THE SILVER INSTITUTE
1200 G STREET, NW
SUITE 800
WASHINGTON, DC 20005
TEL: (202) 835-0185
FAX: (202) 835-0155
EMAIL: INFO@SILVERINSTITUTE.ORG
WWW.SILVERINSTITUTE.ORG

GFMS

WORLD SILVER SURVEY 2008

THE SILVER INSTITUTE

WORLD SILVER SURVEY 2008

GFMS

World Silver Survey 2008 has been kindly supported by the following companies

—MAJOR SPONSORS—

Coeur d'Alene Mines Corporation

Pan American Silver Corp.

Silver Wheaton Corp.

Industrias Peñoles, S.A.B. de C.V.

—SPONSORS—

First Majestic Silver Corp.

Barrick Gold Corporation

Apex Silver Mines Corporation

Hecla Mining Company

Compañia de Minas Buenaventura S.A.A.

Silver Standard Resources Inc.

www.ibkcapital.com

KGHM Polska Miedź S.A.

—CONTRIBUTORS—

Avino Silver & Gold Mines Ltd.
Excellon Resources Inc.
Goldcorp Inc.
Johnson Matthey Inc.
MAG Silver Corp.
Mitsui Global Precious Metals
New York Mercantile Exchange
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, with anticipated 2008 production of approximately 16 million ounces of silver, a 40% increase over 2007 levels. Coeur, which has no silver or gold production hedged, is now set to commence production at the world's largest pure silver mine - San Bartolomé in Bolivia – and is currently another world-leading silver mine – Palmarejo in Mexico. The Company also operates two underground mines in southern Chile and Argentina and one surface mine in Nevada; and owns non-operating interests in two low-cost mines in Australia. The Company also owns a major gold project in Alaska and conducts exploration activities in Argentina, Bolivia, Chile, Mexico and Tanzania. Coeur common shares are traded on the New York Stock Exchange under the symbol CDE, the Toronto Stock Exchange under the symbol CDM, and its CHESS Depositary Interests are traded on the Australian Securities Exchange under symbol CXC.

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 inorganic 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, lead and zinc. Its mission is to add value to non-renewable natural resources in a sustainable manner.
The company was founded in 1887. Its shares have traded on the Mexican Stock Exchange since 1968 under the ticker PE&OLES.

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 increasing its low cost silver production and silver reserves. The Company currently operates seven mines in Mexico, Peru and Bolivia. Manantial Espejo, the Company's eighth mine, is scheduled to commence production in mid 2008. Pan American has increased its silver production for 13 consecutive years and is planning to do so again. Silver production should reach 19.5 million ounces in 2008 and 25 million ounces in 2009.

Silver Wheaton Corp.

Silver Wheaton is the largest pure silver company in the world, expecting to sell approximately 15 million ounces of silver in 2008 and growing to 25 million ounces by 2010, without any capital expenditures being required to generate that growth. The Company has long term contracts to purchase all or a portion of the silver production from mines in Mexico, Sweden, Peru, Greece and the United States, at a low fixed cost. Silver Wheaton's unique and simple business model is designed to create long term shareholder value, providing the best leverage to increases in the silver price while mitigating downside risks. Silver Wheaton is unhedged and well positioned for further growth.

THE SILVER INSTITUTE

(major funding companies)

Barrick Gold Corporation

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

Coeur d'Alene Mines Corporation

Hecla Mining Company

Industrias Peñoles, S.A.B. de C.V.

Pan American Silver Corp.

Silver Standard Resources Inc.

Silver Wheaton Corp.

World Silver Survey 2008

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

Nikos Kavalis, Senior Metals Analyst

William Tankard, Senior Metals Analyst

Matthew Piggott, Metals Analyst

Sierra Highcloud, Metals Analyst

Ayako Furuno, Metals Analyst

Cameron Alexander, Senior Metals Analyst, Perth, Australia

Sanjiv Arole, Metals Analyst, Mumbai, India

Gargi Shah, Metals Analyst, Mumbai, India

Consultants & Other Contributors:

Vitaly Borisovich, Moscow, Russia

Rhona O'Connell

Veronica Han, Beijing, China

Elena Patimova

Richard Napier, Munich, Germany

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

The Silver Institute
1200 G Street, NW, Suite 800
Washington, D.C., 20005, USA
Switchboard: +1 202 835-0185
Fax: +1 202 835-0155
info@silverinstitute.org
www.silverinstitute.org

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: 978-1-880936-16-0

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 fourteenth 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, 2008
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 burst spectacularly above the $20 level this March but its first quarter fireworks should not be allowed to overshadow what was a very solid performance in 2007. Indeed, last year's annual average of $13.38 was 16% higher, the fourth year in a row of double-digit percentage gains. The key development changing silver's fortune has been the pronounced shift in investor behavior, as reflected in the supply/demand figures shown below.

As the data shows, through until the beginning of this decade, the market was still having to absorb large amounts of silver dishoarded from private stocks. This was the legacy of the silver investment boom and then bust of the 1970s and 1980s. A few years ago, this source of supply dried up (sellers were fewer and more buyers emerged). The transformation was completed in 2004-07 as net investment became a market fixture, a process very much helped since 2006 by the launch of ETFs in silver. This shift in investor activity, of course, has not been restricted to silver but forms part of a wider theme that has encompassed most commodities. In particular, the white metal has benefited from the parallel rallies that have taken place in gold and the base metals. Nevertheless, as we explain in this *World Silver Survey*, it was not all plain sailing for silver last year; there were periods when investors appeared to have become disenchanted with its range bound conditions. This helps to explain the relatively low implied figure, although it should be kept in mind that investment's impact on the market and prices tends to be much greater than its modest net weight shown in our supply/demand balance.

Looming much larger on the demand side is the use of silver for industrial applications. Since its low point in 2001, this sector's offtake has grown by 36% and absorbed an additional 120 Moz (3,700 t). Importantly, this source of demand has shown little short-term price sensitivity. In fact, we would argue that although it has not grabbed the headlines like investment, the massive growth in industrial demand has been critical to silver prices' advance in the face of other adverse supply/demand developments. These include the softness over the same period of demand in jewelry, silverware and, especially, photography. Our statistics, for example,

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

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Supply										
Mine Production	542.2	556.9	591.0	606.2	593.6	600.6	621.1	643.8	647.4	670.6
Net Government Sales	33.5	97.2	60.3	62.6	60.3	88.4	60.2	67.5	78.2	42.3
Old Silver Scrap	193.9	181.6	180.7	182.7	187.5	184.0	183.7	186.0	188.0	181.6
Producer Hedging	6.5	-	-	18.9	-	-	9.6	27.6	-	-
Implied Net Disinvestment	48.2	44.8	87.2	-	10.8	-	-	-	-	-
Total Supply	**824.3**	**880.4**	**919.1**	**870.4**	**852.2**	**872.9**	**874.6**	**925.0**	**913.7**	**894.5**
Demand										
Fabrication										
Industrial Applications	316.3	339.0	374.3	335.2	339.2	349.8	367.3	405.3	424.8	455.3
Photography	225.4	227.9	218.3	213.1	204.3	192.9	178.8	160.3	144.0	128.3
Jewelry	140.6	159.8	170.6	174.3	168.9	179.2	174.9	173.8	166.3	163.4
Silverware	114.2	108.6	96.4	106.1	83.5	83.9	67.3	67.8	61.2	58.8
Coins & Medals	27.8	29.1	32.1	30.5	31.6	35.7	42.4	40.0	39.8	37.8
Total Fabrication	824.3	864.4	891.7	859.2	827.4	841.5	830.7	847.4	836.0	843.7
Producer De-Hedging	-	16.0	27.4	-	24.8	20.9	-	-	6.8	25.0
Implied Net Investment	-	-	-	11.2	-	10.5	44.0	77.6	70.8	25.8
Total Demand	**824.3**	**880.4**	**919.1**	**870.4**	**852.2**	**872.9**	**874.6**	**925.0**	**913.7**	**894.5**
Silver Price (London US$/oz)	5.544	5.220	4.951	4.370	4.599	4.879	6.658	7.312	11.549	13.384

show that photography's call on the market has slumped by nearly 85 Moz (2,600 t) since 2001. The other major negative fundamental development that we highlight is soaring growth in mine production over the last four years. This hit 670.6 Moz (20,858 t) in 2007, bringing the gain since 2003 to no less than 70 Moz (nearly 2,200 t). Last year alone mine supply rose by 23.2 Moz (721 t). Fortunately for the price in 2007, the effect of higher mine output was offset by substantial de-hedging (25.0 Moz or 779 t), a sizable drop in government sales and the above-mentioned growth in industrial demand. Under such circumstances, the contribution of investment was sufficient to take the silver price to fresh highs.

Whether this dynamic can be repeated in the future is questionable. Looking first at supply, it is likely that we will see solid gains this year for mine production. Assuming that supply from scrap and government sales combined see relatively little attrition, demand will have to absorb additional metal. The prospects for fabrication to rise sufficiently to do so would seem low, firstly as prices in excess of $15 are having some impact on demand and, secondly, as global GDP and industrial production growth are set to move lower. In particular, this will have a negative effect on industrial offtake, an area which in 2007 accounted for just over half of all demand.

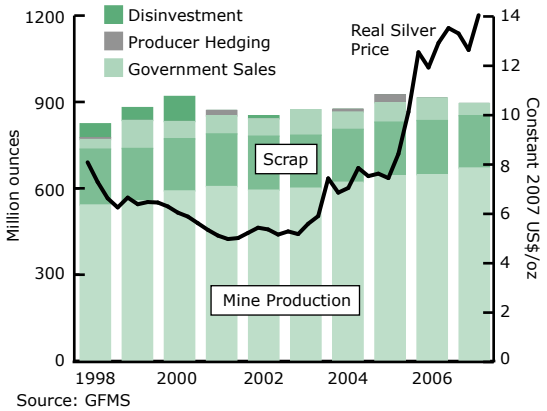
The conclusion then is that other demand, basically from investors and, maybe, de-hedgers, will have to grow (if a price fall is to be avoided). Although we would not rule it out, the probability of a further round of substantial de-hedging is low. Firstly, the outstanding producer book in delta-adjusted terms at end-2007 came to just 58.7 Moz (1,824 t), so the scope for large-scale de-hedging is limited. Secondly, there is always the chance that non-primary producers will seek to lock in historically high silver prices, particularly, perhaps, on any sign of a secular change in direction. This suggests to us that a great deal will be required from investment demand this year. So far, investors seem to be delivering. In the first quarter of 2008, for instance, combined ETF holdings rose by over 32 Moz (almost 1,000 t). Furthermore, the prospects for investment demand remain positive, this year at least, basis expected gains in gold prices, continued US dollar weakness, growing inflation fears and a further substantial inflow of money into the commodities sector. We would be surprised if this does not translate into another major year-on-year gain in silver prices in 2008.

Supply in 2007

- ***World silver mine production staged a firm increase of almost 4% to 670.6 Moz (20,858 t) in 2007, as solid gains were noted among many of Latin America's core producers.***
- ***Net government sales fell in 2007 by 46% to 42.3 Moz (1,314 t) due to a lack of sales from China and India.***
- ***Despite higher silver prices, scrap volumes fell in 2007, by 3% to 181.6 Moz (5,649 t).***

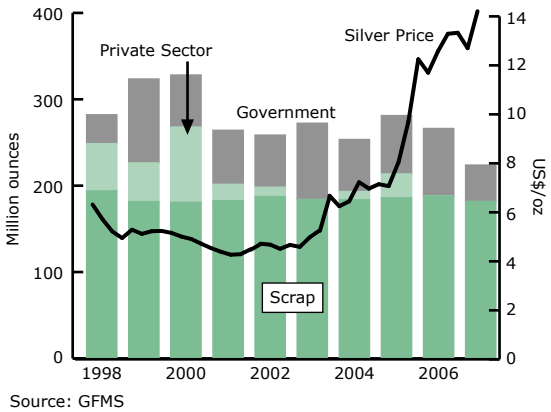
Global silver **mine production** was broadly in line with market expectations last year, as many of the world's key silver producing nations fielded positive results. Latin American output was buoyed firstly by a temporary boost to silver grades at the significant La Coipa silver-gold mine in Chile and, secondly, by first production from

World Silver Supply



Source: GFMS

Mobilization of Above-Ground Stocks



Source: GFMS

major mining developments in Mexico and Bolivia, namely Pan American Silver's Alamo Dorado and Apex Silver's San Cristobal respectively. Outside the region, important gains were noted in China, whose base metals mining sector went from strength to strength, and in Australia, where BHP Billiton's prolific Cannington made a comeback following sub-standard production levels in 2006. These gains were offset by losses at maturing mines in Canada and operational difficulties in Kazakhstan.

In terms of source metallurgy, GFMS recorded solid growth within the primary silver sector, amounting to an 11% increase to 198.1 Moz (6,162 t) (based on revenue analysis, a small number of mines were re-classified as primary silver). The lead/zinc sector also enjoyed a firm improvement, with China and the world's largest silver producer, Peru, leading the way, with regards to the sector's 3% global growth. Silver output as a by-product of copper and gold mining was essentially flat year-on-year. For gold, this was broadly representative of actual gold mine production, which edged down by less than 1% last year.

Net government sales last year fell by 46% to 42.3 Moz (1,314 t). The decline was the result of the two main sellers of the prior year, namely China and India being essentially absent in 2007. In contrast, Russian releases, which comprised the bulk of net sales last year, rose, partly offsetting others' declines.

Scrap supply fell in 2007, declining 3% to 181.6 Moz (5,649 t). The drop may appear counter intuitive, considering the 16% rise in the average dollar silver price last year. However, evidence suggests that there was limited reaction in price sensitive jewelry markets to elevated prices, while there was essentially no copy of the surge in consumer selling back in western markets of gold jewelry. The ongoing decline in scrap from old photographic material due to the penetration of digital technology continued in 2007 but at a surprisingly modest rate, with an increased flow of old X-ray film arresting the decline in several regional markets. There was some compensation for declining photographic scrap in the form of rising supply from electronics, electrical and other secondary material, partly in response to a further tightening of environmental legislation. It was industrial scrap, for example, that was the catalyst for the increase in scrap supply in East Asia, with China again dominating growth in the region.

Demand in 2007

- ***Total fabrication rose by 0.9%, despite the price rise, to 843.7 Moz (26,241 t), as growth in the industrial category outweighed losses in all others.***
- ***Industrial demand rose for the sixth year in a row, up 7% to a record 455.3 Moz (14,162 t).***
- ***Jewelry fabrication fell by a slight 2% but this was to an eight-year low of 163.4 Moz (5,083 t).***
- ***Silverware fabrication slipped by 4% to 58.8 Moz (1,828 t), or roughly half levels 10 years earlier.***
- ***Photographic demand continued its secular slide, falling 11% to 128.3 Moz (3,991 t) last year.***
- ***Coin fabrication fell by 5%, largely because of lower minting in Germany and the United States.***
- ***Producer de-hedging grew strongly in 2007 as 25.0 Moz (779 t) was removed from the outstanding delta-adjusted hedge book.***
- ***Implied net investment was down by nearly two-thirds, as liquidations in the middle months largely offset net purchases over the rest of the year.***

Total fabrication staged a rise of 0.9% in 2007, solely as a result of gains for the industrial segment. In contrast, all other areas saw losses, of which almost 70% were due to the ongoing decline in photographic demand resulting from the shift to digital technology. This and other factors such as western taste changes in silverware and Indian concerns over metal purity mean the bulk of all losses were due to drivers other than the price.

Industrial fabrication posted another record last year, reaching 455.3 Moz (14,162 t), up by 7% on 2006. This growth illustrates three important features of this sector: its largely price inelastic nature (in the short term at least); the difficulties in substituting the metal and a close link to world GDP growth, which in 2007 stood at a still robust 4.9%. Industrial offtake's increase (and declines elsewhere) meant that, for the first time ever, its share of total demand passed the 50% mark (in comparison to 38% a decade earlier). This dominance together with its above noted limited price sensitivity are the key drivers of demand's overall resilience in the face of higher prices.

All regions posted growth in the industrial sector, with the three largest gains in order occurring in India, the United States and then China. Much of the increase for the former came from plating salts, while a large part of the US increase concerned ethylene oxide (EO) catalysts.

The factors behind Chinese growth were more typical of most other countries in that they were led by electrical/electronics demand and brazing alloy/solder offtake, which respectively rose globally by 6% and 10% last year and which both posted fresh record totals. Some of the main end-users driving these gains were the construction, consumer electronics and automobile industries.

World **jewelry** demand in 2007 is estimated at 163.4 Moz (5,083 t), down by less than 2% despite higher prices, although this was to an eight-year low. The price was perhaps most damaging in India, although other factors such as concerns over silver purity also featured. The other major fall, that for Italy, was more driven by export market share loss and weak domestic sales. Such weakness was unusual in the West as most countries there saw rough stability as losses to non-precious rivals and fading consumer confidence were broadly balanced by price-led gains from gold. A marked rise in offtake was noted for China and Russia, thanks chiefly to buoyant local consumption, although the former also increased its export market share.

Silverware offtake fell 4% to 58.8 Moz (1,828 t) or more than 55 Moz (1,700 t) less than 10 years ago. The major drop in India was mainly price driven, while hefty European and US losses were more due to taste changes and imports' rising market share. Higher exports in turn help explain China's growth, while booming domestic sales largely drove the surge in Russian fabrication.

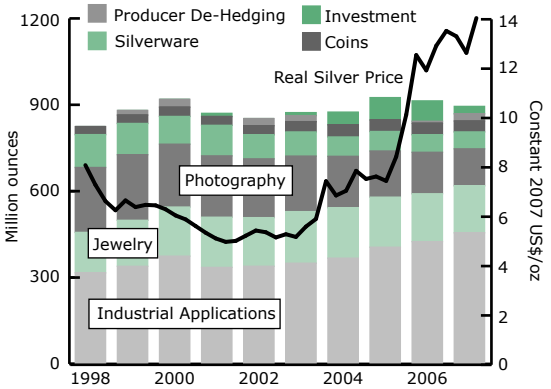
The 11% decline in **photographic** fabrication, to 128.3 Moz (3,991 t), in 2007 was all but surprising, given the continued penetration of digital technology. Of particular interest was the regional split as demand in East Asia remained essentially flat, with European and North American offtake accounting for the bulk of the overall fall. This was largely the result of the relocation of production from the latter two to the former.

In 2007, **coin** fabrication fell by nearly 5% to 37.8 Moz (1,177 t). Lower output in Germany and the United States offset healthy gains in Canada and China.

Taken at face value, the 25.8 Moz (801 t) **implied net investment** figure GFMS derived for the year might appear contradictory to the 51.1 Moz (1,591 t) inflow into the, by year-end three, silver ETFs, as well as other identifiable net increases in investors' holdings of silver. Much of the explanation for this 'mismatch' is the large level of net selling our information suggests took place in the OTC market over the year. On the one hand, this comprised profit taking and stop-loss liquidations in the middle months of the year and, on the other, a shift of stocks away from such positions and into, largely, ETFs. As has normally been the case over the last few years, the above outlined investor activity in silver shadowed price movements in gold for most of 2007 and during the first three months of this year.

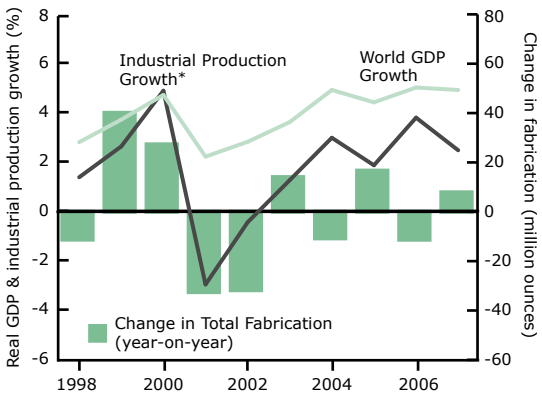
Producers continued to reduce the consolidated **hedge position** in 2007, with a net reduction to the delta-adjusted hedge book calculated at 30% year-on-year. This left the outstanding end-year position at 58.7 Moz (1,824 t). The measured global options book was reduced by a substantial 46% as short-dated positions expired or were delivered into and, in one instance, were converted to forward sales. Forwards were also scaled back as a handful of producers delivered into positions, most notably Polymetal, which is now unhedged.

World Silver Demand



Source: GFMS

Fabrication Demand and World Economic Indicators



* Industrial countries only; Source: IMF, GFMS

2. Silver Prices

- ***The annual average silver price rose a robust 16% in 2007 to a 27-year high of $13.38.***

- ***Much of the gains were investor and gold led, though fabrication's resilience, sizeable de-hedging and lower government sales were also significant.***

The average price that silver achieved in 2007, $13.38, was the highest ever save for the $20.98 posted in 1980. This result represented a 15.9% increase year-on-year, a rise that was stronger than that enjoyed by gold, platinum and palladium (up respectively 15.2%, 14.0% and 10.9%). However, it is worth recalling that 2007's gain was far smaller than the 58.0% leap that 2006 managed. 2007 was also not a one-way street as prices struggled from late February onwards, sliding in a volatile manner to a low for the year in late August of $11.67. Last year may be better remembered for its dramatic fourth quarter rally that took the price to a 26-year high of $15.82 in early November, though even these gains were overshadowed by moves in the first quarter this year as the price streaked up to $20.92 in mid-March.

Investors were arguably the main cause of price gains, in particular the fourth quarter rally. Their interest was mainly fired by the sub-prime crisis, though its impact was in part indirect via the rally that gold saw and there was no repeat of early 2006 when the prospect of an ETF launch led to silver leading the yellow metal for once. The fundamentals, however, were of critical importance in facilitating the rally. Most important was the resilience of fabrication, thanks mainly to notable growth in the 'essential' uses within industrial offtake. Jewelry, however, performed quite well, given the price rise, while the jump in producer de-hedging assisted too. Supply side developments were also supportive, with government sales almost halving and scrap falling despite price gains.

Price volatility was markedly lower last year at 26% in comparison to 2006's 45%, chiefly as there was no single event like the prior year's boom/bust in April/May. Within 2007, volatility was greatest in the fourth quarter at 30% but even that was far lower than the 69% recorded for the second quarter of 2006 and the 45% registered for the first quarter this year.

US$ Silver Price

	1977	1987	1997	2007
Annual Average	4.610	7.016	4.897	13.384
Maximum	4.960	10.925	6.268	15.820
Minimum	4.303	5.360	4.224	11.670
Range:Average	14.3%	79.3%	41.7%	31.0%

Source: GFMS

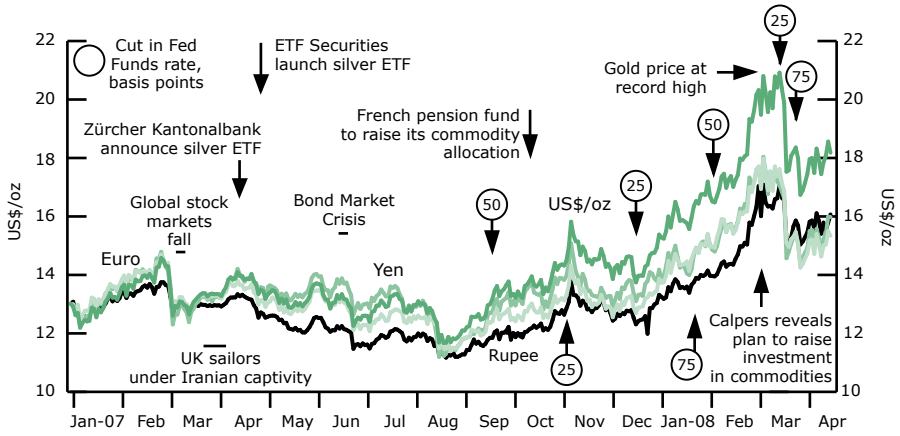
The Silver Price in Other Currencies in 2007

	Euro/kg	Rupee/kg	Yen/10g	Yuan/kg
Annual Average	314.0	18,794	506.3	3,266
Maximum	355.9	20,740	576.0	3,785
Minimum	275.8	16,815	427.6	2,846
Range:Average	25.5%	20.9%	29.3%	28.7%

Source: GFMS

London Silver Market: Spot Price

US$/oz; other currencies reindexed to 3rd January 2007



In a year with dollar weakness to the forefront, there is little surprise that changes in the silver price were again typically more muted in other currencies. On the consuming side, the average rupee price only rose by 7% and, during the year, it fell by almost 20% from February to August. On the producer side, price gains in Peruvian sol, renminbi and yet more so in Australian dollar terms undershot US dollar prices, with the annual average for each up respectively only 11%, 10% and 4%. The local price for Mexico (the last of the top four producers), however, behaved similarly, with a 16% rise.

In real terms, price gains remain impressive, with 2007's annual average representing a 23-year high, if still far below 1980's inflation adjusted average of $52.80. Nonetheless, last year's average was more than 160% above the low reached in 2001, although as a measure of dollar depreciation, it is worth noting that in euro and rupee terms, this post-trough rally is cut back to around 80% and 90% respectively.

After the drama of early 2006 when lease rates soared in anticipation of the ETF launch (with the 12-month rate almost touching 7%), last year saw lease rates at the short end trade largely sideways at trivial levels, though there was weakness at the longer end, with the 12-month sliding steadily from around 1.5% to almost zero. These subdued conditions were a clear sign of ample liquidity and limited interest in either producer hedging or investor shorting of the market. Rates also behaved differently to those for gold in that, as the sub-prime crisis properly broke in August, silver rates, if anything, trended down and saw little increase in volatility, as opposed to gold rates' attempted move higher and jump in volatility.

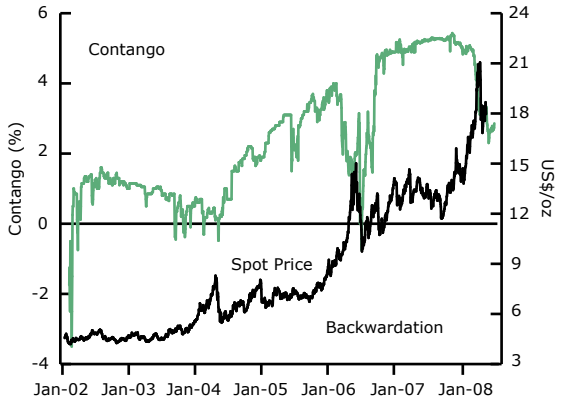
Market Analysis

Last year began in a bullish fashion as the price rallied from the $12.20s to over $14.50 by late February. Much was just shadowing of the gold rally, with buying at least initially focused on the over-the-counter (OTC) market; it was of note that other triggers such as a fall in the dollar did not arrive until several weeks into the rally, a time when fund interest on Comex and ETF holdings began to pick up. During this phase, silver actually outpaced gold, causing their price ratio to slide from almost 50 to its low for the year of just under 47:1. This difference is thought largely a function of silver's lower liquidity as support from the base metals at the time was poor. However, there was some support on the fundamental side, with unsettling news on government tax plans in Bolivia, the location of the major San Cristobal mine project, and an explosion at Australia's Port Pirie smelter.

This brief bullish move, however, ended abruptly in late February as the price slumped into the low $12.60s by early March and then entered a volatile, downward trending phase that saw the price post a low for the year of $11.67 in late August. The initial sharp correction was chiefly triggered by the sell off in gold, which in turn was largely the product of a Chinese stock market slump. This led to equity weakness elsewhere and, due to a need to raise liquidity and a bout of risk aversion, which on this occasion meant moving out of commodities in general, all the precious metals came under pressure, with silver seeing particularly heavy fund selling on the Comex.

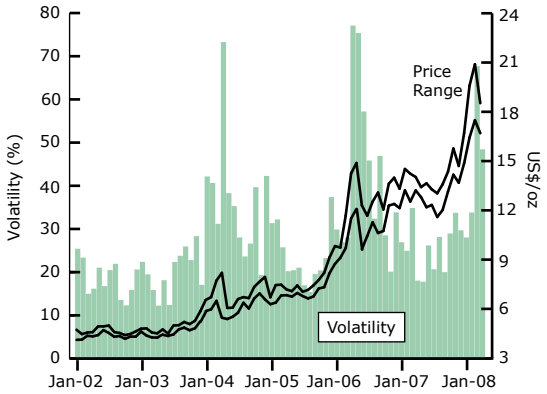
The other main phases of this volatile period were a partial recovery through to mid-April, marked weakness

London Spot Price and 3-month Contango



Source: GFMS

Daily Silver Price Volatility



Source: GFMS

in June, an attempted recovery during July and, lastly, a final bout of weakness in late July/August. As before, much was a function of moves in the gold market, as evidenced in the correlation between gold and silver coming in at 0.59 for the second quarter. For the record, some of the main drivers of investment and gold in these moves were April's bout of dollar weakness, June's bond market crisis (which had an effect similar to the earlier Chinese stock market drop), renewed dollar weakness and oil price strength in July and the reversal of these latter two to start with in August. It was of note that silver's response during the correction phases was stronger than gold's, largely as the latter, unlike silver, saw some safe haven buying at the same time as others were selling to raise cash or reduce perceived risk.

Investment in silver was no doubt assisted by news regarding ETFs. On April 13th, the Zürcher Kantonalbank reported plans for a silver ETF launch in May on the SWX Swiss Exchange and, on April 19th, ETF Securities announced the launch on the 24th of that month of another ETF, in this instance to be listed in London. While price supportive, it was of interest to note the relative calmness with which this news was greeted, certainly in comparison to the drama surrounding the start of trading of the iShares product in April 2006.

The fact that silver performed less well than gold in the middle months was partly a result of investor selling being into a less liquid market. However, perhaps more was due to silver's relatively small price responsive element within fabrication, such that price dips did not stimulate waves of buying similar to those seen in gold. By way of illustration, one obvious demand 'cushion',

Volatility (US$ Price)

	2004	2005	2006	2007
Actual - 1 year	39%	24%	45%	26%
Implied - 1 month	34%	25%	40%	25%
Implied - 3 months	33%	26%	40%	27%
Implied - 1 year	30%	26%	39%	29%

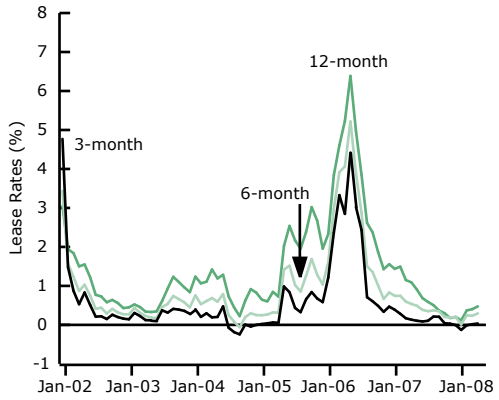
**implied statistics annual averages, source: UBS*

Indian jewelry fabrication, in 2007 only represented just over 1% of total silver demand but 15% of total gold demand (and even if silverware is included, India's share still fails to clear 3%). A second factor of importance is that many in the market thought that silver's semi-industrial nature could act as a drag should world GDP growth slacken. If proxied by moves in the base metals market, this fails to provide much of an explanation for silver's 'over-reaction' in June as most base metals were trading broadly sideways (with the exception of a plummeting nickel). However, general base metal weakness was witnessed initially in August, with the slide for copper perhaps of greatest significance.

This period of weakness ended comparatively swiftly in late August as a rally got underway that led to the price climbing to a 26-year high of $15.82 on November 7th. In this instance, silver was very much behaving as a precious metal as the base metals largely missed out on this rally, particularly in its closing stages. Indeed, silver outperformed gold in this rally, with the price ratio narrowing back to under 53:1 at the price peak.

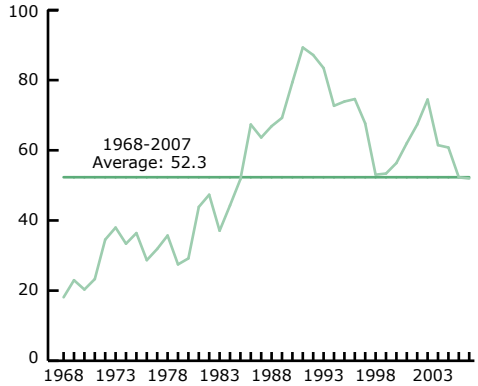
The rally was chiefly driven by investors and their reactions to the emerging sub-prime crisis. The precious

Silver Leasing Rates



Source: GFMS

The Gold / Silver Price Ratio



Source: GFMS

metals all benefited from a flight from conventional assets, such as equities, as the threat of a US recession loomed and as confidence in banks' stability waned. Investment was also supported by the successive cuts in US interest rates and, perhaps more importantly, these rate cuts resulted in a slump in the dollar. It was of note that its decline seemed more broadly based and not just against say the euro; it was only in the fourth quarter that a meaningful positive correlation between silver and the $:¥ rate emerged. The surge in oil prices at this point can neither be ignored, not only in its direct enthusing of investors but also in the manner in which it stoked already growing inflation concerns.

Evidence of growth in investment can be found in the marked expansion through to early November in the Comex 'fund' long (though it remained well short of the late February peak). There was also further growth in ETF holdings, though this was largely confined to two brief periods during the rally.

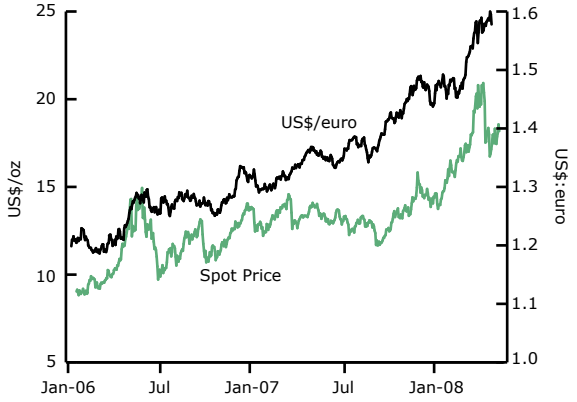
Despite further growth in ETF holdings, prices trended lower for much of the final two months, briefly sliding under $14. This was largely due to an end to the oil rally, a brief recovery in the dollar and perhaps a view that the precious metals had gone up too fast and too soon.

It would be wrong, however, to claim that investors were the sole drivers of the price. The emergence of fairly high levels of producer de-hedging and the resilience of fabrication demand, for example, were instrumental in allowing the rally to be staged. Key to this was the 7% growth recorded for the largest element of demand, industrial offtake, a category which, at least in the short-term, shows very little response to the price. The non-essential area of jewelry also performed comparatively well, slipping by less than 2%. However, it is of note that this was worse than for gold jewelry, which managed a rise of 5% despite price-driven substitution in some markets from the yellow to the white metal. Some might view the 11% drop in photographic demand as very damaging. However, the decline was perhaps smaller than some were expecting and it is worth being reminded that much would be offset by lower photographic scrap.

Indeed, lower photographic scrap was a key reason as to why total scrap fell, though the industrial segment of this is also quite unresponsive to short-term price changes. This leaves price led swings to scrap supply from jewelry and silverware and mainly in India. Prices also received decent support from the slump in government sales, again an area with changes having little to do with the price. The 3% rise in mine production was also arguably not as significant for the price last year as might be thought, given that an increase had for long been expected and its scale perhaps undershot expectations.

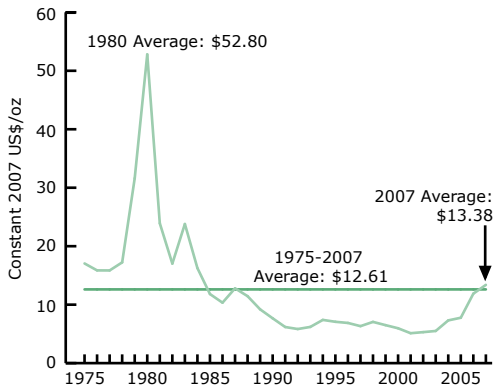
It is worth concluding with a brief review of events this year, as early 2008 saw gains yet stronger than late 2007. This rally saw silver post a high of $20.92 in mid-March, an increase of some 40% from the start of the year and a level last bettered by 1980's $49.45. This rise was again chiefly due to investor buying and once more largely the result of such factors as sub-prime damage to financial confidence and stability and a weaker dollar. Resilient fabrication, a limited supply response and lower liquidity again help explain silver's rise being proportionately greater than that for gold.

The Silver Price and the US Dollar



Source: Reuters EcoWin

Real Silver Prices



Source: GFMS

Silver and Other Commodity Prices

Historically as well as during the recent rally, the performance of other commodity prices has been and remains of paramount importance to that of the silver price. On the one hand, this can be indicative or serve as empirical evidence of an underlying relationship between the silver market and those of other commodities. On the other, it can be a reflection of investors and attitudes towards the metal.

The high correlation that has existed historically between silver and gold prices has been documented by GFMS on numerous occasions. As is also reiterated in Chapter 3, we remain of the view that this apparent link is largely fueled by investors trading the white metal together with gold, rather than an underlying relationship between the markets for the two metals. (In fact, the fundamentals of gold, being largely used in jewelry, and silver, which is primarily an industrial metal, are distinctly different.)

Concerning the correlation between silver and other industrial commodity (for instance base metals and energy) prices, although one would expect the comparable fundamentals to result in the silver price consistently shadowing these, the correlation coefficients that GFMS have calculated seem to suggest otherwise. The information contained in the accompanying table and the chart below, for instance, suggests the strength of such a correlation has varied greatly over the course of 2007 and in 2008 to-date. Moreover, it seems that this correlation is almost always weaker to that between silver and its yellow relative.

Correlations of Changes in Daily Prices

(using log-returns in spot prices)

	2007 Q1	2007 Q2	2007 Q3	2007 Q4	2008 Q1
Gold	0.62	0.59	0.44	0.50	0.63
Oil (WTI)	0.11	-0.10	-0.04	0.24	0.02
GSCI	0.15	-0.09	0.00	0.28	0.09
CRB	0.13	0.17	0.45	0.37	0.34
DJ-AIG Industrial Metals	0.37	0.02	0.08	0.28	0.26
DJ-AIG Agriculture	0.11	0.11	0.15	0.31	0.26

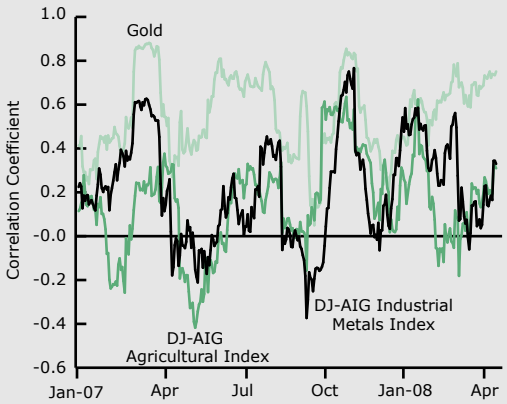
Source: GFMS, Reuters EcoWin

Of more interest perhaps is the jump in the correlation between silver prices and those of agricultural commodities seen in the last quarter of 2007 and during the first three months of this year. As far as a link between silver and these commodities is concerned, there is neither one suggested by the fundamental markets nor one fueled by their being part of the same complex (as it the case with gold).

Looking for the cause of this increase it is our understanding that it was largely fueled by the incidental concurrence of rising gold (and as a result silver) prices on the back of the sub-prime crisis and rising tightness in grain prices, related to increased consumption by developing markets and rising demand for biofuels. This was of course also augmented by investor purchases of commodity basket products that contained both silver and agricultural commodities, which saw tremendous growth during those six months.

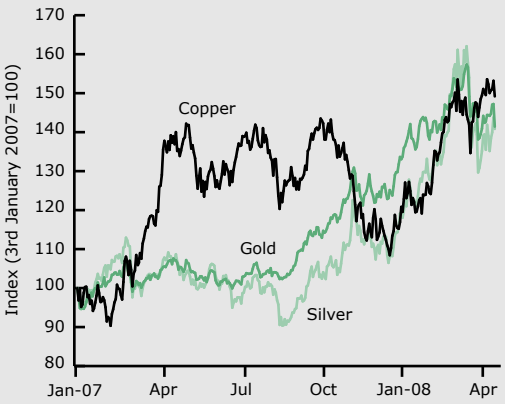
20-Day Rolling Correlation Coefficients

in log-returns between daily silver prices and other indicators



Source: GFMS, Reuters EcoWin

Gold, Silver and Copper Prices



Source: Reuters EcoWin

3. Investment

- ***Investor activity was the main driver of the high and volatile silver price in 2007.***

- ***Gold price expectations were once again a key consideration for investors in silver.***

Overview

Net investment demand is a relatively small item within silver's overall supply/demand balance. However, it is our contention that investors "punch above their weight" when it comes to price determination - something very much helped by the only limited short-term price sensitivity of the other supply/demand variables. This was clear from the price action observed during 2007 and, indeed, the first quarter of this year, the ebb and flow of investor activity acting as the main influence on the direction and level of silver prices.

Silver clearly has a following among some investors based entirely on their views of its price prospects, largely independent of what expectations may be for other commodities, including gold. Nevertheless, we would argue that the majority of institutional and private investors pay close attention to gold and base metal prices when making investment decisions concerning silver. The close relationship between silver and other commodities, particularly gold, during the rally of recent years is confirmed by the data and analysis included in the dedicated focus box in Chapter 2, that addresses the issue of correlations between the silver price and other commodities.

