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 2004

THE SILVER INSTITUTE

WORLD SILVER SURVEY

2004

GFMS

World Silver Survey 2004

Produced for The Silver Institute

by GFMS Limited

Philip Klapwijk
Executive Chairman

Paul Walker
CEO

Philip Newman
Analyst

Bruce Alway
Analyst

Neil Meader
Analyst

Tim Spencer
Analyst

Nikos Kavalis
Analyst

Andrew Leyland
Analyst

Consultants and other Contributors:

Laurette Perrard

Neil Buxton

Hester le Roux

Madhusudan Daga

Vitaly Borisovich

Sanjiv Arole

GFMS Limited
Hedges House, 153-155 Regent Street
London, W1B 4JE
Telephone: +44 (0)20 7478 1777
Facsimile: +44 (0)20 7478 1779
www.gfms.co.uk
e-mail: silver@gfms.co.uk

THE SILVER INSTITUTE
1200 G Street, NW, Suite 800
Washington, D.C., 20005
Telephone: (202) 835-0185
Facsimile: (202) 835-0155
www.silverinstitute.org
e-mail: info@silverinstitute.org

World Silver Survey 2004 has been kindly supported by the following companies

—MAJOR SPONSORS—

Coeur d'Alene Mines Corporation

Noranda Inc.

Industrias Peñoles, S.A. de C.V.

— SPONSORS —

Barrick Gold Corporation

Compañia de Minas Buenaventura S.A.A.

Luismin, S.A. de C.V.

Apex Silver Mines Corporation

Hecla Mining Company

Silver Standard Resources Inc.

Pan American Silver Corp.

IBK Capital Corp.

KGHM POLSKA MIEDŹ S.A.

KGHM Polska Miedź S.A.

—CONTRIBUTORS—

Academy Pioneer, LLC
Avino Silver & Gold Mines Ltd.
Compañia Minera Mantos de Oro
Excellon Resources, Inc.
Johnson Matthey, Inc.
Mitsui Global Precious Metals
New York Mercantile Exchange
Placer Dome Inc.
Tanaka Kikinzoku Kogyo K.K.

About the Major Sponsors...

Coeur d'Alene Mines Corporation

Coeur d'Alene Mines Corporation is the world's largest primary silver producer and a growing, low-cost gold producer. In 2003, the company produced 14.2 million ounces of silver and 119,000 ounces of gold at a cash operating cost of $3.25 per ounce of silver. Coeur has two of the largest silver mines in the U.S.; two expanding, low-cost mines in southern Chile and Argentina; and two major development projects, in Bolivia and Alaska. The Company also owns large land positions around its two South American mines, where major exploration is planned in 2004. Traded under the symbol CDE, Coeur's share price on the New York Stock Exchange increased by 193% in 2003. The Company's market capitalization at Dec. 31, 2003 was $1.2 billion. The company has had a consistent and ongoing policy of not hedging its silver production. As of January, 31, 2004, the Company's cash and equivalents position stood at $252 million. In 2004, construction decisions are expected on Coeur's two development projects, in Bolivia and Alaska, which have the capacity to increase silver production by 40% over current levels, and increase gold production by 89%, by as soon as 2006. At year-end 2003, silver reserves were 175 million ounces and gold reserves 1.4 million ounces.

Industrias Peñoles, S.A. de C.V.

Industrias Peñoles, S.A. de C.V. and Subsidiaries, one of Mexico's leading industrial groups since its foundation in 1887, focuses on the utilization of non-renewable natural resources. Initially dedicated to the exploration, mining, smelting, refining and marketing of non-ferrous metallic minerals, the Company today also develops and commercializes inorganic chemicals. Peñoles is comprised of 20 companies and 6,539 employees, and is the world's largest producer of refined silver, metallic bismuth and sodium sulfate, as well as one of the leading exporters in Mexico's private sector. The Company's shares have been quoted on the Mexican Stock Exchange since 1968.

Noranda Inc.

Noranda is a leading copper and nickel company with investments in fully-integrated zinc and aluminum assets. The Company's primary focus is the identification and development of world-class copper and nickel mining deposits. Noranda is also a major recycler of secondary copper, nickel and precious metals. It employs 15,000 people at its operations and offices in 18 countries and is listed on the New York Stock Exchange and The Toronto Stock Exchange (NRD).

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 page 6.

ISSN 1059-6992

ISBN 1-880936-12-7

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.

While every effort has been made to ensure the accuracy of the information in this document, 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. GFMS Ltd does not accept responsibility for any losses or damages arising directly, or indirectly, from the use of this document.

Contents

This is the tenth 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, 2004**
Hedges House, 153-155 Regent Street, London, W1B 4JE
Tel: +44 (0)20 7478 1777, Fax: +44 (0)20 7478 1779
E-mail: silver@gfms.co.uk, Web site: www.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 tonnes)
1 tonne = 32,151 troy ounces
1 tonne = 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.

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

Table Rounding:
Throughout the tables, totals may not add due to independent rounding.

1. Summary and Outlook

Looking at silver in 2003, it would appear that all the fun came at the end of the year (with the party carrying on well into the first half of 2004). This much is clear from the fact that the intra-year price jumped by a vigorous 26%, while the year-on-year rise in the annual average to $4.88 was a comparatively more modest 6%.

The annual data, presented in Table 1 below, hints at the supply/demand shifts that eventually produced the fourth quarter rally, although it was changes in these variables during the year that arguably had the greatest influence on prices in 2003.

For example, the 1.6% year-on-year rise in fabrication demand was very much skewed towards the final months of the year. This is especially true for its largest component, industrial applications, where demand has continued to grow strongly in 2004, notwithstanding the considerable spike in the silver price. This is a reflection of the lack of price sensitivity of most fabrication demand, particularly in the short run. (The one major exception to this rule is the Indian silver jewelry and silverware market - the world's largest - where offtake did recently suffer from $7-plus metal.)

The other factor operating on the demand side last year was producer de-hedging. We suspect, however, that the reduction of 21.0 Moz (653 t) in mining companies' global hedge book had relatively little impact on the price. A good reason for believing this is that de-hedging accounted for just 2.4% of total demand last year. This compares to 7.5% in the case of the gold market, where the reduction in producers' positions clearly was a material factor, especially as this was concentrated in the first half of 2003.

The other, potentially at least, important demand variable in silver is investment. However, last year the annual data shows that investors featured, though barely, on the supply side. In GFMS' view, given the size of the number (10.4 Moz or 323 t), this can better be interpreted as indicating neutrality than anything else (and for the third year in a row, we would venture). Investment, however, is the best example of intra-year variability among all of the supply/demand variables. This point is important because of the contribution investor/speculator demand for the metal made to the end-year rally. (Its growth was yet more rapid in the first few months of 2004, when it became very much the main driver of silver prices.)

Turning to silver supply in 2003, its largest component, mine production, was for third year in

Table 1
World Silver Supply and Demand
(Million ounces)

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Supply										
Mine Production	451.0	479.2	488.5	523.1	543.7	542.7	582.0	598.8	596.4	595.6
Net Government Sales	17.6	25.3	18.9	-	40.9	95.2	77.1	86.1	61.2	82.6
Old Silver Scrap	152.0	162.9	158.3	169.3	193.9	181.2	180.4	182.4	186.8	191.6
Producer Hedging	-	7.5	-	68.1	6.5	-	-	18.9	-	-
Implied Net Disinvestment	146.9	93.7	145.3	83.1	44.3	66.7	97.9	-	26.2	10.4
Total Supply	**767.6**	**768.6**	**811.1**	**843.6**	**829.4**	**885.8**	**937.4**	**886.1**	**870.7**	**880.2**
Demand										
Fabrication										
Industrial Applications	281.8	295.7	297.7	320.8	316.4	339.2	375.4	337.4	341.4	351.2
Photography	202.9	209.9	210.1	217.4	225.7	228.2	221.9	213.5	205.7	196.1
Jewelry & Silverware	227.9	236.9	263.7	274.3	259.4	273.3	279.9	288.8	265.9	276.7
Coins & Medals	45.2	26.1	25.2	30.4	27.8	29.2	32.8	31.1	32.8	35.3
Total Fabrication	757.7	768.6	796.8	842.9	829.4	869.8	910.0	870.7	845.8	859.2
Net Government Purchases	-	-	-	0.7	-	-	-	-	-	-
Producer De-hedging	9.9	-	14.3	-	-	16.0	27.4	-	24.8	21.0
Implied Net Investment	-	-	-	-	-	-	-	15.4	-	-
Total Demand	**767.6**	**768.6**	**811.1**	**843.6**	**829.4**	**885.8**	**937.4**	**886.1**	**870.7**	**880.2**
Silver Price (London US$/oz)	5.285	5.197	5.199	4.897	5.544	5.220	4.951	4.370	4.599	4.879

succession broadly unchanged year-on-year. Mine production though is like the proverbial supertanker - it takes time to turn but when it does, its impact can be massive. That much is clear when looking back ten years, where the data shows that output was well over 100 Moz lower than the average of the last three years. In the absence of this increase, silver prices would now undoubtedly be higher. Nevertheless, higher prices for silver, gold and base metals are not expected to lead to any meaningful rise in output this year at least.

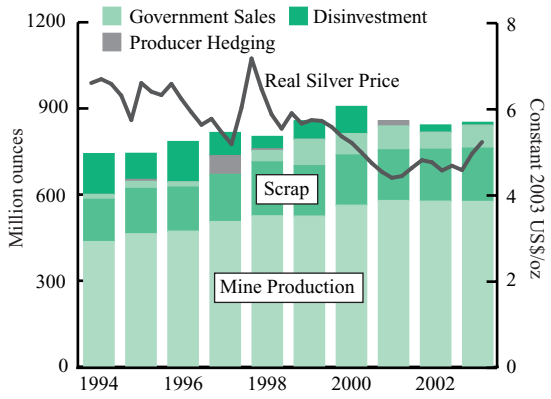
A longer run perspective on supply is also instructive when it comes to government stock sales. These have become an important feature of the market since 1998 and last year's 82.6 Moz (2,570 t) contribution to supply was significant. China remains by far the largest official seller but we would question whether its silver treasure trove is unlimited. Any diminution of Chinese sales or perhaps - as has become clear in recent months - a flexible policy with regards to price would undoubtedly help silver's cause.

Scrap supply increased marginally in 2003 but of greater interest looking forward has been its lack of responsiveness to higher prices, even in 2004 - a notable difference with gold, stemming from the very different composition of the above-ground stock of fabricated products in the two metals.

It would seem therefore that the key variables looking over the rest of 2004 for the price will be fabrication and investment demand and government stock sales. The latter is most unlikely to increase from its 2003 level and, as hinted above, could well decline. Fabrication demand we suspect will continue to provide support for the price as long as the upswing in global industrial production continues, something that, in GFMS' view, may however be a little less certain towards the end of the year if our expectations of renewed economic weakness are correct.

Taken in isolation, a reversal in the economic cycle might be expected to push down silver prices. But that would be to ignore the positive impact of potential investor demand for the metal under such circumstances. Investors and speculators have shown over recent months what a relatively small inflow of cash is capable of achieving in the silver market. It is probable therefore that, while it will continue to be a highly volatile element, investment will help support prices this year at levels above those they would otherwise revert to, basis the interplay of the other supply/demand variables alone.

World Silver Supply



Supply

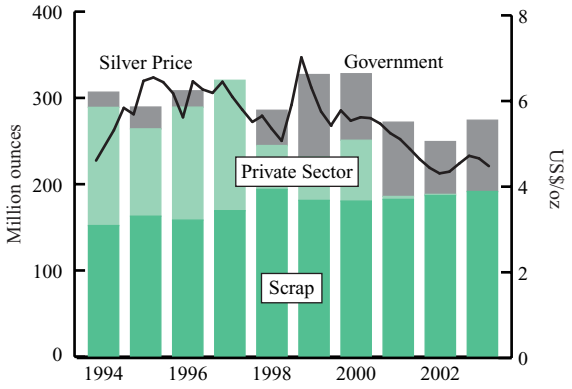
- Total supply increased by 1.1% in 2003, to reach 880.2 Moz (27,376 t)
- Global mine production slipped 0.1% or less than 1 Moz (26 t) to 595.6 Moz (18,525 t). The biggest gains were recorded in Russia, Poland and Chile while the largest decline was measured in Australia.
- Scrap supply rose by 2.6% to 191.6 Moz (5,958 t).
- Net official sector sales rose by a hefty 35% to reach 82.6 Moz (2,570 t).
- Implied net disinvestment continued but at a much reduced and still modest level (10.4 Moz or 323 t).

Total silver supply rose slightly in 2003, primarily because of higher scrap and official sector selling. The 1.1% increase totaling 9.5 Moz (296 t) follows two years of falling supply. During 2001 and 2002, total supply dropped by a combined 67 Moz (2,077 t).

Mine production declined a fraction in 2003 to reach an estimated 595.6 Moz (18,525 t). The modest 0.8 Moz (26 t) cut in output, which represented the second consecutive drop in annual mine supply, was due to sharp declines recorded in North America and Oceania. In the CIS, Europe, Latin America, Asia and Africa, production actually increased.

In absolute terms, Australia, the world's third largest producer, posted the most significant decline with output down 10% year-on-year. Double-digit losses were also recorded in the United States, where lower grades, operational difficulties and closures adversely impacted output. Mine closures also played a part in the 3% and 7% declines respectively measured in Mexico and Canada. These combined with the losses

Mobilization of Above-ground Stocks



in the United States saw North America's combined output scaled back by a noteworthy 10.8 Moz (334 t) year-on-year.

Offsetting the falls described above, the start-up of the primary Dukat mine in the fourth quarter 2002, helped boost Russia's silver output by a noteworthy 39% year-on-year. In Europe, improved production was primarily due to an increase in secondary silver produced at Poland's KGHM's copper mines, whilst the new Dikulushi copper-silver mine in the Democratic Republic of Congo produced 1.1 Moz (34 t) and contributed the bulk of the rise measured in Africa.

Good growth was also recorded in Chile, last year's sixth largest silver producer, where results were boosted by improved output at Cerro Bayo/Martha, in its first full year of operation, and at copper mine Escondida. Elsewhere on the continent, modest gains were recorded in Peru and Bolivia.

An analysis of silver production by source metal reveals that silver generated as a by-product of lead-zinc and gold mining declined year-on-year by an estimated 4% and 5% respectively. Primary silver output, on the other hand, increased its share of global mine production from 28% to 30%, whilst copper's share edged up from 25% to 26% of world mine supply.

Scrap supply increased by 2.6% to 196.1 Moz (5,958 t) with the largest increases recorded in India and Germany. Scrap from the former soared by 40% year-on-year whilst a gain of 14% was measured for the latter. Conversely, a 7% fall in photographic offtake in the United States largely explained the 2.3% fall in that country's scrap supply.

Net government sales rose sharply last year, climbing by 35% or 21.4 Moz (667 t) to reach 82.6 Moz (2,570 t). The increase more than reversed the 29% fall recorded in 2002 with China being largely behind both the decline in that year and the rise in 2003. Much of the remaining 2003 sales comprised the disposal of old coins by several European countries.

In line with 2002, a minimal amount of **implied net disinvestment** was recorded last year. In fact the quantity measured only 10.4 Moz (323 t), less than half that recorded in 2002. It should be noted that the implied net investment/disinvestment number is a residual figure and should be treated as indicative rather than definitive. To put 2003 in perspective, this category represented 1.2% of total supply last year and the 2003 figure only around 10% of the average annual net implied disinvestment number recorded between 1994 and 2000.

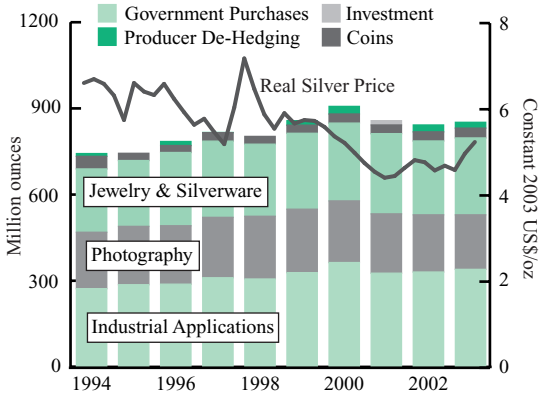
Demand

- Total fabrication in 2003 rose a modest 1.6% to 859.2 Moz (26,723 t).
- Jewelry and silverware bounced back from 2002's fall with growth of 4.1% to 276.7 Moz (8,605 t).
- Industrial offtake continued its recovery, increasing 2.9% to 351.2 Moz (10,923 t).
- Photographic demand, however, saw a further decline, with a 4.7% fall to 196.1 Moz (6,098 t).
- Coin fabrication enjoyed strong growth of 7.5% to 35.3 Moz (1,097 t).
- De-hedging remained a feature of the balance with its 21.0 Moz (653 t) contribution to demand.

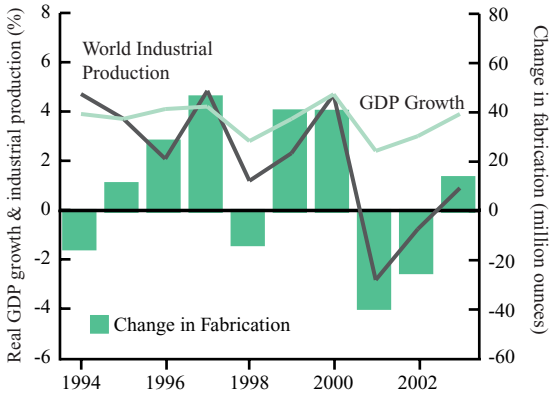
Total fabrication demand rose a slight 1.6% in 2003 to 859.2 Moz (26,723 t) as the turnaround in the jewelry sector, a continuation of the recovery in industrial offtake and quite robust gains for coins were countered by further losses in photographic demand.

The nascent global economic recovery fed through to a modest (2.9%) rise in **industrial demand** (the largest component of overall fabrication) to 351.2 Moz (10,923 t). This represented a continuation of the previous year's recovery but the bursting of the electronics bubble has yet to be made good with the totals achieved remaining well below their peak in 2000 (375.4 Moz or 11,675 t). Nonetheless, it was the electronics segment that accounted for much of the gain in 2003, rising 4.9% to 147.2 Moz (4,578 t).

World Silver Demand



Fabrication Demand and World Economic Indicators



Much of these gains were to be found in East Asia with higher end use in its telecoms, IT and automotive industries. The bulk of the growth in overall industrial fabrication also retains an East Asian focus, with China responsible for a fair part of the gain as its booming economy feeds through to growing demand for silver brazing alloys and so forth.

There was also good industrial demand growth in the United States, with much of the increase occurring in the latter months of the year. Concerns remain, however, that this increase just represents a refilling of a much depleted pipeline rather than any true pick up in end user offtake. An important contributor to the industrial total's solidity was that Indian offtake held steady rather than suffering a slump as seen in 2002.

The stability of Indian **jewelry and silverware** fabrication (compared to its 24% slump in 2002) in the face of a price rise also helps explain the useful 4.1% rise in the global figure for this category to 276.7 Moz (8,605 t). Much of the rise in fabrication occurred in Thailand and then China but the chief explanation of their gains was robust jewelry consumption elsewhere, especially in Europe and North America (the increase in French consumption, for example, was almost into double digits). This growth is largely a function of silver having fashion on its side and being in favor with key designers and brands, particularly at the youth end. Silver jewelry also performed quite well in markets where consumer confidence has been weak as a result of its low cost compared to gold.

Silverware fabrication again appeared to have fared less well than jewelry in 2003 though there were some signs that the secular slide in many key markets was slowing if not as yet bottoming.

The decline in **photographic** fabrication accelerated a fraction to 4.7% in 2003, cutting offtake to 196.1 Moz (6,098 t). The majority of the fall occurred in Japan and the United States as Europe benefited to a degree from an inward corporate transfer of capacity. The global decline was chiefly due to two main developments. Firstly, fears over terrorism, SARS and many countries' sluggish economic growth had negative consequences for international tourism, which fed through to reduced opportunities for camera use. Secondly, there were further inroads from digital technology, principally in the developed world. Indeed, growth in conventional photography in parts of the developing world helped minimize the overall impact of digital technology. A further point for consideration is that the fall in the demand for fresh bullion from photography would have been less than the decline in fabrication. This is because there was a notable fall in photographic scrap in many countries, the flip side of a smaller silver halide cycle.

Coin fabrication rose a robust 7.5% to 35.3 Moz (1,097 t) in 2003. Offtake in the United States (the largest fabricator) slipped a little but this was outweighed by growth in the second biggest, Germany.

The net 21.0 Moz (653 t) decline in the delta-adjusted hedge book meant that last year **producer hedging** appeared, once again, on the demand side of the market balance. A 42% cut in forward sales was responsible for the decline as the adjusted options book, in contrast, was moderately higher year-on-year. The bulk of last year's fall was achieved through producers delivering into scheduled forward positions without doing any fresh hedging. Where new hedging was completed, it was mainly in the form of purchased puts and sold call options, with the bias towards the former.

2. Silver Prices

- Silver prices in 2003 averaged $4.88, up 6% year-on-year but a stronger 26% intra-year.
- A surge in investor interest (especially in the latter part of 2003 and even more so into 2004) drove much of the increase though higher fabrication also helped. A jump in government sales restrained the rally.

Silver prices ended 2003 on a buoyant note, achieving their high for the year ($5.965) on the last trading day and so bringing about a strong 26% intra-year gain. The market's increase in 2002 also means that, by end-2003, the price had risen almost 50% on the November 2001 trough of $4.05.

It is easy to forget how late last year the recent rally got underway (sub-$5 levels still being posted in early November) and that, for much of 2003, prices were rangebound between $4.50 and $5.00. It should therefore come as little surprise that the annual average price last year only rose 6% over 2002 (a far less impressive move than the 17% increase that gold saw, let alone the 28% jump that platinum experienced).

There is also sobering value in placing last year's annual average, $4.88, into a historical context. This price, in real terms, was the lowest, barring 2001 and 2002, since World War II, illustrating the depths to which silver had sunk in the early 2000s. Price volatility for the year as a whole was also fairly subdued historically and even the fourth quarter figure (the most volatile quarter in 2003) was far from extraordinary.

Silver prices in terms of other currencies showed a clear, typical pattern of gains being smaller than in dollar terms (for example the mere 3% rise in the

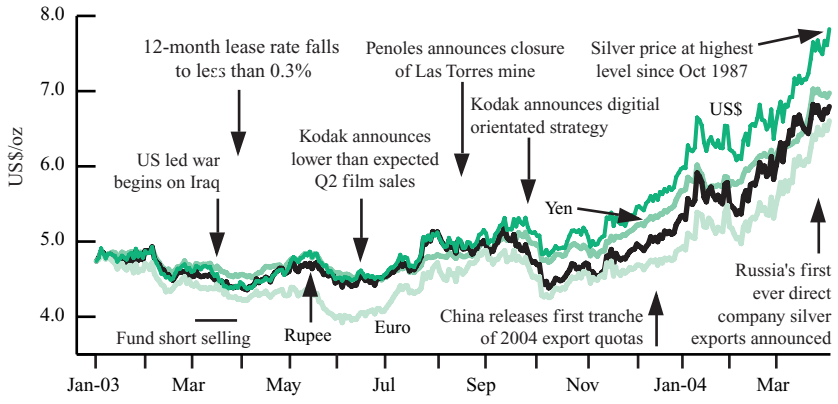
US$ Silver Price

	1973	1983	1993	2003
Annual Average	2.546	11.430	4.313	4.879
Maximum	3.256	14.668	5.420	5.965
Minimum	1.956	8.370	3.560	4.370
Range:Average	51.1%	55.1%	43.1%	32.7%

The Silver Price in Other Currencies in 2003

	US$/oz	Euro/kg	Rupee/kg	Yen/10g
Annual Average	4.879	138.6	8,138	181.4
Change y-o-y	6.1%	-11.6%	2.6%	-1.9%
Maximum	5.965	152.0	9,575	205.5
Minimum	4.370	121.6	7,580	167.9

London Silver Market: Spot Price
US$/oz; other currencies reindexed to 2nd January 2003



rupee price) or, in some cases, actually falling (the case importantly for the yen and euro price). The main outlier was the Mexican peso price, which rose 19.3%.

Lease rates last year saw two distinct phases. The first (from January to late July and coinciding with the period of rangebound prices) saw depressed but stable rates in force, save for a brief spike in mid/late February. The 3-month rate, for example, in the first seven months of the year averaged just 0.2% in comparison to the 2002 average of 0.9%.

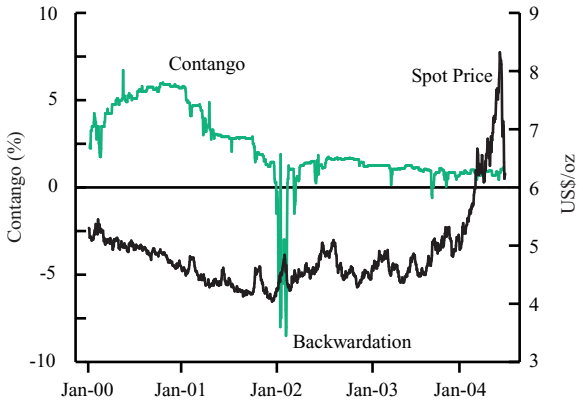
The second phase (the rest of the year) saw much higher and more volatile rates. Perhaps a little strangely, this pattern was slightly more marked in the initial months of the phase, rather than towards the end when prices were beginning to take off. Illustrating both points, the 12-month rate averaged 1.0% in the final five months of 2003 against just 0.4% in the first seven, having peaked in August at 1.9%.

Market Analysis

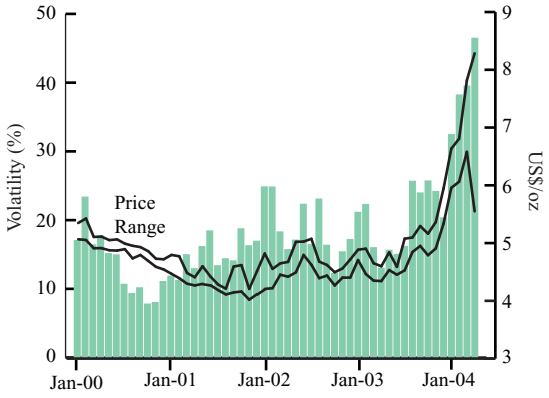
Price movements in 2003 were driven by three main factors; a surge in investment, a rise in fabrication and higher government sales. Their interaction chiefly involved a counterbalance between the latter two with investors engaged initially in a more two-way trade, leaving prices rangebound. This broadly lasted until the fourth quarter when investors switched more aggressively and uniformly to the buy side, triggering the rally that carried on through into 2004.

It may come as some surprise that investor action should be cited as the main basis for 2003's price gains when the supply/demand balance still shows implied

London Spot Price and 3-month Contango



Daily Silver Price Volatility
Based on London fixings (20-day rolling average)



net *dis*investment. Two points, however, need to be considered concerning this residual. Firstly, the scale of disinvestment in 2003 was far smaller than in 2002. Secondly, much of the inflow of funds occurred quite late in the year, with the full 2003 figure picking up earlier periods of selling back (which helps explain why the intra-year price gain was so much stronger than the year-on-year). A clear example of interest not being one way was the heavy selling seen on Comex during February/March, May and even October.

Much of the investor interest since the beginning of 2003 has been short term and speculative, with little evidence of more strategic, buy-hold activity. This helps explain the volatility of their interest, with heavy fund selling the driving force behind the implosion of the Iraq war premium in the first quarter of 2003. Perhaps more important was the mass entry into the market by trend followers in February/March this year and their wholesale exit in April, which were the prime causes of the recent dramatic $2 rise and fall in prices.

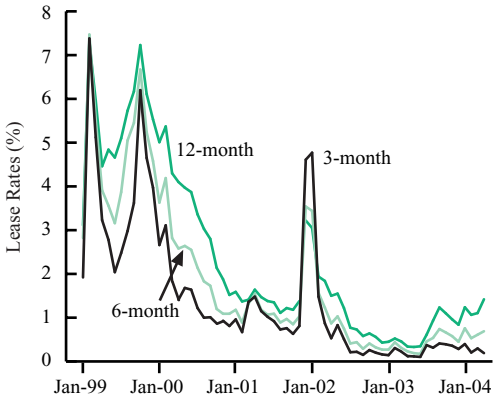
While remaining generally speculative, there was a change in emphasis as regards investor motivation as

Volatility (US$ price) - Annual Averages*

	2000	2001	2002	2003
Rolling 20-Day	13%	15%	18%	20%
Implied vol 1 Month	17%	17%	21%	22%
Rolling 250-Day	19%	13%	18%	18%
Implied vol 1 Year	18%	16%	18%	19%

*Implied volatilities: UBS; Rolling volatility calculated basis London fixings

Silver Leasing Rates



the year progressed (and a shift in focus to the OTC market) as the fourth quarter rally had a degree of fundamental backing. Investors then were inspired by signs of an acceleration in the global economy and a belief that commodity prices in general would front run this recovery, especially if the booming Chinese economy was in strong need of the commodities in question. It was this that helped fuel the pronounced rise in base metal prices. The gold rally had different investor motivations, chiefly economic and political insecurities, but both sets of drivers spilled over into the silver market. It may be of note that silver prices at end-April 2004 were roughly comparable to those in January this year at the tail end of the general commodity boom but before the trend followers' less warranted spike.

