged by 6.8 Moz (212 t), to register the largest absolute increase of any country last year. Annual production totalled 42.6 Moz (1,326 t), to place Bolivia as the world's fifth largest silver producer, behind Australia. Leading the charge, Coeur d'Alene Mines' San Bartolomé more than doubled output, reaching 7.5 Moz (232 t) in its first full year of production. Similarly, successful commissioning of Pan American Silver's mill expansion at San Vicente in the third quarter of the year lifted output by 1.8 Moz (57 t), while at Sumitomo Corp's San Cristóbal production is estimated to have increased by just under 2.0 Moz (62 t), as it built up to design capacity after a drawn-out ramp up period.

Argentina showed the second strongest growth globally in absolute terms. Annual production totalled 17.1 Moz (533 t), as supply was boosted by a handful of new mines, while losses were minimal. Headlining the increase, Pan American Silver's Manantial Espejo and Silver Standard's Pirquitas project were brought online during the year, adding 3.8 Moz (117 t) and 1.1 Moz (34 t) of fresh production respectively. Additionally, at Coeur d'Alene Mines' Martha, silver production increased by 1.0 Moz (31 t). Throughput rates at the new on-site concentrator were roughly doubled relative to the prior arrangement, when ore was trucked 600 miles (960 km) for processing at the Cerro Bayo plant in Chile. Similarly, at Hochschild's San José mine, higher throughput following the completion of a mill expansion in the second half of 2008 lifted output by 0.6 Moz (19 t).

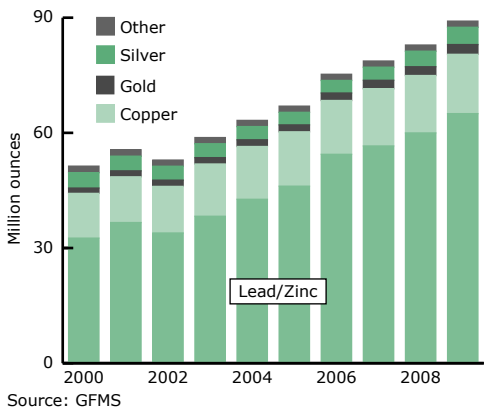
In **Guatemala**, output continued to reach new heights, as the country's only large scale silver producer, Goldcorp's Marlin operation, saw mill throughput and silver recovery rates increase by 17% and 13% respectively, lifting production to 4.2 Moz (129 t). Elsewhere, in the **Dominican Republic**, 2009 saw the start of GlobeStar Mining's Cerro de Maimón, which elevated the country's output to 0.6 Moz (18 t) from negligible levels in recent years.

Production in **Chile** declined by 7% to 41.8 Moz (1,301 t) in 2009, representing the largest decline across the region by some margin. The suspension of Coeur d'Alene Mines' Cerro Bayo in October 2008 led to a drop of 1.2 Moz (38 t). Other losses again came from a number of the country's copper producers, including BHP Billiton's Escondida where silver output fell by 11%, due to down-time at the Laguna Seca mill in the second half of the year, as upgrades were made in an attempt to improve reliability. The only gain of note came from Yamana Gold's Minera Florida, which lifted production by 0.3 Moz (9 t) following successful completion of a mill expansion in the first quarter of 2009.

Asia

Last year, **Chinese** silver production rose by 8% to 89.1 Moz (2,771 t), establishing yet another record for the country. Once again, the bulk of the increase was generated as a by-product of copper, lead and zinc mining, with primary silver output remaining relatively flat. After being hit heavily by price falls in late 2008 and early 2009, the base metal sector rebounded strongly over the year, thanks to the stimulus package applied by the Chinese government, with the mining sector being a major beneficiary. At a regional level Hunan, Henan and Jiangxi, where most of the largest non-ferrous smelters are located, remained the leading provinces in terms of

Chinese Silver Mine Production by Source Metal



Source: GFMS

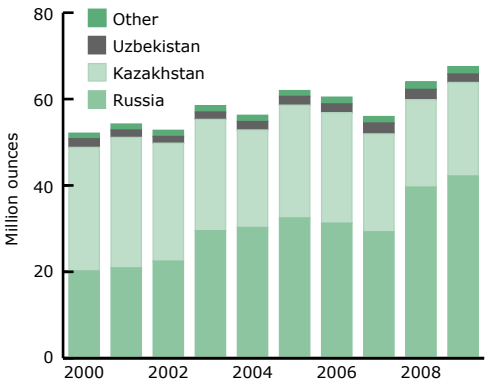
silver output. Strong growth was reported by Henan Yuguang Gold & Lead and Jiangxi Copper, with their silver output reaching 19.6 Moz (611 t) and 13.8 Moz (430 t) respectively in 2009 (although a significant portion of these figures includes silver recovered from imported concentrates).

Turkish mine production expanded by almost 40% last year, to total 14.0 Moz (436 t). The most significant factor was an increase at the Gümüşköy primary silver mine operated by Eti Gümüş. The mine was privatized in 2004 after many years of state ownership, and recent capital investment has led to consecutive strong increases in output for the past two years, to reach an estimated 11.2 Moz (350 t) in 2009. Elsewhere, output in the **Philippines** more than doubled, as TVI Pacific's Canatuan increased significantly after gossan zone operations ceased in 2008 and the plant was reconfigured to process unoxidized sulfides, with a full year's production in 2009.

Oceania

In **Australia**, production fell in both the primary silver and lead/zinc sectors, leading to the nation's output contracting by 15%, or 9.4 Moz (292 t). In the former, production at Cannington mine fell to 33.8 Moz (1,050 t), primarily due to a 28% drop in output in the first quarter. The fall can be ascribed to a 16% decline in head grade, but also due to unseasonably high rainfall that led to flooding at the mine. Turning to the lead/zinc sector, weather also played a role, with a reduction in output seen at China Minmetals' Century (formerly owned by OZ Minerals). Output in the first quarter alone fell by 0.5 Moz (15 t). Furthermore, a decline was seen at Xstrata's Mount Isa operations, which recorded a substantial reduction in the volume of silver produced in crude lead of 2.4 Moz (75 t). Levels of silver smelted from purchased concentrates also showed a strong decline. A small positive came from the start up of OZ Minerals' Prominent Hill copper-gold-silver operation, which produced 0.7 Moz (22 t) in its first year of production.

CIS Silver Mine Production



Source: GFMS

Commonwealth of Independent States (CIS)

Output in the CIS recorded its second successive annual rise, growing by 3.5 Moz (109 t), with much of the gain concentrated in **Russia**. Output in that country rose by 6% to 42.2 Moz, (1,312 t), with a large increase from Chukotka, ascribed to greater volumes of silver produced as a by-product of gold mining activities at Kinross' Kupol mine. The operation saw its first full-year of production after starting up in the second quarter of 2008, recording a 2.6 Moz (82 t) increase year-on-year. Elsewhere, output from the primary silver sector fell, as Polymetal's Dukat saw a 0.7 Moz (22 t) decline due to throughput issues while commissioning a plant expansion to a design capacity of 125 ktpm. Silver produced as a by-product of copper and zinc mining experienced a surge in production, with strong gains seen from many operations in the Sverdlovsk region.

Production in **Kazakhstan**, the region's second largest producer, also grew, by 1.4 Moz (45 t). Production from Kazakhmys increased slightly despite the closure of the Akbastau mine, as throughput was supplemented by stockpiles, resulting in a net 1% increase in refined silver output. Countering this, **Uzbekistan's** output fell by 0.5 Moz (14 t), with losses concentrated in the primary silver sector, which is estimated to have declined by 71%. This was due to a fall at Oxus Gold's Nukrakon (formerly Vysokovoltnoye) joint venture with the Uzbek government. Irrigation of the heap leach pads was suspended through 2009 following an inventory build up of crude silver doré due to an in-country refining bottleneck. In February 2010 the company reported that the stockpile had been refined at the state owned Almalyk refinery, and that stacking and leaching would resume.

Europe

European silver output fell marginally in 2009, by 1%, to 50.7 Moz (1,577 t). In the region's leading producer, **Poland**, copper-silver production from KGHM Polska Miedź rose slightly, to 38.7 Moz (1,203 t), in line with a slight increase in mining rate. This represented the first year in which the company's silver production increased, following five years of decline. **Sweden** also

An Overview of Corporate Transactions in 2009

Looking at the M&A space in 2009, Silver Wheaton entrenched itself as the pre-eminent silver streaming company by not only acquiring its rival, Silverstone Resources Corp, but also securing 25% of the life-of-mine silver production from Barrick Gold's Pascua-Lama gold/silver mine. Silver Wheaton's share of Pascua-Lama's silver reserves amount to 168 Moz (5,225 t), and the $152 million, all-share Silverstone transaction gives the company 100% of the silver produced from Capstone's Cozamin mine, in Mexico, from reserves of 17.4 Moz (541 t) of silver for a period of 10 years. Meanwhile the Barrick deal, which also included 100% of the silver production at three of Barrick's currently producing mines until the end of 2013, is costing Silver Wheaton $625 million in cash payments in addition to the stream purchase price of $3.90/oz silver.

In February 2010, the company converted a debenture with Pan American Silver into an agreement to acquire 12.5% of the life-of-mine silver output from the Loma de La Plata zone of the Navidad project, in Argentina. Pan American gained ownership of the project when it successfully completed its $544 million bid, launched in October 2009, for Aquiline Resources. Navidad hosts M&I resources containing in excess of 632.0 Moz (19,657 t) of silver. Pan American was also active in Mexico, where it signed an agreement with Orko Silver to earn a 55% interest in a 62.3 Moz (1,960 t) M&I resource at the La Preciosa project.

Elsewhere in Mexico, major gold and silver producer Goldcorp gained ownership of the Camino Rojo project, containing M&I resources of 60.7 Moz (1,888 t) of silver plus 3.4 Moz (106 t) of gold, through the C$296 million, all-share takeover of Canplats Resources. The project is located just 50 km southeast of Goldcorp's operating Penasquito mine. Also in Mexico, primary silver producer First Majestic Silver acquired Normabec Mining Resources for its Real de Catorce project, which contains an M&I resource of 33.7 Moz (1,048 t) of silver.

Sumitomo Corporation bought out its 65% partner in the San Cristóbal mine in Bolivia, Apex Silver, for almost US$28 million after Apex entered Chapter 11 bankruptcy proceedings. In Australia, Perilya re-acquired a 100% interest in the silver contained at the Broken Hill mine for $55 million in cash from Coeur d'Alene Mines.

Finally, two big silver producers added more gold properties to their portfolios, with JSC Polymetal acquiring gold projects (the Varvarinskoye gold-copper mine, in Kazakhstan, and the Mayskoye gold deposit, in Russia) and Hochschild Mining acquiring Southwestern Resources as well as significant interests in Gold Resource Corp and Lake Shore Gold. Silvercorp Metals, on the other hand, failed in its bid to acquire Klondex Mines for its Fire Creek gold exploration property, in Nevada.

saw an increase, of 3%, attributable to the lead/zinc sector, with higher silver output at Boliden's Garpenberg, despite a fall in grades in the second half of 2009, and at Lundin Mining's Zinkgruvan, due to record throughput. Production fell in **Portugal**, however, where at Neves-Corvo zinc mining was suspended in lieu of a focus on copper mining and processing until zinc prices increase, and due to suspension of operations at Aljustrel.

Africa

African silver mine production decreased modestly last year, by 5%, as declines in the Democratic Republic of the Congo (DRC) and South Africa were partly offset by stronger primary output from Morocco. In the **DRC** the only mine that yields significant volumes of silver, Anvil Mining's Dikulushi copper-silver mine, was placed on care-and-maintenance in December 2008, leading to the country's output dropping to negligible levels, and **South African** output fell concomitantly with lower gold mine production. At Managem's Imiter primary silver mine in **Morocco**, production is estimated to have increased modestly, thanks to higher silver grades in ore processed.

Outlook

• ***Silver mine supply is expected to increase in 2010, with a strong contribution from the by-product gold sector.***

Global silver mine supply is expected to increase further in 2010, to reach another successive record high. During the recent trough in demand for the base metals due to the economic crisis, silver prices remained relatively robust, sufficient that many primary silver mines remained cash flow positive even at silver price lows. While the majority of silver is produced as a by-product of base metal mining, cuts to silver-bearing polymetallic production proved much more limited than we expected 12 months ago. With a return to favorable pricing for many base metals, it is unlikely that we will see significant headwinds against high quality polymetallic projects under development. It would take a sustained simultaneous downturn in the prices of gold, silver, zinc, lead and copper to cause widespread pressure to future silver supply.

Average Prices of Source Metals

($/ton)						Change
	2005	2006	2007	2008	2009	y-o-y
Lead	976	1,288	2,595	2,085	1,726	-17%
Zinc	1,382	3,273	3,250	1,870	1,659	-11%
Copper	3,684	6,731	7,126	6,952	5,164	-26%
Gold ($/oz)	444	604	695	872	972	12%

Source: LME, Thomson Reuters

World Mine Production of Source Metals

(Thousand tons)						Change
	2005	2006	2007	2008	2009	y-o-y
Lead	3,422	3,525	3,626	3,896	4,029	3%
Zinc	10,146	10,447	11,129	11,690	11,378	-3%
Copper	14,925	14,991	15,415	15,420	15,790	2%
Gold (tons)	2,549	2,483	2,473	2,409	2,572	7%

Source: ILZSG, GFMS

Primary silver supply is expected to increase marginally in 2010, with the bulk of the growth instead coming from the gold mining sector, although we expect some growth from lead/zinc as well. Notable primary silver developments for the current year include the ramping up of operations at Silver Standard's Pirquitas, and expansion at Polymetal's Dukat, in Russia to accommodate feed from the Goltsovoye mine.

Output from the gold sector is expected to rise by almost 25%, with growth at Minefinders' Dolores in Mexico plus a full year's production at Harmony's Hidden Valley in Papua New Guinea and Coeur d'Alene Mines' Palmarejo in Mexico. Turning to the lead/zinc sector, the most notable increase will be a full year of production of silver in lead/zinc concentrates at Goldcorp's Penasquito, also in Mexico, as the sulfides project continues to ramp up towards full capacity in 2011. In contrast, output from the copper sector is expected to remain relatively stable.

Regionally the bulk of the increases will come from North America, specifically Mexico, which could see a 20% increase to total output driven by the above-mentioned projects.

Indexed Silver & By-product Metal Prices

Source: Thomson Reuters

By-Product Analysis

- ***Primary silver supply recorded a 7% increase, to account for 30% of total mine production in 2009.***

- ***Changes in the output of silver sourced as a by-product of other metals were mixed, with silver from gold and copper mining up by 21% and 3% respectively, and silver sourced from lead/zinc mining down 4%.***

The rise in global silver mine supply last year was due to growth in the gold and silver mining sectors, which together accounted for 42% of global silver supply in 2009. In the primary sector, growth was seen from several properties in Latin America, such as a full-year's production at San Bartolomé, start-up at Manantial Espejo, and expansion at Pallancata. Total production from the primary sector was 213.9 Moz (6,653 t). From the gold sector, global output of silver reached 86.7 Moz (2,696 t), again mainly due to relatively new projects. A full year of output at Dolores and Kupol and the start up of operations at Palmarejo were among the largest additions, producing an additional 7.0 Moz (218 t) collectively.

The base metal markets registered a remarkably swift rebound in 2009 from the financial crisis triggered in late 2008. Although the economic downturn, triggered in part by the collapse of Lehman Brothers, saw average annual prices for copper, lead and zinc fall by 26%, 17% and 11% respectively in 2009, by end-December prices had recovered such that copper stood at $7,346/ton, zinc at $2,570/ton and lead at $2,395/ton.

Lead consumption still registered growth in 2009, despite a sharp decline in industrial production in a number of the mature economies. According to the International Lead Zinc Study Group (ILZSG), demand increased by 1% last year to 8.76M tons, with the metal's "recession-resistant"

Silver Output by Source Metal

(million ounces)

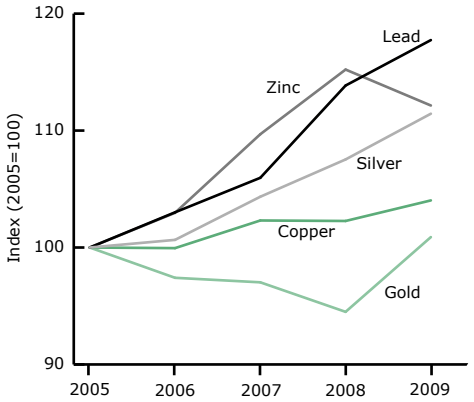
	2008 Output	% of Total	2009 Output	% of Total	Change y-o-y
Primary	199.3	29%	213.9	30%	7%
Gold	71.4	10%	86.7	12%	21%
Lead/Zinc	249.9	36%	240.7	34%	-4%
Copper	160.7	23%	165.9	23%	3%
Other	3.4	0%	2.5	0%	-26%

Source: GFMS

properties coming to the fore. Demand is driven by the battery market, accounting for over two-thirds of offtake. Within this, the replacement battery market accounts for 70% of demand, and is a function of vehicle population rather than production. Zinc demand fell by just over 5%, as consumption is heavily weighted towards the auto and non-residential construction sectors; both particularly hard hit during the recent economic downturn. GFMS estimate that despite a surge in Chinese demand, global consumption fell by 2% last year.

The combination of weak demand and lower prices brought about a swift supply response from a number of lead and zinc producers, particularly in North America and Australia. The latest data from the ILZSG shows that global zinc concentrate output fell by 3% last year to 11.38M tons. Zinc production in North America contracted by 5% year-on-year. Also production fell in China, highlighting the structural tightness in the Chinese concentrate market.

Indexed Global Metal Mine Production



Source: ILZSG, GFMS

Although lead concentrate output increased by 3%, this was primarily due to sharply higher Chinese production, which rose by an estimated 14% to 1.76M tons. The expansion within China tended to come from a myriad of small scale operations rather than the commissioning of large scale mining properties; a trend that looks set to continue, and will eventually limit mine production growth in the future. After China, the next largest lead producer is Australia with production typically around 0.60M tons per year. In 2009, lead mine production however fell by 12% to 0.53M tons. This, however, reflected the problems at Century and Cannington (primary silver) mentioned earlier. The Magellan mine, which has a rated capacity of around 85,000 tpy of lead-in-concentrate, remained closed last year due to environmental problems although it was reactivated in 2010. However, it should be noted that this mine does not yield any silver. The two other main sources of growth in lead concentrate in 2009 were Russia and Bolivia. In the former this primarily reflected higher utilization rates, while in the latter the rise was largely due to the ramp up to full capacity at San Cristóbal. Overall, Bolivian lead-in-concentrate production increased by 20% in 2009 to 0.10M tons.

For zinc, and to a lesser extent lead, mine output in 2009 was reduced on price grounds. The situation for by-product output from the copper market is somewhat different, as prices did not fall so far down the cost curve during 2009. Rather, the limited growth in mine supply reflected a structural shortage of capacity. GFMS estimate that copper concentrate output increased by 2% to 15.79M tons in 2009. A notable feature was a limited rise in China of just 2%, despite strong demand, reflecting a lack of new projects being commissioned. Elsewhere, especially within Chile, lower grades at many established mines also limited the increase in output despite the high prices seen in much of 2009.

Much of the expansion in copper mine production is located in the African Copperbelt where output growth has consistently fallen below expectations. This factor, together with lower grades at a number of existing producers, may limit the growth in copper production. Another key factor has been the increasing importance of the solvent extraction electro-winning (SX-EW) processing route that does not yield any silver. GFMS estimate that in 2005, this accounted for 18% of global mined copper output. By 2009, its share had expanded to nearly 21%.

Notably, however, many of the price-driven cuts to global output of copper, lead and zinc seen in 2009 were not at significant silver bearing operations.

Production Costs

- ***Silver mine cash costs were almost flat year-on-year, rising by less than 1%, due to the interplay between by-product metal price fluctuations, exchange rates and inflationary factors.***

Silver Mine Production Costs

(US$/oz unless stated)	2007	2008	2009
Total cash costs	1.36	5.20	5.23
Average spot price	13.38	14.99	14.67
Sample size (Moz)	130.6	117.0	122.7
Global Primary Production	194.5	199.3	213.9

Source: GFMS

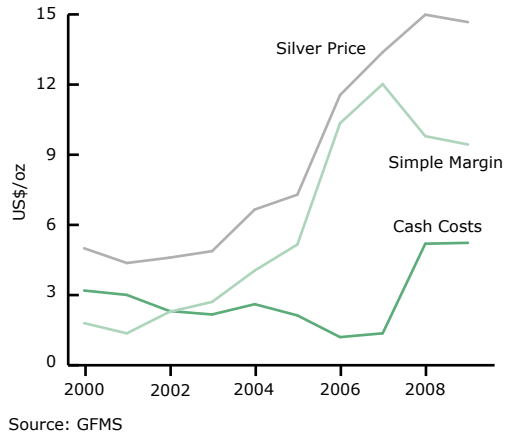
Global average cash costs at primary silver mines in 2009 were $5.23/oz, up from a revised figure of $5.20/oz in 2008. It should be noted that GFMS' analysis excludes all mines not considered to be primary silver producers, determined by a mine's principal commodity in terms of mine planning and revenue. The 2009 sample size of 122.7 Moz (3,816 t) represents 57% of global primary silver supply.

Unlike the prior year, when the largest proportion of cash cost increases were driven by a considerable fall in by-product metal credits, 2009 saw no such clear driver of year-on-year cost changes. While the annual average prices of copper, lead and zinc fell by 26%, 17% and 11% respectively last year, gold prices increased by 12% providing an important offset.

Exchange rates proved to have a pronounced effect. In Mexico, home to 27% of the world's primary silver production and the world's largest primary silver mine, the weakening of the peso, by 21% relative to the dollar, translated into meaningful input cost reductions when looking at costs in US dollars. Likewise we saw weakening of the Peruvian sol, albeit by a more muted 3%. These currency fluctuations provided an important buffer to cost inflation elsewhere, as although fuel and explosives costs in many cases fell during 2009, some producers cited the increased cost of other inputs, such as grinding media, tyres and cyanide.

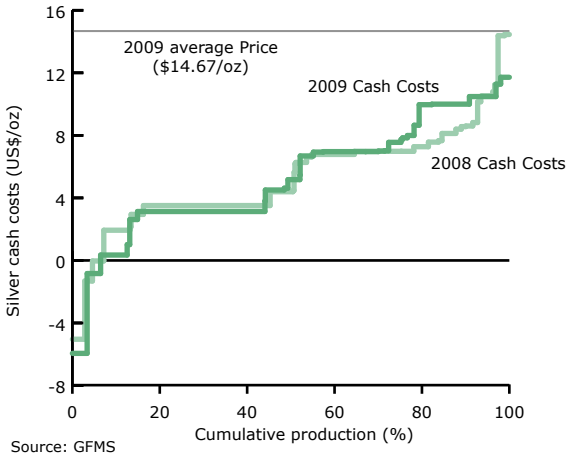
Production volumes also had an effect. Of the operations which saw the greatest fluctuation in cash costs, Endeavour Silver's Guanajuato saw unit costs net of by-product credits fall to one tenth of the level seen in 2008, due to a combination of higher throughput, and consequently metal production, and by-product metal prices. At the other end of the spectrum, Buenaventura's Uchucchacua saw the greatest increase to annual cash costs, increasing by 49%, with 27%, 23% and 8% reductions to the production of zinc, lead and silver respectively, coupled with an increase in contractor labor costs.

Historical Silver Cash Costs



Source: GFMS

Silver Mine Cash Costs



Source: GFMS

Producer Hedging

• ***The silver producer hedge book was substantially scaled back, by 22.3 Moz (694 t) in 2009, leaving the total outstanding position at end-year at 25.6 Moz (796 t).***

Producer de-hedging generated an estimated 22.3 Moz (694 t) of demand last year as several mining companies reduced, or eliminated outright, remaining hedge positions, with fresh hedging remaining somewhat limited. Although the global book being cut by almost 50% in a single year is certainly noteworthy, this outcome is arguably less dramatic than a cut of similar proportions that occurred last year in the gold industry, since silver hedging has tended to be implemented over shorter time frames, therefore making larger relative swings less exceptional.

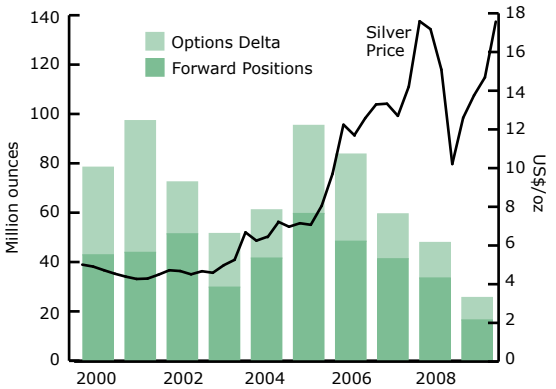
Regarding the most significant element to last year's activity, producer buy-backs, two key players eliminated outstanding positions ahead of contract maturity last year. Barrick Gold's silver fixed priced forward sales, amounting to 7.1 Moz (221 t) were bought back towards the end of the year, along with its non-participating gold hedges after raising $4.0 billion via a rights issue for this purpose. During Chapter 11 bankruptcy proceedings, Apex Silver's remaining hedges (calculated at just over 6.8 Moz (212 t) on a delta-adjusted basis) were wound up prior to the San Cristóbal transaction with Sumitomo Corp. Other companies that reduced hedge cover included Boliden, which at end-2009 only held hedge cover against part of its 2010 production (as opposed to around two years' hedge cover that has conventionally been renewed on an ongoing basis). KGHM also slimmed its bought put position year-on-year, both in nominal terms, and adjusting for options delta; the rallying silver price has seen its options move progressively further out of the money. Elsewhere we estimate that Peñoles' position decreased moderately last year.

In contrast, the producers that added materially to their hedge books last year included Kinross which hedged its silver price exposure at the established La Coipa gold-silver mine. Perilya, following the repurchase of its silver sale agreement with Coeur d'Alene Mines for silver output from Perilya's Broken Hill mine, sold forward approximately 1.6 Moz (49 t) of production over the next two years. Coeur also established a put structure covering 5.4 Moz (168 t) to protect against price deterioration, although at current prices the delta accompanying these contracts is relatively low.

GFMS use Brady plc's *Trinity*™ trading and risk management system as an integral tool for the valuation and analysis of producers' options hedging exposure and sensitivity. As is evident in the chart (below right) the case remains that the aggregate options book is foremost providing downside price protection to hedged producers. This is perhaps to be expected, given the proportion of producers that hold puts, versus those that have written calls (on a nominal basis the ratio is roughly 2:1).

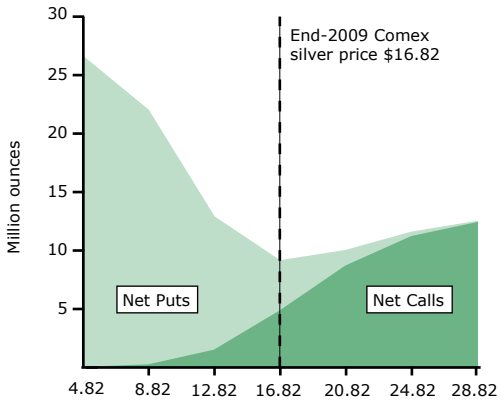
Silver streaming agreements, as mentioned in the corporate box on page 30, have remained an important alternative means of project financing, that have contributed to a muted level of silver project finance-driven hedging.

Producer Hedging: Outstanding Positions



Source: GFMS

End-2009 Delta Adjusted Options Position



Source: GFMS; Brady plc

5. Supply from Above-Ground Stocks

- ***Net supply from above-ground stocks dropped by 86% to just 20.2 Moz (629 t) in 2009.***

- ***The decline was driven by a surge in net investment, higher de-hedging, lower government sales and a drop in silver scrap supply.***

- ***A marked decline in sales from Russia and the continued lack of any material sales from China and India led to a 50% fall in net government sales.***

- ***Scrap fell to a 13-year low, largely the result of the ongoing decline in photo-related recycling.***

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 or by governments.

The accompanying table features the net contribution to supply from its various components. As the appended note points out, this approach differs from the way this information is presented in Table 1 on page 8 (where figures appear on either the supply or demand side). This is done in order to provide readers with a measure of the net drain on above-ground stocks (in both fabricated and bullion form) required to plug the fundamental deficit that for yet another year appeared between mine supply and fabrication demand. Additionally, this approach allows us to compare the contribution from net supply from above-ground stocks with that of mine production.

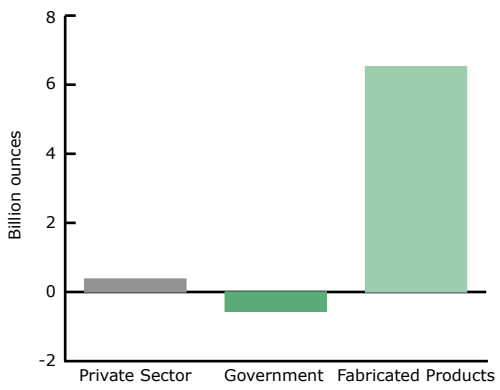
Net Silver Supply © GFMS Ltd / The Silver Institute

(Million ounces)

	2008	2009
Implied Net Disinvestment	-48.2	-136.9
Net Producer Hedging	-11.6	-22.3
Net Government Sales	27.6	13.7
Sub-total Bullion	-32.1	-145.5
Old Silver Scrap	176.0	165.7
Total from Above-Ground Stocks	**143.9**	**20.2**
Mine Production	**684.7**	**709.6**
Total Net Supply	**828.6**	**729.8**

Note: In contrast to Table 1 on page 8, total supply is presented on a net basis in the table above. This provides a measure of the drain on existing above-ground stocks of metal that was required to fill the gap between mine production and fabrication demand.

Changes in Above-ground Stocks (2000-2009)



Source: GFMS

Under this methodology, mine supply, at 709.6 Moz (22,072 t), accounted for 97% of total supply last year. (Note that using the approach featured in Table 1, mine supply accounted for 80% of total supply.) The source for the remaining 20.2 Moz (629 t) of metal supplied to the market in 2009 was recycled above-ground stocks of silver which, in turn, were split between scrap supply and net government sales, net of the decline in the producer hedgebook and implied net investment.

As for government sales, its total fell by just over one half to 13.7 Moz (426 t), primarily driven by lower stock sales from Russia coupled with the continued absence of any disposals from China and India. Sales from this source accounted for a mere 2% of total net supply.

Unlike gold, where the bulk of liquidity for the lending market is provided by central banks, the metal used to fund producers' activities in the silver forward and derivatives market is largely sourced from privately held stocks of bullion. By implication, therefore, the 22.3 Moz (694 t) decline in the producer hedgebook is understood to have also been reflected in a net rise in private stocks of silver. Combined with the 136.9 Moz (4,258 t) implied net investment figure derived for the year, this suggests that privately held stocks of silver bullion rose by a total

of 159.2 Moz (4,952 t). (Note that this analysis excludes newly minted bullion coins, which are discussed in a separate section in Chapter 3.) Combining this with the 13.7 Moz (426 t) net fall in government owned stocks suggests above-ground bullion stocks increased by 145.5 Moz (4,526 t) over the year. In other words, private individuals and governments combined demanded rather than supplied silver bullion on a net basis in 2009.

The largest contribution historically to supply from above-ground stocks has been from the recycling of fabricated products. The bulk of this continues to be accounted for by photographic scrap, which has been in steady decline over the last few years (in line with the fall in photographic fabrication demand). Last year, a further drop in photographic scrap coupled with lower industrial scrap left the overall total for scrap falling by 6% to a 13-year low, in spite of the impressive advance in silver prices over the year. Behind this apparent conundrum is the fact that most sources of recycled silver are a good deal less price sensitive than those, for example, for gold.