Silver Price and Investment Indicators

	2006 Average	2007 Average	Change y-o-y
Silver Price $/oz	11.549	13.384	16%
Contango (3-mth annualized)	3.34%	5.15%	n/a
US$ Libor (3-mth annualized)	5.20%	5.30%	n/a
S&P 500 Index	1,310	1,477	13%
CRB Index	334	405	21%
XAU Index	140	150	7%
World GDP Growth*	5.02%	4.94%	n/a
Advanced Countries CPI*	2.35%	2.15%	n/a

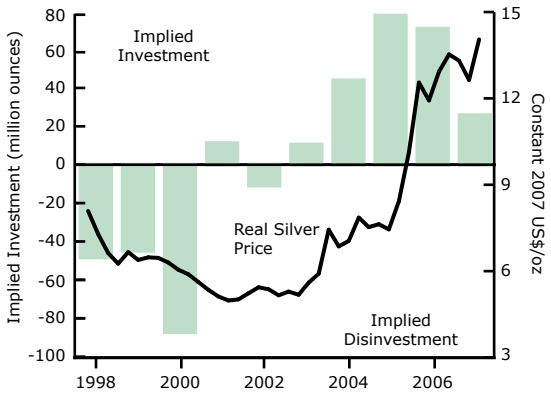
*Annual rates; Source: IMF World Economic Outlook, April 2008; GFMS

It was therefore not surprising that silver investment activity in 2007 closely followed gold's lead. For instance, looking at weekly speculative positions in Comex silver futures (generally understood to provide a good guide to overall investor interest in the market), the correlation coefficient calculated between their weekly returns and those of the Comex gold settlement price stood at 0.55 over the year. Moreover, although GFMS do not publish disaggregated net investment figures in the same way as we do for gold, information collected through field research and an assessment of publicly available data (for instance on speculative activity in silver futures on the Comex) suggest that the net impact of investor activity on the underlying physical market was very similar in the case of both silver and gold during the course of last year.

Indexed Gold and Silver Prices

Source: GFMS

Implied Net (Dis)investment



Source: GFMS

London Bullion Market (LBM) and Comex Turnover

(daily averages)

	LBM No. of Transfers	Turnover Moz	Comex Turnover Moz	LBM/ Comex Ratio
2001	241	108	52	2.1:1
2002	241	87	63	1.4:1
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

Source: LBMA, Comex

Specifically, modest net investment over the January to late April period was followed by heavy selling through to late August, resulting in a market in net disinvestment over the first eight months of the year. This was more than offset by the jump in interest seen in the last four months of the year, fueled by the sub-prime credit crisis bringing the investment case for gold to the fore and this also boosting interest in silver.

Continuing on the theme of silver being traded together with gold, of particular interest was the fact that throughout 2007 silver tended to underperform gold. To the habitual follower of the gold and silver markets, this would, at first, seem strange, as during rallies silver normally outperforms its yellow cousin, due to it being a smaller and less liquid market.

It is GFMS' view that this 'paradox' largely reflects a gradual shift in investors' thinking that has seen some of them increasingly favor safe haven instruments in place of the riskier, higher yielding options that had been in vogue over the first half of this decade. This trend, which our field research confirms continued throughout last year, and particularly following the eruption of the sub-prime credit crisis, boosted the relative appeal of gold compared to silver in 2007, resulting in the gold: silver ratio trending upwards throughout the year. (More recently this has been reversed as the entrance of a large number of speculators into the wider commodities complex has led to substantial purchases of silver, which was seen as undervalued compared to the rest of the precious metals complex.)

Having mentioned the credit markets' crisis, it is worth contrasting the first and second order effects this had on silver investment. During its early stages, through to late August, investors were seen moving out of positions

Investment in Commodities

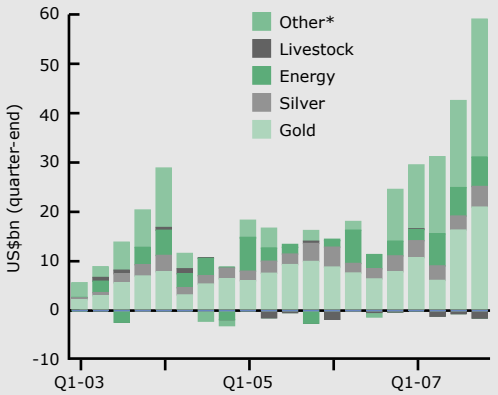
Commodities continued to attract robust inflows in 2007 as prices set consecutive records amidst a bull market. The investor base in natural resources widened further, primarily in response to the sub-prime crisis and weak and volatile equity markets. Moreover, inflows into the complex also rose last year on the back of soaring agricultural prices, due to changing diets in developing countries, demand from biofuel production, and volatile weather conditions.

Oil's surge has also provided a solid backdrop, this greatly compounding inflationary expectations, fears over stagflation and sentiment towards lower corporate earnings (spurred by higher producer prices). Commodities subsequently proved to be a relatively safe haven from the unfolding credit crisis, and a crucial hedge against inflation and the sinking dollar over the year. As such, inflows into the complex reached unprecedented levels, reflected by both the data shown in the chart below.

Returns in base metals, often important for sentiment towards silver, were largely mixed in 2007, perhaps reflecting negative outlook on global growth. Nevertheless, the more recent surge in speculative interest in commodities has seen healthy levels of interest in the industrial metals complex.

The outlook for basic materials should remain positive in the near-term, a premise based on market tightness, which has been driven by the structural shortfalls in supply and an unrelenting rise in demand across much of the sector. Silver stands to benefit from this, especially if pension funds maintain strong interest similar to that witnessed in 2007, as the Swiss-based Novartis and California's CalPERS both signalled a growing appetite for diversifying further into precious metals and other commodities. This could take the form of either index vehicles or, more importantly perhaps for silver, ETFs.

Speculative Positions in Commodity Futures



* Other includes soft, agricultural and dairy commodities
Source: Various

in the metal, partly to raise cash to cover margins elsewhere, to fund redemptions or simply as a result of heightened risk aversion. Later, as the dust settled, the increased attention gold's safe haven properties received in contrast also began to benefit silver greatly.

Notwithstanding the importance of gold to silver investment demand, it is worth mentioning here the impact other commodity prices had on silver investment demand. As is discussed in detail in the focus boxes on pages 15 and 17, the strength of the wider complex and particularly that of industrial commodities have also benefited silver investment.

Concerning the overall net impact of investor activity on the physical market in 2007, our supply/demand analysis generates an implied net investment figure of 25.8 Moz (801 t), which was down by 64% year-on-year. It should be noted here that, unlike the other elements of supply and demand discussed in this *World Silver Survey*, implied net investment is not independently calculated but derived as the balancing item that brings supply and demand into equilibrium. As a result, the figure cannot be treated as a precise weight equivalent of net investor activity but rather as a rough proxy.

As a reality check to our implied net investment figures, GFMS compare them with our analysis of the limited publicly available data as well as with information collected through field research to confirm the suggested flows make sense. Starting with the flows for which information is reported, last year the, now three, active silver ETFs saw cumulative inflows amount to 51.1 Moz (1,591 t). Due to a requirement for the silver kept in trust for these products to be held in allocated physical form, we can be confident that this inflow had a direct one-for-one impact on the physical market. In contrast, the real effect on the underlying physical market of the increase in speculative net positions in Comex and Tocom futures, amounting to a nominal 24.3 Moz (754 t), is less straightforward, although GFMS are confident it was of significant magnitude. Finally, our estimates suggest that 10.6 Moz (330 t) of silver coins and small bars were absorbed by Indian investors last year, with a smaller volume purchased on a net basis by retail investors in Europe and North America.

Partly offsetting the above, field research suggests that there were substantial sales from positions held in various over-the-counter (OTC) products, much of which was in unallocated metal account form. On the one hand, this was fueled by profit taking and stop loss selling during the late April to late August period. On the other, it reflected bullion "switching hands", away from unallocated positions and into ETFs.

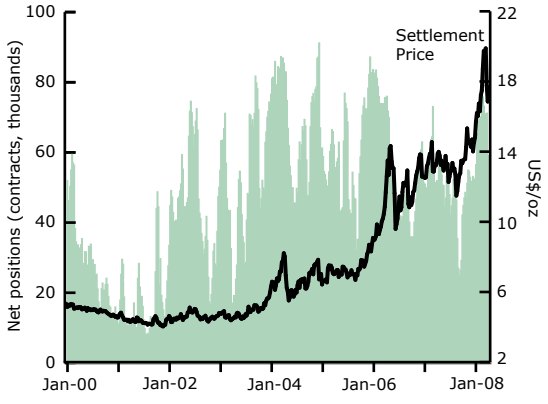
Net "Fund" Position on Comex

		Contracts	Moz	Price
2003		52,622	263	4.88
2004		68,949	345	6.69
2005		59,450	297	7.30
2006		56,912	285	11.55
2007	Q1	60,065	300	13.27
	Q2	52,909	265	13.32
	Q3	39,380	197	12.68
	Q4	50,896	254	14.22
2008	Q1	69,223	346	17.60

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

Comex: Net "Fund" Positions

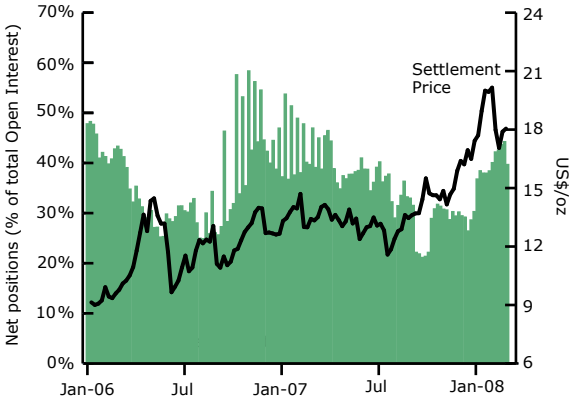
Non-Commercial & Non-Reportable Net Futures Positions & Price



Source: CFTC

Comex: Net "Fund" Positions

Weekly Net Futures Positions as a Percentage of Total Open Interest



Source: CFTC

To sum up, although an accurate disaggregation of the 25.8 Moz (801 t) implied net investment total is not possible, the figure seems to broadly match the flows discussed above. Specifically, inflows into silver ETFs, speculative positions in futures and positive net retail investment demand were partly offset by noteworthy releases from investors' stocks held in OTC products.

Going forward, GFMS believe that as long as gold prices remain strong, the case for silver investment will not fade. Based on our expectation for the rally to continue at least through to the end of the year and quite possibly into 2009, our projections see silver investment demand and price strength persist throughout the period. Nevertheless, the substantial speculative component of investment demand will most likely mean that occasional short term liquidations, such as the one that took silver from a peak of nearly $21 on 17th March to less than $17 within ten trading days, will continue to take place.

A more interesting question, perhaps, is how silver is set to perform compared to gold. On the one hand, continued trouble in global markets and the resulting rise in risk aversion would suggest that gold's safe haven properties would make it relatively more attractive. On the other, the persistence of strong commodity prices, in spite of clear signs of a slow down in the global economy, continues to attract speculators to the wider complex. Although this is beneficial to both metals' prices, as we have witnessed in 2008 to date, it tends to help silver "catch up with" and even outperform gold. (This is partly due to a good number of investors trading the gold:silver ratio, as well as the fact that some speculators prefer to trade silver because of its higher price volatility.)

Commodity Exchanges Activity

Comex

CFTC reports on the combined non-commercial and non-reportable net positions in silver futures traded on Comex are widely used as a proxy for speculative activity on the exchange. The net long, which throughout the year essentially followed movements in the silver price, remained well below its historic highs seen in 2004. After the price spike in February, the net long position trended lower before plummeting in the third quarter to lows not posted since the first half of 2003. This was largely the result of the onset of the global credit crisis and resultant liquidations in financial and commodity markets. As discussed earlier, the second order effects of the crisis were however positive and this was reflected in a partial recovery in the net long, which at year-end, stood at 56,498 contracts, up by 5,267 contracts (equivalent to a nominal 26.3 Moz or 819 t) on the end-2006 level.

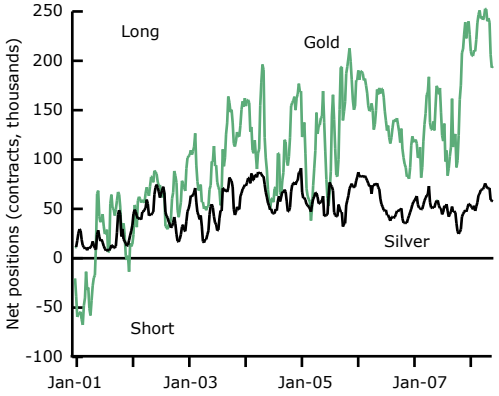
However, at 6.8 million contracts (equivalent to a nominal 34,036 Moz or nearly 1.1M t), total turnover in Comex silver futures in 2007 was up by a remarkable 25% from the level recorded the previous year. Total open interest in Comex silver futures at end-year rose by more than 51% from the end-2006 level to reach 152,888 contracts.

Chicago Board of Trade

Speculative positions in CBOT (now CME-Group) silver futures were at such low levels over the majority of 2007 that only 12 observations were reported by the CFTC. However, when looking at total volume in CBOT 5,000-oz silver futures, this reached 1.5 million contracts last year, up 26% year-on-year. Open interest though

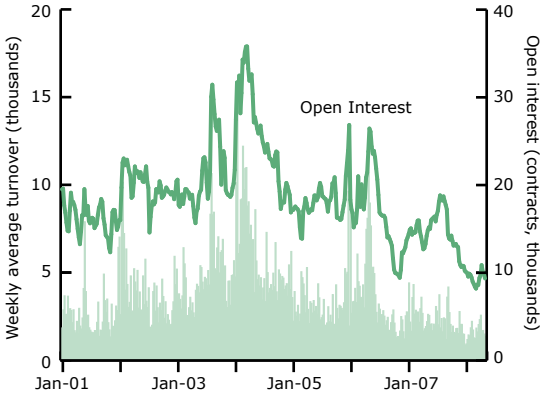
Comex: Net "Fund" Positions

Non-Commercial & Non-Reportable Net Futures Positions



Source: CFTC

Tocom Futures Turnover and Open Interest



Source: Tocom

Exchange Traded Funds

Last year saw total holdings in silver ETFs experience robust gains as these products continued to grow in popularity and helped widen silver's investor base. Total volumes in the three physically-backed investment vehicles that now trade in silver experienced substantial gains, rising by 42% or 51 Moz (equal to roughly 1,590 t) over the year, to a nominal value of $2.5 billion over the year. (Note: throughout this focus box, instead of the end-2007 holdings, we have used those of January 2nd 2008 to eliminate an erroneous transaction in the iShares Silver Trust that was recorded on the last trading day of 2007.)

Illustrative of the growing investor interest, the iShares Silver Trust continued its impressive growth, and predictably experienced the bulk of inflows, representing nearly 90% of total holdings by end-2007. Stocks of the fund grew markedly over the year, increasing by 24% or 30 Moz (a little over 900 t).

In response to the marked success of the iShares product, two additional silver funds were launched in the first half of last year by ETF Securities and the Swiss Zürcher Kantonalbank. The ETF Securities product recorded a healthy inflow as accumulated holdings rose to over 12 Moz (384 t) since the fund began trading on the London Stock Exchange on April 24th. Such impressive growth exemplified investors' desire to have direct exposure to silver and the precious metals complex. Although these volumes remain marginal in comparison to those of the iShares fund, by year-end silver stocks held for the ETF Securities product represented 7% of total ETF holdings.

The Zürcher Kantonalbank issued ETF, which trades on the Swiss Stock Exchange, saw its holdings grow by 9 Moz (284 t) since the launch of the product on May 11th through to the end of the year. Demand for the vehicle was strong from the onset, at least partly fueled by the decision by Novartis, the Swiss pension fund to allocate 4% of its 14 billion Swiss franc portfolio to precious metals.

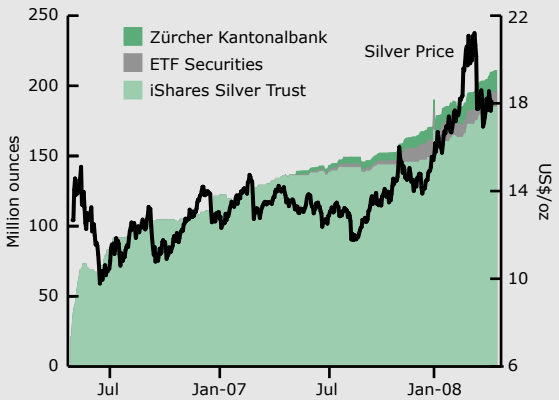
Both of these recently launched funds took turns vying for second place during the year. Nevertheless, neither of the two managed to attract sufficient interest to become comparable, in holdings, to the iShares product.

The collective impact of silver ETFs on the silver price has been often documented by GFMS. We remain of the view that, were it not for these products, current price levels and the ranges that have prevailed over the last couple of years would have been difficult to attain (even given the gold price rally). For the record, the metal's annual average in 2007 had risen by more than 80% from the respective figure set in 2005 and its range rose to $11.67-$15.82 from $6.39-$9.22 in these two respective years.

Notwithstanding ETFs' singular contribution to the price, a severe impact of these products on liquidity and silver leasing rates, has yet to materialise. In the run-up to the launch of the first silver ETF in the second half of 2005 and early in 2006, some market participants had forecasted a major ramp up in lease rates and prices to all time highs, due to a very large portion of the available above-ground stock of metal being absorbed by an ETF (and therefore removed from the pool of silver liquidity). These concerns had at that time led to the aggressive front-loading of investor purchases, in advance of the product's launch, which were the principal driver of the price rallying to levels unseen since the early 1980s.

It is finally worth adding a word of caution. Although the success of the ETFs has undoubtedly made a key contribution to the silver bull market since their launch, they may pose a threat to prices going forward. Despite the resilience to liquidation that positions in ETFs have shown so far, this could change if prices in future were to enter a secular decline.

iShares Silver Trust Holdings



Source: various ETF issuers

declined sharply, falling by end-December to under 5,000 contracts, down by over half the figure seen at end-2006. It is worth noting that in contrast to gold, where the Chicago-based exchange accounted for one-fourth of US gold futures turnover in 2007, the CBOT's importance to the silver market has been minimal.

Tocom

Data on non-reportable net positions in Tocom futures, which is kindly provided by Sumitomo Corp, can be used as a broad indication of speculative activity on the Japanese exchange. Although failing to reach the record highs set in 2006, the net speculative long did rise strongly through to mid-year, peaking at 12,184 contracts on July 27th. Thereafter, liquidations drove the net long to a trough in November before a marginal recovery brought positions to an end-year level of 3,044 contracts (equivalent to a nominal 2.9 Moz or 91 t).

Total volume in Tocom silver futures reached a little over 536,000 contracts (a nominal 518 Moz or nearly 16,000 t), down by 37% year-on-year. Total open interest on the exchange at year-end stood at over 9,500 contracts, down a notable 36% on the end-2006 figure.

OTC Market

The lack of meaningful publicly available data on activity in silver products traded on the OTC market means that GFMS have to rely on information collected through field research. This suggests that 2007 overall saw substantial net selling from positions in OTC products (the bulk of which were in the form of unallocated metal accounts).

The decline in positions held through OTC products was driven by two distinct trends. On the one hand, much of the fall reflected profit taking and stop loss selling taking place over the period from late April through to late August. On the other, it was the result of positions or stocks essentially "changing hands". Specifically, as the price rose over certain periods, metal was bid out of stocks already in place (most likely accumulated at lower prices) to satisfy new investors' demand. Another related phenomenon, which we believe was at work, albeit to a more limited extent than in gold, was the switching of positions out of structured products and unallocated accounts to allocated metal, the latter including the silver ETFs. It is finally worth adding that, although on a net basis the OTC market was in disinvestment last year, this does not mean that there were no gross purchases of silver in this arena.

Physical Investment

Although investment in physical silver bullion continued to account for only a small portion of the overall market last year, net demand registered another healthy year-on-year increase. This was mainly driven by the 12% rise in Indian demand for coins and small bars, which our estimates see at 10.6 Moz (330 t) last year.

This increase reflects a continuation of the structural shift GFMS have documented having taken place in the Indian market throughout this decade. In particular, investment that would normally have been effected through silverware or jewelry is now being done via coin and bar. The primary reason for this is that many consumers in India are now aware of the endemic underkarating of silverware and jewelry.

Moving to the North American market, as noted in the section on coin demand in Chapter 7, sales of silver US Eagle coins were essentially flat year-on-year, in spite of a surge in demand towards year-end. Our information is that secondary market turnover was somewhat subdued until the fourth quarter, since when it has improved noticeably on both the buy and sell sides. Overall volumes though, in spite of silver prices recently reaching the $20 level have failed to match those seen a decade ago during the "Buffett spike", symptomatic perhaps of both less loosely-held silver being available and many US investors' preference these days for ETFs.

Although healthy levels of activity were noted throughout the year in Europe, field research suggests that overall net demand was somewhat lower than the exceptionally high (by the region's standards) 2006 figure. This decline can in part be explained by the lower volatility the silver price saw last year. (As VAT applies to taking delivery of silver bullion, positive expected returns require substantial price moves.) It is worth, finally, adding here that, although silver investment in bar form was down year-on-year, demand for state-minted coins, which enjoy a lower 7% VAT level in parts of the European Union, was up strongly year-on-year, with higher purchases also noticeable in the first quarter of 2008.

4. Mine Supply

- ***Global silver mine production in 2007 totaled 670.6 Moz (20,858 t), a fresh record following a rise of 4% from the 2006 total.***

- ***Primary silver production drove global levels higher, increasing by 11% from a lackluster 2006. Silver as a by-product of gold, lead and zinc also staged a collective increase, up a muted 1%.***

- ***Primary silver cash costs were recorded in 2007 at a weighted average of $1.52/oz, an increase of $0.46/oz. Tightness in the labor, energy and consumables markets continued to apply pressure.***

- ***Producer de-hedging continued in 2007 with a 25.0 Moz (779 t) removal from the delta-adjusted book. This reduced the overall producer position by a sizable 30%.***

Mine Production

- ***Global mine production rose for the fifth consecutive year, to 670.6 Moz (20,858 t), on the back of strong growth in Chile, China and a recovery in Australian output.***

Global silver production continued on an upward trend in 2007, with solid gains seen in Asia and most importantly in Latin America, where output expanded by 9%, buoyed by the fifth consecutive year of growth in Chile. Two of the country's significant silver related operations, namely El Peñón and La Coipa, experienced strong growth due to the completion of expansion activities at the former and the exploitation of silver-rich ores at La Coipa's Puren deposit. Of great significance in Latin America was the onset, in August 2007, of San Cristobal which, in the period to end-December, added 2.2 Moz (68 t).

Top 20 Silver Producing Countries

Ranking 2006	Ranking 2007	Country	Output (Moz) 2006	Output (Moz) 2007
1	1	Peru	111.1	112.3
2	2	Mexico	96.4	99.2
3	3	China	75.3	82.4
5	4	Chile	51.5	62.0
4	5	Australia	55.6	60.4
6	6	Poland	40.4	39.5
7	7	Russia	39.5	38.0
8	8	United States	36.7	37.3
9	9	Canada	31.2	25.8
10	10	Kazakhstan	25.6	22.7
11	11	Bolivia	15.2	16.9
12	12	Sweden	8.6	9.4
15	13	Argentina	6.2	8.5
13	14	Indonesia	7.9	8.2
16	15	Turkey	6.0	7.5
14	16	Morocco	7.6	7.1
17	17	Iran	3.2	3.1
19	18	India	2.7	2.9
24	19	Guatemala	1.6	2.8
21	20	Uzbekistan	2.1	2.8
		Rest of World	23.1	21.5
		World Total	**647.4**	**670.6**

Source: GFMS

Top 20 Silver Producing Companies

Ranking 2006	Ranking 2007	Company	Output (Moz) 2006	Output (Moz) 2007
3	1	BHP Billiton	35.2	45.7
1	2	Industrias Peñoles	45.1	44.5
2	3	KGHM Polska Miedź	39.9	39.1
7	4	Cia. Minera Volcan [1]	15.9	21.1
4	5	Kazakhmys	21.6	19.0
10	6	Pan American Silver [2]	13.0	17.1
11	7	Goldcorp	13.0	17.0
6	8	Cia. Minas Buenaventura [1]	17.1	16.0
5	9	Polymetal [2]	17.3	15.9
7	10	Southern Copper Corp.	16.2	15.2
14	11	Hochschild Mining	11.6	13.6
9	12	Rio Tinto	14.0	13.0
15	13	Teck Cominco	11.5	12.1
12	14	Codelco [3]	12.9	11.7
13	15	Coeur d'Alene Mines [2]	12.8	11.5
21	16	Yamana Gold [4]	6.6	8.6
17	17	Barrick Gold [5]	9.6	8.1
20	18	Boliden AB	6.8	7.7
16	19	Xstrata Zinc [6]	10.0	7.5
18	20	Zinifex	9.6	7.0

1 Includes attributable production from minority subsidiaries.
2 Primary silver producer. 3 Includes contained silver in anode slimes.
4 Pro-forma, subsequent to Meridian acquisition.
5 Estimate. 6 Reported sales.

Source: Company Reports; GFMS

Table 2 - World Silver Mine Production (million ounces)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Europe										
Poland	36.0	35.9	36.7	38.0	38.9	44.2	43.8	40.5	40.4	39.5
Sweden	8.6	8.9	9.5	8.8	9.4	9.9	9.4	9.1	8.6	9.4
Greece	1.4	1.3	1.0	2.0	2.4	0.1	0.0	0.0	0.8	1.2
Portugal	1.0	0.9	0.7	0.7	0.6	0.7	0.8	0.8	0.6	0.9
Romania	1.2	1.2	1.1	1.2	1.0	0.9	0.9	0.9	0.7	0.7
Bulgaria	0.8	0.7	0.6	0.8	0.8	0.7	0.6	0.6	0.5	0.4
Macedonia	1.4	0.8	0.8	0.5	0.4	0.2	0.1	0.2	0.3	0.3
Spain	1.5	3.8	3.7	1.8	0.4	0.1	0.0	0.2	0.2	0.2
Ireland	0.3	0.3	0.5	0.3	0.2	0.3	0.2	0.2	0.1	0.1
Italy	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1
Serbia and Montenegro	0.4	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.1
Czech Republic	0.3	0.3	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Other Countries	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Europe	**53.3**	**54.3**	**55.0**	**54.7**	**54.5**	**57.2**	**55.8**	**52.7**	**52.5**	**53.0**
North America										
Mexico	86.4	79.8	84.3	88.7	88.3	82.6	82.6	93.1	96.4	99.2
United States	66.2	62.7	63.7	55.9	43.4	39.9	40.2	39.2	36.7	37.3
Canada	36.4	37.5	37.7	40.7	44.1	41.0	41.6	34.2	31.2	25.8
Total North America	**189.0**	**180.0**	**185.7**	**185.3**	**175.9**	**163.5**	**164.4**	**166.5**	**164.2**	**162.4**
Latin America										
Peru	65.1	71.7	78.4	86.0	88.8	93.9	98.4	102.6	111.1	112.3
Chile	43.1	44.4	39.9	43.4	38.9	42.2	43.7	44.3	51.5	62.0
Bolivia	13.1	13.6	14.9	12.2	14.9	15.8	14.0	12.8	15.2	16.9
Argentina	2.2	3.3	3.3	5.6	4.1	4.4	4.6	5.0	6.2	8.5
Guatemala	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.6	2.8
Honduras	1.5	1.6	1.7	1.6	1.8	1.7	1.6	1.8	1.9	1.8
Brazil	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
Colombia	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.2	0.3	0.3
Uruguay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Nicaragua	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other Countries	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
Total Latin America	**125.9**	**135.4**	**138.8**	**149.5**	**149.1**	**158.7**	**163.1**	**167.7**	**188.3**	**205.4**
Asia										
China	43.7	48.0	51.3	55.6	52.9	58.8	63.2	67.0	75.3	82.4
Indonesia	10.0	8.7	10.0	12.0	10.7	9.6	8.6	9.9	7.9	8.2
Turkey	2.8	3.5	3.5	3.7	3.7	3.6	4.0	5.2	6.0	7.5
Iran	2.5	2.6	2.7	2.6	2.6	2.6	2.7	3.0	3.2	3.1
India	1.7	1.9	1.8	1.7	1.9	1.9	2.1	2.2	2.7	2.9
Papua New Guinea	1.9	1.9	2.4	2.2	2.1	2.0	1.7	1.5	1.6	1.4
Philippines	0.6	0.6	0.7	1.1	0.3	0.3	0.3	0.6	0.8	1.1
North Korea	1.0	0.8	0.7	0.6	0.7	0.8	0.8	0.8	0.9	0.9
Japan	3.2	3.2	3.5	2.7	2.7	2.7	1.7	1.0	1.1	0.4
Thailand	0.1	0.2	0.2	0.2	0.7	0.6	0.5	0.6	0.5	0.4
Saudi Arabia	0.4	0.3	0.3	0.3	0.3	0.6	0.5	0.4	0.3	0.3
Malaysia	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Countries	1.3	1.2	1.1	1.2	1.3	1.2	1.4	1.5	1.5	1.6
Total Asia	**69.4**	**72.9**	**78.2**	**84.0**	**79.9**	**84.7**	**87.6**	**93.8**	**101.9**	**110.3**

Table 2 - World Silver Mine Production (million ounces) © GFMS Ltd / The Silver Institute

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Africa										
Morocco	9.8	8.9	9.3	9.1	8.5	6.2	6.7	7.4	7.6	7.1
South Africa	5.1	4.9	4.6	3.5	3.6	2.8	2.3	2.8	2.8	2.3
Dem. Rep. of the Congo	0.0	0.0	0.0	0.0	0.1	1.2	1.1	1.7	2.2	2.3
Tanzania	0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.4	0.4
Zambia	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.4
Namibia	0.4	0.0	0.5	0.6	0.6	0.9	0.9	1.0	1.1	0.3
Zimbabwe	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.3
Botswana	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Ethiopia	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Other Countries	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0
Total Africa	**16.2**	**14.7**	**15.3**	**14.3**	**13.8**	**12.2**	**12.1**	**14.3**	**15.1**	**13.2**
Oceania										
Australia	47.2	55.0	65.1	63.3	66.8	59.9	71.5	77.4	55.6	60.4
New Zealand	0.8	0.8	0.7	0.9	0.9	1.0	1.0	1.5	1.1	0.9
Fiji	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Total Oceania	**48.1**	**55.8**	**65.8**	**64.3**	**67.8**	**60.9**	**72.5**	**78.9**	**56.7**	**61.3**
CIS										
Russia	19.5	19.8	20.2	20.9	22.5	34.4	39.6	40.5	39.5	38.0
Kazakhstan	17.0	20.6	28.6	30.2	27.3	25.8	22.6	26.1	25.6	22.7
Uzbekistan	2.6	2.0	2.0	1.7	1.6	1.7	1.9	2.0	2.1	2.8
Armenia	1.0	1.1	1.1	1.2	1.3	1.3	1.3	1.2	1.2	1.2
Kyrgyzstan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2
Tajikistan	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total CIS	**40.2**	**43.7**	**52.1**	**54.2**	**52.8**	**63.4**	**65.6**	**70.0**	**68.7**	**65.0**
World Total	**542.2**	**556.9**	**591.0**	**606.2**	**593.6**	**600.6**	**621.1**	**643.8**	**647.4**	**670.6**

China exhibited firm growth, led by a continued strong performance in the base metals sector, while Australian production recovered partially from a lull in 2006, as production at several mines picked up, most notably at Cannington, the world's largest primary silver mine, following the completion of rehabilitation activities. Collectively, these significant increases in output helped global silver mine production rise almost 4%. The global skew was not all positive, however, with declining production reported in the CIS (-5%), Africa (-12%) and North America (-1%). At a national level, the main protagonists behind the falls were Kazakhstan, South Africa and Canada respectively.

North America

North American silver production edged lower by 1% last year as a precipitous fall in Canada wiped out gains in the United States and Mexico. In **Mexico**, the world's second largest silver producer, mine output increased by 3% in 2007 to total 99.2 Moz (3,086 t), an all-time record. The debut of Pan American Silver's Alamo Dorado mine provided the greatest single boost to the industry last year, contributing an additional 3.8 Moz (118 t) of silver, with commercial operations having commenced in April. In 2007, Metallica Resources' Cerro San Pedro provided a further 0.4 Moz (12 t), with commercial production declared on May 1st. Regarding existing operations, firm gains were recorded at Gammon Gold's Ocampo, and El Cubo, as well as at Southern Copper Corporation's La Caridad property. A plant expansion at Endeavour Silver's Guanacevi led to a 41% increase at the property.

It was by no means a one sided story though, with a number of heavy losses noted for the year. At Goldcorp's Luismin, output fell by just under one fifth, with lower rates of mine development at San Dimas, partly linked to a skilled personnel shortage. Southern Copper Corporation's IMMSA and La Cananea suffered a combined 1.8 Moz (57 tonne) decline, with the latter having endured a year of prominent strike action. Output at the nation's largest silver mine, Peñoles' Fresnillo, meanwhile, was essentially flat year-on-year.

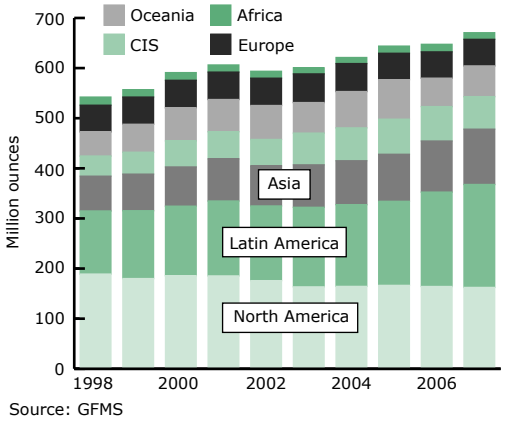
Incidentally, in April 2008, Peñoles announced plans to spin off its precious metals assets, namely Fresnillo, La Cienega and its 50% stake in La Herradura to a separate group, Fresnillo Plc, to be listed in London.

United States' mine production amounted to 37.3 Moz (1,160 t) in 2007, representing a fractional gain year-on-year. Hecla's Lucky Friday provided the country's greatest supply increase in terms of primary silver mining. The underground mine's silver production was upped by 7% to 3.1 Moz (96 t) as mill upgrades facilitated increased throughput. At Kennecott's Bingham Canyon, although silver in concentrate fell, refined metal production actually registered a moderate increase. Operations at Apollo Gold and Elkhorn's Montana Tunnels joint venture mine recommenced in March 2007, having previously ceased in May 2006. Ten months of operations led to a quadrupling of production from the polymetallic operation. On the development front, Sterling Mining declared the start of processing activities at its Sunshine mine in Idaho in September, followed by the announcement of its first concentrate shipment, which was made in December.

There were nevertheless a small handful of declines at important operations. Coeur d'Alene Mines' Rochester noted a 10% decrease in production last year, as mining activities were concluded in August. Residual leaching activities are expected to continue at the mine for several years, though the company is looking to dispose of the property. Elsewhere, a dip in processed grade at Greens Creek in Alaska during the fourth quarter led to a modest drop in annual production. In February 2008, Hecla entered into an agreement with Kennecott to purchase its 70.3% stake and consolidate ownership of the mine, with the transaction completed in April.

Canadian silver mining recorded a heavy loss as one of the country's leading silver sources, Barrick's Eskay Creek silver mine, continued to wind down operations as mining activities are expected to cease this year. Similarly, a moderate drop in output was noted at Xstrata's Brunswick zinc mine (expected to conclude operations in 2010). Although production levels of its principal product, nickel, saw an increase, silver output from Vale Inco's Sudbury complex dropped by 14% to 2.2 Moz (68 t). Offsetting a fraction of these losses, Breakwater Resources' Langlois in Quebec achieved commercial operations in July 2007 and produced almost 0.2 Moz (5 t) of silver in concentrate over the course of the year.

World Silver Mine Production



Source: GFMS

Latin America

Latin American production rose by 17.1 Moz (531 t), a 9% increase from last year. The world's biggest silver producer, **Peru**, recorded another year of growth, albeit a marginal 1%, to total 112.3 Moz. Growth was mostly driven by the country's lead/zinc operations, which increased production by 6.1 Moz (191 t). The greatest contribution came from Hochschild's Arcata mine, where an improvement in processed head grade and increased plant capacity led to a 1.8 Moz (56 t) increase, totaling 6.6 Moz (204 t). Buenaventura's stalwart silver giant, Uchucchacua, contributed a substantial 9.9 Moz (307 t), a 2% increase from last year.

In May, the National Federation of Mining Workers announced a strike, which lasted for four days. It called for miners to be offered state-managed pension funds, and for the retirement age to be lowered. Despite the dramatic 11% drop this caused production year-on-year in May, the strike's impact was largely mitigated by overall increases for the year. Volcan Compañia Minera S.A.A. posted positive results all round, and its primary zinc mine, Carahuacra, increased silver production by a marked 54%. Its established Cerro de Pasco mine also increased production by 26%, to total 7.7 Moz (239 t). Southern Copper Corp's Cuajone and the polymetallic Antamina joint venture also registered slight increases. Two significant mines that were brought into production in the second half of the year also bolstered output: Hochschild's Pallancata and Milpo's Cerro Lindo, contributing 0.7 Moz (22 t) and 0.8 Moz (24 t) for the year respectively.

Declines to production rates also featured, in many instances due to lower ore grades. Minera el Brocal's Colquijirca showed the greatest decrease in production, of 3.2 Moz (100 t), giving stark contrast to its exceptional performance in 2006 of 10.3 Moz (321 t), as operations settled back to more typical silver grades in 2007. Lower ore grades also affected Pan America's Quiruvilca, where production fell by 0.5 Moz (17 t). Hochschild's overall increase in production was tempered by a decline from Selene. This was due to a combination of lower grades mined and reduced throughput that coincided with the start of Pallancata.

Output in **Chile** expanded upon the gains seen last year, rising by 20% or 10.5 Moz (327 t), the strongest increase seen in any single country in 2007. This rise included a doubling of silver sourced from primary silver operations, as the La Coipa complex continued to exploit the silver rich Puren deposit. Mill tonnage was reduced to facilitate a longer leach time, which helped improve recoveries. In addition, an increase of more than 1.7 Moz (54 t) was reported at El Peñón, as ongoing expansion projects pending from 2006 were completed, and the process circuit was optimized. Interestingly, these two mines, the country's largest primary silver operations, were the subject of ownership changes in 2007; Kinross acquired Goldcorp's 50% stake in operating company Compañía Mantos de Oro to become the 100% owner of La Coipa, while Canadian mid-tier producer Yamana Gold acquired Meridian Gold on October 12th, and consequently holds a 100% interest in the El Peñón mine. New owner Yamana has outlined preliminary plans to continue to increase throughput rates at El Peñón through 2008. Elsewhere, record silver production levels were also reported at Escondida, which helped push silver production in the country, as a by-product of copper mining, to yet higher levels.

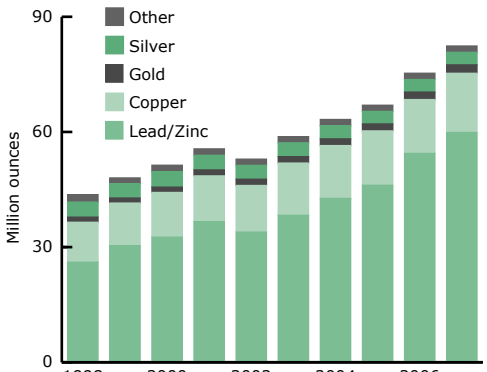
In **Bolivia**, output rose by 1.7 Moz (53 t), with the onset of a significant new project in August; Apex Silver Mines' 65%-owned San Cristobal which generated approximately 2.2 Moz (68 t) of silver in concentrate for the period to end-December. Apex expects to produce approximately 16 Moz (500 t) of payable silver from San Cristobal in 2008, which would make it the country's leading silver producer by a wide margin. During the year, Pan American Silver increased its ownership of the San Vicente mine to 95%, where output incidentally rose by 0.4 Moz (11 t), partly due to a greater volume of ore milled. In **Argentina**, production rose by 38%, totaling 8.5 Moz (265 t). Hochschild and Minera Andes' San Jose joint venture commenced production in the second quarter, contributing 1.0 Moz (30 t). Production from Coeur d'Alene's primary silver mine, Martha, remained broadly level with the previous year at 2.7 Moz (85 t). Despite early gains in the first half of the year, production at Martha in the third quarter fell below 2006 levels, which was primarily attributed to lower ore grades. **Guatemala** saw the region's highest increase in percentage terms, with output climbing by 77% to reach 2.8 Moz (88 t).

Asia

The main contributor to the rise seen in Asia was **China**, which maintained its position as the third largest producer of silver in 2007, with growth of 7.1 Moz (221 t). Although gold output from the country surged in 2007 with corresponding silver benefiting, the driving force behind the the rise in production was, again, an increase in silver sourced from the lead/zinc sector: For example, Silvercorp Metals reported a rise in the tonnage of ore mined and milled at their operations in Henan province, and announced plans in December to triple milling capacity to serve their combined lead-zinc-silver-gold operations. Furthermore, the country's non-ferrous smelters displayed strong growth in output last year.

Elsewhere in Asia production was broadly neutral. Output in the **Philippines** recorded firm growth, with rises in silver production seen across the board. The largest of these rises was seen at Padcal and the polymetallic Rapu Rapu operation. This rise was countered, however, by the decline of over 0.6 Moz (20 t) seen in **Japan**.

Chinese Silver Mine Production by Source Metal



Source: GFMS

Oceania

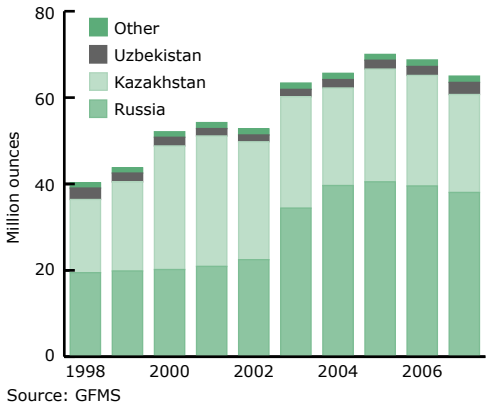
Australia slipped to the position of fifth largest producer of silver in 2007, despite production rising to 60.4 Moz (1,879 t), representing a moderate recovery from the prior year, when production slumped by 28%. Much of the upward momentum was provided by BHP Billiton's Cannington mine, a world leading silver and lead producer, where the conclusion of the Cannington rehabilitation project in January restored production rates from restrained 2006 levels. This translated into an increase of 9.8 Moz (303 t) in payable silver. Other recoveries from 2006 were seen at Xstrata's Mount Isa operations, where increases at the Black Star mine helped push payable metal sales up by 1.1 Moz (35 t), and at CBH Resources' Endeavour, where production returned to 2005 levels.