Given the modest nature of its increase in 2003, it might be assumed that fabrication's contribution to the rally was slight. However, three key points should be noted that give this factor greater significance. Firstly, fabrication is typically quite price inelastic (certainly much less so than gold). This is largely the result of a higher percentage occurring in industrialized countries (Europe, Japan and the United States accounted for 60% all fabrication for silver but just 32% for gold in 2003) in sectors where the price of silver can almost be irrelevant in the short term. This relative inelasticity meant the fourth quarter rally could coexist with growing offtake due to the general rise in industrial production.

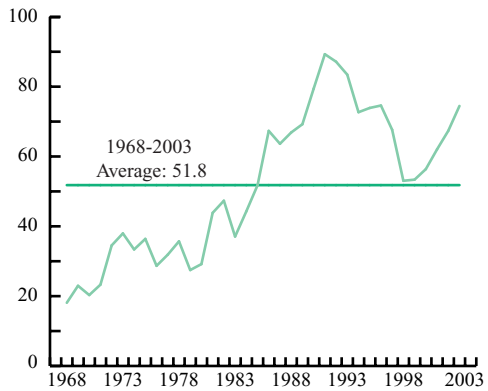
Secondly, fabricators' call on fresh metal is likely to have risen by more than 2% as a good portion of the loss in photographic offtake last year would have been matched by a probable fall in photographic scrap. Lastly, a pick up in physical demand on any price dip must have added a fair degree of stability to prices.

With higher fabrication and investment rising during the year, people might have expected that prices would have increased by more than the 6% rise in the 2003 annual average. That this did not happen was to a large degree due to the 35% rise in net government sales (the largest single absolute change in the supply/demand balance). Once again, the bulk of such disposals came from China. During 2003, market reports often claimed that sales from this source were slacking despite the price rise, yet these disposals are estimated to have risen by almost 10 Moz (around 300 tonnes). Part reason for the discrepancy is that there was a small volume of additional option-related sales from stocks. The perception of sluggish sales must have helped prices while the reality of their actual increase could undermine levels.

There was also a rise in scrap in 2003 yet the modest nature of the gain at under 3% (largely a function of a fall in many countries' photographic scrap) meant this element of supply did little to restrain the rally.

As is usually the case, mine supply had a minimal impact on prices last year. This remained a product of the very slow pace of change in mine output; 2002 and 2003's levels were just 0.1% different and the change in 2004 is expected to be small. Miners' influence via hedging was also slight as this netted out at a mere 21.0 Moz (653 tonnes) of de-hedging last year or an insignificant 2% of total demand (compared to 7% for gold) and little alteration is forecast for 2004.

The Gold/Silver Price Ratio



Silver, Gold and Base Metal Prices

This focus box looks into the linkages between the silver price and the price of gold, as well as some of the members of the base metals complex.

Our research indicates that, over the past 28 years, the prices of gold and silver have had a fairly high correlation, though this has been declining over the last 20 years. The accompanying chart shows the evolution of the correlation between changes in daily prices since 1979. The declining trend over most of the 1980s and 1990s is clearly visible, with some years even showing a negative correlation between changes in the two prices.

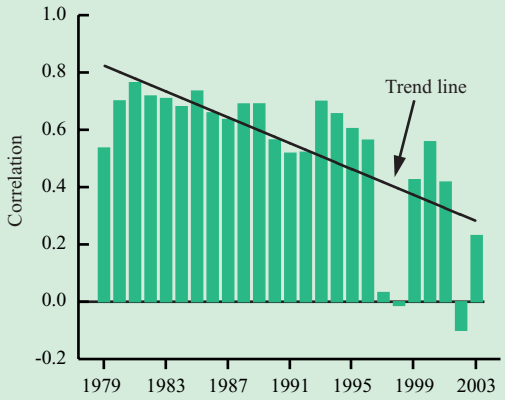
However, in terms of the price drivers in both markets, a rudimentary examination of their fundamentals highlights significant differences. Whereas gold is primarily an adornment and investment commodity, the bulk of silver demand is driven by industrial and photographic use. Furthermore, viewed as an investment commodity, gold would be expected to behave differently because of its "safe haven" status. Silver offtake, by contrast, has little in the way of "safe haven" characteristics and its price is heavily determined by the industrial economic cycle. Given that the price drivers are so different, one would not expect their prices to be strongly related.

Looking at daily gold and silver prices and performing the relevant statistical tests, one can see that from the early 1990s onwards, whereas the gold price seems to be a stationary time series (a series which converges to constant long-term average), silver is a non-stationary one. This suggests that, at least for recent years, there is no strong evidence of a long-term statistically meaningful relationship between the two series (at least not a straightforward one). During other periods nevertheless, the opposite can be observed, indicating that whatever relationship might exist between the prices of the two metals, it does not seem to be constant over time.

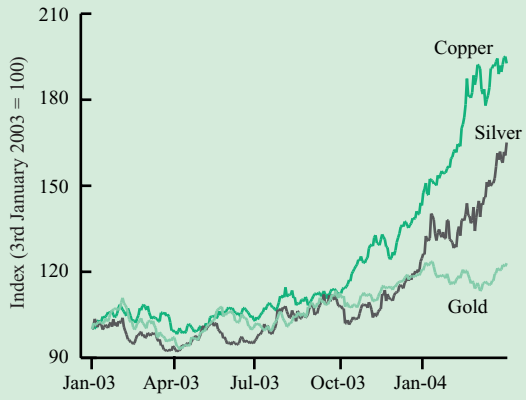
Similar conclusions can be drawn when looking at the relationship between the silver and some of the base metals (essentially industrial goods, their markets thus being driven by factors similar to silver's). Looking at the price of copper, for example, it has demonstrated a correlation with that of silver for the past five years. For most of the period, this correlation has been positive, even though 2000 saw the two prices move in opposite directions. The level of this correlation, just as the case was for gold, has varied, 2001 and 2003 being the years where it has been highest. Finally, further analysis of the statistical properties of the two series failed to provide evidence that could support any conjectures of a straightforward relationship between the two prices.

In conclusion, statistical analysis of the price pairs, as well as other research GFMS have made on the drivers of the silver price, including the continuously updated "GFMS Silver Forecast" (based on a historical analysis of supply and demand conditions as well as prices), indicate that the evidence available suggests that the silver price cannot be predicted by changes in prices of some of the other metals.

Correlation of Gold and Silver Prices



Precious Metal and Copper Prices



3. Investment

- Investor interest picked up strongly from the third quarter onwards before rocketing in December and, particularly, the first quarter of 2004. Silver benefited initially from growing interest in gold and later in the year also from the increased flow of funds into commodities as an asset-class.
- Most demand was highly speculative in nature, with from the end of the year through into 2004 a significant trend following element, in some cases consisting of investors taking substantial positions in the metal in the expectation of double-digit silver prices.

Overview

Looking back at the performance of the price over the first few months of 2004, it is tempting to concentrate on just one variable, investment demand (and later supply) to explain developments in the silver market. However, assessing the entire period from January 2003 through to April 2004 a more complex picture emerges. Investor activity was certainly a key factor behind price movements during most of 2003 for instance, but until the end of the year, this tended to be within a range that was limited at its extremes by the interplay of the other supply/demand variables.

In early 2003, we already saw evidence of fund activity in the market but this was highly speculative in nature and rather short-lived. The run-up to the invasion of Iraq saw, e.g., Comex long positions rise to peak in early February (to a large extent this move was led by gold), but then melt away to end the quarter with funds actually marginally net short the white metal. It was a similar story in the second quarter, when buying by commodity trading advisors (CTAs) and other short-term speculators was the driving force behind the modest rally in May. Once again, the investment demand that occurred was to a large extent either of the trend following variety or, alternatively, other funds range trading; going long below say $4.60 and selling out of, or even shorting, the metal as it moved into the $4.80s. (The latter strategy had worked well, certainly since 2002, when coming off its lows, the price had since then oscillated within a fairly well defined channel.)

Silver Price and Investment Indicators

	2002 Average	2003 Average	Change y-o-y
Silver Price	4.599	4.879	6%
Contango (3-mth annualized)	0.93%	0.95%	n/a
US$ Libor (3-mth annualized)	1.79%	1.21%	n/a
S&P 500 Index	994	965	-3%
CRB Index	211	242	14%
XAU Index	69	83	20%
World Inflation	3.4%	3.6%	n/a
World GDP	3.0%	3.2%	n/a

An important point worth making about silver investment demand, at least during the first half of 2003, is that although it was often led by gold, unlike the yellow metal, there was little evidence of what might be termed “strategic” or, longer-term, purchases based on fundamental, as opposed to merely technical or short-term trading signals. Arguably, this state of affairs began to change in the third quarter when an improvement in industrial demand for silver encouraged greater buy-side interest.

Indeed, at this time a brighter outlook for the global economy and, in particular, industrial production saw manufacturers’ demand for a raft of commodities pick-up, with this in turn encouraging a wave of speculative interest in metals and energy - much of it based on the boom in demand for raw materials in China. Silver, while at this stage not in the vanguard, was certainly a beneficiary of the thirst for alternative investments and the push by hedge funds into base and precious metals.

Already by the end of July speculative buying had seen the key $5/oz level breached on several occasions. For the next few months, silver traded either side of $5, a new range that seemed to be supported by somewhat better fabrication demand and an undoubted uptick in their commitment to the metal, at least in the short term, from speculative funds. It was in December though that investment demand appeared to move up several gears and in the process drive the price to successively higher levels, $6/oz almost being reached by year-end. We would argue that already at this point investment or speculative demand, as referred to in the opening paragraph of this Chapter, had fully taken over the running.

This was certainly apparent from January 2004 onwards when investors piled into the metal in a way not seen since the Buffett-inspired rally in early 1998. At this stage, our information is that the focus of investor demand had to a significant extent shifted away from the Comex. This is partly something that can be deduced by the fact net long non-commercial open interest on Comex (the best proxy for funds’ positions) first stabilized and then began to fall away a little before the end of the quarter, while the price

London Bullion Market (LBM) and Comex Turnover
(daily averages)

	LBM No. of Transfers	Turnover Moz	Comex Turnover Moz	LBM/ Comex Ratio
1997	550	294	95	3.1:1
1998	504	248	82	3.0:1
1999	405	185	83	2.2:1
2000	256	116	63	1.8:1
2001	241	108	52	2.1:1
2002	241	87	63	1.4:1
2003	233	92	82	1.1:1

World's 10 Largest Commodity Trading Advisors, 2003*

	CTA Assets (US$ billion)	
	2002	2003
Campbell & Co	3.7	6.2
Graham Capital Mgt	2.3	5.2
Quantitative Financial	1.5	2.8
FX Concepts	0.6	2.3
John W. Henry & Co	1.3	2.2
Sunrise Capital	1.1	1.8
Transtrend	0.6	1.7
Crabel Capital Mgt	0.7	1.5
Grinham Mgd Funds	0.8	1.3
Rotella Capital	0.8	1.3

World's 10 Largest Hedge Funds, 2003*

	Fund Equity (US$ billion)	
	2002	2003
Vega Asset Mgt	1.5	7.2
Orbis Investment Mgt	4.0	6.8
Millennium Intl Mgt	3.7	4.3
Elliott Mgt Corp	3.0	3.7
Carlson Capital	3.4	3.3
Marshall Wace Asset Mgt	1.9	2.9
Staro Asset Mgt	2.1	2.9
III Associates	1.8	2.9
Ellington Capital Mgt	2.1	2.7
King Street Advisors	2.6	2.4

*Source: Managed Account Reports, 2004
All figures refer to end-December. Data is based solely on entities reporting to the CISDM database.

continued to advance very powerfully, eventually reaching its peak (in London) on April 2nd at $8.29. In addition, there is strong evidence of fund and some private investor buying of large amounts of physical metal loco-London during the first quarter. Certainly there were reports of vaults in the British capital being full of silver, partly because fabrication demand had collapsed but also, in large measure, because of a build-up in investors' holdings. The move by investors into silver (which at the time of writing seems to have in large measure been reversed), it must be said, was primarily based on the belief that a double-digit price was achievable over a relatively short run. In other words, the first quarter saw a classic speculative bubble (that burst in early April). Of course, investors could and did use a variety of arguments to justify their belief that $10 or $12 silver was attainable. These included: the improving supply/demand fundamentals for the metal; reduced supply from above-ground stocks, especially from official Chinese sources; the belief that the silver:gold ratio would converge towards its long term average etc. A number of these claims, in fact, were basically correct (if exaggerated) but, even so, hardly justified sustainable $7 or $8 prices, let alone still higher levels. Nevertheless, at the beginning of May, silver was still trading at, or close to, the $6 mark, an indication that investor interest in the metal remained at above-average levels.

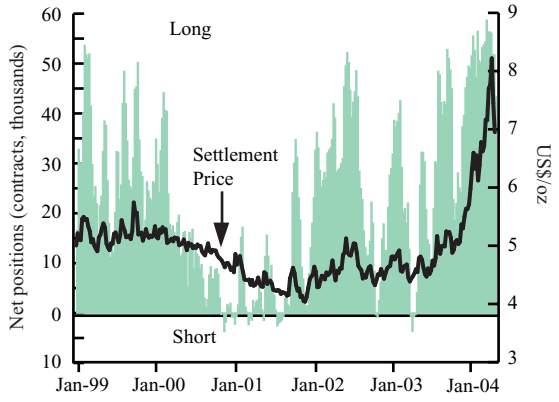
Comex

Driven to a great extent by speculators, activity in Comex silver futures in 2003 showed marked increases compared to the levels seen in 2002. The general climate of economic and political instability, favoring investment in "alternative" products, was very beneficial in terms of generating inflows of investor dollars into commodities in general, including the precious metals complex.

More specifically, turnover for the year, at 4,116,475 contracts (equivalent to 20.6 billion ounces) was up over 31% on the previous year's levels. Average daily turnover and open interest showed increases of 31% and 16% respectively, with the former reaching 16,466 contracts (equivalent to over 82.3 Moz) and the latter settling at 94,622 contracts (equivalent to 473.1 Moz). The 58,528 contract annual high for turnover in late November was last exceeded in February 2000, whereas the high for open interest, at 117,250 contracts had not been reached since as far back as August 1995. Both records were breached in the first few weeks of 2004, as a phenomenal upsurge in investment drove the silver price first over the $7 mark, and subsequently over the $8 one.

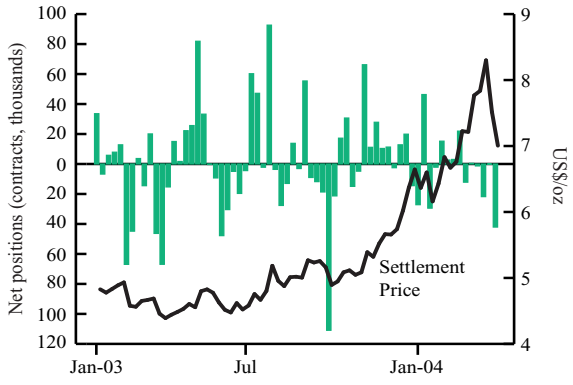
Looking at CFTC reports on non-commercial net positions in futures as a proxy for speculative fund activity, we notice that funds remained net-long for

Comex: Non-commercial Net Open Interest
Weekly Net Positions and Settlement Price



Source: CFTC

Comex: Non-commercial Net Open Interest
Changes in Weekly Net Positions



Source: CFTC

most of 2003. The net position moved around levels similar to the relatively high, historically, levels of 2002, averaging at a net long of over 29,000 contracts (equivalent to close to 146 Moz). Looking at the evolution of the net position over the year, one can see a rather volatile path, driven by a number of long and short liquidations and expansions. The year's high in early September was 52,810 contracts (equivalent to 264.1 Moz), a level unsurpassed since February 1999. The last few weeks of 2003 saw increased activity with an end-year net long of 51,525 contracts.

Tocom

As in 2002, last year saw an increase in activity on the Tocom. Average daily turnover rose by 26% to 4,776 contracts (equivalent to 9.2 Moz), while average open interest managed a more modest 5% rise to just under 21,000 contracts (equivalent to over 40 Moz).

For most of the year, daily turnover was within a 2,000-7,000 contract range, very rarely breaching the 10,000-contract mark. The peak in activity, daily turnover reaching 14,961 contracts (equivalent to 28.9 Moz) took place on July 25th, one day after the London fixing price crossed the $5 barrier. Open interest peaked soon after, at 32,347 contracts (equivalent to 62.4 Moz). The year ended with open interest at a healthy 21,753 contracts. The stronger finish to the year was followed by a surge in activity on Tocom in the first few months of 2004, as the silver price kept breaching multi-year highs.

OTC Market

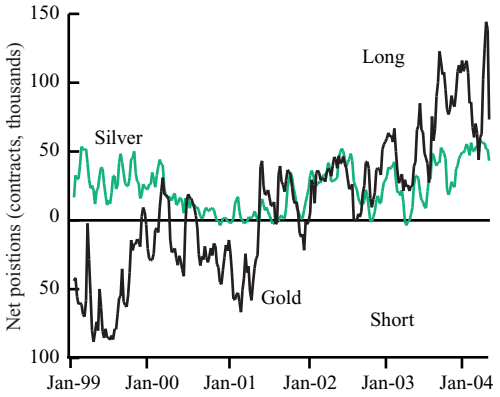
Although there are no hard statistics to go by, anecdotal evidence points to an upsurge in Over-The-Counter (OTC) market activity last year, particularly towards year end and, even more so, in the first few months of 2004. This upsurge in demand for OTC products was mostly from hedge funds, although some high net worth private investors were also involved. For the most part investors were seeking exposure on the long side via forwards, OTC options and also outright purchases of mostly loco-London spot metal. As indicated above, this demand reached a climax towards the end of the first quarter of 2004. Since then, activity has certainly diminished, though neither has it come down to year-ago levels. Evidence of the physical market impact of this investment demand - a good part of it through dealers' delta hedging - could

Net "Fund" Position on Comex

		Contracts	Moz	Price
1999		30,153	151	5.21
2000		13,162	66	4.98
2001		7,284	36	4.37
2002		27,372	137	4.61
2003	Q1	26,593	133	4.68
	Q2	14,442	72	4.59
	Q3	39,246	196	4.97
	Q4	35,357	177	5.32
2004	Q1	53,922	270	6.79

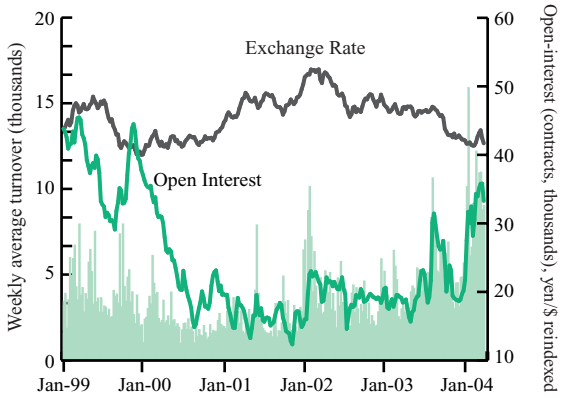
(period averages for non-commercial net futures position, Moz equivalent and settlement price)

Comex: Non-commercial Net Open Interest
Weekly Net Positions



Source: CFTC

Tocom Futures Turnover and Open Interest



be seen in the associated build-up of loco-London bullion stocks.

Exchange Listed Structured Products

GFMS have identified an increasing amount of activity last year in exchange listed structured products as a medium of exposure some investors sought to precious metals. This trend most certainly included a growth in demand for silver warrants and certificates, even though the market is of a smaller size than its gold equivalent, with less than half the total number of products available than in the yellow metal. For instance, at the time of writing, in Germany, the largest market for such exchange listed derivatives, 240 warrants (essentially standardized vanilla options) on silver can be identified. The number of silver certificates available in the same market was 53 issues. The latter included a variety of different products, including price trackers of different types, as well as a number of products structured like knockout options, which in fact constituted the majority of silver certificates available. As with exchange listed products on other metals, the silver ones are also all cash settled.

Physical Investment

Physical investment in silver increased during 2003 and the early part of this year. Usually a good indicator of demand, in the United States at least, are primary market sales of American Eagle bullion coins. However, even though sales were down by close to 13% last year (see page 68), on this occasion the Eagle was a poor indicator of the overall state of physical demand in the country. The main reason for this was the success of other private vendors in growing their sales of 1 oz and 10 oz coins and of 100 oz bars to private investors. Indeed, we believe that sales of these products probably exceeded 5 Moz in 2003 and remained strong in early 2004. Another feature of the market worthy of mention is that dealers report little in the way of physical disinvestment of coin bags or 100 oz bars in the United States, even on the jump in prices towards the end of the first quarter of this year. This is in marked contrast to the massive disinvestment of such material seen in early 1998 during the price spike at that time.

In addition to this mostly retail and US-based buying, it is worth mentioning the growth in demand for allocated and unallocated physical bullion on both sides of the Atlantic during the course of 2003 and also the first quarter of this year. Funds and some high net worth private investors in Europe and North America in certain cases showed a clear preference for taking positions in physical metal as opposed to derivative or other, so-called, “paper products”. This was most noticeable during the January-March 2004 period, although buy-side interest was already remarked upon by dealers in the fourth quarter of 2003.

4. Mine Supply

- Mine production fell for a second consecutive year, leaving global output at 595.6 Moz (18,525 t).
- The modest 0.8 Moz (26 t) reduction was primarily due to lower volumes of by-product silver generated at lead-zinc and gold mines - primary silver output and silver produced at copper mines actually increased year-on-year.
- Cash costs measured at the world's primary silver mines declined 8% year-on-year to $2.12/oz.
- The delta-adjusted hedge book contracted by an estimated 21.0 Moz (653 t) year-on-year. A 42% cut in forward sales explained the decrease.

Top 20 Silver Producing Countries

Ranking 2003	Ranking 2002		Output (Moz) 2002	Output (Moz) 2003
1	1	Mexico	96.4	93.8
2	2	Peru	88.8	89.2
3	3	Australia	66.8	60.2
4	5	China	44.9	46.8
5	7	Poland	38.9	44.3
6	8	Chile	38.9	41.6
7	4	United States	46.4	41.5
8	6	Canada	44.2	41.0
9	9	Russia	24.3	33.8
10	10	Kazakhstan	24.3	22.9
11	11	Bolivia	14.5	15.0
12	13	Sweden	9.4	9.9
13	12	Indonesia	10.7	9.6
14	14	Morocco	8.5	8.1
15	15	Argentina	4.3	4.6
16	17	Turkey	3.7	3.6
17	16	South Africa	3.8	3.4
18	19	Iran	2.6	2.6
19	18	Japan	2.6	2.5
20	22	India	1.9	2.2

Top 20 Silver Producing Companies

Ranking 2003	Ranking 2002	Company Name	Country	Output (Moz) 2002	Output (Moz) 2003
1	1	Industrias Peñoles	Mexico	52.7	48.4
2	3	KGHM Polska Miedz	Poland	38.3	43.7
3	2	BHP Minerals	Australia	46.8	42.7
4	4	Kazakhmys	Kazakhstan	21.7	19.5
5	5	Grupo Mexico	Mexico	19.6	19.0
6	7	Rio Tinto	UK	17.2	18.3
7	6	Barrick Gold	Canada	17.8	17.0
8	8	Coeur d'Alene Mines	USA	14.8	14.2
9	-	Polymetal	Russia	1.8	13.3
10	9	Xstrata*	Australia	13.2	12.0
11	10	Cia. de Minas Buenaventura	Peru	11.7	11.8
12	11	Noranda Inc.	Canada	11.3	10.7
13	14	Newmont Mining	USA	9.2	9.9
14	13	Pasminco	Australia	9.9	9.9
15	15	Hecla Mining Company	USA	8.7	9.8
16	12	Volcan Cia. Minera SA	Peru	10.9	9.5
17	16	Boliden AB	Sweden	8.5	8.7
18	18	Pan American Silver	USA	7.8	8.6
19	17	Codelco	Chile	8.2	8.4
20	19	Comsur	Bolivia	7.6	7.5

*Acquired MIM Holdings June 2003

Mine Production

- Mine supply was essentially flat year-on-year having declined by 0.8 Moz (26 t).
- Strong growth in the CIS (16% higher year-on-year) and Latin America (up 2% from 2002's level) was offset by sharp declines measured in North America (-6%) and Oceania (-10%).
- On a source basis, output at primary operations and silver produced as by-product of copper mining registered solid growth. Lower silver by-product, however, was reported at gold mines and lead-zinc operations.

Global silver output declined for a second consecutive year to reach an estimated 595.6 Moz (18,525 t). The cut in last year's output represented a trivial 0.8 Moz (26 t), or less than half a percent fall from the previous year. On a regional basis, declines were restricted to North America and Oceania, whose combined output was scaled back by a significant 17.4 Moz (539 t) year-on-year. In Asia and Africa, modest increases were measured, while strong growth was recorded in Europe, Latin America and most noticeably in the CIS.