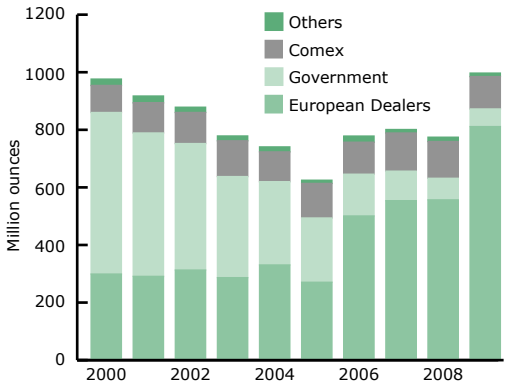
In gold's case, the bulk of fabricated products are in the form of jewelry, scrap from which is highly price sensitive due to the metal content accounting for a very high portion of the finished product's value. Silver-bearing finished products, on the other hand, with a few exceptions, tend to have a low contained metal value. As such, silver scrap tends to be relatively inelastic to price levels and volatility, and is mostly driven by the performance of the relevant sector (taking into account any appropriate lags) as well as environmental legislation.

Identifiable Bullion Stocks

GFMS' analysis of identifiable bullion stocks 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 individuals' vaults, is excluded from our figures. Besides suggesting 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 ones or vice versa.

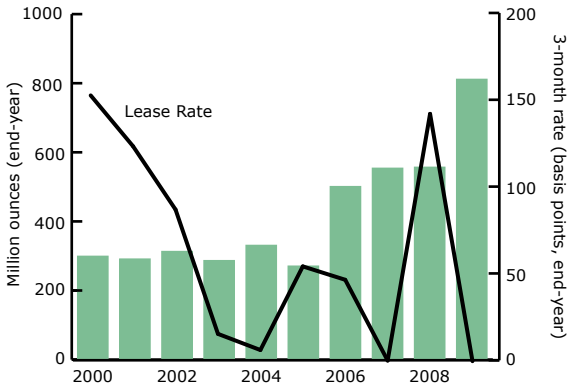
As illustrated in the table on the next page, in total, identifiable bullion stocks grew to an 11-year high of 997.1 Moz (31,015 t) by end-2009. It is of note that the 222.7 Moz (6,928 t) increase last year seems to be far greater than the 145.5 Moz (4,526 t) inflow implied by the sum of implied net investment and producer de-hedging, less net government sales over the year. In part, this is because the implied net investment data aggregates investor activity in all areas. As such, part of the 77.2 Moz (2,402 t) difference between the two is likely to have been related to the 41.2 Moz (1,283 t) dishoarding of silver bullion by Indian investors in the local market over the year. In addition, we believe the gap could be explained by already existing, previously unidentifiable, stocks moving into the identifiable category monitored by GFMS.

Identifiable Bullion Stocks



Source: GFMS

Bullion Stocks in Dealers' Vaults in Europe



Source: GFMS

Identifiable Bullion Stocks

(Million ounces)

	end-2008	end-2009
European Dealers	556.7	811.2
Comex	127.7	112.4
Government	75.0	61.3
Other Stocks	15.0	12.1
Total	**774.4**	**997.1**

Source: GFMS

Comex Silver Stocks

(Million ounces; end period)

	Q1	Q2	Q3	Q4
2007	125.8	139.9	132.6	132.6
2008	135.9	136.0	135.5	127.7
2009	125.4	117.6	115.4	112.4
2010	116.6			

Source: Comex

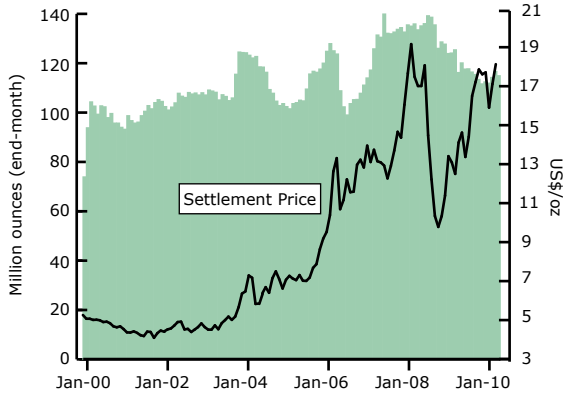
Moving to the breakdown of identifiable bullion stocks of silver at year-end, the increase last year was entirely driven by a dramatic 46% rise in European dealers' inventories, which were partly offset by a decline in stocks elsewhere.

European Dealers' Stocks

Since 1996, GFMS has conducted a confidential survey of bullion stocks held in European dealers' vaults and has reported an aggregate end-year total for these in the *World Silver Survey*. At the end of 2009, European dealers' silver stocks had increased strongly by 46% or 254.5 Moz (7,917 t) from their end-2008 level. At 811.2 Moz (25,232 t), the combined total number was the highest figure in GFMS' 14-year series.

The largest contributor to this increase last year was the record inflows into the silver ETFs (discussed in the relevant focus box in Chapter 3), and to a lesser extent, an increase in silver allocated accounts managed by the banks. (A precise breakdown of European Dealers' Stocks cannot be provided in respect of confidentiality.)

Comex Warehouse Stocks



Source: Comex

In addition, the collapse in Indian imports boosted stock levels, as the country tends to source metal from dealers located in Europe (for instance, Indian bullion imports from the United Kingdom fell by nearly 90% in 2009). This is in sharp contrast to the final quarter of 2008 when record levels of bullion shipments to India led to a major fall in dealers' inventories. Finally, the 22.3 Moz (694 t) decline in the global producer hedgebook seen in 2009 would also have contributed to the rise in dealers' stocks.

Comex Stocks

Stocks held at Comex depositories followed a general declining trend over 2009, with total volumes reaching a three-year low at end-November 2009. Despite a marginal increase in December, total stocks stood at 112.4 Moz (3,497 t) at end-2009, down by some 15.2 Moz (474 t) year-on-year.

The fall was primarily due to strong physical investment demand in the United States. For example, nearly 60% of the fall was concentrated in April last year, at which point US retail investment demand was still very strong.

Indeed, there was anecdotal evidence which suggested that some Comex receipts had been broken in order to satisfy some of this demand. In addition, the decline may have been due to 1,000oz bars being taken out in order to cater for high demand for 100oz bars.

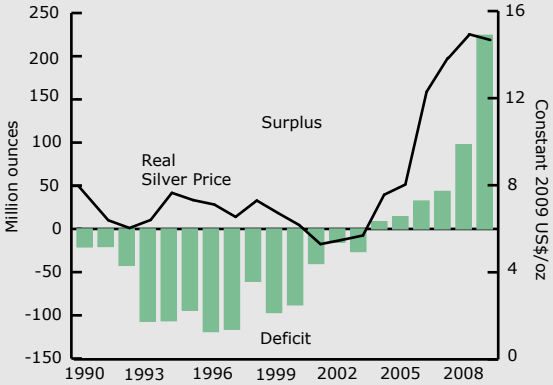
Looking at changes in individual depositories' stocks, the decline last year was almost entirely accounted for by withdrawals from the HSBC vault, with ScotiaMocatta, Brinks and the Delaware Depository actually all posting a small rise compared with end-2008.

Deficits and Surpluses in the Silver Market

Throughout the 1990s and during the first couple of years of the new millennium, the silver market saw a series of considerable market deficits – defined as the difference between supply from mine production plus scrap and demand from fabrication (note that for this analysis, fabrication should exclude coin minting, which instead is treated as new bullion demand). Over the period, these deficits were largely covered by heavy disposals of privately held bullion stocks which had been acquired during the rapid ramp up in investment from mid-1970s through to early 1980s when investors were bullish about the white metal. Sales of government owned bullion, particularly from 1999 until 2006, were another important source used to fill the gap. Not surprisingly, as the graph shows, these private and public sector bullion sales (the counterpart of the deficit) placed considerable downward pressure on silver prices, exacerbating their decline.

More recently, the picture seems to be changing, as a market surplus emerged in 2004 for the first time since the 1980s and the gap between the two has grown every year and eventually reached a high of 283.7 Moz (8,824 t) in 2009. Given the ongoing net sales of government silver stocks over the period, the excess metal has been absorbed by private investors.
Looking at reasons behind this rising buy-side interest, the key driving force probably has been the stellar price performance and higher price expectations. The availability of silver ETFs is certainly thought to have facilitated the process, by expanding the metal's investor base. Furthermore, the marked fall in the dollar and concerns about the stability of global financial system and the economic outlook in the aftermath of the credit crisis have resulted in more investors moving into silver as a safe haven asset. As such, much of the increase in private bullion stocks last year was centered on the ETFs and physical bullion.

Silver Deficits and Surpluses



Source: GFMS

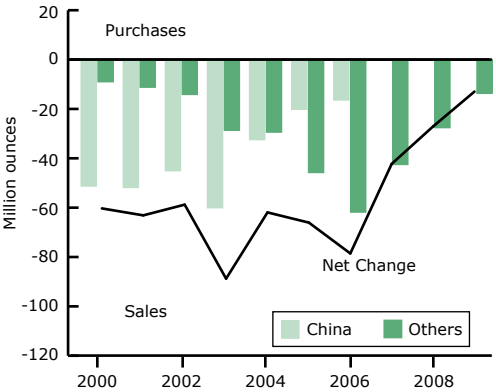
Government Stocks

Our estimates of levels of government-owned stocks (as well as changes in such stocks) are almost exclusively based on proprietary information collected through field research. This is largely due to the lack of meaningful publicly available data on such holdings. This point is of particular importance when assessing our estimates of outstanding holdings, where our numbers are probably somewhat conservative.

Government stocks of silver are estimated to have fallen by 13.7 Moz (426 t) over the course of last year. Not only is this the lowest level of net sales in more than a decade, but it is also around half the revised figure for 2008. Basis GFMS' data, global government stocks of silver could have fallen to around 61 Moz (1,900 t) by the end of 2009.

Looking at the country-by-country breakdown, for the third year in a row, the majority of net sales from

Changes in Government Stocks



Source: GFMS

Silver Borrowing

Silver borrowing declined considerably in 2009 due to the nearly 12% fall in fabrication demand and a further sizeable reduction in the producer hedgebook.

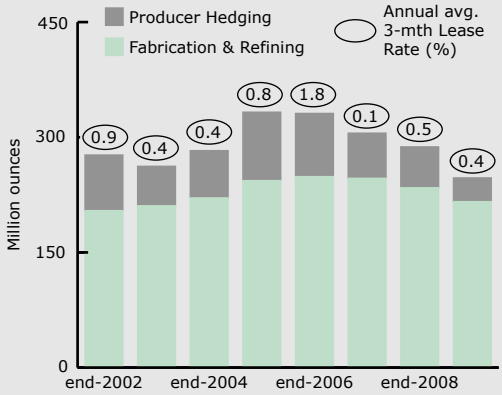
As regards fabrication-related borrowing, this dropped precipitously in the first quarter in line with the slump in manufacturers' orders and work-in-progress. Compounding this was the impact of the global financial crisis and the general reduction in credit lines that it brought about. The situation improved during the course of the year, especially towards the end of 2009, although we believe that fabrication-related borrowing still ended the year well down on end-2008 levels.

The delta-adjusted producer hedgebook fell by an estimated 22.3 Moz (694 t) in 2009. The outstanding hedge book was 25.6 Moz (796 t) by year-end.

The general weakness in borrowing demand did not make itself felt in terms of leasing rates until the second half of the year. Prior to that, and particularly in the January to April period, supply-side factors in fact conspired to maintain leasing rates at a fairly high level across all tenors, although down somewhat on the fourth quarter of 2008's peaks. These supply-side factors included silver being moved on credit risk grounds out of unallocated accounts held with financial institutions to ETFs and, to a lesser extent, allocated positions.

This tightness of liquidity became less of a factor during the course of the year, helping to put rates on a declining path, due to the credit crunch easing and an increasing amount of metal making its way into the loco-London market, reflecting both the strength of investment demand and the virtual absence of bullion shipments to India (in contrast to the latter part of 2008 when a huge outflow to the Sub-continent had drained liquidity from the London bullion market).

Silver Borrowing



Source: GFMS

N.B. The above chart shows GFMS' estimates for the total amount of silver borrowed at year-end. This is split into two main categories, first, the quantity borrowed in relation to producers' outstanding hedge positions and, second, the amount of liquidity required by fabricators and refiners.

government stocks came from Russia last year. Our estimates suggest that the country may have released around 13 Moz (over 400 t) in 2009, down by 51% on 2008's figure. It is of note that despite a recovery in silver prices over the year, disposals from Russia continued to fall in 2009. This could reflect either official stock held by the country starting to reach a level consistent with long term objectives, for example as a strategic holding, or simply the near exhaustion of such stockpiles after several years of heavy disposals.

Turning to China and India, once again, both countries were absent from the market in 2009. As far as China is concerned, it is our understanding that, following several years of heavy sales, its silver stocks have already been reduced significantly from "excessive" levels, and remaining stocks will play some small part in diversifying its reserves portfolio away from US dollars.

Other Stocks

In addition to the above-mentioned stocks, GFMS also track those registered on the Tokyo Commodities Exchange, the CME Group (previously the Chicago Board of Trade) and Japanese trade stocks, as reported by the country's Ministry of Trade and Industry. Due to their only accounting for a small fraction of the overall figure, we have aggregated these under the "Other Stocks" category in the chart on page 36 and the table on page 37. At end-2009, these stocks had declined by 19% year-on-year to 12.1 Moz (378 t).

Scrap

• A lower level of photographic scrap was exacerbated by weaker industrial-related recycling, leaving the global total 6% lower in 2009.

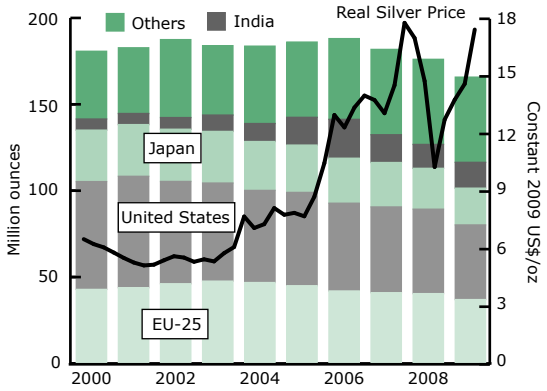
World silver scrap supply continued to fall last year, posting a decline of nearly 6% to a 13-year low of 165.7 Moz (5,155 t). This represented the third consecutive year of losses. Indeed 2009 saw an acceleration in the rate of decline (in percentage and volume terms).

This occurred in spite of several local currency prices registering gains last year. Although dollar prices (basis the annual average) fell in 2009, albeit by a modest 2.1%, in several key markets non-dollar prices rose, particularly in India where the average rupee price increased by 10% to a record high. It was therefore of little surprise to see Indian recycling improve, albeit to just a two-year high. In spite of this, on a global basis the scrapping of old jewelry grew only marginally, principally because of the relatively modest share of jewelry consumption accounted for by the traditionally price sensitive markets like India. That said, western jewelry scrap supply did grow in 2009, because of the surge in gold jewelry recycling, which also drew out old silver pieces.

In spite of this performance, overall global scrap volumes dropped last year, primarily because of the long-term structural decline in photography and a fall in industrial-related scrap. Taking each in turn, the fall in photographic recycling was largely due to the continued slide in the consumer film sector, with the recovery of medical scrap falling to a lesser extent. In terms of the industrial sector, although tighter legislation drove recycling higher, this appeared to be offset by a substantial fall in the recovery of spent ethylene oxide (EO) units, itself the product of the global recession.

European scrap in 2009 fell for the sixth consecutive year, slipping 8% to 37.5 Moz (1,166 t). This drop was mainly due to the fall in recovery from old X-rays of around 5% and from all photographic liquids of over 10%. Coin scrap saw a mixed result and changes here largely explain differences in performance between countries. Establishing an overall picture is hard but it seems that overall coin volumes slipped a little. Jewelry

World Scrap Supply



Source: GFMS

scrap, however, stayed roughly stable and modest due to a limited trade remelt (due largely to the resilience of jewelry consumption) and to negligible selling back by consumers (in contrast to buoyant gold jewelry scrap). There was also no surge in silverware scrap, despite tough conditions, partly as a result of the lack of changing fashions in this sector. Electronic scrap could well have risen, if only by a fraction as the benefits of rising collected volumes together with stable yields continued to be undone by grey market exports of old equipment.

A marked drop in the recycling of domestic coins meant total **German** scrap fell more heavily than the norm, slipping by almost a fifth - a change which accounted for over half the continent's gross decline. In contrast, **French** scrap rose by around 10% last year, with the bulk of gains attributable to a higher coin melt. The drop in **Italian** scrap was muted at just 4%, largely as a result of broad stability in the contribution from its relatively large non-photographic sources. In the **United Kingdom**, the recession produced a steeper drop in the recovery of old consumer film, with recycled medical scrap falling to a lesser extent.

Scrap supply in the **United States** fell for the fourth year in a row, dropping by close to 12%. Historically, US recycling has been dominated by photo-related supplies. However, these have fallen for nine straight years and, as a result, it appears as though photographic scrap in 2009 may have accounted for a smaller share of the country total than industrial scrap. This occurred in spite of a drop in the recovery of silver from spent EO catalysts. This downturn was the product of the global recession, which led to some EO 'changeouts' being postponed until 2010. To some extent this was mitigated by a

Table 4 - Supply of Silver from the Recycling of Old Scrap (million ounces)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Europe										
Germany	16.7	16.8	16.7	19.0	19.2	17.6	14.1	13.4	13.1	10.5
UK & Ireland	10.9	11.1	13.6	13.0	12.4	11.6	10.9	11.2	10.9	10.2
Italy	3.4	3.5	3.6	3.6	3.3	4.3	5.1	5.2	5.2	5.0
France	3.5	3.9	3.9	4.1	3.8	4.1	4.5	4.1	4.4	4.9
Austria	1.6	2.0	1.9	1.5	1.6	1.3	1.3	1.2	1.2	1.1
Netherlands	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.1	1.1	1.0
Sweden	1.1	1.1	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.8
Belgium	0.6	0.7	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6
Denmark	0.6	0.6	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5
Czech & Slovak Republics	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Portugal	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4
Spain	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4
Finland	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3
Norway	1.1	0.7	0.7	0.5	0.3	0.3	0.3	0.3	0.3	0.3
Switzerland	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2
Other Countries	1.1	1.1	1.2	1.1	1.1	1.0	1.0	1.0	1.0	1.0
Total Europe	**44.2**	**44.8**	**47.1**	**48.4**	**47.5**	**45.6**	**42.5**	**41.5**	**40.9**	**37.5**
North America										
United States	62.4	64.5	59.2	56.8	53.3	54.0	50.8	49.6	48.9	43.2
Mexico	1.5	1.4	1.5	1.8	1.9	2.1	2.3	2.7	3.1	3.0
Canada	1.4	1.4	1.4	1.5	1.4	1.5	1.4	1.6	1.7	1.5
Total North America	**65.4**	**67.3**	**62.2**	**60.1**	**56.7**	**57.5**	**54.5**	**53.9**	**53.6**	**47.7**
Latin America										
Brazil	1.5	1.6	1.0	1.2	1.0	1.0	1.0	1.0	1.0	0.9
Chile	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5
Argentina	0.6	0.7	0.6	0.6	0.6	0.6	0.8	0.6	0.5	0.4
Other Countries	0.8	0.8	0.8	0.8	0.8	0.9	1.1	1.0	1.0	1.0
Total Latin America	**3.4**	**3.5**	**2.8**	**3.0**	**2.8**	**3.1**	**3.4**	**3.2**	**3.0**	**2.8**
Middle East										
Saudi Arabia	2.3	0.8	7.2	0.7	1.3	1.6	1.8	1.9	1.9	1.9
Egypt	0.9	1.1	1.3	1.1	1.4	1.4	1.5	1.5	1.7	1.8
Turkey	1.3	1.3	1.4	1.7	1.5	1.3	1.1	1.0	1.1	1.3
Oman	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Other Countries	0.3	0.4	0.3	0.4	0.5	0.4	0.5	0.5	0.5	0.5
Total Middle East	**4.9**	**3.7**	**10.4**	**4.1**	**4.8**	**4.9**	**5.1**	**5.0**	**5.4**	**5.7**
Indian Sub-Continent										
India	6.4	6.4	6.8	9.5	10.4	16.1	22.5	16.1	13.8	15.0
Other Countries	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6
Total Indian Sub-Cont.	**6.8**	**6.9**	**7.2**	**9.9**	**10.9**	**16.6**	**23.1**	**16.6**	**14.4**	**15.6**
East Asia										
Japan	29.8	29.9	30.2	29.9	28.3	27.4	26.0	25.7	23.7	21.3
China	6.0	6.2	6.3	6.6	7.7	8.7	10.4	12.1	11.9	12.1
South Korea	5.3	5.5	5.8	6.1	6.3	6.4	6.7	6.8	6.7	6.5
Thailand	0.6	0.7	0.9	1.0	1.0	1.0	1.1	1.2	1.3	1.3
Taiwan	0.9	0.9	0.9	1.0	1.0	1.0	1.1	1.2	1.2	1.2
Singapore	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5
Hong Kong	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
Indonesia	0.5	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4

Table 4 - Supply of Silver from the Recycling of Old Scrap (million ounces) © GFMS/The Silver Institute

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Vietnam	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4
Philippines	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Other Countries	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
Total East Asia	**44.5**	**44.9**	**45.8**	**46.3**	**46.2**	**46.4**	**47.4**	**49.1**	**46.8**	**44.4**
Africa										
Morocco	0.5	0.5	0.5	0.5	1.3	0.6	0.9	0.9	0.9	1.0
Other Countries	0.6	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6
Total Africa	**1.1**	**1.1**	**1.0**	**1.1**	**1.8**	**1.2**	**1.5**	**1.5**	**1.5**	**1.6**
Oceania										
Australia	2.4	2.4	2.3	2.1	2.0	1.8	1.7	1.7	1.6	1.6
Total Oceania	**2.4**	**2.4**	**2.3**	**2.1**	**2.0**	**1.8**	**1.7**	**1.7**	**1.6**	**1.6**
CIS										
CIS	7.9	8.1	8.5	9.0	10.9	9.0	8.9	9.3	8.7	8.8
Total CIS	**7.9**	**8.1**	**8.5**	**9.0**	**10.9**	**9.0**	**8.9**	**9.3**	**8.7**	**8.8**
World Total	**180.7**	**182.7**	**187.5**	**183.9**	**183.7**	**186.0**	**188.0**	**181.8**	**176.0**	**165.7**

number of plants being completely shut down, although these were generally small-scale (with a silver content of typically less than 0.5 Moz, or 15 t, compared with today's considerably larger installations of in excess of 1 Moz, or 31 t). In fact, the only area of US scrap supply to rise last year was jewelry-related, which benefited from the country's high profile advertising campaigns, aimed at drawing out gold jewelry from the public. This proved to be extremely successful, a by-product of which was the increasing quantities of silver which also entered the supply chain.

Silver scrap in **India** rose by 8% to 15.0 Moz (465 t) in 2009, the first increase recorded since 2006. The price, which breached Rps 30,000/kg during the year, was the key driver of higher volumes in the urban and second tier cities. By contrast, scrap in rural areas was, at best, muted in spite of substantially higher prices.

GFMS meetings with contacts pointed to overall scrap volumes being restrained in rural areas because higher commodity prices and financial aid from the government left farmers relatively well off, thus limiting their need to sell back silver. It is important to recognize that in rural areas silver is still used as a savings vehicle; when crops are sold, cash is converted to silver, and conversely when the sowing season arrives, farmers sell their silver for cash to buy seed and fertilizer. Consequently, the decision to sell silver in these areas is primarily driven by the immediate need for cash (scrap tends to come to the market from these regions most heavily between May and mid-July, just before the sowing for the next kharif - summer or monsoon - crop begins), with price moves being a secondary consideration.

GFMS estimate that scrap volumes across East Asia (excluding Japan) remained largely unchanged last year after a 2% gain from China was entirely offset by modest falls from several other markets. The growth in **China** can best be explained by a rise in jewelry and silverware scrap, coupled with higher receipts of photographic scrap (mainly recycling of X-ray film) and industrial recycling. Elsewhere, **South Korean** scrap supply eased by 2% due to a smaller contribution from the consumer film market, with the recovery of spent EO catalysts broadly unchanged. Finally, **Thai** recycling remained stable as increased silverware remelt (particularly in the first half of the year) was offset by weaker jewelry receipts.

In **Japan**, scrap volumes are estimated to have fallen by around 10% last year, reaching 21.3 Moz (662 t). This represents the lowest level generated in almost twenty years, and was mostly due to the ongoing decline in scrap from the photographic sector, predominantly from consumer film. Supply from old X-rays, which contain more silver than consumer photographic scrap, remained largely stable, as its availability is dependent on medical institutions having kept them for a required length of time. Electronic scrap volumes, however, mitigated the decline in consumer photographic scrap to some extent. According to our research meetings, some electronics companies embarked on inventory releases of stock for scrap in the first quarter, when demand for such products all but vanished, thus boosting supply from this sector.

6. Silver Bullion Trade

- ***UK bullion imports soared by almost two-thirds last year, partly as weak industrial demand led to sizable inflows from East Asia.***

- ***US bullion imports fell by 24% in 2009 to an eight-year low. This was almost entirely due to lower receipts from Mexico and Peru.***

- ***Indian bullion imports fell by 75% in 2009 to a three-year low of 40.5 Moz (1,259 t), due to the dishoarding of local metal, much of which had been imported towards the end of 2008.***

- ***Chinese bullion imports fell by over 20% last year, although this compares to a historically high total in 2008. Exports fell by around 12%, despite a further lift in the country's official export quota.***

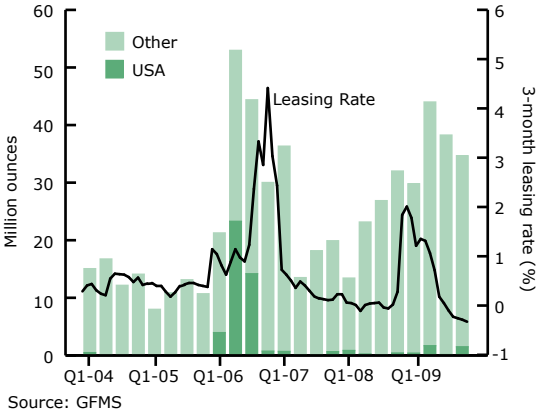
Europe

Europe is one of the main structural deficit areas in the world, given that its fabrication (149.0 Moz or 4,636 t) far exceeds locally generated scrap (37.5 Moz or 1,166 t) and its mine production (50.7 Moz or 1,577 t) (all figures for 2009). To fill the resultant gap, substantial volumes of concentrates, doré, refined bullion and scrap are imported. The bulk of the mine supply and higher grade scrap arrives in Switzerland, that being home to some of the world's largest refineries, whereas much of the refined metal comes first to the United Kingdom, thanks to the role played by the London terminal market. Despite being a deficit region, bullion exports can be significant, reflecting the shipment of refined metal from stocks held in the London and Zurich markets. The scale of the bullion trade for Germany and Italy is also sizable, but the vast majority of this is just intra-European flows.

The key development last year as regards the **UK** bullion trade was the 87% slump in exports to 24.9 Moz (775 t). This was mainly due to the collapse in flows to India from 116.8 Moz (3,633 t) in 2008 to only 13.0 Moz (405 t). This dramatic fall was primarily due to dishoarding in India (of bars acquired in 2008 on lower prices) substituting for new bullion imports to meet fabrication demand. This explains why October and November 2008 both saw UK shipments to India of over 35 Moz (1,100 t) and yet February and March 2009 saw zero imports. UK exports to Switzerland also fell a hefty 44.1 Moz (1,371 t) in 2009 to just 1.0 Moz (31 t).

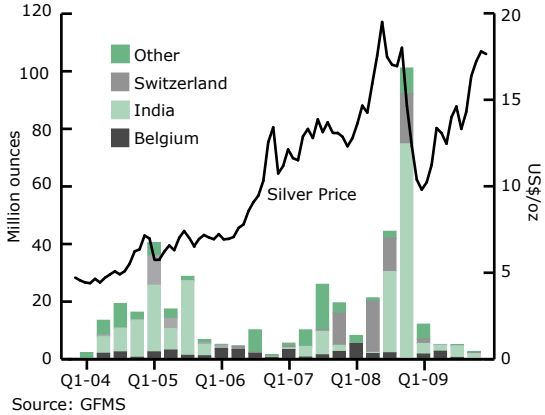
There was a major change too in UK silver bullion imports as these surged by almost two-thirds to 149.1 Moz (4,638 t) last year. The bulk of this rise was due to higher inflows from East Asia, in particular Japan, from whom receipts rose to 25.5 Moz (794 t) from a trivial 0.6 Moz (20 t) in 2008. This illustrates the weakness of end-user demand and the large scale of inventory destocking, forcing delivery of silver (for example purchased under long term contracts) to the London market. It is possible there was an element of disinvestment from some of these countries but UK receipts were not sharply higher in the early months of 2009 (nor in late 2008) when the financial crisis was at its worst (total UK imports peaked

UK Bullion Imports



Source: GFMS

UK Bullion Exports



Source: GFMS

in the second quarter but fourth quarter imports were still greater than in the first quarter). The novelty of sizeable imports from other countries such as Taiwan and Thailand also illustrates the uniqueness of conditions last year.

As reported by destination, **Swiss** silver bullion exports also fell sharply last year, with volumes down 45% to around 24 Moz (750 t). As with UK exports, much of this drop was again due to lower shipments to India, which fell by around 13 Moz (400 t). Not all destinations received less bullion, with the largest gain being Canada, which saw an unusual inflow of 3.4 Moz (107 t) from Switzerland. Total Swiss exports, however, are likely to be greater than the derived total, chiefly as the reported UK import figure of just 0.8 Moz (24 t) is believed to sharply understate the true volume moved.

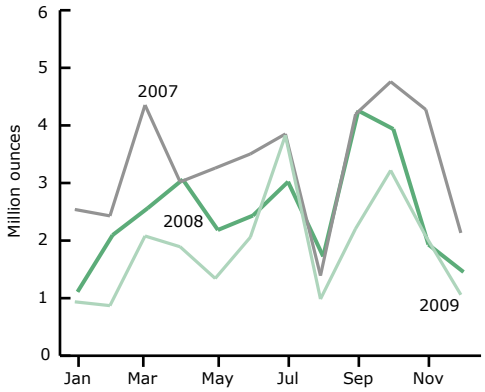
Imports of silver bullion by Switzerland might appear to have fallen last year, with the total as reported by origin down just over a third to around 49 Moz (1,500 t). This reported fall was dominated by the slump in receipts from the United Kingdom, although imports from Hong Kong also fell notably. In contrast, imports from Kazakhstan and then Turkey rose substantially. However, industry sources have queried the overall conclusion, stating that actual Swiss bullion imports would have risen and could have reached a far higher level. The derived reported total, for example, excludes Russian exports and the accuracy of the Hong Kong data has been questioned.

Official **Italian** bullion imports in 2009 fell by 27% to 22.6 Moz (701 t). This was surprising as we estimate that total offtake only fell by 13%. There is not thought to be much compensation from unofficial imports, since these are understood to have remained slight. Nor was there any balancing from bullion exports as these rose last year, meaning net imports fell by 34%. In gold, an apparent deficit was resolved by higher domestic and imported scrap but, for silver, supply from these two sources was broadly unchanged in comparison to 2008. This therefore leaves Italy with a sizable apparent silver deficit, which leads us to question the accuracy of the official data, particularly as regards imports from Germany.

Official data for **Germany** shows 2009 bullion exports falling by 21% to 18.3 Moz (568 t). However, as reported by destination, the drop was steeper at just over 30% but the level reached, 33.3 Moz (1,035 t), was far higher (much of the losses related to Italy, Belgium and the Czech Republic). Similar discrepancies arise as regards German imports; its statistics show a slump of 45% in 2009 to 23.2 Moz (721 t) but imports as derived from origin show a far smaller drop, 15%, and a much greater volume of around 55 Moz (1,700 t) and this still excludes unreported exports. As such, true imports were probably yet higher and the year-on-year drop yet smaller.