Suppressing the gains at these operations, falls in silver output were seen at Zinifex's Century, associated with a decline in silver assay grades from ore feed, and also from reduced mill tonnage at Perilya's Broken Hill mine, together dampening output from the lead-zinc sector.

Commonwealth of Independent States (CIS)

Production in the CIS fell for the second consecutive year, down 3.7 Moz (116 t) to total 65.0 Moz (2,021 t). The primary driver was a reduction in **Kazakhstan**. Copper-focused miner Kazakhmys reported a 12% reduction in output of silver from its copper division, linked to declining output at the Zezkazgan complex and its East Region operations, as mined ore tonnage decreased from 2006 levels, partially due to equipment availability and delivery issues. Total Kazakh silver production stood at 22.7 Moz (706 t), a decline of 11%.

CIS Silver Mine Production



Source: GFMS

Accounting for just over half of the group's production, **Russia** posted a decline of 4% to total 38.0 Moz (1,183 t) in 2007. A 1.8 Moz (56 t) reduction to output at Polymetal's Dukat mine was mitigated partially by a 0.7 Moz (22 t) rise at the smaller Lunnoye, where throughput rates increased and ores from the Arylakh satellite were incorporated into the mill feedstock. Arylakh ores are high silver grade, and feedstock from this source is expected to continue contributing through 2008. Silver production as a by-product of gold mining decreased; although Highland Gold's Berezitovy gold mine commenced production late in 2007, Polymetal's Kahakanjinskoye operation lowered silver output, as mining transited from 'Open Pit One' to 'Open Pit Two'. Elsewhere, in **Uzbekistan** silver output was seen to increase with the advent of production at Oxus Gold's Vysokovoltnoye heap-leach operation.

Europe

European silver production registered a modest 0.5 Moz (16 t), increase from last year. **Poland**, Europe's largest silver producer, showed a slight fall of 2% with output totaling 39.5 Moz (1,229 t). The drop was linked to a modest decline at the copper-silver producer KGHM Polska Miedź. This was partially due to the abolition of Sunday work, following intervention by the National Labor Inspectorate. **Swedish** production, on the other hand, rose by 10%, taking total output to 9.4 Moz (294 t). Boliden reported increased production from all ists divisions, namely: Boliden Area; Aitik, which increased silver head grade by 35%; and Garpenberg, which achieved record throughput levels as a result of increased capacity and better head grades. In **Greece**, mine supply increased by 43%, primarily as a result of higher production from European Goldfields' Stratoni lead-zinc mine.

Africa

African silver production fell moderately by 12%, to total 13.2 Moz (411 t). **Morocco**, the region's most significant producer, saw production reduce by 7%, due to a decline in output from Managem's subsidiary Société Métallurgique d'Imiter's namesake Imiter operation. On the other hand, a slight gain came from the **Democratic Republic of the Congo**, which posted a 4% increase year-on-year. This was largely reflective of Anvil Mining's Dikulushi, which achieved record levels of silver production in the fourth quarter.

Outlook

• Silver mine production is expected to record a sixth consecutive increase, and indeed accelerate in 2008, as 2007's headline start-ups consolidate output levels and several major new mines come on stream.

Looking to the end of the current year, global silver mine production is expected to continue to climb towards the 700 Moz mark, as a proliferation of major projects come on stream, primarily in the Americas, to supplement the substantial ramp up activities currently underway at a number of operations.

Mexican output will likely continue its upward trend with vigor as Pan American Silver's Alamo Dorado will see a full year of commercial operations. This will be further supported by Metallica's Cerro San Pedro and continued expansion activities at several operations including Endeavour Silver's Guanacevi and Guanajuato, as well as First Majestic's La Parilla and Encantada properties.

Bolivia will climb the ranks as Apex Silver and Sumitomo's San Cristobal posts its first full year of production, coupled with the anticipated start of another major project, Coeur d'Alene's San Bartolome. Further south, Argentinean production is expected to see a boost in the second half of the year as Silver Standard makes the transition from developer to producer via the significant Pirquitas project, and Pan American Silver's portfolio of producing mines continues to grow with the addition of Manantial Espejo.

Outside the Americas, output in other key silver producing countries is expected to remain firm with the Kupol project in Russia's far east due to begin commissioning in the near term, along with a return to normal operations at Kazakhmys' Abyz and Zhezkagan. Meanwhile, China's ongoing growth is expected to be maintained, with further increases in the output of silver as a by-product of base metal mining.

Moderating expected gains, further losses seem likely in Canada as maturing operations continue to wind down. In Chile, lower output levels seem probable as La Coipa's operations are scheduled to move back to the more conventional primary gold ore sections rather than the silver-rich Puren deposit, while output growth from the nation's copper industry could also slow.

By-Product Analysis

• Silver production from primary mines expanded strongly by 20.3 Moz (631 t) to stand at 30% of global production in 2007.

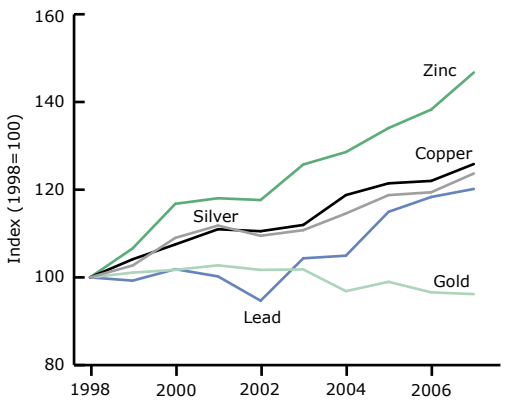
• In contrast, muted change was seen to silver produced as a by-product of lead/zinc (+3%), gold (-1%) and copper (less than 1% decline).

Primary silver production provided much of the impetus for the global rise in mine production in 2007. Indeed, many of the significant increases in the major growth countries were driven by a rise in primary silver production: Cannington in Australia, El Peñón and La Coipa in Chile and primary growth of 11% in Mexico are all good examples. The three largest primary producing countries in 2007 were Mexico, Australia and Peru, collectively accounting for 63% of world primary silver production.

The base metals sector enjoyed another year of elevated price levels in 2007 as producers struggled to meet demand. Once again, the emerging economies, notably those termed the BRICs, provided much of the growth. According to the industry organizations, the International Lead Zinc Study Group (ILZSG) and the International Copper Study Group (ICSG), global copper, lead and zinc demand grew by 7%, 2% and 3% respectively in 2007.

In terms of average annual prices, lead was by far the best performer with an increase of 102%. Copper prices increased by 6% after three consecutive years of large double-digit gains. Zinc prices were largely unchanged from 2006. A stable average annual zinc price masked a sharp decline during the course of 2007, with a peak-to-

Indexed Global Metal Mine Production



Source: ILZSG, ICSG, GFMS Metals Consulting, GFMS

Average Prices of Source Metals

	2003	2004	2005	2006	2007	Change y-o-y
Lead ($/t)	516	888	976	1,288	2,595	102%
Zinc ($/t)	828	1,048	1,382	3,273	3,250	-1%
Copper ($/t)	1,780	2,868	3,684	6,731	7,126	6%
Gold ($/oz)	363	409	444	604	695	15%

Source: LME, Reuters EcoWin

World Mine Production of Source Metals

(Thousand tons)	2003	2004	2005	2006	2007	Change y-o-y
Lead	3,120	3,138	3,437	3,538	3,593	2%
Zinc	9,517	9,732	10,146	10,466	11,105	6%
Copper	13,758	14,595	14,924	14,992	15,465	3%
Gold (tons)	2,621	2,493	2,548	2,486	2,476	0%

Source: ILZSG, ICSG, GFMS

trough fall of 49%. However, prices remain well above the marginal costs of production, and a reduction in zinc supply on price grounds appears unlikely.

The **lead** market was supported by extreme tightness at the concentrate stage. Despite the record prices seen in recent years, a supply response has been slow to emerge. ILZSG figures suggest that global mine output rose by 1.5% last year to 3.6m tons. Although Chinese output, by far the largest producer accounting for 38% of global mine production, was up an estimated 2% to 1.4m tons, production outside of the nation was, on balance, largely unchanged.

Output in Australia, the second largest producer, fell sharply for the second year running, reflecting a number of technical problems in early 2007 and the suspension of the 100,000 tons per year (tpy) Magellan mine on environmental grounds. Lead concentrate output fell by 4% in 2007 to 594,000 tons, which left output 17% down on the peak level of 715,000 tons in 2005.

There was higher output in Latin America, where the key development was the commissioning of the San Cristobal silver-lead-zinc mine by Apex Silver in late 2007. According to the company, the mine will produce 85,000 tons of lead-in-concentrate in 2008. Slightly higher output was seen in Peru due to the new Cerro Lindo mine, and in the United States reflecting higher by-product output from the restart of some zinc-lead operations.

Lead concentrate production growth is likely to accelerate in 2008 reflecting the full-year contribution of the San Cristobal mine. Production should rebound in Australia, as most of the technical problems have been resolved. It should be noted that the Magellan mine does not yield any silver. China is, however, likely to be the largest source of additional concentrate this year.

The supply response by **zinc** to the bull market has emerged much more quickly than that for lead. Global zinc concentrate output increased by 6% last year taking it to 11.1m tons, following a 3% advance in 2006. The increase came from a variety of sources, a trend that looks set to continue in 2008. The main improvement took place in China, which added over 250,000 tons with output now close to 3.2m tons.

Outside of China, the largest increase occurred in Peru, where the mining of a zinc-rich part of the orebody, allowed production at the Antamina mine to increase by over 80%. In addition, operating rates have been ramped up at the recently opened 70,000 tpy Cerro Lindo mine.

Bolivian zinc production rose sharply following the commissioning of the San Cristobal mine. The owner, Apex Silver, suggests that zinc concentrate output may exceed 200,000 tons this year. In North America, United States production rose by 8% in 2007 to 787,000 tons on the back of the restart of a number of operations including Greens Creek, Balmat and SRA's Tennessee mines. In Canada, there was also a revival in lead-zinc output based on a number of medium-sized mines such as Duck Pond, Langlois and Caribou. The full year operation of these mines suggests that output should continue to expand in 2008.

Australia was another source of extra zinc concentrate in 2007 as output at a number of the leading producers returned to normal after a spate of strikes and technical problems. In addition, the 70,000 tpy Lennard Shelf mine was reactivated halfway through last year. However, many of the expansions to lead and zinc production yield little or no silver. The table on page 31 highlights the modest contribution of the lead-zinc sector to silver supply growth last year.

Disruptions have been a particular feature of **copper** supply in recent years. Some of the dislocations to supply are temporary such as strikes and technical problems. Nevertheless, there is a structural element to

Silver Output by Source Metal

(million ounces)

	2006 Output	% of Total	2007 Output	% of Total	Change y-o-y
Primary	177.8	27%	198.1	30%	11%
Gold	64.4	10%	64.1	10%	-1%
Lead/zinc	207.0	32%	213.3	32%	3%
Copper	183.1	28%	182.8	27%	0%
Other	15.0	2%	12.2	2%	-19%

Source: GFMS

the production shortfall as grades decline at a number of mines. Codelco, the world's largest copper producer, has suggested grades could fall by 8% in 2008, which may keep output steady despite higher throughput at its operations.

Figures from the ICSG highlight the extent of the production losses. The organization originally forecast that global mine output in 2007 would be 16.2m tons. The most recent estimate suggests that production was just over 15.5m tons. The tight concentrate position is highlighted by the further decline in treatment charges, as smelters have to compete to secure the limited supplies of concentrate. In early 2008, annual contracts were set at around $45/ton, well down from a year earlier.

Copper output was held back by a series of labor disputes that emerged in early 2008, particularly in Latin America. In addition, some of the extra copper production expected this year should come from the African Copperbelt, which yields only small amounts of silver. Last year, silver from copper operations was essentially unchanged (see table above). This trend looks set to be repeated in 2008.

Production Costs

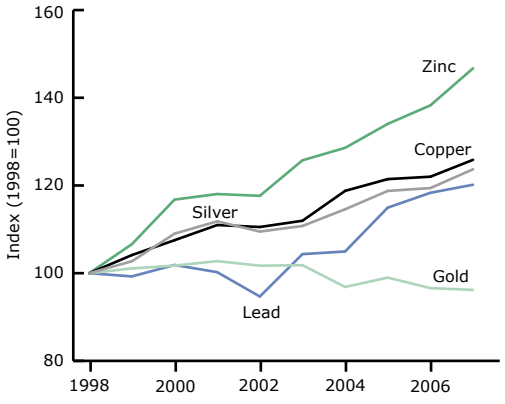
• ***World silver cash costs expanded by 43% in 2007, driven by a combination of labor, consumables and energy cost rises.***

Cash costs at primary silver mines rose last year to a weighted average of $1.52/oz, an increase of $0.46/oz. In order to give a representative view of the operating costs of silver mines, GFMS' analysis excludes those operations where silver is not the primary source of revenue, and all data presented here is analyzed on a by-product silver basis. In the table on page 32, it can be seen that the sample size of the costed population expanded in 2007 to 104.7 Moz (3,257 t), which constitutes 53% of silver metal from primary mines. It should be kept in mind, however, that 70% of the world's silver production in 2007 was sourced as a by-product of other metal mining.

In addition, it is notable that in this year's *World Silver Survey*, several mines have been re-appraised and cash cost calculations for prior years have subsequently been revisited. This has lowered the absolute level of cash costs in GFMS' analysis. The trends discussed in previous editions of the *World Silver Survey* have, however, been preserved; only the magnitude of the directional movement has changed. Revised statistics are presented in the table overleaf.

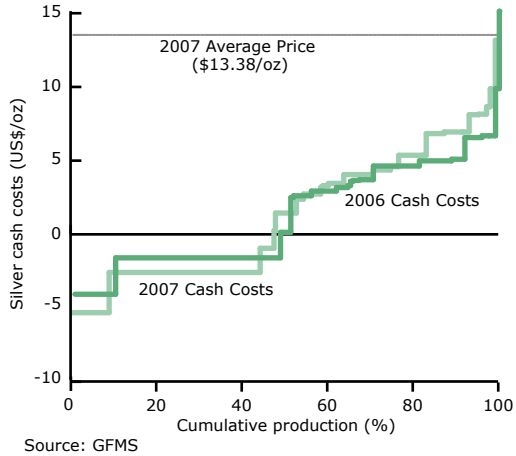
The silver mining industry has not emerged unscathed from a 2007 where cost pressures from the continued global boom in the extractive industries has translated into higher prices for energy, labor and processing consumables; a theme seen in GFMS' analysis of the

Indexed Global Metal Mine Production



Source: ILZSG, ICSG, GFMS Metals Consulting, GFMS

Silver Cash Costs



Source: GFMS

Silver Mine Production Costs

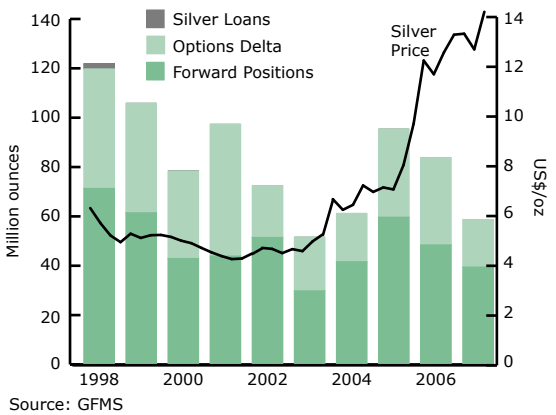
	2005	2006	2007
Cash costs	$2.13	$1.06	$1.52
Average spot price	$7.31	$11.55	$13.38
% sample with costs > spot price	2%	0%	0%
Sample size (million ounces)	86.6	87.4	104.7

Source: GFMS

gold and platinum mining industries alike. Furthermore, this expansion of cash costs came despite broad price increases in some of the main by-product metals; namely gold (+15%), lead (+102%) and copper (+6%), coupled with a stable annual average zinc price (<1% decline); emphasizing the magnitude of the rise.

Turning to some of the operations, the lowest cost silver mine, Hecla and Rio Tinto's Greens Creek, recorded cash costs of -$5.27/oz for 2007. This represents a further reduction from already low 2006 levels. Hecla's Lucky Friday unit also experienced a fall in costs due to mill upgrades and, in the case of both mines, the rise in by-product prices. An interesting point on the interplay between a general rise in processing costs and by-product credits is illustrated by the fact that costs per ton milled at Greens Creek actually increased by 20% in 2007. The most significant change was seen at the largest costed operation, Peñoles' Fresnillo, constituting a third of costed production, noted lower year-on-year costs. Elsewhere minor rises were seen across the majority of the assessed population, with the highest recorded costs at Great Panther's Guanajuato, at $13.21/oz. This represents a reduction of just under $10/oz from 2006, and worth highlighting is an initiative to upgrade the plant, with a view to improving recoveries and concentrate quality moving forward, implemented in the fourth quarter.

Producer Hedging: Outstanding Positions



Source: GFMS

Producer Hedging

• Producer de-hedging activities in the silver market provided a net 25.0 Moz (779 t) of demand, as several producers delivered into large positions, coupled with a low level of fresh hedging.

Forceful producer de-hedging was recorded in 2007 with a meaningful 25.0 Moz (779 t) removed from the delta-adjusted book to leave the outstanding end-2007 position at 58.7 Moz (1,824 t). This figure equated to a net reduction of 30% to the overall producer position year-on-year. The notable cut was a result of fresh hedging remaining very much at the low end of the spectrum, coupled with a handful of previously hedged producers moving to unhedged status through a combination of scheduled deliveries and accelerated buy-backs.

Forward sales were scaled back by around one-fifth to less than 40 Moz (1,230 t), while on a delta-adjusted basis the global options book was slashed by almost half as short-dated contracts reached maturity and expired or were delivered into, or, in the case of the Kinross hedge against Kupol, were converted to forward sales.

In nominal terms (in other words, not delta-adjusted) the hedge book was also down-sized, although at a more moderate level than in delta-adjusted terms, with a net reduction of 25% year-on-year, with a large part of this related to the Kinross adjustment mentioned above.

Discussing reportable company activity, in Russia, Polymetal, operator of the substantial Dukat mine, among other properties, and which listed on the London exchange early in 2007 provided a significant volume of the de-hedging figure when 13.9 Moz (432 t) of forward sales were delivered into. This left the company unhedged with respect to ongoing production. Hochschild Mining, the Peruvian gold and silver miner, also delivered into its remaining forward commitments in 2007.

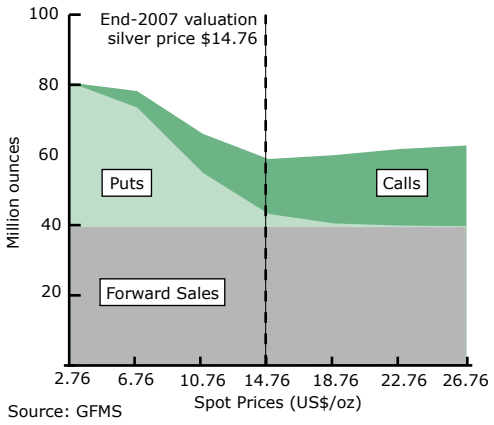
The world's largest gold producer, Barrick Gold, reduced its volume of current silver commitments by 2.5 Moz (78 t) through a combination of buying back and conversion of contracts from a fixed to a floating pricing structure, with the latter essentially having the same market impact as de-hedging. Meanwhile, AngloGold Ashanti's silver hedges were halved in nominal terms as

a portion of contracts matured last year. Other notable activity included the appointment of administrators at Lafayette Mining, operators of the Rapu Rapu mine in the Philippines. The administrators closed out all existing forward sales, including a 1.2 Moz (38 t) silver hedge. Regarding fresh net hedging, the most noteworthy activity was the purchase of puts by KGHM to establish price floors for a portion of output over the next two years at around $12/oz.

It should be noted that at mid-year expectation had been markedly different, with the market forecast to move marginally back to the supply side with modest levels of net producer hedging. The actual outcome was different, primarily as a result of a significant forward transaction which had been anticipated, but that failed to materialize. As such, fresh hedging last year was seen to be comparatively limited.

Although an off-market transactions rather than hedges, silver stream purchase agreements continued to feature in the industry in 2007. This could also in part explain the lack of fresh hedging. In what is a less liquid market than, for example, that of gold, large, long term hedging transactions would profoundly influence the forward market. By electing to sell non-strategic silver streams in off-market transactions, a steady source of revenue is achieved, albeit at lower received prices than via traditional forward sales. The key additional motivation for base metals producers electing to participate in a silver stream sale is that it is a means of raising capital that bypasses certain requirements that exist as conditions of more conventional means of debt issuance. The latter could include the hedging of core products or alternatively equity financing, which may be deemed undesirable. At 13.1 Moz of sales in 2007, the main proponent of silver stream agreements was Silver Wheaton, with Coeur d'Alene, and more recently Silverstone Resources, also having purchase agreements with base metals producers.

End-2007 Delta Adjusted Options Position



Source: GFMS

Sensitivity of the Options Book (Moz, end-2007)

Change in volatility (%)	Change in silver price (US$/oz)				
	-8	-4	0	4	8
4	38.08	26.61	20.13	20.59	22.00
2	38.36	26.52	19.70	20.46	22.04
0	38.63	26.44	**19.24**	20.35	22.10
-2	38.87	26.37	18.76	20.24	22.18
-4	39.08	26.31	18.24	20.16	22.28

Source: GFMS

In most instances silver hedging is concerned with near-dated transactions. Aside from some project hedging that involves commitments over a longer time frame, the bulk of silver hedging spans the next 12 to 24 months.

The chart to the left and matrix above (generated by the Brady Trinity™ integrated trading and risk management system) plots the exposure of the delta hedge by contract type at different spot prices, the responsiveness of which is solely the result of changes in the delta of the options contracts. As well as illustrating the forward-dominated composition of the silver hedge book, the chart shows the relatively current pricing of options contracts: a significant price move in either direction would lead to a meaningful increase in the exposure of the options book: sold calls (under higher prices) or producers' bought puts moving into-the-money under lower price conditions.

Interestingly, the silver book contrasts in a number of ways to the gold producers' global hedge book. Firstly, in the case of the gold hedge book, longer-dated, deeply in-the-money sold calls form a much larger proportion of the current option position, rendering it much less sensitive to moderate price changes. For silver, as well as the contracts generally being shorter-dated and more recently established, there is a notable dominance (in terms of nominal contracts) of protective put options over call options, which, as evidenced in the adjacent chart, would register a delta-adjusted increase under lower prices.

5. Supply from Above-Ground Stocks

- ***Net supply from above-ground stocks fell by 8% to 173.1 Moz (5,383 t) in 2007.***

- ***The decline was led by lower net government sales and rising producer de-hedging, which were largely offset by lower implied net investment.***

- ***The lack of any material sales from China and India drove the 46% decline in government sales.***

- ***The 6.4 Moz (199 t) decline in scrap supply was largely the result of falling Indian recycling, with the rest of the world virtually flat on a net basis.***

Net Silver Supply

(Million ounces)

	2006	2007
Implied Net Disinvestment	-70.8	-25.8
Producer Hedging	-6.8	-25.0
Net Government Sales	78.2	42.3
Sub-total Bullion	0.6	-8.6
Old Silver Scrap	188.0	181.6
Total from Above-Ground Stocks	**188.6**	**173.1**
Mine Production	**647.4**	**670.6**
Total Net Supply	**836.0**	**843.7**

Note: In contrast to Table 1 on page 7, 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.

Overview

The supply of silver to the market can be broadly divided into two categories, namely supply from new mine production and 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.

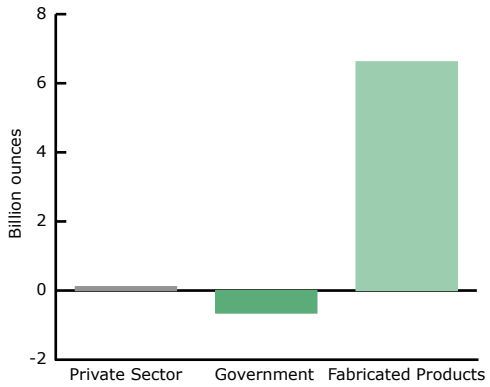
The accompanying table features the net contribution to supply from its various components. As the appended note points out, this approach differs from the way this information is presented in Table 1 on page 7 (where gross figures appear on either the supply or demand side). This is done in order to provide readers with a measure of the net drain on above-ground stocks (both fabricated and bullion form) required to plug the fundamental deficit that for yet another year appeared between mine supply and fabrication demand. The added benefit of this approach is that it allows us to compare the contribution from net supply from above-ground stocks with that of mine production.

Using this definition, mine supply, at 670.6 Moz (20,858 t), accounted for 79% of total supply last year. (Note that using the approach featured in Table 1, mine supply accounted for 75% of total supply.) The remaining 173.1 Moz (5,383 t) was sourced from above-ground stocks of silver, including scrap supply and net government sales, net of the decline in the producer hedgebook and implied net investment.

Starting with net government sales, these were down a noteworthy 46% to a total of 42.3 Moz (1,314 t). Sales from government stocks accounted for 5% of total net supply. The essential elimination of both Chinese and Indian government sales was the driving force behind the decline. A rise in sales from Russian stocks partly offset the fall.

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

Changes in Above-ground Stocks (1998-2007)



Source: GFMS

held stocks of bullion. By implication, therefore, the 25.0 Moz (779 t) decline in the producer hedgebook is understood to have also been reflected in a net increase in private stocks of silver. Combined with the 25.8 Moz (801 t) implied net investment figure derived for the year, this suggests that a total 50.8 Moz (1,580 t) went into privately held stocks of silver bullion. (Note that this analysis excludes newly minted bullion coins, which are discussed in a separate section in Chapter 7.)

Combining this with the 42.3 Moz (1,314 t) net decline in government owned stocks suggests above-ground bullion stocks increased by 8.6 Moz (266 t) over the year. In other words, private individuals and governments combined demanded rather than supplied silver bullion on a net basis in 2007.

The largest contributor to supply from above-ground stocks historically has been supply from the recycling of fabricated products. The largest portion of this continues to be accounted for by photographic scrap. Although this has been on a steady decline over the last few years (in tandem with photographic fabrication demand), last year's fall was muted, largely as a result of strong recovery from medical applications (and fueled by a lag between fabrication and recovery). The balance is accounted for by the recycling of jewelry, silverware, electronic and other industrial products, as well as the melting of silver coins.

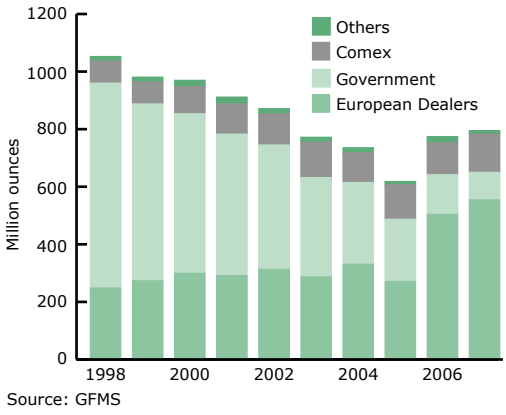
The sources of recycled silver stand in contrast to gold scrap, where the bulk of the market is accounted for by jewelry (and where the metal content accounts for a significantly higher portion of the finished product's value). As a result, silver scrap tends to be relatively inelastic to price levels and volatility, and is mostly driven by the performance of the relevant sector (taking into account any relevant lags) as well as environmental legislation.

Last year was the second consecutive exception to the rule, as the bulk of the decline in scrap supply seen over the year was accounted for by India, where the adjustment of consumers to the higher price environment (partly the result of a lower volatility) was one of the principal drivers of the dramatic decline in the country's recycling seen over the year. As a result of this decline (supply from the rest of the world being flat overall), total global scrap supply in 2007 was down by 3% to 181.6 Moz (5,649 t).

Identifiable Bullion Stocks

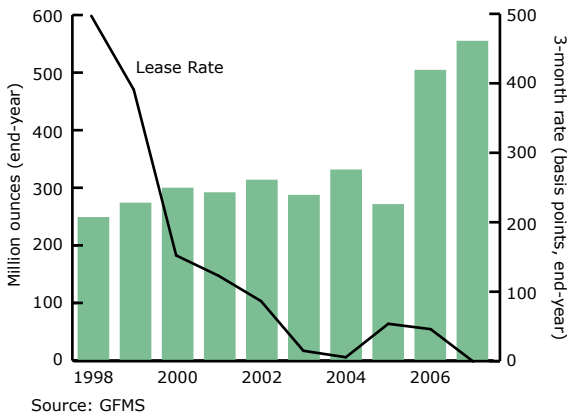
GFMS' analysis of identifiable bullion stocks includes inventories for which sufficient evidence is available to form a statistical picture. In contrast, silver bullion held in depositories on which information is not available, as well as in private individuals' vaults, is excluded from our figures. In addition to 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.

Identifiable Bullion Stocks



Source: GFMS

Bullion Stocks in Dealers' Vaults in Europe



Source: GFMS

Identifiable Bullion Stocks

(Million ounces)

	end-2006	end-2007
European Dealers	503.6	554.1
Comex	111.1	132.6
Government	138.0	95.7
Other Stocks	21.4	12.1
Total	**774.1**	**794.6**

Source: GFMS

Comex Silver Stocks (end period)

(Million ounces)

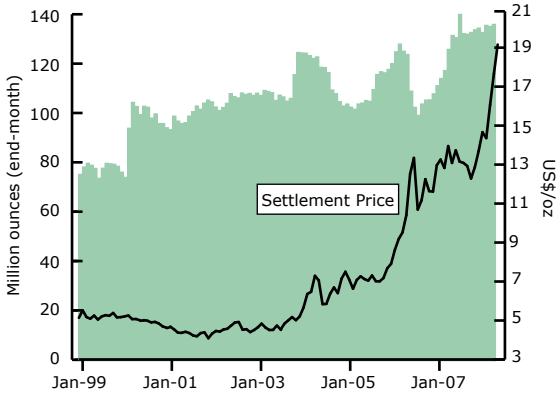
	Q1	Q2	Q3	Q4
2005	103.6	104.7	116.7	120.0
2006	125.0	102.3	105.2	111.1
2007	125.8	139.9	132.6	132.6
2008	135.9			

Source: Comex

For instance, at first look, the 20.5 Moz (638 t) increase in identifiable stocks GFMS estimate took place last year seems to greatly overshoot the 8.6 Moz (266 t) inflow implied by the sum of implied net investment and producer de-hedging, less net government sales over the year. Although it is possible that some portion of this mismatch is fueled by flows of metal that have not been included in our supply and demand analysis, we are confident that a significant part of it is indeed explained by already existing, previously unidentifiable, stocks moving into the identifiable category monitored by GFMS.

The table above and the chart on page 34 feature the levels and breakdown of identifiable bullion stocks of silver at year-end. The increase these experienced over the year was primarily the result of the 50.5 Moz (1,571 t) rise in European dealers' stocks. A smaller, albeit healthy, 21.6 Moz (670 t) increase was also recorded in the stocks held at Comex depositories. These increases were partly offset by the 42.3 Moz (1,314 t) decline in government owned silver and the much smaller outflows from Japanese trade stocks.

Comex Warehouse Stocks



Source: Comex

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 2007, these stood at a combined 554.1 Moz (17,233 t), up by 50.5 Moz (1,571 t) or 10% on their end-2006 level. The largest contributor to this increase seems to have, yet again, been continued inflows into silver ETFs (discussed in the relevant focus box in Chapter 3). Largely as a result of this inflow, it would also seem that the portion of total European dealers' stocks that allocated positions accounted for was up year-on-year. (A precise breakdown cannot be provided in respect of confidentiality.)

Elsewhere, the 25.0 Moz (779 t) decline in the global producer hedgebook seen over the year also contributed to the increase in dealers' inventories. Finally, the failure of Indian imports from Europe to recover sufficiently is also understood to have indirectly boosted stock levels. Although imports into the country were markedly up on their very low 2006 levels, they were still well below the level recorded in 2005. In addition, a smaller portion of imports than has usually been the case was actually sourced from Europe last year.

Comex Stocks

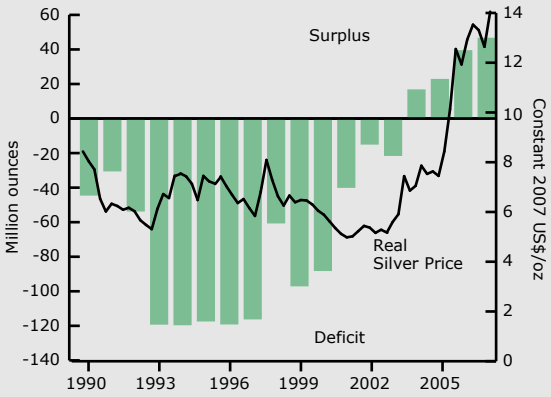
At end-2007, stocks held at Comex depositories reached 132.6 Moz (4,125 t), some 21.6 Moz (670 t) higher than the level they stood at by the end of the previous year. The 19% increase recorded confirms our analysis that there was a local supply surplus in place in the United States last year (taking into account net imports, mine and scrap supply and fabrication demand).

Deficits and Surpluses in the Silver Market

The 1990s and the early part of this decade were characterized by a constant silver market deficit – defined as the difference between supply from mine production plus scrap and demand from fabrication (in this case, excluding coins and medals minting as this is treated as part of new bullion demand). This deficit, which at its peak in the mid-1990s exceeded 100 Moz per annum, was plugged by net sales from above-ground bullion stocks. The bulk of this selling came out of investors' stocks that had been built-up substantially during the bullish conditions of the 1970s and the early 1980s, when the silver market was generally in surplus. These sales were augmented from the late-1990s onwards by a noticeable rise in the quantity of silver mobilized from government hoards. 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.

Recent years, in contrast, have seen an important transition in the market from deficit to surplus, as investors have, in aggregate, shifted from the supply to the demand side of the balance. Both institutional and private investors have been encouraged to move into silver by its excellent price performance and the prospect of further gains in future. The availability of silver ETFs has also facilitated this process. Although the surge in investment demand has clearly been the driving force behind silver's rally, to some extent the foundations for the bull market were put in place by the years of heavy deficits that whittled away the overhang of near-market bullion stocks. Finally, it should be noted that in 2007 the surplus and its corresponding rise in private sector bullion stocks also owed much to de-hedging, which was of a comparable size to the implied net investment figure last year.

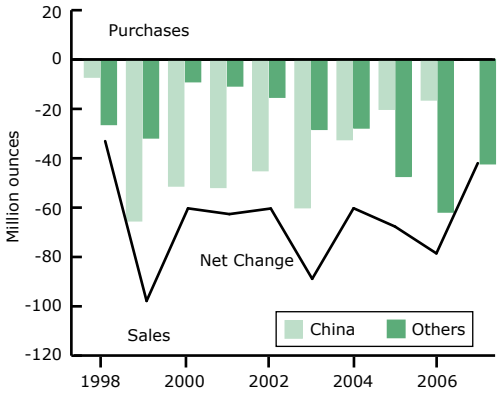
Silver Surpluses & Deficits



Source: GFMS

Looking at changes in individual depositories' stocks, the largest one recorded was the 18.9 Moz (589 t) inflow into ScotiaMocatta, likely related to the switch to a new facility resulting in increased capacity. Stocks held at HSBC Bank USA and the Delaware Depository rose by 5.1 Moz (160 t) and 1.4 Moz (45 t) respectively. Finally, silver stocks held by Brinks Inc. fell by 4.0 Moz (124 t) over the year.

Changes in Government Stocks



Source: GFMS

Government Stocks

Government stocks of silver are estimated to have declined by 42.3 Moz (1,314 t) over the course of last year, to an end-2007 level of 95.7 Moz (2,978 t). 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.

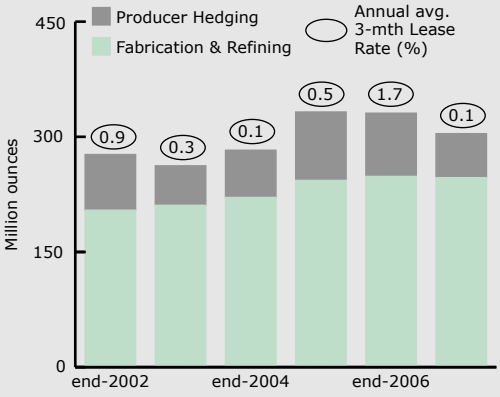
Silver Borrowing

After the high levels of and considerable volatility in silver leasing rates seen the previous year, 2007 presented a much calmer picture. Already in January the cost of borrowing had fallen and the rest of the year saw rates on a largely uninterrupted downward trajectory. Given that a good part of the excitement the previous year had stemmed from the irruption of the first silver ETF, its potential drain on liquidity and the precautionary borrowing this stimulated, it is worth exploring why the allocation, by year-end, of 51.1 Moz (1,591 t) of silver for ETFs failed to keep leasing rates at an elevated level in 2007.

Part of the explanation, we believe, is the unwinding of much of the additional borrowing that had taken place in the first half of 2006 prior to and following the launch of the first ETF. Indeed, the bulk of this may even have occurred in the second half of 2006 basis the significant decline in rates after their peak in May of that year. A more important factor in pushing down leasing rates in 2007 we would therefore suggest was an underlying fall in the level of borrowing demand for silver.

As indicated in the accompanying chart, liquidity demand associated with producer hedging suffered the largest decline. Our data, in fact, show that the global hedge book dropped by no less than 25.0 Moz (779 t) in 2007. Complementing that was a meaningful fall in fabrication-related borrowing. This occurred in spite of the general 0.9% rise in annual fabrication demand because high silver prices forced some users to reduce the amount of silver that they leased as their credit lines became exhausted. The overall reduction in borrowing demand last year noted above would also have contributed to the increase in European dealers' stocks that we comment on elsewhere in this chapter.

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.

Looking at last year, the bulk of net sales from government stocks was overwhelmingly accounted for by Russian disposals. Our estimates suggest the country may have released nearly 40 Moz (over 1,200 t), most likely due to a combination of fairly abundant inventories and the historically attractive silver prices on offer. The small balance of net government sales in 2007 was accounted for by a handful of releases of limited magnitude.

Interestingly, the two countries that featured prominently in the list of sellers last year, namely China and India, were essentially absent in 2007. Regarding the latter, the country seems to have now offloaded all of its silver stocks. Inasmuch, we do not expect India to reappear as a seller of bullion in the near future. As far as China is concerned, it is our understanding that, following several years of heavy sales, the country's holdings have been reduced to a level which makes further sales unlikely, at least in the short to medium term.

Other Stocks

In addition to the above-mentioned stocks, GFMS also track those registered on the Tokyo Commodities Exchange, 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 34 and the table on page 35. Over the course of 2007, these stocks were reduced by 43% or 9.3 Moz (289 t).

Scrap

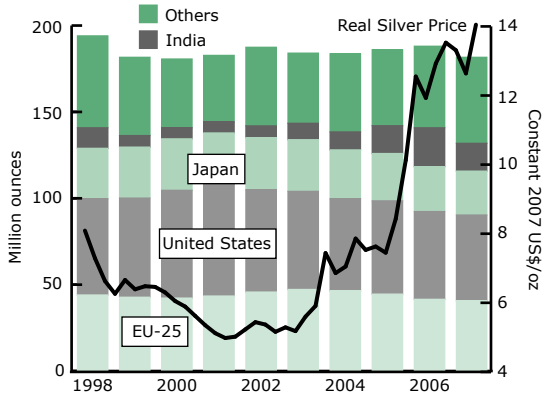
• ***The sharp drop in Indian recycling accounted for the bulk of the 6% fall in global scrap in 2007, while the drop in the recovery from photography was fairly restrained.***

Last year, world scrap supply fell for the first time since 2004, dropping by 3% to 181.6 Moz (5,649 t). The fact that every region, aside from East Asia, recorded a decline in recycling suggests that there was little reaction in the price responsive jewelry markets, in spite of the near 16% rise in average dollar prices in 2007. India, for example, recorded a close to 30% drop in recycling last year, in part due to rapidly adjusting price expectations, but also because the rupee price managed "only" a 7% rise in 2007. Perhaps surprisingly, the recovery from old photographic materials was only moderately lower in most markets (the steeper fall in the United States and Japan being two notable exceptions), primarily because of the steady flow of old X-rays. While the recycling of consumer products has already experienced a material drop, the recovery from silver from the medical sector has shown little sign of diminishing. Added to this was a rise in recovery of industrial products. The ethylene oxide (EO) sector accounted for much of the growth last year, most notably in the United States, but also in China, which was the central contributor to the 3% rise in East Asian scrap supply last year.

GFMS estimate that **Japanese** scrap volumes fell by just over 2% in 2007 to 25.4 Moz (790 t). We would be the first to acknowledge that this is a surprising outturn, not least of all because of declining recoveries from photographic scrap (which has been falling sharply every year since 2003). This may signal that the rate of decline in photographic scrap is starting to slow (one of the largest users of this form of scrap noted that their volumes were stable year-on-year), although we estimate that there is still substantial room for this to fall more in absolute terms. There was, of course, some compensation for declining photographic scrap in the form of rising supply from electronics, electrical and other secondary material.

Last year, scrap supply in the **United States** is estimated to have fallen by around 2%. The fact that recycling did not fall further may appear surprising, given the much talked about reduction in volumes originating

World Scrap Supply



Source: GFMS

from the photographic sector. This in itself continued last year and GFMS estimate that the scrapping of old photographic materials may have experienced a double-digit percentage drop in 2007. To put this into context, the material recovered last year from this industry could have been close to 50% below the peak measured around the turn of the millennium. The loss of this material from the supply side has of course offset much of the fall in photographic demand seen during this period (see Chapter 7 for more on this). However, given the lag in which old material may enter the supply chain (most notably from the medical sector in which long lead times often exist between fabrication and de-stocking), the fall in manufacturing is likely to exceed by some margin the reduction in scrap supply in the short-term.