In absolute terms, Australia recorded the biggest losses with output down by 6.6 Moz (205 t) year-on-year, primarily due to lower grades at the giant Cannington mine. In the United States, a cut of similar magnitude left the world's fourth largest silver producer in 2002 ranked as the world's seventh biggest in 2003. Operational difficulties and mine closures explained the sizable drop in Canada's output last year, which resulted in a drop in the country's ranking from sixth to the world's eighth largest silver producer. Mexico's output was also adversely impacted by a handful of mine closures, although to some extent these losses were offset by growth reported at Pan

Table 2
World Silver Mine Production
Million ounces

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Europe										
Poland	27.6	31.6	30.6	33.8	36.0	35.9	36.7	38.0	38.9	44.3
Sweden	8.1	8.0	7.7	8.5	8.6	8.9	9.5	8.8	9.4	9.9
Romania	1.4	1.4	1.4	1.4	1.2	1.2	1.1	1.2	1.0	0.9
Spain	5.7	4.0	3.3	2.1	1.5	3.1	3.8	2.2	1.2	0.8
Bulgaria	1.8	1.4	1.1	1.0	0.8	0.7	0.6	0.8	0.8	0.7
Portugal	1.0	1.2	1.1	1.1	1.0	0.9	0.7	0.7	0.6	0.7
Ireland	0.5	0.5	0.5	0.4	0.3	0.5	0.8	0.6	0.5	0.7
Yugoslavia (former)	1.2	1.9	2.9	2.1	1.8	1.0	1.0	0.7	0.5	0.3
Czech & Slovak Republics	0.4	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2
Greece	1.4	1.4	0.5	1.2	1.4	1.3	1.0	2.0	2.4	0.1
France	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Italy	0.5	0.5	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Norway	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Other	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Europe	50.0	52.6	50.0	52.1	53.3	53.7	55.3	55.4	55.6	58.7
North America										
Mexico	71.2	72.6	81.3	86.9	91.6	75.2	88.3	97.4	96.4	93.8
United States	47.6	50.2	50.5	70.1	66.2	62.7	63.3	52.6	46.4	41.5
Canada	23.8	40.0	39.9	39.0	36.4	37.5	37.7	40.7	44.2	41.0
Total North America	142.6	162.8	171.7	195.9	194.2	175.4	189.4	190.7	187.0	176.2
Central & South America										
Peru	56.0	61.4	63.3	66.8	65.1	71.7	78.4	86.0	88.8	89.2
Chile	31.6	33.5	36.8	35.1	43.1	44.4	39.9	43.4	38.9	41.6
Bolivia	11.3	13.8	12.3	12.4	13.1	13.6	14.1	13.7	14.5	15.0
Argentina	1.2	1.2	1.0	1.1	2.2	3.3	3.0	5.6	4.3	4.6
Honduras	0.9	1.0	1.2	1.5	1.5	1.6	1.7	1.6	1.8	1.7
Brazil	0.6	0.4	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2
Dominican Republic	0.3	0.7	0.5	0.4	0.2	0.1	0.0	0.0	0.0	0.0
Other	1.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.2
Total Central & South America	103.1	112.2	115.7	117.8	125.9	135.3	137.5	150.7	148.8	152.5
Asia										
China	33.8	34.7	36.5	43.0	43.4	44.2	48.1	46.7	44.9	46.8
Indonesia	3.1	7.7	7.6	8.1	10.0	8.7	10.0	12.0	10.7	9.6
Turkey	2.1	2.1	2.9	2.9	2.8	3.5	3.5	3.7	3.7	3.6
Japan	4.3	3.2	2.9	2.8	3.0	3.0	3.3	2.6	2.6	2.5
India	1.6	1.2	1.1	1.6	1.7	1.9	1.8	1.7	1.9	2.2
Papua New Guinea	2.5	2.1	1.9	1.6	1.9	1.9	2.4	2.2	2.1	2.0
Mongolia	0.9	0.9	0.9	1.0	1.1	1.1	1.0	1.2	1.1	1.1
North Korea	1.7	1.7	1.3	1.2	1.0	0.8	0.7	0.6	0.7	0.7
Thailand	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.7	0.6
Saudi Arabia	0.5	0.5	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.6
Philippines	1.0	1.1	0.8	0.6	0.6	0.6	0.7	1.1	0.3	0.2
Malaysia	0.4	0.4	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0
Other	2.5	2.5	2.3	2.5	2.7	2.6	2.7	2.7	2.9	2.8
Total Asia	54.6	58.4	59.4	66.2	69.0	68.9	74.8	75.0	71.8	72.6
Africa										
Morocco	8.3	6.6	6.4	8.4	9.8	8.9	9.3	9.1	8.5	8.1
South Africa	6.2	5.7	5.5	5.2	5.1	4.9	4.6	4.1	3.8	3.4
Namibia	2.0	2.1	2.1	1.2	0.4	0.0	0.5	0.6	0.6	0.9
Zambia	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Zimbabwe	0.4	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1
Other	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	1.7
Total Africa	17.6	15.4	15.0	15.8	16.2	14.6	15.2	14.6	13.8	14.5

Table 2
World Silver Mine Production
Million ounces

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Oceania										
Australia	33.6	29.6	32.5	35.6	47.2	55.0	65.1	63.3	66.8	60.2
New Zealand	0.8	1.0	1.0	1.0	0.8	0.8	0.7	0.9	0.9	1.0
Fiji	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Oceania	34.4	30.6	33.5	36.7	48.1	55.8	65.9	64.3	67.8	61.2
CIS										
Russia	24.0	23.5	24.4	20.9	19.5	19.8	20.2	20.8	24.3	33.8
Kazakhstan	22.0	20.9	15.5	14.1	13.8	16.0	20.5	24.3	24.3	22.9
Uzbekistan	2.1	2.1	2.2	2.5	2.6	2.0	2.0	1.7	1.6	1.7
Armenia	0.5	0.5	0.9	1.0	1.0	1.0	1.1	1.2	1.3	1.3
Tajikistan	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2
Kyrgyzstan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total CIS	48.8	47.2	43.2	38.7	37.1	39.1	43.9	48.1	51.7	59.9
World Total	**451.0**	**479.2**	**488.5**	**523.1**	**543.7**	**542.7**	**582.0**	**598.8**	**596.4**	**595.6**

American Silver's La Colorada (which is ramping up to full capacity) and at Hecla's San Sebastian (where improved silver grades explained its 19% year-on-year increase in output).

Higher primary output was reported in Russia due to the start of production at Polymetal's Dukat mine and an increase in output at the company's Lunnoe mine. There were additional gains in Poland, where levels were bolstered by a rise in silver by-product at KGHM's copper operations. Impressive growth was also measured in Chile and China with the former reporting increases in both primary and by-product output at the country's copper mines. Higher primary production was partly explained by the first full year contribution from Coeur d'Alene's new Cerro Bayo mine.

Analysis of the sources of silver mine production shows that primary silver mines increased their share of global production from 28% in 2002 to 30% in 2003. Silver by-product generated at copper operations increased 3% year-on-year to 154.0 Moz (4,789 t), while by-product volumes at lead-zinc and gold operations declined by 4% and 5% respectively to reach 179.3 Moz (5,578 t) and 79.1 Moz (2,460 t).

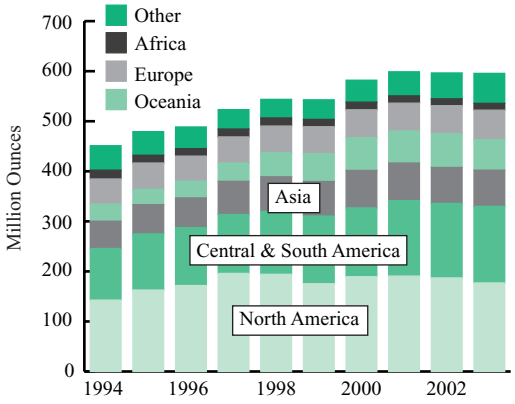
North America

Combined silver production in North America (Mexico, the United States and Canada), which accounted for 30% of global mine supply in 2003, declined by a significant 6% or 10.8 Moz (334 t).

Modest gains reported at a handful of the medium sized producers were not sufficient to offset declines measured from **Mexico's** two largest silver producing companies, namely, Industrias Peñoles and Grupo Mexico, which left 2003 production in the country 3% lower at 93.8 Moz (2,916 t). The former, the world's biggest silver producer, reported a sharp 8% drop in output (from record levels in the previous year) to reach 48.4 Moz (1,506 t). Planned mine closures explained the bulk of the reported losses - La Encantada completed mining operations in the second quarter of 2002, El Monte in the first quarter of 2003 and later, in September, mining was suspended at Las Torres (after 27 years of operations). The combined year-on-year production declines from these operations totaled 2.6 Moz (80 t). Partly offsetting the effects of closures, production at the company's flagship mine, Fresnillo (Proaño), reported a modest 0.73 Moz (22.6 t) increase from the previous year to reach a record high of 32.0 Moz (994 t). It is worth remembering that output at the mine in 1988 stood at a modest 9.3 Moz (291 t) and that, in the last decade alone, production has more than doubled with average annual growth over the period measured at 9%. Currently, expansion works at this world-class ore body are ongoing and when completed should help raise plant throughput by roughly 40% (although this will not result in a one-for-one increase in silver output as lower grades are expected to partly offset the higher processing rate).

Concerning production gains, Frisco, Lusimin and

World Silver Mine Production



Pan American Silver all reported noteworthy increases in production volumes, adding a combined 1.2 Moz (37 t) to the country's total in 2003.

In the **United States** following two consecutive years of heavy losses, production in 2003 once again declined to reach an estimated 41.5 Moz (1,290 t). The cumulative drop in output over the three year period 2001-2003 totaled a significant 21.8 Moz (680 t) and can partly be explained by the completion, in 2002, of mining at gold-silver producer McCoy-Cove. The mine, which at its peak in 2000 produced 12.3 Moz (383 t) of silver, only contributed 6.5 Moz (201 t) in 2001 and, in its final year of production, added 1.5 Moz (46 t). National losses were compounded by declining grades (and output) at copper mine Bingham Canyon where grades dropped by 7% in 2002 year-on-year and by 12% in 2003.

Concerning primary silver output in the United States, there were declines at Coeur d'Alene's Rochester and Galena mines. At the former, the relocation of the primary crusher adversely affected costs and production levels at the mine, while at Galena, lower production was explained by lower grades in the first quarter and the temporary suspension of mining in the June quarter, in order to complete major scheduled repairs on the mine's hoisting equipment. Elsewhere, higher grades at Hecla's Lucky Friday boosted production levels by 15% year-on-year (albeit from a low level in 2002), while the company's joint venture Greens Creek unit in Alaska registered a 7% improvement to reach 11.7 Moz (364 t). On the development front, Hecla announced in the December quarter that it had made the decision to drive a 5,500-foot drift on the 5900 level of the Lucky Friday silver mine in northern Idaho. This should allow the mine to double production to 4.0 Moz (125 t) of silver annually.

Canada's silver output in 2003 was estimated to have declined by 7% year-on-year to reach 41.0 Moz (1,276 t). Noranda's mining operations at Kidd Creek reported the biggest drop, with silver output down 1.0 Moz (33 t) year-on-year, due to difficult ground control conditions in the upper mine and a delay in stope rehabilitation in the lower portion of the mine. Reduced production was also reported at BHP Billiton's Selbaie, where mining activities were completed in February 2004, in accordance with the mine plan. The losses were compounded by the permanent closure of Breakwater's Nanisvik mine in September 2002 (the mine contributed 0.53 Moz (16 t) of silver in its last year of operation). Higher output, on the other hand, was reported at Agnico Eagle's LaRonde gold mine (despite operational delays in the first quarter), where production was up 28% to 4.0 Moz (123 t).

Central and South America

All four of the region's biggest silver producers (Peru, Chile, Bolivia and Argentina) measured higher output in 2003, taking Central and South America's total to a record high of 152.5 Moz (4,743 t). **Peru**, the region's most important producer, recorded silver output in 2003 at 89.2 Moz (2,775 t), a rise from the previous year of less than half a percent. The modest increase was in contrast to the growth measured in the preceding four years, which, on average, rose by 8%, or roughly 6 Moz (184 t) per annum. The slow down partly reflects the fact that new mines (amongst others, the Antamina joint venture and Pan American Silver's Huaron) are now operating at design capacity. Consider, for example, that the two mines mentioned above added a remarkable 6.8 Moz (210 t) to the country's total in 2001 (their first year of operation), a further 3.9 Moz (121 t) in 2002, but only an extra 1.2 Moz (36 t) in 2003.

In addition to the gains described above, a further boost to the country's output was provided by an increase in silver production at the Yanacocha gold operation. Last year, additional material sourced from the unit's fifth open pit, La Quinua (in its second full

year of production), coupled with higher grades helped boost silver output to a record 3.0 Moz (93 t). There was additional support from Buenaventura's primary silver mine, Uchucchacua, which reported a modest 2% increase in full year output to 9.6 Moz (298 t).

Partly offsetting the growth, silver produced at Volcan's zinc operations declined by an estimated 13% year-on-year, while polymetallic producer Minera Corona reported a 20% drop in silver by-product volumes.

Silver output in **Chile** increased by a significant 7% to 41.6 Moz (1,293 t). Higher primary production coupled with a boost in by-product silver generated at the country's copper mines explained the bulk of the measured rise. Production at Coeur d'Alene's new high grade Cerro Bayo mine (in its first full year of operation) accounted for the increase in primary output. Last year, Cerro Bayo produced an estimated 3.2 Moz (100 t) of silver, 74% higher than the previous year.

Sulphide production at copper mine Escondida, meanwhile, which had been temporarily reduced during 2002 due to weak market conditions, reported an increase last year of just over 50%. Silver by-product output at the mine consequently registered a 59%, or roughly 1.4 Moz (43 t), rise year-on-year.

Largely in response to higher prices, **Bolivia** recorded a modest 3% increase in silver production last year to 15.0 Moz (465 t). The slight increase was sufficient to offset losses at Newmont's Kori Kollo gold mine, which is approaching the end of its life, and where silver production levels were down some 38% year-on-year at 0.7 Moz (21 t).

In **Argentina**, output recorded a modest 7% increase from 2002's level to reach 4.6 Moz (142 t). The rise was largely the result of an increase in output at Coeur's primary Martha mine. Ore from the operation is transported to the company's Cerro Bayo plant, located roughly 270 miles to the northwest. Last year, estimates suggest that the mine yielded 1.7 Moz (52.9 t) of silver, an increase of roughly 30% year-on-year.

Asia

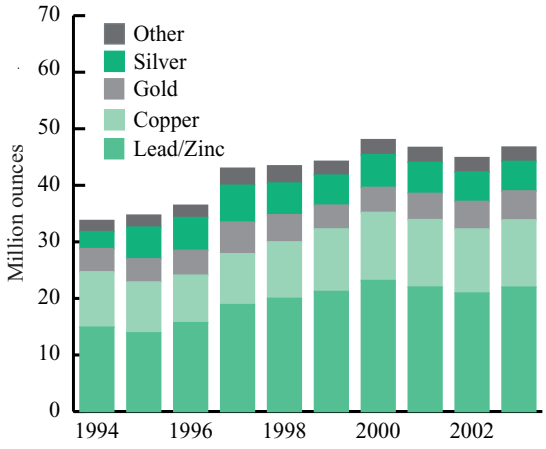
The Asia region generated an estimated 72.6 Moz (2,258 t) of silver in 2003 representing roughly 12% of global mine supply. The modest 1% increase compared to the previous year was due to higher output from China, although to a large extent, this was offset by losses recorded in, among others, Indonesia, Thailand and the Philippines.

Output in **China**, the region's largest producer increased some 4% from the previous year to 46.8 Moz (1,454 t). The bulk of the country's silver production is generated as a by-product of base metal mining and last year there were increases reported in both domestic copper and zinc volumes. In both absolute and percentage terms, zinc posted the biggest rise with output up an estimated 4% year-on-year. Lead output, on the other hand, declined by just over 1% from 2002's levels.

In broad terms, the measured growth in China's mine production was due to a recovery in output from mines hit by technical problems in the previous year, rather than by any additional output from the commissioning of new mines. A further factor was the lower treatment charges in the country, which would have encouraged mines (where possible) to increase production.

In **Indonesia**, the significant 11%, or 1.1 Moz (35 t), decrease in production left the country's total at an estimated 9.6 Moz (297 t). The country's losses were concentrated in the gold mining sector where a number of operations are approaching the end of their lives. As a consequence, silver generated as a by-product of gold mining was down 51% year-on-year at 1.6 Moz (50 t). Production was maintained, however, at copper-gold mine Grasberg, in spite of operational difficulties in the fourth quarter, while at Batu Hijau, improved grades left output modestly higher from the

Chinese Silver Mine Production
By source metal



previous year at an estimated 3.0 Moz (93 t).

Elsewhere in the region, losses were less marked with a fairly small 0.1 Moz (4 t) decline recorded in **Thailand** - the result of lower by-product silver at the country's sole gold producing mine, Chatree. In the **Philippines**, output was scaled back by less than 0.1 Moz (2 t). The losses were concentrated in the first quarter, the result of a month long strike at the country's largest gold operation, Victoria, owned by Lepanto Consolidated Mining. Full year output at the mine was down 7% year-on-year at 0.1 Moz (4 t).

In **Turkey**, meanwhile, higher output at Newmont's Ovacik gold operation partly offset a reduction in production volumes at Etibank's primary mine and in by-product silver generated at the Cayeli copper-zinc mine to leave the county's output down a fraction at 3.6 Moz (113 t).

Oceania

2003 silver output in **Australia** was measured at 60.2 Moz (1,872 t), accounting for over 98% of the region's total mine supply and roughly 10% of global production. Last year, the world's third largest producer recorded a marked 10%, or 6.6 Moz (205 t), cut in output. Needless to say, a sizable drop in output at Cannington, the world's single largest silver producing mine, accounted for the bulk of the significant losses measured in the country as a whole. In detail, the 3.8 Moz (118 t) decline at the mine was the result of a 9% reduction in grades, which fell from an average of 605 g/t in 2002 to 552 g/t in 2003.

Declines were also reported at polymetallic Mt. Isa where silver production was down by 1.0 Moz (32 t) year-on-year. The reduction was the result of a lower than expected contribution from the George Fisher orebody (due to difficult mining conditions) and low productivity from the Mt. Isa lead mine. At the Century mine, meanwhile, higher grades helped lift last year's production an impressive 20% year-on-year to reach 7.1 Moz (223 t).

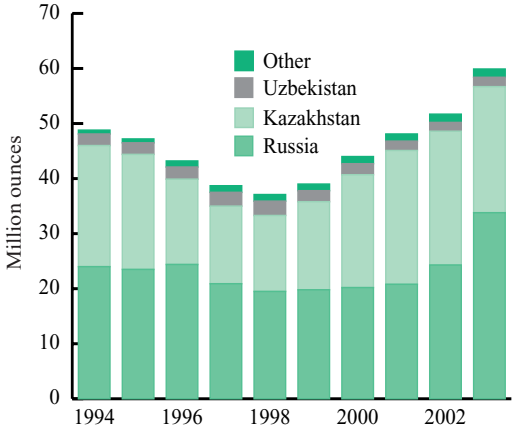
CIS

Output in the countries that constitute the Commonwealth of Independent States (CIS) increased for a fifth successive year to reach 59.9 Moz (1,862 t). Over this period of consistent growth, the region has increased its share of world silver production from 7% to 10%. Last year, higher output was largely attributable to a rise in Russian silver production - volumes in the group's second largest producer, Kazakhstan, actually declined.

In **Russia**, silver output was estimated to have increased by an impressive 9.5 Moz (296 t) year-on-year. The bulk of the reported rise was attributable to the start of Polymetal's Dukat mine and higher output at Lunnoe. According to company statements, mining got underway at Dukat in December 2002 and reached planned production capacity (16.0 Moz, 500 t) in the December quarter 2003. Reported production last year totaled 9.0 Moz (280 t) at Dukat and 4.3 Moz (133 t) at Lunnoe.

Kazakhstan, in contrast, recorded a 6% drop in silver output to 22.9 Moz (711 t). Lower production at Kazakhmys, the country's leading copper and silver producer (accounting for 85% of the country's silver output in 2003), explained the year-on-year reduction. The company produced a reported 19.5 Moz (607 t) of silver granules in 2003, down from 21.7 Moz (674 t) in the previous year.

CIS Silver Mine Production



Europe

Silver mine supply in Europe, which generated 10% of the world total in 2003, increased by a noteworthy 5% to reach 58.7 Moz (1,826 t). The bulk of the growth was attributable to a rise in production in **Poland**, which in turn reflected higher volumes at KGHM Polska Miedz, Europe's largest and the world's second biggest silver producer.

According to reports, silver produced as a by-product of mining copper at Lubin, Polkowice -

Sieroszowice and Rudna amounted to 43.7 Moz (1,358 t) in 2003. The result represented a 14%, or 5.3 Moz (166 t), improvement from the previous year and was partly due to higher grades.

Sweden, where production has been slowly edging up towards 10 Moz (310 t), is the region's second largest and only other significant producer (between them, Poland and Sweden accounted for 92% of the group total). Last year, higher output at Boliden's Aitik and Rio Tinto's Zinkgruran (in both cases the result of better grades) offset declines elsewhere to leave the country's output up 5% year-on-year at 9.9 Moz (307 t).

Silver production collapsed in **Greece** following the suspension, in January 2003, of the Stratoni lead-zinc-silver facility. It appears that the issue hinges on the legality of the mining permits, which at the time of writing had yet to be resolved.

Africa

In spite of its dominance in the gold sector, Africa is the smallest silver producing region in the world - last year the continent only generated 2% of global mine supply, corresponding to 14.5 Moz (450 t).

Interestingly, over half of Africa's total silver output is sourced from a single country, namely, **Morocco**, where silver production in 2003 stood at an estimated 8.1 Moz (253 t), a 5% decline from 2002's level. The primary Imiter mine, operated by Société Métallurgique d'Imiter, a subsidiary of the ONA Group, generated roughly 85% of the country's total with an estimated output last year at 7.1 Moz (220 t).

Production in **South Africa**, the region's second largest producer, was estimated to have declined by 10% from the previous year to 3.4 Moz (106 t). Lower by-product silver from the country's gold operations coupled with a cut in lead and zinc production explained the reported decrease.

Production gains were recorded in the Democratic Republic of Congo, where the country's newest mine, Anvil Mining's Dikulushi copper-silver deposit, contributed 1.1 Moz (34 t) of silver in its first full year of operation (the mine came on stream in September 2002).

Outlook

In the wake of production curtailments and mine closures over the last two years, it is perhaps surprising that the decline in silver output has not been more substantial - it fell by a modest 2.4 Moz (72 t) in 2002 and by only 0.8 Moz (26 t) last year. This can partly be explained by the large number of silver producing mines that the industry has had to absorb over the last few years - Huaron, Antamina, San Sebastian, Julietta, Cerro Bayo, Martha, Lunnoe, Dukat, La Colorada and Dikulushi.

In the current year, a net increase in output from the projects mentioned above, coupled with further growth in silver by-product at copper mines, should see global output in 2004 register a modest increase. The rise, however, at around 4.0 to 5.0 Moz (125 - 155 t) should not be overstated. After all, it falls somewhat short of the average annual addition to global output between 1995 and 2000 of 21.8 Moz (679 t).

In detail, in North America, and in contrast to the significant 10.8 Moz (334 t) production decline measured in 2003, volumes should remain essentially unchanged year-on-year, with mine closures (El Monte, Las Torres) and lower grades (Eskay Creek) being partly offset by higher production at La Colorada in Mexico (which is expected to reach design capacity in mid-2004) and expansions at Fresnillo and Kidd Creek.

In Latin America, year-on-year growth is anticipated with expansions at Chile's Escondida, the reactivation of mining at Tintaya and the start-up of Pan American Silver's Morococha in Peru providing a part of the additional supply.

Turning to Asia and the CIS, Russia's Dukat mine is now operating at full capacity and is expected to increase silver output in the current year and further growth is anticipated in China although this should be partly offset by lower production in Indonesia, the result of gold mine closures and operational issues at Grasberg.

A fall in output in Australia, due to delays in the mine sequencing at George Fisher (Mt. Isa unit) and a drop in grades at Century is also anticipated, but should not be sufficient to upset the production gains made elsewhere to leave global output in 2004 roughly 1% higher year-on-year.

By-Product Analysis

Last year, silver produced at primary operations accounted for 30% of global mine supply. The balance was mainly generated as a by-product of mining lead, zinc, copper and gold. The table overleaf shows the split of output by source metal. Most importantly, the categories used for the purpose of this analysis are

defined on a revenue basis. So, for example, the polymetallic Antamina mine is classified as a copper mine while Cannington falls into the primary producers group.

Primary mines' share of world mine output increased from 28% in 2002 to 30% last year (177.9 Moz, 5,534 t). The increase was primarily due to a sizable contribution from the Dukat mine in Russia coupled with growth in Chile (Cerro Bayo) and Argentina (Martha).

Concerning silver produced as a secondary metal to copper, lead and zinc production, the former category recorded a 3% increase, while lead and zinc mining registered a 4% drop in silver by-product to reach 179.3 Moz (5,578 t).

Silver produced at gold mines declined by an estimated 5% or by 4.6 Moz (142 t). Reductions were reported in all but one of the seven named regions with the biggest losses recorded in the United States, Indonesia and Peru. In the first, the completion of mining at McCoy/Cove in 2002 explained the year-on-year losses. In Indonesia, gold mines in their last phase of operation (currently processing low grade stockpiled ore) largely accounted for the cut in silver by-product.

Since the publication of *World Silver Survey 2003*, the base metals have enjoyed bull market conditions. Copper and lead, in particular, benefited from the rally as terminal market inventories fell drastically to below what are commonly perceived to be minimum levels.

Silver Output by Source Metal

Million ounces

	2002 output	% of total	2003 output	% of total	Change y-o-y
Primary	169.2	28%	177.9	30%	5%
Lead/Zinc	187.0	31%	179.3	30%	-4%
Copper	148.8	25%	154.0	26%	3%
Gold	83.7	14%	79.1	13%	-5%
Other	7.9	1%	5.3	1%	-33%

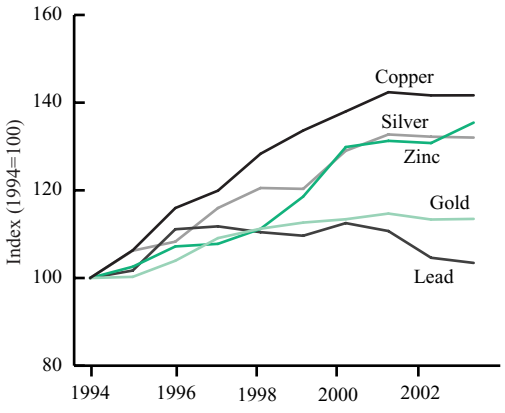
The average price for these metals increased by 14.3% and 13.9% respectively last year.

For lead, it has been lower supply rather than a sharp improvement in demand that has driven the market. Global mine production has now fallen for three consecutive years and output in 2003 at 2.800m tons was 8.1% lower than in 2000, when output was 3.046m tons. The decline in concentrate output is structural rather than cyclical. Reserve exhaustion has seen particularly sharp declines in Sweden (Laisvall), Spain (Los Frailes) and Canada (Polaris and Sullivan). Lower grades have contributed to a steady decline at Africa's two largest producers, Morocco and South Africa.

The key factor in the lead market is the lack of new capacity to replace mines that are being phased out. Not only are no large-scale primary mines being commissioned, but also fewer lead-zinc mines are being developed, and where they are, they tend to have relatively low lead values. As a result, despite the improvement in lead prices and treatment charges, lead miners are not in a position to significantly raise output.

The low treatment charges (from the smelters' perspective) have caused industry restructuring with smelter closures taking place in Europe (Avonmouth and Noyelles Godault, and the temporary closure of

Mine Production



Source: ILZSG, ICSG, WBMS, GFMS Metals Consulting

World Mine Production of Source Metals

Thousand tonnes

	1999	2000	2001	2002	2003	Change y-o-y
Lead	2,968	3,046	2,997	2,832	2,800	-1%
Zinc	8,070	8,839	8,935	8,901	9,218	4%
Copper	12,796	13,212	13,632	13,563	13,565	0%
Gold (tonnes)	2,574	2,591	2,621	2,590	2,593	0%

Sources: ILZSG, WBMS, GFMS

Porto Vesme), and in North America (Glover). Concentrate that was previously destined for these plants has been diverted to China. China's mine production has struggled to keep pace with refined production and their import requirements have surged. Chinese concentrate output in 2003 at 632,000 tons was 4.2% below that in 2000. Refined output in this period grew by 43%. China's concentrate imports rose by 73% last year and were 137% higher than in 2000.

In 2002, the focus of the copper market was on production cuts undertaken by BHP Billiton and Phelps Dodge, and the move by Codelco to stockpile 200,000 tons of copper. The mine cutbacks held back the growth in global concentrate output to just 0.7% last year to 11.057m tons. This followed a 0.4% decline in mine output the previous year.

Tightness at the concentrate stage put pressure on smelters as spot treatment charges fell sharply. Once again, China contributed to the tightness in the concentrate market as its mine production lags well behind refined output. There are signs, however, that copper supply will resume its uptrend. The combination of the reactivation of idled capacity and brownfield expansion, particularly in Latin America, should lead to a sharp rebound in output in 2004.

Average Prices of Source Metals

	1999	2000	2001	2002	2003	Change y-o-y
Lead ($/t)	502	454	476	453	516	14%
Zinc ($/t)	1,077	1,128	886	779	828	6%
Copper ($/t)	1,574	1,814	1,581	1,558	1,780	14%
Gold ($/oz)	279	279	271	310	363	17%

Sources: LME, GFMS

One reason that zinc prices have lagged behind most other base metals is that production has continued to expand, despite the low prices that characterized the early part of the decade. In 2003, average annual cash prices increased by just 6.3% to $828/ton.

Last year saw a sharp rise in a mine output in a number of countries. The largest single increase took place in Ireland, where the restart of the Tara mine contributed to a 66% increase in output. The commissioning of the Storliden mine saw a revival in Swedish output, with a 26% rise to 188,000 tons.

Latin America was another source of extra concentrate. Peru is on course to overtake Australia as the second largest producer. Last year, output rose by 12.3% to 1.369m tons. Higher production at the huge Antamina mine, as well as increased utilization rates at the myriad of small-medium sized mines, were behind the increase. Mexican output also registered a double-digit improvement to just over 500,000 tons.

The development of integrated projects also contributed to the increase in mine production. In Namibia, Anglo American has brought on stream the 140,000 tons per year Skorpion mine/smelter, while in India, Hindustan Zinc has raised output sharply following brownfield expansion.

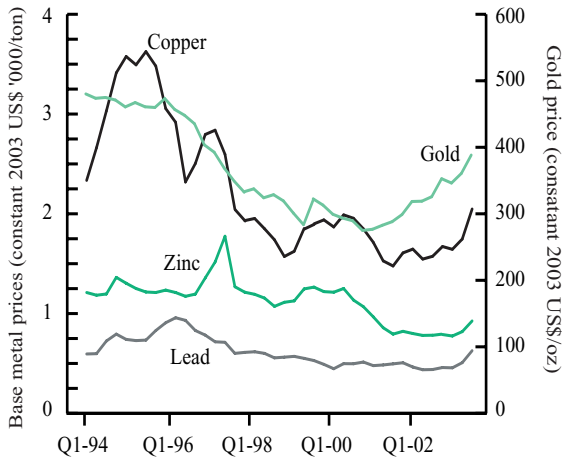
China's impact on the zinc market is similar to that in lead. The country is a grateful recipient of concentrate that has been freed up following the closures of smelters in Australia, Western Europe and the United States, as domestic mine production has not kept pace with refined production growth. Mine production last year at 1.637m tons was still below the 2000 level of 1.780m tons. Import of zinc concentrates over this period rose by 856% to 373,000 tons.