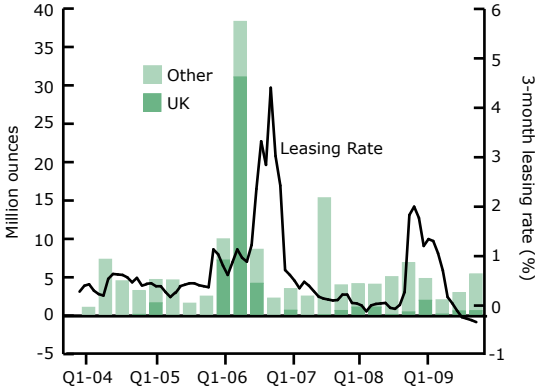
Exports from the **Commonwealth of Independent States** (CIS) dropped last year in spite of higher mine production and lower fabrication demand in the region. Given the consequent increase in the aggregate CIS domestic market surplus in 2009, this implies that the amount of metal exported from previously existing bullion inventories declined considerably. This confirms other information pointing to a lower level of Russian government stock sales last year. The United Kingdom has been an increasingly important destination for CIS silver bullion exports and last year saw the country take in excess of 60% of all shipments from the CIS.

Official Italian Bullion Imports



Source: GFMS

US Bullion Exports



Source: GFMS

The Americas

Turning first to bullion exports from the **US**, these fell to a four-year low of 15.6 Moz (484 t) last year. This performance owed much to a virtual disappearance of trade with India. That said, bullion exports to India had only emerged in 2007 and in fact 2008's deliveries had already experienced a sharp drop. However, the fall in 2009 was compounded by a material decline in total Indian bullion imports (see below). Elsewhere, there appeared to be some offset, with firmer US exports of silver destined for upgrade to coin blanks, a reflection of the strong coin demand which characterized the US market for much of last year.

Bullion imports also fell, by around 24% to 121.4 Moz (3,775 t), their lowest level since 2001. This was almost entirely due to weaker deliveries from Mexico, with Latin America and Peru in particular also scaling back their shipments to the United States.

Bullion exports from **Mexico** are estimated to have fallen by around 19% to a four-year low. This performance was almost entirely due to the strike at Industrias Peñoles' Met-Mex lead-silver refinery, which started on February 8th 2009 and ran for a total of 65 days. According to the company, first quarter 2009 refined output fell by 57%, or 15.7 Moz (488 t), which broadly matched the decline in Mexican trade with the United States.

In spite of the strike, first quarter deliveries to the United States from Mexico were only 8.0 Moz (250 t) lighter, compared with average imports over the previous four quarters. Although Mexican bullion trade with the United States did eventually recover much of the lost ground in 2009 (once the strike ended in mid-April), its ability to do so was hampered by a fall in doré shipments into Mexico last year. For example, in 2008 Chile and Bolivia together shipped in a little over 3 Moz (100 t) into Mexico to be refined. However, last year, this trade fell to a paltry 0.3 Moz (10 t), with each country's doré outturn instead being delivered to other locations in North America, as well as to western Europe, for refining.

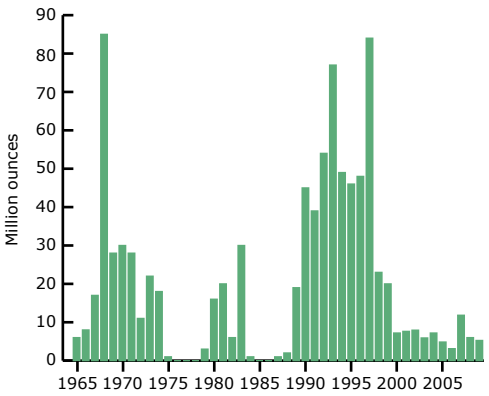
As mentioned above, **Peru** also saw its exports to the United States fall sharply in 2009, by around 60%, or 12 Moz (380 t). This was due to the closure in June 2009 of Doe Run Peru's La Oroya lead/zinc smelter. Production in 2008 had reached 34.5 Moz (1,072 t) of refined silver (in addition to its base metal output), although the closure saw last year's output fall by around 70% to just 10.3 Moz (319 t). In broad measure, this matched the decline in Peru's full year exports, with deliveries to Brazil, second only to the United States (albeit considerably smaller), seeing a decline of some 40% last year.

Middle East and Indian Sub-Continent

Last year, **Turkish** bullion imports collapsed to a paltry 0.2 Moz (6 t), in the process falling to their lowest level since deliveries were first permitted through the Istanbul Gold Exchange in 1995. While domestic manufacturing did weaken in 2009, the main reason for the slump was the surge in the country's primary mine supply, which is refined locally. This increasingly substituted for imported bullion and, in fact, the surge in mine production was so great that exports into Switzerland jumped last year, reaching 4.3 Moz (135 t), a trend which has continued into early 2010. Meanwhile, **Egyptian** silver bullion imports, both through official and unofficial channels, remained extremely subdued last year. The domestic market continued to be serviced almost entirely by locally available and imported scrap supplies. With Egyptian manufacturing a little weaker in 2009, it was of little surprise to see local and international silver prices at near parity and, given the 21% import duty, there was therefore little incentive to import grain into the country.

Silver bullion imports into the **United Arab Emirates** (UAE) fell by 8% on 2008's already modest volumes. Imports from Russia, while weaker year-on-year, again dominated supply, accounting for over 40% of the total, with direct imports from the United Kingdom up strongly. In contrast, bullion imports from Switzerland and Hong Kong were markedly weaker, as shipments from these entrepôts were frequently sent directly to India rather

Dubai Bullion Imports



Source: GFMS

than being vaulted or trans-shipped via Dubai. That said, direct shipments to Indian ports dominated exports from the UAE, rising by almost 40% last year.

Indian bullion imports in 2009 fell sharply to 40.5 Moz (1,259 t), a quarter of the level seen in 2008. While the decline seemed severe in the context of particularly high imports in 2008, owing to the then surge in investment demand, imports in 2009 were nonetheless historically low. Indeed, they represented the smallest volume of inflows since 1991 (with the exception of 2006), when GFMS' comprehensive Indian trade data series began.

Indian Bullion Imports

Moz	2005	2006	2007	2008	2009
OGL^	106.2	16.1	78.9	160.3	34.0
Others**	3.1	1.1	1.1	2.0	6.5
Total Imports	**109.3**	**17.2**	**80.0**	**162.3**	**40.5**
Local Premium*	7%	4%	6%	5%	4%

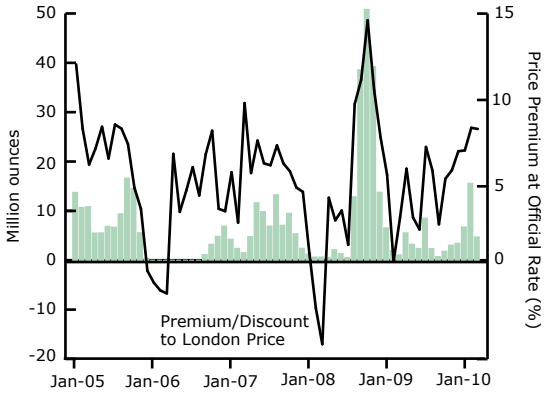
^Open general licence
* percentage above London price at the official exchange rate (excluding all local duties and taxes)
** includes Direct Imports, Non-Resident Indians, Special Import Licence, and Replenishment Imports (i.e. imports of silver bullion for manufacture and re-export).
Source: GFMS

Shipments from key suppliers were lower across the board. UK deliveries fell by almost 90% to just 13.0 Moz (405 t), bringing its share of total Indian imports down to 36%, while receipts from the United States collapsed by a similar magnitude, to a meagre 0.5 Moz (16 t). Small quantities of bullion that arrived from Canada, Thailand and Belgium in 2008 disappeared last year, although imports from Hong Kong rose by 11%, and by 50% from both Italy and Germany. In addition, the import duty on silver bullion was doubled to Rps 1,060/kg last year, although this is understood to have had no direct impact on inflows. In terms of the main ports of entry into India last year these continued to be Ahmedabad, New Delhi, Chennai and Kolkata (the latter two are also fabrication centers).

In general, price movements largely dictate the level of imports into India, as was made apparent in late 2008 when the price of sub-Rps 17,000/kg generated a surge in imports. Last year, however, the price played a limited part in directing the magnitude of offtake. Although prices were on average 10% higher last year, the price during the first six months of 2009 was in fact lower year-on-year, and the intra-year pattern of imports bore little correlation with price movements. Inflows were consistently weak, with average monthly imports of around 3 Moz (100 t) proving less than half the monthly average since the start of the 2000s.

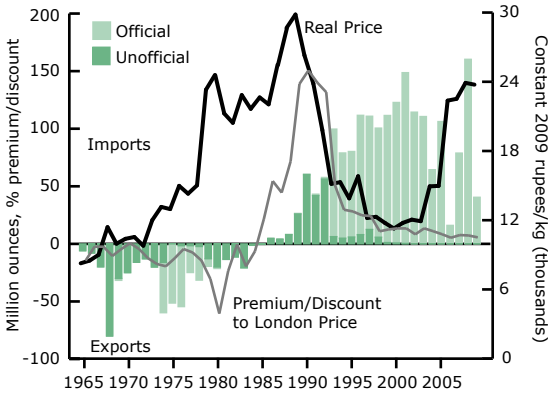
The main reason for the decline in imports, therefore, was not a firmer price. Instead, it was the high level of local supply, which was largely the result of the extraordinary import levels in late 2008. This was mostly composed of gross disinvestment of around 48.2 Moz (1,498 t), which accounted for some 43% of total supply, with imports contributing just 36%. Other local sources, namely, scrap, mine production and some carried-over bullion stocks, made up the balance. Note, however, that a significant proportion of this apparent disinvestment was carried out by silverware fabricators, who converted their bullion stocks (imported in 2008) into products in 2009. This process has been classified as 'disinvestment', as the original bar form of the silver – categorized as 'investment' - has been altered.

Gross Monthly Indian Bullion Imports



Source: GFMS

Net Indian Bullion Imports and Exports



Source: GFMS

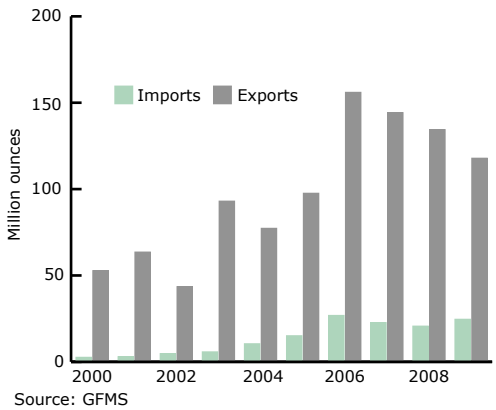
Much of the silver that was imported in 2008, however, remained in bar form last year. Elevated levels of locally available above-ground stocks, combined with weak demand in response to the global economic downturn, led to a surplus of available silver. The large volume of excess metal in the domestic market saw the local price, at times, fall to a discount to the dollar price (although the full year average still registered a premium), prompting some large hoarders to hedge their holdings on the local exchange to lock-in profits, while others took advantage of the discount to export silver. Although it is usually uneconomic to export silver from India, unless the discount in the local market is greater than the cost of exporting (mainly freight and insurance), this proved to be profitable in 2009, leading exports to rise more than ten-fold to 1.7 Moz (52 t), albeit from a modest base in 2008. GFMS' estimate for net silver supply to the Indian market last year, therefore, reached 112.8 Moz (3,509 t).

Turning to the first quarter of this year, GFMS' early estimates indicate that silver imports have already surpassed 26 Moz (800 t). Imports were concentrated in February, on the back of an average rupee silver price of Rps 25,659/kg. Although this was some 20% higher year-on-year, this was considered inexpensive in the context of average prices of over Rps 28,000/kg in the preceding three months.

East Asia

GFMS estimates that **Chinese** silver imports remained relatively stable in 2009, as a modest decline in silver recovered from the process of treating imported base metal concentrates offset slightly higher imports of refined silver bullion. After surging by close to 15% in 2008, concentrate imports plateaued last year, with

Chinese Official Bullion Imports and Exports



Source: GFMS

GFMS' analysis placing the quantity (on a calculated basis) at close to 162.6 Moz (5,058 t). This, coupled with refined imports, lifted total Chinese bullion receipts to an estimated 282.2 Moz (8,777 t). After analyzing the trade data and from anecdotal evidence gathered during numerous research visits in 2009, GFMS estimate that privately held stocks (including metal held by refiners and, to a lesser extent, manufacturers) in China may have risen by close to 92 Moz (2,860 t).

After the VAT rebate was reduced from 17% to just 5% in mid-2007, bullion flows from China to Hong Kong eased and brought with it a more transparent and accurate assessment of silver flows out of China. Moreover, prior to the taxation change, export volumes had often been highly inflated as traders took advantage of the attractive rebate rate, with round tripping schemes seeing metal exported from the mainland, returned unofficially, only to be re-exported to again claim the rebate. Not surprisingly, this additional trade flow inflated export volumes and clouded genuine trade data. Furthermore, the Chinese government has continually assessed the level of permitted exports, adjusting export quotas on an annual basis according to the growth in imports and mine production. In 2005, the Ministry of Commerce issued a quota of 112.5 Moz (3,500 t) and this figure has risen almost every year since, reaching 164.0 Moz (5,100 t) in 2009.

According to official trade statistics, gross bullion exports stood at 114.3 Moz (3,554 t) last year, a decrease of over 12% compared with 2008. The overwhelming bulk of this material was shipped via Hong Kong last year (at almost 75% of the total), with exports to the Asian entrepôt falling 14% year-on-year. Elsewhere, exports to India and Thailand fell heavily (the latter by almost 60%), while direct trade to Taiwan was up by almost 250% on 2008 levels. Looking more closely at the data reveals the fragility of global demand in the first half of 2009, when economic conditions were at their worst, as exports in the first quarter were weaker by almost 50% year-on-year but then slowly recovered as the year progressed.

Silver imports into **Hong Kong** fell to a four-year low, retreating by over 6% in 2009, to 85.9 Moz (2,671 t) according to official customs statistics. Not surprisingly shipments from China dominated deliveries, with trade from the mainland contributing over 90% of total imports at 79.6 Moz (2,476 t), virtually unchanged on the

previous year. After several years of anomalies, which saw exports from China inflated due mainly to changes in tariff rebates, imports from the mainland appear to have settled into a more transparent and accurate assessment of genuine trade. In addition, imports from South Korea and Taiwan, the other two main sources of supply to Hong Kong, both fell by close to 50% last year, while imports from Japan registered a significant gain, partially offsetting further declines from other sources.

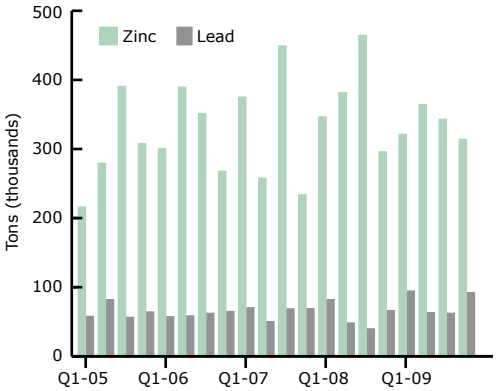
In a clear indication of the weakness in the industrial sector in 2009, **South Korean** bullion imports fell by close to 60% last year to 2.1 Moz (64 t). The greatest falls were recorded from Hong Kong and mainland China, which fell by 95% and 75% respectively, while imports from Australia (the largest supplier in recent years) fell by an estimated 23% year-on-year. Furthermore, given the weakness in the domestic market it was of little surprise that exports were up strongly last year, rising by almost a fifth, with shipments to the United Kingdom up by more than 350%.

Singapore's bullion imports were moderately higher in 2009, increasing 10% to 5.8 Moz (180 t) on the back of a material increase in deliveries from South Korea. Indeed, shipments from Korea rose by almost one-third last year, contributing over 75% of the annual total. Imports from Indonesia were up strongly on 2008, while Chinese deliveries declined by 70%.

Weak fabrication demand saw **Thailand's** silver bullion imports decline 9% last year to an estimated 29.5 Moz (916 t). The sizable fall, to the lowest level since the late 1990s, was principally a function of significantly weaker jewelry fabrication, which suffered as global demand eased in response to the economic malaise. Imports from Hong Kong and China again dominated supply, with their combined shipments falling by almost 25% year-on-year, giving up some market share to Switzerland, from which imports more than doubled to over 3.4 Moz (107 t). The increase lifted Switzerland to the third largest trading partner behind South Korea, which recorded a slight rise year-on-year. Turning briefly to exports, reported bullion deliveries were down sharply last year, slumping by over 90%, with a material decline in exports to Japan the chief architect for the fall.

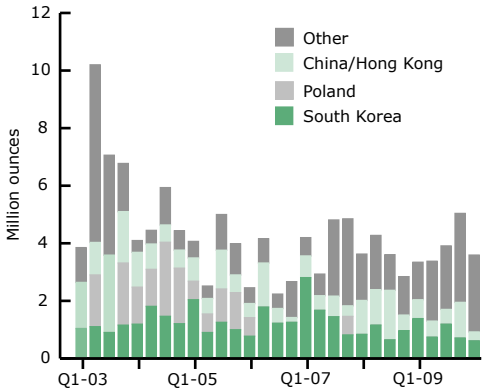
Bullion imports into **Japan** dropped to just over 38 Moz (1,200 t) in 2009, a year-on-year decline of some 37%. Subdued demand levels gave little reason to import silver; April, for example, showed a year-on-year decline in inflows of almost 90%, as a collapse in first quarter demand left fabricators with scant need for fresh supply. Shipments in the fourth quarter showed the highest intra-year volumes, reflecting rejuvenated demand. Exports, in contrast, soared almost seven-fold to 55 Moz (1,696 t) last year. Poor demand left the local market inundated with silver, and the vast majority of the metal was sent to the London terminal market.

Korean Lead and Zinc Concentrate Imports



Source: WBMS

Thai Bullion Imports



Source: GFMS

7. Fabrication Demand

- ***World fabrication fell by 11.9% in 2009, to 729.8 Moz (22,700 t), largely as a result of the global recession.***

- ***The decline in the global total last year represented the steepest fall, in both percentage and volume terms, in GFMS' 20-year series.***

- ***Industrial fabrication accounted for the bulk of last year's losses, falling by 20.6% to a six-year low of 352.2 Moz (10,955 t), in the process eclipsing 2001's technology-related decline.***

- ***The drop in industrial demand was largely a first half event, brought about by a slump in orders and an extended period of pipeline destocking.***

- ***A strong performance from India and a shift in western markets in favor of silver helped limit the fall in global jewelry offtake last year to just 1.1%.***

- ***The growth in Indian fabrication in 2009 was the main reason behind world silverware offtake recording its first annual gain in five years.***

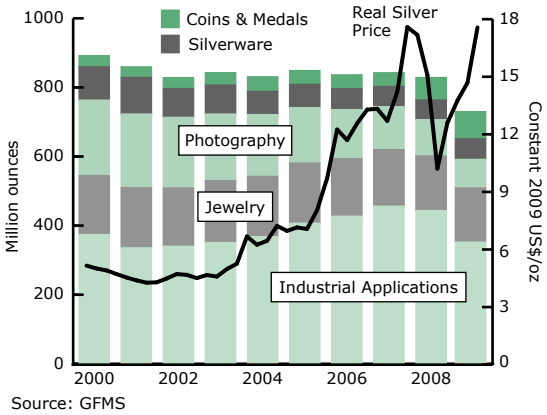
- ***Photographic demand continued to weaken, although the rate of decline quickened last year, largely because of the economic downturn.***

- ***Coins & medals minting achieved a record high last year, spurred on by strong retail investment demand, primarily in the United States.***

Last year, world silver fabrication fell by 11.9% to its lowest level since 1992. Given the scale of the global recession it was not surprising to see industrial demand bear the brunt of the decline, with this segment falling by a noteworthy 91.2 Moz (2,836 t) to a six-year low. In so doing, industrial demand saw its share of total fabrication fall to "just" 48% last year, from close to 54% in 2008. In recent years, industrial demand has not only accounted for more than half of global offtake, but has played an important role in offsetting weaker demand elsewhere, particularly in the context of the structural losses in the photographic sector. Last year was no exception, with photography continuing to decline, although the global recession did see the industry's losses accelerate.

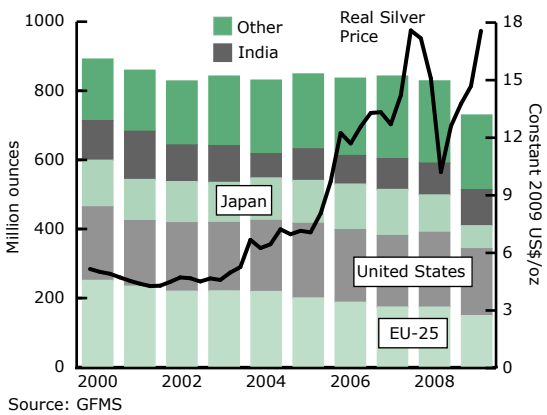
The weakness in these two areas last year meant that the share of demand accounted for by price sensitive components rose in 2009. While it would be wrong to label global jewelry demand in this way (with around 60% of the total largely price *insensitive*), the only 1% loss last year was mainly due to firmer demand in India. Similarly, for silverware, India drove this category higher, offsetting structural losses in western markets, in the process regaining the 60% share occupied by price sensitive silverware demand in this category for the first time since 2003. The largest gain, however, was reserved for coins & medals, which surged to a new record high in 2009, with its share of global offtake rising to almost 11%, compared with just 4% ten years ago. This is indicative of the strength in investment demand that has characterized the silver market, which was responsible for much of the surge in prices during 2009.

World Silver Fabrication (by category)



Source: GFMS

World Silver Fabrication (by region)



Source: GFMS

Industrial Applications

- ***Industrial demand in 2009 fell by 21% to a six-year low of 352.2 Moz (10,955 t), chiefly as a result of the economic slowdown and destocking.***

- ***Every region, bar the Indian Sub-Continent, saw double-digit percentage losses.***

Global industrial demand fell a hefty 20.6% last year. This was the second consecutive annual drop, although 2008's losses were far smaller at 2.8%. The 2009 level of 352.2 Moz (10,955 t) represented a six-year low and it was also smaller than pre-'tech bubble' demand in 2000. The chief driver of last year's fall was the economic crisis, both in terms of slumping end-use and destocking, necessitated by financial stringency or caution over future orders. The impact of high silver prices and substitution was in contrast muted. Almost all the main end-use sectors saw marked losses, with the automotive and residential construction industries hardest hit. In contrast, photo voltaic offtake continued to grow and some more novel uses saw strong gains, although their absolute volumes remained fairly limited.

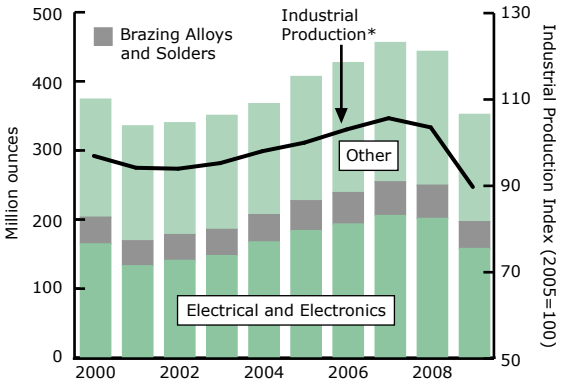
Every region, bar the Indian Sub-Continent, saw double-digit losses, while at the country level, Japan suffered most (down 44%), but even Chinese demand fell (by 10%). The best performance of the majors was India with its 2% drop, largely due to a price-related response from its quasi-industrial sectors. If we exclude India, demand in the rest of the world was weakest in the first quarter but, despite quarter-on-quarter gains through to end-2009, even the fourth quarter only reached levels similar to the depressed final quarter of 2008.

Europe

Industrial fabrication in Europe last year fell by a quarter or almost 17.5 Moz (544 t) to 52.8 Moz (1,644 t). Almost all countries suffered double-digit percentage declines but the most important losses were in Germany and then France. The chief driver of this fall was the slump in end-use triggered by the onset of recession and this being made worse by inventory being run down at all points in the supply pipeline. In contrast, issues such as elevated silver prices, relocation to low labor cost countries and substitution or thrifting were peripheral. As regards the latter for example, the focus on cost reduction for no doubt pressured research and development budgets was often reported as being on minimizing copper use. Within the year, losses were greatest in the first half, while after the summer, month-on-month gains emerged. These increases have continued into 2010, and it seems at a faster pace. However, most contacts feel it is unlikely that demand will return to 2008's levels this year and that such a development may have to wait until 2012 or 2013.

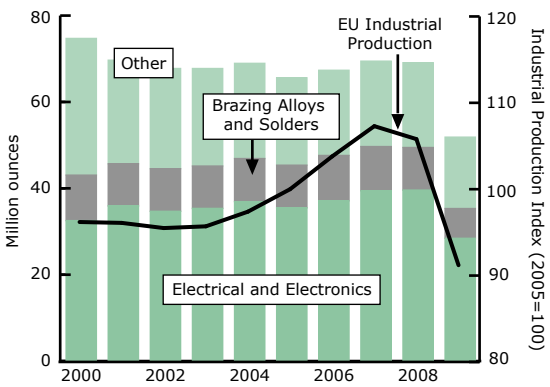
Germany saw its industrial demand drop 28% in 2009 to 19.9 Moz (621 t). This was mainly due to the slump in demand from the electrical and electronics sector as that suffered greatly as a result of the economic slowdown. There were marked changes during the year as fresh orders evaporated early on and did not return in substance until after the summer. There was a time lag, however, for fabrication as the initial months benefitted from the fulfilling of existing orders, leaving the second quarter the weakest, as suggested by exports of semi-manufactured silver items dropping by 19% year-on-year in the first quarter and by 39% in the second. This time lag persisted as the recovery began, with fourth quarter semis exports still down year-on-year (by 12%).

Components of Industrial Applications



*Advanced economies; Source: GFMS, IMF

EU Industrial Fabrication



Source: GFMS, OECD

There was some sectoral differentiation, with automotive and residential end-use the weakest while distribution equipment suffered less. The only sector to show real resilience was mid and high voltage applications, since these often feature as part of large infrastructure projects, but these use very little silver. Demand within Germany fared a little better than in fabricators' export markets (mainly in the EU). This may not be apparent in the data on semis exports as they were heavily boosted by shipments of coin blanks.

The fabrication of brazing alloys in Germany fell even more steeply than electrical demand, reflecting even greater exposure to the badly affected residential and automotive markets. Destocking also seems to have been stronger, although thrifting and substitution again look to have had a lesser impact.

Italian industrial demand in 2009 fell by less than in many other countries, slipping a little over a fifth. This outcome was chiefly due to the diversity of output, with niches such as decorative plating salts, nitrates for mirrors or chlorides for heavy duty batteries, performing better than core areas such as brazing alloys and contacts. There were also gains for photo voltaic pastes, although these were perhaps disappointing and the amount of silver use in truly novel areas remained slight.

Industrial fabrication in **France** fell a sharp 31% last year. All categories look to have suffered falls but the greatest in volume terms (and amongst the steepest) were losses in electrical fabrication and then brazing alloys. This was mainly due to the damage inflicted on order books by the economic crisis but this was made worse by inventory depletions (which have yet to be fully reversed).

UK silver industrial fabrication dropped sharply in 2009, by around 25%, with much of the decline concentrated in the first half. A strong second half recovery then ensued, which has carried on into early 2010 although the industry has shifted to a greater just-in-time focus, with final end-users increasingly reluctant to provide medium to long term guidance to their suppliers.

EU Industrial Production

(Index, 2000 = 100)

2005	2006	2007	2008	2009
104.0	108.1	112.6	110.9	96.1

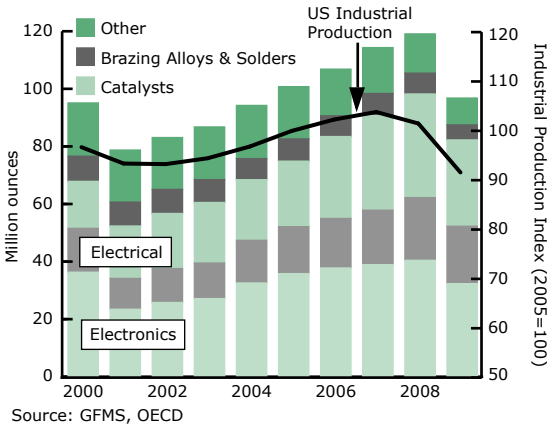
Source: OECD

North America

Last year, **US** industrial fabrication fell to a five-year low, with the decline in both volume and percentage terms exceeding the drop which followed the bursting of the 2001 technology bubble. In fact, the loss of volume in 2009 would have been far greater were it not for substantial gains, which were almost unique, in the photo voltaic (PV) industry. As a result, electrical and electronics silver offtake, which incorporates the PV sector, produced a relatively modest 15% fall in 2009, compared with the near 30% decline for the solders and brazing alloys industry.

In fact, the year had started against a backdrop of a country in recession, with industrial demand continuing to suffer, following the end-2008 slump the sector had experienced. At this time, not only had product demand fallen, but companies, further down the supply chain, were actively destocking, which compounded the problem. These issues carried over into early 2009, with GFMS estimates suggesting that silver industrial fabrication, in the United States, fell by roughly one-third year-on-year in each of the first two quarters. Further impacting demand was the inability of companies to secure finance, which added to the general market uncertainty. As a result, there was a tangible shift, by those companies buying silver bearing products, to no longer offer guidance as to future orders. The industry therefore adopted a greater just-in-time bias, which ultimately impacted the ability of suppliers to produce and hold stock, with further pressure coming from banks who became increasingly unwilling to finance work-in-progress inventory, given the lack of certainty as to the near-term trend in product orders.