Returning to last year, the fall in photographic recycling was nearly offset by higher volumes originating from other market segments. For example, jewelry melt was higher than in 2006, the product of higher silver prices, while the recovery from scrapped electrical and electronic materials also edged up, principally because of the impact of tightening environmental legislation. Finally, in the EO industry there appears to have been an increase in the change-out of spent catalysts, some of which are thought to have contained high silver concentrations.

The flow of scrap into the **Indian** market fell by around 29% in 2007 to touch just 16.1 Moz (500 t). This is somewhat surprising considering the 7% rise in the average rupee silver price last year, but there were three main reasons for this. Firstly, it appears as if Indian consumers' expectations had adjusted to the repeatedly higher level of the silver price by last year and had

Table 3 - Supply of Silver from the Recycling of Old Scrap (million ounces)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Europe										
Germany	16.4	16.1	16.7	16.8	16.7	19.0	19.2	17.6	14.1	13.4
UK & Ireland	10.8	11.5	10.9	11.1	13.6	13.0	12.4	11.6	10.9	11.2
Italy	4.7	3.4	3.4	3.5	3.6	3.6	3.3	4.3	5.1	5.2
France	4.1	4.0	3.5	3.9	3.9	4.1	3.8	4.1	4.5	4.3
Austria	1.8	1.7	1.6	2.0	1.9	1.5	1.6	1.3	1.3	1.2
Netherlands	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.1
Sweden	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0	0.9	0.9
Belgium	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.7	0.6	0.6
Denmark	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.5	0.5	0.5
Czech & Slovak Republics	0.7	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4
Portugal	0.5	0.5	0.5	0.4	0.5	0.5	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	0.4	0.4
Finland	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3
Switzerland	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Norway	0.8	0.9	1.1	0.7	0.7	0.5	0.3	0.3	0.3	0.3
Other Countries	1.2	1.2	1.1	1.1	1.2	1.1	1.1	1.0	1.0	1.0
Total Europe	**45.9**	**44.6**	**44.2**	**44.8**	**47.1**	**48.4**	**47.5**	**45.6**	**42.5**	**41.6**
North America										
United States	55.7	57.4	62.4	64.5	59.2	56.8	53.3	54.0	50.8	49.6
Mexico	10.6	2.3	1.5	1.4	1.5	1.8	1.9	2.1	2.3	2.7
Canada	1.9	1.6	1.4	1.4	1.4	1.5	1.4	1.5	1.4	1.6
Total North America	**68.3**	**61.3**	**65.4**	**67.3**	**62.2**	**60.1**	**56.7**	**57.5**	**54.5**	**53.9**
Latin America										
Brazil	1.6	1.8	1.5	1.6	1.0	1.2	1.0	1.0	1.0	1.0
Argentina	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.8	0.6
Chile	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
Other Countries	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.9	1.1	1.0
Total Latin America	**3.7**	**3.7**	**3.4**	**3.5**	**2.8**	**3.0**	**2.8**	**3.1**	**3.4**	**3.2**
Middle East										
Saudi Arabia	2.1	7.5	2.3	0.8	7.2	0.7	1.3	1.6	1.8	1.9
Egypt	0.4	0.3	0.9	1.1	1.3	1.1	1.4	1.4	1.5	1.5
Turkey	1.7	1.4	1.3	1.3	1.4	1.7	1.5	1.3	1.1	1.0
Oman	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Other Countries	0.4	0.4	0.3	0.4	0.3	0.4	0.5	0.4	0.5	0.5
Total Middle East	**4.7**	**9.7**	**4.9**	**3.7**	**10.4**	**4.1**	**4.8**	**4.9**	**5.1**	**5.0**
Indian Sub-Continent										
India	11.9	6.7	6.4	6.4	6.8	9.5	10.4	16.1	22.5	16.1
Other Countries	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.6
Total Indian Sub-Cont.	**12.4**	**7.0**	**6.8**	**6.9**	**7.2**	**9.9**	**10.9**	**16.6**	**23.1**	**16.6**
East Asia										
Japan	29.2	29.5	29.8	29.9	30.2	29.9	28.3	27.4	26.0	25.4
China	5.8	5.9	6.0	6.2	6.3	6.6	7.7	8.7	10.4	12.1
South Korea	7.8	5.3	5.3	5.5	5.8	6.1	6.3	6.4	6.7	6.8
Thailand	1.0	0.8	0.6	0.7	0.9	1.0	1.0	1.0	1.1	1.2
Taiwan	0.8	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.1	1.2
Singapore	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
Hong Kong	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5
Indonesia	0.4	0.4	0.5	0.4	0.3	0.3	0.4	0.4	0.4	0.4

Table 3 - Supply of Silver from the Recycling of Old Scrap (million ounces) © GFMS/The Silver Institute

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Vietnam	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	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	0.1	0.1	0.1	0.1
Total East Asia	**46.6**	**44.1**	**44.5**	**44.9**	**45.8**	**46.3**	**46.2**	**46.4**	**47.4**	**48.8**
Africa										
Morocco	0.5	0.5	0.5	0.5	0.5	0.5	1.3	0.6	0.9	0.9
Other Countries	0.6	0.6	0.6	0.5	0.5	0.5	0.6	0.6	0.6	0.6
Total Africa	**1.1**	**1.1**	**1.1**	**1.1**	**1.0**	**1.1**	**1.8**	**1.2**	**1.5**	**1.5**
Oceania										
Oceania	2.4	2.4	2.4	2.4	2.3	2.1	2.0	1.8	1.7	1.7
Total Oceania	**2.4**	**2.4**	**2.4**	**2.4**	**2.3**	**2.1**	**2.0**	**1.8**	**1.7**	**1.7**
CIS										
CIS	8.8	7.7	7.9	8.1	8.5	9.0	10.9	9.0	8.9	9.3
Total CIS	**8.8**	**7.7**	**7.9**	**8.1**	**8.5**	**9.0**	**10.9**	**9.0**	**8.9**	**9.3**
World Total	**193.9**	**181.6**	**180.7**	**182.7**	**187.5**	**183.9**	**183.7**	**186.0**	**188.0**	**181.6**

already offloaded their loosely held metal on previous rallies (although by contrast with gold, absolute price levels do appear to have had more of an impact on the silver market, as reflected in weakening jewelry offtake). Secondly, it appears as if the sharp decline in demand for jewelry and silverware since 2001 has adversely impacted on the immediately available pool of metal for scrapping (consistent with the contention that "loosely" held metal has already been sold off). Finally, the agricultural sector performed better in 2007 and there were fewer distress sales of silver from rural India. In addition to this, the government has been offering various relief packages to farmers in order to prevent suicides by debt-ridden individuals, including the waiver of debt, resulting in less pressure to sell silver.

European scrap supply dropped by a modest 2% in 2007 to 41.6 Moz (1,295 t), chiefly due to the lower German number. By sector, volumes from photographic sources fell, chiefly through lower supplies from the consumer and graphic arts components, but steadier receipts from the important old X-ray segment and the ongoing rise in overall recovery rates kept the decline in total photographic scrap quite limited. In contrast, supply from the relatively small area of electronic scrap looks to have risen as gross volumes continued growing and the previous steady slide in yields looks to have ended. Jewelry and silverware scrap also seems to have risen but the scale was limited as returns essentially only came from fabricators and, to a lesser extent, distributors, with supplies from final consumers insignificant. This was really the only area of scrap to see a price response, though this was largely confined to the fourth quarter. The decline for **German** scrap in 2007 was mainly the product of lower photographic scrap, though with supplies from old X-rays comparatively constant, the drop in the total looks to have been kept to single digits. Volumes from coin melt (which we classify as scrap rather than disinvestment in this case for Germany) were relatively stable but volumes from jewelry rose. The dip in **French** scrap was chiefly due to lower jewelry scrap as volumes failed to match the big trade clear out that followed the price spike in April/May 2006, although supplies remained at historically high levels.

Running against trend (and contrary to expectations in early 2007), **UK** scrap supply edged higher last year. This was due to a steady flow of material, primarily from the medical sector, itself in response to the ongoing conversion of hospitals to digital technologies. A move away from traditional X-rays has not necessarily led to a complete clear-out of old material, given the legal requisite to hold records for a given period. That largely explains the still regular flow of old X-rays, even from hospitals or health authorities that completed the conversion process some years ago. **Italian** scrap also rose in 2007, thanks to higher supplies from jewelry and silverware. However, the scale of this area's rise was small, there being no equivalent to the rash of '*compro oro*' signs that boosted gold jewelry scrap. Supplies from photographic sources again fell, though the drop was not great as volumes from X-rays were broadly constant.

6. Silver Bullion Trade

- ***European bullion imports fell sharply in 2007 due to lower US transfers to the United Kingdom, and a fall in receipts from Russia, China and India as Asian, mainly Indian, demand recovered.***

- ***US exports fell sharply due to the end to heavy UK-bound arbitrage-driven transfers.***

- ***Higher mine output and buoyant scrap suppressed Turkish and Egyptian bullion imports respectively but the recovery in Indian demand led to growth in Dubai's entrepôt trade.***

- ***Indian bullion imports soared by 63.0 Moz (1,958 t) in 2007 due mainly to the end of government sales but also to fabrication growth.***

- ***Official Chinese exports were buoyant in the first half and subdued in the second due to VAT reform, leaving the annual total little changed.***

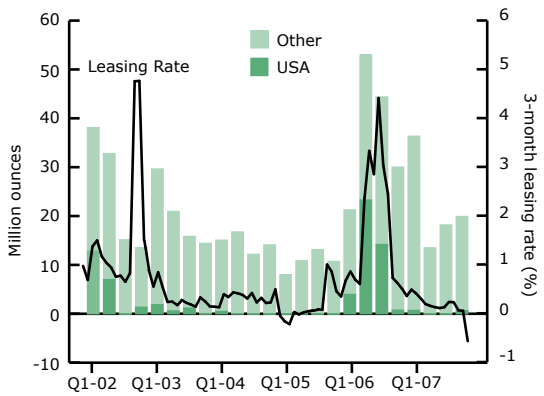
- ***South-East Asia's imports rose strongly in 2007, with South Korea and China the main suppliers.***

Europe

Europe is one of the world's major structural deficit areas for silver as supply from mine production (53.0 Moz or 1,648 t in 2007) and scrap (41.6 Moz or 1,295 t last year) falls far short of fabrication (177.8 Moz or 5,530 t for 2007). To fill this gap, sizeable imports are required and these chiefly take the form of refined bullion, concentrates and doré, though scrap also features. The last three categories mainly go to Switzerland and its refineries though receipts of refined metal are also significant, courtesy of the role Zurich plays as a bullion trading market. Extra-European receipts of refined metal also go to the London terminal market, explaining why UK imports can prove substantial. Despite being a deficit area, the presence of these two trading centers means exports of silver bullion are also important. The last two major countries involved in bullion movements are Italy and Germany, though the bulk of this business is just intra-European transfers.

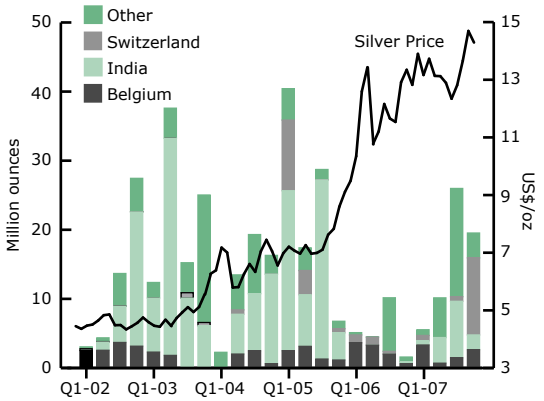
Published data on **UK** silver bullion imports show a dramatic decline of 62% in 2007 to 94.6 Moz (2,943 t). However, the true fall is thought to be lower at around 40% as substantial errors are thought to occur in the figures for flows in 2006. This still sizeable decline is chiefly due to the slump in transfers from the United States as the arbitrage opportunities that existed in 2006 faded away. The other major causes of the fall were firstly lower imports from Russia, China and Hong Kong as the bounce back in Indian imports meant these three were no longer obliged to deliver heavily into London and secondly a slump in exports from India due to the cessation of government silver sales and the recovery in local fabrication demand. During 2007, UK imports were heaviest in the first quarter (chiefly through still large inflows from China) and then in September and December, when large volumes arrived from Russia, Kazakhstan and Canada.

UK Bullion Imports



Source: GFMS

UK Bullion Exports



Source: GFMS

UK exports soared by 197% in 2007 to 57.2 Moz (1,780 t), chiefly through the combined jump from under 1,000 ounces (30 kg) in 2006 to 30.7 Moz (954 t) for shipments to Singapore and India, a clear sign of the recovery in Asian demand. There was also a notable 9.8 Moz (304 t) rise in exports to Switzerland. Within 2007, exports were subdued in the first four months, then the trade to Asia picked up, particularly in the third quarter. Volumes fell away sharply in the fourth quarter, except for a 9.6 Moz (299 t) movement in October to Switzerland.

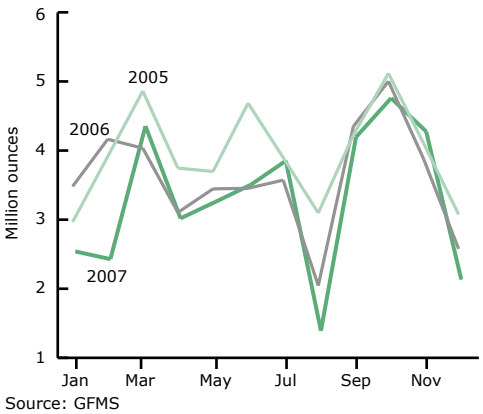
Swiss imports last year are thought to have fallen heavily, chiefly on account of a lower take from Russia (as more went from there to Asia and despite the rise in its government's sales). There was also a substantial fall in imports from Hong Kong (down 88% to 0.6 Moz or 20 t basis origin statistics), again reflecting improved demand within Asia. Swiss exports, however, are said to have held roughly steady or possibly inched up slightly in 2007 but they remained at comparatively subdued levels on a historical basis. There was some growth in flows to Germany and France but this was largely balanced out by lower exports to the United Kingdom.

Official **Italian** silver bullion imports fell by 8% last year to 39.7 Moz (1,235 t). These were sourced overwhelmingly from other EU countries and Switzerland, with the largest reported origin outside of this grouping being Russia at 0.3 Moz (9 t). With exports rising by 11%, this left net imports declining by 9%. This drop in bullion imports is therefore greater than the fall in fabrication requirements (down 6%). There is no help to this balance from scrap, as both imported and domestic volumes are thought to have been broadly stable. Nor can a solution be found in the unofficial component as this is believed to have remained slight. All the above is perhaps best viewed as a return to 'normal' given that, in 2006, supply appears to have been in excess of needs. Readers of last year's *Survey* may recall that the official data then showed bullion imports in October 2006 of a dramatic 15.6 Moz (487 t). Although the annual total is little changed, that month has now been revised down to a more plausible 5.0 Moz (156 t). A meaningful analysis of year-on-year changes is therefore now possible and it is of note that the drop for January-August 2007 at 12% was steeper than September-December's fall of 3%, with the month-on-month tailing off in inflows then seemingly more due to seasonality than price damage.

Official data shows a rise in **German** bullion imports in 2007 of 11% to 60.3 Moz (1,877 t). The bulk (around two-thirds) remained derived from other EU countries though there were also notably higher receipts from Switzerland and Chile. The latter is thought to be mainly gold containing silver doré as the unit price was far in excess of fine silver prices. These supplies essentially replaced lower shipments from Kazakhstan. Bullion exports, in contrast, fell by 18% to 45.4 Moz (1,411 t), chiefly on account of the 21% or 10.5 Moz (326 t) drop in flows to other EU countries. There was, however, a 2.7 Moz (85 t) increase in shipments to Switzerland.

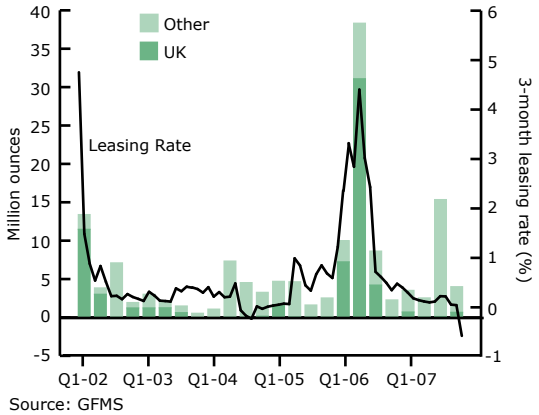
Exports from the **Commonwealth of Independent States** remained at a historically high level last year. 'Surplus' local mine production from the group continues to be exported, with this quantity being augmented by shipments of bullion from official Russian stockpiles. As regards exports from Russia, there was a notable recovery in deliveries to India in 2007 after the slump in such exports the previous year.

Official Italian Bullion Imports



Source: GFMS

US Bullion Exports



Source: GFMS

North America

Bullion imports into the **United States**, as reported by US Customs, were modestly higher in 2007, rising by close to 3% to 160.3 Moz (4,985 t). While a broadly neutral outcome was not unexpected, the data at the country level (in terms of individual exporters to the United States) is less reassuring, with sharp rises reported in material coming from Peru and Chile. As a result, a revised account, based on origins' export data produces a more accurate picture of events last year. This suggests that US imports were in fact around 4% lower in 2007 at 161.0 Moz (5,008 t). Furthermore, the year-on-year change in shipments from the top three exporters to the United States, namely Peru (+5%), Mexico (+5%) and Canada (–24%), broadly reflected the trend in each country's mine supply in 2007, compared with 2006. In contrast, deliveries from Chile were little changed on 2006, with much of the growth in the country's mine production in 2007 being delivered into other markets (including Mexico and Germany).

Turning to silver bullion exports, the reported 56% drop in trade last year was almost entirely due to the near collapse of deliveries to the United Kingdom. At just 1.4 Moz (44 t), this paled into insignificance compared with the 42.8 Moz (1,332 t) shipped into London in 2006, during which time an arbitrage opportunity had encouraged metal to make its way across the Atlantic. The absence of similar conditions last year therefore meant a return to more "normal" bullion flows between the two countries. The fact that US exports did not fall further last year was largely due to a flow of material directly into India, which totaled 12.1 Moz (397 t), in the process securing India as the United States' foremost destination for silver bullion in 2007.

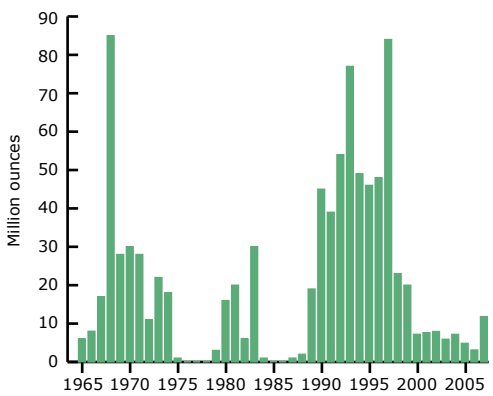
Middle East and Indian Sub-Continent

In **Turkey**, given the substantial rise in primary mine production, which is refined and sold locally, it was surprising to see that bullion imports "only" fell by 13% in 2007. In the past, imports of grain and large bars have effectively made up the shortfall in supply for Turkish fabrication, where not serviced by domestic mine supply. In this regard, the near doubling of mine production in just three years has been accompanied by a halving of bullion imports. While this may appear to be a perfect fit, it does not take into account the fact that the intervening period has seen weaker Turkish silverware and jewelry production, which, all other things being equal, should have precipitated a sharper drop in bullion trade.

Last year, it was surprising to see only a muted reaction from the **Egyptian** bullion import trade, given the removal of the 21% import duty during 2007. Official bullion imports are estimated to have remained at close to the three ton level reported in 2006 and there is little to suggest that there was a compensating rise in unofficial trade. Instead, field research points to scrap supply remaining at the elevated levels witnessed in recent years. Further confirmation of this conclusion comes from the fact that the silver price in the local market remained at parity to the international price, which therefore made no allowance for transportation or, when applicable, the import duty. It was therefore of little surprise that these conditions deterred imports during much of last year.

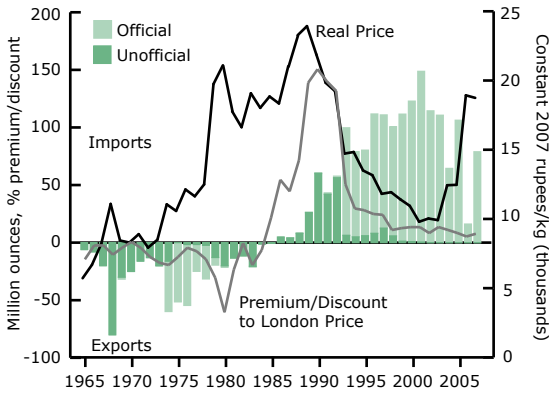
In the **United Arab Emirates**, renewed demand from India last year generated a surge in activity in the once key regional entrepôt. There is little in the way of local silver fabrication, with the vast majority of bullion imports

Dubai Bullion Imports



Source: GFMS

Net Indian Bullion Imports and Exports



Source: GFMS

transshipped, or at times vaulted in Dubai. However, increased volumes of trade, both in and out of the UAE, reflected the uptick in Indian demand. Trade statistics indicate imports from Russia, Hong Kong, and China all rising significantly last year, with the bulk of this supply destined for the Indian Sub-continent. In contrast, imports from South Africa and Brazil were considerably weaker in 2007.

GFMS estimate that gross silver imports into **India** grew by almost five times in 2007 to reach 80.0 Moz (2,489 t). At first sight, this stupendous 369% rise in imports appears to be completely at odds with the price action seen during the year. For instance, the local average silver price rose by 7% in 2007 and the price range was all of 21%, both factors which would have been expected to choke off imports. Furthermore, this rise was on the back of the 58% increase in the silver price in the previous year. As might be expected, a myriad of factors underpinned this outturn, but two stand out as explaining much of this apparently anomalous behavior, namely government sales of mint silver in previous years (which played a vital role in supplying silver to the domestic market at the expense of imports) and the run-down in stocks during 2006 of the metal held by various counterparts.

Turning to the first of these, as regular readers of these *World Silver Surveys* will already know, there were substantial sales of government silver into the domestic market during 2005 and 2006. Basis GFMS estimates, in addition to the 17.2 Moz (535 t) of silver imported in 2006, around 27.8 Moz (864 t) of mint silver was supplied to the market. Furthermore, and coming to the second of the factors mentioned above, our data suggests that there were around 35.4 Moz (1,100 t) of carry-forward stocks of imported silver at the end of 2005 which was brought into 2006 (basically this was silver imported in the latter parts of 2005 on expectations of rising demand that never materialized; exporting silver from India is very costly so most of this was carried over into 2006).

Indian Bullion Imports

Moz	2003	2004	2005	2006	2007
OGL^	107.7	60.3	106.1	16.1	78.9
NRI^	0.1	0.1	0.1	0.1	0.0
SIL^	0.0	0.0	0.0	0.0	0.0
Replenishment**	2.9	4.0	3.1	1.0	1.2
Sub-total	110.6	64.4	109.3	17.2	80.0
Unofficial	0.0	0.0	0.0	0.0	0.0
Total Imports	**110.6**	**64.4**	**109.3**	**17.2**	**80.0**
Local Premium*	12%	10%	7%	4%	6%

* percentage above London price at the official exchange rate (excluding all local duties and taxes)

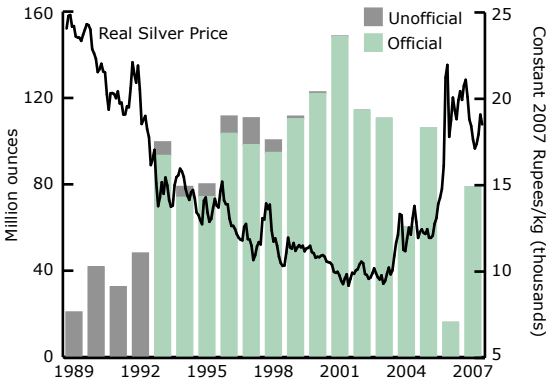
** imports of silver bullion for manufacture and re-export

^ Open General Licence, Non-resident Indians, Special Import Licence

Source: GFMS

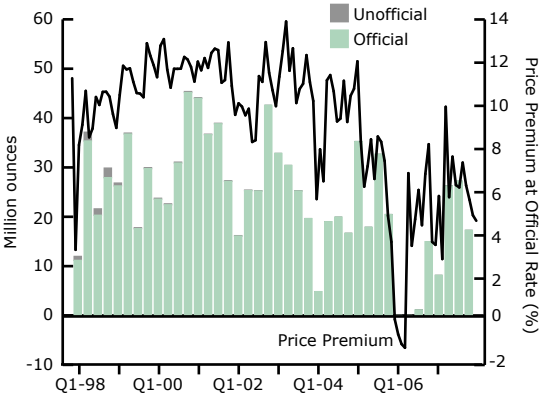
Without wishing to get tied down by the minutiae of our supply and demand balances, GFMS estimate year-end stocks in 2006 of 14.0 Moz (436 t), which together with scrap as well as silver recovered from imported copper ores gave rise to total supply in 2006 of around 106.3 Moz (3,306 t). By contrast with 2006 when there were huge mobilizations of loco-India stocks, demand in 2007 had to be fed from a rise in imports. In summary, total supply last year was composed mainly of imported silver, totaling 80.0 Moz (2,485 t). Allowing for further movements in stocks and scrap, GFMS estimate total supply during 2007 was around 114.8 Moz (3,570 t), an 8% rise over the previous year.

Annual Indian Bullion Imports



Source: GFMS

Quarterly Indian Bullion Imports



Source: GFMS

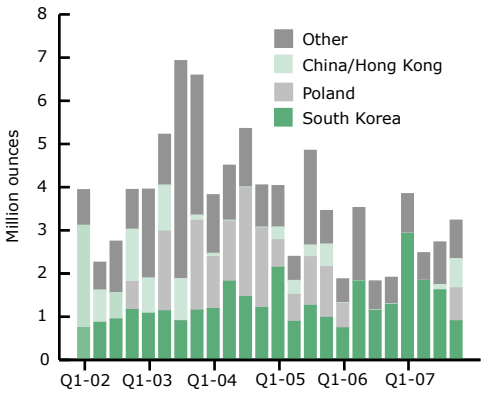
Turning to the actual flows of silver into India last year, taxes continued to distort import patterns as they have for many years. Although the application of uniform Value Added Tax (VAT) was expected to result in shipments to genuine areas of fabrication demand, major distortions persisted last year. The most profound distortion was to be found, not surprisingly, in Noida (a small sub-city of Delhi). Remarkably, this city ended up accounting for over 40% of GFMS' estimates of total imports into the country last year as the Uttar Pradesh government somehow managed to circumvent agreements to apply a uniform rate of VAT on imports. Furthermore, most of the silver landed in Ahmedabad continued to find its way to Mumbai due to the 2% octroi on silver in the latter (on gold it is 0.1%) even though VAT rates are the same. As far as the main exporters to India were concerned, the United States, the United Kingdom, China/Hong Kong, Dubai and Singapore were all substantial suppliers last year.

One final comment is worthy in this section. Toward the end of 2007 and moving into 2008, GFMS have received a number of reports that both official as well as so-called "touch-down" exports of silver have risen sharply. Most of this metal is shipped to Dubai. As is the case with gold (see *Gold Survey 2008* for more on this), the exact form and magnitude of these shipments is difficult to track but they can have profound implications for the implied level of true fabrication offtake in India. As far as genuine exports are concerned, silver traded at a discount to the landed cost of imported silver over prolonged periods towards the end of 2007 and this phenomenon has been particularly acute in 2008, making exports profitable.

East Asia

In recent years, the **Chinese** government has identified the need to increase the annual export quotas for silver as domestic stocks have risen on the back of a rise in mine production and an increase in silver supply from base metal smelters treating imported concentrates. In addition, treatment of scrap material has also risen in the last 24 months as elevated prices for silver and stricter environmental regulations have led to higher recoveries. The rise in domestic supply has led the Chinese Ministry of Commerce (MOFCOM) to regularly review the export quota. In 2007, the quota was raised a further 13% to 144.7 Moz (4,500 t) from the 128.6 Moz (4,000 t) set down for 2006, with 60% of the total available to producers and the remaining 40% offered to traders.

Thai Bullion Imports



Source: GFMS

According to official Chinese trade statistics, bullion exports reached 144.2 Moz (4,484 t) last year, effectively unchanged year-on-year.

The transparency of trade between the Chinese mainland and Hong Kong has increased significantly in recent years, with official trade statistics now reflecting a more accurate picture of true exports from China. However, as outlined in previous *World Silver Surveys*, the unofficial round tripping of silver between Hong Kong and the Chinese mainland, to reclaim the VAT, does muddy the water when reviewing the statistical data, and this has often led to inflated export numbers. This continued to be the case in 2007, although the volume of unofficial trade did decline from the previous year's level. This was due to the policy that was introduced on July 1st which cut the VAT rebate on silver bullion from 17% to 5%, which reduced the incentive to engage in the round tripping of silver between the mainland and Hong Kong. The impact of this measure can best be illustrated by reviewing the two contrasting halves of the year, with a surge in exports to Hong Kong in the first half, particularly the second quarter leading up to the policy change, providing almost two-thirds of the annual total.

Over the last decade, China has positioned itself as the major supplier to the East Asia region with exports from the mainland (most likely via Hong Kong) to this region rising from just 8.8 Moz (275 t) in 2000 to our estimate of 25.8 Moz (802 t) last year.

On the import front, in November, China lifted restrictive regulations on high-purity silver imports that have been in place for the last eight years. The silver import

regulation, which originally came into effect on January 1st 2000, prohibited all unlicensed silver imports into China except those intended for toll refining (largely scrap and concentrates). Under the regulation, companies were required to obtain a license from the central bank before importing silver for sale in the Chinese market. The cancellation of this policy means that companies are now free to import and sell silver in the domestic market without having to apply for a license. However, companies must still pay 17% VAT on the imports.

Silver imports into **Hong Kong** fell by over 9% in 2007, to 127.7 Moz (3,972 t). Not surprisingly, imports from the Chinese mainland dominated trade which, according to official statistics, fell 7% to 118.9 Moz (3,697 t) but still provided 93% of the annual total. In addition, the introduction of the lower VAT rebate on silver exports from China on July 1st last year resulted in a surge in exports in the first half of the year as traders took advantage of the higher level before this incentive was reduced, with bullion imports in the first six months of 2007 providing 62% of the annual total.

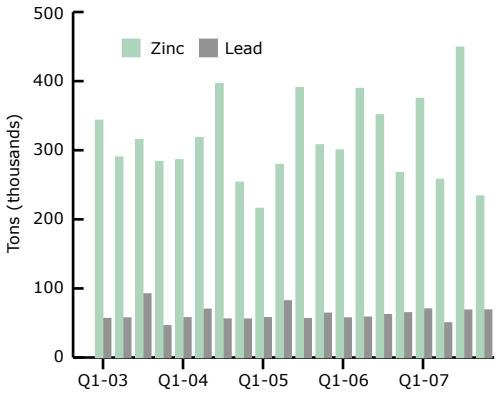
Exports from **South Korea** to elsewhere in East Asia, which dominate the country's overseas trade, rose by 6% as the reduction in VAT refund rates in China resulted in a sharp fall in the latter's bullion trade with the region. Korean smelters took advantage of this, picking up market share, if briefly. Bullion imports into Korea slipped by over 55% in 2007 to 4.1 Moz (128 t). This fall, in spite of the robust industrial sector in Korea, was partly due to the 10% rise in recoverable silver from the two main base smelters, which easily covered local demand and provided some explanation for the increase in exports. Bullion inflows from China, which dominated imports in 2006, were markedly weaker last year, with imports trivial in the first and final quarters of 2007, while supply from Australia (the largest source of silver last year) dropped by 25%.

Bullion imports into **Singapore** rebounded strongly in 2007 after falling almost a third the previous year. Official trade statistics indicate that imports rose by almost 70%, led higher by a surge in deliveries from South Korea in the second quarter, with this flow destined mainly for jewelry fabricators in Thailand and Indonesia.

GFMS estimate that **Thailand's** bullion imports rose by around 7% in 2007 to a calculated 42.2 Moz (1,313 t), with imports from China accounting for much of the growth. This outcome was somewhat unexpected, given that the country's total silver fabrication in 2007 fell by 1% or 0.3 Moz (10 t). Turning to bullion exports, these (also on a calculated basis) fell by almost 40%, with sharply lower deliveries to Singapore and Japan offsetting a rise in shipments to India, which appears to have emerged as a new export destination.

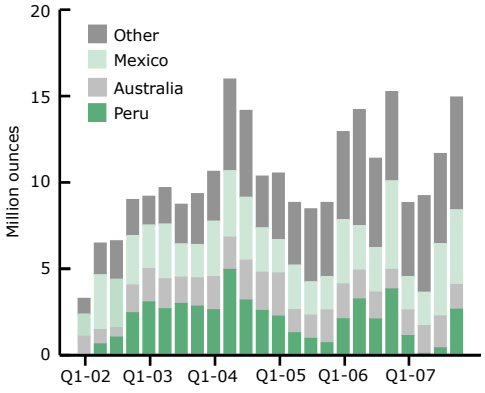
Japanese silver bullion imports fell sharply in 2007, dropping almost 17% to 44.7 Moz (1,389 t). By contrast with previous years, this was not compensated for by a rise in recoveries from other sources such as imported base metals concentrates (although the Ministry for International Trade and Industry did report higher supplies from "other" sources). GFMS believe that at least part of this was due to a rise in bullion de-stocking last year as prices continued to hit recent highs (see Chapter 7 for more on this).

Korean Lead and Zinc Concentrate Imports



Source: WBMS

Japanese Bullion Imports



Source: GFMS

7. Fabrication Demand

- ***Global fabrication in 2007 rose by a modest 0.9% to 843.7 Moz (26,241 t), in the process recouping most of the losses suffered in 2006.***

- ***Industrial fabrication grew for the sixth year in succession, with last year's total up in excess of 7% to 455.3 Moz (14,162 t).***

- ***A key factor behind the increase in the industrial total was the more than 6% rise in electrical and electronics, which broke through the 200 Moz threshold for the first time.***

- ***In contrast, jewelry fabrication slipped by 2% in 2007, the product largely of weaker offtake in Europe and the Indian Sub-Continent, which offset further growth in East Asia.***

- ***Global silverware offtake continued to weaken, with the 4% loss in 2007 contributing to a 9 Moz attrition (281 t) in just two years.***

- ***A further decline was recorded in the photographic sector, where an 11% drop left the global total at just 128.3 Moz (3,991 t).***

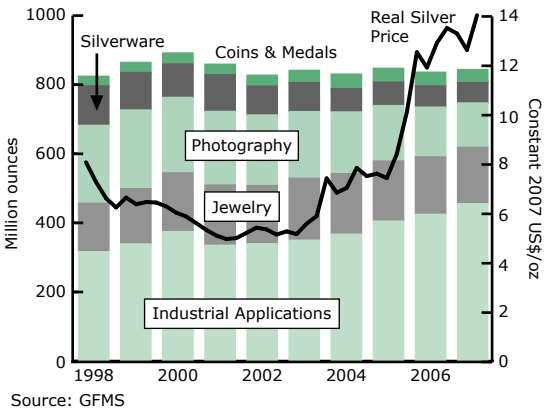
- ***The minting of coins & medals fell by nearly 5% last year, primarily due to lower fabrication in Germany and the United States.***

A cursory review of the global total suggests that little changed last year, with world fabrication up by less than 1% in 2007. However, the performance of the individual components was far from sedentary.

The star performer in 2007 was industrial demand. Not only did the category grow by 7% but in the period since the technology-related slump in 2001, the total has added a not insubstantial 120.1 Moz (3,736 t). Given that other areas of demand declined last year, the growth in the industrial category meant that its share of total fabrication reached 54% in 2007, compared with a more modest 38% ten years ago. In fact, industrial demand has played a key role in offsetting the structural decline in photography. To put this into perspective, in the space of ten years, the manufacture of photographic products has fallen by 97.1 Moz (3,020 t); over the same period industrial fabrication has risen by 139.1 Moz (4,325 t).

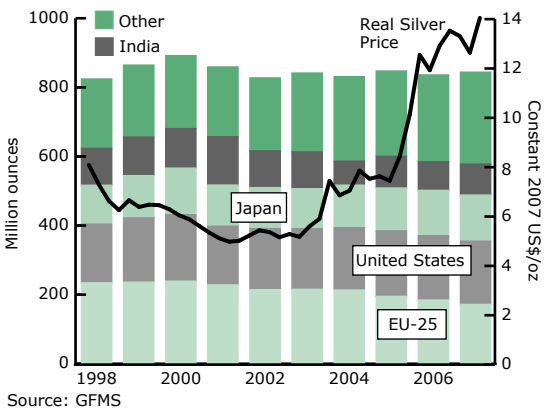
The strength in industrial demand also offset weaker fabrication in both jewelry and silverware. Part of the decline in each sector was price related, given the rise in silver prices last year but, in the case of silverware, a further drop was not entirely unexpected, because of the shift in taste away from this category in several key consuming markets. As a result, an increasing share of total fabrication, in 2007, was accounted for, at least in the short-term, by largely price insensitive demand, namely industrial and photographic fabrication.

World Silver Fabrication (by category)



Source: GFMS

World Silver Fabrication (by region)



Source: GFMS

Industrial Applications

• ***Global industrial demand reached a fresh record of 455.3 Moz (14,162 t) in 2007, up by 7% - a slightly faster pace than in 2006.***

• ***Electrical and electronics fabrication accounted for the greatest increase, though brazing alloys and solders demand also saw respectable growth.***

• ***India, China and the United States accounted for around 70% of the world rise in all industrial uses.***

Europe

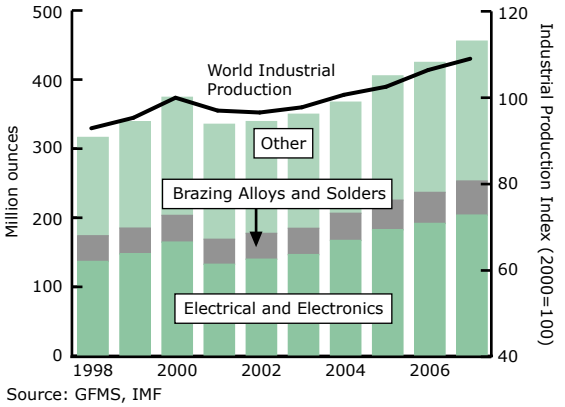
Industrial fabrication in Europe rose by 3% to 70.6 Moz (2,196 t), a rate of growth notably slower than the world average of 7%. Although a six-year high, European industrial demand was still 8% below the peak in 2000, whereas global industrial offtake stood some 22% higher than it did in 2000. This relative underperformance is clear proof of the shift in consuming industries to low labor cost countries, with fabrication typically following a few years later. The obvious beneficiary has been East Asia, whose industrial fabrication (excluding already industrialized Japan) in 2007 was some 46% higher than in 2000. The impact of these shifts was, however, lessened by many end-users only moving as far as central/eastern Europe or North Africa and west European fabricators have been able to remain the key suppliers to these customers.

Another factor driving European sluggishness concerns what we could term the miscellaneous industrial and decorative category as the main components of the overall industrial number, electrical and electronics was around 5% higher than in 2000 and brazing alloys were only down slightly. Losses within this remainder category are thought to be dominated by decorative plating and silver use in the alloying of karat gold jewelry, which we classify as industrial rather than jewelry demand.

Another theme to industrial fabrication last year was the limited impact of the price rally. Efforts to minimize silver use within components (for example, by boosting the nickel content in certain applications) or shift to an entirely different metal (say copper or aluminum) have been ongoing for many years due to silver's price premium over these base metals and there was little evidence of any marked change last year in this relatively gradual process. Nor was there said to be any marked variation in offtake during the year, with only a handful of contacts noting a fourth quarter slowdown and then only blaming concerns over the solidity of economic growth moving forward and not the sharp rise in the silver price then. However, some have expressed caution over possibilities for offtake in 2008 due to end-users' earlier building of stocks and to expectations of a greater focus on trimming work-in-progress volumes.

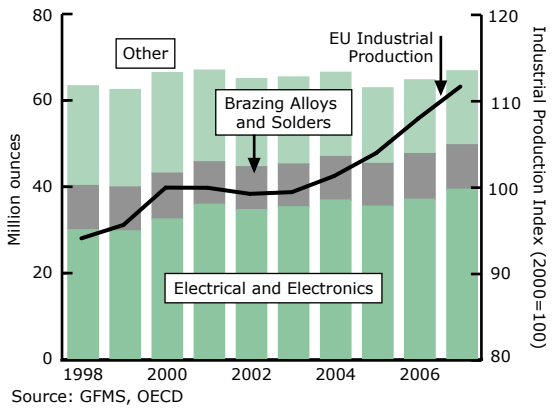
German industrial offtake saw another year of healthy growth to a fresh record, with output up 7% to 27.4 Moz (851 t), chiefly on account of strength in the electrical and electronics component. The increase that this area enjoyed was chiefly due to buoyant component end-use in the local market and elsewhere within Europe; exports to Asia may have risen but this is a niche business, while sales to the US market were notably weak. Some indication of the strength of demand can be gleaned from official data on the export of semi-manufactured items, which rose by 16% in gross weight

Components of Industrial Applications



Source: GFMS, IMF

EU Industrial Fabrication



Source: GFMS, OECD

terms last year (though the quality of this data is compromised by its inclusion of semis for other, smaller areas, such as jewelry, and the unit values are suspect). By end-use, growth was dominated by areas such as contacts in heavy machines for new factories or circuit breakers for residential use, though other areas (on the minor electronic side) such as sputtering targets and componentry for LCD screens also saw growth.

Brazing alloys and solders offtake saw notable growth in 2007, posting another record thanks to strong demand in such sectors as air-conditioning units and automotive. This occurred despite ongoing and successful largely price driven efforts to minimize silver use.