Production Costs

Cash costs calculated for the sub-set of primary silver mines where cost data is available declined 8% year-on-year to $2.12/oz. Combined with the 6% increase in the average silver price, average margins (in US dollar terms) widened 21% to $2.75/oz.

Only one of the mines in the sub-set reported cash

Source Metal Prices (real terms)



costs above the average spot price for the period while two operations stated costs at less than one dollar per ounce of silver produced. In fact, one of these low cost producing mines actually reported negative costs!

This can be explained by the method used to calculate costs, which, for the data set available have been stated on a by-product basis (revenues from secondary metals are deducted from operating costs). In the case of Coeur d'Alene's Cerro Bayo operation in Chile (cash costs $0.60/oz) and Hecla's San Sebastian unit in Mexico (negative $0.25/oz), the low unit operating charges were a consequence of significant gold credits.

Total production costs (including depreciation, depletion and amortization) declined by a sizable 17% year-on-year to each $2.66/oz.

Silver Mine Production Costs

		2001	2002	2003
Cash costs:	highest	$5.14	$5.15	$5.01
	lowest	$2.17	$0.38	($0.25)
	weighted average	$3.01	$2.32	$2.12
Average spot price		$4.37	$4.60	$4.88
% output with costs > spot price		14.8%	3.1%	3.1%
Sample size (million ounces)		74.5	81.3	81.6

Producer Hedging

- Producer hedging activities generated an estimated 21.0 Moz (653 t) of silver demand in 2003.
- The cut in the global hedge book was due to a reduction in forward sales, which declined by a significant 42% year-on-year (21.6 Moz, 672 t).

In 2003, the delta-adjusted producer hedge book declined for a second consecutive year, leaving the outstanding position at an estimated 51.5 Moz (1,600 t). The cut in the book amounted to 21.0 Moz (653 t), a 15% reduction from the 24.8 Moz (772 t) decrease measured in the previous year. Taken in combination with the modest decline in mine production, the net supply from the mining industry in 2003 came to 574.5 Moz (17,872 t), representing a 0.5% increase from 2002's level.

Considering the firmer average price in the first nine months (up 2.6% year-on-year) and the impressive fourth quarter rally, the significant decline in last year's adjusted position was perhaps a little surprising. This anomaly can partly be explained by the increase in the volume of purchased puts, which in some instances, were secured at the expense of forward cover. This action resulted in a decline in the delta against the contracts and hence a net reduction in the adjusted volume (a forward sale or purchase carries a delta of one while the delta against the bought puts at the end of 2003 was measured at 0.18).

Before going into any further detail, it is worth mentioning that the companies that report silver hedging data, or those that stated that they did not have any metal hedged, accounted for just over 55% of global mine production. In other words, while it is more than likely that the data used to calculate the global position does not reflect all silver transactions, the following discussion can be regarded as broadly indicative of the market trends.

As mentioned in last year's *World Silver Survey*, GFMS has improved and updated its hedging analysis. Specifically, each trade by year of expiry and instrument is entered into the Brady Trinity™ integrated trading and risk management system. The use of Brady Trinity™ enables accurate deltas for each trade to be calculated while also allowing for sophisticated sensitivity and scenario analysis.

As at the end of December 2003, the delta-adjusted silver producer book consisted of 58% forwards and 42% of options. The decline in the hedge book last year was solely the result of the 21.6 Moz (672 t) year-on-year reduction in forward sales, the adjusted options position actually modestly increased. The trivial change in the options book, however, masked a dramatic swing in the volumes on a product basis. Consider, for example, that in nominal terms, sold calls were scaled back by 39%, or by 18.8 Moz (584 t) year-on-year, whilst the volume of nominal bought puts rose by 23%, or by 4.4 Moz (137 t).

The fact that the net 14.4 Moz (448 t) decline in the nominal options book was not reflected in the change measured on a delta-adjusted basis was the result of the higher silver price used in the valuation. In way of explanation, the value of an option, as well as the delta, will change in response to movements, in particular in the spot price of the underlying commodity, but also in market volatility, interest rates and time to expiry. At the end of 2002 the silver price fixed at $4.67/oz compared to $5.97/oz at the end of last year.

The higher silver price used to value the options resulted in a decrease in the delta against the purchased put options, while the delta against the sold calls increased (*ceteris paribus*). The higher delta against the sold call (which rose from 0.26 to 0.59) resulted in a 37%, or 4.7 Moz (145 t) increase in the delta-adjusted position and this was only partly offset by the 49%, 4.1 Moz (126 t) decrease in the adjusted volume of purchased puts. Hence, compared to the previous year, the adjusted options book reported a net 0.6 Moz (19 t) increase.

To illustrate these effects further, the combined end-2003 options delta-adjusted position has been charted against changes in the spot price, the responsiveness of which is solely the result of changes in the delta of the options contracts. As the silver price increases from the end-2003 spot price of $5.97, it is the rising delta against the sold calls that is the overriding factor driving the response. In contrast, under lower prices, it is the delta against the sold calls that falls away dramatically (as the options move further out, or out of the money) while that against the purchased puts increases sharply (as the options move further in or into the money).

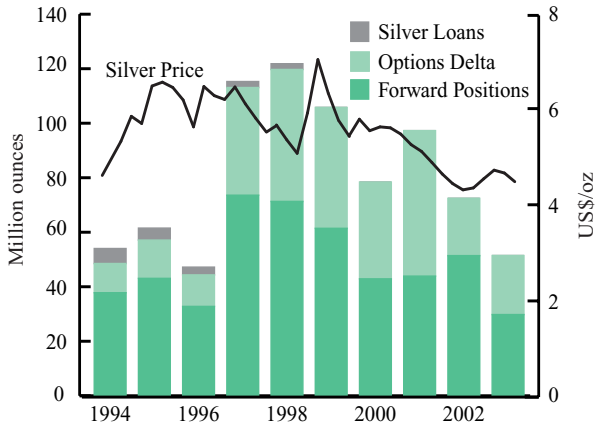
Looking at the current year, and despite the surge in prices above $8/oz in early April, there is no guarantee that producers' hedging activities will appear, once again, on the demand side. Firstly, silver contracts are, in the main, near dated, so any positions put in place now could have expired by the end of the year. Secondly, hedged producers last year largely allowed forward sales to decline, and in preference purchased protective put options - if this trend continues in 2004, the lower delta against the options contracts would, again, tend to push the delta-adjusted hedge book lower. Lastly, without any new (significant) projects requiring hedging in the current year, it is considered that fresh supply from this source could be limited.

Twelve-month Hedge Conditions*

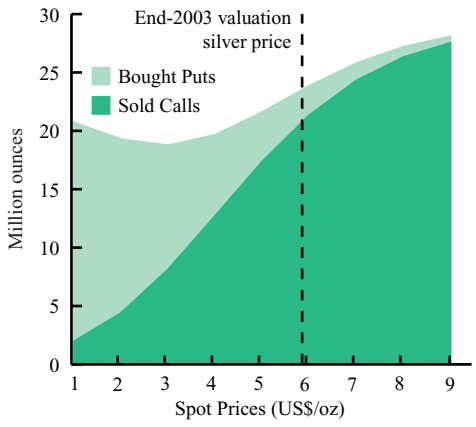
	2001	2002	2003
Spot price	$4.37	$4.60	$4.88
Libor	3.9%	2.2%	1.4%
Lease rate	1.5%	1.2%	0.7%
Contango	2.4%	1.0%	0.7%
Forward price	$4.47	$4.64	$4.91
Premium	$0.10	$0.04	$0.03

*12-month averages

Producer Hedging: Outstanding Positions



End-2003 Options Delta Adjusted Postion



5. Supply from Above-ground Stocks

- Supply from above-ground stocks increased by 14.2 Moz (441 t) last year to 263.6 Moz (8,198 t).
- A jump in net government sales of 21.4 Moz (667 t) was the main reason for this increase and also for the associated rise in supply to the market from existing bullion inventories. Private stocks though probably increased because de-hedging outweighed a small amount of residual implied net disinvestment.
- Scrap supply rose in 2003, boosted by a one-off increase in coin scrap, but is expected to fall in future, broadly in line with lower silver use in photography, the largest single source of recycled metal.

Summary

Annual silver supply is from two basic sources: newly mined production (whether primary or by-product) or recycled above-ground stocks (either scrapped fabricated products or dishoarded bullion from private or government inventories). Mine production at 595.6 Moz (18,525 t) provided 69.3% of total silver supply in 2003, compared to 70.5% the previous year. The balance of supply - 30.7% in 2003 and 29.5% in 2002 - came from mobilized above-ground stocks (netting out the return of bullion to stock from producer de-hedging). It is interesting to note that, on this basis, annual supply from above-ground stocks was actually higher in silver than in gold (15%). This is because of the greater weight of producer de-hedging and investment demand in gold's 2003 supply/demand balance. These two factors outweigh the tendency for official sales to be much higher in the case of gold than for silver (see below) and the similar percentage of supply in both metals from scrap (although in the case of the yellow metal, scrap is a far more price sensitive component of supply, as is explained later in this Chapter).

Supply from Above-ground Stocks
Million ounces

	2002	2003
Implied Net Disinvestment	26.2	10.4
Producer Hedging	-24.8	-21.0
Net Government Sales	61.2	82.6
Sub-total Bullion	62.6	72.0
Scrap	186.8	191.6
Total	**249.4**	**263.6**

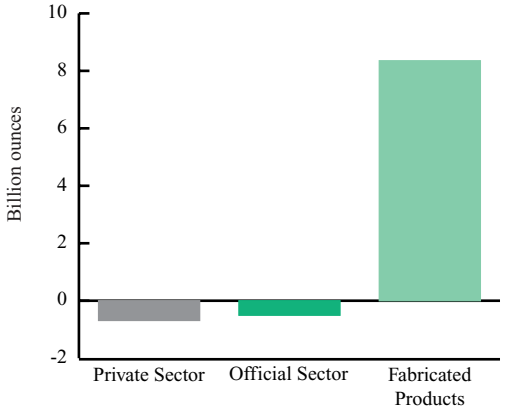
The table shows the net contribution to supply in both years from each of the components of above-ground silver stocks, namely, bullion stocks, sold into the market as a result of producer hedging (an element of demand in both 2002 and 2003), net disinvestment, net government sales and supply from scrapped fabricated products.

On the assumption that producer de-hedging was entirely a private sector matter, our numbers show that private sector stocks (the sum of Implied Net Disinvestment and Producer Hedging) rose marginally last year, compared to the essentially flat picture for the combined total in 2002. We suspect, however, that the annual total in 2003 (and indeed the implied net disinvestment number itself) masks some greater build-up in private sector bullion stocks towards year-end by investors due to the annual total capturing the effect of declines in such inventories earlier in the year.

In contrast, net sales from government stocks are estimated to have increased by nearly 35% in 2003 to reach 82.6 Moz (2,570 t). As explained below, and in greater detail in the special section on page 34, the bulk of this supply came from China. Yet even though net official sales loomed large in the silver supply/demand balance last year, at 9.6% of the total, they still accounted for a smaller percentage than was the case for gold (14.6% of 2003 supply). This is cold comfort though for a market where government sales were a relatively unimportant issue in terms of silver supply prior to the start-up of Chinese sales in 1998.

Combining the private and official sectors, total net sales of bullion stocks are estimated at 72.0 Moz

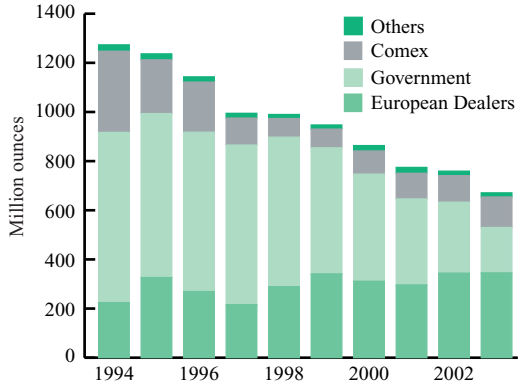
Changes in Above-ground Stocks, 1994-2003



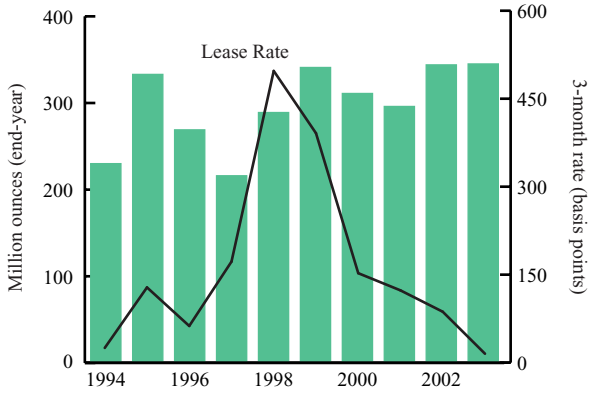
(2,240 t) in 2003, some 9.4 Moz (293 t) higher than in 2002. As indicated above, it is probable that the downward pressure these stock sales placed on silver prices began to lift towards the end of the year as private sector bullion inventories started to rise as a result of growth in investment demand. This was even more the case in the first quarter of 2004 when we suspect supply to the market from above-ground stocks of bullion would have fallen to very low levels, as burgeoning investment demand would have offset a possibly lower rate of net government sales.

The other main component of above-ground stock supply is recycled fabricated products. GFMS' data shows that scrap supply rose by 2.6% last year to 191.6 Moz (5,958 t). The reason for the increase, however, owed nothing to the rise in silver prices during the course of 2003. In fact, as explained later in this Chapter, the increase is entirely due to German coin scrap (which arguably could instead have been classified as a government sale). Indeed, there are two general comments worth making in this Summary about scrap supply. The first is that there is a tendency now for it now to decline due to such a large share of it coming from recycled photographic waste (mainly spent fixer solutions and old x-ray films). The second is that scrap supply in silver is relatively price-insensitive. This was demonstrated during the price spike in the first quarter of this year. Although silver scrap supply did rise, the scale of the increase was very modest compared to, e.g., the huge and immediate lift in gold scrap supply last year during rallies in the price of the yellow metal. The difference, of course, lies in the very different make-up of the stock of above-ground fabricated products. In the case of gold, a very significant share is in low mark-up and, therefore, intrinsically price sensitive jewelry, a phenomenon the like of which barely exists in the more diverse stock of fabricated silver products, where the metal's price almost always is but a fraction of the cost of the finished article (or even semi-manufactured component).

Identifiable Bullion Stocks



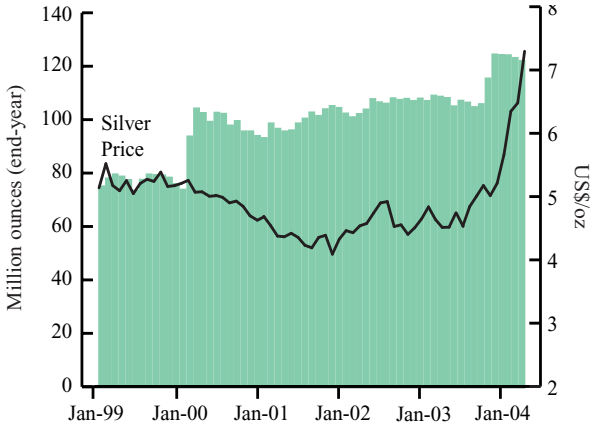
Bullion Stocks in Dealers' Vaults in Europe



Identifiable Bullion Stocks

GFMS' category of identifiable bullion stocks includes those inventories that can be measured with sufficient confidence to be presented statistically. As such they exclude bullion that is very widely distributed in private hands and which cannot therefore be counted on a scientific basis. (These additional bullion stocks are arguably less likely to enter the market.) The table over the page and in the related graph show the trend in identifiable bullion stocks over the past two and ten years respectively. Both reveal that such identifiable stocks have been on a declining trend. Last year, for example, identifiable bullion stocks dropped by 67 Moz (around 2,100 t). This broadly fits with the 72.0 Moz (2,239 t) number shown in the table on page 30 and would therefore suggest that most bullion supply to the market came from identifiable stocks last year. The difference of 5 Moz (around 150 t) would by implication have come from non-identified sources. However, this does not really fit with evidence of positive retail investment in silver bullion last year (highlighted in Chapter 3), that is not featured in any of the measured categories indicated in

Comex Warehouse Stocks



the table above. (We suspect that the explanation for this apparent but small statistical discrepancy could be an undercounting of scrap or producer hedging.)

European Dealers' Stocks

For many years, GFMS has conducted a proprietary and confidential survey of bullion stocks held in European dealers' vaults. This provides a fairly "hard" number for near market bullion stocks held in Europe. Curiously, the data shows that stocks ended the year at pretty much the same level as they had been at end-2002. However, this fits with our overall view that private sector bullion inventories - globally - if anything rose last year rather than fell. Furthermore, during the course of 2003 European dealers' stocks did fall before rising again in the fourth quarter. Also, within the total, there were some significant shifts in ownership of bullion stocks, which are hidden by the relatively unchanged and aggregate year-on-year picture.

Comex Stocks

After the small rise in the quantity of registered and

Identifiable Bullion Stocks
Million ounces

	end-2002	end-2003
European Dealers	344	345
Comex	108	124
Government	289	206
Others	18	17
Total	**759**	**671**

Comex Silver Stocks (end period)
(Million ounces)

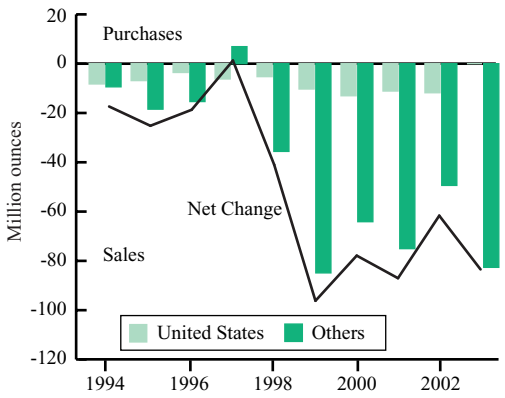
	Q1	Q2	Q3	Q4
2002	102.2	106.6	107.5	108.0
2003	108.7	107.2	105.9	124.3
2004	122.1			

eligible silver stocks held in Comex depositories recorded in 2002, last year, by contrast, saw an increase of 16.3 Moz (507 t) or 15% to the end-2003 figure of 124.3 Moz (3,866 t). The increase, however, took place in the final quarter of the year, as prior to then, Comex stocks had actually fallen, through to the end of the third quarter, by some 2.1 Moz (65 t) from their end-2002 levels. The increase in fourth quarter stocks at first glance might seem to be related to the growth in non-commercials' long positions on the exchange, as investor/speculator demand grew during the final months of 2003. However, a more important influence was the price arbitrage opportunity that presented itself during the period and which saw, for example, a huge rise in US bullion imports during October, especially from the United Kingdom (a good part of this being delivered into Comex depositories).

Government Stocks

GFMS estimate that at the end of 2003 government-held silver bullion stocks totaled some 206 Moz (6,410 t), compared to a revised 289 Moz (8,990 t) at the end of the previous year. (In last year's *World Silver Survey,* we had estimated end-2002 official stocks at 267 Moz or 8,300 t.) The level of and changes in government silver bullion stocks are areas

Changes in Government Stocks



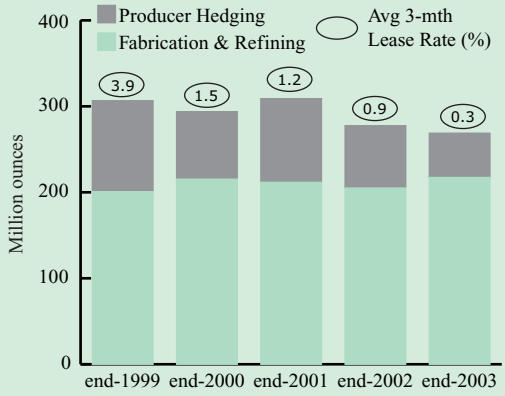
Silver Borrowing

Silver borrowing demand in 2003 is estimated to have fallen by around 9 Moz (280 t) in 2003. As the graph below shows, the reduction all came from producer hedging related demand, whereas, in contrast borrowing from other sources increased. The story of the 21.0 Moz (653 t) decline in producer hedging last year is covered in some detail in Chapter 4. It is worth reiterating here though that this figure represents the actual quantity of silver returned to lenders as a result of the contraction in the producer hedge book, i.e. the net market impact of changes in producers' positions.

The increase in borrowing from other sources was the result of two developments, both of which were concentrated in the final months of 2003. These were, firstly, the pick-up in fabrication demand for the metal, particularly from industrial users and, secondly, the rise in the silver price towards year-end. The latter encouraged some fabricators to borrow rather than fix metal in the expectation that prices would fall back again towards the $5 level. This tendency, it seems, became even more pronounced in the first quarter of 2004, with a number of large manufacturers extending their borrowings instead of buying metal outright.

When it comes to the supply of metal to the lending market, it is clear that this has continued to be sufficient to prevent much of an increase in silver lease rates. Indeed, borrowing costs, on average, fell in 2003 across all tenures. For example, 3-month rates averaged 26 basis points last year compared to 86 basis points in 2002. This broadly fits with the stable private sector stocks picture described elsewhere in this Chapter. Of course, what matters is whether stocks are actually available for lending or not - generally a function of whether metal is held on an unallocated or allocated basis. Our information is that there was always enough metal available for lending in 2003 and also in the first few months of this year. Unlike the 1997-98 rally in the silver price, this time round it was not accompanied/fueled by a liquidity squeeze. This suggests that the recent rise in prices was broader based (no single player buying up and allocating metal) and that fresh longs, in general, therefore contributed to an improvement in market liquidity. Nevertheless, the pick-up in borrowing demand (commented on above) towards the end of 2003 and in early 2004 did result in some increase in silver leasing rates, particularly at the longer end of the maturity spectrum. For example, 12-month rates from October 2003 to April 2004 averaged 110 basis points compared to 48 basis points in the same seven month period one year earlier.

Silver Borrowing



which are difficult to analyze statistically. There are several reasons for this. Perhaps the most important is that, unlike gold, there are no official statistics published by e.g. the IMF or national central banks, which at least provide a useful starting point in assessing the level of or changes in stocks. The main reason for this is silver's "demonetization" and also small value on the balance sheets of those official institutions that still hold residual inventories, often in coin form. A further complicating factor is that ownership of official silver bullion stocks is often more diverse than is the case for gold, where with few exceptions reserves are an item on the balance sheet of the national central bank. Particularly in the case of China - the source of most government sales since 1998 - this is an important issue and one that complicates an already difficult analytical task.

GFMS' data series for government stocks is based on a number of country-by-country estimates and undoubtedly has a somewhat conservative bias. This has been revealed, for instance, by a series of sales by European countries of old coin stocks following the introduction of the euro. (Awareness of these disposals in fact explains much of the revision to our end-2002 data.)

Returning, however, to sales in 2003, as indicated above, these were dominated by China. We estimate Chinese government bullion stock sales last year accounted for no less than 69% of our total of 82.6 Moz (2,570 t). Given the importance of these disposals, they are commented on in more detail in the special section on page 34.

Excluding China, the bulk of the remaining 25.3 Moz (786 t) of sales was accounted for by a number of

Chinese Bullion Stocks

GFMS are highly confident that, since 1998, the Chinese have made a substantial contribution to global silver supplies via the run down of domestic stocks of the metal. To the extent that there is any debate about this matter, it centers around the order of magnitude of these sales and the actual source of the stockpiled metal.

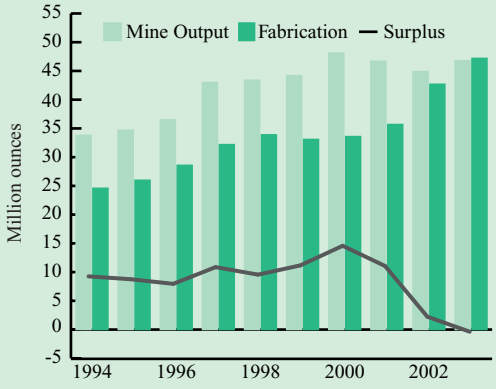
To clarify the first of these points, it is necessary to provide a little bit of background as to how GFMS puts together its data series. Each component of our supply/demand balance is independently estimated, as are the trade flows into and out of any country. In the case of China, we derive estimates for mine production (split into its constituent parts of primary and by-product production), scrap and recovery from imported silver contained in amongst other, base metals concentrates (we return to this below). Total supply, the sum of these components, is then compared against total demand (derived from estimates of each major component of offtake), and net trade flows are added to or subtracted from this to arrive at an implied stock change figure for the country as a whole.

Clearly, a miscalculation of any of these components will have an influence on this residual or implied stock change figure. For example, if our mine production were too low, then the implied stock run down in recent years would be too high (and conversely, the implied stock build up in the 1980s and much of the 1990s would have been too low). Furthermore, an overestimation of demand would result in a higher implied stock run down in recent years (and as with mine supply, a stock building figure that was too low in the 1980s and most of the 1990s). Quite clearly, estimation of time series such as these is never perfect, and we would readily concede that some series may overestimate while others underestimate the reality. However, assuming no systematic bias in our data, at least some of this should net off.

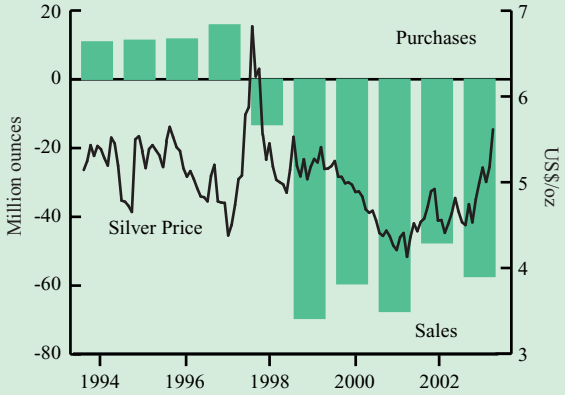
The one area where there has been considerable change over the past five years, and to which we have devoted a significant research effort, revolves around the question of silver recovered from imported base metals concentrates, slags and scrap. Data from Chinese sources on these flows is at best patchy, and GFMS have focused on identifying the source of, in particular, concentrates and the contained silver therein. Based on these calculations, we estimate that recovery of silver from all of these sources rose by close to 28% (from a revised 2002 figure) to reach some 29.2 Moz (908 t).

However, even allowing for this phenomenal growth, GFMS still believe that the overall balances for China in 2003 suggest a stock draw down, as the figure below illustrates (by our estimates, silver production from domestic sources is now fully matched by fabrication demand). As a final point of clarification, we do not believe that this stock run down was entirely from official stocks. As we have argued at length in past *Silver Surveys*, there are large holdings of so-called quasi-official stocks, and we believe that part of the run down was met from these sources.

Chinese Mine Production and Fabrication Demand



Chinese Government Purchases and Sales



European countries' disposals of old coins and a reduction in official Russian bullion stocks.

Other Stocks

Other identifiable bullion stocks not commented on in the sections above, consist of those registered on the Tokyo Commodities Exchange, the Chicago Board of Trade and Japanese trade stocks, which are reported to the Ministry of Trade and Industry. These stocks make up the "Others" category in the table on page 32 and in the chart on page 31. In aggregate, these stocks fell by about 1 Moz (31 t) during the course of 2003 to end the year at 17 Moz (just under 530 t).

Scrap

- Scrap supply rose by 2.6% last year to 191.6 Moz (5,958 t), showing little response to the intra-year increase in price.

Scrap supply increased by 2.6% in 2003, rising by 4.8 Moz (148 t) to a total of 191.6 Moz (5,958 t). Given the "industrial" sources of silver scrap supply, it is no surprise that, unlike gold where low mark-up jewelry dominates the numbers, its price elasticity is rather low. Thus the intra-year dollar price rise of 26% did not have a material impact on scrap levels.

To have an appreciation of the main drivers of silver scrap, it is necessary to look beyond price volatility and absolute price levels. Other parameters that have just as much, if not more, importance on scrap supply include recycling and environmental regulation as well as advances in recycling technology.

On the one hand, the rules controlling waste disposal, material recycling and product "cradle to grave" liability are becoming more and more onerous and extensive. This creates more pressure on manufacturers using silver to ensure that its recoverability is taken into account during the design phase of a product, which will ultimately lead to more silver being recycled.

Also, advances in the technologies employed by the recycling industry are resulting in lower recovery costs. A better cost structure, combined with a higher silver price, no doubt played a part in improving the marginal returns of silver recyclers and thus helped contribute to the rise in global scrap supply.