US Industrial Fabrication



Source: GFMS, OECD

Table 5 - World Silver Fabrication (including the use of scrap - million ounces)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Europe										
Italy	66.6	60.0	57.4	55.8	55.4	50.8	46.5	43.8	38.6	33.6
Germany	40.4	39.8	35.4	39.1	40.4	40.5	41.0	40.2	40.9	32.8
Belgium	35.3	32.1	30.8	29.3	27.6	26.2	28.7	27.3	25.5	23.2
UK & Ireland	42.0	45.2	42.5	43.4	51.6	42.8	32.6	25.1	23.4	19.2
France	29.2	29.2	27.7	26.3	13.0	12.5	12.7	13.2	13.5	10.3
Austria	1.1	1.1	1.2	1.2	1.3	1.3	1.2	1.2	9.0	10.1
Spain	6.7	5.5	5.2	4.8	6.3	5.6	5.0	4.5	4.3	4.0
Poland	3.9	3.4	3.2	3.8	4.3	4.7	4.8	4.4	4.2	3.5
Switzerland	9.0	3.5	3.4	3.0	3.1	3.3	3.1	3.1	3.1	2.8
Netherlands	1.9	1.8	2.1	1.9	2.5	2.2	2.0	2.0	2.1	1.8
Greece	3.3	3.0	2.8	2.9	2.8	2.6	2.5	2.3	2.2	1.8
Portugal	3.5	2.6	1.7	2.7	4.1	1.7	1.5	1.4	1.4	1.3
Norway	2.9	2.3	1.9	2.0	2.1	1.8	1.7	1.3	1.3	1.0
Sweden	1.3	1.0	1.0	1.2	1.2	1.2	1.2	1.1	1.1	0.9
Denmark	1.0	0.9	0.8	0.7	0.7	0.7	0.7	0.7	0.6	0.6
Czech & Slovak Republics	0.8	1.0	0.7	0.7	0.7	0.6	0.7	0.6	0.6	0.5
Hungary	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Romania	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3
Yugoslavia (former)	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
Finland	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3
Cyprus & Malta	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2
Other Countries	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1
Total Europe	**251.1**	**234.3**	**219.8**	**220.7**	**218.9**	**200.4**	**187.7**	**174.0**	**173.7**	**149.0**
North America										
United States	192.2	169.6	177.0	175.3	180.3	189.4	185.8	180.2	186.4	164.4
Mexico	17.3	17.1	18.1	20.2	21.9	22.3	18.9	18.5	17.5	16.4
Canada	3.3	2.9	3.1	2.5	3.5	4.0	5.7	8.0	12.4	13.0
Total North America	**212.8**	**189.5**	**198.2**	**198.1**	**205.8**	**215.7**	**210.4**	**206.7**	**216.3**	**193.8**
Latin America										
Brazil	6.8	6.6	6.4	6.6	7.3	7.5	4.7	7.2	6.9	6.4
Argentina	2.3	1.8	1.9	2.4	2.5	2.6	1.9	2.0	1.9	1.6
Dominican Republic	0.6	0.3	0.2	0.4	0.4	0.5	0.6	0.6	0.7	1.0
Peru	1.0	1.0	1.0	0.7	0.7	0.6	0.7	0.7	0.7	0.8
Colombia	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6
Chile	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Other Countries	1.0	1.0	1.0	0.9	1.1	1.0	1.1	1.1	1.2	1.0
Total Latin America	**12.9**	**11.8**	**11.6**	**12.1**	**13.1**	**13.3**	**10.1**	**12.7**	**12.5**	**11.8**
Middle East										
Turkey	7.4	6.4	8.2	9.4	10.3	9.9	8.9	8.0	8.4	6.6
Israel	2.9	2.7	2.7	2.6	2.7	2.7	2.7	2.7	2.5	2.0
Egypt	2.0	1.8	1.6	1.8	2.0	1.8	1.7	1.7	1.6	1.4
Iran	1.4	1.5	1.4	1.5	1.5	1.6	1.6	1.6	1.5	1.4
Other Countries	1.9	1.8	1.8	1.8	1.9	2.0	2.0	2.0	2.0	2.1
Total Middle East	**15.7**	**14.2**	**15.6**	**17.1**	**18.4**	**18.0**	**16.8**	**16.0**	**16.1**	**13.5**
Indian Sub-Continent										
India	114.5	139.5	106.4	106.4	69.5	91.6	82.8	89.1	92.2	104.3
Bangladesh & Nepal	6.0	5.9	4.8	4.5	4.2	3.7	3.6	3.6	3.7	3.6
Other Countries	3.2	2.2	2.1	2.1	2.3	2.4	2.4	2.4	2.4	2.3
Total Indian Sub-Cont.	**123.6**	**147.6**	**113.3**	**113.1**	**76.1**	**97.7**	**88.8**	**95.1**	**98.3**	**110.2**

Table 5 - World Silver Fabrication (including the use of scrap - million ounces)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
East Asia										
China	36.1	39.8	47.6	52.8	59.0	61.6	68.0	75.8	75.6	70.7
Japan	135.0	119.3	118.7	116.0	123.0	124.1	131.7	133.6	108.4	66.6
Thailand	30.9	32.9	32.6	36.6	37.0	37.0	37.0	36.7	33.6	30.7
South Korea	19.6	17.1	18.4	19.7	20.3	21.3	22.7	23.3	22.7	18.3
Taiwan	9.4	8.8	9.4	10.8	11.3	12.3	13.4	14.0	13.7	11.5
Indonesia	4.2	5.2	4.5	4.7	5.8	5.1	5.7	5.5	5.4	5.2
Hong Kong	4.4	3.2	3.4	3.2	3.4	3.5	3.8	4.0	3.9	3.2
Vietnam	0.7	0.7	0.8	0.9	1.0	1.0	1.1	1.2	1.3	1.3
Myanmar, Laos & Cambodia	0.8	0.9	1.0	1.0	0.9	0.9	0.8	0.8	0.8	0.8
Malaysia	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.6	0.6	0.6
Other Countries	0.4	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Total East Asia	**242.3**	**229.0**	**237.3**	**246.7**	**262.8**	**268.1**	**285.4**	**296.0**	**266.5**	**209.3**
Africa										
Morocco	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5
Tunisia	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.4	0.4	0.3
South Africa	0.3	0.2	0.2	0.2	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
Libya	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1
Other Countries	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Total Africa	**1.8**	**1.7**	**1.7**	**1.7**	**1.8**	**1.8**	**1.8**	**1.9**	**1.9**	**1.7**
Oceania										
Oceania	7.0	6.0	5.8	6.3	5.8	3.9	4.3	6.5	8.7	9.1
Total Oceania	**7.0**	**6.0**	**5.8**	**6.3**	**5.8**	**3.9**	**4.3**	**6.5**	**8.7**	**9.1**
CIS										
CIS	24.4	25.3	25.0	26.7	28.2	29.7	31.0	33.6	34.5	31.4
Total CIS	**24.4**	**25.3**	**25.0**	**26.7**	**28.2**	**29.7**	**31.0**	**33.6**	**34.5**	**31.4**
World Total	**891.7**	**859.4**	**828.3**	**842.4**	**830.8**	**848.7**	**836.4**	**842.5**	**828.6**	**729.8**

Taking each sector in turn, as noted above electrical and electronics offtake fell by around 15%, with the loss of production concentrated in the consumer electronics sector. For example, the multi-layer ceramic capacitor (MLCC) industry was impacted by the first ever drop in global cell phone shipments (albeit by a modest 4%). The market for copper:nickel alloys, however, bore the brunt of the decline, having taken significant market share from silver:palladium blends some years ago, which were therefore shielded from much of the downturn. Having lost much of the mass market for precious metal bearing MLCCs, this industry has become increasingly reliant on defense applications. However, the defense industry tends to focus more on product performance, rather than input costs. And so, with this in mind, there appeared to be little incentive to thrift on the use of palladium, with average silver:palladium compositions in the United States broadly unchanged last year at 80:20.

In terms of electrical demand, as a broad category this appeared to be the least affected segment of US industrial demand. As noted in the introduction, the PV industry led the way in this regard, first in terms of a less pronounced drop during the early part of last year, which then gave way to a stronger upturn, relative to many other sectors of industrial demand. Another way in which the global recession hit the PV industry, was that US production of PV cells exceeded the level of installations. This apparent mismatch is likely to see fabrication lag behind PV installations during 2010, at least until the excess production is absorbed.

Elsewhere, the use of silver in contact materials fell sharply, not only because of the difficulties in the construction industry (for example for heavy duty switches), but also because of the sharp downturn in the country's automotive industry. A 19% drop in 2008 vehicle production was followed, last year, by a slump

Table 6 - Silver Fabrication: Industrial Applications (including the use of scrap - million ounces)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Europe										
Germany	20.8	21.4	21.2	21.7	23.5	23.9	25.5	27.4	27.5	19.9
UK & Ireland	16.5	14.3	13.9	14.9	15.5	12.4	12.5	12.0	12.1	9.1
Italy	10.9	10.4	10.4	10.2	11.5	10.9	10.9	11.3	10.6	8.3
France	12.3	15.9	14.6	13.8	10.3	10.2	10.4	10.7	10.8	7.5
Switzerland	8.3	2.7	2.7	2.3	2.4	2.6	2.5	2.5	2.5	2.2
Spain	2.0	1.3	1.3	1.2	2.1	1.9	1.9	1.9	1.9	1.7
Netherlands	1.7	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.3
Poland	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.7
Austria	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.5	0.5
Norway	1.2	0.7	0.6	0.6	0.8	0.7	0.6	0.5	0.5	0.4
Sweden	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Czech & Slovak Republics	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2
Belgium	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2
Other Countries	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.6
Total Europe	**76.6**	**71.1**	**69.1**	**69.0**	**70.5**	**67.0**	**68.6**	**70.7**	**70.3**	**52.8**
North America										
United States	95.1	78.7	83.1	86.8	94.2	100.8	106.8	114.1	119.0	96.8
Mexico	3.4	3.0	3.0	3.1	3.0	3.2	3.1	3.3	3.1	2.7
Canada	0.5	0.5	0.5	0.5	0.6	1.0	1.7	2.7	2.4	1.3
Total North America	**99.1**	**82.3**	**86.6**	**90.4**	**97.8**	**105.0**	**111.6**	**120.0**	**124.6**	**100.8**
Latin America										
Brazil	3.2	3.2	3.2	3.0	3.7	4.5	2.9	4.0	3.9	3.5
Argentina	0.8	0.6	0.6	0.6	0.6	0.9	1.0	1.1	1.0	0.8
Colombia	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
Ecuador	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	0.3
Total Latin America	**4.6**	**4.5**	**4.5**	**4.3**	**5.0**	**6.0**	**4.6**	**5.7**	**5.5**	**4.8**
Middle East										
Turkey	1.4	1.1	1.2	1.4	1.5	1.5	1.6	1.6	1.6	1.4
Israel	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7
Oman	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Egypt	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other Countries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Middle East	**2.6**	**2.2**	**2.3**	**2.4**	**2.5**	**2.5**	**2.6**	**2.7**	**2.7**	**2.3**
Indian Sub-Continent										
India	46.1	50.8	44.4	44.4	33.9	53.7	54.2	63.9	65.0	63.5
Pakistan	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Total Indian Sub-Cont.	**46.7**	**51.1**	**44.7**	**44.7**	**34.1**	**54.0**	**54.6**	**64.2**	**65.3**	**63.8**
East Asia										
Japan	72.1	55.4	59.1	60.4	73.7	84.1	89.5	90.9	73.7	41.6
China	21.9	22.3	25.6	27.6	30.1	31.8	35.1	39.1	39.2	35.2
South Korea	14.8	12.4	13.9	15.0	15.6	16.6	17.9	18.4	17.9	13.5
Taiwan	8.8	8.4	9.1	10.4	10.9	11.9	12.9	13.5	13.2	11.0
Hong Kong	3.9	2.7	3.0	2.9	3.1	3.2	3.4	3.6	3.5	2.8
Other Countries	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.8	0.6
Total East Asia	**122.0**	**101.7**	**111.1**	**117.0**	**134.0**	**148.2**	**159.5**	**166.2**	**148.3**	**104.7**

Table 6 - Silver Fabrication: Industrial Applications (including the use of scrap - million ounces)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Africa										
Morocco	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2
South Africa	0.2	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
Total Africa	**0.6**	**0.5**	**0.5**	**0.5**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
Oceania										
Oceania	2.5	2.1	2.1	2.2	2.2	2.0	2.1	2.1	2.1	1.9
Total Oceania	**2.5**	**2.1**	**2.1**	**2.2**	**2.2**	**2.0**	**2.1**	**2.1**	**2.1**	**1.9**
CIS										
CIS	19.6	20.1	19.3	20.3	20.9	21.6	22.9	23.9	23.9	20.5
Total CIS	**19.6**	**20.1**	**19.3**	**20.3**	**20.9**	**21.6**	**22.9**	**23.9**	**23.9**	**20.5**
World Total	**374.2**	**335.6**	**340.1**	**350.8**	**367.6**	**407.0**	**427.0**	**456.1**	**443.4**	**352.2**

of one-third in US auto output. Added to this were the bankruptcy filings for Chrysler and General Motors, with a pronounced knock-on effect for their suppliers.

The export trade in silver powders also offered some respite for the US trade, with volumes lower by 6% in 2009. In fact, deliveries into both Taiwan and China were up significantly in 2009, a product in part of China's stimulus package, which also provided some residual benefits for Taiwan. However, these were offset by a marked fall in trade with Japan and Germany in particular. In spite of 2009's solid performance, it is worth bearing in mind that the 2009 total still fell considerably short of the peaks achieved as recently as 2006-07 (during which time US exports of silver powders were some 70% higher than over the last two years).

The ethylene oxide (EO) sector also saw a notable decline in its silver consumption in 2009. As discussed in Chapter 5, a few small, sub-0.5 Moz (15 t) plants were closed last year, the corollary of which was a delay in new plant commissions which had been scheduled for 2009. Instead, many of these new capacity additions were simply put back until 2010, to take advantage not only of a stronger global economy, but also in terms of more receptive financial markets (in terms of securing capital).

United States Industrial Production

(Index, 2000 = 100)

2005	2006	2007	2008	2009
103.2	107.3	108.9	106.5	96.1

Source: OECD

Turning to brazing alloys (solders only account for a token level of US silver demand), this segment experienced a material drop in demand in 2009. In previous years, growing competition from imports has impacted US fabrication, but last year the drop was almost entirely a function of the US recession (with fabrication in Canada experiencing a more pronounced decline). In addition to pipeline destocking, the industry suffered from a marked downturn in the housing and construction sectors, which impacted demand for, as an example, air conditioning and heating units.

India

Industrial silver use in India saw a rise of 2% last year. This subdued result was due to two main reasons. First, there was a slowdown in growth in the 'authentic' industrial uses, namely electrical & electronics applications, and brazing alloys & solders. Second, a drop in offtake was recorded in the price-sensitive areas of industrial demand, including jari (gold/silver thread used in saris), foils and plating. Total industrial demand did nonetheless outweigh the combined use of silver in jewelry, silverware and investment (see Chapter 3 for further details on investment), restoring the picture of recent years that was disrupted in 2008.

The 'authentic' industrial sector accounted for a third of total industrial demand in India last year, compared to around 14% in 2000. This increase has been driven primarily by strong economic growth, and has proved relatively price insensitive (demand has risen in spite of the 247% increase in the rupee price over the same period). Last year, therefore, GFMS believe the main

Indian Vehicle Production

(units, 000s)

2005	2006	2007	2008	2009
1,422	1,680	1,964	2,065	2,334

Source: Global Insight

cause of the slow growth rate was the dip in Indian GDP growth, which fell to 5.7% last year from 7.3% in 2008, rather than the 10% increase in the average rupee silver price.

The use of silver in contact manufacturing grew by 5%, in 2009. Sluggish offtake from the construction industry, which uses contacts for fuses and circuit breakers, was largely to blame for this result; both residential and commercial construction projects were often faced with slow progress, delays or outright deferral. In contrast, the fabrication of silver contacts for the automotive sector rose sharply, as vehicle production grew by 13% in 2009, according to data from Global Insight. Robust growth was also seen from the railway sector, due to increased demand for power, as the electrification of a number of lines started to progress last year.

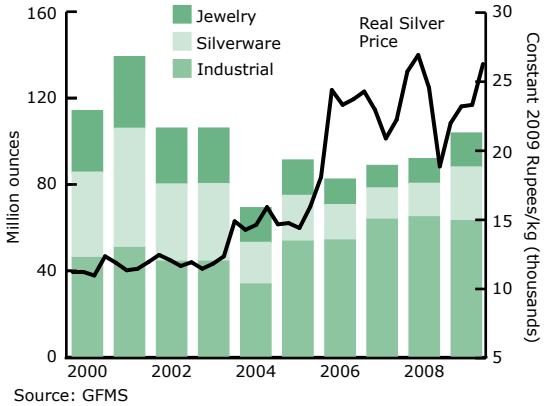
Growth in the production of brazing alloys and solders also eased last year, rising by 7%, compared to the 10% growth achieved in 2008. The liquidity crunch, combined with higher real interest rates, acted to not only curb private investment, but also impede government sponsored infrastructure projects, leading to a lethargic construction industry. Looking ahead, however, investment commitments have been made in the fiscal budget this year, including infrastructure and mass housing schemes, which should result in a boost in demand for silver.

Turning to the price sensitive areas of demand, the 10% rise in the average rupee silver price was the main cause of losses in this category, which made up over two-thirds of total industrial offtake last year. Of the different areas of demand here, the use of silver in jari suffered the most, seeing a double-digit fall. A jari sari that would have cost Rps 10,000 a decade ago would have cost at least Rps 150,000 last year. Chemical and plastic based jari, therefore, continued to replace real jari. In addition, the resale of old saris became prevalent last year, with small-scale dealers advertizing that they would buy old jari and kasab (a type of embroidery work that uses jari threads) in local jewelry markets. Although dealers' margins are understood to have held up, the high silver price also ensured a good return for the customer.

The use of silver in foils also fell in 2009, declining by 9% due to higher prices. Foils are used in the decoration of sweets, special food preparations and tobacco, as well as in temples for decorating idols of deities. Some fabricators are said to have compromised on the quality of foils by reducing the silver content. Comparatively, the decline in the use of silver in pharmaceuticals and ayurvedic medicines was limited at 5%, mainly as the pharmaceutical companies passed on the increase in input cost by raising the price of their products.

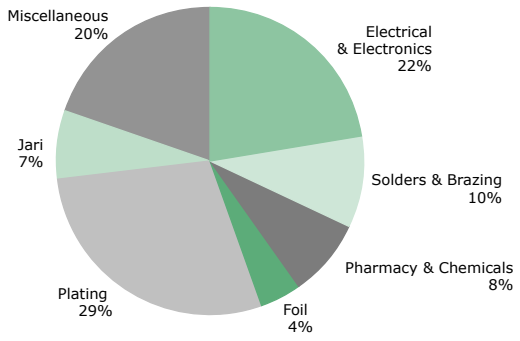
Demand for silver in plating fell by a relatively modest 4%, despite the 10% increase in the average annual price. High gold prices led to a strong rise in offtake of imitation jewelry, much of which is made of silver-plated copper. Plating for silverware showed a fall in offtake, although this was partly mitigated by some substitution from sterling silverware to plated silverware.

Indian Fabrication



Source: GFMS

Indian Industrial Fabrication, 2009



Source: GFMS

Japanese Industrial Production

(Index, 2000 = 100)

2005	2006	2007	2008	2009
101.7	106.3	109.3	105.8	83.3

Source: OECD

Japanese Non-Photographic Nitrate & Contact Production

Million ounces

	2006	2007	2008	2009
non-photo nitrates	23.9	24.5	20.8	12.3
contacts	11.3	11.4	9.9	6.1

Source: GFMS

East Asia

Last year, **Japanese** industrial demand plummeted by just over 30%, to 41.6 Moz (1,306 t). No sector was spared a decline, with the important exception of silver powder, used in photo voltaics. This bleak outcome was due almost entirely to the global economic contraction, which severely choked both domestic and export demand. Exports also faced the additional pressure of a strong yen, although they made a gallant recovery in the fourth quarter. There was, however, little hope that this could alleviate the rest of the year's considerable losses.

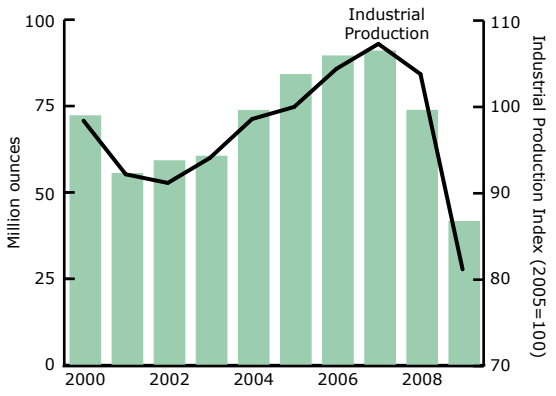
The non-photographic use of silver nitrate was one of the sectors that faced the sharpest decline, collapsing by an estimated 41%. The first quarter proved particularly painful for producers; indeed, a major fabricator reported an almost complete paralysis of orders in the first quarter, which meant that much of this period was used for factory cleaning. This was due to the fact that demand for end-use products, in electrical and electronic items, was sharply curtailed as the consumption of these largely non-essential goods evaporated in response to the severe economic downturn. In addition, cell phone operators changed their charging system, which led to a notable decline in demand for phones. Previously, the cost of contracts was high and the phone itself was cheap, whereas now the cost of contracts has been cut and the price of phones has increased, which has sharply reduced cell phone turnover.

Demand for silver contacts also faced a steep fall to some 6.1 Moz (189 t), due to not only a decline in their end-use in electronic goods, but also in their use in automobiles. Japan's total vehicle production fell by over 30% to below eight million units, the lowest level since the 1970s, despite the introduction of vehicle scrappage schemes both at home and abroad. The decline in contact demand was compounded by attrition in the construction industry, where new property construction plummeted by 28% year-on-year. This, too, was led by dire economic circumstances, which saw dwindling household incomes and sustained deflation, leaving few consumers willing to buy new homes.

Silver use in solders and brazing alloys, used mainly in the construction industry and air conditioning and refrigeration units, recorded a notable 29% decline in demand. The pattern of offtake, however, was somewhat different to that of other sectors of industrial demand, as this reportedly weakened towards the end of the year, rather than showing improvement after the first quarter. The earlier part of the year was able to maintain relatively steady demand as building projects which had been approved, and financed, in 2008 were still under construction. As the year progressed, however, fabrication declined as fewer projects came on stream, largely as funding for new projects had shrivelled by then. With regard to air conditioning units, use in these applications fell by almost 20%, according to the Japan Refrigeration and Air Conditioning Industry Association.

The use of silver in paste for plasma televisions (PDPs) is also believed to have declined last year, hit not only by slashed spending on discretionary goods, but also by ongoing market penetration by liquid crystal display televisions (LCD). In contrast to all other areas of industrial fabrication, however, total demand for silver

Japanese Industrial Fabrication



Source: GFMS, IMF

The Main Uses of Silver

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

Industrial

Silver is the best electrical and thermal conductor of all metals and is therefore used in numerous electrical applications, particularly in 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 used in the fabrication of photo voltaic cells has undergone a period of rapid growth and is set for further development, while demand for consumer electronics such as televisions and monitors using Plasma Display Panels (PDP) and CD-ROM have added to demand. Silver conductive inks are also now used in the area of printed electronics, to meet the need for low-cost processing in the high-growth and emerging markets such as Organic Light Emitting Diodes (OLEDs) and sensors as well as the developing radio frequency identification (RFID) tag segment. The ease of electro-deposition of silver from a double-alkali metal cyanide, such as potassium silver cyanide, or by using silver anodes accounts for its widespread use in coating. Silver is also used as a coating material for optical data storage media (DVDs, for example).

The unique optical reflectivity of silver, and its property of being virtually 100% reflective after polishing, allows it to be used both in mirrors and glass coatings, cellophane or metals. Batteries, both rechargeable and non-rechargeable, are manufactured with silver alloys (increasingly silver:zinc) as the cathode and is regarded as a rapid growth area. Although expensive, silver cells have superior power-to-weight characteristics than 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 though demand from laptop and automotive industries is growing rapidly. Silver, usually in the form of mesh screens but also as crystals, is 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. Silver is employed as a bactericide and algicide in an ever increasing number of applications, including water purification systems, surface treatments and disinfectants. The joining of materials (called brazing if done at temperatures above 600º 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, usually 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 disturbs 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.

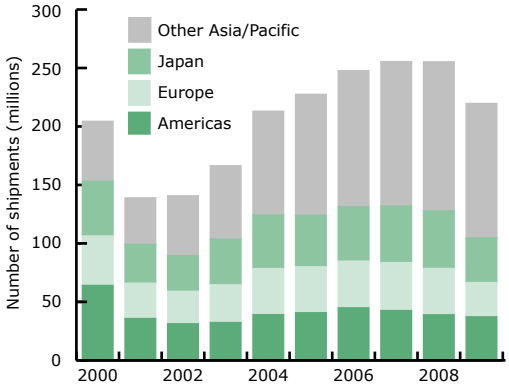
Jewelry and Silverware

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 less 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



Source: SIA

paste showed a notable gain. The silver powder required to make this paste, destined for use in photo voltaic (PV) cell production, was the largest single sector of silver demand in Japan last year, and grew by some 30%. This was driven by strong demand, both domestic and export, which took full year total production in Japan to almost 18 Moz (550 t). Looking ahead, PV is expected to consolidate its position as the leading end-use for silver in Japan. Thin film technology (which uses trivial amounts of silver) has as yet to make significant inroads into the market, as the government remains cautious of potential problems that may arise from using cadmium telluride (CdTe) thin films, owing to cadmium's toxicity.

GFMS estimate that **Chinese** industrial uses of silver fell for the first time since our series commenced in 1990, falling 10% to 35.2 Moz (1,095 t) last year. Despite the domestic economy growing at a robust rate of 8.7%, China was far from immune from the global financial crisis with exports falling acutely in some key industrial sectors (particularly shipments to Japan and the United States) as foreign economic conditions deteriorated, triggering many factory shutdowns and increased unemployment in several cities along the Pearl River Delta. Domestic consumption held up reasonably well (following a fragile start to the year), after the government's stimulus package saw offtake rebound, which in turn saw silver demand used in some applications actually improve on 2008 levels or in some instances retreat only slightly.

Looking at each sector in turn, the largest of these, electrical and electronics offtake, is estimated to have fallen by as much as 10% last year, principally due to a decline in exports. According to the Chinese Ministry of Industry and Information, exports of computer components fell 12% last year while electronic components, electronic materials, and other basic exports fell a more significant 23%. Furthermore, substantial year-on-year falls were recorded in several other segments, with exports of LCD panels dropping 14%, wireless handset parts down 11%, and LCD monitors were weaker by as much as 40%. On the other side of the ledger, exports of assembled computers increased year-on-year (albeit modestly) as did LCD televisions and cell phone handsets, with the former increasing by 14%.

While demand in existing end-uses may have fallen in 2009, offtake of silver in emerging industrial applications continued to gain some momentum though the pace of growth was slowed somewhat by the global economic problems. Thin film photo voltaic cell production, printable conductive inks for use in printed electronics, LED and OLED lighting were all segments that continued to expand as research and development shifted into full scale production facilities. In addition, production of RFID (radio frequency identification) tags was also an area that has continued to develop with China regarded as the world's largest market for RFID by value.

Chinese brazing alloy and solder demand fell by 12% last year, to 11.0 Moz (342 t). It was mainly the export sector that limited growth opportunities, with local consumption retreating only marginally. On the domestic front, there had been a slowdown in infrastructure projects since work was finalized for the 2008 Olympic Games, in spite of some offset from the 2010 Shanghai Expo. However, economic stimulus projects, initiated by the government in 2009, boosted demand in the second half of the year as public works programs were initiated.

China's automotive industry was one sector that bucked the global trend in 2009, recording a significant increase in output. According to China's Association of Automobile Manufacturers, 13.6 million vehicles were produced last year, an increase of 46% which lifted China to the world's

Global Billings

(semi-conductor shipments per year, millions)

	World	Americas	Europe	Japan	Other Asia
2008	255.3	39.0	39.6	49.3	127.4
2009	219.7	37.2	29.3	38.3	114.9
Change	-35.6	-1.8	-10.3	-11.0	-12.5
Change %	-14%	-5%	-26%	-22%	-10%

Source: SIA

Table 6a - Silver Fabrication: Electrical and Electronics (including the use of scrap - million ounces)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
United States	51.5	34.1	37.6	39.5	47.4	52.1	55.0	57.7	61.4	52.4
Japan	36.7	26.6	29.4	30.2	38.0	43.7	46.0	46.8	38.7	22.1
Germany	14.3	15.7	15.6	16.2	17.7	18.3	19.7	21.4	21.7	15.7
China	10.3	10.3	10.9	11.8	12.8	13.5	15.2	17.3	17.3	15.6
India	4.8	4.7	4.9	5.1	5.4	9.6	10.0	12.5	13.5	14.2
Taiwan	7.0	6.9	7.6	8.9	9.2	10.2	11.1	11.6	11.3	9.4
South Korea	8.2	7.2	8.1	8.9	9.3	9.8	10.7	10.9	10.6	8.2
France	7.3	11.0	9.9	9.5	8.1	8.0	8.2	8.5	8.6	5.7
UK & Ireland	6.6	5.6	5.5	5.9	6.1	4.5	4.4	4.5	4.7	3.4
Hong Kong	3.5	2.5	2.8	2.7	3.0	3.0	3.3	3.5	3.3	2.7
Italy	3.1	2.8	2.8	2.9	3.8	3.5	3.6	3.8	3.4	2.6
Mexico	2.1	1.8	1.8	1.9	1.8	2.1	2.0	2.1	2.1	1.8
Brazil	1.3	1.3	1.3	1.2	1.7	2.1	0.9	1.5	1.5	1.2
Turkey	0.9	0.7	0.8	1.0	1.0	1.0	1.0	1.1	1.1	0.9
Australia	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.6
Netherlands	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4
Switzerland	5.3	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.4
Spain	0.3	0.0	0.0	0.0	0.3	0.3	0.3	0.4	0.3	0.3
Austria	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Other Countries	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
World Total	**164.8**	**133.1**	**140.9**	**147.7**	**167.6**	**184.0**	**193.6**	**205.7**	**201.6**	**158.1**

Table 6b - Silver Fabrication: Brazing Alloys and Solders (including the use of scrap - million ounces)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
China	6.7	6.9	7.9	8.7	9.7	10.3	11.3	12.5	12.5	11.0
India	1.8	1.8	1.9	2.1	2.2	4.2	4.3	5.2	5.7	6.1
United States	8.7	8.3	8.4	7.9	7.3	7.7	7.2	7.7	7.2	5.2
Japan	4.4	3.5	3.3	3.3	3.7	3.8	3.9	4.0	3.7	2.6
Germany	3.2	2.8	3.0	3.1	3.2	3.2	3.4	3.6	3.5	2.0
UK & Ireland	2.8	2.7	2.5	2.8	3.0	2.9	3.1	2.4	2.3	1.8
Italy	2.1	2.0	2.1	2.0	2.0	2.2	2.4	2.5	2.4	1.8
South Korea	1.0	1.2	1.4	1.4	1.4	1.9	2.0	2.1	2.2	1.7
Switzerland	1.6	1.3	1.3	1.4	1.4	1.5	1.4	1.4	1.4	1.2
Canada	0.3	0.3	0.3	0.3	0.4	0.8	1.5	2.4	2.2	1.1
Taiwan	1.2	0.9	1.0	1.1	1.1	1.1	1.2	1.3	1.2	1.0
Brazil	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.9
Spain	1.1	1.0	1.0	0.9	0.8	0.6	0.6	0.6	0.6	0.6
France	1.1	1.0	1.0	0.8	0.7	0.8	0.8	0.9	0.8	0.5
Australia	0.8	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5
Mexico	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4
Netherlands	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Israel	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Other Countries	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2
World Total	**38.6**	**36.1**	**37.4**	**38.0**	**39.3**	**43.2**	**45.4**	**48.9**	**48.1**	**38.8**

New Uses of Silver in Industrial Applications

While the price of silver is currently benefiting from its precious metal status, it will undoubtedly be its industrial properties in future years that will ensure physical demand endures (well after the current investment cycle subsides), with the metal expected to play a pivotal role in new industrial applications. The main growth areas over the past decade have predominately been in electronics, renewable energy and health sectors, all of which rely on the properties of the metal as a catalyst, for storing or conducting electricity and as a biocide, and it is from these broad areas of development that novel areas of silver demand are likely to emerge on a commercial scale.

Over the last decade, the photo voltaic (PV) industry has emerged as a significant industrial user of silver, growing at an exponential rate as science has raced to replace the world's dependency on burning fossil fuels to generate energy. GFMS estimate silver demand for this sector to have reached 28.0 Moz (870 t) in 2009 and, with PV cell production regarded as a safe, clean, efficient means of future power generation with very low environmental impact, it is expected to be a major segment of silver demand in future years. Moreover, industry projections have silver offtake potentially reaching 186 Moz (5,800 t) per annum by 2020 (see the PV focus box for more on this).

Silver has historically been recognized as a substance useful for treating ailments and for its anti-bacterial qualities. In recent years these health benefits have been proven in the laboratory and are now emerging in mainstream applications for both the industrial and consumer markets. Silver products used in the medical field, such as bandages impregnated with silver sulfadiazine to treats burns and injuries have been around for a number of years and are now widespread and available from the local pharmacy.

However, it is in other medical developments (mainly in the area of nano-technology) that may see silver demand increase as penetration by this technology gains momentum. Moreover, silver impregnated medical instruments such as intravascular catheters or endotracheal tubes, for example, have proven to reduce infection and this opens the door for a vast array of applications. Indeed, there are few areas in the medical field where the use of silver cannot be beneficial. Functional paints and coatings (including glass and plastics) containing silver are also able to reduce the growth of unwanted bacteria and other micro-organisms where a high level of hygiene is critical.

In the household environment, demand for silver is also expected to rise as new anti-bacterial uses are being trialed and introduced. Several ranges of clothing are currently available using anti-microbial silver and odor absorbing carbon nano-particles, as are washers and dryers based on the same principles. Air cleaners, air conditioners, and water filtration systems are just some of the basic home appliances that are expected to generate demand for silver. The market for anti-microbial additives in plastics and polymers with retained anti-bacterial effects has experienced significant worldwide growth over the last several years. This growth has been driven primarily by the increasing occurrence of infections caused by bacteria and fungi. This technology can be used in almost every application, with tap fittings, bench tops or light switches such examples where silver can be used to fight bacteria.