Industrial fabrication in **Italy** rose by a modest 3% to 11.1 Moz (346 t). Growth within the electrical and electronics and the brazing alloy and solders areas was stronger (if not quite as buoyant as Germany's) but the total was undermined by a decline in the use of silver in the alloying of karat gold jewelry. Within the dominant electronics and electrical segment, the increase was chiefly due to contacts, though nitrates for the automotive industry saw slight growth. One area that disappointed was silver use in photo voltaic cells but this was largely just due to one-off corporate issues.

French industrial demand is thought to have risen by around 4% to 10.7 Moz (334 t). As with Italy, the miscellaneous industrial and decorative area saw losses but decent growth was recorded for brazing alloys and solders and electrical and electronics offtake, despite some signs of imports taking market share and there being further relocation of end-users to low labor cost countries.

Industrial fabrication in the **United Kingdom** was only moderately lower last year at 12.0 Moz (372 t). This reflected healthy domestic demand in several end-uses but also the fact that there was little substitution away from silver. In addition, although offshore relocations have been a factor in recent years, there was little sign that this materially affected UK demand in 2007.

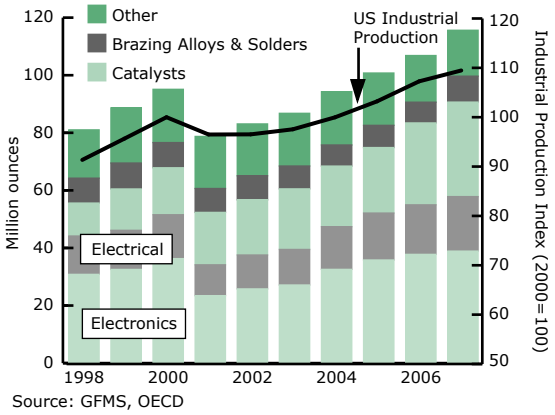
EU Industrial Production

(Index, 2000 = 100)

2003	2004	2005	2006	2007
99.3	101.4	104.0	108.1	111.6

Source: OECD

US Industrial Fabrication



Source: GFMS, OECD

North America

Industrial fabrication in the **United States** returned a healthy 8% growth rate in 2007, with last year's total 36.6 Moz (1,139 t) above the low point seen in 2001. Given this performance, it might appear disingenuous to talk about a slowdown, but much of the rise over the last twelve months was concentrated in a few industries, including photo voltaic cells and ethylene oxide (EO) catalysts. Brazing alloys and solders also achieved a strong increase but it appears that corporate developments may have played a key role in what is arguably a fairly mature market. However, this is not to say that other segments did not report a higher level of fabrication but the growth rate, for example in the use of silver in the electronics industry, was notably modest in 2007.

An indication of the apparent slowdown was reflected in semi-conductor statistics showing the value of billings (source: SIA), which revealed a 5% reduction for the Americas in 2007, compared with a 3% worldwide increase. Tellingly, the Asia/Pacific region recorded a 6% rise in its global billings during 2007. This outcome is consistent with the decline noted above in the United States and was partly due to the offshore relocation to low cost locations of manufacturers of mass produced items, leaving behind research and development and the manufacture of high-end products, which partly explains the only modest growth rate in the electronics demand for silver last year. Part of the year-on-year decline in US global billings also reflected the sharp rise in 2006 (+10%) in expectation of healthy demand last year, but the economic slowdown in the domestic market, which gathered pace in the second half of 2007, led to an element of stock run down.

Table 4 - World Silver Fabrication (including the use of scrap - million ounces)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Europe										
Italy	56.3	62.3	66.6	60.1	57.4	55.8	55.4	50.7	46.4	43.6
Germany	47.9	41.8	40.4	39.8	35.4	39.1	40.4	40.5	41.0	40.2
UK & Ireland	39.1	39.8	42.0	45.2	42.5	43.4	51.6	42.8	34.2	28.6
Belgium	33.8	37.5	35.3	32.1	30.8	29.3	27.6	26.2	28.7	27.3
France	28.7	26.9	29.2	29.2	27.7	26.3	13.0	12.5	12.7	13.2
Spain	8.8	7.5	6.7	5.5	5.2	4.8	6.3	5.6	5.0	4.5
Poland	3.6	3.7	3.9	3.4	3.2	3.8	4.3	4.7	4.8	4.4
Switzerland	10.7	11.1	9.0	3.5	3.4	3.0	3.1	3.3	3.1	3.1
Greece	4.1	4.1	3.3	3.0	2.8	2.9	2.9	2.9	2.8	2.6
Netherlands	2.2	2.8	1.9	1.8	2.1	1.9	2.5	2.2	2.0	2.0
Portugal	3.1	3.2	3.5	2.6	1.7	2.7	4.1	1.7	1.5	1.4
Norway	1.5	3.0	2.9	2.3	1.9	2.0	2.1	1.8	1.7	1.3
Austria	1.4	1.2	1.1	1.1	1.2	1.2	1.3	1.3	1.2	1.2
Sweden	1.4	1.4	1.3	1.0	1.0	1.2	1.2	1.2	1.2	1.1
Denmark	1.0	1.0	1.0	0.9	0.8	0.7	0.7	0.7	0.7	0.7
Czech & Slovak Republics	0.9	0.8	0.8	1.0	0.7	0.7	0.7	0.6	0.7	0.6
Romania	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Hungary	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Finland	0.7	0.7	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.3
Yugoslavia (former)	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
Cyprus & Malta	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Other Countries	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2
Total Europe	**246.6**	**250.4**	**251.1**	**234.4**	**219.8**	**220.7**	**219.0**	**200.5**	**189.5**	**177.8**
North America										
United States	169.7	185.9	192.2	169.6	177.0	175.3	180.3	189.4	185.8	181.7
Mexico	21.9	21.7	17.3	17.1	18.1	20.2	21.9	22.3	18.9	18.5
Canada	3.8	3.9	3.3	2.9	3.1	2.5	3.5	4.0	5.7	7.8
Total North America	**195.4**	**211.5**	**212.8**	**189.5**	**198.2**	**198.1**	**205.8**	**215.7**	**210.4**	**208.0**
Latin America										
Brazil	8.1	7.7	6.8	6.6	6.4	6.6	7.3	7.5	4.7	7.2
Argentina	3.5	3.0	2.3	1.8	1.9	2.4	2.5	2.6	1.9	2.0
Peru	1.1	1.0	1.0	1.0	1.0	0.7	0.7	0.6	0.7	0.7
Colombia	1.1	0.9	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Chile	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Ecuador	0.7	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.4	0.4
Other Countries	1.6	1.8	1.1	0.9	0.7	0.9	1.1	1.2	1.3	1.3
Total Latin America	**16.5**	**15.3**	**12.9**	**11.8**	**11.6**	**12.1**	**13.1**	**13.3**	**10.1**	**12.7**
Middle East										
Turkey	6.6	6.0	7.4	6.4	8.2	9.5	10.5	10.1	9.1	8.2
Israel	3.1	3.1	2.9	2.7	2.7	2.6	2.7	2.7	2.7	2.7
Egypt	1.9	2.0	2.0	1.8	1.6	1.8	2.0	1.8	1.7	1.6
Iran	1.3	1.4	1.4	1.5	1.4	1.5	1.5	1.6	1.6	1.6
Other Countries	1.7	1.8	1.9	1.8	1.8	1.8	1.9	2.0	2.0	2.0
Total Middle East	**14.6**	**14.3**	**15.7**	**14.2**	**15.6**	**17.2**	**18.5**	**18.2**	**17.1**	**16.1**
Indian Sub-Continent										
India	106.7	111.9	114.5	139.5	106.4	106.4	69.5	91.6	82.8	89.7
Bangladesh & Nepal	5.1	5.7	6.0	5.9	4.8	4.5	4.2	3.7	3.6	3.6
Other Countries	2.8	3.4	3.2	2.2	2.1	2.1	2.3	2.4	2.4	2.4
Total Indian Sub-Cont.	**114.6**	**121.0**	**123.6**	**147.6**	**113.3**	**113.1**	**76.1**	**97.7**	**88.8**	**95.7**

Table 4 - World Silver Fabrication (including the use of scrap - million ounces)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
East Asia										
Japan	112.8	122.5	135.0	119.3	118.7	116.0	123.0	124.1	131.7	133.5
China	34.1	33.7	36.1	39.8	47.6	52.8	59.0	61.6	68.0	75.8
Thailand	28.2	30.9	30.9	32.9	32.6	36.6	37.0	37.0	37.0	36.7
South Korea	13.8	16.7	19.6	17.1	17.8	19.2	19.8	20.2	20.9	21.6
Taiwan	6.8	6.7	9.4	8.5	9.0	10.3	11.3	11.7	12.8	13.2
Indonesia	3.1	3.6	4.2	5.2	4.5	4.7	5.8	5.1	5.7	5.5
Hong Kong	3.6	3.9	4.4	3.2	3.4	3.2	3.4	3.5	3.8	4.0
Vietnam	0.6	0.7	0.7	0.7	0.8	0.9	1.0	1.0	1.1	1.2
Myanmar, Laos & Cambodia	0.8	0.9	0.8	0.9	1.0	1.0	0.9	0.9	0.8	0.8
Malaysia	0.4	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.6
Other Countries	0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.5	0.5	0.5
Total East Asia	**204.4**	**220.6**	**242.3**	**228.6**	**236.4**	**245.7**	**262.4**	**266.3**	**283.0**	**293.3**
Africa										
Morocco	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Tunisia	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.4
South Africa	0.3	0.3	0.3	0.2	0.2	0.2	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	0.1	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	**1.7**	**1.7**	**1.8**	**1.7**	**1.7**	**1.7**	**1.8**	**1.8**	**1.8**	**1.9**
Oceania										
Oceania	5.6	5.8	7.0	5.9	5.8	6.2	5.7	3.9	4.3	4.6
Total Oceania	**5.7**	**5.8**	**7.0**	**6.0**	**5.8**	**6.3**	**5.8**	**3.9**	**4.3**	**4.6**
CIS										
CIS	24.7	23.8	24.4	25.4	25.0	26.7	28.2	29.8	30.9	33.7
Total CIS	**24.7**	**23.8**	**24.4**	**25.4**	**25.0**	**26.7**	**28.2**	**29.8**	**30.9**	**33.7**
World Total	**824.3**	**864.4**	**891.7**	**859.2**	**827.4**	**841.4**	**830.7**	**847.3**	**836.0**	**843.7**

A growing cause for concern last year was the impact of rising silver prices, although the bearing this had on the level of fabrication was far from clear-cut. In some cases, the rising cost of financing inventory and work-in-progress materials favored just-in-time manufacturing. Elsewhere, alternative manufacturing techniques were employed, for example in the shielding industry, which saw the use of sputtering (otherwise known as vapor disposition) gain in popularity at the expense of spray paint systems.

In contrast to the sluggish growth in the electronics market, electrical demand posted stronger gains last year. In the main, this was driven by continued growth in the photo voltaic cell industry. Although photo voltaic cells have been manufactured for over two decades, it has only been in the past four to five years that fabrication has taken off and in fact the volume of silver used in 2007 would have been noticeably higher were it not for capacity constraints relating to polysilicon production. Elsewhere, the use of silver in multi-layer ceramic capacitors (MLCCs) was broadly unchanged on 2006. In effect, there was little sign of either further substitution in favor of base metal alloys or of a greater use of silver at the expense of palladium. As noted in previous *World Silver Surveys*, the MLCC industry in the United States, in terms of precious metal fabrication, is dominated by small and medium sized companies, which have generally lacked the resources to invest in nitrogen furnaces, capable of accommodating copper:nickel alloys.

United States Industrial Production

(Index, 2000=100)

2003	2004	2005	2006	2007
97.2	100.0	103.2	107.3	109.5

Source: OECD

Table 5 - Silver Fabrication: Industrial Applications (including the use of scrap - million ounces)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Europe										
Germany	18.4	18.3	20.8	21.4	21.2	21.7	23.5	23.9	25.5	27.4
UK & Ireland	16.1	15.1	16.5	14.3	13.9	14.9	15.5	12.4	12.5	12.0
Italy	10.6	10.6	10.9	10.4	10.4	10.2	11.5	10.8	10.8	11.1
France	11.2	11.6	12.3	15.9	14.6	13.8	10.3	10.2	10.4	10.7
Switzerland	10.0	10.4	8.3	2.7	2.7	2.3	2.4	2.6	2.5	2.5
Spain	3.1	2.7	2.0	1.3	1.3	1.2	2.1	1.9	1.9	1.9
Netherlands	1.7	1.7	1.7	1.5	1.5	1.5	1.6	1.6	1.6	1.6
Poland	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8
Austria	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6
Norway	0.4	1.4	1.2	0.7	0.6	0.6	0.8	0.7	0.6	0.5
Sweden	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Czech & Slovak Republics	0.4	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Belgium	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Other Countries	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8
Total Europe	**74.5**	**75.0**	**76.7**	**71.1**	**69.0**	**69.0**	**70.5**	**66.9**	**68.5**	**70.6**
North America										
United States	81.0	88.6	95.1	78.7	83.1	86.8	94.2	100.8	106.8	115.4
Mexico	3.0	3.3	3.4	3.0	3.0	3.1	3.0	3.2	3.1	3.3
Canada	0.5	0.5	0.5	0.5	0.5	0.5	0.6	1.0	1.7	2.4
Total North America	**84.5**	**92.5**	**99.1**	**82.3**	**86.6**	**90.4**	**97.8**	**105.0**	**111.6**	**121.0**
Latin America										
Brazil	3.5	3.2	3.2	3.2	3.2	3.0	3.7	4.5	2.9	4.0
Argentina	1.2	1.0	0.8	0.6	0.6	0.6	0.6	0.9	1.0	1.1
Colombia	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
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	0.4
Total Latin America	**5.4**	**4.8**	**4.6**	**4.5**	**4.5**	**4.3**	**5.0**	**6.0**	**4.6**	**5.7**
Middle East										
Turkey	1.3	1.2	1.4	1.1	1.2	1.5	1.6	1.7	1.8	1.9
Israel	1.0	0.9	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Egypt	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other Countries	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Middle East	**2.5**	**2.4**	**2.6**	**2.2**	**2.3**	**2.5**	**2.6**	**2.7**	**2.9**	**2.9**
Indian Sub-Continent										
India	31.9	37.9	46.1	50.8	44.4	44.4	33.9	53.7	54.2	64.5
Pakistan	0.5	0.6	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Total Indian Sub-Cont.	**32.4**	**38.5**	**46.7**	**51.1**	**44.7**	**44.7**	**34.1**	**54.0**	**54.6**	**64.8**
East Asia										
Japan	52.8	60.8	72.1	55.4	59.1	60.4	73.7	84.1	89.5	90.9
China	20.7	20.9	21.9	22.3	25.6	27.6	30.1	31.8	35.1	39.1
South Korea	11.2	12.2	14.8	12.4	13.4	14.5	15.2	15.5	16.2	16.7
Taiwan	6.2	6.3	8.8	8.0	8.7	9.9	10.9	11.3	12.3	12.7
Hong Kong	3.0	3.3	3.9	2.7	3.0	2.9	3.1	3.2	3.4	3.6
Indonesia	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6
Total East Asia	**94.5**	**103.9**	**122.0**	**101.4**	**110.2**	**115.9**	**133.5**	**146.4**	**157.1**	**163.6**

Table 5 - Silver Fabrication: Industrial Applications (including the use of scrap - million ounces)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Africa										
Morocco	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.3
South Africa	0.2	0.2	0.2	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**	**0.6**	**0.6**	**0.5**	**0.5**	**0.5**	**0.6**	**0.6**	**0.6**	**0.6**
Oceania										
Australia	2.3	2.4	2.5	2.1	2.1	2.2	2.2	2.0	2.1	2.1
Total Oceania	**2.3**	**2.4**	**2.5**	**2.1**	**2.1**	**2.2**	**2.2**	**2.0**	**2.1**	**2.1**
CIS										
CIS	19.6	18.8	19.6	20.1	19.3	20.3	20.9	21.6	22.9	23.9
Total CIS	**19.6**	**18.8**	**19.6**	**20.1**	**19.3**	**20.3**	**20.9**	**21.6**	**22.9**	**23.9**
World Total	**316.3**	**339.0**	**374.3**	**335.2**	**339.2**	**349.8**	**367.3**	**405.3**	**424.8**	**455.3**

Another key area of growth in US silver industrial fabrication in 2007 was in the ethylene oxide (EO) industry. According to industry estimates, global EO production rose by 6% in 2007, compared with an average of 4% over the previous ten years. While it is difficult to extrapolate the precise silver content of each plant, what is clear is that the use of silver per installation has risen materially over the past decade, with some newly installed capacity consuming as much as 2.2 Moz (68 t), compared with a prior usage of 150,000 ounces (five tons) per plant.

Looking ahead to this year, the slowdown discussed in the context of 2007 suggests that many existing uses of silver may well experience a decline in 2008. In contrast, as touched on above, photo voltaic cell demand is not only expected to continue to expand but the rate of growth may also now accelerate, given the capacity constraints of polysilicon production that appear to have been overcome, with some industry estimates pointing to a 30% increase in 2008. In this regard, not only are environmental concerns and legislation encouraging a greater take-up of photo voltaic cells, but record oil prices are strengthening the price competitiveness of the technology. Part of the growth this will create in electrical demand may, however, be offset by the impact of a faltering US economy, which, for example, will have an adverse impact on construction and building renovation.

Elsewhere, an opportunity may emerge in the plating industry, where substitution away from gold may benefit silver. In this area, palladium is likely to derive the greatest benefit, but this metal may on occasion be combined with silver, for example in the form of a palladium-plated silver product. Finally, it is worth noting that this forward looking discussion excludes other emerging uses, such as radio frequency identification (RFID) tags, largely because these products have been discussed in the *New Developments in Silver* focus box, but we would expect silver fabrication in the United States to benefit from growth in these applications.

India

GFMS estimate that industrial offtake rose by nearly 19% to 64.5 Moz (2,005 t) in 2007, a reflection of the fact that much of the demand in this category is relatively price insensitive (there was a 7% rise in the average rupee silver price in 2007, this on the back of a 58% rise in 2006). Notably, this was the third year in succession in which industrial demand outstripped the combined use of silver in jewelry, silverware and bars & coins. This category's market share now stands at over 64% of total fabrication, up from just 35% at the start of this decade. The primary driver of higher demand was healthy growth in the industrial sector combined with rising value added within the country itself (in the past semi-fabricated silver containing products were imported for assembly in India, but now an increasing volume is serviced from domestic manufacturing).

During 2007, jari, pharmaceutical & chemicals and foils registered modest declines (of around 5% in each category), continuing the trend of the past few years. Jari, which is gold and silver thread woven into saris, dropped by 5% to around 6.0 Moz (185 t), mainly due to very high prices which prompted fabricators to substitute

Indian Vehicle Production

(000s)

2003	2004	2005	2006	2007
1,022	1,309	1,421	1,693	1,953

Source: Global Insight

other materials, including silver plated base metals and even plastic. As GFMS have noted before, gutka (a preparation of crushed betel nut, tobacco, and sweet or savory flavorings) has registered modest growth in recent years despite there being restrictions placed on its production and sale (for health reasons). Silver foils are used extensively in the packaging of gutka which is why it is of relevance to our data series. GFMS estimate that there was somewhere in the region of a 6% decline in the use of silver foil last year, to 3.2 Moz (100 t), as restrictions on the sale of gutka in public places really started to impact consumption. Elsewhere, the use of silver (and gold) in ayurvedic medicine fell, due in the main to higher prices.

Turning to the "authentic" industrial categories, silver use in electrical and electronics and brazing alloys and solders recorded healthy rises of 25% and 20% respectively. Underpinning this very strong outturn was robust growth in industrial production, with manufacturing alone registering a 9.2% rise in 2007. One standout area in 2007 was the automobile sector, where output rose by over 15% according to Global Insight data. It is important to bear in mind that some of this production is from the assembly of imported kits, and so the actual demand for silver containing parts like contacts is recorded elsewhere (for example, in Korea). However, the level of indigenous manufacturing is increasing over time and this could rapidly ramp up domestic demand for products like contacts and plating salts.

With regards to other areas of silver demand, India is a global hub for the manufacturing of optical storage media (CDs, DVDs, and so on) which utilize silver. A key statistical problem here, similar to that in the automobile sector, is the extent to which the silver used is actually fabricated from raw metal in India itself. For example, our information is that substantial quantities of silver nitrate are still imported into India for use in applications like this. Looking to the future, India is fast becoming a global center for the manufacture of a range of products such as cell phones, and will, in our view, continue to experience strong growth.

Global Billings

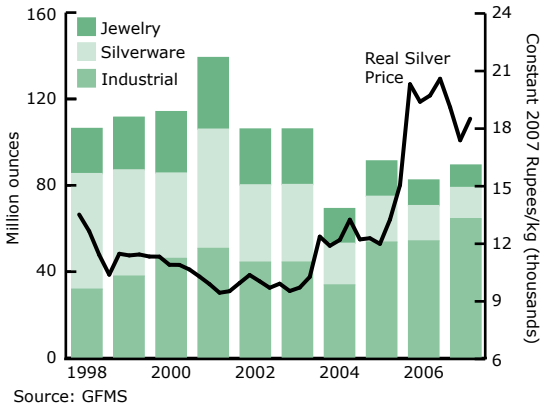
(semi-conductor shipments per year, millions)

	World	Americas	Europe	Japan	Asia
2006	247.7	44.9	39.9	46.4	116.5
2007	255.5	42.6	41.0	48.3	123.6
Change	7.8	-2.3	1.1	1.9	7.1
Change %	3%	-5%	3%	4%	6%

Source: SIA

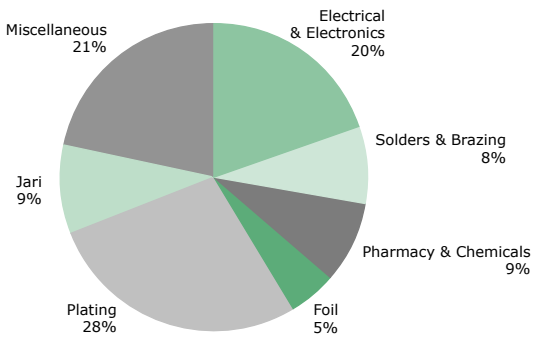
GFMS estimates indicate that the use of silver in plating grew by around 32% to 17.7 Moz (550 t). After a modest 4% rise in 2006 (related to the 61% rise in the average silver price), this segment's robust growth last year was

Indian Fabrication



Source: GFMS

Indian Industrial Fabrication, 2007



Source: GFMS

Japanese Industrial Production

(Index, 2000=100)

2003	2004	2005	2006	2007
95.4	100.5	101.7	106.3	109.1

Source: OECD

Japanese Non-Photographic Nitrate & Contact Production

Million ounces

	2004	2005	2006	2007
non-photo nitrates	20.0	21.9	23.9	24.5
contacts	10.5	10.9	11.3	11.4

Source: GFMS

a reflection of the stupendous growth in the fashion/ costume jewelry segment. Finally, the use of silver in miscellaneous industrial and decorative applications recorded a healthy rise of 24% last year, driven in the main by a booming housing sector (boosting the production of mirrors in particular, which are very popular in modern apartments) that has shown double-digit growth rates in the last few years.

East Asia

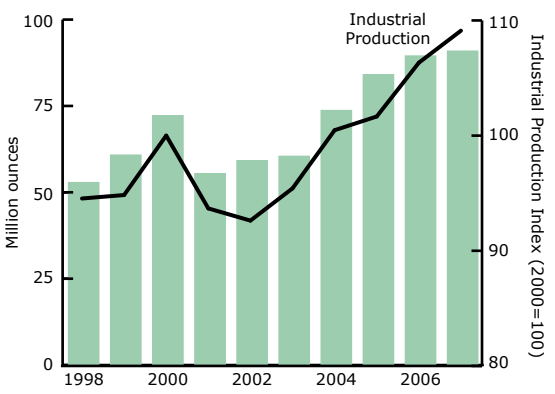
GFMS estimate that the growth in **Japanese** industrial uses of silver slowed in 2007. Industrial offtake is thought to have risen by around only 1.6% to 90.9 Moz (2,827 t), leaving this category of demand around 26% higher than the level seen during the peak of the technology bubble in 2000.

It is worth starting this section by noting that the statistical picture in Japan was not as clear cut as in previous years, almost certainly due to the fact growth slowed. By contrast, in previous years when growth was very strong, the picture which emerged from speaking to the major players in the market was one of an unambiguous increase in offtake. Nowhere was this clearer than in the non-photographic silver nitrate market, where a number of fabricators reported lower silver use year-on-year, while others noted a rise. One large fabricator was particularly frank about their position in 2007 and noted that they had lost share to the competition, suggesting that their loss had been compensated for elsewhere in the market. Interestingly, it appears as if those close to the recycling chain have become more competitive in recent years, be this from old or process scrap, the volume of the latter having risen sharply in the past few years on the back of growth in plasma display panels (PDPs). Yet another manufacturer reported sharply lower silver use last year, but this was most likely related to problems faced by one of their main customers, again leaving the overall statistical picture a little unclear. Others, by contrast, reported modest rises in offtake.

A similarly ambiguous picture emerges from an examination of another large market, that for silver plating salts. Not surprisingly, the competitive pressures at the more "commoditized" end of the spectrum, from countries like Korea and China, have seen many fabricators of salts in Japan report lower production volumes. However, this has not been uniform across Japan, with some reporting higher production, presumably driven by the fact that overall use of silver containing products in the global economy has continued to rise sharply. Interestingly, one of the larger producers of silver potassium cyanide saw their offtake rise by all of 10% last year, they claim on the back of substitution away from gold plating to silver because of the former's high price.

Yet a further complication in 2007 was the apparent depletion in stocks through the year. As would be expected with prices pushing ever higher, fabricators have once again had to revisit their stock positions. Considering that we run our final numbers off a detailed supply/demand balance, the extent of these rundowns can have a material impact on the analysis of trends within any one year. Many fabricators reported to us that they had run down stocks last year, and this has boosted fabrication totals; a corollary of this is that final offtake

Japanese Industrial Fabrication



Source: GFMS, IMF

would have been lower than indicated in the data tables contained within this *World Silver Survey* if our estimates of the stock depletion are too high.

If one moves further back along the supply chain to the bullion suppliers, the picture is a little clearer, although even here there are differences of opinion. In the main, most reported higher demand year-on-year for bullion, although the increases reported tended to be modest – all well below 10% and most 5% or significantly lower. Basis this information, we have opted to place our final growth estimates at the lower end of the spectrum.

Notwithstanding all of these caveats, we believe that offtake probably did rise modestly last year, driven primarily by higher demand for the digital products that permeate virtually every aspect of our modern lives. As was the case in 2006, production of PDPs and photo voltaic cells grew robustly (although it should be noted that the net volumes of silver used in both of these areas are relatively small). Similarly, the demand for silver containing products for use in mobile devices grew strongly in 2007, offsetting weaknesses in other areas of demand such as computers. Automobile production was only up marginally last year and this certainly constrained the growth in overall offtake too.

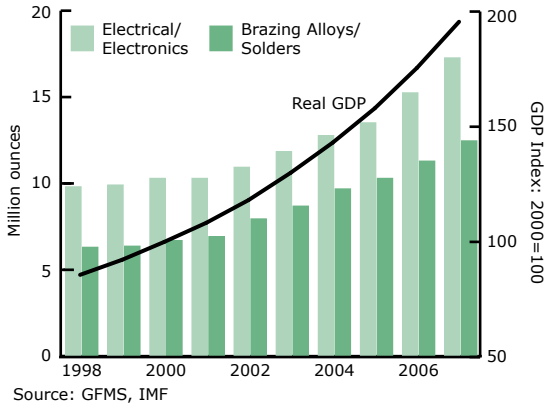
GFMS estimate that **Chinese** industrial uses of silver rose sharply in 2007, up by 11% to 39.1 Moz (1,217 t). The incredible rates of economic advancement, coupled with China's lower labor cost structure, are two prime reasons why China has rapidly become a dominant industrial power. Firstly, lower production costs have allowed the East Asian giant to compete aggressively with Japan and the United States for export trade and secondly, the increase in wages growth (a beneficiary of the double-digit GDP growth recorded again last year) has led to an explosion in demand for electronic personal and household products within the domestic market.

Turning to actual uses of silver, 2007 growth was dominated primarily by the electronics segment which again reaped the rewards of continued global growth in demand for low-end household and personal appliances. Domestic cell phones sales in China reached 150 million units in 2007, up 23%, while output of integrated circuits (ICs) used across a myriad of electronics applications, increased by over a tenth in 2007. Computers, network communications and consumer goods accounted for almost 90% of China's IC market last year, with growth in those sectors ranging from 15% to 20%. Fabrication volumes this year are likely to benefit from the Olympic Games being held in Beijing with sales of flat screen televisions (using PDPs), wide-format LCD monitors, and the adoption of third–generation cell phone technology all expected to benefit.

While demand for electronics may be a driving force behind the rapid industrial expansion (increasing by 13% last year and a staggering 68% since the beginning of the decade), growth in industrial silver demand is not limited to this segment. The construction boom witnessed over the last decade, in no small measure a result of the investment in infrastructure by the Chinese government, has provided growth across an array of applications. For instance, brazing alloys and solders, used widely across the construction and maintenance fields, has seen rapid expansion, with GFMS estimating that offtake of fine silver used in these applications rose by more than 10% last year to 12.5 Moz (388 t). While the lead up to this year's Olympic Games has provided a focus for construction schedules, the increase in infrastructure investment is unlikely to slow significantly in the coming years with vast amounts of projects in the pipeline, notably high-speed trains, airports and urban transit systems, which should underpin growth in this area.

Elsewhere, despite higher oil prices and stricter emission standards, China's automobile industry continued on its rapid march to becoming one of the foremost vehicle manufacturers in the world, with production last year increasing by 22% to 7.2 million vehicles, according to the China Association of Automobile Manufacturers. Also

Chinese Industrial Uses of Silver



Source: GFMS, IMF

The Main Uses of Silver

Silver's unique properties include its strength, malleability and ductility, its electrical and thermal conductivity, its sensitivity to and high reflectance of light and, despite 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 substitute metals in most applications, particularly in high-tech uses in which reliability, precision and safety are paramount.

Industrial

Silver is the best electrical and thermal conductor of all metals and so is used in many electrical applications, particularly in conductors, switches, contacts and fuses. Contacts provide junctions between two conductors that can be separated and through which a current can flow, and account for the largest proportion of electrical demand. The most significant uses of silver in electronics are in the preparation of thick-film pastes, typically silver-palladium for use as silk-screened circuit paths, in MLCCs, in the manufacture of membrane switches, silvered film in electrically heated automobile windshields and in conductive adhesives. Silver used in the fabrication of photo voltaic cells is seen as an area of explosive growth in the short to medium term while lower retail prices have led to a surge in televisions using Plasma Display Panels (PDPs), which has boosted silver demand for these electronic products. Silver inks are also now used in smart cards and RFID tags and this is regarded as an area of rapid expansion. 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 solutions are made up of a cyanide, a carbonate, silver and a brightener. The silver is usually added as the single salt, silver cyanide, or the double salt, potassium silver cyanide.

Various forms of silver are used as anodes and may be in the form of plates, bars, rods, grain or in custom-designed shapes. Silver is also used as a coating material for compact disks and digital video disks.

The unique optical reflectivity of silver, and its property of being virtually 100% reflective after polishing, allows it to be used in mirrors, glass coatings and cellophane. Many batteries, both rechargeable and non-rechargeable, are manufactured with silver alloys as the cathode. 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 similar electrical products. 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 EO 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 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.

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. Photographic film manufacturers demand very high purity silver.

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 quantities 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".

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 the United States, Australian, Canadian and Mexican bullion coins for investors.

away from the consumer market, silver fabrication in the photo voltaic industry has enjoyed a rapid acceleration in recent years with China, already among the top four global producers, set to benefit considerably with the investment of Suntech Power Holdings Co. Ltd (one of the world's largest manufacturers of photo voltaic cells and modules), the company recently announcing that it has begun construction of a new plant close to Shanghai.

Industrial demand for silver in **Hong Kong** rose by 6% to reach 3.6 Moz (113 t) with the rapid economic expansion of mainland China and global demand for electronics continuing to provide the impetus for growth. Finished goods only constitute about 25% of Hong Kong's electronic exports with the majority of exports dominated by parts and components, particularly semi-conductors, switches and contacts going to the mainland. While a significant majority of industrial fabrication has been relocated to lower production cost centers in China, Hong Kong still relies heavily on the electronics industry, with this sector accounting for 50% of Hong Kong's total exports in 2007.

Industrial offtake in **South Korea** rose by 3% in 2007, driven in the main by robust demand in the electrical and electronics segment, which accounted for almost 59% of total South Korean offtake. This boosted industrial demand by 0.5 Moz (16 t) to 16.7 Moz (518 t) last year. In addition, strong gains in the construction industry, both domestically and offshore, helped lift industrial offtake with robust demand for brazing and solder alloys.

The country's electronics industry, which has shown remarkable growth since the mid-1990s, is now propelling the expansion of the entire manufacturing industry and exports. Since the middle of this decade, however, the rate of increase has slowed as domestic and foreign markets became saturated and competition among global fabricators intensified. Particularly in the case of memory chips, displays and cell phones, in which Korea recently dominated, competition from lower labor cost producers in China threaten to erode South Korea's market share, with imports of less expensive components on the rise from these sources. That said, South Korea still dominates several segments of the industry and, with the advancement of developing countries, demand growth is likely to continue, albeit at a more modest pace, for the short to medium term.

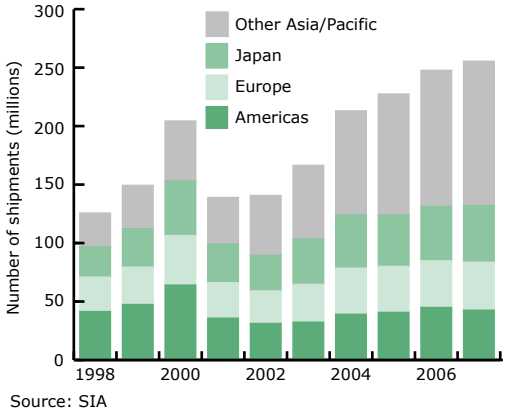
Korean Industrial Production

(Index, 2000=100)

2003	2004	2005	2006	2007
114.6	126.3	134.6	145.9	155.8

Source: OECD

Global Semi-conductor Billings



Source: SIA

Looking ahead, we estimate that industrial demand for silver, while not falling, may slow in 2008, as offtake in the key market of the United States softens in the wake of the current credit crisis. Demand for applications in communication (cell phones), flat panel displays, PMP and MP3 players, along with electronics associated with the automobile industry (for example, GPS navigation systems, touchscreen screens and digital TV tuners) is likely to dominate segment growth.

Industrial demand for silver in **Taiwan** rose by 3% to reach 12.7 Moz (394 t) in 2007. Last year was the second year in succession of rising industrial demand for silver, led higher by continued growth in the electronics sector. Demand for silver using products such as switches, contacts, and plating solutions, which constitute the bulk of silver used in electronics, was boosted by the strength of global demand for household consumer items. Moreover, over 70% of Taiwan's export revenue is based on the electronics sector, with the island dominating production of notebook computers, motherboards and PDPs used in the fabrication of flat-screen televisions. In 2007, Taiwanese shipments of LCD televisions rose to 15.4 million units, representing an annual growth rate of 71% compared to 2006. In addition, industrial offtake has also benefited from the rapid expansion of photo voltaic technology in Taiwan, with several foreign and local companies investing heavily in this sector, lifting Taiwan to the fourth largest global photo voltaic producer.

Table 5a - Silver Fabrication: Electrical and Electronics (including the use of scrap - million ounces)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
United States	44.1	47.1	51.5	34.1	37.6	39.5	47.4	52.1	55.0	57.7
Japan	23.7	30.0	36.7	26.6	29.4	30.2	38.0	43.7	46.0	46.8
Germany	12.2	12.2	14.3	15.7	15.6	16.2	17.7	18.3	19.7	21.4
China	9.8	9.9	10.3	10.3	10.9	11.8	12.8	13.5	15.2	17.3
India	4.2	4.5	4.8	4.7	4.9	5.1	5.4	9.6	10.0	12.5
Taiwan	4.8	4.8	7.0	6.5	7.2	8.4	9.2	9.6	10.4	10.8
South Korea	6.0	6.6	8.2	7.2	7.6	8.4	8.8	9.0	9.5	9.8
France	6.7	6.8	7.3	11.0	9.9	9.5	8.1	8.0	8.2	8.5
UK & Ireland	6.4	6.0	6.6	5.6	5.5	5.9	6.1	4.5	4.4	4.5
Italy	2.9	3.0	3.1	2.8	2.8	2.9	3.8	3.5	3.6	3.8
Hong Kong	2.5	2.9	3.5	2.5	2.8	2.7	3.0	3.0	3.3	3.5
Mexico	1.3	1.9	2.1	1.8	1.8	1.9	1.8	2.1	2.0	2.1
Brazil	1.4	1.3	1.3	1.3	1.3	1.2	1.7	2.1	0.9	1.5
Turkey	0.9	0.8	0.9	0.7	0.8	1.0	1.1	1.1	1.2	1.2
Australia	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7
Netherlands	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Switzerland	7.3	7.5	5.3	0.4	0.4	0.5	0.5	0.4	0.4	0.4
Spain	1.0	1.0	0.3	0.0	0.0	0.0	0.3	0.3	0.3	0.4
Austria	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Other Countries	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
World Total	**136.8**	**147.7**	**164.8**	**132.7**	**140.0**	**146.7**	**167.2**	**182.6**	**191.8**	**203.9**

Table 5b - Silver Fabrication: Brazing Alloys and Solders (including the use of scrap - million ounces)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
China	6.3	6.4	6.7	6.9	7.9	8.7	9.7	10.3	11.3	12.5
United States	8.6	9.0	8.7	8.3	8.4	7.9	7.3	7.7	7.2	9.0
India	1.5	1.6	1.8	1.8	1.9	2.1	2.2	4.2	4.3	5.2
Japan	4.2	4.2	4.4	3.5	3.3	3.3	3.7	3.8	3.9	4.0
Germany	3.1	3.0	3.2	2.8	3.0	3.1	3.2	3.2	3.4	3.6
Italy	1.7	2.0	2.1	2.0	2.1	2.0	2.0	2.1	2.3	2.4
UK & Ireland	3.0	2.8	2.8	2.7	2.5	2.8	3.0	2.9	3.1	2.4
Canada	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.8	1.5	2.2
South Korea	0.8	0.8	1.0	1.2	1.4	1.4	1.4	1.5	1.5	1.6
Switzerland	1.6	1.5	1.6	1.3	1.3	1.4	1.4	1.5	1.4	1.4
Taiwan	1.0	1.0	1.2	0.9	1.0	1.1	1.1	1.1	1.2	1.3
France	1.0	0.9	1.1	1.0	1.0	0.8	0.7	0.8	0.8	0.9
Brazil	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8
Spain	1.0	1.1	1.1	1.0	1.0	0.9	0.8	0.6	0.6	0.6
Australia	0.7	0.7	0.8	0.6	0.6	0.6	0.6	0.5	0.5	0.5
Mexico	1.0	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Netherlands	0.3	0.3	0.3	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	0.1
Other Countries	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
World Total	**37.1**	**37.3**	**38.6**	**36.1**	**37.4**	**38.0**	**39.3**	**42.8**	**44.9**	**49.3**

New Developments in Silver

While silver has enjoyed a resurgence in investor interest in recent years, it will be the industrial applications of the metal that will ensure physical demand for silver will continue, with the white metal expected to play a vital role in future economic growth. The main growth area in industrial silver in recent years has been in the health, electronics and renewable energy fields, which rely on the properties of the metal as a catalyst, biocide and for conducting and storing electricity.

The expansion of silver used in the manufacturing process of photo voltaic cells has been explosive over the last decade, with industry continuing to strive to find methods of reducing our demand for non-renewable energy sources. This technology has been employed globally and is now considered almost mainstream. While we have now included photo voltaic cell production in our "Main Uses" focus box, the growth potential in this sector is still significant and remains a key element for potential "new" industrial developments. In addition, consumer demand for televisions using flat screens has seen a surge in demand for plasma display panels (PDPs) in recent years and it is anticipated that silver used in this electronics application will double over the next five years.

Silver conductive ink technology, currently represented in the main by traditional "thick-film" applications in which screen printing is used in the creation of PCBs, automobile heaters, electromagnetic interference (EMI) shielding and membrane switches, is rapidly giving way to the advancement of RFID tags, which are quickly being taken up across an array of industries as a means of tracking stock. Each RFID application consists of tags, readers and a computer system. Tags are made up of a microchip and an antenna with the silver conductive ink used predominately on the tag antenna but also as a bond between the chip and the circuit board substrate, with the use of silver per tag currently ranging from 6-10 milligrams. The use of RFID tags, expected to ultimately be offered as an alternative to bar codes, has recorded exponential growth in the past few years and, with the price per tag cost reduced through the economies of scale, the global uptake of this technology offers enormous scope for growth.

The antibacterial properties of silver have been well publicized over many years but the recent advancement of biocide technology is now beginning to gain momentum and appear in mainstream society. Applications in the medical field, such as silver sulfadiazine cream used in the treatment of burns, or bandages that release silver ions on application, have been introduced to supermarkets and pharmacies globally after initially being developed for the military. Another medical use that originated in the military, and is expected to gain mainstream exposure, is a powder containing silver that clots blood flow on contact and prevents the growth of bacteria and fungi. In the home, a soap which employs silver ions to kill virulent bacteria is now available. In addition, a silver-based product dubbed 'Anti-bacterial Glass', which is reported to kill 99.9% of bacteria and stops the spread of fungi, which has been developed and trialed and is set to be commercially distributed. In the office environment, paper containing silver compounds to protect against fungus, mold and mildew is now available. For household consumers, technology is utilizing silver across an array of applications from silver impregnated clothing ranges (to protect against odors), to detergent free washing machines, air conditioners and tooth brushes that all use silver ions to kill bacteria.