However, it is important not to overemphasize the importance of the price-scrap relationship. Regular readers of the *World Silver Survey* will be familiar with the fact that the historical correlation between price and scrap supply is less than +0.5 and relatively large price movements do not have a major impact on scrap volumes, particularly in developed economies.

Finally, an important issue in the short to medium term for silver is falling photographic demand. However, the debate needs to take into account the related impact on photographic scrap. The sector has high recovery rates which in turn will have the effect of muting the overall decline in demand for new silver by this sector.

In 2003, GFMS estimate that scrap volumes in **India** rose sharply, up by around 40% to 9.5 Moz (294 t). This may seem to be surprising given that the average local silver price rose by just 2.6% year-on-year, and it is indeed the case that this was not the primary driver of higher levels of scrap, at least in the first half. To understand what transpired last year, one needs to understand the role that silver plays in the rural economy.

In particular, (poor) farmers usually use silver as a "bank", buying it when there are sufficient funds (say around November after selling their crops). The metal is usually bought in the form of crude jewelry, mainly consisting of large bracelets for the arms and legs (weighing anything up to 30 ounces in weight), or crude silver bars of various weights, which are often buried underground for storage and safety.

The reason that silver is widely used as a savings mechanism is due to the lack of penetration of the banking system in many parts of rural India. The farmer then sells this stored silver just before the monsoon (May-June) to buy seeds and other implements to produce a crop, bringing scrap metal back to the market (this also happens during the rabi season).

With these comments as background, the dynamics of the scrap market in 2003 can be best explained by two phenomena occurring at different times of the year. Our data suggests that in the first half of the year, the legacy of four years of drought in some of the main silver consuming regions (for example Rajasthan) saw distress sales of silver by farmers in need of cash to pay for basic necessities like food. These elevated levels of selling back happened in spite of a relatively low average silver price (of around Rs.7,900 per kilogram for the first half of the year).

World Scrap Supply

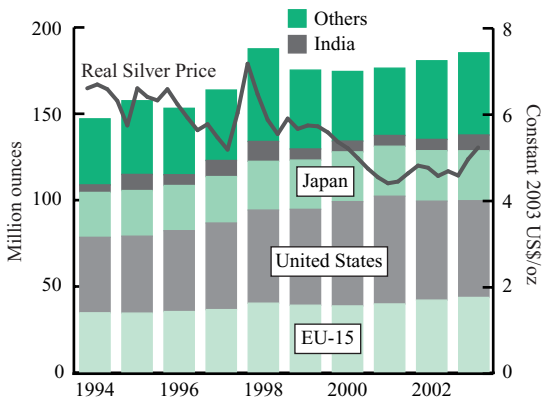


Table 3
Supply of Silver from the Recycling of Old Scrap
Million ounces

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Europe										
Germany	15.4	14.8	15.4	16.1	16.4	16.1	16.7	16.8	16.7	19.0
UK & Ireland	7.9	7.4	7.6	8.4	10.8	11.5	10.9	11.1	13.6	13.0
France	4.2	4.7	4.5	4.3	4.1	4.0	3.5	3.9	3.9	4.1
Italy	2.8	3.2	3.5	3.4	4.7	3.4	3.4	3.5	3.6	3.6
Austria	1.9	2.0	1.8	1.8	1.8	1.7	1.6	2.0	1.9	1.5
Netherlands	1.3	1.1	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4
Sweden	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0
Belgium	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6
Denmark	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5
Portugal	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.5	0.5
Norway	0.8	0.8	1.0	1.0	0.8	0.9	1.1	0.7	0.7	0.5
Spain	0.3	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4
Czech & Slovak Republics	0.7	0.7	0.9	0.8	0.7	0.6	0.6	0.5	0.4	0.4
Finland	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4
Switzerland	0.6	1.6	1.7	0.8	0.4	0.3	0.3	0.3	0.3	0.3
Other	1.2	1.1	1.2	1.2	1.2	1.2	1.1	1.1	1.2	1.1
Total Europe	40.3	41.1	42.5	42.7	45.9	44.6	44.2	44.8	47.1	48.4
North America										
United States	45.2	46.0	48.4	51.8	55.7	57.4	62.4	64.5	59.2	57.9
Mexico	2.3	4.8	2.4	4.3	10.6	2.3	1.5	1.4	1.5	1.9
Canada	1.3	1.7	1.8	1.6	1.9	1.6	1.4	1.4	1.4	1.5
Total North America	48.7	52.5	52.6	57.7	68.3	61.3	65.4	67.3	62.2	61.3
Central & South America										
Brazil	1.9	1.9	1.9	1.6	1.6	1.8	1.5	1.6	1.0	1.2
Argentina	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6
Chile	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4
Other	0.7	0.7	0.7	0.7	0.9	0.9	0.8	0.8	0.8	0.8
Total Central & South America	3.8	3.8	3.8	3.4	3.7	3.7	3.4	3.5	2.8	3.0
Middle East										
Saudi Arabia	1.9	3.0	1.3	3.2	2.1	7.5	2.3	0.8	7.2	7.9
Turkey	2.3	2.3	1.9	1.6	1.7	1.4	1.3	1.3	1.4	1.8
Egypt	0.9	0.8	0.7	0.3	0.4	0.3	0.9	1.1	1.3	1.2
Oman	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Other	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.3	0.4
Total Middle East	5.5	6.6	4.4	5.7	4.7	9.7	4.9	3.7	10.4	11.3
Indian Sub-Continent										
India	4.5	9.6	6.4	9.6	11.9	6.7	6.4	6.4	6.8	9.5
Other	0.2	0.3	0.2	0.3	0.5	0.4	0.4	0.5	0.5	0.5
Total Indian Sub-Continent	4.7	9.9	6.6	10.0	12.4	7.0	6.8	6.9	7.2	9.9
East Asia										
Japan	26.9	27.3	27.1	27.8	29.2	29.5	29.8	29.9	30.2	29.9
China	4.1	4.3	4.5	4.6	5.8	5.9	6.0	6.2	6.3	6.6
South Korea	3.0	3.3	3.4	3.6	7.8	5.3	5.3	5.4	5.5	5.7
Taiwan	0.7	0.7	0.7	0.8	0.8	0.9	0.9	0.9	0.9	1.0
Thailand	0.3	0.3	0.4	0.8	1.0	0.4	0.3	0.4	0.5	0.5
Singapore	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Hong Kong	0.3	0.3	0.3	0.4	0.5	0.4	0.4	0.4	0.4	0.4
Indonesia	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.4	0.3	0.3
Vietnam	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3
Philippines	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Malaysia	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total East Asia	36.5	37.6	37.7	39.3	46.6	43.7	44.2	44.5	45.1	45.4

Table 3
Supply of Silver from the Recycling of Old Scrap
Million ounces

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Africa										
Morocco	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Other	0.6	0.7	0.7	0.5	0.6	0.6	0.6	0.5	0.5	0.5
Total Africa	1.0	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.1
Oceania										
Australia	2.5	2.5	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.1
Total Oceania	2.5	2.5	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.1
CIS										
CIS	9.0	7.7	7.4	7.1	8.8	7.7	7.9	8.1	8.5	9.0
Total CIS	9.0	7.7	7.4	7.1	8.8	7.7	7.9	8.1	8.5	9.0
World Total	**152.0**	**162.9**	**158.3**	**169.3**	**193.9**	**181.2**	**180.4**	**182.4**	**186.8**	**191.6**

By contrast, in the second half, and notwithstanding the good start to the monsoon and robust economic numbers, the average price of Rs.8,372 per kilogram (plus much higher price volatility) brought the price-sensitive nature of Indian silver markets to the fore and selling for cash rose sharply. By year-end, as silver pushed above the Rs. 9,000 level, scrap volumes spiked ever higher, and our information was that the flow into Mumbai alone was running at 300-500 kilograms per day, more than sufficient to satisfy local demand.

GFMS estimate that **Japanese** scrap volumes fell slightly last year, by just over 1%. The main driver behind this was the decline in silver recovered from photographic applications (an indication of rising digital penetration in the Japanese market).

A similar picture was seen in the **United States** where old scrap supply declined by a little over 2% to 57.9 Moz (1,800 t). Other areas of scrap are thought to have been broadly stable, although the recycling of ethylene oxide (EO) catalysts rose last year. This was due to an increase in activity at plants containing the catalysts, which effectively shortened their "shelf life" and therefore increased the propensity for the catalysts to be changed.

The scrap supply from **Europe** last year rose a modest 3% to 46.7 Moz (1,454 t). Scrap from this continent tends not to show much of a price response until higher levels are achieved (with industry sources typically placing the trigger at somewhere between $8 and $10). This limited elasticity remained the case in 2003, as evidenced by there being few indications of scrap growing towards year-end when the price was beginning to take off.

Conversely, some may have been expecting an overall decline in 2003 due to lower photographic scrap as digital inroads cut into the silver halide cycle. This can be seen to be happening very clearly in some countries, such as the Netherlands and Germany, where recovery rates within photography are already very high. However, enhanced recovery (due, for example, to tighter environmental controls) in countries with currently lower recycling rates, such as France, helped counter the impact of the fall in silver halide use.

Most areas of industrial scrap are thought to have been broadly steady, partly as a result of ever declining yields in electronic scrap being balanced by higher recovery rates. The sector, however, that lay behind much of the overall scrap increase was a higher coin melt, with Germany responsible for much of the gain. It is possible that much of this latter tranche of supply might be better allocated to government sales (as has been done with Spain's coin sales in 2003) but, until 'harder' information is to hand, it is perhaps more neutral to place the German tonnage in scrap.

It appeared that the collection for scrap from silver coins in **Saudi Arabia, Yemen** and parts of **North Africa** was not the thriving activity in 2003 as it was in the previous year. The scrapping of old coins, such as the Maria Theresa Taler coin, reached over 6.5 Moz (190 t) in 2002. There is evidence to suggest, however, that this trade virtually dried up last year. (This form of scrap supply did briefly surge again, however, at the peak of the price rally in early 2004.)

6. Silver Bullion Trade

- Good demand for silver in East Asia resulted in higher trade flows from Europe (particularly the United Kingdom) and mainland China to Hong Kong, Japan and Thailand. Net bullion imports into the United States rose by a robust 21% year-on-year while inflows into India and Italy were broadly stable.

Europe

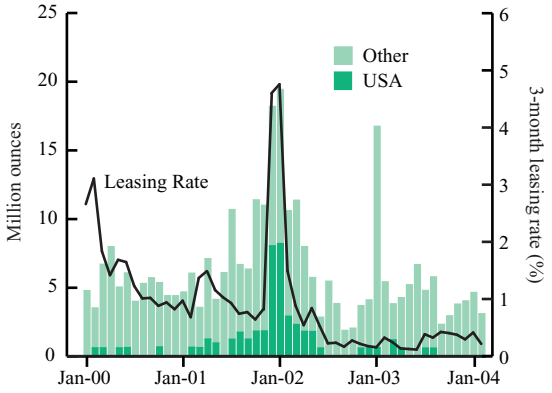
Europe is one of the largest bullion importers, with the United Kingdom and Switzerland the two principal players here. That these two dominate is largely a function of London and Zurich being major physical bullion trading centers and home to some of the largest refineries, taking in mine production from elsewhere in the world and turning out bullion bars and other products. These two roles mean that silver bullion exports from Europe are substantial.

A second factor behind Europe's sizeable imports is its structural deficit; total European fabrication demand in 2003 is estimated at 222.7 Moz (6,928 t), compared to supply from mine production at 58.7 Moz (1,826 t), scrap at 48.4 Moz (1,506 t) and dishoarding. One important feature that differentiates the silver bullion trade from gold is that imports of scrap from price sensitive areas are rarely substantial and 2003 appears to have been no exception.

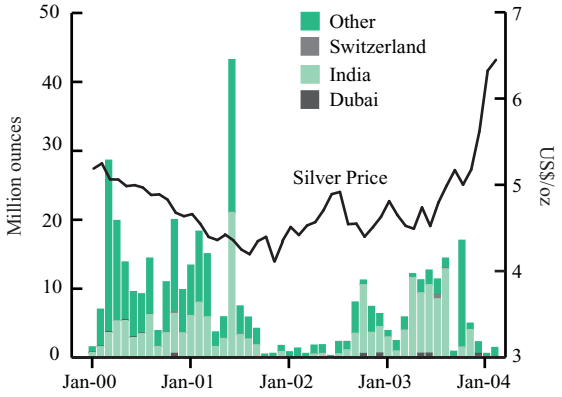
Imports of silver bullion into the **United Kingdom** last year fell to their lowest level since 2000. Much of the decline was attributable to lower shipments from North, Central and South America. In particular, imports from the United States were over 80% lower last year. The sharp fall in imports into the United Kingdom from Central and South America was perhaps surprising, given that combined mine production from Peru and Chile was 2.4% higher. However, this was partly due to a substantial portion of Peruvian silver being destined for the United States, instead of the United Kingdom. Elsewhere, imports from across Europe were sharply higher in 2003, with 13.0 Moz (405 t) from Spain accounting for much of the increase. Looking ahead to this year, of concern to the UK industry was the introduction on March 1st of European Union (EU) countermeasure tariffs, against the United States, on a comprehensive range of precious metal categories. Starting at 5%, the tariffs are due to rise by 1% each month, until a resolution is brokered. Otherwise the duties will continue to rise, reaching 17% in two years.

In contrast, exports rose by 86% to an estimated 8.9 Moz (2,762 t), for which there were two main reasons. Firstly, shipments to India more than doubled to 54.0 Moz (1,679 t) as the country sourced considerably less of its requirements from China. Secondly, in response to the Comex squeeze towards the end of the third

UK Bullion Imports



UK Bullion Exports



quarter, exports to the United States first emerged in mid-September before a sharp rise the following month (in fact October accounted for 94% of total 2003 trade with the United States). However, the squeeze was short-lived and the last two months saw a complete absence of any silver destined for across the Atlantic.

Germany is an oft overlooked participant in the bullion trade yet, in 2003, its imports surpassed 60 Moz (1,850 t) and its exports exceeded 65 Moz (2,000 t). (A key difference between Germany and the two majors is that the former's trade is more intra-European.) That Germany's exports can prove so substantial, despite a fabricating base of over 40 Moz (1,200 t), is mainly due to the contribution to supply from imported concentrates and scrap.

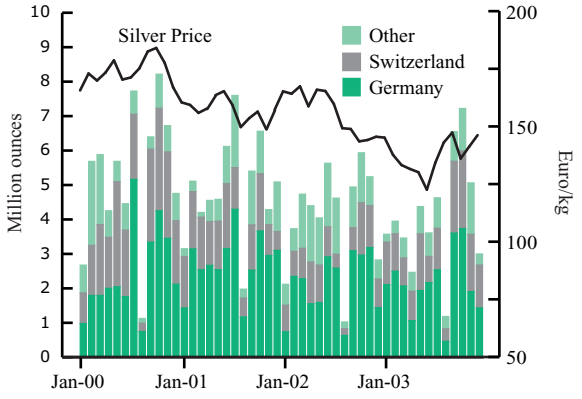
Official **Italian** bullion imports were essentially flat year-on-year in 2003 at 49.1 Moz (1,526 t) with Germany and Switzerland continuing to dominate the list of origins. That official imports were flat is scarcely surprising given that total fabrication demand last year was also little changed on 2002. Nor are matters distorted if we take into account unofficial flows as these are again thought to have been insignificant (the case since 2001).

The picture does appear to be disturbed if bullion exports are considered. Official Italian data shows a massive rise in exports from typical levels of a little over 3 Moz (around 100 t) to more than 9 Moz (280 t) last year. These heavy flows, however, are not reported by the principal destinations in their own statistics. Industry sources within Italy are also very skeptical of bullion exports being so high. Exports, nevertheless, do seem to have risen a little, bringing about a small decline in *net* bullion imports. This slight fall looks to have been largely countered by a rise in imported scrap such that the change in total supply for Italy is brought back to broadly flat.

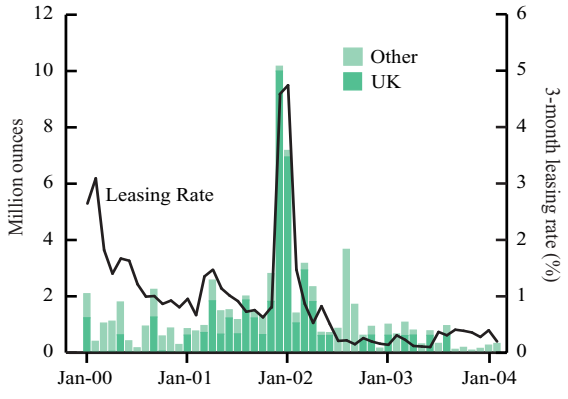
North America

Despite the much publicized rise in imports from the United Kingdom, total imports into the **United States** were just over 5% higher in 2003. Much of the country's import trade is related to mine production, both across the region and in Central and South America. Although Mexico accounted for nearly half of the United States' 2003 imports, shipments from Mexico were over 9% lower year-on-year, although the extent of the decline may appear surprising given that the country's mine production declined by less than 3%. In contrast, Canada's mining performance was more closely matched to its trade south of the border; US imports from Canada fell by almost 12%, compared with a 7% fall in domestic mine output. However, the most significant year-on-year change (in volume terms) was reserved for Peru, which, despite only marginal growth in 2003 mine supply, saw its imports to the United States increase three-fold.

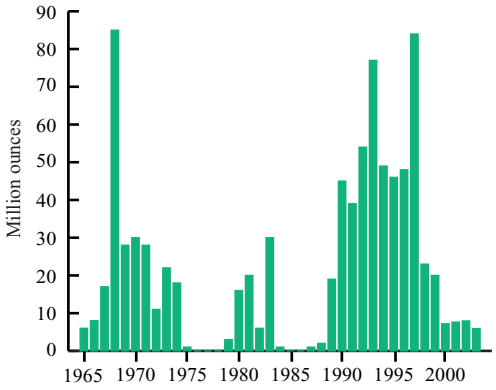
Official Italian Bullion Imports



US Bullion Exports



Dubai Bullion Imports



Finally, as discussed above, silver imports from the United Kingdom surged last year, in response to a premium on Comex vis-à-vis London. However, the opportunity was short-lived resulting in some potential deliveries being canceled.

The opportunity to deliver silver to the Comex may have contributed to lower exports to the United Kingdom as well as to other destinations. In particular, trade across North America was sharply lower. The most notable change was an 80% fall in shipments to Mexico, although the 2002 total was exceptionally high and in fact exports to Mexico last year returned to more "normal" levels.

Middle East and Indian Sub-Continent

One of the most notable developments last year in the **Egyptian** silver market was the reappearance of a local premium (compared with the international silver price), which encouraged a return of bullion imports in 2003. Furthermore, a sharp rise in silver jewelry fabrication led to additional shipments, although the volume is estimated to have remained below the levels of the late 1990s.

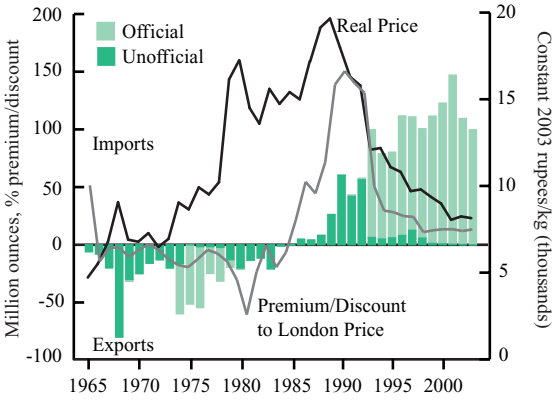
Silver jewelry fabrication was also considerably higher in **Turkey** in 2003. Although scrap supply is estimated to have risen last year, local sales of domestic mine production are thought to have been broadly stable. As a result, to fill the gap, silver bullion imports rose by close to 12%, to their highest level since the Istanbul Gold Exchange was established in 1999.

The only other country in the region to have a role in silver bullion, albeit a small one, is the **United Arab Emirates**. In fact, evidence appears to indicate that imports were even smaller last year than in 2002. Shipments originating from East Asia, particularly China, Hong Kong and South Korea, all but ceased while quantities sourced from elsewhere (for example eastern Europe) may have increased a little.

Preliminary GFMS estimates for silver imports into **India** in 2003 suggest that there was a slight fall year-on-year of around 3%. It should be stressed that at the time of writing, final year numbers are still unavailable, and that the figures shown in the table opposite are only estimates. We are of the view that it remains a distinct possibility that imports last year were at similar levels to those seen in 2002. Notwithstanding this, we are confident that year-on-year imports into India did not change dramatically, so to the extent this has any impact, it is at the margin.

The reasons for believing that imports did not change dramatically are two-fold. Firstly, it sits well with the anecdotal evidence that we have received from our field trips in India (of which we made three during the current research cycle, in addition to retaining the services of two consultants in India). Some contacts have argued that the market was up slightly while some have argued that it was down marginally, but the broad consensus is that not a great deal of change was seen in 2003. Secondly, as with all of GFMS' research, we independently estimate flows of metal into India (that is independently of Indian data sources). Based on this exercise, we have arrived at

Net Indian Bullion Imports and Exports



Indian Bullion Imports

Million ounces

	1999	2000	2001	2002	2003^
OGL	108.9	121.9	145.5	109.1	107.7
NRI	0.1	0.1	1.1	0.1	0.1
SIL	1.4	0.1	0.0	0.0	0.0
Replenishment**	3.0	0.9	1.7	4.8	2.9
Sub-total	113.3	123.0	148.3	114.1	110.6
Unofficial	1.2	0.8	0.4	0.0	0.0
Total Imports	114.5	123.8	148.7	114.1	110.6
Local premium*	11%	12%	12%	10%	12%

*percent above London price at the official exchange rate

** imports of silver bullion for manufacture and export

^ estimated

import numbers that are broadly in line with those seen in 2002. Given the potential margin of error in any of our estimates, however, we would argue that this suggests that demand in 2003 was for all intents and purposes flat year-on-year.

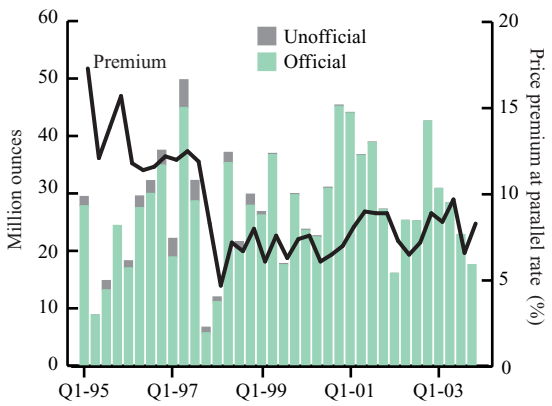
Last year, the only real sources of silver bullion in India were via the Open General Licence (OGL) and replenishment routes. In the context of the latter, we have to add yet another caveat to the numbers above. Data from the Gem and Jewellery Export Promotion Council currently indicates that replenishment imports of silver fell sharply year-on-year. However, based on GFMS jewelry data for the United States and Europe, we are inclined to believe that this drastically underestimates the true level of replenishment shipments last year.

As far as the sources of metal are concerned, China/Hong Kong, the United Kingdom and Switzerland still dominate, as they have over the past decade (by our estimates, easily accounting for over 70% of total imports). By contrast with last year, however, the mix of supplies from the three changed. Although imports from Switzerland rose marginally, there was a marked shift away from Chinese supplies to shipments from the United Kingdom. By our estimates, imports from the United Kingdom almost doubled while those from China fell sharply. For example, while in previous years China/Hong Kong supplied well over 50% of India's requirements, GFMS estimates point to this having fallen to just over 30% in 2003.

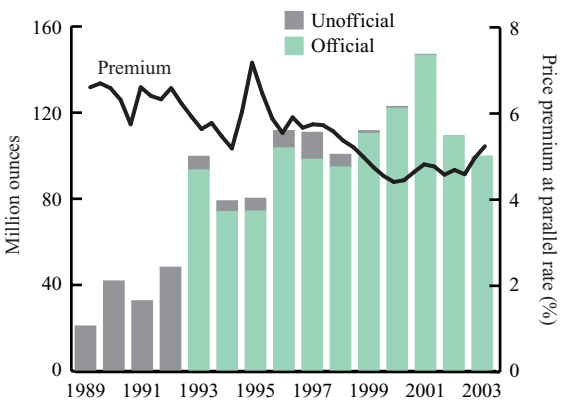
Turning to the specifics of silver imports, during 2003 a new phenomenon was seen in terms of how shipments of the metal were recorded. Traditionally, import duty has been paid at the first port of call (for example, Kandla is a major port in Gujarat, and most silver was duty paid Kandla). In terms of how GFMS has cross checked import data in the past, information on duty paid silver at major ports like Kandla was very important.

However, in 2003, there were important changes in how this business was done. Instead of silver containers being offloaded and duty paid at the port of initial entry into India (for example, Chennai, Kandla, Pippavava), this has now been done more often at the final destination (for example, Delhi, Hyderabad, Ahmedabad). Consequently, collecting and checking silver import data has become much more difficult (hence the caveats pertaining to the import data made

Indian Bullion Imports



Indian Bullion Imports



above). It is interesting to observe for example that imports into the busiest port for silver in Gujarat were recorded at around 29 Moz (900 t) in the first eleven months of 2003, substantially less than in previous years.

As has been the case in India for some time, the tax structure has as much to do with where initial shipments of silver are made as does actual final demand. Last year, the local tax structure in silver was still skewed in favor of Ahmedabad as compared to Mumbai, with the latter continuing to apply a hefty octroi (local import tax) of 2%. This negated the impact of the (effectively) uniform 1% sales tax regime which was introduced across India in February of 2002. As a consequence of these tax anomalies, substantial quantities of silver are still shipped from one state to another unofficially. In what will not come as much of a surprise to regular readers of these *Surveys*, the much-heralded and eagerly awaited application of uniform VAT across India has still not materialized.

As far as import duties are concerned, the 2003 budget brought about a dramatic change in the gold market. Without delving into too much detail, the reduction in import duty to Rs.100 per 10 grams on pre-numbered bars in metric weight fundamentally shifted the form in which most gold was imported into India (effectively killing off the Indian tola bar market at a stroke). However, unlike gold, there was no reduction in import duty on silver (it remained at Rs.500 per kilogram).

Turning to the current year, the most significant reform announcement (in January) was the freeing of gold and silver imports from the canalizing agencies (the system under which only certain registered companies, including commercial banks and state agencies, could import gold and silver). At the time of writing, the trade is still waiting for the Reserve Bank of India to clarify the new guidelines for such imports.

East Asia

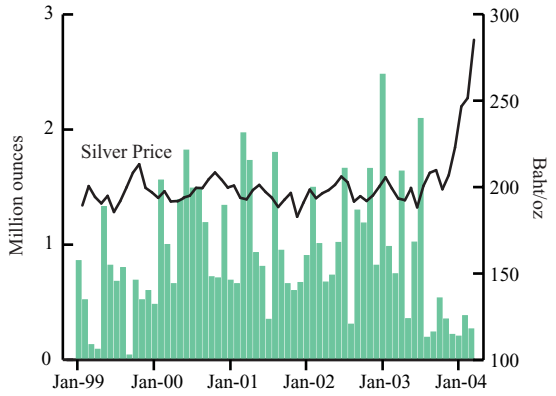
That **China** was a substantial supplier of metal to the international markets in 2003 is not in doubt. To the extent that there are any outstanding statistical issues surrounding these shipments, it pertains to the source of the metal, not the quantities. In 2003, the official export quota was between 71 and 80 Moz (2,200 and 2,500 t) (there is no consensus as to what the exact quota was last year), effectively flat on 2002's 71 Moz (2,200 t), but substantially lower than 2004's 98 Moz (3,050 t).

As we have argued before, the increase in quotas is partly a result of the statistical reporting catching up with the reality on the ground. However, in 2003, a substantial portion of the growth in exports (and presumably the increase in the quota) was related to the rise in recovery of silver from imported concentrates and scrap as well as base metal slags. What this has in effect done is to boost the surplus of "new" metal over the demand for silver from domestic fabricators. It is worth reiterating, for instance, that China has for many years been a surplus producer of silver as domestic mine production outstripped local manufacturing demand (resulting in the build up of stocks through the 1980s and much of the 1990s). In essence, the excess of "new" supply over demand has grown.