The quantity of silver used in these medical applications remains modest currently due to the lead times in adopting new technology but over time is expected to grow. That said, while unit demand is likely to grow substantially, given the extremely modest amount of silver which will be absorbed by each product, the total amount of silver consumed in this area is not expected to materially alter the future trend in total industrial demand.

Two new areas that have gained momentum in the last few years have been the development of silver oxide batteries and silver conductive inks used increasingly in the electronics field. While silver used in batteries is not new, the most common being the button shaped silver oxide cell, with annual global demand of approximately 4.8 Moz (150 t) it is the area of high-performance silver-zinc rechargeable batteries that is showing considerably potential for use in laptops, mobile devices and importantly the automotive industry, with this area expected to expand rapidly. Similarly, silver inks, used mainly in such applications such as membrane switches and PCBs is set to expand as demand for RFID technology continues to develop.

In addition, silver conductive inks for use in printed electronics to meet the need for low-cost processing in emerging markets such as Touch Screens and devices such as Organic Light Emitting Diodes is another area set for explosive growth. According to industry estimates, the printed electronics market is expected to reach $10 billion by 2012, and as much as $300 billion by 2025. These nano-silver inks can offer higher resolution, improved performance, and reduced material usage compared to thick film silver pastes, opening the door to substantial markets for silver inks that would not be available to conventional silver pastes.

Elsewhere, demand for silver used as a wood preservative is growing with offtake from the timber industry expected to expand to some degree as environmentally friendly alternatives to solvent based preservation systems are legislated.

Global Photo Voltaic Market

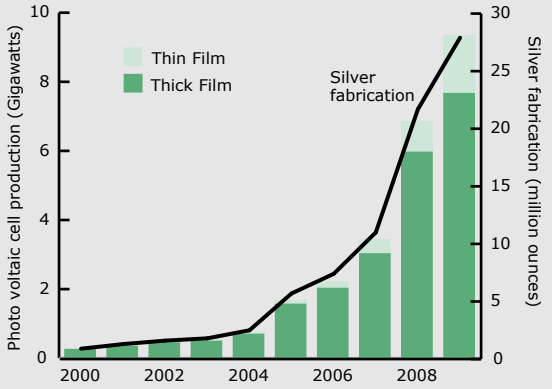
Silver demand for the production of photo voltaic (PV) cells reached an estimated 28.0 Moz (870 t) last year, an increase of 30%. Although this high growth rate in the midst of a global economic downturn can be partly attributed to the fact that PV demand is still arguably in an early growth phase, it is also testament to the seriousness with which producers, governments and consumers take solar power as an energy source. In 1999, solar installations reached 280 Megawatts (MW); last year they soared to 7.3 Gigawatts (GW), against global *production* of 9.3 GW, according to Solarbuzz.

There are two broad groupings of PV cells, thick and thin film. It is the former which is of interest in terms of silver demand, as the latter is understood to use only trivial volumes of the metal. At present, thick film holds a roughly 80% market share, although the proportion of thin film has been increasing steadily. That said, thin film technology will likely take some time before it makes significant inroads into thick film technology, as, despite thin film's lower production costs, its higher implementation expenses and lower efficiency have yet to be convincingly overcome.

Thick film cell production came to 7.6 GW in 2009, out of a total of 9.3 GW. As noted above, this is equivalent to 28.0 Moz (870 t) of silver fabrication. This is based on GFMS' estimates that around 3,650 ounces (114 kg) of silver is currently required (in the form of paste) in thick film technology to generate one MW of energy. In certain applications, however, the amount used can be considerably higher. The 9.3 GW of production last year compares with 7.3 GW of installations, indicating that cell output exceeded demand. This led to module prices falling by 38%, to the benefit of thick film consumption, as its price premium to thin film was eroded.

Looking ahead, silver offtake in PV is set to increase in future, with some estimates forecasting as much as 186 Moz (5,800 t) of silver use by 2020. However, this will be partly contingent on the extent to which government subsidies will still be available, and also solar power's relative affordability compared to other energy sources in the future.

Photo Voltaic Production



Source: Solarbuzz, Photon International, GFMS

largest producer. Modern vehicles use silver in a myriad of applications such as switches, window de-misters, and within electronics such as GPS navigation systems and these are regarded as areas of exponential growth, particularly given the probable introduction of silver:zinc batteries into the emerging electric car market.

Industrial demand for silver in **Hong Kong** declined 20% in 2009 to 2.8 Moz (88 t). As was the case elsewhere, the hefty fall was largely attributable to an acute decline in demand in the first six months of the year for electrical and electronic components, as manufacturing reacted to the deteriorating economic conditions and acute fall in end-user demand. The performance of Hong Kong's economy largely hinges on exports, given its status as a free trade hub and a small but open economy. However, in 2009 this sector recorded a marked decline, with trade to mainland China (46% of total exports) falling by almost 25%, while exports to the United States and Taiwan slumped by more than 50% year-on-year.

South Korea's industrial demand fell by almost 25% last year to an eight year low. The bulk of the drop was due to losses in the electrical and electronics segments though a marked slowdown was recorded across most arenas, including the automotive components industry, chemical and manufacturing segments. Brazing alloys and silver solder demand was also weaker as a result of the economic slowdown. Moreover, South Korea's exports were down almost 14% in 2009 due to decreased demand from the developed market economies with first half offtake acutely affected by the fragile financial environment. Looking more closely at individual sectors reveals a broad slowdown across a myriad of applications. Indeed, it is estimated that demand for the key electronics industry fell 23% last year to 8.2 Moz (254 t) chiefly due to a lack of consumer demand from both the stagnant domestic economy and from key export markets, with growth from emerging applications such as smart phones, LED, and photo voltaic film insufficient to offset the wider decline.

Elsewhere, the automotive industry's catastrophic slowdown during the first half of the year had a material effect across the supply chain for electrical components, while a weaker manufacturing sector saw offtake for brazing alloys and solders slip 24% to 1.7 Moz (52 t) according to GFMS analysis. In addition, silver fabrication in ethylene oxide catalyst production also fell despite a new manufacturing facility being commissioned in May last year as demand from the major market of China declined substantially, forcing production to be scaled back accordingly.

In a clear indication of the severe impact of the global economic crisis, **Taiwan's** industrial uses of silver declined by 17% last year to 11.0 Moz (341 t), a level not seen since 2004. In 2009, Taiwan's GDP contracted 1.9% with exports dropping by 20%. The drop was largely due to weak demand for Taiwan's electronic and electrical equipment, which accounted for over 45% of Taiwan's total exports' value. The first half of the year was by far the most toxic, with offtake in the period slumping close to 30% as consumer demand, and that of the entire supply chain, fell away acutely as economic uncertainty increased.

In contrast to many other major global fabricating countries Taiwan's decline was at the lower end of the scale as rising demand (particularly in the second half of the year) from China limited the damage. Moreover, Chinese demand (which accounts for almost 40% of Taiwan's total exports), for electronics and optical products such as flat panel display, LED and PC motherboards, curbed the decline in the second half of 2009 to below 6% year-on-year.

Photography

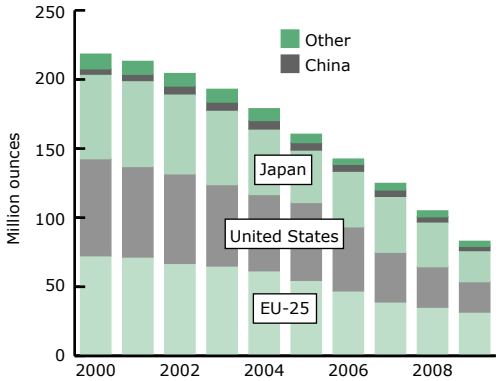
- ***Demand for silver in photographic applications dropped by 21% last year to less than half the level seen five years ago.***

Global photographic demand for silver declined by 21% last year, falling below 83 Moz (2,577 t). This eclipsed 2008's record drop, in both percentage and tonnage terms, and marked the lowest level of offtake since GFMS' data series began in 1990. At that time, photographic fabrication comprised the largest single sector of global silver demand, accounting for around 30% of offtake; in 2009, however, its share of total demand fell to a modest 9%, to become only the third largest end-use sector.

Part of last year's decline was, of course, due to the ongoing migration to digital solutions. With regards to silver halide-based analog systems, data from Photofinishing News indicates that worldwide demand fell for film rolls, for both consumer and professional use, by 26%, and by 9% for color negative paper. The global economic downturn also played a part in curbing demand last year, not least because the decline in tourism led to a drop in the number of holiday pictures being developed.

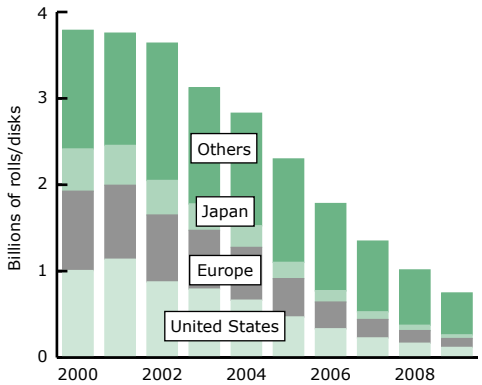
The medical sector, which accounts for the largest portion of silver in photographic fabrication, showed a comparatively modest decline of around 14% year-on-year. Not only was the conversion into digital deferred in some markets, but there was also steady demand for conventional X-rays from emerging markets, including India and China where digital technology in this field has yet to make significant inroads.

World Photographic Fabrication



Source: GFMS

World Consumer Film Sales



Source: Photofinishing News Inc.

Table 7 - Silver Fabrication: Photographic Use (including the use of scrap - million ounces)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Europe										
EU-25	72.5	71.6	66.9	65.0	61.6	54.7	47.1	39.0	35.2	31.7
Other Countries	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
Total Europe	**72.6**	**71.7**	**67.1**	**65.2**	**61.8**	**54.8**	**47.2**	**39.2**	**35.4**	**31.8**
North America										
United States	70.2	65.5	64.8	58.9	55.2	56.4	46.4	35.9	29.3	22.0
Total North America	**70.2**	**65.5**	**64.8**	**58.9**	**55.2**	**56.4**	**46.4**	**35.9**	**29.3**	**22.0**
Latin America										
Brazil	2.4	2.3	2.1	2.2	2.2	1.4	0.0	1.4	1.3	1.0
Argentina	1.3	1.0	1.1	1.5	1.5	1.3	0.5	0.5	0.5	0.5
Total Latin America	**3.7**	**3.3**	**3.2**	**3.7**	**3.7**	**2.7**	**0.5**	**2.0**	**1.8**	**1.5**
Indian Sub-Continent										
India	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Sri Lanka	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Indian Sub-Cont.	**0.7**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.4**	**0.4**	**0.4**
East Asia										
Japan	61.2	62.2	57.8	53.9	47.4	38.0	40.2	40.5	32.4	22.5
China	3.9	4.5	5.7	5.8	6.1	5.4	5.0	4.6	3.7	3.1
Total East Asia	**65.0**	**66.7**	**63.5**	**59.7**	**53.6**	**43.3**	**45.3**	**45.1**	**36.1**	**25.6**
Oceania										
Australia	2.7	2.4	2.3	2.1	1.5	0.1	0.1	0.1	0.1	0.1
Total Oceania	**2.7**	**2.4**	**2.3**	**2.1**	**1.5**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
CIS										
CIS	3.2	3.1	3.0	2.8	2.7	2.6	2.4	2.1	1.8	1.5
Total CIS	**3.2**	**3.1**	**3.0**	**2.8**	**2.7**	**2.6**	**2.4**	**2.1**	**1.8**	**1.5**
World Total	**218.3**	**213.1**	**204.3**	**192.9**	**178.8**	**160.3**	**142.4**	**124.8**	**104.9**	**82.9**

Looking ahead, the future of silver use in photographic applications looks set to decline yet further. Although there is likely to remain a core of demand for halide technology, this will largely be reserved for niche artistic applications, as consumer photography, the motion picture industry and radiography shift yet further into digital technology. Indeed, the fact that all major photographic companies are making concerted efforts to diversify their product portfolios away from traditional halide-based photography is an indication of things to come for global silver demand in this sector.

In the **United States**, photographic demand slumped by 25% last year to reach 22.0 Moz (684 t). This was symptomatic not only of the continuing substitution into digital technology, but also of the recessionary environment, in both consumer and motion picture film. For the former, fewer vacations resulted in less photographs being taken; indeed, demand for 24 exposure films fell by 29% last year, according to Photofinishing News. For the latter, constrained budgets led to lower film production, and losses were further compounded by prolonged uncertainty over the Screen Actors Guild labor dispute, which having started in June 2008 was only resolved in June 2009.

Fabrication in **Europe** decreased by a lesser extent, albeit still by 10%, to total 31.8 Moz (990 t). Stronger declines in film (both consumer and professional) and color negative paper offtake, of 30% and 13% respectively,

Film & Paper Consumption & Photographic Fabrication

	2005	2006	2007	2008	2009
Film**	2,298	1,782	1,347	1,014	747
Paper^	1,474	1,359	1,251	1,156	1,050
Fabrication*	160	142	125	105	83

**Million of rolls, ^millions square meters, *Moz

Source: Photofinishing News Inc., GFMS

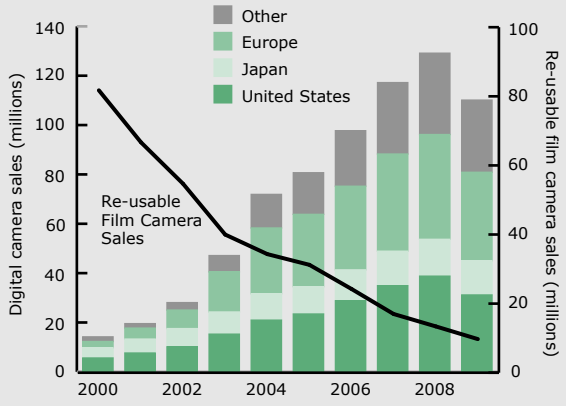
Digital Technology and the Photographic Market

Last year saw another hefty fall in silver use in photographic applications, continuing the trend that started in 2000. Over this ten-year period global demand in photography has suffered a cumulative decline of 145.0 Moz (4,510 t). The diminution in demand in 2009 was the most acute witnessed this decade with GFMS estimating demand slumped 21% last year to 82.9 Moz (2,577 t). The chief catalyst for such a significant and accelerated decline in offtake has been the rapid penetration of digital technology across an array of industrial applications, and most importantly, the migration away from analog cameras using silver halide film to digital cameras in the amateur market.

According to industry analysts Photofinishing News, photographic film sales fell 26% in 2009 and have now recorded a precipitous decline of over 80% since the start of the decade. In contrast, uptake of digital still cameras is reported to have risen from just 11 million units to almost 137 million units over the same period, clearly illustrating the diverging trends. Importantly, the ability of consumers to take a virtually unlimited number of photographs using digital cameras has not translated into increased demand for printed images as the vast bulk of images captured are stored in electronic form. Where once color negative film was processed in photo-labs on photographic paper (containing silver), selected images are now often printed on color inkjet printers in the home. However, growth in instant do-it-yourself minilabs, as print costs have fallen considerably, limited the fall in photographic paper consumption to single digits last year and to 40% this decade.

In addition to the decline in the consumer photographic market there has also been a downturn in demand for silver in the other key segments on the commercial side. The introduction of digital radiography systems at the expense of silver halide impregnated X-ray film has seen global demand ease in the area of healthcare, while migration from film to digital in the motion picture industry is also gaining momentum. Furthermore, updating to digital Computer to Plate (CTP) technology used in modern printing processes at the expense of the older Computer to Film (CTF) formats, (where the computer file is output onto a photographic film) has now already occurred across much of the industry, resulting in a material drop in graphics art demand.

Digital and Film Camera Sales



Digital camera sales include toy & entry level cameras
Source: Lyra Research Inc., Photofinishing News Inc.

were mitigated by a less severe fall in the medical sector. In some cases, digital conversions by medical institutions that had been scheduled for 2009 were deferred to this year, owing to financial constraints. The exception to this was the United Kingdom, where the transition to digital technology is already near completion. The decline from this sector in Europe as a whole may, therefore, be more pronounced this year, as pent-up demand for digital conversion takes place at an inflated rate.

GFMS estimate that silver use in photographic applications in **Japan** fell by just over 30% last year, to reach 22.5 Moz (700 t). Offtake declined from all three of the main areas of demand: photographic film; X-ray; and the graphic arts sector. Silver fabrication in Japan for photographic applications has been in decline for almost a decade now, with the exception of 2007 which saw manufacturing of a number of overseas operations being repatriated to Japan. The main reason behind the decline last year was the continued migration towards digital photography, which further consolidated its foothold in the market. Data from Photofinishing News shows that demand for 24 exposure film rolls (for professional and consumer use) fell by 30% in 2009. In addition, there was a reported decline in the use of silver for motion picture films. This was attributed to the fact that the economic contraction meant that fewer motion pictures were made last year, as investment in film production underwent a notable decline.

Silver use in X-ray applications is also estimated to have declined last year. This was partly driven by a decline in domestic demand, as hospitals have been offered financial incentives to adopt digital technology

over traditional halide X-rays. Future requirements for silver are expected to fall yet further, given the pace at which digital image processing systems have been implemented. This was especially marked in the second half of last year, which saw a boost in demand for (digital) diagnostic image processing systems of some 33% year-on-year, according to the Japan Industries Association of Radiological Systems (JIRA), in contrast to declines for almost all diagnostic X-rays.

The graphic arts sector is also estimated to have cut its silver usage, although at a lesser rate than was the case in 2008. While the migration into digital technology has been embraced with great enthusiasm in this sector, the capital required to refit an existing operation proved unattainable for many of the smaller outfits last year, thus deferring the future losses in silver use.

Photographic demand in **China** recorded a fall of 17% last year to 3.1 Moz (95 t), with this trend reflecting secular declines elsewhere and thus retreating as a result of the ongoing penetration of digital technology. The largest falls were recorded in the consumer photographic film and paper segment, with the rapid migration to digital cameras (particularly in urban centers) having a material effect on offtake. There were, however, some positive growth segments led primarily by ongoing expansion of China's health system that saw medical demand for low-end analog X-ray equipment increase in 2009. Moreover, this area is set for rapid expansion after the central government announced last year it will fund construction of 2,000 county-level hospitals and 29,000 township hospitals, and while most city hospitals will receive digital radiography technology, regional facilities most likely will continue to use cheaper silver halide analog systems.

Jewelry

• ***Jewelry fabrication in 2009 fell, if only by 1%, to an 11-year low of 156.6 Moz (4,870 t).***

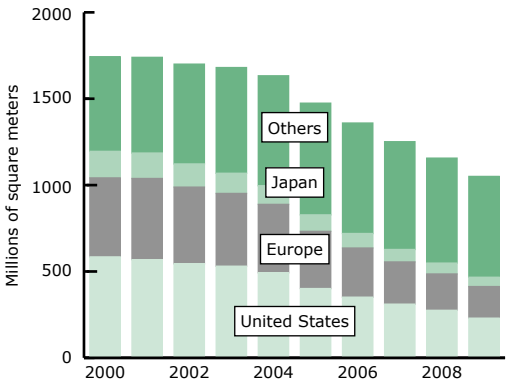
Jewelry demand slipped a modest 1.1% to 156.6 Moz (4,870 t) in 2009. Even if limited, that was the sixth fall in a row to a level 13% below the 2003 peak and to an 11-year low. The year-on-year changes for individual quarters did not vary greatly but there was a strong divergence between countries. Thailand saw the largest absolute fall while Italy, Turkey and the United States saw sizable losses. In contrast, India enjoyed a strong rebound while China saw further steady gains. These contrasts were mainly due to the impact on jewelry exports of the slight dip in consumption and destocking in the core markets of the industrialized world.

Europe

Jewelry fabrication in Europe last year fell by 6%, chiefly as a result of losses in Italy brought about by a fall in its exports. The region's retail-level consumption, however, is estimated to have risen a fraction.

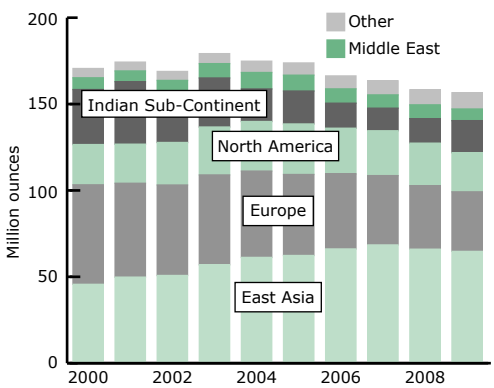
Italian jewelry offtake fell for the ninth consecutive year to a 14-year low of 21.3 Moz (663 t) in 2009. As gloomy as that sounds, the year's drop of 6% was, despite tough economic times, lower than the four previous years' average of 10%. Italy also remains the third largest fabricator after Thailand and China. The prime cause of the drop was exports' 6% fall. Losses here were greatest in shipments to elsewhere in Europe, with the UK take particularly weak. The largest decline for any single country, however, was in direct exports to Russia, where losses were getting on for double the fall in shipments to the United States.

World Color Photographic Paper Consumption



Source: Photofinishing News Inc.

World Jewelry Fabrication



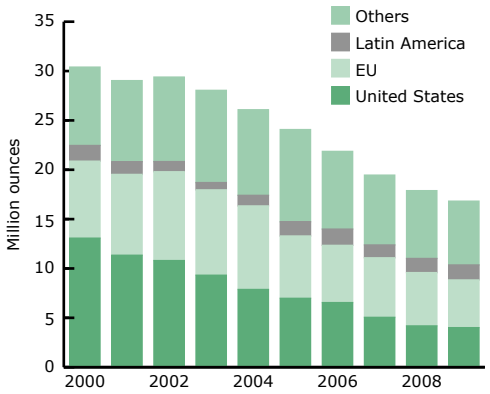
Source: GFMS

However, not all areas suffered losses, as exports to East Asia and South America grew. The fact that shipments to East Asia rose suggests that competition from rival producers is unlikely to head the list of factors behind the decline. It should also be remembered that some of the exports to East Asia are chain on spool for hand finishing and onward shipment to Europe and North America.

Arguably a more important driver was one facet of economic problems, destocking by retailers. This does much to explain why there was a gulf between consumption in Europe (which we believe rose a fraction) and its take from Italy (which fell by just over 10%). Structural change within consumption generally (such as a shift from plain to gemset) also continued to whittle away at the weight of silver sold. This in a sense became more apparent last year as much trading down from gold was to high margin, light pieces (a key factor behind the fine weight drop in US-bound shipments). It is also worth reiterating that trading down in general (another facet of economic problems) is usually poor for the fine silver weight as gains from gold, while good for value, tend to get outweighed by losses at the lower end to base metals. Italian consumption itself fell a little, being hit by competition from non-precious metal jewelry, a weak economy and limited interest in silver per se.

It might seem odd to place much blame on a third aspect of recent turmoil, elevated silver prices, given that one of silver's obvious rivals is gold. However, industry contacts reported that demand last year seemed more price sensitive last year, with sales very strong when prices dipped below €300/kg (in April and in July) and weak when prices moved well above €350/kg (from September onwards). This is born out in the monthly export data;

Official Italian Jewelry Exports*



Source: GFMS;* finished pieces only

after double-digit year-on-year losses in the economically traumatic first two months of the year, exports were stable to higher through to August after which marked losses returned. However, it is important to note that this was mainly due to the trade flexing its buying rather than final consumers reacting to the price.

German fabrication ended 2009 down just over 5%. Jewelry imports also fell, and actually more steeply. Nonetheless, the country's consumption (which is of a similar scale to India and China's) was invariably reported as stable, in terms of purchases by consumers. This discrepancy is thought to be resolved by notable destocking at the retail level. Within 2009, fabricators reported sales to retailers in the first half as broadly stable year-on-year but weak in the second half. This was mirrored in imports, which rose by 5% year-on-year in the first half and fell by 16% in the second (gross weight terms). Exports' intra-year behavior was more in line with the economic cycle, falling sharply in the second quarter but achieving stability in the third and fourth.

Jewelry fabrication in **France** bucked the global and regional trend, rising almost 10% last year. This was driven by domestic consumption gains, with sales up 9% in unit terms according to Société 5. Growth was reported in particular for shopping mall retailers, with gains generally attributed to a mix of substitution from gold and silver's own perceived desirability. These benefits were not all lost to imports as these, in fine weight terms, rose a little less. Exports, however, fell notably but their importance in weight terms is limited.

Although **UK** jewelry fabrication fell last year, of greater importance was the more robust performance of jewelry imports. This reflected the retail sector's, and primarily the independent network's, shift in favor of sterling silver. In fact, the popularity of silver jewelry (and the country's gold jewelry scrap collection) enabled a number of small retail shops to avoid bankruptcy. In terms of sterling silver, one of the most successful products was charm bracelets, fitted with low cost beads that could be purchased individually but, together, amounted to a significant retail price point, thereby generating repeated customer visits as well as meeting a wide range of budgets.

Russia suffered a massive economic recession last year, with the country's GDP falling by 8% and the rouble

Table 8a - Silver Fabrication: Jewelry and Silverware (including the use of scrap - million ounces)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Europe										
Italy	55.5	49.4	46.9	45.3	43.4	39.5	35.2	32.2	27.8	25.0
Germany	9.1	8.7	7.9	7.7	7.3	6.8	6.8	6.5	6.2	5.4
Poland	3.0	2.5	2.3	2.9	3.1	3.4	3.6	3.2	3.1	2.4
Other Countries	20.1	17.8	16.3	15.9	14.6	13.4	12.8	11.4	11.2	10.1
Total Europe	**87.7**	**78.4**	**73.3**	**71.8**	**68.3**	**63.1**	**58.4**	**53.4**	**48.2**	**42.9**
North America										
Mexico	13.2	12.9	14.0	15.6	16.2	16.4	14.0	13.6	13.0	12.0
United States	13.4	13.0	13.7	15.1	15.4	15.7	15.0	14.2	13.0	11.6
Canada	1.8	1.5	1.5	1.7	1.6	1.4	1.2	1.1	1.0	0.9
Total North America	**28.4**	**27.4**	**29.3**	**32.4**	**33.2**	**33.5**	**30.1**	**28.9**	**26.9**	**24.6**
Latin America										
Total Latin America	**4.5**	**4.1**	**3.9**	**4.0**	**4.3**	**4.6**	**5.0**	**5.0**	**5.1**	**5.4**
Middle East										
Turkey	6.0	5.3	6.8	7.9	8.7	8.3	7.2	6.2	6.7	5.1
Other Countries	7.1	6.7	6.4	6.6	7.0	7.0	6.9	6.9	6.6	6.0
Total Middle East	**13.0**	**11.9**	**13.2**	**14.5**	**15.7**	**15.3**	**14.0**	**13.1**	**13.3**	**11.1**
Indian Sub-Continent										
India	68.0	88.4	61.7	61.7	35.4	37.6	28.2	24.9	26.9	40.5
Bangladesh & Nepal	6.0	5.9	4.8	4.5	4.2	3.7	3.6	3.6	3.7	3.6
Other Countries	2.3	1.7	1.7	1.7	1.9	1.9	1.9	1.9	1.9	1.9
Total Indian Sub-Cont.	**76.3**	**96.1**	**68.2**	**67.9**	**41.5**	**43.3**	**33.8**	**30.5**	**32.5**	**46.0**
East Asia										
Thailand	30.8	32.7	32.3	36.2	36.9	36.8	36.8	36.5	33.3	30.4
China	9.1	11.5	14.3	17.1	20.5	22.6	26.2	29.5	29.8	29.3
South Korea	4.9	4.6	4.5	4.6	4.7	4.7	4.8	4.9	4.8	4.8
Indonesia	3.7	4.7	4.0	4.1	5.2	4.5	5.1	4.8	4.8	4.7
Other Countries	5.1	5.1	5.1	5.1	5.4	5.8	5.7	5.9	5.8	5.9
Total East Asia	**53.6**	**58.6**	**60.1**	**67.2**	**72.7**	**74.4**	**78.6**	**81.6**	**78.6**	**75.2**
Africa										
Total Africa	**1.2**	**1.1**	**1.1**	**1.2**	**1.2**	**1.2**	**1.2**	**1.3**	**1.3**	**1.2**
Oceania										
Total Oceania	**0.8**	**0.7**	**0.8**	**0.7**	**0.8**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
CIS										
Russia	0.9	1.4	1.8	2.6	3.6	4.4	4.6	6.6	7.8	8.5
Other Countries	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.8	0.7
Total CIS	**1.5**	**2.0**	**2.4**	**3.3**	**4.3**	**5.2**	**5.4**	**7.4**	**8.6**	**9.1**
World Total	**267.0**	**280.3**	**252.3**	**263.1**	**242.0**	**241.3**	**227.2**	**221.9**	**215.1**	**216.1**

Jewelry & Silverware

GFMS first began reporting jewelry and silverware discretely four years ago, although we have maintained combined presentation of the two. In general, demand for both components has been in decline over the last decade. Although jewelry accounted for 21% of total fabrication demand last year, an increase from its 19% share in 2008, this was more a function of a sharp downturn in offtake from industrial applications than an actual gain. Silverware offtake registered a modest increase of almost 5%, a surprising result given that it has mostly been on a steeper downward trajectory than jewelry. Dig beneath the headline number, however, and the explanation is clear. The apparent growth was driven mainly by concerted stock re-building in India, where inventory levels had shriveled to an unsustainably low level. The rise is thus more indicative of a rise in fabrication, rather than a recovery in consumer demand.

slumping against the US dollar. At first sight, therefore, it may seem astonishing that silver jewelry fabrication in 2009 actually recorded double digit gains in percentage terms. The explanation is that exceptionally high and rising local gold prices coupled with the impact of the economic slowdown forced both manufacturers and consumers into shifting from karat gold to silver products. This can also be seen by the fact that Russian gold jewelry consumption fell by close to a third in 2009.

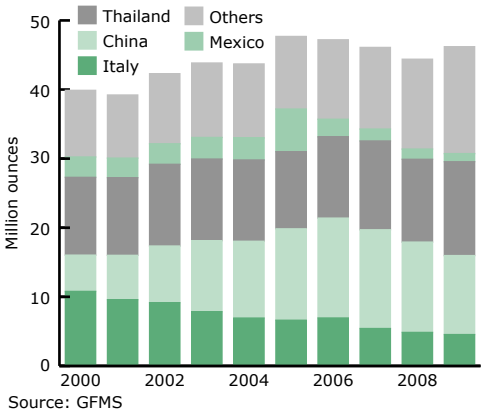
North America

In the **United States** it was of little surprise to see silver jewelry fabrication fall back, by around 10%, given the country's economic recession. However, two points are worth making. Firstly, the decline in jewelry consumption was not as marked, given the rise in jewelry imports and, secondly, in both cases neither suffered to the same extent as the country's gold jewelry market. In fact the two were interrelated, with rising gold prices encouraging the US retail trade to expand their assortments in silver. The trend away from gold was by no means uniform, with low to mid-tier major retailers focused on silver-bonded-gold jewelry. This was often in a 90:10 sterling silver:14-karat gold configuration, although as the year progressed, 95% silver became increasingly common. For many outlets, this avoided the need to introduce 10-karat gold, which might have been viewed as a downgrade. In contrast, for higher end majors and much of the independent retail network, sterling silver was the preferred route.

Given the sensitivity of shifting away from gold, and the perceived drop in quality this might convey, there was a proclivity to buy in branded rather than generic products. As well as offering greater margin stability, gold-bonded-silver items were often sold at gold retail price points, in the process delivering a significant boost to retail margins.

Were it not for the shift away from gold, US silver jewelry fabrication might have experienced a far more substantial drop last year. The boost to US silver consumption also resulted in the first year-on-year improvement in silver jewelry imports since 2005. Driving the growth were India, Thailand and, to a lesser extent, the Dominican Republic, which offset a drop in trade with China. Shipments from Italy were also lower, although the drop was less marked than in recent years, partly because of the growing preference for designer sterling silver.