Progress also continues to be made in seeing silver developed as a biocide. One area that has the greatest potential is in the building and marine industries, where silver can be used in preventing mildew and bacterial damage. Legislative changes introduced in recent years have instigated a shift away from environmentally damaging solvents (often containing chromated copper arsenate) to water based applications. However, the modest cost increase of the new technology and a delay in issuing licenses is currently slowing the take up from industry. In addition, growth in the use of inorganic silver as an anti-bacterial agent in the plastics market is also an area of potential expansion. Silver ions are supported in an inorganic matrix or alumina-silica-based biocides that are often used not so much to protect the integrity of the material, but more to protect consumers, particularly in a medical environment where containing disease transmission is a critical concern.

Finally, silver may be about to find a role in the autocatalyst emission control sector, the fabrication of which has been the preserve of the platinum group metals (PGMs) since their introduction in 1970s. However, current information suggests that the use of silver may be restricted to the diesel particulate filter (the bulk of the PGMs are used in the adjacent oxidation catalyst). Furthermore, the new technology appears to be limited to off-road heavy duty diesel vehicles (such as tractors), which represent only a small share of the global autocatalyst market.

Table 6 - Silver Fabrication: Photographic Use (including the use of scrap - million ounces)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Europe										
EU-25	77.2	77.0	72.5	71.6	66.9	65.0	61.6	54.7	48.7	42.6
Other	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1
Total Europe	**77.4**	**77.2**	**72.6**	**71.7**	**67.1**	**65.2**	**61.8**	**54.8**	**48.8**	**42.7**
North America										
United States	69.0	73.5	70.2	65.5	64.8	58.9	55.2	56.4	46.4	35.9
Mexico	3.4	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total North America	**72.5**	**76.4**	**70.2**	**65.5**	**64.8**	**58.9**	**55.2**	**56.4**	**46.4**	**35.9**
Latin America										
Brazil	3.2	3.2	2.4	2.3	2.1	2.2	2.2	1.4	0.0	1.4
Argentina	1.8	1.6	1.3	1.0	1.1	1.5	1.5	1.3	0.5	0.5
Total Latin America	**5.0**	**4.8**	**3.7**	**3.3**	**3.2**	**3.7**	**3.7**	**2.7**	**0.5**	**2.0**
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	0.4	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Indian Sub-Cont.	**0.7**	**0.7**	**0.7**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.4**
East Asia										
Japan	58.2	59.9	61.2	62.2	57.8	53.9	47.4	38.0	40.2	40.5
China	6.1	3.7	3.9	4.5	5.7	5.8	6.1	5.4	5.0	4.6
Total East Asia	**64.3**	**63.6**	**65.0**	**66.7**	**63.5**	**59.7**	**53.6**	**43.3**	**45.3**	**45.1**
Oceania										
Australia	1.6	1.7	2.7	2.4	2.3	2.1	1.5	0.1	0.1	0.1
Total Oceania	**1.6**	**1.7**	**2.7**	**2.4**	**2.3**	**2.1**	**1.5**	**0.1**	**0.1**	**0.1**
CIS										
CIS	3.8	3.4	3.2	3.1	3.0	2.8	2.7	2.6	2.4	2.1
Total CIS	**3.8**	**3.4**	**3.2**	**3.1**	**3.0**	**2.8**	**2.7**	**2.6**	**2.4**	**2.1**
World Total	**225.4**	**227.9**	**218.3**	**213.1**	**204.3**	**192.9**	**178.8**	**160.3**	**144.0**	**128.3**

Photography

• ***A further double-digit percentage decline in photography last year, meant that over 50 Moz (1,500 t) has been lost in just three years.***

Global photographic use of silver fell last year by nearly 11% to 128.3 Moz (3,991 t). Demand was lower in all regions, although the corporate strategy of the large manufacturers, namely Kodak, Fuji, Agfa and Konica once again had an important role to play in where silver nitrate - the basic intermediate form of silver used in photographic products - was fabricated.

Photography's contribution to demand has now fallen by 99.6 Moz (3,097 t) from the peak recorded in 1999. The reason for this abrupt decline is digital technology substituting for traditional silver halide-based analog systems. This process has been most rapid and extensive in the consumer film segment, where sales of color film have collapsed. Data on color film sales (kindly provided by Photofinishing News) illustrate the point: since peaking in 2001, the volume of film sales has dropped by no less than 64%. Meanwhile color negative paper sales have fallen by 36% over the same period, the rate of decline here somewhat attenuated by the printing of digitally captured images on photographic paper.

Although not yet as dramatic, the impact of digital technology has also been seen on other non-consumer segments of the photographic market. The consumption of radiographic film, for instance, has dropped by over 10% since the early part of this decade. While on the face of it, this may appear a 'reasonable' result, that is actually far from being the case if one takes into account the strong increase in demand for diagnostic imaging that has resulted from an aging population in the developed world and the spread of better healthcare to developing

countries. The explanation is that in many instances hospitals have migrated to digital systems. Likewise, the drop of 'only' around one-third in the graphic arts segment needs to be seen in the context of considerable growth in printed media output in recent years. Indeed, the only segment of the photographic market that has until recently remained largely immune from digital inroads is motion picture film, mainly due to copyright issues and the considerable investment in new theaters in the 1990s prior to digital technology being commonplace.

Fabrication demand in the **United States** fell last year by over 20% to 35.9 Moz (1,117 t). Since peaking in 1999, output has more than halved. This compares to a global drop of 44%. The reason for the heavier decline noted in the United States owes a great deal to corporate decisions regarding the location of photographic products fabrication and the related demand for silver nitrate. These tended to provide an additional boost to output levels in the late-1990s, whereas more recently they have tended to accelerate the decline in US photographic silver demand.

Photographic demand in **Europe** experienced a 12% decline last year, to 42.7 Moz (1,329 t). In addition to the secular trend related to digital technology, offtake in the region was affected by corporate developments, related to production being repatriated. Finally, analysis of trade data suggests that, at the margin, the decline in exports from the region reflected lost market share.

GFMS estimate that **Japanese** silver offtake in photographic applications was marginally higher last year, rising by around 1% to 40.5 Moz (1,260 t) from a revised 2006 figure of 40.2 Moz (1,251 t) (GFMS' data for the past few years has also been slightly amended). First time readers of these *World Silver Surveys* will, not surprisingly, find this outturn somewhat counter intuitive considering the well publicized penetration of digital technologies in the photographic space. The increase recorded last year, as in 2006, was of course not a reflection of a rising market per se, but simply a result of production shifts globally.

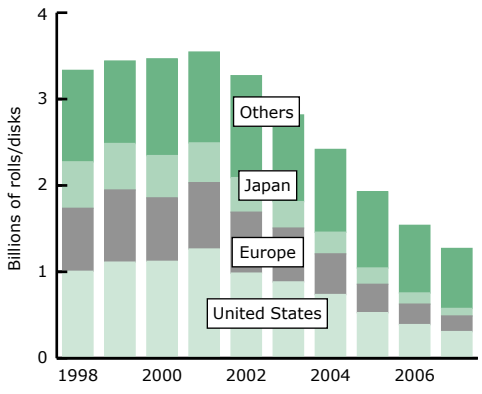
As GFMS noted last year, Japanese companies have consolidated their domestic production on the back of two trends. Firstly, due to the decline in global demand for traditional photographic products, Japanese fabricators have made the strategic decision to consolidate production in their homeland (reversing the trend of the 1990s when off-shoring of production from Japan to the United States and Europe was integral to their strategy). Consequently, they have shut facilities outside of Japan and moved their (declining) production from these back to domestic plants. Secondly, competition in the market has declined and the Japanese have been able to take increasing market share, which has further boosted domestic fabrication of photographic products.

Film & Paper Consumption & Photographic Fabrication

	2003	2004	2005	2006	2007
Film**	2,816	2,417	1,926	1,538	1,270
Paper^	1,750	1,663	1,448	1,290	1,235
Fabrication*	193	179	160	144	128

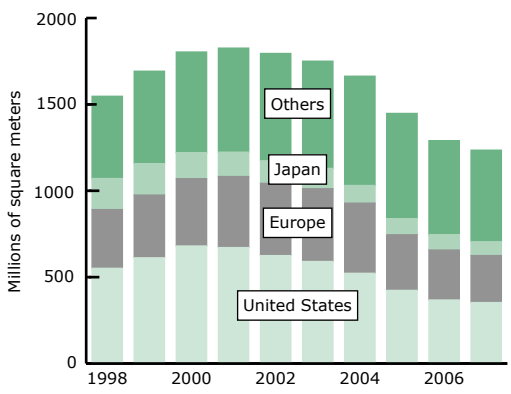
**Million of rolls, ^millions square meters, *Moz
Source: Photofinishing News Inc., GFMS

World Consumer Film Sales



Source: Photofinishing News Inc.

World Color Photographic Paper Consumption



Source: Photofinishing News Inc.

Digital Technology and the Photographic Market

Silver offtake from photographic applications fell for the eighth year in a row in 2007, with the decline reaching double-digits for the second year in succession. Since its peak, in 1999, demand has faltered by a cumulative 99.6 Moz (3,097 t) to the 128.3 Moz (3,991 t) recorded last year. The driver of the ongoing retracement has almost exclusively been the penetration of digital technology across an array of industries, and importantly the rapid rate at which these advancements have been taken up by consumers. In line with the falls recorded across the decade so far, last year's 11% fall in demand was largely the result of dwindling consumer film sales. In 2007, according to Photofinishing News Inc., film sales slumped a further 17%. In contrast, sales of digital cameras, according to Lyra Research Inc. estimates, increased by almost 20%.

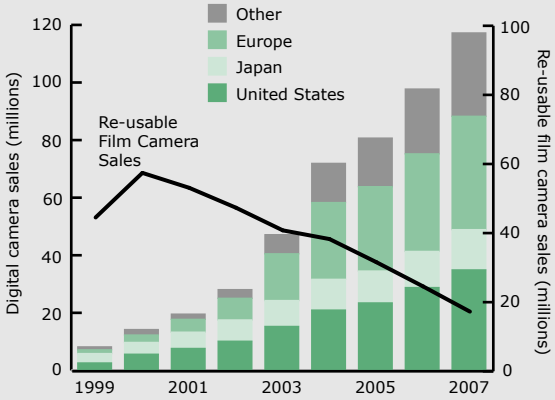
However, while the shift to digital photography has had a significant and almost immediate effect on film sales, the impact of digital photography on the consumption of photographic paper, which also contains silver, is less pronounced. Digital technology which essentially eliminated the cost of taking more pictures, due to the almost zero marginal cost, had many industry participants hoping this might translate to higher demand for images printed. Although these dynamics have indeed provided some support to the market, the ability to view and share images without printing tends to encourage consumers to store a large portion of their images in an electronic form. Furthermore, the ability of users to print their own images, after the introduction of low cost inkjet printers for the home market, has further adversely affected photographic paper consumption.

Importantly, one trend that may further moderate the rate of decline for photographic paper has been the evolution of a new range of electronic products that are not sold as being dedicated to photographic use, but, often offer the integrated function as a built in "extra". For example, camera phones, PDAs, camcorders are all now regularly sold with built-in cameras as standard and, with the quality of the cameras rapidly increasing, the transfer from these devices to prints, while being modest, is likely to increase.

Silver use in graphic arts has also come under significant pressure with the shift to digital applications. For example, within the printing industry, the migration to computer-to-plate (CTP) printing presses, which bypasses the need to transfer to film prior to producing printing plates, has been one of the most important trends in reducing the use of silver, with this technology now widely integrated across the global media industry.

One area where silver photographic film has not declined radically as a result of digital penetration is radiographic film, where the growth of conventional technology in the developing world, coupled with the high cost of substitution, has offset the decline across the developed world. In addition, the use of silver halide film by the motion picture industry has also benefitted from the developing world's rapid take up of analog technology, with India and China now regarded as the second and third largest producers of motion film globally. Elsewhere though, the conversion to digital cinemas gained momentum in 2007, with close to 5,000 screens now converted, mostly in the United States and the United Kingdom, where the changeover has been facilitated by the emergence of third parties willing to finance the substantial conversion costs.

Digital and Film Camera Sales



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

As far as offtake in individual categories is concerned, amateur film and to a lesser extent paper have continued to struggle, although the attrition in the former has been far more severe than in the latter. However, as noted above, the absolute use of silver in these applications in Japan did not fall by anywhere nearly as much as the global total declined last year due to the repatriation of manufacturing (according to Photofinishing News, global film consumption is around 65% below its peak level). Furthermore, while film production has fallen sharply over the past few years, paper sales have been relatively robust. Indeed, some fabricators increased color paper sales last year, reflecting not only the repatriation of fabrication and market share growth but the continued expansion of the digital camera print business. (Many companies in Japan have invested heavily in recent years to expand sales of in-store print facilities and, arguably this could become a growth market in the future.) Lithographic applications continue to struggle, but remain surprisingly strong considering the competitive threat from digital. The reason for this is that the Japanese market still has a considerable legacy effect in the graphic arts area, with many of the "mom and pop" operations still persevering with silver halide technologies because of

the high costs of switching. It is certainly the case that most of the larger, more sophisticated, companies have already made the transition. For example, CTP continues to make gains at the expense of traditional technologies. Looking to the future, the somewhat surprising view from Japan is that these traditional technologies will probably persist for at least the next 10 years. Indeed, some estimate that digital penetration in this segment will peak in the next three to four years at between 60-70%.

As far as X-rays are concerned, GFMS estimate that this was flat year-on-year, reflecting strong demand from developing countries where digital medical technologies have yet to make significant inroads, as well as consolidation in the domestic market. The market is now primarily for "dry" X-rays domestically, although exports are mainly of the "wet" system. Dental X-rays by contrast remain a strictly analog market in Japan.

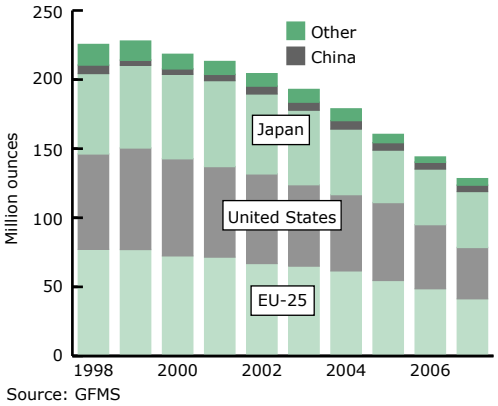
After a peak of 6.1 Moz (190 t) in 2004, **Chinese** photographic fabrication has subsequently recorded successive year-on-year declines. In 2007, China's silver offtake in photographic applications slipped a further 9% to 4.6 Moz (143 t). Not surprisingly, the key driver of the decline has been the ongoing shift to digital technology, which has led to an acute decline in demand for traditional analog products. Reflecting global demand trends, Kodak closed its film, paper, and single use camera facility in Xiamen last year, as a result of the decline in demand for these traditional film-based products, replacing the operation with a new digital CTP plant to meet the growing market in China and the Asia-Pacific region.

Interestingly, while consumption of traditional analog products was weaker last year, the decline was partially offset by the rapid expansion of the motion picture industry in China. The liberalization of government policy and an increase in the number of cinemas, have provided the catalyst for the growth in this sector, with China now considered the third largest film maker behind the United States and India. Moreover, production of motion picture films increased by over 20% in 2007 and box office revenue surpassed 3 billion yuan, up by 30% year-on-year.

Lastly, the production of X-ray film remains an important component of photographic demand in China and one that is set to support offtake in future years. China's rapid economic advancement witnessed this decade has provided access to modern health care facilities to millions of its citizens. Initially, the benefits of the stronger economy and rapid infrastructure growth were felt in the larger cities, with the construction of new hospitals and health clinics. However, modernization and improved health facilities are now penetrating into rural areas and satellite cities (where health care was at best rudimentary) providing X-ray and other medical services.

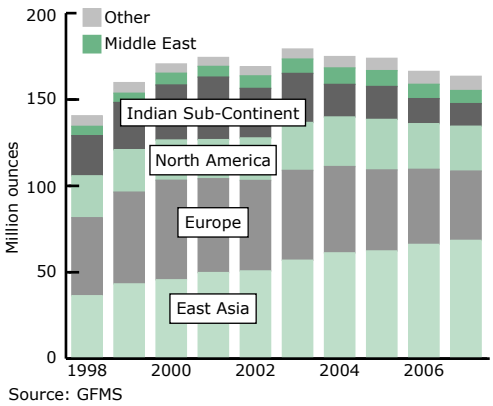
Meanwhile, the introduction of digitally based systems, now widely used in western countries, is expected to eventually lead to the phasing of out silver halide film use across the country. However, the established nature of the older technology will ensure the decline in demand will be a gradual affair.

World Photographic Fabrication



Source: GFMS

World Jewelry Fabrication



Source: GFMS

Jewelry

- ***Jewelry demand in 2007 stood at 163.4 Moz (5,083 t), down only 2% but to an eight-year low, chiefly as a result of higher and volatile prices.***

- ***Tonnage losses were greatest for Italy and India while notable gains were recorded in China.***

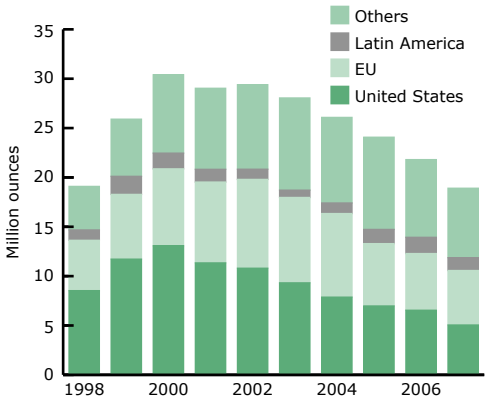
Europe

Jewelry fabrication in 2007 fell for the seventh year in a row, slipping 8% to 40.1 Moz (1,248 t). Most countries saw noticeable losses despite consumption typically being stable as exports were weak and imports healthier.

Silver jewelry fabrication in **Italy** fell by just over 8% last year to 25.8 Moz (802 t). Much was driven by domestic sales, which, in contrast to the stability seen for most of the EU-15, fell heavily. The sluggishness of consumer spending and rivalry from outside of jewelry have not helped but perhaps the main driver was competition within jewelry. This was not from gold as any trading down from that due to price looks to have benefited steel, newcomer brass and other non-precious metals, although gold-plated silver appears to have become more common. Within the non-precious arena, we could also include stones, in particular cubic zirconia, as the drift to stone-set continues to 'dilute' metal's share.

Another of the main causes of falling consumption is the swing to branded items. In Italy, branded silver only accounts for a small slice of the total but rivals, such as steel, are almost always branded and consumers have responded strongly to their heavy promotion (the top three jewelry advertisers in Italy were all predominantly steel brands). It is hard to argue that silver's price has been the main factor in jewelry brands' limited interest as this has been evident for many years but there are clear advantages to remaining with non-precious materials to generate or safeguard margins. Some interest has been shown in silver by clothing and accessory brands. While good for silver's image, their contribution to fine weight sales is slight as the bulk of expenditure is on brand value and the pieces tend to be light.

Official Italian Jewelry Exports*



Source: GFMS;* finished pieces only

Exports of finished pieces last year also appear to have suffered heavily, perhaps falling by a double-digit amount on a fine weight basis, with the silver price and its volatility frequently cited as a key driver. By some margin the chief area of loss was the United States, due additionally to that country's drop in consumption, Italy losing market share to rival exporters and a strong euro. Such factors also featured in the drop in exports to elsewhere in the Americas, East Asia and the United Kingdom. Shipments to other EU-15 countries, however, were broadly stable, save for growth to Spain which could reflect some 'officialization' of that market. Exports to the EU accession countries also rose but greater gains were seen in shipments, both direct and indirect, to Russia, thanks mainly to its strong consumption growth.

The fact that Italy managed to avoid a double-digit fall in its jewelry fabrication was due to a better performance for exports of semi-manufactured items. There is no separate data on jewelry semis and the quality of data on semis appears worse than on finished pieces but several producers' commentary on these flows supports the 4% rise in gross exports of all semis. The bulk of these are understood to be chain on spool, much of which would go to low labor cost countries, for the addition of a pendant or similar, and then be re-exported.

German jewelry offtake was broadly flat year-on-year in 2007 at 3.9 Moz (120 t). Exports of finished items fell (chiefly due to losses to East Asia and the United States) while shipments of jewelry semis were stable to possibly up a fraction. Domestic sales similarly were stable to slightly higher, with some evidence of price-led substitution from gold to silver but also some market share loss to steel and other non-precious areas. Sales by value and by piece certainly look to have continued rising, with light weight, stone-set and branded items selling well. In contrast, heavy chains saw further losses.

Table 7 - Silver Fabrication: Jewelry and Silverware (including the use of scrap - million ounces)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Europe										
Italy	45.3	51.4	55.5	49.4	46.9	45.3	43.4	39.5	35.2	32.2
Germany	9.6	9.8	9.1	8.7	7.9	7.7	7.3	6.8	6.8	6.5
Poland	2.7	2.9	3.0	2.5	2.3	2.9	3.1	3.4	3.6	3.2
Other Countries	21.6	21.2	20.1	17.8	16.3	15.9	14.7	13.6	13.1	11.8
Total Europe	**79.2**	**85.2**	**87.7**	**78.4**	**73.3**	**71.8**	**68.4**	**63.4**	**58.7**	**53.8**
North America										
United States	12.6	13.1	13.4	13.0	13.7	15.1	15.4	15.7	15.0	14.2
Mexico	15.3	15.1	13.2	12.9	14.0	15.6	16.2	16.4	14.0	13.6
Canada	2.2	1.9	1.8	1.5	1.5	1.7	1.6	1.4	1.2	1.1
Total North America	**30.1**	**30.1**	**28.4**	**27.4**	**29.3**	**32.4**	**33.2**	**33.5**	**30.1**	**28.9**
Latin America										
Total Latin America	**6.1**	**5.7**	**4.5**	**4.1**	**3.9**	**4.0**	**4.3**	**4.6**	**5.0**	**5.0**
Middle East										
Turkey	5.2	4.7	6.0	5.3	6.8	7.9	8.7	8.3	7.2	6.2
Other Countries	6.8	7.0	7.1	6.7	6.4	6.6	7.0	7.0	6.9	6.8
Total Middle East	**12.0**	**11.8**	**13.0**	**11.9**	**13.2**	**14.5**	**15.7**	**15.3**	**14.0**	**13.0**
Indian Sub-Continent										
India	74.4	73.6	68.0	88.4	61.7	61.7	35.4	37.6	28.2	24.9
Bangladesh & Nepal	5.1	5.7	6.0	5.9	4.8	4.5	4.2	3.7	3.6	3.6
Other Countries	1.9	2.4	2.3	1.7	1.7	1.7	1.9	1.9	1.9	1.9
Total Indian Sub-Cont.	**81.5**	**81.7**	**76.3**	**96.1**	**68.2**	**67.9**	**41.5**	**43.3**	**33.8**	**30.5**
East Asia										
Thailand	27.9	30.8	30.8	32.7	32.3	36.2	36.9	36.8	36.8	36.5
China	4.8	6.9	9.1	11.5	14.3	17.1	20.5	22.6	26.2	29.5
South Korea	2.6	4.5	4.9	4.6	4.5	4.6	4.7	4.7	4.8	4.9
Indonesia	2.6	3.1	3.7	4.7	4.0	4.1	5.2	4.5	5.1	4.8
Other Countries	5.0	5.2	5.1	5.1	5.1	5.1	5.4	5.8	5.7	5.9
Total East Asia	**42.9**	**50.5**	**53.6**	**58.6**	**60.1**	**67.2**	**72.7**	**74.4**	**78.6**	**81.6**
Africa										
Total Africa	**1.2**	**1.1**	**1.2**	**1.1**	**1.1**	**1.2**	**1.2**	**1.2**	**1.2**	**1.3**
Oceania										
Total Oceania	**0.7**	**0.8**	**0.8**	**0.7**	**0.8**	**0.7**	**0.8**	**0.7**	**0.7**	**0.7**
CIS										
Russia	0.7	0.8	0.9	1.4	1.8	2.6	3.6	4.5	4.6	6.6
Other Countries	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.8
Total CIS	**1.1**	**1.3**	**1.5**	**2.0**	**2.4**	**3.3**	**4.3**	**5.2**	**5.4**	**7.4**
World Total	**254.8**	**268.3**	**267.0**	**280.4**	**252.4**	**263.1**	**242.1**	**241.6**	**227.5**	**222.2**

Jewelry & Silverware

In *World Silver Survey 2007*, GFMS produced, for the first time, individual data series for jewelry and silverware. Although GFMS will continue to publish a combined series, it is clear that each category has performed very differently over the past ten years. Perhaps not surprisingly, silverware has seen a sharp fall in demand, due mainly to its loss of appeal in "western" markets and the fall in investment and gifting driven demand in India.

By contrast, jewelry demand has performed moderately well, rising in absolute terms by around 16%, although its share of total fabrication is still below 20%. There is one main reason for this rather modest growth in overall demand, namely the fact that Indian jewelry offtake has performed very poorly, more than halving in the past decade. Jewelry's share of total offtake has fallen because industrial demand has risen so strongly (and this in spite of the dramatic decline in photography).

Jewelry offtake in **France** for a second year bucked the global and regional trend, registering growth (a modest 4%). Basis Ecostat figures, domestic sales by piece rose by 3% but that all came from stone-set items and, with some drift to lower average weights, it is doubtful if the fine weight of metal consumed would have risen. Furthermore, exports of finished pieces look to have fallen and imports to have taken market share. That fabrication managed growth is thought due therefore to a favorable shift in the trade balance on jewelry semis.

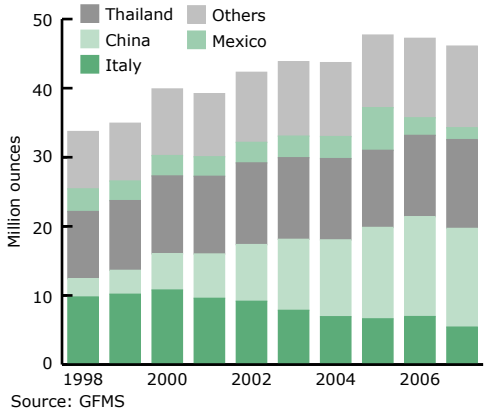
Although jewelry manufacturing in the **United Kingdom**, continued to weaken last year, this was not reflective of domestic jewelry consumption, which is estimated to have grown last year. Part of the rise in retail demand was due to market share gains at the expense of white gold, particularly 9-karat, which saw a deterioration in sales against a backdrop of rising retail prices.

North America

Last year in the **United States**, both silver jewelry fabrication and imports fell, albeit modestly, although the decline in manufacturing was the greater of the two. The fact that the import sector gained further market share, at the expense of domestic fabricators, was entirely expected but what was surprising was the fall in US silver jewelry consumption last year, albeit by only a slim margin.

During the past year, GFMS have made several research trips to the United States, meeting companies involved in much of the supply chain and a common theme that emerged was the substitution in favor of silver jewelry at the expense of gold, because of rising price point pressures associated with the yellow metal. There is little doubt that several major retailers employed this strategy, albeit to varying degrees. However, in most cases the redistribution of showcase space in favor of silver remained modest. While major retailers may have embraced the white metal ahead of the independent sector, there were signs, as the year progressed, that the high-end independent guild stores in particular had re-appraised silver. Their initial reticence was based around a misplaced view of being seen to downgrade an existing product assortment, an opinion stemming from the different price points of gold and silver. However, this assessment failed to take account of the growing availability of branded silver, a segment which found popularity among the high-end independents. In fact,

US Silver Jewelry Imports



Source: GFMS

branded silver, either through long-established or new lines, achieved success across a variety of retail outlets, encompassing both store-based and other mediums. However, by its very nature, a greater share of the retail value of a branded product is accounted for by design and the intrinsic value of the brand, than will be the case for generic products. As a result, it is therefore consistent to talk about rising brand success in 2007, along with a fall in the volume of total silver consumption.

Silver jewelry fabrication in **Mexico** increased by just over 2% last year. This was due to higher local consumption more than compensating for lower exports. Jewelry sales in the domestic market have benefited from some degree of substitution to silver from high-priced gold. Sales to tourists are also reported to have grown. On the export front by contrast, shipments declined last year. Official trade data, for instance, show a 5% fall in the gross volume of jewelry exported. Much of the decline stemmed from a slide in exports to the United States, comfortably still Mexico's largest market.

Middle East

Last year, Middle East jewelry fabrication fell to its lowest level since 2002. The 7% fall was almost entirely due to a 15% decline in Turkey, although Egyptian offtake also slipped back, by around 4%.

Since peaking in 2004, **Turkish** fabrication has experienced successive declines, with last year's total recorded at around two-thirds of the 2004 level. However, the decline was not reflective of the country's silver jewelry consumption, which is estimated to have

Consumer Trends & Jewelry Consumption

Silver jewelry consumption in most western countries (which comprise the bulk of the global total, particularly at an adornment level) was fairly stable last year. This stands in contrast to gold, which typically suffered marked losses. For example, US silver jewelry sales fell just a few percentage points whereas those for gold jewelry were down by 16%. It would be difficult to claim that the rally in the gold price to increasingly unaffordable levels against a deteriorating macroeconomic background had nothing to do with this divergence. However, this pattern does not always hold true; for example, Italian consumption of both metals fell by similar amounts.

The divergence could be due to gold having become less fashionable and silver more so. This, however, would be a difficult argument to advocate. Firstly, there are clear signs of gold plated silver (either fully or accented) and gold filled silver (where the gold is of sufficient substance to be 'karatable') becoming more common. Secondly, the tide is arguably still swinging in favor of the 'yellow look', even if it has yet to properly spread from top end fashion to the mass market.

The gap could also be due to 'apparent fashion', as the brands push silver as rising metal prices have forced them to focus on that metal as margin requirements mean price points for gold well above target. This is important to consider as in most markets the branded share for all jewelry is rising. Indeed, it is likely that branded silver sales in the top two adornment markets (the United States and Germany) did better than broad stability and actually registered growth. In sharp contrast, gold jewelry (certainly if plain) is less likely to be branded. Furthermore, branded silver has a low slice of total silver sales in Italy and that country was anomalous last year with its sliding silver jewelry consumption. The rise of branded is important as it tends to mean less money spent on metal and more on perceived brand value.

Part of the reason that branding of silver is rare in Italy is that brands in the low and mid-tiers focus on non-precious metals, such as steel, and it is these companies that dominate the country's jewelry advertising. This growing use of non-precious metals is quite widespread, it being cited as a key reason as to why previous years' growth in silver jewelry consumption had ground to a halt in Germany. It would be hard to claim that non-precious metals had a better image than precious, especially if white, and as such the trading down through gold and arguably silver too would seem to be more a function of the cold logic of margins and price points.

There are also signs that brands are focusing on small, light weight items, such as earrings, rather than heavier forms, such as chains, so as to generate the margins they seek. The trend to lower average weights certainly remains with us. French silver jewelry sales by piece last year, for example, rose by 3% (and within that earrings were up 8%)* yet we estimate that the fine weight remained roughly flat. This remains very much bound up with the secular drift from quasi-investment pieces to one or two season accessory items (usually self-purchased), which should favor silver over gold but does perhaps open up more opportunities for non-precious.

It would be hard to argue that metal per se has become more fashionable as the share attributable to stone-set pieces is understood to have continued rising. In France, for example, sales by piece of stone-set silver rose by 6% last year but plain silver was flat*. One reason for this shift is that the 'accessorization' of jewelry requires new styles every season and the addition of stones makes this far easier. Frequent style changes also mean more attention on design, invariably entailing higher labor charges. These two ongoing swings are the final two main changes that will therefore proportionately reduce the amount of money being spent on metal.

** figures courtesy of Ecostat*

Illustrations of Recent Trends

Left: sterling silver necklace with gold accents by Better Silver

Below: sterling silver necklace with semi-precious stones by Uno A Erre

Above: cuff, bracelet & ring in sterling silver from Tiffany's Notes Collection

Table 7a - Silver Fabrication: Jewelry (including the use of scrap - million ounces)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Europe										
Italy	26.7	34.0	38.9	37.2	36.7	35.7	34.2	31.5	28.2	25.8
Germany	3.5	4.1	3.6	3.7	3.3	3.6	3.7	3.8	3.8	3.9
Poland	2.6	2.8	2.9	2.4	2.2	2.8	3.0	3.3	3.5	3.2
France	2.4	2.5	2.6	2.5	2.4	2.4	2.0	1.5	1.6	1.7
Spain	1.7	1.4	1.4	1.4	1.5	1.7	1.4	1.4	1.3	1.1
Portugal	1.7	1.9	1.9	1.6	1.4	1.5	1.4	1.2	1.1	1.0
Greece	1.2	1.2	1.0	1.0	0.9	1.0	1.0	1.1	1.1	1.0
UK & Ireland	2.8	2.7	2.8	2.5	1.8	1.2	1.2	1.0	1.0	0.5
Sweden	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4
Denmark	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3
Switzerland	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Cyprus	0.3	0.3	0.3	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	0.2	0.2
Finland	0.2	0.2	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	0.1	0.1	0.0	0.0	0.0
Other Countries	0.7	0.7	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.7
Total Europe	**45.1**	**53.1**	**57.6**	**54.3**	**52.4**	**52.0**	**50.0**	**46.9**	**43.4**	**40.1**
North America										
United States	10.2	10.8	11.2	10.9	11.8	13.4	13.8	14.1	13.5	12.9
Mexico	12.3	12.1	10.5	10.4	11.5	13.0	13.6	14.0	12.0	12.2
Canada	1.8	1.6	1.6	1.3	1.3	1.4	1.4	1.2	1.0	0.9
Total North America	**24.3**	**24.5**	**23.3**	**22.6**	**24.6**	**27.7**	**28.7**	**29.3**	**26.4**	**26.0**
Latin America										
Brazil	1.3	1.2	1.0	1.0	1.0	1.2	1.3	1.4	1.5	1.5
Peru	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.3
Argentina	0.3	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.3	0.3
Colombia	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Ecuador	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Other Countries	1.4	1.6	0.9	0.7	0.6	0.7	0.9	1.1	1.2	1.2
Total Latin America	**4.0**	**3.9**	**3.0**	**2.7**	**2.5**	**2.8**	**3.1**	**3.4**	**3.7**	**3.7**
Middle East										
Turkey	2.1	1.9	3.2	3.0	4.1	5.0	6.0	5.7	4.8	4.1
Egypt	1.4	1.5	1.5	1.3	1.2	1.4	1.5	1.4	1.3	1.3
Saudi Arabia	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6
Israel	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5
Other Countries	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.2
Total Middle East	**5.4**	**5.4**	**6.8**	**6.2**	**7.3**	**8.3**	**9.5**	**9.2**	**8.3**	**7.6**
Indian Sub-Continent										
India	20.9	24.4	28.4	33.2	25.9	25.7	16.1	16.4	11.9	10.4
Bangladesh & Nepal	1.4	1.9	2.4	2.2	2.0	1.9	1.9	1.8	1.7	1.8
Other Countries	0.9	1.1	1.0	0.8	0.8	0.8	0.8	0.9	0.9	0.9
Total Indian Sub-Cont.	**23.2**	**27.4**	**31.8**	**36.2**	**28.7**	**28.4**	**18.8**	**19.0**	**14.5**	**13.1**
East Asia										
Thailand	24.4	27.3	27.2	28.8	28.4	32.1	32.5	32.3	32.5	32.0
China	3.7	5.3	7.0	8.8	11.0	13.1	15.6	17.4	20.2	22.9
Indonesia	2.2	2.7	3.2	4.1	3.3	3.5	4.5	3.7	4.4	4.2
South Korea	2.1	3.7	4.0	3.8	3.8	3.9	4.0	3.9	4.0	4.2

Table 7a - Silver Fabrication: Jewelry (including the use of scrap - million ounces)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Japan	1.7	1.7	1.7	1.6	1.6	1.5	1.8	2.0	1.9	2.1
Vietnam	0.5	0.6	0.6	0.7	0.8	0.8	0.9	0.9	1.0	1.1
Myanmar, Laos & Cambodia	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.6	0.6
Malaysia	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6
Taiwan	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3
Hong Kong	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.3
Other Countries	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
Total East Asia	**36.4**	**43.3**	**45.6**	**49.8**	**50.8**	**57.0**	**61.2**	**62.3**	**66.1**	**68.5**
Africa										
Morocco	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Tunisia	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
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	0.3	0.3
Total Africa	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**	**1.0**
Oceania										
Australia	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6
Other Countries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Oceania	**0.7**	**0.7**	**0.8**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
CIS										
Russia	0.2	0.3	0.3	0.5	0.6	0.9	1.3	1.6	1.6	2.3
Other Countries	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.6
Total CIS	**0.6**	**0.7**	**0.7**	**0.9**	**1.1**	**1.4**	**1.8**	**2.1**	**2.2**	**2.9**
World Total	**140.6**	**159.8**	**170.6**	**174.3**	**168.9**	**179.2**	**174.9**	**173.8**	**166.3**	**163.4**

grown last year. Instead, the drop in jewelry fabrication owed more to the continued relocation of Turkish manufacturers to lower cost countries, particularly in regards to East Asia. It was therefore of little surprise to see a jump in Turkish jewelry imports last year, with Thailand accounting for much of the growth.

The fall in **Egyptian** jewelry manufacturing in 2007 followed a small decline the year before. The 4% drop in fabrication last year was due to the continued inroads being made by low cost imported products, a great deal of which have replicated currently available gold designs. In addition, much of the product brought into Egypt is still rhodium plated but more recently gold plated silver has become available. The growing assortment on offer reflects a rise in the country's jewelry consumption, which may have grown by as much as 10% in 2007. One interesting development in the local jewelry market is white gold losing market share to yellow gold products, as retailers have tried to differentiate the two metals, a sign of the success silver has enjoyed in the Egyptian market.

Indian Sub-Continent

In 2007, silver jewelry fabrication in **India** fell by over 12% from 11.9 Moz (369 t) to 10.4 Moz (323 t). The modest 7% increase in the rupee price, coupled with the 58% rise in 2006, was certainly a negative influence on demand. In addition to the impact of elevated price levels, high volatility (with a price range of over 23%) adversely affected demand for silver jewelry. Interestingly, while there were some parallels between the dynamics of the silver and the gold jewelry markets last year, with volatility negatively affecting both markets, silver appears to have been more sensitive to the absolute price level than was gold (gold jewelry offtake actually grew in 2007; see *Gold Survey 2008* for more on this). A secondary factor which has been at work for the past few years is the change in consumption patterns in the Indian market, and consumer attitudes to silver jewelry. In effect, our information suggests that changes in Indian tastes, possibly driven by rising incomes, have negatively shifted the demand curve for silver jewelry.

As far as the dynamics of 2007 were concerned, there is little doubt that a combination of a rising absolute rupee price level (with the metal repeatedly scaling all-time highs) coupled to high levels of volatility pushed down demand. However, it would be a mistake to only focus on price drivers of demand last year because other longer terms factors have been at work too.

Firstly, the perennial issue of the very poor quality of silver that is on offer to gullible consumers continues to plague the market. As GFMS have noted before, the issue of under-karating is far more serious in silver than in gold and, with no hallmarking system in place, the quality is often abysmal. Growing awareness of this, in particular amongst rural consumers, has seen the demand for jewelry wane quite dramatically. These same consumers have instead either migrated to investing in silver bars and coins where purity and cheating are perceived to be less of a problem (it is no coincidence that demand for bar and coin rose last year) or to gold jewelry. In effect, silver jewelry has all but shed any pretensions of being an investment option (although it must be noted that very heavy silver jewelry is still an investment option for some farmers).

Secondly, the jump in incomes over the past few years on the back of rapid economic growth appears to have moved many more consumers into the more aspirational gold jewelry category. Gold is generally preferred in jewelry and, as critical income levels have been breached, consumers have moved away from silver to gold (in spite of rising gold prices). And finally, costume jewelry, which competes directly with silver jewelry on price, has continued to make inroads into the latter's market share.

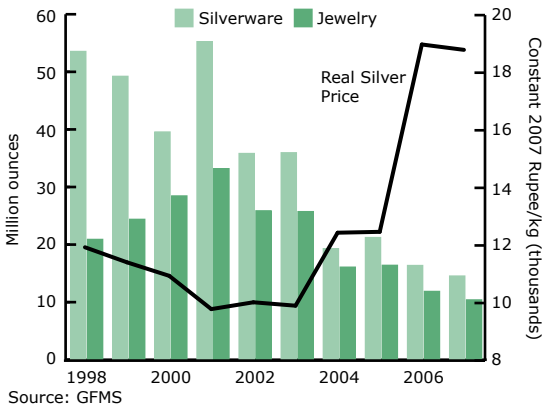
East Asia

Jewelry demand in **Thailand** was slightly weaker in 2007, slipping 2% or 0.5 Moz (17 t), to 32.0 Moz (995 t). Despite the modest fall, Thailand remains the world's largest fabricating nation. China, regarded as a potential challenger for Thailand's crown, continued to narrow the gap with fabrication there up 14% last year, led higher by a rise in local consumption. In contrast, Thailand is almost entirely reliant on exports with silver jewelry sales in the domestic market dominated by the tourist trade. The purchase of silver by locals is often regarded as a "last resort", with gold being the preferred option due to the recycling potential.

Many would argue that the sharp price rise across the precious metals complex in 2007 may have aided the migration to silver and benefited its fabrication. However, the 6% rise in the local silver price left many smaller family run operations struggling to finance the cost of replacing and carrying inventory, with credit issues across the wholesale trade often resulting in destocking to cover rising costs. Higher prices appear to have caused the closure of several small factories in Bangkok and Chiang Mai, with several looking to other alternatives, such as stainless steel or plated jewelry, where higher margins can be obtained. Moreover, with wholesalers in western markets regularly looking for price discounts, labor costs on jewelry orders were constantly under pressure, with fabricators often having to absorb the silver price increase, further eroding profitability.