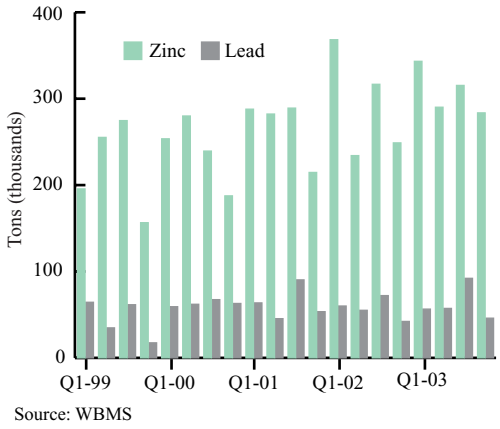
The overwhelming bulk of Chinese silver exports are still shipped via Hong Kong, although there has been a notable increase in direct shipments from the mainland to end consuming markets like Thailand. Based on GFMS estimates, China now supplies silver directly to a diverse group of end consuming and refining countries such as Thailand, as already mentioned, as well as India, South Korea, Dubai, Malaysia and the United Kingdom to mention a few.

Hong Kong sourced most of its silver from China in 2003, although smaller quantities were imported from elsewhere, including South Korea and Switzerland. At first sight, this may appear slightly curious considering that Chinese silver is usually available at a discount to

Singapore Bullion and Semis Imports



Korean Lead and Zinc Concentrate Imports



Source: WBMS

the international price. Our belief is that this is partly related to the demand for consistent high quality silver for industrial uses both in Hong Kong itself and the mainland (there is also a small flow of bullion from Hong Kong to the mainland itself).

Taking Hong Kong and China as a whole (i.e. stripping out trade flows between the two), we estimate that net exports to the rest of the world would have amounted to over 80 Moz (2,500 t) in 2003.

Japanese bullion imports rose sharply in 2003, partly as a result of stock building taking place after the run down (and low imports) of the previous two years. Interestingly, Japanese recovery from other sources (for example, imported base metals concentrates) also rose sharply in 2003. South America remains the largest supplier of metal, mainly due to the long term financing arrangements that are in place between the Japanese trading houses and the producers.

South Korean bullion imports rose by 15% last year to reach 4.2 Moz (132 t). This volume, however, was eclipsed by the surge in supply from local smelters which is estimated to have increased by 4.4 Moz (137 t) in 2003 alone. Higher demand for silver in the country resulted in exports rising marginally.

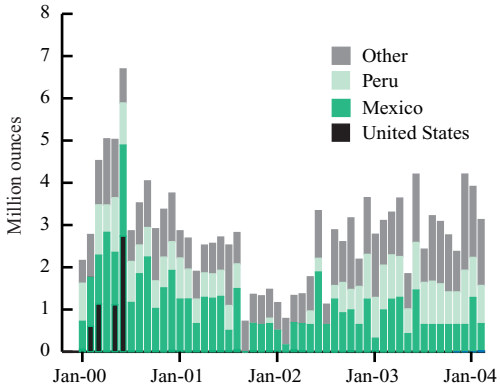
Unlike its dwindling role in gold distribution, **Singapore** continues to play an important part as regards south-east Asian silver supplies. However, this may change in 2004 as the ramifications of the VAT changes on silver bullion in Thailand continue to unfold (discussed further in the section on Thailand below).

Official Singapore trade data tends to support, in trend terms, GFMS' own estimates for bullion imports and exports both falling by around 18% year-on-year. The main reason for the declines relates to less silver being shipped to Thailand. Just over 40% of the 13.5 Moz (420 t) that we estimate was imported into Singapore in 2003 was sourced from South Korea with the remainder from Poland, Germany and China. Of course, nearly all the silver is destined for Thailand and Indonesia.

Another strong year for silver jewelry was behind the 10% increase in silver bullion imports into **Thailand** last year. It should be pointed out that this is based on GFMS' own calculations which take into account the unofficial flows of silver into Thailand. This is important because such shipments arguably account for around 40% of total imports.

An important change occurred in the Thai silver market last year that has affected and will continue to affect the silver distribution and jewelry manufacturing sectors. From July 2003, modified VAT regulations were activated that changed the status of raw materials, including fine silver, used in the manufacture of jewelry to being VAT exempt. It is perhaps for this reason that bullion imports grew by an average of 70% in 2003, according to official Thai trade data, highlighting a switch from unofficial to official shipment routes. We believe the shift to official imports was real but understand that it did not really become sizeable until later in the year as more companies chose to become registered.

Japanese Bullion Imports



7. Fabrication Demand

- Fabrication demand rose by 13.3 Moz (415 t) or 1.6% to 859.2 Moz (26,723 t) in 2003. This represents a reverse in fortune for silver offtake which had fallen by an average of 3.6% in the preceding two years.
- The increase can be partly traced to the rebound in jewelry demand. East Asian offtake (jewelry and silverware combined) rose by 12% to reach 66.0 Moz (2,052 t) while the North American figure climbed 10.6% to reach 32.4 Moz (1,008 t). This resulted in global jewelry and silverware demand increasing by 4.1% to 276.7 Moz (8,605 t).
- Industrial demand for silver posted a relatively strong increase in 2003, rising by 2.9% to 351.2 Moz (10,923 t). The main driver was a resurgent electronics sector, boosting demand for silver plating solutions, particularly in East Asia.
- Photographic demand continued to suffer at the hands of the digital revolution. Following three previous consecutive years of falls, silver offtake in this category dropped by 4.7% to 196.1 Moz (6,098 t) in 2003.
- The largest increases in total offtake were recorded in Thailand, China and Germany while the biggest falls were seen in Japan, Belgium and France.

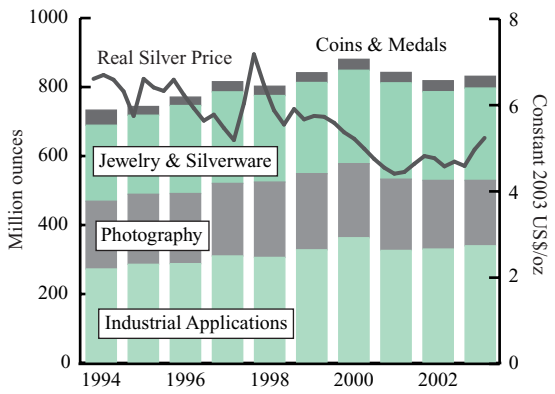
A pickup in global economic activity as 2003 progressed helped push fabrication demand up by 13.3 Moz (415 t) or 1.6% to reach 859.2 Moz (26,723 t).

One of the key factors behind the increase in total offtake, in contrast to the 2.9% fall in 2002, was the recovery in jewelry demand. After falling by 8% in 2002, mainly because of plummeting demand in India, jewelry offtake staged an impressive turnaround last year, growing by 4.1%. Further strong growth in Thailand and China was behind the global increase, with robust consumer demand for silver jewelry in Europe and the United States again a critical reason underpinning the strong growth in fabrication.

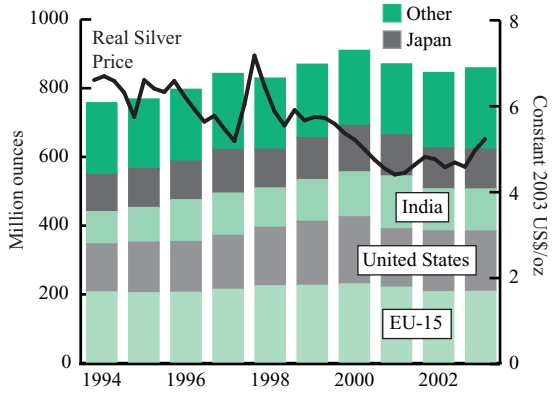
The 2.9% rise in silver usage in industrial applications came mostly from the steady acceleration in demand for silver plating materials in the electronics sector, particularly during the latter part of 2003.

Finally, the annual decline in photographic demand accelerated in 2003. After falling, on average, by 3.4% over the previous three years (2000 to 2002), it dropped by 4.7% last year to 196.1 Moz (6,098 t). While the expected long term trend is one of continued decline, as digital technology eats into the silver halide market, it is thought that growth in consumer photography in developing and growing economies like China's will help slow the fall to some extent.

World Silver Fabrication (by category)



World Silver Fabrication (by region)



Industrial Applications

- Stronger economic growth in 2003 helped silver industrial demand to rise by 2.9% or 9.7 Moz (303 t) to reach 351.2 Moz (10,923 t).
- The largest absolute increase was recorded in East Asia, where industrial offtake rose by 5.3% or 5.9 Moz (184 t).

Industrial silver fabrication in **Germany** rose by 3% in 2003 to 21.7 Moz (676 t). Most of the elements making up this category saw growth though much of the increase was attributable to higher electrical offtake. This was quite a feat given that total EU sales of silver contacts are thought to have fallen a little in 2003. That Germany managed to buck the trend as regards fabrication was chiefly due to a stable home market, higher shipments to other EU countries plus further growth in exports to central Europe (especially Poland and the Czech Republic) as Germany is well suited to supplying the factories relocating there from western Europe. (It is of note that trade data shows a double digit rise in the estimated net fine weight of silver semi exports, a fair portion of which would be covered by the industrial fabrication category.)

By sector, sales to the construction industry remained weak, those to white good manufacturers were steady, telecoms began the year slack but had improved noticeably by year end while automotive requirements were more uniformly healthy (due largely to the ever increasing complexity of cars).

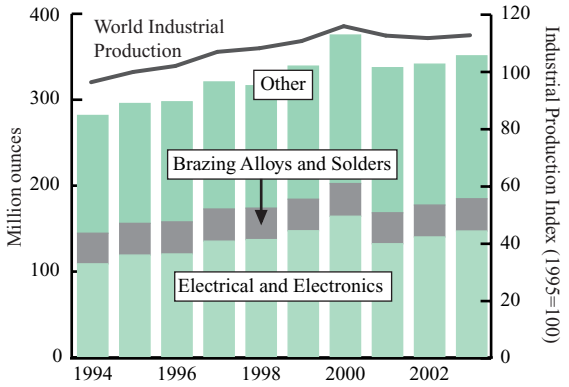
This mix by end user in turn meant that the fabrication of brazing alloys saw a very slight rise, with certain areas of the important heating, cooling and ventilation industry also enjoying a buoyant year. In fact, the only major segment of industrial fabrication to show a decline in 2003 was decorative uses, a fall in part attributable to the lower sales of plating salts to silverware manufacturers.

French industrial silver use slipped 6% to 13.7 Moz (426 t). The decline was partly the result of corporate changes, some of which involved the relocation of consuming industries to East Asia. It is also believed that the share of the domestic market taken by imports may have risen slightly. By sector, losses were greatest for electronics and brazing alloys.

Overall industrial demand in **Italy** also fell, but just by 2% to 10.2 Moz (317 t). The drop was chiefly due to lower offtake by the gold jewelry industry (which uses silver as an alloying agent). Some sectors of electronics use, however, saw growth, for example supplies going to the car industry.

Consuming industry relocation is again a feature for Italy. However, a fair part of this shift has just been to central Europe since the medium sized, often family owned firms that dominate manufacturing do not have the resources or desire to transfer somewhere too distant. As a result, the likelihood of this relocated consumption continuing to be supplied by Italian fabrication is greater than for some other countries.

Main Components of Industrial Applications



EU Industrial Fabrication

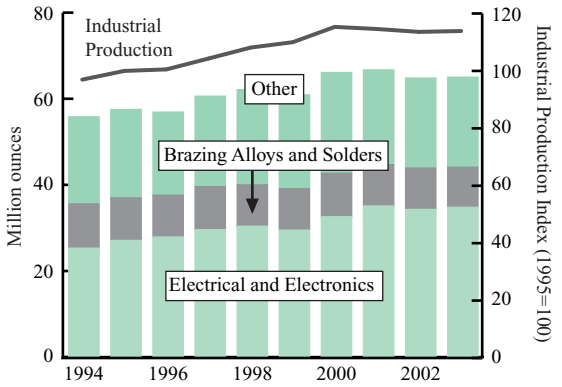


Table 4
World Silver Fabrication
(including the use of scrap)
Million ounces

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Europe										
Italy	52.1	50.1	52.2	56.5	56.3	62.1	65.4	58.5	56.0	55.0
UK & Ireland	31.2	32.3	34.4	35.5	39.2	39.9	43.2	46.5	43.7	44.8
Germany	54.4	47.6	47.2	47.6	48.4	42.1	41.2	41.1	36.8	40.6
Belgium	21.1	23.4	25.3	27.2	33.8	37.5	35.3	32.1	30.8	29.3
France	28.2	31.1	27.2	28.7	28.7	26.9	29.1	29.2	27.7	26.2
Spain	10.7	9.9	9.3	8.7	8.8	7.5	6.7	5.5	5.2	4.8
Poland	2.6	3.1	3.0	3.4	3.6	3.7	3.9	3.4	3.2	3.8
Switzerland	7.1	7.3	7.8	9.6	10.7	11.1	9.0	3.5	3.4	3.0
Greece	3.9	3.8	4.3	4.5	4.1	4.1	3.3	3.0	2.8	2.9
Portugal	2.0	2.4	2.8	2.9	3.1	3.2	3.5	2.6	1.7	2.7
Norway	1.6	1.6	1.4	1.5	1.5	3.0	2.9	2.3	1.9	1.9
Netherlands	2.4	3.0	2.5	2.4	2.2	2.8	1.9	1.8	2.1	1.9
Austria	1.5	1.6	1.5	1.3	1.4	1.2	1.1	1.1	1.2	1.2
Sweden	1.5	1.4	1.5	1.7	1.4	1.4	1.3	1.0	1.0	1.2
Czech & Slovak Republics	0.6	0.8	0.7	0.8	0.9	0.8	0.8	1.0	0.7	0.7
Denmark	1.0	1.0	1.0	1.1	1.0	1.0	1.0	0.9	0.8	0.7
Hungary	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.4	0.4	0.4
Finland	1.0	0.9	1.0	0.9	0.7	0.7	0.6	0.5	0.5	0.4
Romania	0.4	0.3	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4
Cyprus & Malta	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3
Other	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.3	0.3	0.3
Total Europe	224.4	222.9	224.7	235.7	247.3	250.5	251.8	235.3	220.9	222.7
North America										
United States	139.7	147.1	147.6	157.2	170.0	186.2	195.2	169.9	177.1	175.3
Mexico	27.6	17.5	20.8	23.5	21.9	21.7	17.3	17.1	18.1	19.7
Canada	3.1	2.7	2.7	2.8	3.4	3.5	3.0	2.9	3.1	2.5
Total North America	170.4	167.3	171.1	183.5	195.3	211.4	215.5	189.8	198.3	197.5
Central & South America										
Brazil	8.3	9.4	8.4	8.4	8.1	7.7	6.8	6.6	6.4	6.6
Argentina	4.1	3.9	3.8	3.8	3.1	2.7	2.3	1.8	1.9	2.3
Peru	0.9	1.0	1.1	1.1	1.1	1.0	1.0	1.0	1.0	0.7
Colombia	1.1	1.1	1.1	1.1	1.1	0.9	0.8	0.7	0.7	0.7
Chile	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4
Ecuador	0.7	0.7	0.7	0.7	0.7	0.5	0.5	0.5	0.5	0.4
Other	0.5	0.6	0.9	1.3	1.6	1.8	1.1	0.9	0.7	1.0
Total Central & South America	15.9	17.1	16.4	16.8	16.2	15.1	12.8	11.8	11.6	12.0
Middle East										
Turkey	5.4	6.4	6.7	6.9	6.6	6.0	7.4	5.5	7.8	8.1
Israel	3.1	3.4	3.7	4.0	3.9	3.9	3.6	3.3	3.3	3.2
Egypt	2.5	2.2	2.3	2.1	1.9	2.0	2.0	1.8	1.6	1.8
Iran	1.7	1.6	1.7	1.6	1.3	1.4	1.4	1.5	1.4	1.5
Other	1.1	1.2	1.3	1.5	1.6	1.7	1.6	1.6	1.6	1.6
Total Middle East	13.8	14.8	15.7	16.2	15.3	15.0	16.3	13.8	15.8	16.3
Indian Sub-Continent										
India	93.9	101.3	122.2	122.9	114.7	121.5	131.0	154.0	122.5	122.5
Bangladesh & Nepal	4.6	5.2	5.8	6.4	5.1	5.8	6.0	6.0	4.8	4.5
Other	2.8	3.8	2.7	4.1	2.8	3.4	3.2	2.1	2.1	2.1
Total Indian Sub-Continent	101.2	110.2	130.7	133.5	122.6	130.6	140.2	162.1	129.4	129.1
East Asia										
Japan	108.4	112.7	112.1	127.2	112.8	122.5	135.0	119.3	118.7	115.9
China	24.6	26.0	28.6	32.2	33.9	33.1	33.6	35.7	42.7	47.2

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

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Thailand	29.1	27.7	27.6	27.1	24.2	26.7	30.2	32.6	35.8	40.4
South Korea	16.4	18.6	18.5	18.6	13.8	16.7	20.6	18.1	19.1	20.7
Taiwan	5.3	5.7	6.4	6.9	6.8	6.7	9.4	8.5	9.0	10.3
Indonesia	2.7	3.1	3.4	4.1	2.7	3.2	3.9	4.3	4.8	5.1
Hong Kong	3.4	3.4	3.7	4.4	3.6	3.9	4.4	3.2	3.4	3.3
Myanmar, Laos & Cambodia	1.0	1.1	1.1	1.0	0.8	0.9	0.8	0.9	1.0	1.0
Vietnam	0.5	0.6	0.7	0.7	0.6	0.7	0.7	0.7	0.8	0.9
Malaysia	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.6	0.7
Other	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5
Total East Asia	192.1	199.8	202.8	222.8	199.8	215.2	239.7	224.2	236.2	245.8
Africa										
Morocco	0.5	0.5	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6
Tunisia	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
South Africa	0.4	0.5	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2
Algeria	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Other	0.5	0.5	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4
Total Africa	1.9	2.0	1.8	1.8	1.7	1.7	1.8	1.7	1.7	1.7
Oceania										
Australia	6.3	5.3	5.2	5.2	5.6	5.8	7.0	5.9	5.8	6.2
New Zealand	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Oceania	6.3	5.3	5.2	5.2	5.7	5.8	7.0	6.0	5.8	6.3
CIS										
CIS	31.6	28.9	28.2	27.2	25.4	24.3	24.9	25.8	26.1	27.6
Total CIS	31.6	29.0	28.2	27.2	25.4	24.3	24.9	25.8	26.0	27.6
World Total	**757.7**	**768.6**	**796.8**	**842.9**	**829.4**	**869.8**	**910.0**	**870.7**	**845.8**	**859.2**

After falling for two years, industrial fabrication in the **United Kingdom** staged a modest recovery last year, with a 6% rise taking the total to 15.9 Moz (495 t). Much of the increase was due to higher exports, which, in the main, compensated for weak sales in the home market. These developments are related as the shift for UK based companies to move production facilities overseas, for example to eastern Europe or East Asia, has accelerated in recent years. And whether a UK supplier is retained in the long run will invariably depend on the location of the new plant. This was notably true in the fuse industry which was affected by the closure of UK based facilities. Elsewhere, demand for silver components in telecommunication base stations held up last year but an increasing share of the market was sourced from imports. In addition, the lack of demand for Third Generation (3G) infrastructure was compensated by healthy demand for 2.5G base stations. These have provided an intermediate solution for the industry (they can satisfy demand, for example, for picture cell phones), which has struggled to build on the substantial sums recently paid for the 3G licenses. Elsewhere, the solder and brazing alloys sector received a boost from higher exports, although the total remained below the peak recorded two years ago.

North America

The 3.5% rise in total industrial fabrication in the **United States** last year means that domestic output has now increased for the past two years. That said, 2003's rise was notably modest and perhaps, more importantly, the year-on-year increase was lower than in 2002. Finally, it is worth noting that last year's total was still considerably below the peak registered in 2000. What does this modest performance convey about the state of the US manufacturing base, both last year and for 2004?

EU Industrial Production
Index (1995=100)

1999	2000	2001	2002	2003
110.3	115.5	114.6	113.6	113.9

Source: OECD

To answer this, it is worth briefly examining the main trends in 2003. In broad measure, the previous twelve months can be divided into two distinct growth patterns. Firstly, industrial fabrication over the first nine months was notably cautious and represented a continuation of the pattern established in 2002; subdued demand across the entire supply chain combined with a "just-in-time" approach, which, by its very nature, reaffirmed the stop-start environment of the US market. As a result, despite an initial upturn in activity, up until the fourth quarter output was broadly flat year-on-year. The second distinct phase emerged in the final three months but for some sectors it was not until November when there was a pronounced upturn in orders. That said, the trend over the preceeding months, and in particular the first quarter rise, dictated that, in spite of the upturn, a cautious approach be maintained. Even so, the extent of this increase lifted the market and was in large part responsible for the annual rise in 2003 fabrication.

Perhaps more importantly, this trend has continued into 2004. However, anecdotal evidence is mixed as to whether, even at this stage, this still reflects a refilling of a much depleted supply chain or if instead it does point to a sustained rise in end-use demand. On a cautionary note, some market players have noticed that the sudden rise in demand, combined with capacity reductions over the past two years (as a result of the electronics bubble bursting in 2001), has actually fostered supply concerns, which in turn has led to multi-ordering of silver bearing components - a trend that was all too pronounced in 2000. On a positive note, evidence has also emerged that the high silver price of the first four months of 2004 was too short-lived to adversely impact on fabrication.

United States Industrial Production
Index (1995=100)

1999	2000	2001	2002	2003
123.9	129.3	124.9	124.2	124.6

Source: IMF

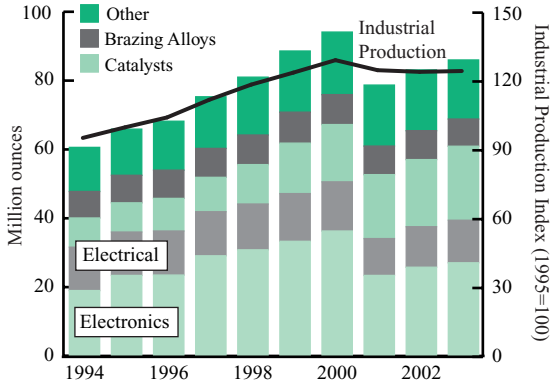
Turning to the individual sectors, both electrical and electronics fabrication posted modest increases in 2003.

In previous years, electronics demand from the multi-layer ceramic capacitor (MLCC) industry has been affected by a number of different forces, pulling in opposite directions. In particular, a desire to switch completely to a copper-nickel solution adversely affected precious metal demand in the MLCC sector. That said, for those companies retaining precious metal manufacturing facilities the focus was directed at increasing the silver content at the expense of palladium. Even so, the US MLCC industry is still characterized by relatively high palladium alloys. Last year, this technological shift slowed considerably and 2003 was typically seen as a period of consolidation. In addition, the recovery in fabrication was tempered by earlier offshore relocations, although, once again, this trend also slowed in 2003.

Staying within the electrical and electronics sector, one of the key growth areas in 2002 was the substitution in favor of silver (at the expense of gold) in the manufacture of DVDs. Last year (as well as in early 2004), silver and silver alloys were predominantly retained in both DVD-9 and DVD-R, whilst DVD-18, in 2004, is migrating from a gold to a silver alloy.

Elsewhere, demand for solder and brazing alloys suffered a 6% fall, taking the 2003 total to a 10-year low. As a result, for the first time, the United States lost its position to China as the foremost producer in this category. Much of the decline was attributable to

US Industrial Fabrication



stiff import competition. In contrast, fabrication for ethylene oxide (EO) catalysts rose last year, as a result of at least one new plant being brought into production.

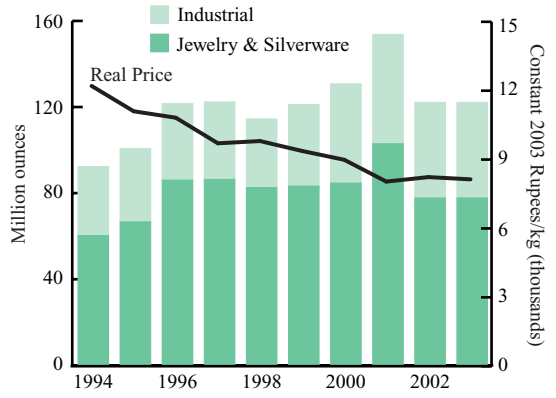
India

Indian industrial demand is estimated to have remained effectively flat year-on-year in 2003, at 44.4 Moz (1,381 t) (down significantly on the record 50.8 Moz (1,579 t) recorded in 2001). Notwithstanding this decline, India remains one of the world's largest industrial users of silver, only trailing in size the United States and Japan.

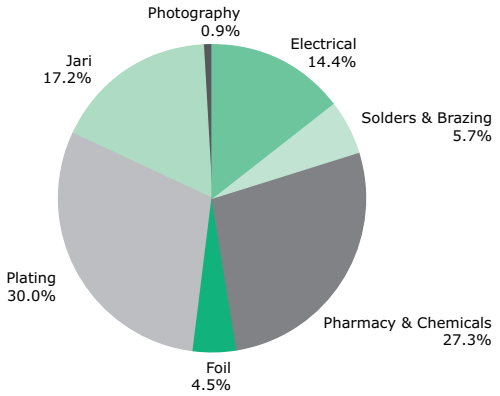
Before proceeding to an examination of the performance of the various components of demand, there is an important clarification that should be made regarding the macro-data. As we argue in Chapter 6, the collection of silver import data over the past two years has become much more difficult, in part due to changes in tax regimes, but mainly due to the increase in the number of active players and the final markets into which they have been taking the metal. At the time of writing, we would have to countenance the possibility that industrial uses of silver actually rose (albeit modestly) last year. The reason for this cuts to the heart of the GFMS methodology.

Our data sets are derived from a comprehensive supply and demand balance of raw bullion. This is complemented and supplemented through our field research on both the demand and supply side. Needless to say, if the trade data underestimates bullion inflows, this will necessarily mean that the derived demand number is too low (as explained in Chapter 6, complications in the systematic collection of import data in 2003 have led us to believe that the numbers available at the time of writing are possibly too low).

Indian Fabrication



Indian Industrial Fabrication, 2003



Unfortunately, because the year-on-year changes were not large (be they slightly up or slightly down), our field research has not been able to provide definitive guidance either. For instance, one of India's largest bullion importers in recent years is of the firm view that imports were down last year. However, other information which we have been privy too suggests that this is a market share issue rather than one of gross market size (another large importer of silver was up year-on-year).

Matters are even more complicated on the demand side due to the disparate number of active market participants, so definitive guidance is not to be found there. For example, it is estimated by the government that there are 500 industrial units and around 3,000 very small household units producing jari (which is used in saris) in Surat, the main producing area. Some producers with whom we have spoken have suggested the market was up while others have suggested it was down. Given that we have clearly not surveyed the whole jari industry, it is difficult to draw firm conclusions as to the direction of that market. The bottom line, and one that is consistent with the view that there were no major changes in the market last year, is that the evidence from the demand side is ambiguous, especially when it comes to the "non-industrial" uses of silver (here we are differentiating between "real" industrial applications such as electrical uses of silver and "quasi-industrial" uses of silver which we still count in the industrial category such as jari).