US Official Silver Jewelry Imports



Source: GFMS

Mexican silver jewelry fabrication declined by around 6% last year to 11.1 Moz (346 t). Given high and volatile silver prices plus the weak local economy, the drop in output was not that excessive. The main explanation for this outcome was a shift away from gold to silver jewelry production by local manufacturers. In the domestic market, even the lightest weight gold jewelry has simply become unaffordable for most consumers. Demand has therefore grown for more economical alternatives such as silver, gold-plated silver and costume jewelry. A similar tendency has been at work, of course, in Mexico's export markets. This was an important factor in limiting the drop in overall official Mexican silver jewelry exports to just 12% last year. The bulk of that decline occurred in shipments to the United States, with deliveries to the rest of the world little changed in aggregate.

Middle East

In the Middle East, jewelry fabrication dropped by 16% to an eight-year low. While manufacturing was lower across much of the region, the fall last year was concentrated in **Turkey**. This was hardly surprising, given the scale and speed of the country's recession, which not only impacted retail demand, but also produced a price elastic response as a weaker domestic currency pushed up local silver prices. There was, however, a modest offset, in terms of higher exports to the United States, not of sterling silver products, but of gold bonded to silver. Although the Turkish export industry was initially reticent about expanding into a relatively unknown area, the scale of the decline in their gold jewelry trade with the United States encouraged many companies to increase their product offering in this area.

Consumer Trends and Jewelry Consumption

Jewelry consumption in its core markets of the industrialized world looks to have fallen by a few percent last year. This contrasts sharply with gold jewelry, where losses were around a fifth. Some of this difference was due to price changes as the yellow metal's annual (dollar) average price rose by 12% while the silver price fell by 2%. It is therefore easy to see how substitution to less expensive silver could occur. However, that fails to explain why silver jewelry consumption in Europe rose by around 1% but fell by perhaps more than 5% in the United States. Similarly, economic performance in 2009 was not a clear guide, with EU-27 GDP falling by a faster 4.2% than the US dip of 2.4%. Differences within Europe were also marked, with Italian sales down a little while the French figure was up not far off 10%.

In assessing why US consumption 'underperformed', we should begin by stating that the above figures are in weight terms and, if we translate into value, a different picture emerges. US retailers strove to keep jewelry pieces at key price points and an obvious way to do that was to introduce silver in the place of gold. However, this process was very much in favor of high design sterling silver pieces or gold-clad silver jewelry. These would all have far higher markups than generic silver items and so the *value* of all silver jewelry sold in the United States might well have risen.

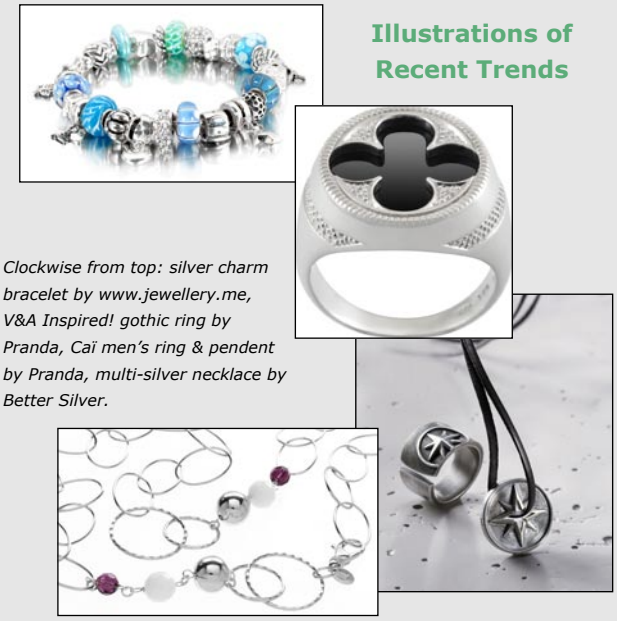
This phenomenon was less pronounced in Europe, partly as its markets tend to be less price point driven. There is also arguably a clearer gulf between the two metals as silver jewelry items in France, the United Kingdom and Germany would be seen by many as a more fashionable, youthful choice, fitting into an entirely different market segment to gold jewelry. As a result, a switch to silver was less of a feature. The main exception here is Italy, where silver is seen to have less cachet, meaning many consumers buying high fashion items might well have gone straight for costume jewelry and many trading down from gold would also have opted for that category and its well advertized brands.

Both gold and silver have suffered in weight terms from the structural changes seen in the industrialized world in recent years. These include a shift from heavy, plain, unbranded items to light, high design, gemset branded pieces, all of which trims expenditure on metal. By way of illustration, French silver jewelry (in unit terms) was 41% gemset in 2009 compared to less than 30% at the start of the decade (figures courtesy of Société 5.). Such changes are also continuing, as suggested by the average fine weight of hallmarked silver items in the United Kingdom dropping from 15.2g in 2008 to 14.2g last year. The greater inclusion of non-precious materials, a more recent development, also shows no sign of stopping, with the gulf between the gross and fine weight of Italian jewelry exports continuing to grow wider.

Silver jewelry is better able to cope with these trends than gold as pieces in silver can still achieve price points in the semi-disposable accessory market, which has performed far better than the middle ground of items retailing at several hundred dollars/euros and upwards. The brands in general tend to show more interest in silver as it too can sustain their generally higher markups over the fine metal price. One new area the brands are trying to push, and with some success, is men's jewelry and this niche remains strongly white in color.

On the subject of color, the recent flirtation with the 'yellow look' seems to have faded in our more troubled times. However, rose gold with its vintage connotations has done well and so it has not been a straight victory for the white look (which would tend to favor silver). The vintage theme fits in as part of a broader trend to more intricate, figurative designs away from clean 'high-tech' styles. This is a slight negative for metal use as more of a consumer's budget will get diverted to labor. The popularity of vintage or artificially aged designs is said to be bound up with a need to avoid overt displays of fresh spending but the introduction of these new styles should have been positive as it has required the fashion-conscious consumer to go out and buy these pieces.

Illustrations of Recent Trends



Clockwise from top: silver charm bracelet by www.jewellery.me, V&A Inspired! gothic ring by Pranda, Caï men's ring & pendent by Pranda, multi-silver necklace by Better Silver.

Elsewhere, **Egypt's** economic difficulties resulted in a 10% drop in the country's jewelry fabrication. The fall in consumption was not as pronounced, with jewelry imports, mainly from Dubai, falling to a lesser extent. This owed much to their increasingly attractive designs, which are often based on contemporary gold models.

Indian Sub-Continent

Indian jewelry fabrication rose to 15.7 Moz (487 t) last year, up a hefty 37%, the only significant rise in offtake since 2001. Although this outcome seems to imply a strong recovery in jewelry consumption, this was not the case. In fact, most of the rise in fabrication was due to an increase in jewelry stocks at the trade level, which was not matched by a rise in consumer demand at the retail level.

GFMS estimate that stock building of finished products by the trade accounted for at least 25% of total jewelry fabrication last year, reaching a total of 4.0 Moz (126 t). This was aimed at replenishing stocks which had been allowed to run down over the last six years, as the combination of falling consumption and rising prices made it unviable for the trade to maintain high levels of stocks. Our research meetings with retailers and fabricators in India suggested that stock levels had, in some cases, fallen below the optimum level necessary to simply supply their shops.

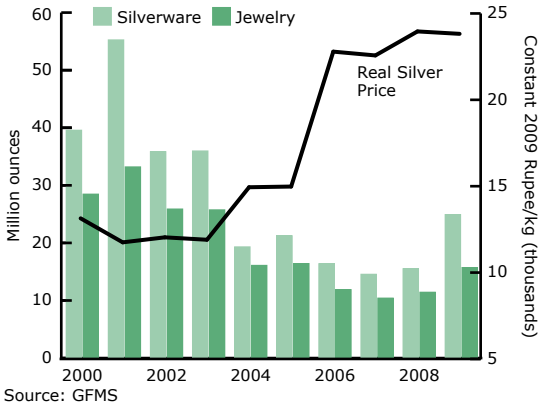
This build-up in trade stocks last year may seem surprising, not least because of the 10% rise in the rupee silver price. GFMS research, however, suggests that much of the bullion used for fabrication of jewelry (and silverware) last year had, in fact, been acquired by the trade in 2008 when the rupee silver price fell markedly, to below Rps 18,000/kg, following an intra-year price correction of 37%. Indeed, imports fell to close to a record low last year (2006 having marked the nadir of shipments this decade), indicating the limited use of newly imported metal for fabrication. In this context a methodological point needs to be highlighted: GFMS data sets only measure fabrication demand when bar is converted to a fully or semi-manufactured product.

Retail consumption rose by 6% last year. This was driven primarily by an improvement in demand from the rural areas which are the backbone of the heavy jewelry market in weight terms. Our information is that higher commodity prices and financial aid from the government for the farming community helped offset the impact of both higher inflation and higher silver prices. For example, research contacts in the Vidarbha region in the state of Maharashtra suggested that farmers realized Rps 5,000 per quintal last year, up from Rps 1,200 the previous year, for the key regional crop. In addition, the modern jewelry segment saw considerable growth in 2009, both locally and for exports. Among other things, higher gold prices spurred substitution into silver in both these markets. Ongoing urbanization, elevated prices and issues arising out of under-karating, however, continued to mitigate the gains somewhat.

East Asia

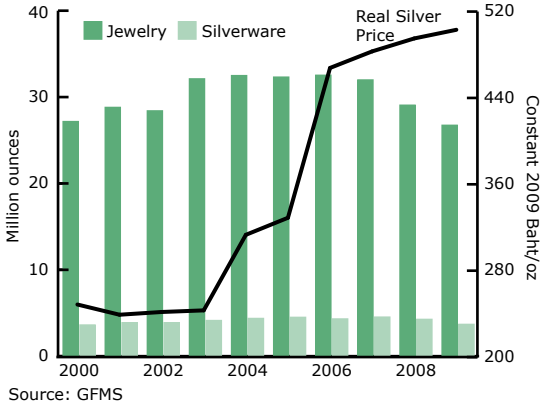
Thailand held on to the number one ranking as the world's largest silver jewelry fabricating nation last year, despite a sizable 8% fall, a smaller drop for Italy and a rise for China, with offtake slipping to an eleven year low of 26.7 Moz (832 t). Much of the fall was driven by a decline in exports, which account for the vast bulk of Thailand's offtake, with notable losses recorded in several key markets. Domestically, silver jewelry consumption recorded a modest gain, with this largely branded

Indian Jewelry and Silverware Fabrication



Source: GFMS

Thai Jewelry and Silverware Fabrication



Source: GFMS

Table 8 - Silver Fabrication: Jewelry (including the use of scrap - million ounces)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Europe										
Italy	38.9	37.2	36.7	35.7	34.2	31.5	28.2	25.8	22.6	21.3
Germany	3.6	3.7	3.3	3.6	3.7	3.8	3.8	3.9	3.9	3.7
Poland	2.9	2.4	2.2	2.8	3.0	3.3	3.5	3.2	3.0	2.4
France	2.6	2.5	2.4	2.4	2.0	1.5	1.6	1.7	1.6	1.7
Spain	1.4	1.4	1.5	1.7	1.4	1.4	1.3	1.1	1.1	1.2
Greece	1.0	1.0	0.9	1.0	1.0	1.1	1.1	1.0	1.2	1.0
Portugal	1.9	1.6	1.4	1.5	1.4	1.2	1.1	1.0	1.1	1.0
UK & Ireland	2.8	2.5	1.8	1.2	1.2	1.0	1.0	0.5	0.4	0.4
Sweden	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3
Switzerland	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Denmark	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2
Cyprus & Malta	0.3	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	0.2	0.2	0.2	0.2	0.1	0.1
Finland	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Austria	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Other Countries	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.6
Total Europe	**57.6**	**54.3**	**52.4**	**52.0**	**50.0**	**46.9**	**43.4**	**40.1**	**36.7**	**34.5**
North America										
Mexico	10.5	10.4	11.5	13.0	13.6	14.0	12.0	12.2	11.8	11.1
United States	11.2	10.9	11.8	13.4	13.8	14.1	13.5	12.9	12.0	10.7
Canada	1.6	1.3	1.3	1.4	1.4	1.2	1.0	0.9	0.8	0.8
Total North America	**23.3**	**22.6**	**24.6**	**27.7**	**28.7**	**29.3**	**26.4**	**26.0**	**24.6**	**22.6**
Latin America										
Brazil	1.0	1.0	1.0	1.2	1.3	1.4	1.5	1.5	1.5	1.7
Peru	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.4	0.5
Argentina	0.2	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.2
Colombia	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Ecuador	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
Other Countries	0.9	0.7	0.6	0.7	0.9	1.1	1.2	1.2	1.4	1.7
Total Latin America	**3.0**	**2.7**	**2.5**	**2.8**	**3.1**	**3.4**	**3.7**	**3.7**	**4.0**	**4.4**
Middle East										
Turkey	3.2	3.0	4.1	5.0	6.0	5.7	4.8	4.1	4.5	3.3
Egypt	1.5	1.3	1.2	1.4	1.5	1.4	1.3	1.4	1.3	1.2
Saudi Arabia	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6
Israel	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4
Other Countries	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2
Total Middle East	**6.8**	**6.2**	**7.3**	**8.3**	**9.5**	**9.2**	**8.3**	**7.7**	**8.0**	**6.7**
Indian Sub-Continent										
India	28.4	33.2	25.9	25.7	16.1	16.4	11.9	10.4	11.4	15.7
Bangladesh & Nepal	2.4	2.2	2.0	1.9	1.9	1.8	1.7	1.8	1.9	1.9
Other Countries	1.0	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	1.0
Total Indian Sub-Cont.	**31.8**	**36.2**	**28.7**	**28.4**	**18.8**	**19.0**	**14.5**	**13.1**	**14.2**	**18.6**
East Asia										
Thailand	27.2	28.8	28.4	32.1	32.5	32.3	32.5	32.0	29.1	26.7
China	7.0	8.8	11.0	13.1	15.6	17.4	20.2	22.9	23.6	24.4
South Korea	4.0	3.8	3.8	3.9	4.0	3.9	4.0	4.2	4.1	4.2
Indonesia	3.2	4.1	3.3	3.5	4.5	3.7	4.4	4.2	4.2	4.2

Table 8 - Silver Fabrication: Jewelry (including the use of scrap - million ounces)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Japan	1.7	1.6	1.6	1.5	1.8	2.0	1.9	2.1	2.0	2.1
Vietnam	0.6	0.7	0.8	0.8	0.9	0.9	1.0	1.1	1.2	1.2
Myanmar, Laos & Cambodia	0.6	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6
Malaysia	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Hong Kong	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3
Taiwan	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
Other Countries	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Total East Asia	**45.6**	**49.8**	**50.8**	**57.0**	**61.2**	**62.3**	**66.1**	**68.5**	**66.0**	**64.7**
Africa										
Morocco	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2
Tunisia	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Algeria	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other Countries	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3
Total Africa	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**	**1.0**	**1.0**	**0.9**
Oceania										
Australia	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6
Total Oceania	**0.8**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
CIS										
Russia	0.3	0.4	0.6	0.9	1.2	1.5	1.6	2.3	2.5	3.0
Other Countries	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.5
Total CIS	**0.7**	**0.9**	**1.1**	**1.4**	**1.8**	**2.1**	**2.2**	**2.9**	**3.1**	**3.5**
World Total	**170.6**	**174.3**	**168.9**	**179.2**	**174.8**	**173.8**	**166.3**	**163.5**	**158.3**	**156.6**

segment aimed predominantly at the middle class urban consumer and the tourist trade.

The first quarter of 2009 was perhaps the worst in over a decade for Thailand's fabricators as orders from across the wholesale supply chain collapsed due to the recessionary conditions experienced in most export markets. This slump in demand forced many family run silversmiths out of the industry as running costs outstripped cash flow. This has been an ongoing trend in recent years as rising metal prices, coupled with increased credit terms requested from foreign wholesalers have limited the opportunity for small scale fabricators to compete without sizable financial backing, and this has led to a sustained period of destocking. Those larger companies that are well established were forced to compete with fabricators, both domestically and abroad, for a shrinking market as exports to Europe and the United States (historically the two mainstay markets) were both severely hampered by their domestic economic problems.

Demand steadily improved in the second half of the year as consumer confidence returned, although order volumes and lead times remained constrained in comparison to previous years. Moreover, reduced weights were also a feature of the market (averaging four grams per piece) as was the use of cubic zirconia, and to a lesser extent, semi-precious stones to reduce metal content and to maintain retail prices. A vast percentage of Thailand's fabrication has been at the lower end of the market, retailing at less than thirty dollars per piece. However, several of Thailand's larger fabricators are now producing jewelry for well known European brands (largely as a result of lower manufacturing costs), with this segment gaining some momentum due to price-led substitution gains from gold to silver.

Thailand's trade statistics can often be misleading as the official export data often does not match anecdotal evidence from the trade. According to customs statistics on a calculated basis, exports of silver jewelry increased by more than 5% in 2009. However, field research would

indicate these figures to be very optimistic, with the vast majority of Thai fabricators canvassed being in agreement with our assessment. One key feature to come out of research meetings conducted by GFMS last year was the necessity of fabricators to establish new markets to offset declines from established trade routes that were under performing. Exports to China were stronger in 2009 as were shipments to Australia, with the backpacker trade (hand carried) as well as genuine exports reportedly robust. In addition, new markets were established in Russia and Scandinavian countries though volumes remained modest.

Silver jewelry fabrication in **South Korea** increased by almost 3% last year to 4.2 Moz (131 t). The modest rise was due to higher local consumption more than compensating for a sizable fall in the export trade. Jewelry sales in the domestic market have benefitted from some degree of substitution to silver as higher gold prices have had an impact at the retail counter, with many young consumers looking to silver as a more affordable option while still looking to the "white" look of popular gold designs. Furthermore, several local fabricators shifted a proportion of production to silver as demand for gold weakened with the only other alternative being to shed staff. Exports did not perform as well, with customs statistics indicating a more than 20% reduction in gross exports last year, led lower by substantial falls to the United States, Japan and Hong Kong.

Jewelry demand in **Indonesia** was effectively flat in 2009 at 4.2 Moz (129 t). Domestic consumption looks to have grown once more, partly as a result of substitution gains due to the sharply higher gold price. Growth in this segment has been dominated by a younger demographic who are turning to silver due to its low entry point. Moreover, several silver fabricators are now duplicating designs most commonly found in 10-karat gold jewelry at a far lower price point to satisfy the rising demand. In volumes terms, however, this segment of the market is still only modest and is concentrated in larger urban centers.

Turning to exports, demand was mixed with the backpacker tourist trade (based mainly in Bali) reported to have been quite robust as consumers looked to cheaper fashion alternatives. That said, there was considerable weakness from genuine export markets, particularly in the first half of the year, with trade to the United States, and most European destinations, well down on 2008 levels.

Last year, **Chinese** silver jewelry fabrication rose by 3% to 24.4 Moz (757 t), establishing yet another record for the country's jewelry sector. This gain has resulted in China standing firmly as the world's second largest silver jewelry fabricator.

Looking back, the rapid growth in the last few years has been attributable to China's strong economic performance, which again exceeded expectations in achieving growth at a double-digit pace towards the end of 2009. Perhaps of greater importance though will have been the further penetration of fashion jewelry into the country's smaller cities, driven by more marketing promotion and a rapid expansion of jewelry specific shops across China. Furthermore, the popularity of 'white' jewelry among the young generation continued to encourage them to purchase silver jewelry as a more affordable alternative to the white look of platinum or 18-karat white gold.

Looking at the trends within the fashion jewelry segment, one point of particular interest last year was the ongoing shift away from plain styles in favor of stone-set products, which often mirror 18-karat white gold designs. These pieces therefore attract a far higher labor cost component and, importantly, provide an opportunity for the jewelry trade to earn higher and less transparent margins. As for consumers, these western styles proved to be popular particularly among the fashion conscious youth in the first and second tier cities, with silver jewelry often seen as just another accessory that can be added to enhance an outfit or "look". Turning to traditional jewelry, demand was relatively stable last year, as consumers in rural areas continued to purchase simple robust jewelry with basic customary designs.

Finally, it is important to note that the rise in fabrication discussed above refers mainly to silver jewelry for domestic consumption. In contrast, the export segment was severely impacted by the economic crisis experienced in the United States and Europe. This was particularly the case in the first six months and this fragility restricted overall Chinese fabrication growth to "only" 3%.

Table 9 - Silver Fabrication: Silverware (including the use of scrap - million ounces)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Europe										
Italy	16.6	12.2	10.1	9.6	9.1	8.0	7.1	6.4	5.2	3.7
Germany	5.5	5.0	4.5	4.1	3.5	3.0	2.9	2.7	2.3	1.7
Greece	2.3	2.1	1.9	1.9	1.7	1.5	1.4	1.2	1.0	0.8
Norway	1.4	1.3	1.1	1.1	1.0	0.9	0.9	0.6	0.7	0.5
Sweden	0.5	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.3
Denmark	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Other Countries	3.3	2.7	2.5	2.3	2.1	2.0	1.8	1.6	1.6	1.2
Total Europe	**30.1**	**24.1**	**20.9**	**19.8**	**18.3**	**16.2**	**14.9**	**13.3**	**11.4**	**8.4**
North America										
Mexico	2.6	2.4	2.5	2.7	2.6	2.5	2.0	1.4	1.2	0.9
United States	2.2	2.1	1.9	1.8	1.6	1.5	1.4	1.4	1.0	0.9
Canada	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.1
Total North America	**5.1**	**4.8**	**4.7**	**4.7**	**4.5**	**4.3**	**3.6**	**2.9**	**2.3**	**1.9**
Latin America										
Colombia	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2
Peru	0.5	0.5	0.5	0.3	0.3	0.3	0.3	0.3	0.2	0.2
Other Countries	0.7	0.6	0.6	0.5	0.6	0.7	0.7	0.7	0.7	0.6
Total Latin America	**1.6**	**1.4**	**1.4**	**1.2**	**1.2**	**1.2**	**1.3**	**1.3**	**1.2**	**1.0**
Middle East										
Turkey	2.7	2.3	2.7	2.9	2.8	2.6	2.4	2.1	2.2	1.8
Israel	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.2	0.9
Egypt	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2
Other Countries	1.6	1.7	1.5	1.6	1.7	1.7	1.7	1.7	1.7	1.5
Total Middle East	**6.2**	**5.7**	**5.9**	**6.2**	**6.2**	**6.1**	**5.8**	**5.4**	**5.3**	**4.3**
Indian Sub-Continent										
India	39.5	55.2	35.8	35.9	19.3	21.2	16.4	14.5	15.5	24.9
Bangladesh & Nepal	3.6	3.7	2.8	2.6	2.3	1.9	1.9	1.9	1.8	1.7
Other Countries	1.2	0.9	1.0	1.0	1.0	1.1	1.1	1.0	1.0	0.9
Total Indian Sub-Cont.	**44.4**	**59.9**	**39.6**	**39.5**	**22.6**	**24.2**	**19.3**	**17.4**	**18.4**	**27.5**
East Asia										
China	2.1	2.7	3.3	3.9	4.8	5.2	6.1	6.5	6.3	5.0
Thailand	3.6	3.9	3.9	4.1	4.4	4.5	4.3	4.5	4.3	3.7
South Korea	0.8	0.8	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.6
Indonesia	0.5	0.6	0.7	0.7	0.8	0.8	0.7	0.6	0.6	0.6
Other Countries	0.9	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.6
Total East Asia	**8.0**	**8.8**	**9.3**	**10.2**	**11.4**	**12.0**	**12.5**	**13.2**	**12.6**	**10.4**
Africa										
Africa	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Total Africa	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
Oceania										
Oceania	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Oceania	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
CIS										
Russia	0.6	0.9	1.2	1.7	2.4	2.9	3.0	4.3	5.2	5.5
Other Countries	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total CIS	**0.8**	**1.1**	**1.3**	**1.9**	**2.5**	**3.1**	**3.2**	**4.5**	**5.4**	**5.7**
World Total	**96.4**	**106.1**	**83.5**	**83.9**	**67.2**	**67.5**	**61.0**	**58.4**	**56.9**	**59.5**

Silverware

• ***Silverware fabrication increased by almost 5%, to 59.5 Moz (1,851 t) in 2009.***

After three consecutive years of decline, silverware demand rose 4.6% to 59.5 Moz (1,851 t) in 2009, its highest level since 2006. The growth was almost entirely driven by a surge in demand in India which reported a 61% increase in 2009. Put otherwise, excluding India from this analysis provides a more accurate global picture, with demand slumping 16% for the rest of world.

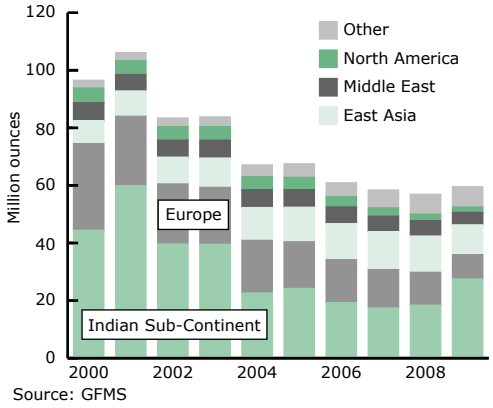
Europe

The structural changes, such as the fading tradition of gifting silverware at weddings and the decline of formal dining, that have been driving European silverware fabrication lower for more than a decade were joined last year by the economic crisis. This brought about a marked acceleration in the pace of annual decline to 26%, with double-digit losses seen in almost all countries. Contacts in some countries, in particular **Germany**, noted additional losses for fabrication due to rising competition from ever higher quality imports and to producer relocations, mainly to East Asia. In contrast, the general impact of elevated silver prices was quite marginal.

Italian silverware demand slumped by almost 30% in 2009 to just 3.7 Moz (114 t), or only 22% of the level in 2000. Much of the drop since then was due to secular shifts in consumer behavior and this again explains why losses were worse for heavy, traditional items, such as trays or cutlery, and less steep for other areas, such as light weight photo frames or religious items. The drop last year, however, was far steeper than in the 10 years prior, when the average annual fall was "only" 12%. This highlights the damage done by the economic crisis. Silverware export statistics can be unreliable but an impression of this damage can be taken from shipments to two crisis-hit countries, the United States and Russia, which fell respectively (in gross weight terms) by 47% and 80%. Losses within 2009 were heaviest in the early months, when trade destocking exacerbated the decline.

Silverware demand in **Russia** increased again in 2009 in spite of the economic crisis, although actual final consumption growth slowed considerably compared to previous years' levels. In fact last year's total, of 5.5 Moz (171 t), represented a record high for this sector.

World Silverware Fabrication



Source: GFMS

North America

Silverware fabrication in the **United States** suffered another pronounced drop, although the fall was less marked than in 2008. The near collapse in the second half of 2008 continued into early 2009, although the final six months did produce a partial recovery in offtake. Given that production is largely targeted at the wedding market, it was to be expected that the country's recession would see demand for silverware sets replaced by lower cost alternatives, with little opportunity for this essentially foregone purchase to be recouped. Silverware fabrication in **Mexico** slumped last year by over 22% in volume terms. This took output to around one-third of the levels recorded in the early 2000s. The rise in the silver price plus changes in consumers' expenditure priorities and tastes have been important factors behind this decline and in 2009 they were supplemented by the adverse impact of the severe downturn in the Mexican economy.

Middle East

The manufacture of silverware in **Turkey** fell sharply last year. A pronounced drop in Turkish GDP growth, towards the end of 2008 carried over into early 2009, not only had a direct impact on consumption, but also resulted in a sharp drop in the value of the Turkish lira against the US dollar. This in turn pushed up local silver prices, which further impacted demand for silverware, with consumers generally reluctant to purchase lighter pieces. It was a similar story in **Israel** where demand for silverware fell heavily. A modest decline in Judaic purchases (the mainstay of domestic demand) as a result of a reduction in consumer spending due to the economic slowdown, coupled with a marked decline in exports helps explain the 25% annual decline.

Indian Sub-Continent

Indian silverware fabrication in 2009 rose a steep 61% to 24.9 Moz (774 t), its highest level since 2003 (although it remained down almost a third from that year's levels). The massive increase may seem odd, not least because of the 10% rise in the annual average price. It was, however, a heavy stock build up of finished products at the trade level rather than an increase in retail consumption that was behind the rise in fabrication. Furthermore, although the actual manufacturing for building silverware stocks occurred last year, the purchase of raw bullion was in fact made in 2008 (for more details on this refer to the Indian jewelry section in this chapter).

The most consistent source of demand for silverware comes from items used in religious rituals, including lamps, bells and plates. In temples, silverware is used to make idols of deities, as well as intricate covering sheets for temple doors and ceilings. For example, one research contact mentioned an order for making Lord Ganesha's idol for a new temple opening which consumed 0.28 Moz (0.8 t) of silver. Such items are largely unaffected by price, as they are typically funded by wealthy trust funds, and their purchase cannot usually be delayed.

Corporate gifts and innovative silverware items, for example swords as gifts for eminent personalities, also underpinned demand. In one instance, a replica bullock cart containing around 250 ounces (eight kgs) of silver was made to honor the agriculture minister. In general, however, new products such as silver replicas of local currency notes used as gifts on auspicious occasions were constrained by higher prices. As for the offtake of traditional silver utensils, demand was mainly seen among the wealthier elites and non-resident Indians. Mass sales of silverware remained under pressure from under-karating, higher prices and competition from less expensive replica products made from other materials.

With regard to electroformed items, research meetings with fabricators revealed that these have not yet received widespread consumer acceptance. Despite the fact that these hollow pieces use less silver than solid items, high fabrication costs have rendered them relatively unpopular. For example, the retail making charges are Rps 3/g for a solid item, compared to Rps 16/g for an electroformed piece. In addition, consumers tend to prefer heavy-weight items over their lighter counterparts, particularly in the traditional consuming regions.

East Asia

The 14% drop in **Thailand's** offtake to 3.7 Moz (115 t) was mainly due to sharp falls in export demand, although local sales also fell notably. A marked decline in tourist visitors in the early part of the year when the economic conditions were at their worst had profound effect on the low end of the market as visitors during this period were reluctant to spend on discretionary items in light of the economic uncertainty. Moreover, higher silver prices also had a negative impact on "local" consumption, with ceremonial bowls, tableware and cutlery the most obvious casualties of the slowdown, although the downturn was felt broadly across all product segments. On the export front (according to official trade statistics), demand from Thailand's historical mainstay markets of the United States, Hong Kong, and mainland China fell acutely as consumers moved away from silver to more modern and perhaps more affordable alternatives.

Chinese silverware fabrication continued to decline in 2009, falling by 21% to a five-year low of 5.0 Moz (154 t). The sharp fall should come as no surprise, since the rapid growth in Chinese silverware fabrication over the last decade was largely underpinned by booming export demand. As discussed in previous *Surveys*, low production and labor costs and an improvement in quality have led to China taking export market share from traditional exporting countries, such as Italy and Thailand, over recent few years.

Indeed, the marked weakness last year was almost exclusively driven by a slump in exports, with official trade data stating that gross exports of silverware from China dropped to trivial levels in 2009. Information from local fabricators also confirmed that export orders fell heavily last year, as the collapse in demand from western markets resulted in some closure of small export-focused factories in southern China in early 2009.

Turning to the domestic market, demand held up strongly. In part, this was due to a rapid increase in disposable income, as a range of silverware, which usually bears high mark-ups and is usually regarded as a luxury good, has become more affordable for the average Chinese citizen. Elsewhere, giftware remains popular with simple table settings of chopsticks and bowls dominating sales, while gifted silverware with refined and complex patterns has grown in popularity in the second and third tier cities.