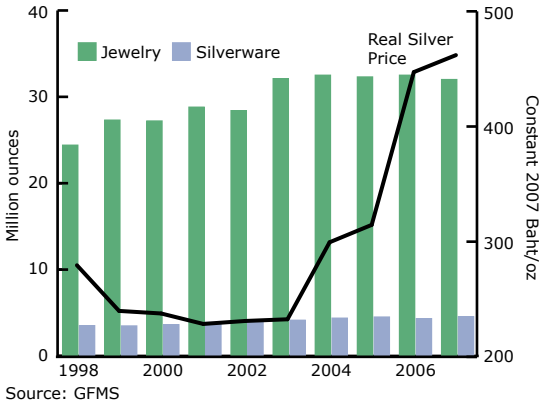
In addition to price pressure, the rising value of Thailand's currency against the US dollar, which increased slightly more than 20% against the greenback last year (to a ten-

Indian Jewelry and Silverware Fabrication



Source: GFMS

Thai Jewelry and Silverware Fabrication



Source: GFMS

year high), added further pain to fabricators in Thailand as labor charges are calculated on a US dollar basis, in essence, adding a further 20% to operating costs. However, this too was often absorbed in order to remain competitive in global export markets.

Turning to jewelry styles, there has definitely been a shift to smaller, light weight items (a further reason for the annual decline in fine silver offtake), with fabricators often replicating semi-precious and precious stone-set designs found in gold jewelry. The use of larger stones, with less precious metal, appears to be a trend that is gaining momentum, with labor intensive designs featuring amethyst, white mother of pearl, and African garnet all doing well in the United States and European markets. In addition, the introduction of low cost body jewelry such as toe rings, "belly button" rings, and other body piercing designs appear to have captured a niche market among the backpacker trade, with this minor segment growing at a rapid rate. The increased cost of gold jewelry has also instigated an increase in mixed metal designs among the top end fabricators, with jewelry that has the appearance of gold, but is predominately made from silver, selling strongly in several markets.

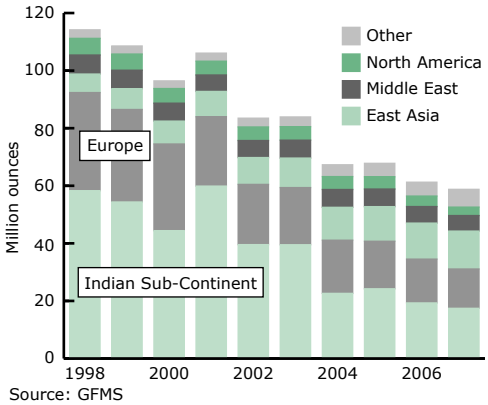
Competition from fabricating nations such as Italy, China, and Mexico to supply the all important US market remained intense, with margins and designs under constant pressure from wholesale buyers. In 2007, Thai exports to the United States (in fine volume terms) rose by over 9%, while combined China/Hong Kong increased exports by approximately 5%. In contrast, Mexican exports to the United States declined, while Italian imports were weaker by over a fifth.

In 2007, silver jewelry fabrication in **China** continued its rapid rise, increasing by almost 14% last year, from 20.2 Moz (627 t) in 2006 to 22.9 Moz (713 t). The 11% increase in the local silver price did little to dampen the growth of this burgeoning sector, which has risen strongly from an industry producing just 7.0 Moz (218 t) at the beginning of the decade to now be third behind Italy and Thailand as the world largest producer of silver jewelry. With exports (in gross weight terms) remaining relatively flat last year, increasing just 3% according to customs data, the rise in fabrication was largely as a result of stronger jewelry consumption on the domestic front. Moreover, silver jewelry has been a beneficiary of the rising prices in the other precious metal segments, with demand boosted by the success of "white" gold jewelry (and platinum and palladium) with the same "look" available in silver at a far lower price point. Chinese consumers in the larger cities have been quick to adopt western influenced designs, which are often stone-set and have a higher labor component, while in the satellite cities and rural areas, the preference there remains for more simple robust and traditional designs.

South Korean jewelry production rose by a modest 3% to 4.2 Moz (130 t) in 2007. Domestic consumption looks to have increased, with the higher price point of gold jewelry boosting sales of the more affordable white metal, which have also been helped by a rise in consumer confidence. Branded silver jewelry has continued to gain market share and several fabricators have replicated designs often found in the white gold segment, with demand among the youth demographic particularly strong.

Indonesian jewelry and silverware fabrication both declined in 2007, with the former slipping by 5% year-on-year to 4.2 Moz (131 t) and the latter by just over 7% to 0.6 Moz (20 t). Domestically, silver jewelry is not widely accepted, with the preference being firmly for gold and with only limited demand for the perceived "fashion" jewelry in the larger cities from the youth demographic. Instead, the Indonesian trade rely heavily on direct exports and sales to the backpacker tourist trade. Despite visitors to Indonesia increasing by over a tenth in 2007, sales of jewelry were reportedly weaker last year with higher prices given as the main reason for the slowdown.

World Silverware Fabrication



Source: GFMS

Table 7b - Silver Fabrication: Silverware (including the use of scrap - million ounces)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Europe										
Italy	18.6	17.4	16.6	12.2	10.1	9.6	9.1	8.0	7.1	6.4
Germany	6.2	5.7	5.5	5.0	4.5	4.1	3.5	3.0	2.9	2.7
Greece	2.9	2.9	2.3	2.1	1.9	1.9	1.9	1.8	1.7	1.6
Norway	1.0	1.3	1.4	1.3	1.1	1.1	1.0	0.9	0.9	0.6
Sweden	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.4	0.4
Spain	2.3	1.9	1.5	1.1	0.9	0.8	0.7	0.5	0.4	0.3
Other Countries	2.7	2.5	2.3	2.2	2.0	2.0	1.9	1.8	1.8	1.7
Total Europe	**34.1**	**32.1**	**30.1**	**24.1**	**20.9**	**19.8**	**18.5**	**16.5**	**15.2**	**13.7**
North America										
Mexico	3.1	3.0	2.6	2.4	2.5	2.7	2.6	2.5	2.0	1.4
United States	2.4	2.3	2.2	2.1	1.9	1.8	1.6	1.5	1.4	1.4
Canada	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2
Total North America	**5.8**	**5.6**	**5.1**	**4.8**	**4.7**	**4.7**	**4.5**	**4.3**	**3.6**	**2.9**
Latin America										
Colombia	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Peru	0.6	0.6	0.5	0.5	0.5	0.3	0.3	0.3	0.3	0.3
Other Countries	0.9	0.8	0.7	0.6	0.6	0.5	0.6	0.7	0.7	0.7
Total Latin America	**2.1**	**1.8**	**1.6**	**1.4**	**1.4**	**1.2**	**1.2**	**1.2**	**1.3**	**1.3**
Middle East										
Turkey	3.1	2.8	2.7	2.3	2.7	2.9	2.8	2.6	2.4	2.1
Israel	1.6	1.6	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Egypt	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2
Other Countries	1.5	1.6	1.6	1.7	1.5	1.6	1.7	1.7	1.7	1.7
Total Middle East	**6.6**	**6.4**	**6.2**	**5.7**	**5.9**	**6.2**	**6.2**	**6.1**	**5.8**	**5.4**
Indian Sub-Continent										
India	53.5	49.2	39.5	55.2	35.8	35.9	19.3	21.2	16.4	14.5
Bangladesh & Nepal	3.7	3.8	3.6	3.7	2.8	2.6	2.3	1.9	1.9	1.9
Other Countries	1.1	1.3	1.2	0.9	1.0	1.0	1.0	1.1	1.1	1.0
Total Indian Sub-Cont.	**58.3**	**54.4**	**44.4**	**59.9**	**39.6**	**39.5**	**22.6**	**24.2**	**19.3**	**17.4**
East Asia										
China	1.1	1.6	2.1	2.7	3.3	3.9	4.8	5.2	6.1	6.5
Thailand	3.5	3.5	3.6	3.9	3.9	4.1	4.4	4.5	4.3	4.5
South Korea	0.5	0.8	0.8	0.8	0.7	0.7	0.7	0.8	0.7	0.7
Indonesia	0.4	0.4	0.5	0.6	0.7	0.7	0.8	0.8	0.7	0.6
Other Countries	1.0	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.7	0.7
Total East Asia	**6.4**	**7.2**	**8.0**	**8.8**	**9.3**	**10.2**	**11.4**	**12.0**	**12.5**	**13.2**
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	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Oceania	**0.0**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
CIS										
Russia	0.4	0.5	0.6	0.9	1.2	1.7	2.4	2.9	3.0	4.3
Other Countries	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total CIS	**0.5**	**0.7**	**0.8**	**1.1**	**1.3**	**1.9**	**2.5**	**3.1**	**3.2**	**4.5**
World Total	**114.2**	**108.6**	**96.4**	**106.1**	**83.5**	**83.9**	**67.3**	**67.8**	**61.2**	**58.8**

Silverware

• ***Silverware demand fell by a modest 4% in 2007 to 58.8 Moz (1,828 t) as heavy losses in India, Europe and Mexico were partially countered by gains for Russia and China.***

European silverware fabrication fell by 10% last year to 13.7 Moz (425 t), a level only around 40% of that seen a decade earlier. Almost all countries saw losses, though the decline was dominated by Italy's 0.7 Moz (21 t) drop.

The 9% fall in **Italian** demand to 6.4 Moz (199 t) in 2007 was dominated by the double-digit fall in domestic sales of traditional heavy pieces, due mainly to ongoing cultural changes, such as silverware appearing less frequently on wedding lists. In contrast, sales of photo frames were fairly stable while those of giftware, especially if light or of a nominal utility, could even have risen. The top end also continued to perform notably better than the mass market. Exports of finished pieces fell once more, with losses greatest for the US market due to such factors as euro strength and poor local consumption. In contrast, shipments to other EU countries are thought only slightly lower while exports to Russia and elsewhere in the CIS were said to have been strong. This latter performance is not reflected in the trade data and that is one reason why we believe the reported 15% drop in silverware exports is overstated. Exports of semi-manufactured items are thought to have fared yet better, with some contacts even enjoying growth last year. **German** silverware saw a similar year to Italy in that its offtake also fell by 9% (to 2.7 Moz or 83 t), with losses greatest for traditional heavy pieces and in the second half of the year.

Russian silverware fabrication is estimated to have grown by an impressive 44% in 2007 (similar to the smaller jewelry segment). That, at least, is the conclusion basis hallmarking data. The local market is undoubtedly experiencing extraordinary growth in demand for 'luxury goods' and, given Russians' historical liking for fine silverware, a major rise in consumption is understandable basis recent years' new wealth. However, we are a little skeptical that true growth has been quite as strong as the data suggests. Our experience in assessing Russian gold jewelry demand shows that official figures have pointed to similar spectacular gains in local fabrication but, for gold, part of the growth can actually be explained by imported goods being hallmarked as locally made. The same explanation may apply to silver but as yet we do not have sufficient evidence to revise our Russian silverware and jewelry numbers.

Silverware offtake in the **United States** edged lower last year, falling by 6% to just 1.4 Moz (42 t). Little has changed since *World Silver Survey 2007*, with similar conditions still driving demand lower. One point raised last year was the impact that the economic climate had on silverware consumption. In other words, a robust economy has tended to encourage those consumers who may have considered plated or solid silver to opt for the latter. In contrast, periods of economic uncertainty have not only favored plated products but also stainless steel items. As a result, it was of little surprise to see, against a backdrop of a deteriorating economy and the consumer uncertainty this created, a further shift away from solid silverware. Following on from 2006's double-digit drop, **Mexican** silverware demand slumped by 31% last year as most of the impact of yet higher metal prices was passed on to consumers and their purchases fell sharply. High prices and sluggish sales also forced the trade to reduce inventories, with manufacturers, for example, unable to fund anything like the same volume of work-in-progress.

In **Turkey**, silverware fabrication continued to decline, with the 10% drop resulting in lower production for the fourth year in succession. In the time since its peak in 2003, silverware offtake has fallen by 0.8 Moz (25 t) or 27%. The explanation for this trend showed little sign of abating, namely a fall in the consumers' appetite for silverware as well as continued price point pressure, in the light of a further rise in silver prices. The only modest drop in **Israeli** silverware fabrication was in part the result of the country gaining market share as a result of cost advantages as well as the lower price elasticity of demand for Judaica items (which continue to account for a large portion of the country's production).

Indian silverware fabrication fell by 11.2% to 14.5 Moz (452 t) in 2007, continuing the secular downward trend seen over the past few years. Notwithstanding the change in tastes that has driven silverware offtake lower than otherwise would have been expected, there is no doubt that the 7% rise in the local silver price on the back of a 58% rise in the previous year gave very little scope for a rise in demand for silverware. Furthermore, our research meetings with retailers, traders and

manufacturers in 2007 suggest that consumption at the retail level actually fell more sharply than the fabrication number above would suggest and this was reflected in a substantial build up in unsold stocks. As we have written about at length in more recent *World Silver Surveys*, demand for silverware (as well as jewelry) has appeared to be in decline in recent times mainly due to non-price factors (although price has clearly played a role in choking off demand in the past two years). Our view is that one of the main drivers of this phenomenon has been growing consumer awareness of the very poor quality of much silverware. This is particularly true of the rural areas where demand is typically quite strong. Matters have not been helped in recent years by the release of low quality government silver which has been recycled directly into silverware without being refined to a higher purity. A corollary of this is that silverware is no longer seen as an investment vehicle either, with demand shifting to either bars or coins.

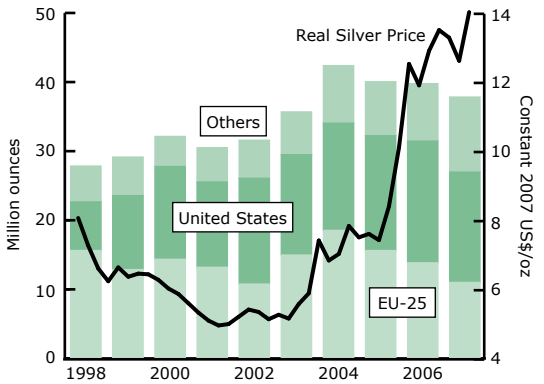
While quality issues have undoubtedly played a role in trimming offtake in this category, arguably the biggest threat to silverware consumption has been competition from other gifts. It is worth bearing in mind that most silverware is purchased throughout the year mainly as a gift (typically given on occasions of births, marriages, anniversaries and even deaths). Many in the trade lament that consumer choice has moved firmly away from traditional gifts like silverware to items like bone china crockery, as well as other more modern presents like consumer electronics or travel vouchers. In addition, corporate gifting of silverware has fallen sharply in recent years, substituted by a shift to items such as consumer durables, electronics or shopping vouchers. Moreover, the breakdown of the so-called joint family system in urban India has meant that most nuclear families no longer purchase silver dinner or tea sets as in the past.

Thailand's silverware fabrication recovered from a poor 2006, with offtake rising almost 5% last year to 4.5 Moz (141 t). While largely reliant on exports, Thailand has managed to protect its global market share from competitors (mainly China) through high quality workmanship for traditional products. Official trade data indicates that silverware exports increased markedly last year, with the strongest gains recorded for European destinations (particularly Denmark and the United Kingdom) while exports to the United States slipped by almost a third. Although demand for products at the bottom end of the market (such as photo frames and other giftware) was stable, demand for some heavier items (such as ceremonial bowls or silver boxes) at the upper end was reported to have recorded a stronger year. However, higher silver prices reduced fabricator margins and placed additional pressure on the industry to finance the cost of inventory carry and stock replenishment.

China moved into the silver medal position in 2007, overtaking Italy as the world's second largest producer of silverware, when only at the beginning of the decade it was just a small player. GFMS estimate that, despite higher silver prices, its silverware fabrication increased again last year, rising almost 8% to 6.5 Moz (204 t). China's lower labor costs have provided fabricators with a commercial advantage over competitors and this is the primary reason for the rapid expansion of the industry in recent years, with exports via the entrepôt of Hong Kong to western markets providing much of the growth. According to official customs data, gross exports of silverware from China increased by over a third in 2007, with the vast majority sent to Hong Kong before being re-directed to various global markets.

Domestically, demand for silverware, while starting from a very low base, has also grown at a rapid rate over recent years, with items becoming more affordable due to economic expansion and wage growth. A range of smaller products, such as photo-frames, tableware and figurines, remain a popular gift giving option for weddings and seasonal celebrations and are often regarded as a status symbol among rural citizens. Demand for heavier trays and bowls has weakened in recent years, while practical applications such as chop sticks, water jugs and tableware (serviette rings and bowls) have been gaining momentum among the growing wealthy classes.

World Coin Fabrication



Source: GFMS

Table 8 - Silver Fabrication: Coins and Medals (including the use of scrap - million ounces)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
United States	7.0	10.7	13.4	12.3	15.3	14.5	15.5	16.6	17.6	16.0
Germany	10.0	7.0	8.8	8.1	6.0	9.7	9.7	9.7	8.7	6.3
Canada	1.1	1.4	1.0	0.9	1.0	0.3	1.3	1.6	2.9	4.3
China	2.4	2.3	1.2	1.5	2.1	2.3	2.3	1.8	1.6	2.6
Australia	1.0	0.9	1.0	0.8	0.6	1.3	1.3	1.0	1.4	1.7
Mexico	0.2	0.4	0.7	1.1	1.1	1.5	2.7	2.6	1.9	1.6
Spain	1.7	1.5	1.8	1.8	1.5	1.1	2.2	1.7	1.5	1.2
France	0.3	0.3	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.5
Austria	0.3	0.3	0.2	0.3	0.4	0.4	0.5	0.6	0.5	0.5
UK & Ireland	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.5
Poland	0.1	0.1	0.2	0.2	0.3	0.3	0.6	0.6	0.5	0.3
Switzerland	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3
Russia	0.2	0.2	0.1	0.2	0.3	0.4	0.4	0.4	0.3	0.3
Portugal	1.0	0.9	1.2	0.7	0.0	0.8	2.4	0.3	0.2	0.1
Other Countries	1.5	2.0	1.4	1.3	1.5	1.6	2.2	1.7	1.5	1.5
World Total	**27.8**	**29.1**	**32.1**	**30.5**	**31.6**	**35.7**	**42.4**	**40.0**	**39.8**	**37.8**

Coins and Medals

• ***Global coin fabrication fell by around 2.0 Moz (60 t) last year, largely due to lower minting in Germany and the United States.***

The close to 5% fall in global coin minting in 2007 was the third successive year in which coin offtake has declined. As a result, in the three years since peaking in 2004, the manufacture of coins and medals has fallen by a cumulative 4.5 Moz (141 t). During this time, weaker European minting (principally in Germany, Portugal and Spain) has comfortably offset growth in North America (driven by Canada).

Coin minting in the **United States** fell to a three-year low in 2007 of 16.0 Moz (497 t). The decline occurred in spite of there being little change in the country's minting of the Eagle bullion coin, which fell less than 1% to 9.9 Moz (308 t). This in itself was an impressive outcome given that year-to-date sales over the first ten months were over 20% lower year-on-year. However, combined sales of 3.5 Moz (110 t) in the last two months offset much of the earlier shortfall.

The fall in **Germany's** coin outturn left the total at its lowest level since 2002. Last year, five commemorative issues were minted, as was the case in 2006 (but one fewer than in 2005), but the number of coins per issue was scaled back. Whereas in 2006 each issue featured 1.8 million "standard" coins and 300,000 proof pieces, last year the number of standard coins was reduced by 200,000 pieces, while the number of proof coins remained unchanged. In addition, one of the 2006 issues, concerning Germany's Football World Cup, had included four million standard pieces of which there was no repeat in 2007.

Looking ahead briefly to this year, February 2008 marked the launch of a 1-ounce bullion coin in **Austria**. As with other bullion coins available in the country and the important neighboring market of Germany, this new Philharmoniker attracts a VAT rate of 7%, compared with the 20% levied on bars. The VAT disparity, as discussed in Chapter 3 in more detail, has, already in 2007, led to a rise in coin demand at the expense of bars, although the fall in the bar market comfortably exceeded the growth in coin purchases. Even so, several countries did enjoy higher sales of their bullion coins in a number of European countries. Coin offtake in **Spain** fell by 18%, primarily because of lower minting of the €12 commemorative coin, which amounted to one million pieces in 2007, compared with 1.4 million the year before.

Elsewhere, **Chinese** minting rose by 1.0 Moz (31 t), partly it seems because of a new strategy introduced recently, which has seen gold and silver coins launched at the same time. Finally, **Mexican** coin fabrication fell to a four-year low, although there is evidence to suggest that local consumption exceeded minting last year.

8. Appendices

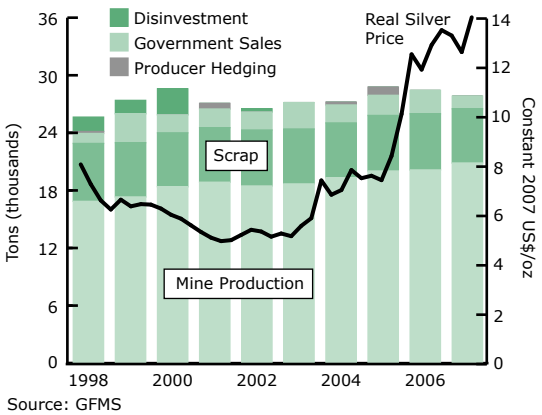
Contents

Appendix 1

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

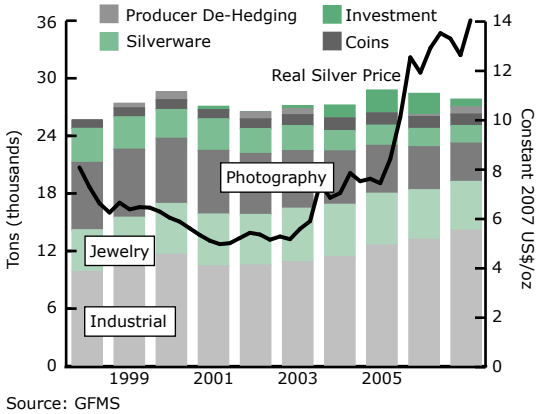
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Supply										
Mine Production	16,863	17,321	18,381	18,855	18,464	18,679	19,319	20,026	20,136	20,858
Net Government Sales	1,041	3,022	1,874	1,946	1,876	2,748	1,873	2,100	2,433	1,314
Old Silver Scrap	6,032	5,647	5,621	5,684	5,830	5,721	5,713	5,786	5,849	5,649
Producer Hedging	203	-	-	587	-	-	299	859	-	-
Implied Net Disinvestment	1,499	1,393	2,711	-	336	-	-	-	-	-
Total Supply	**25,638**	**27,384**	**28,587**	**27,072**	**26,506**	**27,149**	**27,203**	**28,770**	**28,418**	**27,821**
Demand										
Fabrication										
Industrial Applications	9,837	10,545	11,641	10,426	10,549	10,879	11,425	12,607	13,212	14,162
Photography	7,011	7,087	6,790	6,628	6,353	5,999	5,562	4,987	4,478	3,991
Jewelry	4,373	4,970	5,306	5,422	5,253	5,574	5,438	5,407	5,171	5,083
Silverware	3,551	3,376	2,999	3,299	2,596	2,610	2,093	2,109	1,905	1,828
Coins & Medals	866	907	999	948	983	1,110	1,318	1,246	1,237	1,177
Total Fabrication	25,638	26,885	27,735	26,723	25,734	26,172	25,836	26,355	26,003	26,241
Producer De-Hedging	-	499	852	-	772	651	-	-	211	779
Implied Net Investment	-	-	- -	349	-	326	1,367	2,415	2,203	801
Total Demand	**25,638**	**27,384**	**28,587**	**27,072**	**26,506**	**27,149**	**27,203**	**28,770**	**28,418**	**27,821**
Silver Price (London US$/oz)	5.544	5.220	4.951	4.370	4.599	4.879	6.658	7.312	11.549	13.384

World Silver Supply



Source: GFMS

World Silver Demand



Source: GFMS

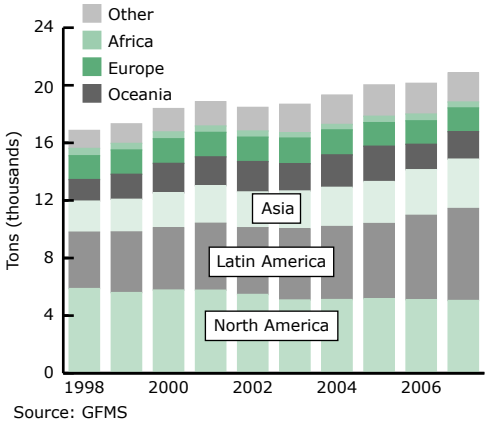
Table 2 - World Silver Mine Production (tons)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Europe										
Poland	1,119	1,115	1,140	1,183	1,211	1,376	1,362	1,261	1,257	1,229
Sweden	268	275	294	275	293	307	291	284	266	294
Greece	45	40	31	62	75	4	0	0	25	36
Portugal	31	27	21	23	19	22	25	24	20	28
Romania	39	39	34	38	32	29	28	27	23	23
Bulgaria	25	21	18	24	25	22	19	20	16	14
Macedonia	44	24	24	17	14	5	3	7	11	11
Spain	47	118	115	55	13	2	0	5	5	5
Ireland	11	10	17	9	8	9	7	6	4	4
Italy	4	4	2	2	2	2	0	3	3	3
Serbia & Montenegro	12	6	6	4	4	1	1	1	2	2
Czech Republic	8	8	7	8	0	0	0	0	0	0
Other Countries	4	0	0	0	0	0	0	0	0	0
Total Europe	**1,657**	**1,687**	**1,711**	**1,700**	**1,695**	**1,779**	**1,736**	**1,638**	**1,632**	**1,648**
North America										
Mexico	2,687	2,483	2,621	2,760	2,747	2,569	2,569	2,894	2,999	3,086
United States	2,060	1,950	1,980	1,740	1,350	1,240	1,250	1,220	1,140	1,160
Canada	1,131	1,166	1,174	1,265	1,373	1,276	1,295	1,063	969	804
Total North America	**5,879**	**5,600**	**5,775**	**5,765**	**5,470**	**5,085**	**5,114**	**5,177**	**5,108**	**5,050**
Latin America										
Peru	2,025	2,231	2,438	2,674	2,761	2,921	3,060	3,191	3,456	3,494
Chile	1,341	1,381	1,242	1,349	1,210	1,312	1,360	1,379	1,602	1,929
Bolivia	407	424	462	381	462	491	434	399	472	525
Argentina	69	102	102	176	126	138	145	156	192	265
Guatemala	0	0	0	0	0	0	0	10	50	88
Honduras	46	49	53	50	56	54	50	56	58	56
Brazil	10	7	7	7	7	7	8	9	10	11
Colombia	5	8	8	7	7	10	9	7	8	8
Uruguay	0	0	0	0	0	0	0	3	3	3
Nicaragua	3	3	3	3	2	2	3	2	2	2
Other Countries	11	6	3	3	3	3	4	4	4	7
Total Latin America	**3,917**	**4,211**	**4,317**	**4,649**	**4,636**	**4,937**	**5,073**	**5,218**	**5,857**	**6,389**
Asia										
China	1,358	1,494	1,596	1,729	1,646	1,828	1,967	2,082	2,342	2,562
Indonesia	311	271	312	374	332	297	266	308	246	255
Turkey	87	108	109	114	114	113	126	162	187	235
Iran	77	79	83	82	82	82	84	94	100	97
India	52	60	56	54	59	61	64	68	84	90
Papua New Guinea	58	59	73	69	64	63	54	47	51	44
Philippines	19	18	23	34	9	10	9	19	24	35
North Korea	32	26	22	19	20	25	25	25	29	29
Japan	99	99	109	85	85	83	54	32	34	14
Thailand	4	5	5	6	22	18	16	20	17	13
Saudi Arabia	14	11	9	10	10	17	15	14	10	9
Malaysia	7	3	0	0	0	0	0	0	0	0
Other Countries	39	37	35	38	41	37	43	47	48	49
Total Asia	**2,157**	**2,269**	**2,433**	**2,613**	**2,485**	**2,634**	**2,724**	**2,917**	**3,170**	**3,431**

Table 2 - World Silver Mine Production (tons)

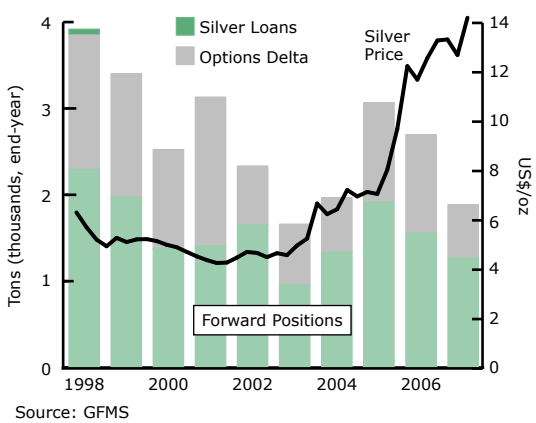
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Africa										
Morocco	306	278	289	283	263	193	209	231	237	221
South Africa	157	152	144	110	113	87	71	88	87	70
Dem. Rep. of the Congo	1	1	1	1	3	36	34	54	68	70
Tanzania	1	2	3	7	7	8	13	13	13	12
Zambia	8	5	5	5	6	6	8	10	11	12
Namibia	13	0	17	19	20	29	27	30	35	8
Zimbabwe	6	6	5	4	4	4	4	8	8	8
Botswana	5	5	4	4	4	4	4	4	4	3
Ethiopia	1	1	1	1	1	1	2	1	1	1
Other Countries	7	9	9	10	9	8	6	6	6	5
Total Africa	**505**	**458**	**477**	**443**	**429**	**378**	**377**	**444**	**468**	**411**
Oceania										
Australia	1,469	1,709	2,024	1,970	2,077	1,864	2,222	2,407	1,728	1,879
New Zealand	26	24	23	27	29	30	30	46	35	29
Fiji	2	2	1	2	2	1	2	1	1	0
Total Oceania	**1,496**	**1,736**	**2,048**	**1,999**	**2,108**	**1,895**	**2,254**	**2,454**	**1,764**	**1,908**
CIS										
Russia	605	617	628	650	699	1,070	1,233	1,260	1,230	1,183
Kazakhstan	527	642	890	940	849	802	703	812	796	706
Uzbekistan	82	64	62	53	49	53	60	64	65	87
Armenia	33	33	35	38	39	41	40	38	38	36
Kyrgyzstan	1	1	1	1	1	1	1	1	6	6
Tajikistan	3	3	4	4	4	4	4	4	3	3
Total CIS	**1,252**	**1,360**	**1,620**	**1,686**	**1,641**	**1,971**	**2,041**	**2,177**	**2,137**	**2,021**
World Total	**16,863**	**17,321**	**18,381**	**18,855**	**18,464**	**18,679**	**19,319**	**20,026**	**20,136**	**20,858**

World Silver Mine Production



Source: GFMS

Silver Producer Hedging: Outstanding Positions



Source: GFMS

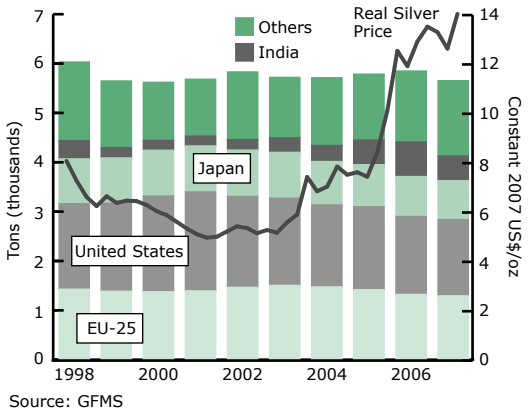
Table 3 - Supply of Silver from the Recycling of Old Scrap (tons)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Europe										
Germany	510	500	520	523	520	592	598	546	439	417
UK & Ireland	337	358	338	346	423	404	386	360	340	348
Italy	145	105	105	110	113	112	104	133	160	161
France	127	124	110	122	120	126	118	127	139	135
Austria	57	52	50	62	58	48	50	40	40	38
Netherlands	40	40	45	42	44	44	45	42	40	35
Sweden	34	34	33	33	32	32	32	31	29	28
Belgium	20	20	20	21	20	20	20	20	20	20
Denmark	19	19	18	18	17	17	17	16	16	16
Czech & Slovak Republics	22	19	19	14	13	13	14	14	14	14
Portugal	14	14	14	13	14	14	14	13	13	13
Spain	13	12	13	13	13	14	14	13	13	12
Finland	15	15	13	13	12	13	12	12	11	11
Switzerland	14	10	10	10	10	10	10	10	8	8
Norway	25	29	33	21	21	14	10	9	9	8
Other Countries	36	36	35	34	36	34	34	32	31	32
Total Europe	**1,428**	**1,387**	**1,376**	**1,395**	**1,466**	**1,506**	**1,476**	**1,418**	**1,322**	**1,295**
North America										
United States	1,733	1,785	1,941	2,005	1,842	1,766	1,659	1,680	1,580	1,544
Mexico	330	71	48	44	48	55	60	64	72	84
Canada	60	50	45	45	44	47	44	46	44	50
Total North America	**2,123**	**1,906**	**2,034**	**2,094**	**1,934**	**1,868**	**1,763**	**1,790**	**1,696**	**1,678**
Latin America										
Brazil	50	55	48	50	32	36	32	32	32	32
Argentina	20	20	20	23	20	20	20	20	24	20
Chile	17	13	12	12	12	12	12	14	16	16
Other Countries	29	27	25	24	24	25	24	29	33	30
Total Latin America	**116**	**115**	**105**	**109**	**88**	**93**	**88**	**95**	**105**	**98**
Middle East										
Saudi Arabia	64	232	70	24	224	23	40	50	56	58
Egypt	13	10	28	35	40	35	42	43	46	48
Turkey	53	43	40	39	44	52	47	41	35	30
Oman	6	5	5	5	5	5	5	5	6	6
Other Countries	12	11	10	11	11	11	15	13	15	16
Total Middle East	**148**	**301**	**153**	**114**	**324**	**126**	**149**	**152**	**158**	**157**
Indian Sub-Continent										
India	370	207	200	200	210	294	324	500	700	500
Other Countries	15	11	13	15	15	15	15	16	17	17
Total Indian Sub-Cont.	**385**	**218**	**213**	**215**	**225**	**309**	**339**	**516**	**717**	**517**
East Asia										
Japan	908	917	927	931	940	930	880	852	810	790
China	180	182	187	192	196	206	240	270	324	377
South Korea	244	164	164	170	180	190	195	198	208	211
Thailand	30	24	20	21	28	30	32	31	35	37
Taiwan	26	28	28	28	27	30	31	32	34	36
Singapore	12	12	12	12	13	13	14	14	16	16
Hong Kong	15	11	11	11	12	12	13	13	14	14
Indonesia	12	13	15	13	10	10	11	11	12	12

Table 3 - Supply of Silver from the Recycling of Old Scrap (tons) © GFMS / The Silver Institute

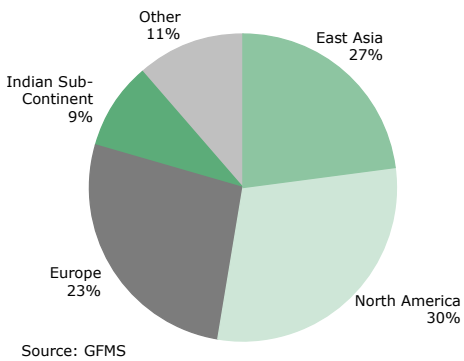
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Vietnam	12	12	11	10	9	10	10	11	11	12
Philippines	7	7	7	6	6	6	6	6	6	6
Other Countries	4	3	3	3	4	4	4	4	4	4
Total East Asia	**1,450**	**1,372**	**1,384**	**1,398**	**1,425**	**1,441**	**1,436**	**1,443**	**1,476**	**1,517**
Africa										
Morocco	17	16	16	16	16	16	40	19	29	28
Other Countries	17	17	18	17	17	17	17	17	18	18
Total Africa	**34**	**33**	**34**	**33**	**33**	**33**	**57**	**36**	**47**	**46**
Oceania										
Oceania	74	75	76	74	73	65	64	55	53	52
Total Oceania	**74**	**75**	**76**	**74**	**73**	**65**	**64**	**55**	**53**	**52**
CIS										
CIS	275	240	245	252	263	280	340	280	276	288
Total CIS	**275**	**240**	**245**	**252**	**263**	**280**	**340**	**280**	**276**	**288**
World Total	**6,032**	**5,647**	**5,621**	**5,684**	**5,830**	**5,721**	**5,713**	**5,786**	**5,849**	**5,649**

World Silver Scrap Supply



Source: GFMS

World Scrap Supply, 2007



Source: GFMS

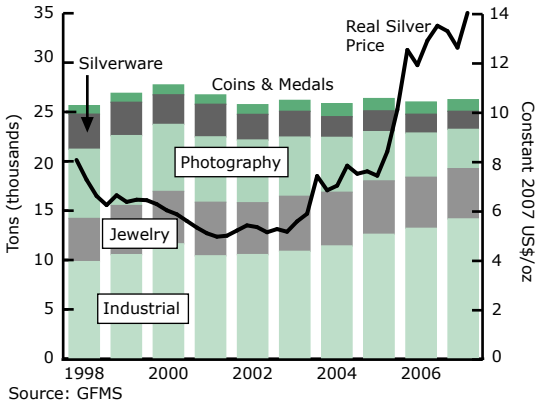
Table 4 - World Silver Fabrication Including the Use of Scrap (tons)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Europe										
Italy	1,750	1,938	2,073	1,869	1,785	1,735	1,722	1,577	1,443	1,357
Germany	1,490	1,301	1,256	1,237	1,102	1,216	1,257	1,260	1,275	1,249
UK & Ireland	1,215	1,238	1,307	1,406	1,323	1,350	1,604	1,330	1,064	890
Belgium	1,052	1,167	1,098	999	958	910	858	814	894	850
France	892	837	910	909	862	819	404	389	396	410
Spain	275	234	210	171	161	148	198	175	156	141
Poland	111	117	120	107	100	120	134	145	149	135
Switzerland	332	344	281	108	106	94	96	101	97	97
Greece	126	126	104	94	87	90	90	90	86	82
Netherlands	70	88	60	57	64	60	79	69	63	63
Portugal	96	100	107	80	53	82	127	54	45	43
Norway	47	94	89	71	60	62	65	56	52	40
Austria	42	38	33	34	37	37	40	40	38	38
Sweden	43	42	41	31	33	37	38	38	37	35
Denmark	32	31	32	28	24	22	21	21	21	21
Czech & Slovak Republics	28	24	25	31	21	22	21	20	20	20
Romania	16	13	13	12	12	12	12	12	12	12
Hungary	13	14	15	13	13	13	13	12	12	12
Finland	21	21	17	14	14	13	12	12	13	10
Yugoslavia (former)	5	5	5	7	7	7	8	8	9	9
Cyprus & Malta	11	12	12	10	10	9	9	9	9	9
Other Countries	6	5	5	4	4	4	5	5	5	5
Total Europe	**7,671**	**7,787**	**7,811**	**7,289**	**6,836**	**6,864**	**6,811**	**6,237**	**5,895**	**5,530**
North America										
United States	5,277	5,783	5,977	5,275	5,505	5,454	5,608	5,891	5,778	5,644
Mexico	682	675	537	530	564	629	682	693	587	576
Canada	118	121	104	90	96	78	109	126	178	242
Total North America	**6,077**	**6,579**	**6,618**	**5,895**	**6,164**	**6,160**	**6,400**	**6,710**	**6,543**	**6,463**
Latin America										
Brazil	253	238	210	204	198	204	227	232	145	223
Argentina	108	93	73	56	58	74	78	80	60	64
Peru	34	32	30	32	32	23	21	19	22	21
Colombia	33	27	24	22	22	22	22	21	21	21
Chile	15	14	13	13	13	13	13	13	13	13
Ecuador	21	17	17	14	14	12	12	10	12	12
Other Countries	16	16	35	27	23	27	34	38	42	41
Total Latin America	**514**	**477**	**402**	**368**	**360**	**376**	**408**	**414**	**315**	**395**
Middle East										
Turkey	204	187	230	200	254	295	326	315	284	255
Israel	97	97	91	83	83	81	83	85	85	84
Egypt	58	63	64	55	49	57	62	55	52	49
Iran	42	43	45	48	43	45	47	50	49	49
Other Countries	54	56	60	57	56	56	59	61	62	63
Total Middle East	**455**	**445**	**490**	**442**	**486**	**534**	**577**	**567**	**531**	**500**
Indian Sub-Continent										
India	3,317	3,479	3,560	4,339	3,309	3,310	2,163	2,850	2,575	2,789
Bangladesh & Nepal	160	178	187	185	150	140	132	116	113	113
Other Countries	87	105	98	67	66	66	71	73	74	75
Total Indian Sub-Cont.	**3,564**	**3,762**	**3,845**	**4,591**	**3,525**	**3,516**	**2,366**	**3,039**	**2,762**	**2,977**

Table 4 - World Silver Fabrication Including the Use of Scrap (tons)