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

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Europe										
Germany	18.0	18.5	17.2	17.8	18.4	18.3	20.8	21.4	21.2	21.7
UK & Ireland	11.7	11.9	12.2	12.5	16.3	15.2	17.6	15.4	15.0	15.9
France	11.6	12.0	11.7	13.4	11.2	11.6	12.3	15.9	14.6	13.7
Italy	10.2	10.6	11.2	11.4	10.6	10.6	10.9	10.4	10.4	10.2
Switzerland	6.5	6.6	6.9	8.6	10.0	10.4	8.3	2.7	2.7	2.3
Netherlands	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.5	1.5	1.5
Spain	1.7	1.8	2.0	2.9	3.1	2.7	2.0	1.3	1.3	1.2
Poland	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Norway	0.4	0.4	0.4	0.4	0.4	1.4	1.2	0.7	0.6	0.6
Austria	0.6	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5
Sweden	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3
Czech & Slovak Republics	0.4	0.5	0.5	0.4	0.4	0.5	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	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7
Total Europe	65.0	67.0	66.6	71.9	74.6	75.2	77.7	72.3	70.0	69.9
North America										
United States	60.6	65.9	68.2	75.3	81.0	88.6	94.1	78.7	83.1	86.0
Mexico	2.8	2.5	2.6	2.7	3.0	3.3	3.4	3.0	3.0	3.1
Canada	0.6	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5
Total North America	64.0	69.2	71.4	78.7	84.5	92.5	98.1	82.3	86.6	89.6
Central & South America										
Brazil	3.2	3.5	3.3	3.4	3.5	3.2	3.2	3.2	3.2	3.0
Argentina	1.3	1.2	1.2	1.2	1.2	1.0	0.8	0.6	0.6	0.6
Colombia	0.3	0.3	0.3	0.3	0.3	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	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Total Central & South America	5.2	5.4	5.2	5.3	5.4	4.8	4.6	4.5	4.5	4.3
Middle East										
Turkey	1.1	1.2	1.2	1.4	1.3	1.2	1.4	1.1	1.3	1.5
Israel	0.9	1.0	1.0	1.0	1.0	0.9	1.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Middle East	2.1	2.3	2.4	2.5	2.5	2.3	2.5	2.1	2.2	2.3
Indian Sub-Continent										
India	32.1	34.1	35.5	36.0	31.9	37.9	46.1	50.8	44.4	44.4
Pakistan	0.5	0.6	0.5	0.7	0.5	0.6	0.5	0.3	0.3	0.3
Total Indian Sub-Continent	32.6	34.8	36.0	36.7	32.4	38.5	46.7	51.1	44.7	44.7
East Asia										
Japan	51.1	53.6	52.1	59.4	52.8	60.8	72.1	55.4	59.1	60.3
China	17.3	18.2	19.1	20.3	20.7	20.9	21.9	22.3	25.6	27.6
South Korea	10.0	11.9	11.9	12.3	11.2	12.2	15.7	13.4	14.6	16.0
Taiwan	4.7	5.2	5.8	6.3	6.2	6.3	8.8	8.0	8.7	9.9
Hong Kong	2.4	2.5	2.8	3.4	3.0	3.3	3.9	2.7	3.0	2.9
Indonesia	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Total East Asia	85.9	91.8	92.2	102.3	94.5	103.9	123.0	102.4	111.4	117.3
Africa										
Morocco	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2
South Africa	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
Other	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total Africa	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5

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

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Oceania										
Australia	2.2	2.4	2.3	2.1	2.3	2.4	2.5	2.1	2.1	2.2
Total Oceania	2.2	2.4	2.3	2.1	2.3	2.4	2.5	2.1	2.1	2.2
CIS										
CIS	24.0	21.9	21.1	20.6	19.6	18.8	19.6	20.1	19.3	20.3
Total CIS	24.0	21.9	21.1	20.6	19.6	18.8	19.6	20.1	19.3	20.3
World Total	**281.8**	**295.7**	**297.7**	**320.8**	**316.4**	**339.2**	**375.4**	**337.4**	**341.4**	**351.2**

The reason we have differentiated between these two broad categories of industrial uses is that the drivers behind each are often quite different. In the context of products like jari, the strength of the rural economy is key while electrical and electronics uses of silver are driven much more by what economists would term the "industrial economy". To the extent that we have a view on demand last year, and notwithstanding all of our reservations about the data, we believe it is probable that "genuine" industrial uses rose in 2003.

For instance, GFMS estimates indicate that fabrication of silver for use in both electrical/electronics and solders/brazing applications rose last year, probably by around 5%. One of the largest producers of plating salts reported strongly higher offtake last year and, given the relative degree of concentration in this sector, we believe that this probably applied across the market. This view is also backed up by "final demand" data from the electrical and electronics industries. As we mentioned in last year's *Silver Survey*, India's electronics industry is going through rapid changes (similar to those seen in China over the past couple of years), with manufacturing moving away from simple assembly of imported components to actual fabrication from raw materials (e.g. converting bullion into plating salts). This is especially true of the South Koreans who are increasingly manufacturing from the "bottom up", hence boosting the fabrication numbers reported in this *Survey*.

Further evidence for a rise in demand from these sectors can be found in the hard economic data. For example, sales of consumer durables rose sharply last year (full year data is still not available, but they rose 8.2% between April and October compared to a drop of 6.5% in the same period of 2002). More and more Indians are buying motorcycles, cars, electronic goods and cell phones that are being manufactured locally. In the context of cars, GFMS research shows production rose 22% in 2003, boosting demand for industrial items like contacts.

Again, to the extent that one can take a view on the trends within the industrial sector, we would argue that it is probable "non-industrial" uses of silver, in applications like jari (the thread used in saris) and plating (in decorative applications like jewelry), fell slightly last year. This is consistent with the weak performance of the rural economy in the main silver consuming areas in the first half of the year (see the section on Jewelry and Silverware for more on this).

Global Billings
(semiconductor shipments per year, millions)

	World	Americas	Europe	Japan	Asia
2002	140.7	31.3	27.8	30.5	51.2
2003	165.3	31.9	32.3	38.6	62.5
Change	24.6	0.7	4.5	8.1	11.3
Change %	17	2	16	27	22

Source: SIA

East Asia

Japanese industrial uses of silver rose by around 2% in 2003, up from 2002's 59.1 Moz (1,839 t). This modest rise may, at first sight, appear surprising, not least of all because of the robust performance of the electronics sector last year. Indeed, considering that

Japanese uses of gold in electronics rose by a considerable 25% year-on-year, this seems somewhat contradictory. The reasons for this are, however, quite easy to understand and are a reflection of the very diverse uses of silver in industrial applications.

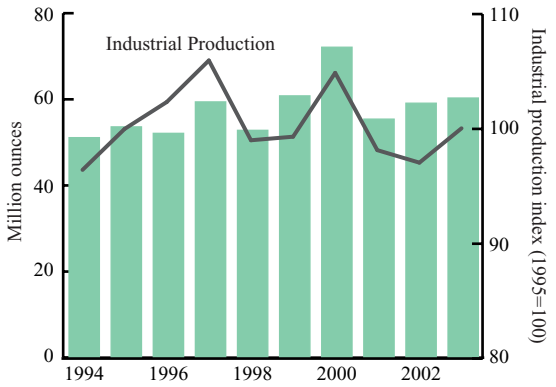
For example, the overwhelming amount of industrial gold finds its way into gold bonding wire and gold potassium cyanide, most of which are used directly in electronics applications. Silver, by contrast, is not nearly as dependent on electronics, with electrical uses being as important (if not more so), and the drivers of these two markets can differ quite markedly. One other key issue that differentiates the gold and silver markets is that the former tends, in the main, to be more "high tech" than the latter, meaning that any shift offshore is more difficult to achieve. Gold bonding wire is a good example of this phenomenon. There is a high degree of geographical concentration in production (especially of the rod from which the wire is drawn) because of the technical demands associated with its production, and the ability of others (say the Chinese) to compete head-on in this field is much more difficult than say low end silver contacts or silver potassium cyanide.

Japanese Industrial Production
Index (1995=100)

1999	2000	2001	2002	2003
99.8	105.4	98.2	97.1	100.1

Source: OECD

Japanese Industrial Fabrication



Japanese Non-Photographic Nitrate and Contact Production
Million ounces

	2000	2001	2002	2003
non-photo nitrates	17.1	12.0	14.0	14.9
contacts	11.5	7.9	8.6	8.5

The relocation of production is one of the key reasons we believe Japanese industrial uses of silver did not increase last year by as much as might have been expected. A good example of this is silver contacts. As our data tables show, GFMS believe that contact production in 2003 fell, albeit very slightly. There were two key reasons for this. In spite of a rise in demand for electronics applications in Japan itself, our information suggests that the lower end of the market saw a noticeable shift in production to China last year (usually by Japanese companies taking advantage of lower production costs on the mainland as well as rapidly growing demand and the absence of import duties). Indeed, one of Japan's largest fabricators of contacts attributed the bulk of their 10% drop in domestic production to the relocation of manufacturing to China.

Yet a further reason for the decline in contact production in Japan was the fall in automotive production. In particular, the production of silver tin oxide alloys, which are used widely in contact weld tape applications in the automotive industry, fell in 2003. Added to this, contact production for use in the construction industry also declined (which also saw silver nitrate production for use in mirrors fall).

Elsewhere, GFMS estimate that silver use in solders and brazing alloys was at best stable in 2003. As is the case with lower end contacts, Japanese production in this area has been under pressure as fabricators look to shift production offshore, in particular to China. Dental uses of silver are also thought to have fallen marginally last year, the result of lower production of the key dental alloy, Kinpara 12 (which contains 40% silver).

Chinese industrial uses of silver are estimated to have risen by 8% year-on-year to reach 27.6 Moz (859 t), a record for the country and a reflection of the phenomenal growth seen in the economy over the past year. Indeed, it will not come as a surprise to anybody in the metals industry that domestic demand for silver in China rose strongly last year. The broad consensus

is that, in the industrial metals at least, China has been the primary impetus behind the recent bull rally in prices.

Notwithstanding some of the reservations that have been expressed in the past about the accuracy of the Chinese economic data, it seems safe to assume that there has been rapid growth over the past few years. Last year, China's economy grew at an official 9.1%, shaking off an outbreak of SARS (Severe Acute Respiratory Syndrome) at the beginning of the year to record its best performance in seven years. Remarkably, with an annualized growth rate of 9.9% GDP growth in the fourth quarter, there are now serious concerns about economic overheating (Beijing has recently announced plans to curb spending, raise some energy prices and tinker with credit supply to curb growth).

Turning to the silver market itself, GFMS estimates that all categories of demand rose last year. Brazing alloy and solder fabrication rose more strongly than electrical and electronics demand, reflecting in part the different technological demands associated with each category (our information suggests that China still imports substantial quantities of higher end electronics products but that, in solders and brazing alloys, the mainland is more self-sufficient).

Production of contacts is estimated to have risen sharply, amongst other reasons on the back of the construction boom and high vehicle production. For instance, GFMS' research on the autocatalyst market in Japan (see our *Platinum and Palladium Survey* released in May) shows that passenger car production in China in 2003 rose by a phenomenal 36% to 3.9 million units.

Data from the National Bureau of Statistics shows marked growth in a whole raft of silver consuming applications (the production of electronic communications equipment, transport apparatus and electrical machinery rose sharply), boosting demand for products like plating salts, silver powder and silver cadmium oxide (which is still used in China). On the brazing alloy front, production of household refrigerators rose by 37% year-on-year, but still trailed the massive 47% rise in the manufacture of air conditioners.

Hong Kong remains an important fabricator of silver for industrial uses and GFMS estimate that demand in this category fell slightly in 2003, the result of some plating applications moving back to palladium as its price has fallen.

Korean Industrial Production
Index (1995=100)

1999	2000	2001	2002	2003
131.9	154.0	155.0	167.6	176.1

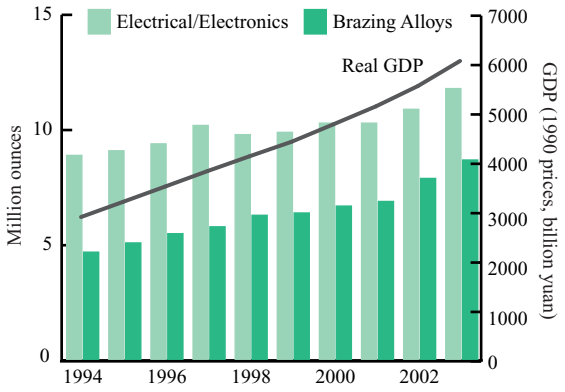
Source: OECD

Industrial demand for silver in **South Korea** rose by 10% year-on-year to reach 16.0 Moz (499 t). Last year was the second year in a row of rising industrial demand for silver, underpinned by a resumption of the much anticipated long term growth trend in the electronics sector. Demand for silver based products such as contacts and silver plating chemicals, which constitute the bulk of silver use in electronics, was driven by the pickup in end-consumer demand for the latest models of products, ranging from DVD players, photo cell phones and personal computers. Importantly, demand from the corporate sector has also signaled a return of increased IT spending by industry.

According to the Korean Chamber of Commerce and Industry (KCCI), South Korean semiconductor production grew by a substantial 51% in 2003, with the general electronics sector expanding by around 12%. Raw material substitution and other thrifting practices muted the rise in silver use by the electronics sector but it still managed a healthy rise of 12%.

In a broader context, the construction industry was quite robust while manufacturing faired less well. Commercial and residential construction is estimated to have expanded by an impressive 15% while the

Chinese Industrial Uses of Silver



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 is hence 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 multi-layer ceramic capacitors, in the manufacture of membrane switches, silvered film in electrically heated automobile windshields, and in conductive adhesives.

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. The plating thickness of some items, such as fuse caps, is less than one micron although the silver then tarnishes more easily, and coatings of two to seven microns are normal for heavy duty electrical equipment. 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 both in mirrors and glass coatings, cellophane or metals.

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 ethylene oxide catalysts for the petrochemical industry.

Silver is employed as a bactericide and algicide in an ever increasing number of applications, including water purification systems in hospitals, remote communities and domestic households.

The joining of materials (called brazing if done at temperatures above 600º Celsius and soldering when below) is facilitated by silver's fluidity and strength. Silver brazing alloys are used widely in applications ranging from air-conditioning and refrigeration equipment to power distribution equipment in the electrical engineering sector. It is also used in the automobile and aerospace industries. Bearings electroplated with high purity silver have greater fatigue strength and load carrying capacity than any other type and are used in various high-tech and heavy-duty applications.

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.

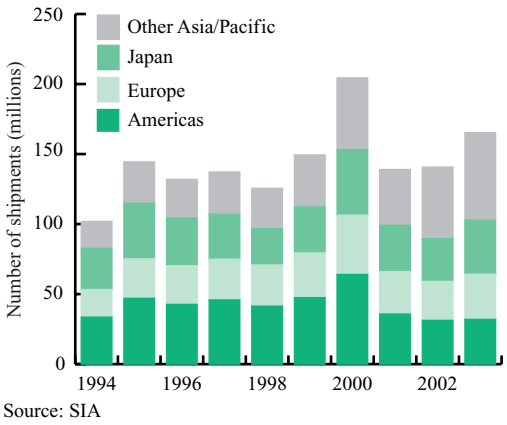
Jewelry and Silverware

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". Plated silverware usually has a coating of 20-30 microns, while jewelry plating is only 3-5 microns.

Coins

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

Global Semiconductor Billings



Source: SIA

production of machinery, automobiles and ship-building grew, on average, by no more than 5%. Silver use in the form of brazing alloys is estimated by GFMS to have risen by 4.5% to 1.5 Moz (48 t).

The outlook for 2004 is quite promising and a rate of growth similar to that achieved in 2003 is forecast. This is based on information from our local sources predicting slightly lower but still robust electronics demand and a slight increase in brazing alloy production.

Taiwanese industrial demand rose by an impressive 15% year-on-year in 2003. Driven primarily by a booming electronics sector, silver industrial demand increased by 1.3 Moz (39 t) to reach 9.9 Moz (309 t) last year. The industrial demand category for Taiwan is dominated by plating solutions such as thick film pastes which account for around two-thirds of the total. Contacts are the second largest sub-category and represent nearly one-fifth of industrial demand. Thus, it becomes apparent as to why silver offtake rose so strongly in 2003 as it paralleled the booming conditions in the Taiwanese electronics sector. Behind the surge in demand for pastes, contacts and silver bearing conductors was the rapid growth experienced in liquid-crystal displays for use in products ranging from televisions, cell phones and laptop computers to vehicles and game consoles. Of course, the metal also benefited from increased production of the many electronic components that also require silver coated contacts and connectors.

Photography

- Silver photographic demand recorded its largest ever percentage fall, dropping by 4.7% or 10 Moz (300 t) to a 14-year low of 196.1 Moz (6,098 t).
- Demand fell in the three largest fabricating countries. US and Japanese offtake fell a combined 8.4 Moz (262 t) last year. The fourth of the majors, the United Kingdom, in contrast, saw a rise.

The quantity of silver nitrate produced in the **United States** for photographic end-uses is estimated to have fallen last year by around 6.8%. The decline to 61.6 Moz (1,917 t) of contained silver was the lowest level recorded since 1996 and stemmed from two main causes. The first was the result of corporate decisions regarding the location of production of certain photographic materials. In the second half of 2002, one manufacturer relocated production (and the associated silver nitrate output) to Europe. Conversely, last year, a different foreign manufacturer transferred some production to the United States, which had a positive impact on local demand for silver. On a net basis, these two corporate decisions had a negative impact on overall US silver nitrate demand.

This was exacerbated by the second cause of the decline in silver requirements, namely lower demand for some traditional silver-based photographic products. The lower demand was most acutely felt in the area of consumer film. Kodak, the dominant manufacturer in the United States, for example, has reported that its worldwide consumer film products (including 35mm film, Advantix film and one-time use cameras) suffered a 12% decline in volume last year.

Film sales have been hardest hit in developed country markets - by digital inroads and retailer destocking - whereas sales in some emerging markets have performed strongly; Kodak's overall sales in 2003 were up 12% to China, 17% to India and 26% to Russia. An indication of the company's continued belief in the future growth potential of silver halide film in emerging markets was its deal to acquire 20% of Lucky Film, China's largest film producer. However, in developed country markets film sales seem now to be in outright secular decline (for all manufacturers, not just Kodak).

There is less clarity when it comes to the outlook for demand for consumer photographic paper. Kodak

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

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
United States	31.6	36.0	36.3	41.9	44.1	47.1	50.6	34.1	37.6	39.5
Japan	22.5	23.9	22.7	25.8	23.7	30.0	36.7	26.6	29.4	30.2
Germany	10.9	11.9	11.6	11.9	12.2	12.2	14.3	15.7	15.6	16.2
China	8.9	9.1	9.4	10.2	9.8	9.9	10.3	10.3	10.9	11.8
France	5.4	6.1	6.3	7.7	6.7	6.8	7.3	11.0	9.9	9.5
South Korea	5.3	6.4	6.4	6.5	6.0	6.6	8.6	7.6	8.2	9.2
Taiwan	3.3	3.6	4.2	4.7	4.8	4.8	7.0	6.5	7.2	8.4
UK & Ireland	4.6	4.7	5.0	5.1	6.8	5.7	6.8	4.9	5.3	5.5
India	2.6	3.0	3.2	4.2	4.2	4.5	4.8	4.7	4.9	5.1
Italy	2.7	2.7	3.3	3.2	2.9	3.0	3.1	2.8	2.8	2.9
Hong Kong	1.8	1.9	2.2	2.7	2.5	2.9	3.5	2.5	2.8	2.7
Mexico	1.2	1.1	1.1	1.2	1.3	1.9	2.1	1.8	1.8	1.9
Brazil	1.5	1.6	1.4	1.4	1.4	1.3	1.3	1.3	1.3	1.2
Turkey	0.8	0.9	0.9	1.0	0.9	0.8	0.9	0.7	0.8	1.0
Australia	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7
Netherlands	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5
Switzerland	3.5	3.8	4.1	5.5	7.3	7.5	5.3	0.4	0.4	0.5
Austria	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Romania	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Egypt	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Spain	0.9	0.9	0.9	0.9	1.0	1.0	0.3	0.0	0.0	0.0
World Total	**109.0**	**119.2**	**120.5**	**135.4**	**137.2**	**147.5**	**164.4**	**132.4**	**140.3**	**147.2**

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

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
China	4.7	5.1	5.5	5.8	6.3	6.4	6.7	6.9	7.9	8.7
United States	7.7	8.0	8.2	8.4	8.6	9.0	8.7	8.3	8.4	7.9
Japan	4.7	4.8	5.1	5.0	4.2	4.2	4.4	3.5	3.3	3.3
Germany	4.0	3.5	2.9	3.1	3.1	3.0	3.2	2.8	3.0	3.1
UK & Ireland	2.3	2.3	2.3	2.3	2.4	2.2	2.3	2.6	2.3	2.4
India	1.6	1.9	2.1	1.6	1.5	1.6	1.8	1.8	1.9	2.1
Italy	1.9	2.1	2.1	1.9	1.7	2.0	2.1	2.0	2.1	2.0
South Korea	1.0	1.2	1.2	1.1	0.8	0.8	1.0	1.2	1.4	1.5
Switzerland	1.8	1.8	1.7	1.7	1.6	1.5	1.6	1.3	1.3	1.4
Taiwan	0.8	1.0	1.1	1.1	1.0	1.0	1.2	0.9	1.0	1.1
Spain	0.3	0.3	0.6	0.9	1.0	1.1	1.1	1.0	1.0	0.9
Brazil	0.8	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.7	0.7
Australia	0.6	0.7	0.7	0.6	0.7	0.7	0.8	0.6	0.6	0.6
France	1.4	1.3	1.4	1.4	1.0	0.9	1.0	0.9	0.9	0.6
Mexico	1.0	0.9	0.9	0.9	1.0	0.6	0.6	0.5	0.5	0.5
Canada	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3
Netherlands	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2
Austria	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Israel	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
World Total	**35.6**	**36.9**	**37.3**	**37.4**	**36.6**	**36.7**	**38.0**	**36.0**	**37.1**	**37.5**

New Uses of Silver

While enjoying rekindled interest from the investment community, silver remains first and foremost an industrial metal. Therefore, its relevance in industry, particularly in growth areas such as health, electronics and energy is essential for the metal. This issue is heightened by the immediate threat that digital technology poses for silver photographic demand. There are, however, several potential growth areas for silver. They are based on silver's strengths as a catalyst, as a biocide and for conducting and storing electricity.

Fuel cells offer a medium to long-term option for power generation, particularly in motor vehicles. At present, the fuel cell development path for use in vehicles is centered on proton exchange membrane (PEM) cells and alkaline-based cells. The latter are of interest because they have various technical and cost advantages over PEM cells, including being able to use non-platinum catalysts such as silver. It should be noted that the most promising research is currently focused on platinum based fuel cells but research into using silver or gold as catalysts is also underway.

The anti-bacterial properties of silver are well documented, but it is only recently that improvements in nano-particle research and production techniques have enabled more widespread use of silver as a biocide and anti-bacterial agent.

Hospitals, particularly those with a specialist burns unit, are more widely using bandages that release silver ions as part of their wound management procedures, reducing the frequency for painful dressing changes as well as achieving better healing.

Also, silver biocides may be able to replace arsenic and other chemical preservatives in wood as well as being incorporated into marine antifouling coatings. In the United States, chromated copper arsenate was phased out by the end of last year and a government backed study looking at silver as an alternative is being considered.

Gold use in electronics (bonding wires, plating) has been and is continuing to be replaced on grounds of cost and silver is often the main candidate to act as a substitute. This will become more prevalent as more low cost, mass-produced consumer products incorporate some sort of logic control and data storage. Of course, other materials such as copper, aluminum and ceramics are also in competition with silver.

High temperature superconductor wires, combining a ceramic core with a silver sheath, have been developed for use in new generation power generation plants and distribution grids. The wires are very efficient in carrying electricity and widespread usage could see many millions of ounces used in this application alone.

reported that paper volume was marginally lower last year but, on the other hand, its sales of photo quality inkjet media performed strongly. As we have discussed before, there is a legitimate debate over the extent to which silver-based paper sales have the scope to grow to offset some of the losses consumer film will suffer, at least in developed country markets.

Silver use in analog radiographic products was also reported by Kodak to be down slightly in 2003. Two other important areas of demand last year - again according to Kodak's public comments - were more clear cut; growth in motion picture films (due to more worldwide releases of blockbuster movies) and a sharp reduction in graphic arts films demand (hit by the onward march of digital technology and the weakness of the commercial printing market). Finally, the professional segment saw a fall in both paper and film sales, particularly the latter, due to competition from digital technology.

The 2.4% fall in **European** photographic fabrication to 65.6 Moz (2,040 t), left the total at a 10-year low. As noted elsewhere, a combination of the Iraq War, low economic growth and the SARS virus all adversely affected international travel and tourism, which effectively reduced the opportunity for using cameras. In addition, there was continued and rising competition from digital formats. This has by no means been limited to consumer film, with a much greater impact, for example, in the graphic arts sector. It was perhaps not surprising, therefore, to see, in recent Agfa results, that "new digital solutions" accounted for 42% of group sales in 2003.

Japanese photographic demand is estimated to have fallen quite sharply in 2003, by around 6.8% to 53.9

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

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Europe										
Belgium	20.6	22.8	24.8	26.6	33.2	36.9	34.7	31.6	30.4	28.8
UK & Ireland	15.9	16.7	18.2	19.0	19.1	21.0	21.8	27.7	26.0	26.8
France	13.7	15.9	13.2	12.7	14.5	12.2	13.7	10.1	9.9	9.4
Czech & Slovak Republics	0.0	0.0	0.0	0.1	0.3	0.0	0.3	0.5	0.2	0.2
Hungary	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Romania	0.2	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2
Bulgaria	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Germany	16.1	14.8	13.8	14.5	9.9	6.7	1.7	1.6	0.4	0.0
Spain	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Poland	0.5	0.5	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Europe	67.4	71.1	70.7	73.5	77.4	77.2	72.6	71.8	67.2	65.6
North America										
United States	57.6	59.7	59.9	62.9	69.4	73.8	73.9	65.8	66.2	61.6
Mexico	3.2	3.3	3.4	4.1	3.4	2.9	0.0	0.0	0.0	0.0
Total North America	60.8	63.0	63.3	66.9	72.8	76.7	73.9	65.8	66.2	61.6
Central & South America										
Brazil	3.2	4.0	3.4	3.4	3.2	3.2	2.4	2.3	2.1	2.2
Argentina	1.8	1.8	1.8	1.8	1.8	1.6	1.3	1.0	1.1	1.5
Total Central & South America	5.0	5.8	5.2	5.2	5.0	4.8	3.7	3.3	3.2	3.7
Indian Sub-Continent										
India	1.6	0.6	0.6	0.6	0.3	0.3	0.3	0.3	0.3	0.3
Sri Lanka	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.1	0.1	0.1
Total Indian Sub-Continent	1.8	0.9	0.9	1.0	0.7	0.7	0.7	0.5	0.5	0.5
East Asia										
Japan	55.1	56.9	57.9	58.6	58.2	59.9	61.2	62.2	57.8	53.9
China	5.6	5.6	5.8	6.0	6.1	3.7	3.9	4.5	5.7	5.8
Taiwan	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total East Asia	60.8	62.5	63.7	64.6	64.3	63.6	65.0	66.7	63.5	59.7
Oceania										
Australia	1.9	1.6	1.6	1.6	1.6	1.7	2.7	2.4	2.3	2.1
Total Oceania	1.9	1.6	1.6	1.6	1.6	1.7	2.7	2.4	2.3	2.1
CIS										
CIS	5.2	5.0	4.7	4.5	3.8	3.4	3.2	3.1	3.0	2.8
Total CIS	5.2	5.0	4.7	4.5	3.8	3.4	3.2	3.1	3.0	2.8
World Total	**202.9**	**209.9**	**210.1**	**217.4**	**225.7**	**228.2**	**221.9**	**213.5**	**205.7**	**196.1**

Moz (1,677 t) (down from 62.2 Moz (1,799 t) in 2002). As was the case in 2002, we believe that all of the major manufacturers experienced declines in production last year, some by more than others, and for varying reasons.

One interesting reality check on our contention that photographic demand fell is to be found in the area of photographic scrap recovery. As part of GFMS' research work on the Japanese market, we spend some considerable time looking at the scrap market (for all the precious metals it should be added). As we discuss in Chapter 5, most of the major collectors of scrap with whom we have spoken reported lower volumes of photographic material year-on-year, which is the reason for the slight fall in the total shown in that chapter. The reason that this is significant is obvious; as demand for photographic products in any given period falls, all other things being equal, one would

expect silver scrap recovery from this source to fall as well.

The were a number of factors behind the decline recorded last year. Firstly, in the first half of the year, there was the impact of SARS on Asian demand. It should be stressed that Asian demand for photographic products has been growing in importance for Japanese manufacturers for many years now (indeed, GFMS data suggests that growth in Asian demand is one of the key reasons Japanese offtake in photographic applications has not fallen by more than it did over the past two years). All of the main manufacturers reported lower demand from the main markets in Asia, in particular China, in the first half of the year (at the Imaging Summit 2003 held in Germany, it was argued that the main reason for the lack of growth in the world market for photographic paper last year was SARS).

The second reason for the fall was to be found in the domestic market itself. The peak tourist months of July and August witnessed considerable rain which adversely impacted on the number of photographs taken.

Thirdly, our information suggests that part of the decline was attributable to the shift offshore of certain photographic production units.

Finally, there was the ongoing impact of digital photography on traditional silver halide applications. Recent government data in Japan suggests that more than half of all households now own at least one digital camera. In addition to this, in spite of a very well developed infrastructure to service the printing of digital images, it remains the case that far fewer pictures are being printed than would have been the case if the user was "forced" to print, as is the case with traditional technologies.

As an interesting aside in the context of digital and the scrap market, as we noted above, silver recovery from photographic scrap fell last year. What this highlights is the fact that digital's impact on the silver market is not one-to-one i.e. it is not the case that for a one unit fall in silver halide fabrication due to digital technologies that there is a one unit fall in silver demand. The reason for this is that as traditional silver use falls, so does scrap recovery.