8. Appendices

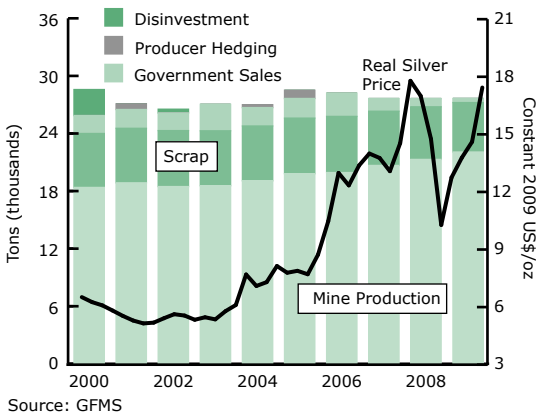
Contents

Appendix 1

Table 1 - World Silver Supply and Demand (tons) © GFMS / The Silver Institute

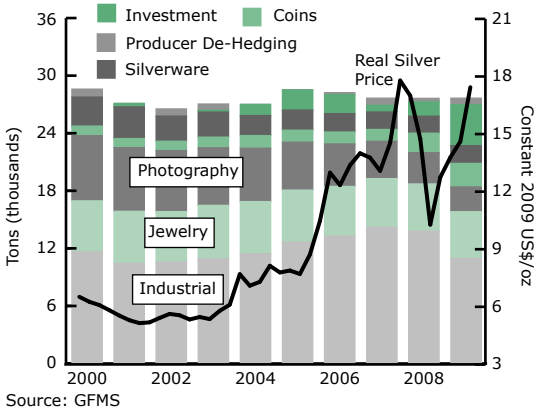
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Supply										
Mine Production	18,381	18,856	18,472	18,557	19,068	19,805	19,935	20,665	21,297	22,072
Net Government Sales	1,874	1,961	1,841	2,759	1,924	2,051	2,433	1,322	858	426
Old Silver Scrap	5,621	5,684	5,830	5,721	5,713	5,786	5,849	5,654	5,476	5,155
Producer Hedging	-	587	-	-	299	859	-	-	-	-
Implied Net Disinvestment	2,710	-	391	-	-	-	-	-	-	-
Total Supply	**28,586**	**27,087**	**26,535**	**27,038**	**27,004**	**28,501**	**28,216**	**27,642**	**27,631**	**27,652**
Demand										
Fabrication										
Industrial Applications	11,640	10,437	10,578	10,910	11,434	12,659	13,282	14,187	13,790	10,955
Photography	6,790	6,628	6,353	5,999	5,562	4,987	4,428	3,881	3,263	2,577
Jewelry	5,306	5,420	5,252	5,573	5,437	5,406	5,172	5,084	4,922	4,870
Silverware	2,999	3,299	2,596	2,610	2,089	2,101	1,896	1,816	1,769	1,851
Coins & Medals	999	948	983	1,110	1,318	1,246	1,237	1,235	2,028	2,447
Total Fabrication	27,734	26,732	25,763	26,202	25,840	26,398	26,015	26,203	25,773	22,700
Producer De-Hedging	852	-	772	651	-	-	211	753	360	694
Implied Net Investment	-	355	-	185	1,163	2,103	1,990	685	1,498	4,258
Total Demand	**28,586**	**27,087**	**26,535**	**27,038**	**27,004**	**28,501**	**28,216**	**27,642**	**27,631**	**27,652**
Silver Price (London US$/oz)	4.953	4.370	4.599	4.879	6.658	7.312	11.549	13.384	14.989	14.674

World Silver Supply



Source: GFMS

World Silver Demand



Source: GFMS

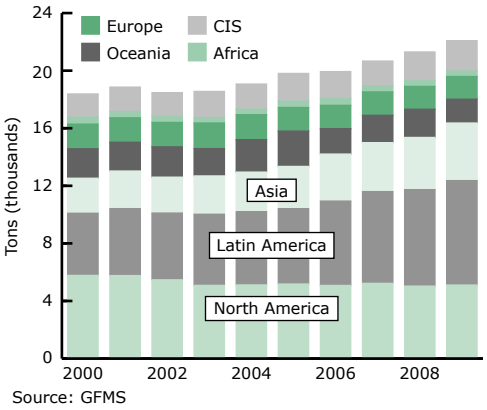
Table 3 - World Silver Mine Production (tons)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Europe										
Poland	1,140	1,183	1,211	1,376	1,362	1,261	1,258	1,231	1,209	1,220
Sweden	294	275	293	307	291	284	266	294	263	270
Greece	31	62	75	4	0	0	25	35	35	29
Portugal	21	23	19	22	25	24	20	28	41	26
Bulgaria	18	24	25	22	19	21	18	14	11	11
Spain	115	55	13	2	0	5	2	2	2	6
Macedonia	24	17	14	5	3	7	11	11	13	4
Romania	34	38	32	29	28	27	13	4	4	4
Serbia & Montenegro	6	4	4	1	1	1	2	2	3	4
Ireland	17	9	8	9	7	6	4	4	5	2
Italy	2	2	2	2	0	3	3	1	1	1
Other Countries	7	8	0	0	0	0	0	0	0	0
Total Europe	**1,711**	**1,700**	**1,695**	**1,779**	**1,736**	**1,640**	**1,623**	**1,626**	**1,588**	**1,577**
North America										
Mexico	2,621	2,760	2,747	2,569	2,569	2,894	2,970	3,135	3,241	3,256
United States	1,980	1,740	1,350	1,240	1,250	1,220	1,140	1,260	1,120	1,239
Canada	1,174	1,265	1,373	1,276	1,295	1,063	969	829	670	609
Total North America	**5,775**	**5,765**	**5,470**	**5,085**	**5,114**	**5,177**	**5,079**	**5,225**	**5,032**	**5,104**
Latin America										
Peru	2,438	2,674	2,762	2,921	3,060	3,191	3,456	3,501	3,681	3,854
Bolivia	462	381	462	491	434	399	472	525	1,114	1,326
Chile	1,242	1,349	1,210	1,312	1,360	1,379	1,602	1,929	1,396	1,301
Argentina	102	176	126	138	145	156	192	243	321	533
Guatemala	0	0	0	0	0	10	50	88	100	129
Honduras	53	50	56	54	50	56	58	56	60	59
Dominican Republic	0	0	0	0	0	0	0	0	0	18
Brazil	7	7	7	7	8	9	10	11	11	12
Colombia	8	7	7	10	9	7	8	10	9	11
Nicaragua	3	3	2	2	3	2	2	2	2	5
Uruguay	0	0	0	0	0	3	3	3	2	3
Other Countries	3	3	3	3	4	4	4	4	4	5
Total Latin America	**4,318**	**4,649**	**4,636**	**4,938**	**5,073**	**5,218**	**5,857**	**6,372**	**6,702**	**7,255**
Asia										
China	1,596	1,729	1,646	1,828	1,967	2,082	2,341	2,448	2,578	2,771
Turkey	109	114	114	113	126	162	187	235	313	436
Indonesia	312	374	332	297	266	308	246	268	248	240
India	56	54	67	91	105	102	183	178	212	227
Iran	83	82	82	82	84	94	100	90	98	108
Papua New Guinea	73	69	64	63	54	47	51	44	53	66
Mongolia	32	37	35	34	37	38	38	38	37	35
Philippines	23	34	9	10	9	19	24	28	14	34
North Korea	22	19	20	25	25	25	29	29	29	26
Dem. Rep. of Laos	0	0	0	1	3	6	6	4	7	15
Japan	109	85	85	83	54	32	34	14	12	12
Saudi Arabia	9	10	10	17	15	14	10	9	8	7
Other Countries	3	2	6	2	3	3	3	2	2	3
Total Asia	**2,433**	**2,613**	**2,494**	**2,665**	**2,764**	**2,951**	**3,268**	**3,401**	**3,626**	**4,002**

Table 3 - World Silver Mine Production (tons)

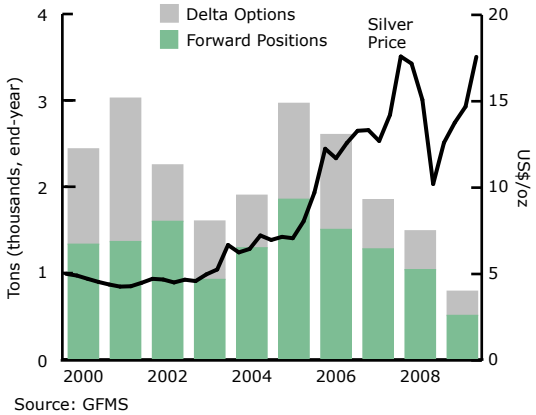
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Africa										
Morocco	289	283	263	193	209	231	237	212	238	259
South Africa	144	110	113	87	71	88	87	77	84	82
Zambia	5	5	6	6	8	10	11	12	12	13
Tanzania	3	7	7	8	13	13	13	12	12	12
Botswana	4	4	4	4	4	4	4	4	5	4
Mali	2	2	3	2	2	2	3	3	2	3
Ghana	2	2	2	2	1	2	2	2	2	2
Dem. Rep. of the Congo	1	1	3	36	34	54	68	70	34	0
Namibia	17	19	20	29	27	30	35	8	8	0
Other Countries	11	11	9	9	8	6	4	4	3	3
Total Africa	**477**	**443**	**429**	**378**	**377**	**439**	**463**	**403**	**401**	**379**
Oceania										
Australia	2,024	1,970	2,077	1,864	2,222	2,407	1,728	1,879	1,926	1,635
New Zealand	23	27	29	30	30	46	35	19	32	19
Fiji	1	2	2	1	2	1	1	0	0	0
Total Oceania	**2,048**	**1,999**	**2,108**	**1,895**	**2,254**	**2,454**	**1,764**	**1,898**	**1,959**	**1,654**
CIS										
Russia	628	650	699	918	941	1,010	972	910	1,232	1,312
Kazakhstan	890	940	849	802	703	812	796	706	629	674
Uzbekistan	62	53	49	53	60	64	63	78	75	61
Armenia	35	38	39	41	40	37	40	38	42	41
Kyrgyzstan	1	1	1	1	1	1	6	6	10	9
Tajikistan	4	4	4	4	4	3	3	3	3	3
Total CIS	**1,620**	**1,686**	**1,641**	**1,818**	**1,749**	**1,927**	**1,880**	**1,740**	**1,991**	**2,100**
World Total	**18,381**	**18,856**	**18,472**	**18,557**	**19,068**	**19,805**	**19,935**	**20,665**	**21,297**	**22,072**

World Silver Mine Production



Source: GFMS

Silver Producer Hedging: Outstanding Positions



Source: GFMS

Table 2 - Silver Fabrication: Coins and Medals Including the Use of Scrap (tons)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
United States	418	384	476	452	483	517	548	497	780	1,054
Canada	30	27	32	10	40	51	89	133	281	336
Austria	8	10	13	13	15	18	17	17	259	296
Germany	273	251	187	301	301	303	272	195	223	232
Australia	31	23	20	40	40	32	43	109	182	201
China	38	47	65	72	72	57	50	81	88	94
Mexico	20	35	34	47	85	81	58	51	43	52
Spain	55	55	47	34	70	54	46	38	34	32
Other Countries	127	114	109	141	212	134	115	115	139	150
World Total	**999**	**948**	**983**	**1,110**	**1,318**	**1,246**	**1,237**	**1,235**	**2,028**	**2,447**

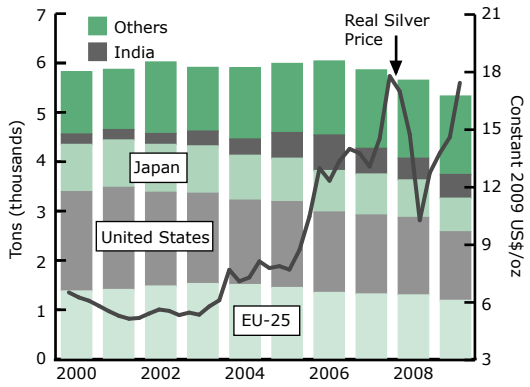
Table 4 - Supply of Silver from the Recycling of Old Scrap (tons)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Europe										
Germany	520	523	520	592	598	546	439	418	407	328
UK & Ireland	338	346	423	404	386	360	340	348	340	316
Italy	105	110	113	112	104	133	160	161	161	155
France	110	122	120	126	118	127	139	129	138	154
Austria	50	62	58	48	50	40	40	38	36	33
Netherlands	45	42	44	44	45	42	40	35	34	32
Sweden	33	33	32	32	32	31	29	28	27	26
Belgium	20	21	20	20	20	20	20	20	19	18
Denmark	18	18	17	17	17	16	16	16	15	14
Czech & Slovak Republics	19	14	13	13	14	14	14	14	13	12
Portugal	14	13	14	14	14	13	13	13	12	12
Spain	13	13	13	14	14	13	13	12	14	11
Finland	13	13	12	13	12	12	11	11	10	10
Norway	33	21	21	14	10	9	9	8	9	9
Switzerland	10	10	10	10	10	10	8	8	8	7
Other Countries	35	34	36	34	34	32	31	32	31	30
Total Europe	**1,376**	**1,395**	**1,466**	**1,506**	**1,476**	**1,418**	**1,322**	**1,290**	**1,273**	**1,166**
North America										
United States	1,941	2,005	1,842	1,766	1,659	1,680	1,580	1,544	1,520	1,344
Mexico	48	44	48	55	60	64	72	84	95	92
Canada	45	45	44	47	44	46	44	50	52	48
Total North America	**2,034**	**2,094**	**1,934**	**1,868**	**1,763**	**1,790**	**1,696**	**1,678**	**1,667**	**1,484**
Latin America										
Brazil	48	50	32	36	32	32	32	32	32	29
Chile	12	12	12	12	12	14	16	16	16	14
Argentina	20	23	20	20	20	20	24	20	16	14
Other Countries	25	24	24	25	24	29	33	30	30	30
Total Latin America	**105**	**109**	**88**	**93**	**88**	**95**	**105**	**98**	**94**	**86**
Middle East										
Saudi Arabia	70	24	224	23	40	50	56	58	59	60

Table 4 - Supply of Silver from the Recycling of Old Scrap (tons)

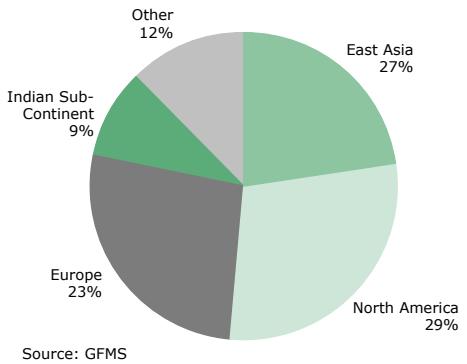
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Egypt	28	35	40	35	42	43	46	48	52	55
Turkey	40	39	44	52	47	41	35	30	36	40
Oman	5	5	5	5	5	5	6	6	6	6
Other Countries	10	11	11	11	15	13	15	16	16	16
Total Middle East	**153**	**114**	**324**	**126**	**149**	**152**	**158**	**157**	**168**	**178**
Indian Sub-Continent										
India	200	200	210	294	324	500	700	500	430	465
Other Countries	13	15	15	15	15	16	17	17	17	20
Total Indian Sub-Cont.	**213**	**215**	**225**	**309**	**339**	**516**	**717**	**517**	**447**	**485**
East Asia										
Japan	927	931	940	930	880	852	810	800	736	662
China	187	192	196	206	240	270	324	377	370	377
South Korea	164	170	180	190	195	198	208	211	209	204
Thailand	20	21	28	30	32	31	35	37	40	40
Taiwan	28	28	27	30	31	32	34	36	37	36
Singapore	12	12	13	13	14	14	16	16	15	15
Hong Kong	11	11	12	12	13	13	14	14	14	14
Indonesia	15	13	10	10	11	11	12	12	12	12
Vietnam	11	10	9	10	10	11	11	12	12	11
Philippines	7	6	6	6	6	6	6	6	6	6
Other Counties	3	3	4	4	4	4	5	5	5	5
Total East Asia	**1,384**	**1,398**	**1,425**	**1,441**	**1,436**	**1,443**	**1,476**	**1,527**	**1,456**	**1,382**
Africa										
Morocco	16	16	16	16	40	19	29	28	29	31
Other Countries	18	17	17	17	17	17	18	18	18	18
Total Africa	**34**	**33**	**33**	**33**	**57**	**36**	**47**	**46**	**47**	**50**
Oceania										
Oceania	76	74	73	65	64	55	53	52	51	49
Total Oceania	**76**	**74**	**73**	**65**	**64**	**55**	**53**	**52**	**51**	**49**
CIS										
CIS	245	252	263	280	340	280	276	288	272	275
Total CIS	**245**	**252**	**263**	**280**	**340**	**280**	**276**	**288**	**272**	**275**
World Total	**5,621**	**5,684**	**5,830**	**5,721**	**5,713**	**5,786**	**5,849**	**5,654**	**5,476**	**5,155**

World Silver Scrap Supply



Source: GFMS

World Scrap Supply, 2009



Source: GFMS

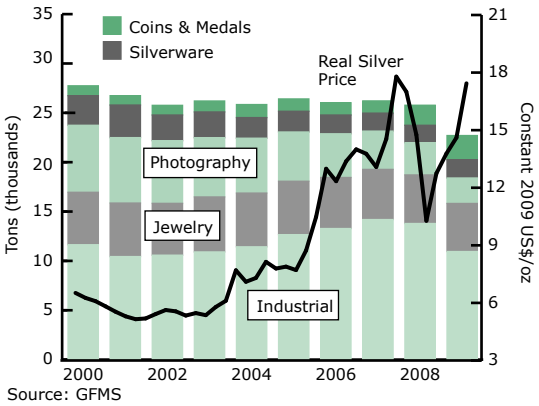
Table 5 - World Silver Fabrication Including the Use of Scrap (tons)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Europe										
Italy	2,072	1,867	1,786	1,736	1,722	1,579	1,446	1,362	1,202	1,045
Germany	1,256	1,237	1,102	1,216	1,257	1,260	1,275	1,249	1,272	1,020
Belgium	1,098	999	958	910	858	814	894	850	792	721
UK & Ireland	1,307	1,406	1,323	1,350	1,604	1,330	1,013	780	729	597
France	910	909	862	819	404	389	396	410	421	319
Austria	33	34	37	37	40	40	38	38	279	315
Spain	210	171	161	148	198	175	156	141	132	125
Poland	120	107	100	120	134	145	149	135	132	109
Switzerland	281	108	106	94	96	101	97	97	97	88
Netherlands	60	57	64	60	79	69	63	63	64	57
Greece	104	94	87	90	86	82	77	70	68	56
Portugal	107	80	53	82	127	54	45	43	42	40
Norway	89	71	60	62	65	56	52	40	40	30
Sweden	41	31	33	37	38	38	37	35	34	29
Denmark	32	28	24	22	21	21	21	21	20	18
Czech & Slovak Republics	25	31	21	22	21	20	20	20	19	17
Hungary	15	13	13	13	13	12	12	12	13	12
Romania	13	12	12	12	12	12	12	12	12	10
Yugoslavia (former)	5	7	7	7	8	8	9	9	10	8
Finland	17	14	14	13	12	12	13	10	10	8
Cyprus & Malta	12	10	10	9	9	9	9	9	9	8
Other Countries	5	4	4	4	5	5	5	5	5	5
Total Europe	**7,810**	**7,288**	**6,837**	**6,865**	**6,807**	**6,232**	**5,840**	**5,412**	**5,403**	**4,635**
North America										
United States	5,977	5,275	5,505	5,454	5,608	5,891	5,778	5,604	5,799	5,113
Mexico	537	530	564	629	682	693	587	576	545	510
Canada	104	90	96	78	109	126	178	250	386	404
Total North America	**6,618**	**5,895**	**6,164**	**6,160**	**6,400**	**6,710**	**6,543**	**6,431**	**6,729**	**6,027**
Latin America										
Brazil	210	204	198	204	227	232	145	223	215	199
Argentina	73	56	58	74	78	80	60	64	60	48
Dominican Republic	19	10	7	11	13	17	19	20	22	32
Peru	30	32	32	23	21	19	22	21	23	25
Colombia	24	22	22	22	22	21	21	21	19	17
Chile	13	13	13	13	13	13	13	13	13	12
Other Countries	33	31	30	28	33	31	35	33	37	32
Total Latin America	**402**	**368**	**360**	**376**	**408**	**414**	**315**	**395**	**388**	**366**
Middle East										
Turkey	230	200	254	294	321	309	276	247	262	205
Israel	91	83	83	81	83	85	85	84	79	63
Egypt	64	55	49	57	62	55	52	53	50	45
Iran	45	48	43	45	47	50	49	49	48	44
Other Countries	60	57	56	56	59	61	62	63	64	65
Total Middle East	**490**	**442**	**486**	**532**	**572**	**561**	**524**	**496**	**502**	**421**
Indian Sub-Continent										
India	3,560	4,339	3,309	3,310	2,163	2,850	2,575	2,770	2,868	3,244
Bangladesh & Nepal	187	185	150	140	132	116	113	113	114	112
Other Countries	98	67	66	66	71	73	74	75	74	71
Total Indian Sub-Cont.	**3,845**	**4,591**	**3,525**	**3,516**	**2,366**	**3,039**	**2,762**	**2,958**	**3,056**	**3,427**

Table 5 - World Silver Fabrication Including the Use of Scrap (tons)

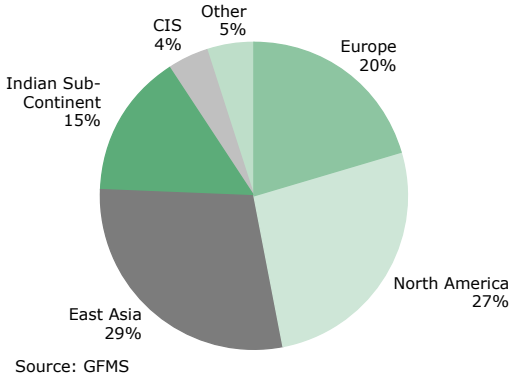
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
East Asia										
China	1,122	1,238	1,479	1,641	1,835	1,917	2,116	2,358	2,351	2,198
Japan	4,200	3,711	3,693	3,607	3,826	3,860	4,097	4,155	3,372	2,070
Thailand	962	1,022	1,014	1,138	1,151	1,150	1,150	1,140	1,046	954
South Korea	611	531	571	612	631	664	705	725	706	570
Taiwan	293	275	291	335	351	384	418	434	425	356
Indonesia	132	161	139	146	181	159	178	170	168	163
Hong Kong	138	100	105	99	107	110	118	125	120	99
Vietnam	22	23	26	28	30	32	35	37	39	40
Myanmar, Laos & Cambodia	26	28	30	32	28	28	26	26	26	26
Malaysia	18	18	20	21	22	21	20	20	20	20
Other Countries	13	14	14	15	14	15	14	14	14	14
Total East Asia	**7,536**	**7,122**	**7,381**	**7,673**	**8,175**	**8,339**	**8,878**	**9,205**	**8,288**	**6,509**
Africa										
Morocco	18	19	18	18	19	19	19	20	19	17
Tunisia	10	10	10	11	11	11	10	11	11	10
South Africa	8	7	7	8	8	8	8	8	8	8
Algeria	6	6	5	6	6	6	6	6	6	6
Libya	4	4	4	4	4	4	4	5	5	4
Other Countries	8	8	8	8	9	9	9	9	10	9
Total Africa	**54**	**53**	**52**	**54**	**57**	**58**	**57**	**59**	**60**	**54**
Oceania										
Australia	218	184	180	193	178	121	133	200	271	283
New Zealand	1	1	1	1	1	1	1	1	1	1
Total Oceania	**219**	**186**	**181**	**195**	**179**	**122**	**134**	**201**	**272**	**284**
CIS										
CIS	760	787	776	831	878	925	963	1,046	1,074	977
Total CIS	**760**	**787**	**776**	**831**	**878**	**925**	**963**	**1,046**	**1,074**	**977**
World Total	**27,734**	**26,732**	**25,763**	**26,202**	**25,840**	**26,398**	**26,015**	**26,203**	**25,773**	**22,700**

World Silver Fabrication



Source: GFMS

World Silver Fabrication, 2009



Source: GFMS

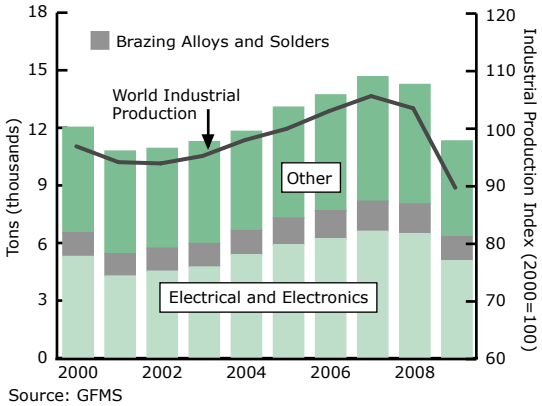
Table 6 - Silver Fabrication: Industrial Applications Including the Use of Scrap (tons)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Europe										
Germany	647	665	659	675	730	744	794	851	857	621
UK & Ireland	512	444	433	464	483	385	388	372	378	282
Italy	339	322	324	318	357	338	340	350	328	258
France	384	496	455	430	320	317	322	334	336	232
Switzerland	259	85	84	72	76	81	77	77	76	69
Spain	62	40	40	38	65	60	58	59	58	53
Netherlands	52	48	48	47	48	49	49	49	49	40
Poland	23	22	21	21	22	22	23	24	25	21
Austria	17	17	17	17	17	17	17	17	17	15
Norway	37	23	20	19	26	22	17	16	15	11
Sweden	11	10	10	10	10	10	10	11	11	8
Czech & Slovak Republics	8	11	9	9	8	8	9	9	9	7
Belgium	10	8	8	8	8	8	8	8	8	6
Other Countries	23	21	21	22	22	22	23	24	24	20
Total Europe	**2,384**	**2,211**	**2,148**	**2,148**	**2,193**	**2,085**	**2,135**	**2,200**	**2,188**	**1,644**
North America										
United States	2,958	2,449	2,584	2,699	2,931	3,134	3,323	3,548	3,703	3,012
Mexico	107	94	93	96	93	101	95	102	98	84
Canada	17	16	16	16	19	31	53	83	75	40
Total North America	**3,082**	**2,559**	**2,693**	**2,811**	**3,043**	**3,266**	**3,471**	**3,733**	**3,875**	**3,136**
Latin America										
Brazil	98	98	98	94	115	139	91	124	121	110
Argentina	25	20	20	20	20	28	32	34	32	24
Colombia	6	6	6	6	6	5	5	5	5	4
Ecuador	2	2	2	2	2	2	2	2	2	2
Other Countries	12	13	13	12	12	12	12	12	12	11
Total Latin America	**143**	**139**	**139**	**134**	**155**	**186**	**142**	**177**	**172**	**151**
Middle East										
Turkey	44	35	39	44	45	47	48	50	51	43
Israel	30	26	24	24	24	25	26	26	25	21
Oman	3	3	3	3	3	3	3	3	3	3
Other Countries	5	4	4	4	4	4	4	4	4	3
Total Middle East	**82**	**68**	**70**	**74**	**77**	**79**	**81**	**83**	**83**	**70**
Indian Sub-Continent										
India	1,435	1,579	1,381	1,382	1,053	1,670	1,687	1,986	2,022	1,975
Pakistan	16	10	8	8	9	9	10	10	10	9
Total Indian Sub-Cont.	**1,451**	**1,589**	**1,389**	**1,390**	**1,062**	**1,679**	**1,697**	**1,996**	**2,032**	**1,984**
East Asia										
Japan	2,244	1,723	1,839	1,879	2,292	2,614	2,783	2,827	2,293	1,293
China	681	693	795	859	936	990	1,093	1,217	1,220	1,096
South Korea	459	387	432	468	486	517	557	572	557	420
Taiwan	274	262	282	325	339	371	402	418	409	341
Hong Kong	121	85	93	90	97	99	107	113	109	88
Other Countries	16	14	15	17	19	19	19	20	24	20
Total East Asia	**3,795**	**3,164**	**3,455**	**3,638**	**4,168**	**4,611**	**4,961**	**5,168**	**4,612**	**3,257**

Table 6 - Silver Fabrication: Industrial Applications Including the Use of Scrap (tons)

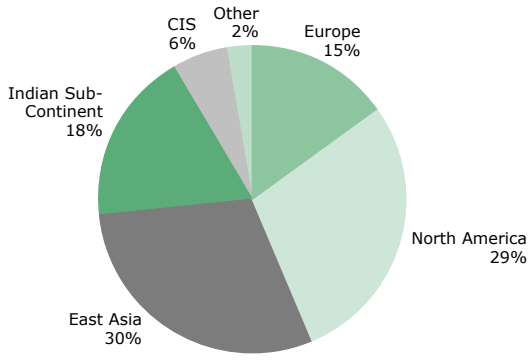
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Africa										
Morocco	8	8	8	8	8	8	9	9	8	7
South Africa	5	4	4	4	4	4	4	4	4	4
Other Countries	5	5	5	5	6	6	6	7	7	6
Total Africa	**18**	**17**	**17**	**17**	**18**	**19**	**19**	**20**	**20**	**18**
Oceania										
Oceania	77	65	66	68	69	63	65	66	65	58
Total Oceania	**77**	**65**	**66**	**68**	**69**	**63**	**65**	**66**	**65**	**58**
CIS										
CIS	609	624	600	630	650	672	712	744	744	637
Total CIS	**609**	**624**	**600**	**630**	**650**	**672**	**712**	**744**	**744**	**637**
World Total	**11,640**	**10,437**	**10,578**	**10,910**	**11,434**	**12,659**	**13,282**	**14,187**	**13,790**	**10,955**

Components of Industrial Demand



Source: GFMS

World Silver Industrial Fabrication, 2009



Source: GFMS

Table 6a - Silver Fabrication: Electrical and Electronics Including the Use of Scrap (tons)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
United States	1,603	1,062	1,168	1,228	1,474	1,622	1,710	1,796	1,909	1,630
Japan	1,140	828	913	940	1,181	1,360	1,432	1,457	1,204	688
Germany	445	488	484	503	551	569	613	665	674	488
China	320	320	340	368	397	420	474	537	539	486
India	150	145	151	159	167	300	312	390	420	442
Taiwan	216	215	235	276	287	318	345	360	352	293
South Korea	255	224	252	276	289	304	334	340	329	254
France	228	342	309	297	252	248	254	264	269	178
UK & Ireland	206	175	172	183	190	141	138	139	145	107
Hong Kong	110	77	87	85	92	94	101	108	104	83
Italy	95	86	87	90	118	108	112	119	106	82
Mexico	64	56	56	58	56	64	61	65	64	56
Brazil	40	40	40	38	52	66	27	48	46	37
Turkey	28	22	25	30	31	31	32	33	34	29
Australia	19	18	20	21	21	22	23	23	22	20
Netherlands	18	16	16	16	16	17	17	17	17	13
Switzerland	165	12	12	14	14	13	13	13	15	13
Spain	9	0	0	0	10	10	10	11	11	8
Austria	7	7	7	7	7	7	7	7	7	6
Other Countries	8	7	7	7	7	7	7	7	7	6
World Total	**5,125**	**4,140**	**4,382**	**4,596**	**5,213**	**5,722**	**6,021**	**6,399**	**6,271**	**4,918**

Table 6b - Silver Fabrication: Brazing Alloys and Solders Including the Use of Scrap (tons)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
China	208	215	247	270	301	320	351	388	390	342
India	55	57	60	64	67	130	134	161	177	190
United States	272	258	260	247	228	240	224	240	225	162
Japan	137	109	104	104	116	119	122	123	114	82
Germany	101	88	95	97	100	98	105	112	108	62
UK & Ireland	88	83	79	86	92	90	95	76	72	57
Italy	65	63	64	63	64	67	74	78	75	55
South Korea	31	38	42	44	45	59	64	67	68	52
Switzerland	50	41	40	42	42	48	44	44	42	38
Canada	10	9	9	9	12	24	46	76	68	34
Taiwan	37	29	31	33	35	36	39	40	39	31
Brazil	23	23	23	22	23	25	26	26	25	27
Spain	33	30	30	28	25	20	20	20	20	18
France	33	32	32	25	22	25	26	27	26	17
Australia	24	20	19	20	20	16	17	17	17	15
Mexico	20	17	16	17	16	16	15	16	15	12
Netherlands	8	7	7	7	8	7	7	7	7	6
Austria	3	3	3	3	3	3	3	3	3	3
Other Countries	3	2	2	2	2	2	2	2	7	5
World total	**1,201**	**1,124**	**1,162**	**1,182**	**1,221**	**1,345**	**1,413**	**1,521**	**1,496**	**1,207**