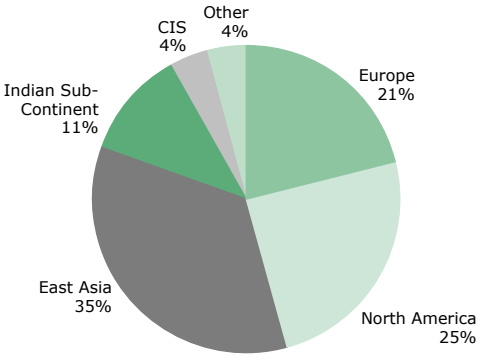
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
East Asia										
Japan	3,508	3,809	4,200	3,711	3,693	3,607	3,826	3,860	4,097	4,151
China	1,059	1,049	1,122	1,238	1,479	1,641	1,835	1,917	2,116	2,358
Thailand	876	962	962	1,022	1,014	1,138	1,151	1,150	1,150	1,140
South Korea	429	519	611	531	555	596	617	628	651	671
Taiwan	210	210	293	263	279	319	351	364	397	410
Indonesia	96	113	132	161	139	146	181	159	178	170
Hong Kong	112	120	138	100	105	99	107	110	118	125
Vietnam	19	22	22	23	26	28	30	32	35	37
Myanmar, Laos & Cambodia	25	28	26	28	30	32	28	28	26	26
Malaysia	12	15	18	18	20	21	22	21	20	20
Other Countries	11	12	13	14	14	15	14	15	14	14
Total East Asia	**6,357**	**6,861**	**7,536**	**7,110**	**7,353**	**7,641**	**8,161**	**8,283**	**8,803**	**9,124**
Africa										
Morocco	18	17	18	19	18	18	19	19	19	20
Tunisia	10	10	10	10	10	11	11	11	10	11
South Africa	8	8	8	7	7	8	8	8	8	8
Algeria	6	6	6	6	5	6	6	6	6	6
Libya	4	4	4	4	4	4	4	4	4	5
Other Countries	8	8	8	8	8	8	9	9	9	9
Total Africa	**53**	**53**	**54**	**53**	**52**	**54**	**57**	**58**	**57**	**59**
Oceania										
Australia	176	180	218	184	180	193	178	121	133	143
New Zealand	1	1	1	1	1	1	1	1	1	1
Total Oceania	**176**	**181**	**219**	**186**	**181**	**195**	**179**	**122**	**134**	**145**
CIS										
CIS	770	741	760	789	777	832	879	926	963	1,048
Total CIS	**770**	**741**	**760**	**789**	**777**	**832**	**879**	**926**	**963**	**1,048**
World Total	**25,638**	**26,885**	**27,735**	**26,723**	**25,734**	**26,172**	**25,836**	**26,355**	**26,003**	**26,241**

World Silver Fabrication



Source: GFMS

World Silver Fabrication, 2007



Source: GFMS

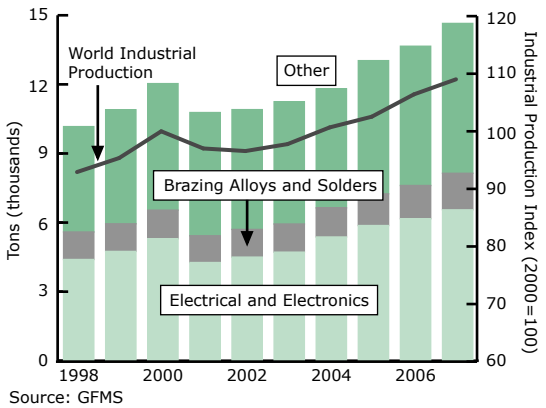
Table 5 - Silver Fabrication: Industrial Applications Including the Use of Scrap (tons)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Europe										
Germany	571	571	647	665	659	675	730	744	794	851
UK & Ireland	501	469	512	444	433	464	483	385	388	372
Italy	329	331	340	324	324	317	357	336	337	346
France	349	362	384	496	455	430	320	317	322	334
Switzerland	311	322	259	85	84	72	76	81	77	77
Spain	95	83	62	40	40	38	65	60	58	59
Netherlands	52	52	52	48	48	47	48	49	49	49
Poland	23	23	23	22	21	21	22	22	23	24
Austria	17	17	17	17	17	17	17	17	17	17
Norway	11	45	37	23	20	19	26	22	17	16
Sweden	11	11	11	10	10	10	10	10	10	11
Czech & Slovak Republics	13	16	8	11	9	9	8	8	9	9
Belgium	10	10	10	8	8	8	8	8	8	8
Other Countries	24	23	23	21	21	22	22	22	23	24
Total Europe	**2,317**	**2,334**	**2,385**	**2,213**	**2,147**	**2,147**	**2,193**	**2,082**	**2,132**	**2,196**
North America										
United States	2,520	2,757	2,958	2,449	2,584	2,699	2,931	3,134	3,323	3,588
Mexico	92	103	107	94	93	96	93	101	95	102
Canada	17	17	17	16	16	16	19	31	53	75
Total North America	**2,629**	**2,877**	**3,082**	**2,559**	**2,693**	**2,811**	**3,043**	**3,266**	**3,471**	**3,765**
Latin America										
Brazil	108	98	98	98	98	94	115	139	91	124
Argentina	36	30	25	20	20	20	20	28	32	34
Colombia	9	7	6	6	6	6	6	5	5	5
Ecuador	2	2	2	2	2	2	2	2	2	2
Other Countries	12	12	12	13	13	12	12	12	12	12
Total Latin America	**167**	**149**	**143**	**139**	**139**	**134**	**155**	**186**	**142**	**177**
Middle East										
Turkey	41	38	44	35	39	46	51	53	56	58
Israel	31	30	30	26	24	24	24	25	26	26
Egypt	4	4	4	4	3	3	3	3	3	3
Other Countries	4	4	4	4	4	4	4	4	4	4
Total Middle East	**79**	**75**	**82**	**68**	**70**	**76**	**82**	**86**	**89**	**91**
Indian Sub-Continent										
India	992	1,180	1,435	1,579	1,381	1,382	1,053	1,670	1,687	2,005
Pakistan	15	18	16	10	8	8	9	9	10	10
Total Indian Sub-Cont.	**1,007**	**1,198**	**1,451**	**1,589**	**1,389**	**1,390**	**1,062**	**1,679**	**1,697**	**2,015**
East Asia										
Japan	1,643	1,890	2,244	1,723	1,839	1,879	2,292	2,614	2,783	2,826
China	645	651	681	693	795	859	936	990	1,093	1,217
South Korea	349	379	459	387	416	452	472	481	503	518
Taiwan	193	196	274	250	270	309	339	351	381	394
Hong Kong	93	101	121	85	93	90	97	99	107	113
Indonesia	16	16	16	14	15	17	19	19	19	20
Total East Asia	**2,939**	**3,233**	**3,795**	**3,152**	**3,427**	**3,606**	**4,154**	**4,555**	**4,886**	**5,089**

Table 5 - Silver Fabrication: Industrial Applications Including the Use of Scrap (tons)

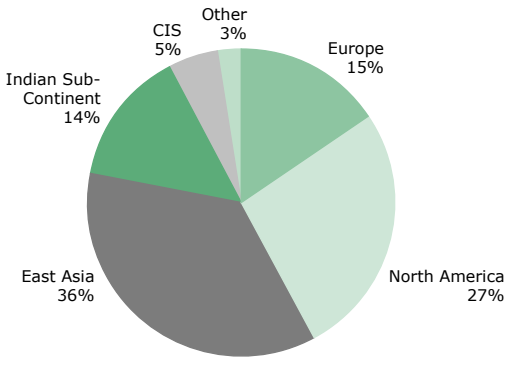
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Africa										
Morocco	7	7	8	8	8	8	8	8	9	9
South Africa	5	5	5	4	4	4	4	4	4	4
Other Countries	5	5	5	5	5	5	6	6	6	7
Total Africa	**17**	**17**	**18**	**17**	**17**	**17**	**18**	**19**	**19**	**20**
Oceania										
Australia	72	76	77	65	66	68	69	63	65	66
Total Oceania	**72**	**76**	**77**	**65**	**66**	**68**	**69**	**63**	**65**	**66**
CIS										
CIS	610	586	609	624	600	630	650	672	712	744
Total CIS	**610**	**586**	**609**	**624**	**600**	**630**	**650**	**672**	**712**	**744**
World Total	**9,837**	**10,545**	**11,641**	**10,426**	**10,549**	**10,879**	**11,425**	**12,607**	**13,212**	**14,162**

Components of Industrial Demand



Source: GFMS

World Silver Industrial Fabrication, 2007



Source: GFMS

Table 5a - Silver Fabrication: Electrical and Electronics Including the Use of Scrap (tons)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
United States	1,373	1,464	1,603	1,062	1,168	1,228	1,474	1,622	1,710	1,796
Japan	738	933	1,140	828	913	940	1,181	1,360	1,432	1,456
Germany	380	380	445	488	484	503	551	569	613	665
China	305	308	320	320	340	368	397	420	474	537
India	130	140	150	145	151	159	167	300	312	390
Taiwan	148	150	216	203	223	260	287	298	324	336
South Korea	188	206	255	224	236	260	275	280	296	303
France	207	210	228	342	309	297	252	248	254	264
UK & Ireland	199	185	206	175	172	183	190	141	138	139
Italy	90	92	95	86	87	90	118	108	112	119
Hong Kong	77	90	110	77	87	85	92	94	101	108
Mexico	40	60	64	56	56	58	56	64	61	65
Brazil	45	40	40	40	40	38	52	66	27	48
Turkey	28	24	28	22	25	30	33	34	36	37
Australia	17	18	19	18	20	21	21	22	23	23
Netherlands	18	18	18	16	16	16	16	17	17	17
Switzerland	228	232	165	12	12	14	14	13	13	13
Spain	30	30	9	0	0	0	10	10	10	11
Austria	7	7	7	7	7	7	7	7	7	7
Other Countries	8	8	8	7	7	7	7	7	7	7
World Total	**4,255**	**4,595**	**5,125**	**4,128**	**4,354**	**4,564**	**5,201**	**5,681**	**5,966**	**6,341**

Table 5b - Silver Fabrication: Brazing Alloys and Solders Including the Use of Scrap (tons)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
China	196	198	208	215	247	270	301	320	351	388
United States	269	280	272	258	260	247	228	240	224	280
India	47	50	55	57	60	64	67	130	134	161
Japan	130	131	137	109	104	104	116	119	122	123
Germany	97	94	101	88	95	97	100	98	105	112
Italy	54	62	65	63	64	63	64	65	72	76
UK & Ireland	92	87	88	83	79	86	92	90	95	76
Canada	10	10	10	9	9	9	12	24	46	68
South Korea	25	26	31	38	42	44	45	47	48	50
Switzerland	49	48	50	41	40	42	42	48	44	44
Taiwan	31	32	37	29	31	33	35	36	39	40
France	32	29	33	32	32	25	22	25	26	27
Brazil	25	23	23	23	23	22	23	25	26	26
Spain	32	33	33	30	30	28	25	20	20	20
Australia	22	23	24	20	19	20	20	16	17	17
Mexico	30	20	20	17	16	17	16	16	15	16
Netherlands	8	8	8	7	7	7	8	7	7	7
Israel	3	3	3	2	2	2	2	2	2	2
Other Countries	3	3	3	3	3	3	3	3	3	3
World Total	**1,155**	**1,159**	**1,201**	**1,124**	**1,162**	**1,182**	**1,221**	**1,331**	**1,395**	**1,534**

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

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Europe										
EU-25	2,400	2,396	2,254	2,226	2,081	2,023	1,916	1,700	1,514	1,324
Other Countries	8	6	6	5	5	5	5	5	5	4
Total Europe	**2,408**	**2,402**	**2,260**	**2,231**	**2,086**	**2,028**	**1,921**	**1,705**	**1,519**	**1,329**
North America										
United States	2,147	2,285	2,185	2,037	2,017	1,832	1,716	1,753	1,442	1,117
Mexico	107	91	0	0	0	0	0	0	0	0
Total North America	**2,254**	**2,376**	**2,185**	**2,037**	**2,017**	**1,832**	**1,716**	**1,753**	**1,442**	**1,117**
Latin America										
Brazil	100	100	76	70	64	68	68	43	0	45
Argentina	56	49	40	32	34	48	48	40	16	16
Total Latin America	**156**	**149**	**116**	**102**	**98**	**116**	**116**	**83**	**16**	**61**
Indian Sub-Continent										
India	10	10	10	10	10	10	10	10	10	9
Sri Lanka	12	12	12	4	4	4	4	4	4	4
Total Indian Sub-Cont.	**22**	**22**	**22**	**14**	**14**	**14**	**14**	**14**	**14**	**13**
East Asia										
Japan	1,810	1,864	1,902	1,935	1,799	1,677	1,476	1,180	1,251	1,260
China	190	114	120	140	176	180	190	167	157	143
Taiwan	1	1	0	0	0	0	0	0	0	0
Total East Asia	**2,001**	**1,979**	**2,022**	**2,075**	**1,975**	**1,857**	**1,666**	**1,348**	**1,408**	**1,403**
Oceania										
Australia	51	52	85	74	71	64	47	4	4	4
Total Oceania	**51**	**52**	**85**	**74**	**71**	**64**	**47**	**4**	**4**	**4**
CIS										
CIS	119	107	100	95	92	88	83	80	76	64
Total CIS	**119**	**107**	**100**	**95**	**92**	**88**	**83**	**80**	**76**	**64**
World Total	**7,011**	**7,087**	**6,790**	**6,628**	**6,353**	**5,999**	**5,562**	**4,987**	**4,478**	**3,991**

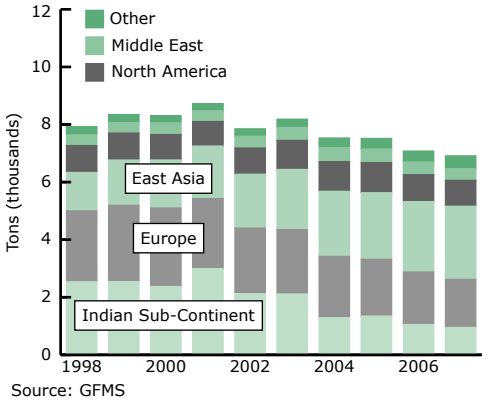
Table 7 - Silver Fabrication: Jewelry and Silverware Including the Use of Scrap (tons)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Europe										
Italy	1,410	1,598	1,725	1,537	1,457	1,408	1,348	1,230	1,096	1,001
Germany	300	304	284	271	245	240	226	213	210	203
Poland	83	89	92	78	71	91	95	105	111	101
Greece	126	126	104	94	87	90	90	90	86	82
France	81	85	88	85	84	81	69	55	57	59
Spain	126	105	93	76	74	76	63	61	52	44
Portugal	60	66	66	55	49	52	48	42	38	36
UK & Ireland	102	98	100	90	68	50	48	43	41	26
Norway	35	47	51	46	40	42	37	32	34	25
Sweden	31	30	29	20	22	26	27	27	26	24
Denmark	29	28	29	25	21	19	18	18	18	18
Switzerland	12	10	10	10	10	10	10	10	10	10
Cyprus & Malta	11	12	12	10	10	9	9	9	9	9
Finland	18	18	14	11	11	10	9	9	10	7
Austria	15	11	8	7	7	7	7	5	4	4
Other Countries	25	24	23	23	23	22	23	22	23	23
Total Europe	**2,464**	**2,651**	**2,728**	**2,439**	**2,279**	**2,235**	**2,128**	**1,971**	**1,824**	**1,672**
North America										
United States	391	408	416	405	428	471	479	487	465	442
Mexico	477	470	410	401	437	486	504	511	434	423
Canada	67	60	57	47	48	52	50	44	36	34
Total North America	**935**	**938**	**883**	**853**	**913**	**1,009**	**1,033**	**1,042**	**935**	**899**
Latin America										
Brazil	45	40	36	36	36	42	44	50	54	54
Peru	32	30	28	29	29	20	18	16	19	18
Colombia	24	20	18	16	16	16	16	16	16	16
Argentina	16	14	8	4	4	6	10	12	12	14
Ecuador	19	15	15	12	12	10	10	8	10	10
Other Countries	54	59	37	29	25	30	37	41	45	44
Total Latin America	**190**	**178**	**142**	**126**	**122**	**124**	**135**	**143**	**156**	**155**
Middle East										
Turkey	163	147	186	164	211	245	272	258	224	194
Israel	64	66	59	55	57	56	57	58	58	56
Egypt	54	58	60	51	46	53	58	52	48	46
Saudi Arabia & Yemen	16	18	20	18	18	18	19	21	21	22
Other Countries	76	77	81	83	77	79	83	86	86	87
Total Middle East	**373**	**366**	**405**	**371**	**410**	**452**	**489**	**476**	**437**	**404**
Indian Sub-Continent										
India	2,315	2,289	2,115	2,750	1,918	1,918	1,100	1,170	878	775
Bangladesh & Nepal	160	178	187	185	150	140	132	116	113	113
Other Countries	60	75	70	53	54	54	58	60	60	61
Total Indian Sub-Cont.	**2,535**	**2,542**	**2,372**	**2,988**	**2,122**	**2,112**	**1,290**	**1,346**	**1,051**	**949**
East Asia										
Thailand	869	958	957	1,017	1,004	1,127	1,147	1,145	1,146	1,136
China	149	214	283	358	443	530	637	702	816	917
South Korea	80	140	152	144	139	144	145	147	149	153
Indonesia	80	97	116	147	124	129	162	140	159	151

Table 7 - Silver Fabrication: Jewelry and Silverware Including the Use of Scrap (tons)

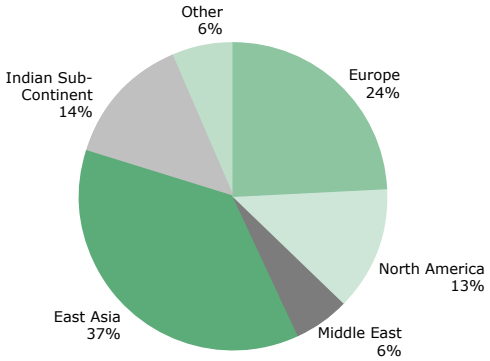
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Japan	55	55	54	53	52	49	56	64	61	65
Vietnam	19	22	22	23	26	28	30	32	35	37
Myanmar, Laos & Cambodia	25	28	26	28	30	32	28	28	26	26
Malaysia	12	15	17	18	20	21	22	21	20	20
Taiwan	16	13	13	10	9	10	12	13	12	12
Hong Kong	19	19	17	15	12	10	10	10	11	11
Other Countries	9	9	10	11	11	11	11	11	11	11
Total East Asia	**1,333**	**1,571**	**1,667**	**1,823**	**1,869**	**2,091**	**2,260**	**2,313**	**2,446**	**2,539**
Africa										
Morocco	11	10	10	11	11	10	11	11	11	11
Tunisia	9	9	9	9	9	10	10	10	9	10
Algeria	5	5	5	5	4	5	5	5	5	5
Other Countries	11	11	12	11	11	12	13	13	13	13
Total Africa	**36**	**35**	**36**	**36**	**35**	**37**	**39**	**39**	**37**	**39**
Oceania										
Australia	22	23	24	22	23	22	23	22	21	21
Other Countries	1	1	1	1	1	1	1	1	1	1
Total Oceania	**23**	**24**	**25**	**23**	**24**	**23**	**24**	**23**	**22**	**22**
CIS										
Russia	20	24	29	44	56	81	113	139	144	206
Other Countries	14	17	18	19	20	21	22	23	23	25
Total CIS	**34**	**41**	**47**	**63**	**76**	**102**	**135**	**162**	**167**	**231**
World Total	**7,924**	**8,346**	**8,305**	**8,721**	**7,849**	**8,184**	**7,532**	**7,516**	**7,076**	**6,911**

World Jewelry & Silverware Fabrication



Source: GFMS

World Jewelry & Silverware Fabrication, 2007



Source: GFMS

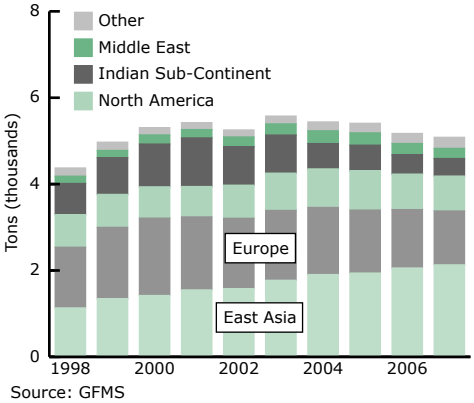
Table 7a - Silver Fabrication: Jewelry Including the Use of Scrap (tons)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Europe										
Italy	830	1,058	1,210	1,157	1,142	1,110	1,065	980	876	802
Germany	108	126	112	114	104	113	116	118	119	120
Poland	80	86	89	75	68	88	92	102	108	98
France	74	78	80	77	76	74	62	48	50	52
Spain	54	45	45	42	46	52	42	44	40	35
Portugal	54	59	59	49	44	47	43	37	34	32
Greece	36	36	32	30	28	30	32	34	33	32
UK & Ireland	88	85	87	77	56	38	36	32	30	16
Sweden	14	14	13	9	10	12	12	12	12	11
Denmark	13	12	13	11	10	9	8	8	8	8
Switzerland	9	7	7	7	7	7	7	7	7	7
Cyprus & Malta	8	9	8	7	7	6	7	7	7	6
Norway	5	7	8	7	6	6	6	5	5	5
Finland	6	5	4	3	3	3	3	3	3	2
Austria	4	4	4	3	3	3	3	2	1	1
Other Countries	21	21	20	20	20	19	20	19	20	20
Total Europe	**1,404**	**1,652**	**1,791**	**1,690**	**1,629**	**1,617**	**1,554**	**1,458**	**1,351**	**1,248**
North America										
United States	316	336	348	340	368	416	428	440	420	400
Mexico	382	376	328	325	358	403	423	434	372	380
Canada	57	51	49	39	40	44	42	36	30	28
Total North America	**755**	**763**	**725**	**704**	**766**	**863**	**893**	**910**	**822**	**808**
Latin America										
Brazil	40	36	32	32	32	38	40	45	48	48
Peru	12	12	12	13	13	10	9	8	11	10
Argentina	10	8	5	3	3	4	7	7	8	9
Colombia	8	6	6	6	6	6	6	6	6	6
Ecuador	10	8	8	7	7	6	6	5	6	6
Other Countries	45	51	29	22	17	23	29	34	37	36
Total Latin America	**125**	**121**	**93**	**83**	**78**	**87**	**97**	**105**	**116**	**115**
Middle East										
Turkey	66	59	101	92	129	154	185	176	150	127
Egypt	43	46	47	40	36	44	48	43	41	39
Saudi Arabia & Yemen	12	14	16	15	15	15	16	17	18	18
Israel	15	15	14	13	13	13	13	14	13	14
Other Countries	32	32	34	34	33	33	34	36	37	37
Total Middle East	**168**	**167**	**212**	**193**	**226**	**258**	**296**	**286**	**258**	**236**
Indian Sub-Continent										
India	650	758	885	1,032	804	800	500	510	369	323
Bangladesh & Nepal	45	59	74	69	63	58	60	56	54	55
Other Countries	27	34	32	24	24	24	26	27	27	28
Total Indian Sub-Cont.	**722**	**851**	**990**	**1,125**	**891**	**883**	**586**	**593**	**451**	**406**
East Asia										
Thailand	760	850	845	896	884	999	1,011	1,005	1,012	995
China	115	165	218	275	341	408	486	540	627	713
Indonesia	69	84	99	128	103	108	139	117	137	131
South Korea	64	115	126	118	117	121	123	122	126	130
Japan	52	53	52	51	50	48	55	63	60	64

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

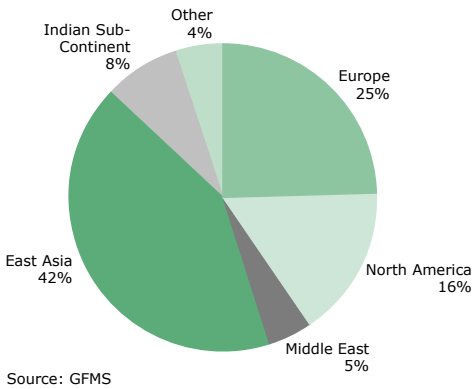
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Vietnam	17	20	20	21	24	26	27	29	33	34
Myanmar, Laos & Cambodia	17	19	18	20	21	23	20	20	19	19
Malaysia	11	14	16	17	18	19	20	19	19	18
Taiwan	10	8	8	6	6	7	8	9	9	9
Hong Kong	12	12	11	10	8	7	7	7	8	8
Other Countries	6	6	7	8	8	8	8	8	8	8
Total East Asia	**1,133**	**1,346**	**1,420**	**1,549**	**1,579**	**1,772**	**1,905**	**1,939**	**2,057**	**2,129**
Africa										
Morocco	9	8	8	9	8	8	8	8	8	9
Tunisia	6	6	7	6	6	7	7	7	6	7
Algeria	4	4	4	3	3	3	4	4	3	3
Other Countries	9	9	9	9	9	10	10	10	10	10
Total Africa	**27**	**27**	**28**	**27**	**27**	**28**	**29**	**29**	**28**	**30**
Oceania										
Australia	21	22	23	21	22	21	21	21	20	20
Other Countries	1	1	1	1	1	1	1	1	1	1
Total Oceania	**21**	**22**	**24**	**22**	**23**	**22**	**22**	**22**	**21**	**21**
CIS										
Russia	7	9	10	16	20	28	39	49	50	72
Other Countries	10	13	13	14	15	16	16	17	17	18
Total CIS	**18**	**21**	**23**	**29**	**34**	**44**	**56**	**65**	**67**	**91**
World Total	**4,373**	**4,970**	**5,306**	**5,422**	**5,253**	**5,574**	**5,438**	**5,407**	**5,171**	**5,083**

World Jewelry Fabrication



Source: GFMS

World Jewelry Fabrication, 2007

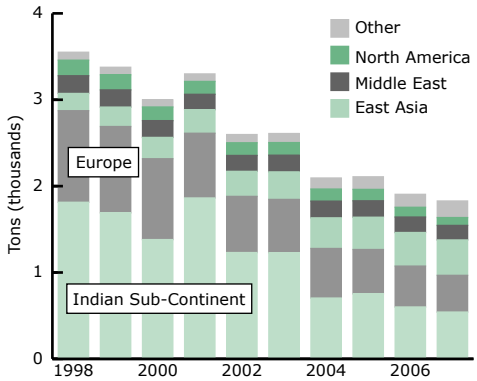


Source: GFMS

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

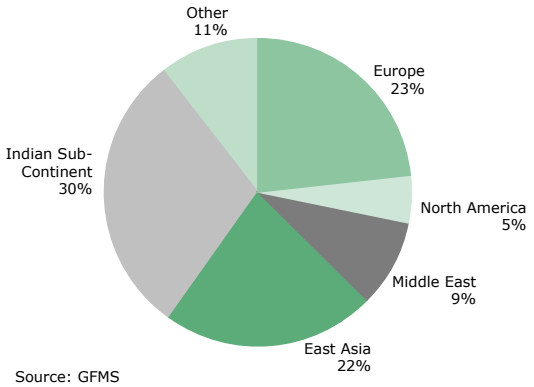
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Europe										
Italy	580	540	515	380	315	298	283	250	220	199
Germany	192	178	172	157	142	128	110	95	91	83
Greece	90	90	72	64	59	60	58	56	53	50
Norway	30	40	44	39	34	35	31	27	29	20
Sweden	17	17	16	11	12	14	15	15	14	12
Spain	72	60	48	34	28	24	21	17	12	9
Other Countries	79	75	70	64	61	58	56	54	54	51
Total Europe	**1,060**	**999**	**936**	**749**	**650**	**617**	**574**	**513**	**473**	**425**
North America										
Mexico	95	94	82	76	79	83	81	77	62	43
United States	75	72	68	65	60	55	51	47	45	42
Canada	10	9	8	8	8	8	8	8	6	6
Total North America	**180**	**175**	**158**	**149**	**147**	**146**	**140**	**132**	**113**	**91**
Latin America										
Colombia	16	14	12	10	10	10	10	10	10	10
Peru	20	18	16	16	16	10	9	8	8	8
Other Countries	30	25	21	17	17	17	19	21	22	23
Total Latin America	**66**	**57**	**49**	**43**	**43**	**37**	**38**	**39**	**40**	**41**
Middle East										
Turkey	97	87	85	72	83	91	87	82	74	67
Israel	50	51	46	42	44	43	44	45	45	42
Egypt	11	12	13	11	10	10	10	9	8	6
Saudi Arabia & Yemen	4	4	4	4	3	3	4	4	3	4
Other Countries	47	49	51	53	48	50	52	54	53	53
Total Middle East	**205**	**199**	**194**	**178**	**184**	**193**	**193**	**190**	**179**	**168**
Indian Sub-Continent										
India	1,665	1,531	1,230	1,718	1,114	1,118	600	660	509	452
Bangladesh & Nepal	115	119	113	116	87	82	72	60	59	58
Other Countries	33	41	39	29	30	30	32	33	33	33
Total Indian Sub-Cont.	**1,813**	**1,691**	**1,381**	**1,863**	**1,231**	**1,229**	**704**	**753**	**601**	**542**
East Asia										
China	34	49	65	83	102	122	151	162	189	204
Thailand	109	108	112	121	121	129	136	140	134	141
South Korea	16	25	26	26	22	23	22	25	23	23
Indonesia	11	13	17	19	21	21	23	23	21	20
Other Countries	30	29	27	26	24	24	23	24	22	22
Total East Asia	**200**	**225**	**247**	**273**	**290**	**319**	**355**	**374**	**389**	**410**
Africa										
Africa	8	9	9	9	9	9	9	9	9	10
Total Africa	**8**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**10**
Oceania										
Oceania	2	2	2	1	1	1	1	1	1	1
Total Oceania	**2**	**2**	**2**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
CIS										
Russia	13	16	19	29	36	53	73	91	93	134
Other Countries	4	4	5	5	5	5	6	6	6	6
Total CIS	**17**	**20**	**23**	**34**	**41**	**58**	**79**	**96**	**99**	**141**
World Total	**3,551**	**3,376**	**2,999**	**3,299**	**2,596**	**2,610**	**2,093**	**2,109**	**1,905**	**1,828**

World Silverware Fabrication



Source: GFMS

World Silverware Fabrication, 2007



Source: GFMS

Table 8 - Silver Fabrication: Coins and Medals Including the Use of Scrap (tons)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
United States	219	333	418	384	476	452	483	517	548	497
Germany	312	218	273	251	187	301	301	303	272	195
Canada	34	44	30	27	32	10	40	51	89	133
China	75	71	38	47	65	72	72	57	50	81
Australia	31	29	31	23	20	40	40	32	43	53
Mexico	6	11	20	35	34	47	85	81	58	51
Spain	54	46	55	55	47	34	70	54	46	38
France	10	10	11	13	16	17	15	17	17	17
Austria	10	10	8	10	13	13	15	18	17	17
UK & Ireland	19	19	17	14	16	15	14	14	13	14
Poland	5	5	5	7	8	8	17	18	15	10
Switzerland	9	12	12	13	12	12	10	10	10	10
Russia	6	7	4	7	9	12	11	12	8	9
Portugal	31	29	36	21	0	26	75	9	5	4
Other Countries	46	63	42	40	48	51	70	54	48	48
World Total	**866**	**907**	**999**	**948**	**983**	**1,110**	**1,318**	**1,246**	**1,237**	**1,177**

Appendix 2

Silver Prices, 1987 - 2007 (The Effects of Exchange Rates and Inflation)

1. Actual Prices (money of the day)

	London US$/oz	India* Rupee/kg	Thai Baht/oz	Japan Yen/10g	Korea Won/10g	China Yuan/kg	Eurozone** Euro/kg	Mexico Peso/oz
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	5.220	8,022	197.38	191	1,995	1,389	158	49.90
2000	4.951	8,002	198.61	172	1,800	1,318	172	46.82
2001	4.370	7,420	194.15	171	1,814	1,163	157	40.82
2002	4.599	7,934	197.57	185	1,850	1,224	156	44.41
2003	4.879	8,138	202.39	182	1,869	1,298	139	52.64
2004	6.658	10,606	267.79	232	2,452	1,772	172	75.14
2005	7.312	11,083	294.07	259	2,407	1,926	189	79.68
2006	11.549	17,843	437.51	432	3,545	2,958	296	125.88
2007	13.384	18,794	461.98	506	3,999	3,266	314	146.26

* 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.
** From 1986-1998, the DM/kg price is expressed in Euro/kg at the official conversion rate of 1.95583

2. Real Prices*** (Constant 2007 money)

	London US$/oz	India* Rupee/kg	Thai Baht/oz	Japan Yen/10g	Korea Won/10g	China Yuan/kg	Eurozone** Euro/kg	Mexico Peso/oz
1987	12.794	21,096	389.32	369	4,625	2,757	310	232.23
1988	11.453	23,346	343.39	302	3,574	2,162	279	166.54
1989	9.199	24,009	278.84	268	2,613	1,556	244	126.52
1990	7.667	21,955	230.16	240	2,229	1,685	180	100.27
1991	6.176	19,890	182.27	181	1,774	1,520	152	73.66
1992	5.832	19,286	169.61	163	1,728	1,441	132	63.61
1993	6.191	14,743	178.76	154	1,854	1,436	146	63.76
1994	7.393	14,859	207.05	173	2,140	2,119	171	79.13
1995	7.071	13,516	190.64	157	1,934	1,727	146	109.63
1996	6.873	13,174	183.30	181	1,923	1,588	151	96.62
1997	6.326	11,818	202.34	186	2,051	1,450	161	78.61
1998	7.052	11,937	279.51	227	3,181	1,654	184	88.58
1999	6.497	11,413	239.87	186	2,520	1,579	180	74.85
2000	5.962	10,945	237.64	168	2,224	1,494	194	64.13
2001	5.117	9,789	228.56	169	2,153	1,312	173	52.58
2002	5.301	10,026	231.15	185	2,137	1,392	170	54.45
2003	5.499	9,907	232.60	182	2,086	1,460	149	61.74
2004	7.309	12,443	299.48	232	2,641	1,917	182	84.18
2005	7.763	12,473	314.58	260	2,524	2,047	196	85.85
2006	11.879	18,980	447.25	432	3,635	3,099	302	130.87
2007	13.384	18,794	461.98	506	3,999	3,266	314	146.26

*** Derived from the actual prices shown above using consumer price indices.

Appendix 3

Silver Prices in US$ per ounce

	London Silver Market - Spot			Comex Spot Settlement		
	High	Low	Average	High	Low	Average
1982	11.1100	4.9010	7.9219	11.2100	4.9800	7.9311
1983	14.6680	8.3700	11.4301	14.7150	8.4000	11.4340
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	5.4894
1999	5.7900	4.8800	5.2198	5.7600	4.8720	5.2184
2000	5.4475	4.5700	4.9514	5.5470	4.5630	4.9691
2001	4.8200	4.0500	4.3696	4.8570	4.0280	4.3594
2002	5.0975	4.2350	4.5990	5.1250	4.2230	4.6007
2003	5.9650	4.3700	4.8787	5.9930	4.3460	4.8958
2004	8.2900	5.4950	6.6578	8.2110	5.5140	6.6871
2005	9.2250	6.3900	7.3115	9.0000	6.4270	7.3223
2006	14.9400	8.8300	11.5492	14.8460	8.8090	11.5398
2007	15.8200	11.6700	13.3835	15.4990	11.4650	13.3762

US Prices in 2007

Comex Settlement

US$ per ounce	High	Low	Average
January	13.514	12.130	12.827
February	14.690	13.327	13.951
March	13.530	12.640	13.082
April	14.058	13.293	13.734
May	13.527	12.806	13.153
June	13.757	12.210	13.086
July	13.359	12.469	12.928
August	13.118	11.465	12.274
September	13.794	12.190	12.909
October	14.377	13.250	13.696
November	15.499	13.963	14.663
December	14.797	13.826	14.358

Leasing Rates in 2007

Monthly Averages

Average	3-month	6-month	12-month
January	0.39%	0.74%	1.44%
February	0.28%	0.75%	1.49%
March	0.17%	0.60%	1.15%
April	0.13%	0.54%	1.09%
May	0.11%	0.49%	0.91%
June	0.09%	0.39%	0.69%
July	0.10%	0.35%	0.59%
August	0.21%	0.37%	0.50%
September	0.21%	0.35%	0.37%
October	0.04%	0.20%	0.30%
November	0.03%	0.19%	0.18%
December	-0.01%	0.20%	0.20%

Appendix 4

Leading Primary Silver Mines

Rank	Mine Name	Country	Company	2006	2007
				Moz	Moz
1	Cannington*	Australia	BHP Billiton	27.72	37.47
2	Fresnillo (Proaño)	Mexico	Industrias Peñoles SA de CV	33.66	33.52
3	Dukat	Russia	OJSC Polymetal	12.60	10.80
4	Uchucchacua	Peru	Compañia de Minas Buenaventura SA	9.69	9.87
5	Greens Creek**	United States	Hecla Mining Co	8.87	8.65
6	Arcata	Peru	Hochschild Mining	4.75	6.55
7	Imiter	Morocco	Société Métallurgique d'Imiter	5.98	5.41
8	Rochester	United States	Coeur d'Alene Mines	5.11	4.61
9	Tayahua***	Mexico	Grupo Carso	4.00	4.00
10	La Colorada	Mexico	Pan American Silver Corp	3.49	3.96
11	Huaron	Peru	Pan American Silver Corp	3.66	3.83
12	Alamo Dorado	Mexico	Pan American Silver Corp	-	3.81
13	Selene	Peru	Hochschild Mining	4.16	3.41
14	Lunnoye	Russia	OJSC Polymetal	2.60	3.30
15	Lucky Friday	United States	Hecla Mining Co	2.87	3.07

*reported payable metal in concentrate; **historically a silver mine, Greens Creek's primary revenue stream switched to zinc in 2006. GFMS regard this as a short term anomaly and as such have maintained its classification as a primary silver mine; ***estimate

Silver Mine Production by Source Metal

(million ounces)

	2004	2005	2006	2007
Primary				
Mexico	41.2	45.6	46.7	52.1
Australia	45.9	48.7	30.7	41.8
Peru	30.8	31.2	33.9	30.9
Other	50.9	66.6	66.5	73.3
Total	**168.8**	**192.1**	**177.8**	**198.1**
Gold				
Mexico	8.0	12.9	13.6	14.6
Peru	8.1	9.9	10.7	9.4
Chile	20.4	12.7	10.1	8.6
Other	44.4	25.5	30.0	31.5
Total	**81.0**	**60.9**	**64.4**	**64.1**
Copper				
Poland	43.2	40.0	39.9	39.1
Chile	23.1	28.7	32.9	37.1
Kazakhstan	17.7	20.5	21.4	19.0
Other	78.9	91.3	88.9	87.7
Total	**162.9**	**180.5**	**183.1**	**182.8**
Lead/Zinc				
China	42.7	46.1	54.4	59.8
Peru	44.8	45.3	48.8	54.9
Mexico	24.2	21.7	21.1	20.0
Other	88.7	85.3	82.7	78.5
Total	**200.4**	**198.4**	**207.0**	**213.3**
Other	**8.1**	**12.0**	**15.0**	**12.2**
World Total	**621.1**	**643.8**	**647.4**	**670.6**

Silver Mine Production by Main Region and Source Metal

(million ounces)

	2004	2005	2006	2007
North America				
primary	62.2	76.8	71.1	73.4
lead/zinc	37.6	28.0	28.4	28.0
copper	22.4	30.0	27.4	25.3
gold	35.9	21.4	24.0	25.2
other	6.3	10.3	13.3	10.5
Total	**164.4**	**166.5**	**164.2**	**162.4**
Central & South America				
primary	32.5	36.3	45.5	52.2
lead/zinc	59.6	58.4	63.8	71.4
copper	38.9	45.9	51.6	55.3
gold	32.2	27.1	27.3	26.5
other	0.0	0.0	0.0	0.0
Total	**163.1**	**167.7**	**188.3**	**205.4**
Asia & CIS				
primary	22.9	24.4	24.6	25.3
lead/zinc	67.1	71.8	78.9	84.0
copper	51.5	56.6	55.3	54.4
gold	10.1	9.4	10.3	10.0
other	1.6	1.6	1.6	1.6
Total	**153.2**	**163.8**	**170.6**	**175.3**
Rest of the World				
primary	51.2	54.5	36.7	47.3
lead/zinc	36.1	40.2	35.9	30.0
copper	50.1	48.0	48.8	47.8
gold	2.8	3.0	2.8	2.4
other	0.2	0.1	0.1	0.0
Total	**140.4**	**145.8**	**124.2**	**127.5**
World Total	**621.1**	**643.8**	**647.4**	**670.6**

Appendix 5

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-06	495,649	133,259	197,390	152,624	124.5	1.1	410
Feb	624,491	127,839	138,682	116,712	152.9	1.5	457
Mar	562,330	139,615	228,004	130,442	187.9	2.0	506
Apr	807,269	116,254	269,800	121,244	238.1	3.0	693
May	513,822	110,238	173,275	144,622	205.7	2.8	561
Jun	508,746	97,874	108,169	104,758	164.3	1.8	442
Jul	255,777	99,142	65,874	113,906	169.5	1.9	380
Aug	452,551	108,854	104,647	98,482	94.7	1.2	337
Sep	268,393	99,007	93,191	110,790	110.4	1.3	427
Oct	244,152	110,237	82,548	122,310	98.4	1.1	361
Nov	424,771	106,667	90,338	77,877	108.8	1.4	381
Dec	275,112	101,155	95,041	93,159	107.7	1.4	406
Jan-07	364,565	114,336	78,136	108,348	98.8	1.3	374
Feb	589,332	124,697	92,508	93,293	108.1	1.5	415
Mar	479,896	110,549	102,602	111,361	112.0	1.5	484
Apr	625,023	111,447	83,688	97,112	105.7	1.5	446
May	417,343	112,563	97,046	112,531	137.5	1.8	446
Jun	680,612	116,705	113,928	102,239	112.4	1.5	503
Jul	404,108	118,550	89,292	110,666	114.9	1.5	449
Aug	784,089	107,421	112,162	100,045	120.8	1.5	458
Sep	469,459	117,643	114,353	118,368	108.1	1.4	497
Oct	581,062	136,393	121,618	137,871	106.4	1.5	496
Nov	1,018,495	135,914	168,372	111,673	129.0	1.9	533
Dec	393,243	152,888	83,800	122,385	119.1	1.7	439

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*
2006	Q2	82.95	-	-	82.95	0.89
	Q3	104.32	-	-	104.32	1.20
	Q4	121.14	-	-	121.14	1.56
2007	Q1	131.95	-	-	131.95	1.76
	Q2	136.26	1.55	2.60	140.41	1.76
	Q3	143.54	2.56	5.11	151.21	2.06
	Q4	**150.80	12.35	9.14	172.29	2.54
2008	Q1	179.37	10.62	14.36	204.35	3.68

*Using the London price

**Due to an erroneous transaction in the last trading day of 2007, we have used the first observation in 2008 as a proxy

Source: Respective issuers, GFMS