Table 7 - Silver Fabrication: Photographic Use Including the Use of Scrap (tons)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Europe										
EU-25	2,254	2,226	2,081	2,023	1,916	1,700	1,463	1,214	1,096	986
Other Countries	6	5	5	5	5	5	5	4	4	4
Total Europe	**2,260**	**2,231**	**2,086**	**2,028**	**1,921**	**1,705**	**1,468**	**1,219**	**1,100**	**990**
North America										
United States	2,185	2,037	2,017	1,832	1,716	1,753	1,442	1,117	912	685
Total North America	**2,185**	**2,037**	**2,017**	**1,832**	**1,716**	**1,753**	**1,442**	**1,117**	**912**	**685**
Latin America										
Brazil	76	70	64	68	68	43	0	45	40	32
Argentina	40	32	34	48	48	40	16	16	16	14
Total Latin America	**116**	**102**	**98**	**116**	**116**	**83**	**16**	**61**	**56**	**46**
Indian Sub-Continent										
India	10	10	10	10	10	10	10	9	9	8
Sri Lanka	12	4	4	4	4	4	4	4	4	4
Total Indian Sub-Cont.	**22**	**14**	**14**	**14**	**14**	**14**	**14**	**13**	**13**	**12**
East Asia										
Japan	1,902	1,935	1,799	1,677	1,476	1,180	1,251	1,260	1,008	700
China	120	140	176	180	190	167	157	143	115	95
Total East Asia	**2,022**	**2,075**	**1,975**	**1,857**	**1,666**	**1,348**	**1,408**	**1,403**	**1,123**	**795**
Oceania										
Oceania	85	74	71	64	47	4	4	4	3	3
Total Oceania	**85**	**74**	**71**	**64**	**47**	**4**	**4**	**4**	**3**	**3**
CIS										
CIS	100	95	92	88	83	80	76	64	56	47
Total CIS	100	95	92	88	83	80	76	64	56	47
World Total	**6,790**	**6,628**	**6,353**	**5,999**	**5,562**	**4,987**	**4,428**	**3,881**	**3,263**	**2,577**

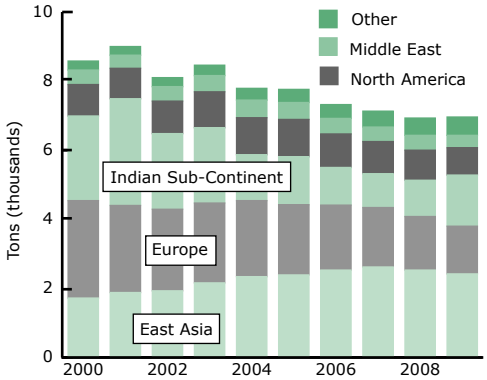
Table 8a - Silver Fabrication: Jewelry and Silverware Including the Use of Scrap (tons)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Europe										
Italy	1,725	1,537	1,457	1,408	1,348	1,230	1,096	1,001	863	777
Germany	284	271	245	240	226	213	210	203	193	168
Poland	92	78	71	91	95	105	111	101	95	76
France	88	85	84	81	69	55	57	59	57	59
Greece	104	94	87	90	86	82	77	70	68	56
Spain	93	76	74	76	63	61	52	44	41	41
Portugal	66	55	49	52	48	42	38	36	39	36
UK & Ireland	100	90	68	50	48	43	41	26	23	21
Sweden	29	20	22	26	27	27	26	24	22	20
Norway	51	46	40	42	37	32	34	25	26	19
Denmark	29	25	21	19	18	18	18	18	17	16
Switzerland	10	10	10	10	10	10	10	10	10	9
Cyprus & Malta	12	10	10	9	9	9	9	9	9	8
Finland	14	11	11	10	9	9	10	7	7	5
Austria	8	7	7	7	7	5	4	4	4	3
Other Countries	23	23	23	22	23	22	23	23	24	21
Total Europe	**2,728**	**2,439**	**2,279**	**2,235**	**2,124**	**1,963**	**1,816**	**1,660**	**1,498**	**1,334**
North America										
Mexico	410	401	437	486	504	511	434	423	404	374
United States	416	405	428	471	479	487	465	442	404	362
Canada	57	47	48	52	50	44	36	34	30	28
Total North America	**883**	**853**	**913**	**1,009**	**1,033**	**1,042**	**935**	**899**	**838**	**764**
Latin America										
Brazil	36	36	36	42	44	50	54	54	54	57
Peru	28	29	29	20	18	16	19	18	20	22
Colombia	18	16	16	16	16	16	16	16	14	13
Argentina	8	4	4	6	10	12	12	14	12	10
Ecuador	15	12	12	10	10	8	10	10	10	7
Other Countries	37	29	25	30	37	41	45	44	50	58
Total Latin America	**142**	**126**	**122**	**124**	**135**	**143**	**156**	**155**	**159**	**168**
Middle East										
Turkey	186	164	211	245	272	258	224	194	207	158
Egypt	60	51	46	53	58	52	48	50	46	42
Israel	59	55	57	56	57	58	58	56	52	40
Saudi Arabia & Yemen	20	18	18	18	19	21	21	22	22	23
Other Countries	81	83	77	79	83	86	86	87	86	82
Total Middle East	**405**	**371**	**410**	**452**	**489**	**476**	**437**	**408**	**413**	**345**
Indian Sub-Continent										
India	2,115	2,750	1,918	1,918	1,100	1,170	878	775	837	1,261
Bangladesh & Nepal	187	185	150	140	132	116	113	113	114	112
Other Countries	70	53	54	54	58	60	60	61	61	59
Total Indian Sub-Cont.	**2,372**	**2,988**	**2,122**	**2,112**	**1,290**	**1,346**	**1,051**	**949**	**1,012**	**1,432**
East Asia										
Thailand	957	1,017	1,004	1,127	1,147	1,145	1,146	1,136	1,037	946
China	283	358	443	530	637	702	816	917	928	912
South Korea	152	144	139	144	145	147	149	153	149	150
Indonesia	116	147	124	129	162	140	159	151	149	147

Table 8 a- Silver Fabrication: Jewelry and Silverware Including the Use of Scrap (tons)

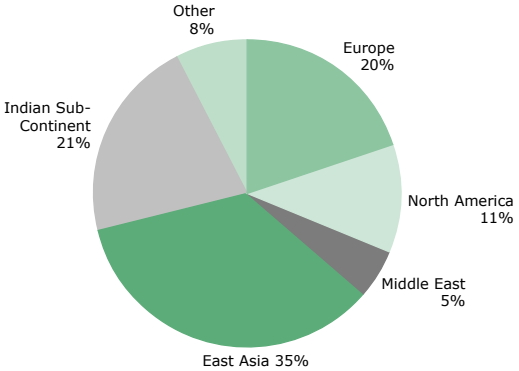
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Japan	54	53	52	49	56	64	61	65	62	65
Vietnam	22	23	26	28	30	32	35	37	39	40
Myanmar, Laos & Cambodia	26	28	30	32	28	28	26	26	26	26
Malaysia	17	18	20	21	22	21	20	20	20	20
Taiwan	13	10	9	10	12	13	12	12	12	11
Other Countries	27	26	23	21	21	21	22	22	22	21
Total East Asia	**1,667**	**1,823**	**1,869**	**2,091**	**2,260**	**2,313**	**2,446**	**2,539**	**2,444**	**2,338**
Africa										
Tunisia	9	9	9	10	10	10	9	10	10	10
Morocco	10	11	11	10	11	11	11	11	11	9
Algeria	5	5	4	5	5	5	5	5	5	4
Other Countries	12	11	11	12	13	13	13	13	14	13
Total Africa	**36**	**36**	**35**	**37**	**39**	**39**	**37**	**39**	**40**	**36**
Oceania										
Australia	24	22	23	22	23	22	21	21	20	20
Other Countries	1	1	1	1	1	1	1	1	1	1
Total Oceania	**25**	**23**	**24**	**23**	**24**	**23**	**22**	**22**	**21**	**22**
CIS										
Russia	29	43	55	80	112	138	144	205	241	263
Other Countries	18	19	20	21	22	23	23	25	25	21
Total CIS	**47**	**61**	**75**	**101**	**134**	**161**	**168**	**229**	**266**	**284**
World Total	**8,305**	**8,720**	**7,849**	**8,183**	**7,526**	**7,507**	**7,068**	**6,901**	**6,692**	**6,721**

World Jewelry & Silverware Fabrication



Source: GFMS

World Jewelry & Silverware Fabrication, 2009



Source: GFMS

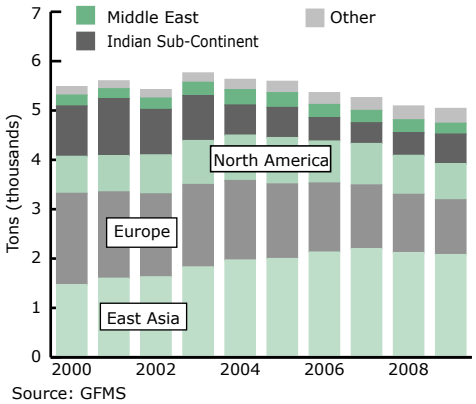
Table 8 - Silver Fabrication: Jewelry Including the Use of Scrap (tons)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Europe										
Italy	1,210	1,157	1,142	1,110	1,065	980	876	802	703	663
Germany	112	114	104	113	116	118	119	120	122	115
Poland	89	75	68	88	92	102	108	98	92	74
France	80	77	76	74	62	48	50	52	49	54
Spain	45	42	46	52	42	44	40	35	35	38
Greece	32	30	28	30	32	34	33	32	36	32
Portugal	59	49	44	47	43	37	34	32	33	31
UK & Ireland	87	77	56	38	36	32	30	16	14	12
Sweden	13	9	10	12	12	12	12	11	10	9
Switzerland	7	7	7	7	7	7	7	7	7	7
Denmark	13	11	10	9	8	8	8	8	8	7
Cyprus & Malta	8	7	7	6	7	7	7	6	6	5
Norway	8	7	6	6	6	5	5	5	4	5
Finland	4	3	3	3	3	3	3	2	2	2
Austria	4	3	3	3	3	2	1	1	1	1
Other Countries	20	20	20	19	20	19	20	20	21	19
Total Europe	**1,791**	**1,690**	**1,629**	**1,617**	**1,554**	**1,458**	**1,351**	**1,248**	**1,143**	**1,072**
North America										
Mexico	328	325	358	403	423	434	372	380	368	346
United States	348	340	368	416	428	440	420	400	372	334
Canada	49	39	40	44	42	36	30	28	26	24
Total North America	**725**	**704**	**766**	**863**	**893**	**910**	**822**	**808**	**766**	**704**
Latin America										
Brazil	32	32	32	38	40	45	48	48	48	52
Peru	12	13	13	10	9	8	11	10	13	16
Argentina	5	3	3	4	7	7	8	9	8	7
Colombia	6	6	6	6	6	6	6	6	6	7
Ecuador	8	7	7	6	6	5	6	6	6	4
Other Countries	29	22	17	23	29	34	37	36	42	52
Total Latin America	**93**	**83**	**78**	**87**	**97**	**105**	**116**	**115**	**123**	**138**
Middle East										
Turkey	101	92	129	154	185	176	150	127	139	103
Egypt	47	40	36	44	48	43	41	43	40	36
Saudi Arabia & Yemen	16	15	15	15	16	17	18	18	18	20
Israel	14	13	13	13	13	14	13	14	14	12
Other Countries	34	34	33	33	34	36	37	37	37	38
Total Middle East	**212**	**193**	**226**	**258**	**296**	**286**	**258**	**239**	**249**	**210**
Indian Sub-Continent										
India	885	1,032	804	800	500	510	369	323	355	487
Bangladesh & Nepal	74	69	63	58	60	56	54	55	58	60
Other Countries	32	24	24	24	26	27	27	28	29	30
Total Indian Sub-Cont.	**990**	**1,125**	**891**	**883**	**586**	**593**	**451**	**406**	**441**	**578**
East Asia										
Thailand	845	896	884	999	1,011	1,005	1,012	995	904	832
China	218	275	341	408	486	540	627	713	733	757
South Korea	126	118	117	121	123	122	126	130	127	131
Indonesia	99	128	103	108	139	117	137	131	129	129
Japan	52	51	50	48	55	63	60	64	61	64

Table 8 - Silver Fabrication: Jewelry Including the Use of Scrap (tons)

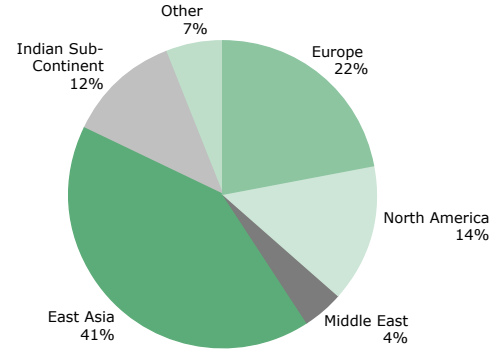
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Vietnam	20	21	24	26	27	29	33	34	37	38
Myanmar, Laos & Cambodia	18	20	21	23	20	20	19	19	19	19
Malaysia	16	17	18	19	20	19	19	18	19	19
Hong Kong	11	10	8	7	7	7	8	8	8	8
Taiwan	8	6	6	7	8	9	9	9	8	8
Other Countries	7	8	8	8	8	8	8	8	8	8
Total East Asia	**1,420**	**1,549**	**1,579**	**1,772**	**1,905**	**1,939**	**2,057**	**2,129**	**2,053**	**2,013**
Africa										
Morocco	8	9	8	8	8	8	8	9	8	7
Tunisia	7	6	6	7	7	7	6	7	7	7
Algeria	4	3	3	3	4	4	3	3	3	3
Other Countries	9	9	9	10	10	10	10	10	11	11
Total Africa	**28**	**27**	**27**	**28**	**29**	**29**	**28**	**30**	**30**	**28**
Oceania										
Australia	23	21	22	21	21	21	20	20	19	20
Other Countries	1	1	1	1	1	1	1	1	1	1
Total Oceania	**24**	**22**	**23**	**22**	**22**	**22**	**21**	**21**	**20**	**21**
CIS										
Russia	10	14	19	28	38	48	51	70	79	92
Other Countries	13	14	15	16	16	17	17	18	18	16
Total CIS	**23**	**28**	**34**	**43**	**55**	**64**	**68**	**89**	**97**	**108**
World Total	**5,306**	**5,420**	**5,252**	**5,573**	**5,437**	**5,406**	**5,172**	**5,084**	**4,922**	**4,870**

World Jewelry Fabrication



Source: GFMS

World Jewelry Fabrication, 2009

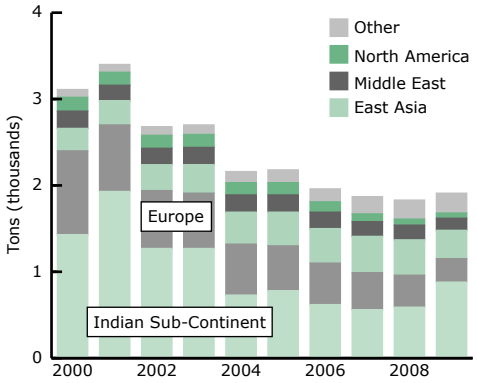


Source: GFMS

Table 9 - Silver Fabrication: Silverware Including the Use of Scrap (tons)

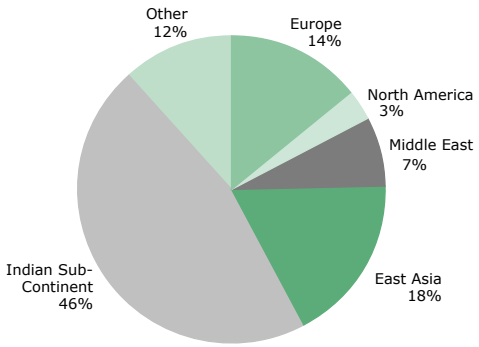
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Europe										
Italy	515	380	315	298	283	250	220	199	160	114
Germany	172	157	142	128	110	95	91	83	71	53
Greece	72	64	59	60	54	48	44	38	32	24
Norway	44	39	34	35	31	27	29	20	21	14
Sweden	16	11	12	14	15	15	14	12	12	10
Denmark	16	14	12	11	10	10	10	10	10	9
Other Countries	102	84	77	72	67	61	56	50	49	37
Total Europe	**936**	**749**	**650**	**617**	**570**	**505**	**464**	**413**	**355**	**261**
North America										
Mexico	82	76	79	83	81	77	62	43	36	28
United States	68	65	60	55	51	47	45	42	32	28
Canada	8	8	8	8	8	8	6	6	4	4
Total North America	**158**	**149**	**147**	**146**	**140**	**132**	**113**	**91**	**72**	**60**
Latin America										
Colombia	12	10	10	10	10	10	10	10	8	7
Peru	16	16	16	10	9	8	8	8	7	6
Other Countries	21	17	17	17	19	21	22	23	22	17
Total Latin America	**49**	**43**	**43**	**37**	**38**	**39**	**40**	**41**	**36**	**30**
Middle East										
Turkey	85	72	83	91	87	82	74	67	68	55
Israel	46	42	44	43	44	45	45	42	38	28
Egypt	13	11	10	10	10	9	8	7	6	6
Saudi Arabia & Yemen	4	4	3	3	4	4	3	4	4	3
Other Countries	47	50	44	46	48	50	49	49	48	43
Total Middle East	**194**	**178**	**184**	**193**	**193**	**190**	**179**	**169**	**164**	**135**
Indian Sub-Continent										
India	1,230	1,718	1,114	1,118	600	660	509	452	482	774
Bangladesh & Nepal	113	116	87	82	72	60	59	58	57	52
Other Countries	39	29	30	30	32	33	33	33	32	28
Total Indian Sub-Cont.	**1,381**	**1,863**	**1,231**	**1,229**	**704**	**753**	**601**	**542**	**571**	**854**
East Asia										
China	65	83	102	122	151	162	189	204	196	154
Thailand	112	121	121	129	136	140	134	141	133	115
South Korea	26	26	22	23	22	25	23	23	22	20
Indonesia	17	19	21	21	23	23	21	20	20	17
Other Countries	27	26	24	24	23	24	22	22	21	19
Total East Asia	**247**	**273**	**290**	**319**	**355**	**374**	**389**	**410**	**391**	**325**
Africa										
Africa	9	9	9	9	9	9	9	10	9	9
Total Africa	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**10**	**9**	**9**
Oceania										
Oceania	2	1	1	1	1	1	1	1	1	1
Total Oceania	**2**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
CIS										
Russia	19	29	36	53	73	91	93	134	162	171
Other Countries	5	5	5	5	6	6	6	6	6	5
Total CIS	**23**	**34**	**41**	**58**	**79**	**96**	**99**	**141**	**169**	**176**
World total	**2,999**	**3,299**	**2,596**	**2,610**	**2,089**	**2,101**	**1,896**	**1,816**	**1,769**	**1,851**

World Silverware Fabrication



Source: GFMS

World Silverware Fabrication, 2009



Source: GFMS

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
1976	4.353	1,217	88.81	415	677	N/a	180	0.07
1977	4.633	1,120	94.52	400	721	N/a	177	0.10
1978	5.422	1,393	110.26	367	844	N/a	179	0.12
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	1,995	1,389	158	49.90
2000	4.953	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	440	6,024	3,230	337	198.30

* From 1976-1998, 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 2009 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
1976	16.409	14,588	405.61	683	5,207	N/a	362	186.83
1977	16.401	12,405	401.20	608	5,030	N/a	342	225.56
1978	17.828	15,047	433.64	535	5,143	N/a	338	226.65
1979	32.710	19,278	808.79	1,097	8,877	N/a	603	392.18
1980	54.633	25,406	1284.60	1,997	16,411	4,924	1,079	592.16
1981	24.751	21,395	607.24	925	7,578	2,729	630	247.09
1982	17.612	20,013	459.36	768	5,733	2,243	486	270.22
1983	24.620	22,967	638.97	1,037	8,487	3,313	713	411.47
1984	16.817	21,693	463.95	723	6,142	2,698	554	247.51
1985	12.226	22,686	391.77	536	4,871	2,298	421	180.81
1986	10.697	22,081	331.96	335	4,281	2,251	277	206.06
1987	13.238	25,335	406.69	369	4,977	2,905	295	257.07
1988	11.851	28,030	358.72	302	3,846	2,278	265	184.34
1989	9.518	28,827	291.28	268	2,812	1,640	232	140.05
1990	7.933	26,361	240.62	240	2,398	1,776	171	111.00
1991	6.390	23,881	190.60	181	1,909	1,602	156	81.54
1992	6.034	23,158	177.24	163	1,860	1,519	136	70.41
1993	6.405	17,700	186.90	154	1,995	1,513	150	70.58
1994	7.650	17,842	216.56	173	2,303	2,233	176	87.59
1995	7.317	16,230	199.36	157	2,081	1,820	150	121.35
1996	7.112	15,819	191.74	181	2,069	1,673	155	106.96
1997	6.545	14,191	211.61	186	2,207	1,529	166	87.02
1998	7.297	14,332	292.52	227	3,423	1,743	189	98.05
1999	6.723	13,704	251.08	186	2,712	1,664	184	82.86
2000	6.169	13,141	248.68	168	2,393	1,575	199	70.99
2001	5.294	11,754	239.21	169	2,316	1,379	177	58.20
2002	5.485	12,039	241.74	185	2,299	1,463	175	60.28
2003	5.690	11,897	243.24	182	2,244	1,534	153	68.34
2004	7.562	14,940	313.21	232	2,842	2,016	187	93.19
2005	8.032	14,976	329.00	260	2,716	2,152	202	95.03
2006	12.291	22,789	467.79	432	3,913	3,258	311	144.87
2007	13.848	22,566	483.12	507	4,304	3,441	323	161.90
2008	14.936	23,959	495.11	491	5,461	3,325	329	175.66
2009	14.674	23,815	503.12	440	6,024	3,230	337	198.30

* From 1976-1998, 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
1984	10.1100	6.2200	8.1446	10.0640	6.2950	8.1585
1985	6.7500	5.4500	6.1319	6.8350	5.5250	6.1459
1986	6.3100	4.8530	5.4645	6.2850	4.8540	5.4653
1987	10.9250	5.3600	7.0156	9.6600	5.3790	7.0198
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	3.9334
1993	5.4200	3.5600	4.3130	5.4430	3.5230	4.3026
1994	5.7475	4.6400	5.2851	5.7810	4.5730	5.2808
1995	6.0375	4.4160	5.1971	6.1020	4.3750	5.1850
1996	5.8275	4.7100	5.1995	5.8190	4.6760	5.1783
1997	6.2675	4.2235	4.8972	6.3070	4.1550	4.8716
1998	7.8100	4.6900	5.5442	7.2600	4.6180	5.4953
1999	5.7500	4.8800	5.2184	5.7600	4.8720	5.2143
2000	5.4475	4.5700	4.9514	5.5470	4.5630	4.9654
2001	4.8200	4.0500	4.3696	4.7180	4.0260	4.3047
2002	5.0975	4.2350	4.5990	5.1130	4.2160	4.5952
2003	5.9650	4.3700	4.8787	5.9830	4.3460	4.8865
2004	8.2900	5.4950	6.6578	8.2110	5.5140	6.6847
2005	9.2250	6.3900	7.3115	9.0000	6.4270	7.3199
2006	14.9400	8.8300	11.5492	14.8460	8.8090	11.5469
2007	15.8200	11.6700	13.3835	15.4990	11.4650	13.3777
2008	20.9200	8.8800	14.9891	20.6850	8.7900	14.9604
2009	19.1800	10.5100	14.6743	19.2950	10.4200	14.6925

US Prices in 2009

Comex Settlement

US$ per ounce	High	Low	Average
January	12.560	10.420	11.386
February	12.560	10.420	11.433
March	13.862	11.950	13.088
April	13.015	11.785	12.502
May	15.600	12.480	14.110
June	15.945	13.574	14.625
July	13.985	12.637	13.375
August	14.980	13.871	14.401
September	17.408	15.035	16.502
October	17.893	16.173	17.175
November	18.766	16.431	17.858
December	19.295	16.779	17.609

Source: Comex

Leasing Rates in 2009

Monthly Averages

Average	3-month	6-month	12-month
January	1.20%	1.51%	1.71%
February	1.34%	1.75%	1.98%
March	1.30%	1.78%	1.97%
April	1.05%	1.55%	1.75%
May	0.70%	1.18%	1.41%
June	0.16%	0.69%	1.10%
July	0.03%	0.47%	0.91%
August	-0.12%	0.27%	0.80%
September	-0.25%	0.10%	0.64%
October	-0.28%	0.01%	0.62%
November	-0.31%	-0.06%	0.49%
December	-0.35%	-0.15%	0.40%

Source: LBMA

Appendix 5

Leading Primary Silver Mines

Rank	Mine Name	Country	Company	2008 Moz	2009 Moz
1	Fresnillo	Mexico	Fresnillo plc	33.78	35.42
2	Cannington[1]	Australia	BHP Billiton	34.56	33.76
3	Dukat	Russia	JSC Polymetal	12.50	11.80
4	Gümüsköy[2]	Turkey	Eti Gümüş A.Ş.	9.00	11.20
5	Uchucchacua	Peru	Compañia de Minas Buenaventura SA	11.42	10.56
6	Arcata	Peru	Hochschild Mining	9.03	9.54
7	Pallancata	Peru	Hochschild Mining	4.19	8.42
8	San Bartolomé	Bolivia	Coeur d'Alene Mines	2.86	7.47
9	Greens Creek	United States	Hecla Mining Co	7.23	7.46
10	Imiter[2]	Morocco	Société Métallurgique d'Imiter	6.25	6.75
11	Alamo Dorado	Mexico	Pan American Silver Corp	6.12	5.32
12	San José	Argentina	Hochschild Mining	4.38	5.00
13	Ying[3]	China	Silvercorp Metals	3.32	4.26
14	Martha	Argentina	Coeur d'Alene Mines	2.71	3.71
15	Huaron	Peru	Pan American Silver Corp	3.63	3.56

1 reported payable metal in concentrate; 2 estimate; 3 Reported Sales

Silver Mine Production by Source Metal

(million ounces)

	2006	2007	2008	2009
Primary				
Mexico	46.7	53.6	57.1	58.6
Peru	33.9	30.4	39.5	42.2
Australia	30.7	37.5	35.4	33.8
Other	66.6	72.9	67.3	79.3
Total	***177.9***	***194.5***	***199.3***	***213.9***
Gold				
Mexico	13.6	14.8	17.2	23.0
Chile	10.1	8.0	12.3	15.8
Russia	3.8	3.2	8.1	11.4
Other	34.7	34.6	33.8	36.5
Total	***62.3***	***60.7***	***71.4***	***86.7***
Copper				
Poland	39.9	39.1	38.4	38.7
Chile	32.9	37.6	27.7	25.8
Peru	17.7	17.0	20.1	23.6
Other	79.8	77.9	74.5	77.8
Total	***170.4***	***171.5***	***160.7***	***165.9***
Lead/Zinc				
China	54.4	56.6	60.0	65.0
Peru	48.8	56.2	49.1	47.3
Bolivia	13.0	14.4	30.6	31.4
Other	110.9	107.2	110.2	97.0
Total	***227.1***	***234.5***	***249.9***	***240.7***
Other	**3.2**	**3.3**	**3.4**	**2.5**
World Total	**640.9**	**664.4**	**684.7**	**709.6**

Source: GFMS

Silver Mine Production by Main Region and Source Metal

(million ounces)

	2006	2007	2008	2009
North America				
primary	71.1	75.0	72.7	74.1
lead/zinc	49.6	49.3	44.3	37.8
copper	19.2	18.6	18.2	20.4
gold	21.9	23.5	24.9	30.9
other	1.6	1.6	1.8	0.9
Total	***163.3***	***168.0***	***161.8***	***164.1***
Central & South America				
primary	45.5	51.2	54.9	65.9
lead/zinc	63.8	72.7	82.1	81.0
copper	51.6	55.6	48.7	50.8
gold	27.3	25.4	29.7	35.6
other	0.0	0.0	0.0	0.0
Total	***188.3***	***204.9***	***215.5***	***233.3***
Asia & CIS				
primary	24.6	25.4	30.2	33.4
lead/zinc	77.9	78.7	86.1	92.9
copper	51.2	50.0	48.5	50.3
gold	10.2	9.5	14.2	17.9
other	1.6	1.6	1.6	1.6
Total	***165.5***	***165.3***	***180.6***	***196.2***
Rest of the World				
primary	36.7	42.9	41.6	40.5
lead/zinc	35.8	33.7	37.4	29.0
copper	48.4	47.3	45.2	44.3
gold	2.9	2.2	2.6	2.2
other	0.0	0.0	0.0	0.0
Total	***123.8***	***126.2***	***126.9***	***116.1***
World Total	**640.9**	**664.4**	**684.7**	**709.6**

Appendix 6

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

	Comex Number of Contracts				LBM Clearing Turnover[3]		
	Futures		Options				
	Turnover[1]	Open Interest[2]	Turnover[1]	Open Interest[2]	Ounces transferred (millions)	Value (US$bn)	Number of transfers
Jan-08	719,308	185,540	144,326	138,861	117.6	1.9	529
Feb	989,601	166,678	188,881	133,766	132.4	2.3	517
Mar	881,776	146,632	188,396	133,766	154.7	3.0	676
Apr	912,952	123,841	203,904	161,621	119.2	2.1	500
May	580,959	124,655	144,284	173,114	121.2	2.1	490
Jun	859,976	126,221	149,030	147,127	119.5	2.0	480
Jul	722,663	131,599	121,652	160,277	105.5	1.9	481
Aug	953,123	115,590	170,257	140,182	150.0	2.2	625
Sep	792,072	103,812	160,396	144,595	143.7	1.7	576
Oct	594,307	93,779	122,010	162,706	136.2	1.4	569
Nov	578,009	84,202	62,344	88,404	107.6	1.1	446
Dec	324,075	85,923	45,402	91,237	102.1	1.1	343
Jan-09	423,943	92,990	67,912	107,138	111.7	1.3	315
Feb	652,242	94,102	68,408	90,276	105.8	1.4	362
Mar	433,757	94,506	59,553	97,591	98.8	1.3	319
Apr	575,714	89,263	88,982	100,855	101.1	1.3	305
May	418,399	102,631	85,473	117,815	97.5	1.4	342
Jun	869,109	104,594	104,093	113,022	100.0	1.5	358
Jul	486,592	99,411	87,124	126,559	90.5	1.2	310
Aug	842,904	105,057	73,071	113,071	79.3	1.1	322
Sep	657,020	128,160	136,242	129,190	113.0	1.9	406
Oct	809,303	130,427	110,012	144,120	101.1	1.7	341
Nov	1,159,284	131,516	102,646	100,705	81.0	1.4	350
Dec	680,278	124,953	77,897	107,859	88.0	1.6	348

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

Silver ETF Holdings

(Moz, end-period)		iShares Silver Trust	*ETF Securities	ZKB	Total	Value US$ Bn**
2008	Q2	192.98	11.02	21.55	225.56	3.98
	Q3	220.30	13.59	27.25	261.14	3.38
	Q4	218.40	14.23	32.72	265.35	2.86
2009	Q1	266.75	17.25	45.07	329.07	4.31
	Q2	280.51	19.89	49.37	349.77	4.88
	Q3	276.42	28.35	55.18	359.96	5.92
	Q4	305.89	32.97	58.98	397.84	6.76
2010	Q1	298.30	34.00	64.88	397.18	6.87

*Includes ETF Securities London, Australia and NYSE; **Using the quarter-end London price
Source: Respective issuers, GFMS