As far as specific changes within the end use categories goes, our information points to motion picture and radiography production having been stable year-on-year, with most of the decline in offtake having been due to a sharp fall in fabrication for the amateur market (around 80% of the decline in demand is attributable to this category) and a smaller

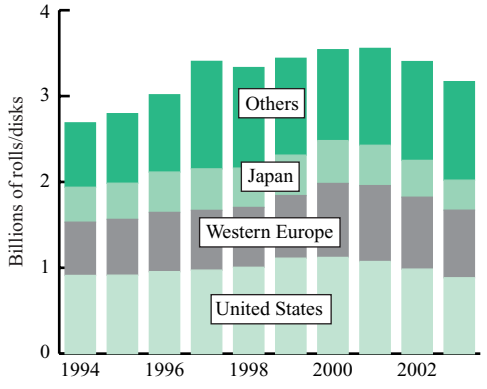
Worldwide Film and Paper Consumption and Photographic Fabrication Demand

	1999	2000	2001	2002	2003
Film**	3,441	3,540	3,555	3,402	3,168
Paper^	1,699	1,750	1,805	1,785	1,720
Fabrication*	228	222	213	206	196

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

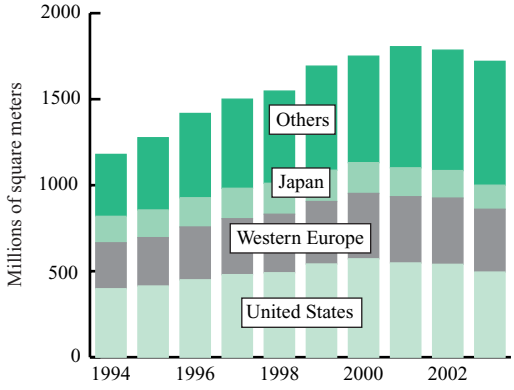
Source: Photofinishing News, GFMS

World Consumer Film Sales



Source: Photofinishing News Inc.

World Color Photographic Paper Consumption



Source: Photofinishing News Inc.

Digital Technology and the Photographic Market

Last year saw another fall in silver use in photographic applications, continuing the trend that started in 2000. Over the four-year period in question, global demand in photography has suffered a cumulative decline of 32 Moz (999 t). The main factor contributing to this reduction has been competition from digital technology. Much of its impact has been through a reduction in film sales as digital cameras' share of the amateur photographic market has grown. In 2003, for example, global sales of digital cameras rose by 89%, reaching approximately 45 million units. Conventional camera sales, a high proportion of which were single-use, at 3,168 million units, still exceeded the digital figure but, significantly, were down by 6.9% year-on-year. Thus, although conventional analog models still make up the bulk of the camera population, their share is now falling fairly rapidly, especially as, in several high-income countries, digital cameras are already outselling them.

The gradual switch to digital photography by consumers, especially in Japan, North America and Western Europe, also has an impact on silver demand in photographic paper. There has been much debate as to whether, in the short to medium term at least, this could, paradoxically, boost silver offtake via growth in photographic paper sales as digital camera users capture more images and print these out on silver-based paper. At this stage, it is difficult to draw hard and fast conclusions. However, in some countries where digital camera penetration is high, it appears that paper demand is not growing as some manufacturers' had hoped because users find electronic storage of images less expensive and often more convenient than printing-out hard copies. Furthermore, even when printing pictures, amateur photographers often opt to use home-owned inkjet printers, not utilizing photographic paper. It is therefore debatable whether paper demand will indeed respond positively to the ongoing growth in the digital camera population.

Besides consumer film sales, the other area where advances in digital imaging technology have had a major impact in recent years is on silver demand in the graphic arts sector. This trend continued in 2003, with silver demand suffering accordingly. Of greater concern, perhaps, was that last year saw, for the first time, a decline in silver use in radiographic film.

The encroachment of digital technology in the developed world has been partially offset by growth in demand for less expensive conventional technology in developing countries.

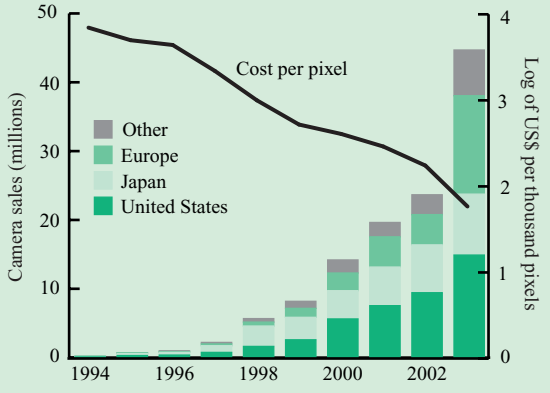
The professional film sector includes color negative, color reversal and black-and-white film. The sector saw further falls in silver demand in 2003, largely driven by competition from digital technology.

Silver demand in the production of motion picture films increased in 2003. Due to the high level of fixed investment theaters involve, the movie industry is reluctant to switch over to digital technology.

The falling cost of digital imaging technology is one of the main factors that have contributed to weakening photographic demand for silver. The accompanying chart shows that over the last decade there has been an impressive decline in the cost of digital cameras, in this case measured by the falling cost per pixel. Advances in technology are expected to reduce costs even further. The X3 chip, for example, mentioned in *World Silver Survey 2003*, which is claimed to improve radically the quality of digital images for a given number of pixels, is now due to be released in a point-and-shoot camera retailing at under $400.

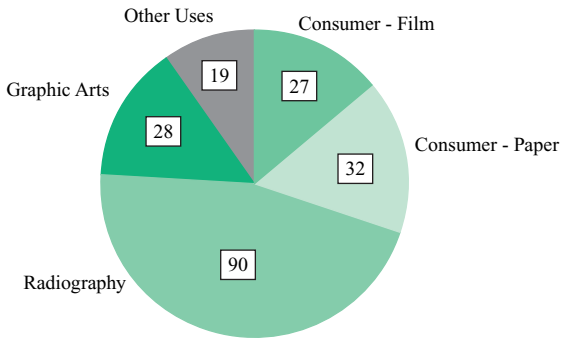
Finally, cell phones with integrated digital cameras are also believed to have begun to impact negatively silver photographic demand (e.g. single-use film cameras), especially given recent developments, leading to phones capable of image resolutions of up to 640x480 pixels and improved image transferability.

Digital Cameras: Sales and Cost per Pixel*



*Includes toy cameras.
Source: Lyra Research, Inc., GFMS

Photographic Uses of Silver, 2003
million ounces



Source: Photofinishing News Inc., GFMS

proportion to lithography (which fell again year-on-year as computer-to-plate continues to grow).

Chinese photographic demand rose marginally year-on-year, by just over 2% to reach 5.8 Moz (180 t). As we noted last year, at first sight this may appear very low given the size of the Chinese population and the economic growth over the past five years. However, as explained in *Silver Survey 2003,* much of photographic demand (in particular for the amateur market) on the mainland is fed from imports, although domestic production has been on the rise since the sharp fall in 1999 (associated with the consolidation in the industry that took place in 1998).

2003 witnessed yet another important change in the structure of the Chinese photographic market when Kodak signed a 20-year cooperation agreement with Lucky. This gave the US company 20 percent of China Lucky Film Corporation in return for a cash injection and the provision of certain technology and equipment. According to their agreement, Lucky gets an emulsion product line for color output and capital and technological support for upgrading its film base and coating production line. Kodak will supply Lucky with $100 million in capital and has guaranteed to upgrade Lucky technology to a level where it can produce world class film.

This is a welcome respite for Lucky who have been struggling to cope with vigorous competition not only from Kodak, but from Fuji Film of Japan. According to data published by China Today, a roll of Kodak film is cheaper in China than anywhere else in the world (at around 18 yuan or $2 a roll compared to Lucky film which retails at 13 yuan). Interestingly, in spite of Lucky's film being cheaper than the other main competitors (Kodak and Fuji), many customers have expressed a preference for the latter two, citing quality as the reason they were willing to pay more.

Looking to the future, it would seem probable to us that domestic fabrication of film products in China should increase. Certainly there must be growth potential in spite of the rising penetration of digital on the mainland. The received wisdom is that currently the average Chinese buys only 0.15 rolls of film a year against more than three in the United States, and even on the most pessimistic projections, this would be expected to grow. Our view is that more and more of this growth is likely to be manufactured on the mainland itself. Furthermore, in a move that supports this view, Kodak last year announced plans to continue making reloadable cameras that use 35mm film in emerging markets, such as China, India, Eastern Europe and Latin America (and that it planned to introduce six new cameras in those markets in 2004), in spite of stopping selling film cameras in the United States, Canada and western Europe in order to boost digital sales.

Jewelry and Silverware

- Total jewelry and silverware fabrication demand rose by an impressive 4.1% or 10.8 Moz (335 t).
- The top two performing countries were Thailand and China, rising by 13% and 22% respectively.
- North American fabrication offtake recorded the second largest regional gain, rising by an impressive 11% year-on-year.
- After falling 28% in 2002, Indian demand was flat last year at 77.7 Moz (2,418 t).

Europe

Silver jewelry and silverware fabrication in Europe declined again in 2003 but the scale of the drop was slight at just 1%, thus ending the run of sharp falls seen in 2001 and 2002. This deceleration was chiefly due to buoyant jewelry consumption (a largely fashion driven event), plus signs that silverware's secular slide was slowing. That total fabrication did not do better was mainly due to a patchy export performance and imports' market share often rising.

Italy's silverware and jewelry fabrication in 2003 fell a slight 2% to 44.5 Moz (1,384 t), with both segments registering small losses.

Having shown steep declines in recent years, last

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

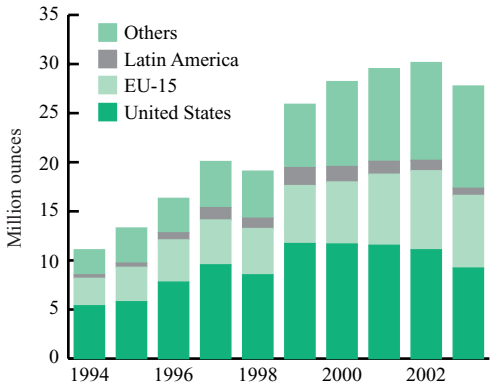
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Europe										
Italy	41.4	39.0	40.5	44.8	45.3	51.2	54.2	47.8	45.4	44.5
Germany	11.6	10.3	10.0	10.0	10.1	10.0	9.3	9.4	7.8	7.7
Poland	1.1	1.6	1.8	2.3	2.7	2.9	3.0	2.5	2.3	2.9
Greece	3.9	3.8	4.2	4.5	4.1	4.1	3.3	3.0	2.8	2.9
France	1.9	2.0	2.0	2.2	2.6	2.7	2.8	2.7	2.7	2.6
Spain	4.0	4.1	4.5	4.0	4.1	3.4	3.0	2.4	2.4	2.4
Portugal	1.5	1.7	1.9	1.9	1.9	2.1	2.1	1.8	1.6	1.7
UK & Ireland	2.9	3.0	3.3	3.4	3.3	3.1	3.2	2.9	2.2	1.7
Norway	1.2	1.2	1.1	1.1	1.1	1.5	1.6	1.5	1.3	1.3
Sweden	1.2	1.0	1.1	1.3	1.0	1.0	0.9	0.6	0.7	0.8
Denmark	0.9	0.9	0.9	1.0	0.9	0.9	0.9	0.8	0.7	0.6
Finland	0.9	0.7	0.8	0.8	0.6	0.6	0.5	0.4	0.4	0.3
Switzerland	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3
Cyprus & Malta	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3
Austria	0.4	0.4	0.4	0.4	0.5	0.4	0.3	0.2	0.2	0.2
Other	0.9	0.9	0.7	0.8	0.8	0.8	0.7	0.8	0.7	0.7
Total Europe	74.3	71.2	74.0	79.2	79.7	85.3	86.6	77.5	71.8	71.1
North America										
Mexico	8.7	11.0	14.2	16.3	15.3	15.1	13.2	12.9	14.1	15.6
United States	12.0	12.5	12.4	12.5	12.6	13.1	13.7	13.0	13.7	15.1
Canada	1.0	1.2	1.3	1.5	1.8	1.5	1.4	1.5	1.5	1.7
Total North America	21.6	24.8	28.0	30.4	29.7	29.7	28.4	27.4	29.3	32.4
Central & South America										
Brazil	1.8	1.9	1.8	1.6	1.4	1.3	1.2	1.2	1.2	1.4
Peru	0.8	0.9	1.0	1.1	1.0	1.0	0.9	0.9	0.9	0.6
Colombia	0.8	0.8	0.8	0.8	0.8	0.6	0.6	0.5	0.5	0.5
Ecuador	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.3
Argentina	1.0	0.9	0.8	0.8	0.2	0.2	0.2	0.1	0.1	0.1
Other	0.6	0.7	1.0	1.4	1.7	1.9	1.2	0.9	0.8	1.0
Total Central & South America	5.7	5.9	6.0	6.3	5.8	5.4	4.5	4.1	3.9	3.9
Middle East										
Turkey	4.3	5.1	5.5	5.5	5.2	4.7	5.9	4.3	5.5	6.0
Israel	2.1	2.3	2.6	3.0	2.8	2.9	2.6	2.4	2.5	2.4
Egypt	1.8	2.0	2.1	2.0	1.7	1.9	1.9	1.6	1.5	1.7
Saudi Arabia	0.3	0.4	0.4	0.6	0.5	0.6	0.6	0.6	0.6	0.6
Other	2.4	2.5	2.6	2.6	2.4	2.5	2.6	2.7	2.5	2.6
Total Middle East	11.0	12.4	13.3	13.6	12.8	12.6	13.7	11.6	12.5	13.3
Indian Sub-Continent										
India	60.2	66.6	86.0	86.3	82.5	83.2	84.6	102.9	77.7	77.7
Bangladesh & Nepal	4.5	5.1	5.8	6.4	5.1	5.7	6.0	5.9	4.8	4.5
Other	2.1	2.9	2.0	3.1	1.9	2.4	2.3	1.7	1.7	1.7
Total Indian Sub-Continent	66.8	74.6	93.8	95.8	89.5	91.4	92.8	110.5	84.3	84.0
East Asia										
Thailand	28.9	27.4	27.1	26.8	23.9	26.5	30.0	32.4	35.5	40.0
China	1.0	1.4	2.4	3.1	4.7	6.3	6.7	7.4	9.4	11.5
South Korea	6.4	6.8	6.6	6.3	2.6	4.5	4.9	4.6	4.5	4.6
Indonesia	2.3	2.7	2.9	3.6	2.2	2.7	3.4	3.8	4.3	4.6
Japan	2.2	2.2	2.1	1.9	1.8	1.8	1.7	1.7	1.7	1.6
Cambodia	1.0	1.1	1.1	1.0	0.8	0.9	0.8	0.9	1.0	1.0
Vietnam	0.5	0.6	0.7	0.7	0.6	0.7	0.7	0.7	0.8	0.9
Malaysia	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.7
Hong Kong	1.0	0.9	0.9	1.0	0.6	0.6	0.5	0.5	0.4	0.4
Taiwan	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.3
Other	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
Total East Asia	44.4	44.2	45.0	45.6	38.3	45.1	50.1	53.2	58.7	66.0

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

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Africa										
Morocco	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3
Tunisia	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Algeria	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2
Other	0.5	0.5	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4
Total Africa	1.3	1.3	1.2	1.2	1.2	1.1	1.2	1.1	1.1	1.2
Oceania										
Australia	0.6	0.6	0.5	0.6	0.7	0.7	0.8	0.7	0.7	0.7
New Zealand	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Oceania	0.6	0.6	0.6	0.6	0.7	0.8	0.8	0.7	0.8	0.7
CIS										
CIS	2.2	2.0	1.9	1.7	1.7	1.8	2.0	2.5	3.5	4.1
Total CIS	2.2	2.0	1.9	1.7	1.7	1.8	2.0	2.5	3.5	4.1
World Total	**227.9**	**236.9**	**263.7**	**274.3**	**259.4**	**273.3**	**279.9**	**288.8**	**265.9**	**276.7**

year's modest fall for silverware represented a surprisingly good performance. The domestic market, which takes the bulk of output, was still soft last year but the relatively limited drop suggests that the secular decline in local sales might be bottoming. As noted in past *Surveys*, consumption has been hard hit by the 'modernization' of consumer behavior as silverware faded as a wedding list stalwart. This trend was still visible last year, with traditional heavy items (such as trays or center pieces) being the worst affected segment. However, since much of this market has already gone, losses here assume an ever diminishing importance. Other sectors, such as photo-frames, were, in contrast, quite stable whilst some producers saw growth in giftware and at the top end.

Official Italian Jewelry Exports



Exports also fell by less than once feared though there were marked variations by destination. The bulk of the losses were in exports to other EU countries, in particular those in southern Europe. The declines for the latter group mirror the falls within Italy at the mid/lower price point as taste modernizes with a small time lag. Strong gains, however, were seen in shipments to central and eastern Europe as the new money here develops a keen taste for silver pieces. There was a similar, substantial rise for China/Hong Kong and hopes are high for this nascent market. Exports to Italy's largest market, the United States, also rose.

Italian silver jewelry fabrication fell in 2003, but only a fraction. This was the net result of a modest fall in exports of finished pieces, stable sales to the local market and a strong rise in the export of semi-finished items. It should be noted that the small overall change for 2003 does hide marked variations; the first half was again in general weaker than the second while mass market producers performed less well than more specialized companies.

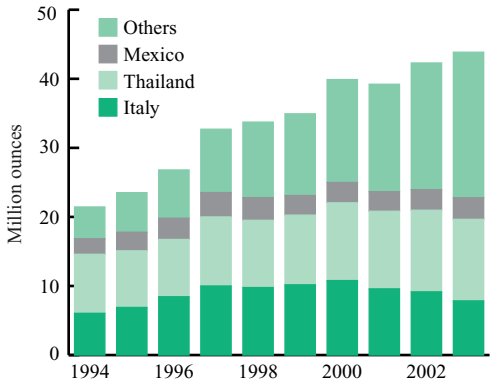
Domestic consumption is thought to have seen further growth last year though the scale of the gain is thought smaller than in previous years. Sales continued to rise still largely as a function of a healthy

youth and branded market, a clear sign of the benefits of having fashion on your side. Whilst this is a fairly widespread phenomenon, Italy is spearheading another market feature, namely the development of a top end segment, with a new wave of designs at price points once reserved for gold. That local fabricators did not benefit more from strong consumption was due to higher imports (up 12% on a gross weight basis).

The drop in exports was chiefly a function of lower shipments to the US market. The scale of the fall was far smaller than that suffered for gold (largely due to healthier consumption) but Italy again suffered from export competition, with Asian exporters leading the challenge. Exports to elsewhere in the EU were slightly lower, as growth in some countries, for example the UK market, was outweighed by losses in others, particularly in southern Europe. Shipments to Mexico and the entrepôts in the Americas also fell, often quite markedly, and, perhaps for the latter group, through market share loss to Switzerland, whose imports from Italy boomed. A good portion of the pieces routed through the latter are thought destined for eastern Europe and the Far East though direct exports to Russia and Hong Kong also rose strongly.

Silver jewelry consumption in **France** was also strong in 2003 (enjoying a rise almost into double digits) but further growth in imports' market share meant domestic fabrication fell slightly. **German** jewelry consumption last year appears to have shown yet stronger growth and, with local output's market share holding steady and exports rising, jewelry fabrication rose healthily. This gain was, however, outweighed by losses in silverware, mainly as domestic market sales continued their secular slide.

US Silver Jewelry Imports



As such, fabrication of silverware and jewelry combined fell a modest 2% to 7.7 Moz (240 t).

Despite a 15% rise in hallmarking of silverware and jewelry in the **United Kingdom**, domestic fabrication declined for the fourth successive year. The sharp drop in 2003 output was due to a combination of increasing low cost import competition and continued offshore relocation of manufacturing facilities.

Further afield in **Russia**, jewelry fabrication is estimated to have seen another year of strong growth, as evidenced by the hallmarking data. This picture of a buoyant domestic market is also supported by data from origin on imports (Italy reports its exports to Russia more than doubling in 2003).

North America

Jewelry and silverware fabrication across the region rose by 10.6% to 32.4 Moz (1,007 t). Mexico retained its position as the top North American fabricator with a 10.6% increase in 2003 output, while manufacturing in the United States also posted a more than 10% rise last year.

Fabrication in the **United States** rose for the second year in a row by 1.4 Moz (44 t), to a record level of 15.1 Moz (469 t). Much if not all of the increase was due to a pronounced rise in activity in the jewelry sector, which was driven by markedly higher retail consumption. This in itself owed much to the continued popularity of "white look" jewelry as well as the popularity of silver jewelry amongst younger consumers.

Domestic fabricators also appears to have taken market share from the import sector, which posted only modest growth in 2003. Although shipments from China once again posted a significant rise, much of the increase was offset by a double-digit fall in Italian imports, which have now fallen for the third year in a row.

The performance of the US silver jewelry industry once again contrasted quite sharply with that of the gold sector, which saw both lower fabrication and retail sales in 2003 and in effect has failed to repeat the success of the 1990s.

Mexican jewelry and silverware fabrication recorded another strong increase in 2003, in the process rising to a level not surpassed since 1997. We estimate that demand reached a solid 15.6 Moz (486 t). At first sight, this result may seem odd given the weakness of the Mexican economy last year, with GDP growth estimated at a mere 1.5% and overall consumer

spending sluggish. However, fabrication demand has nevertheless benefited from several positive developments. First, some manufacturers have switched production from gold to more affordable silver jewelry, particularly for the domestic market. Secondly, silver jewelry has become more fashionable among local consumers, in part due to improved, more modern designs. And, third, Mexican exports of silver jewelry did well last year; official trade data shows that the dollar value of sales to the key American market rose at a double-digit rate.

Middle East

Jewelry and silverware fabrication in **Turkey** rose to a record level of 6.0 Moz (187 t). Even so, there were marked differences in the performance of the two constituent parts that make up this total.

Following the 1999 earthquakes and the economic and financial crises of 2000 and 2001, last year marked the first tangible period of optimism, following a period of consolidation in 2002. As a result, there was a noticeable pickup in economic activity last year, which was clearly seen in a sharp rise in consumer expenditure. As discussed in *Gold Survey 2004*, this contributed to a record level of gold demand. As a result, it was perhaps no surprise that Turkish silver jewelry fabrication rose so sharply last year. Not only was domestic consumption higher but a marked rise in exports, notably to a range of European destinations, helped boost Turkish offtake. Finally, a rise in tourism, albeit of less than 4% (according to the World Tourism Organization), also boosted demand.

In sharp contrast, the silverware industry experienced a modest decline in fabrication in 2003. In general, this reflected increasing consumer preference for smaller and lighter silverware items, as well as a shift away from this category, for example towards stainless steel cutlery.

After two years of falling output, **Egyptian** silverware and jewelry fabrication rose by more than 13% last year to 1.7 Moz (53 t). This outcome may appear unexpected, given the parlous state of domestic consumption, but a sharp rise in tourist arrivals accounted for most of the increase in demand. This trend, combined with ongoing weakness in local gold demand (through to the end of 2003), encouraged a number of small workshops to switch from gold to silver.

Silverware output rose modestly last year, but still remained considerably below the levels posted in the late 1990s. This sector has suffered in tandem with a weakening economy, as companies have reduced their demand for silverware gifts for employees (an important part of the Egyptian silverware market). That demand rose modestly last year suggests more so that the market "bottomed out" in 2002.

Indian Sub-Continent

As we explain in more detail in Chapter 6 and in the Industrial Fabrication section, GFMS believe that the preliminary data for **India** that we have collected may underestimate the actual level of imports. An evaluation of the supply and demand balance, basis this set of data, would point to the Indian market having been down slightly year-on-year, in spite of the sharp rise in scrap in 2003. However, at the time of writing, we are inclined to take the view that jewelry offtake is best interpreted as flat, for reasons explained more fully below.

Following on from what has just be noted, GFMS data in Table 7 shows Indian jewelry and silverware fabrication pegged at the same level as 2002 i.e. 77.7 Moz (2,418 t). This still leaves jewelry offtake substantially lower than the levels seen in previous years (and all of 25 Moz down on 2001's record level).

To readers familiar with the Indian market, and who have read *Gold Survey 2004*, this will come as something of a surprise. After all, gold jewelry demand is thought to have risen in India last year in spite of the sharp rise in the price. Even more perplexing is the fact that the average silver price only rose modestly last year (by 2.6% versus gold's 10% rise). One explanation we heard in India is that this is a reflection of a secular shift away from silver. While not dismissing this out of hand, our view is that most of the softness in silver jewelry offtake in 2002 and 2003 can be explained by a combination of price (or more precisely the timing of price rallies) and the agricultural cycle.

To understand this, one needs to examine the influence of the monsoon (it is our long held view that the agricultural cycle is a key determinant of both gold and silver jewelry demand). There is little doubt that the agricultural cycle and incomes are major influences on gold and silver jewelry demand, but as the last year has illustrated, the relationship is not always a simple one to dissect. Why, for instance, did gold jewelry demand rise (implying that the income effect in rural areas due to a better monsoon offset the effect of higher prices) but silver jewelry did not? One

explanation which we find compelling is the fact that the good rains reported by various government agencies, and reflected in the table on this page, impacted differently on various geographical areas at different times.

What is particularly interesting in this context is that certain of the key silver consuming states have been in the grip of droughts for the past three to four years and that the good monsoon rains only began to have a positive impact quite late in 2003. For example, the state of Rajasthan has been particularly badly affected by the droughts, with over 4.8 million hectares of the post monsoon crop destroyed and ground water levels considerably reduced, affecting more than 43 million people and 54 million livestock. In spite of reports of good rains in this and other drought affected states in the north, it is revealing that the Indian Red Cross and International Federation still felt it necessary to put out a drought appeal for the states of Gujarat, Rajasthan and Orissa as recently as June of last year. Clearly the rains that fell last year were not a panacea.

As is always the case in India, we would caution against drawing too simple a conclusion from events like this. Certainly, drought is not a sufficient condition for lower buying because political factors can be equally influential in determining incomes (for example, powerful Members of Parliament are often able to secure significant financial aid for their constituents at such times).

All India Monsoon Rainfall
(rainfall % of normal)

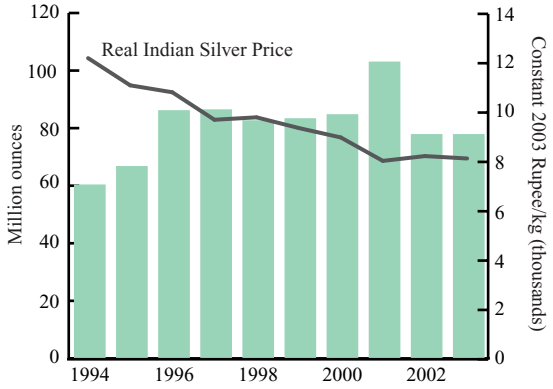
1999	2000	2001	2002	2003
96	92	94	81	102

(source: National Informatics Centre)

Notwithstanding this point, we believe that the droughts affecting areas like Rajasthan and Gujarat will have had a negative impact on silver offtake and that the monsoon rains would probably have only impacted on demand later in the year (this was certainly not a first half phenomenon).

Indeed, the under performance of the agricultural sector in the first half must have been a key influence holding back offtake, especially when the silver price is taken into account. Consider for instance that in the first half of the year the average silver price was well

Indian Jewelry and Silverware Fabrication



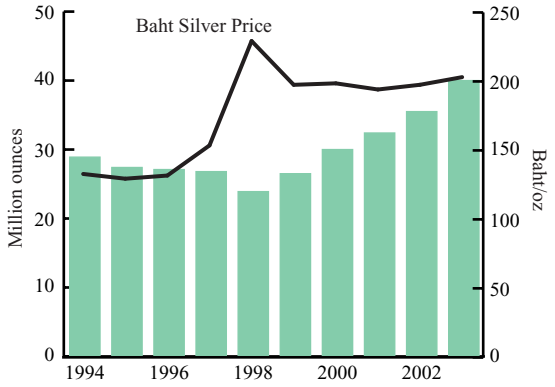
below the crucial Rs.8,000 per kilogram mark (at Rs.7,890 per kilogram). As regular readers of these *Surveys* will know, this is the critical price level at which Indians usually stop buying, so the fact that the price was below this for much of the first half would suggest that it (the price) was not a major constraining factor.

What then of the reports of a good monsoon? As already noted, it seems that its positive impact on the agricultural sector was really only felt in the second half of the year, and then quite late on. And to the extent that there was a positive income effect associated with a rise in agricultural output, this was more than offset by the sharp rise in the price during the second half. For example, the price rose to Rs.8,365 per kilogram on average during the second half, well above the key Rs.8,000 buyers' resistance level. As the price pushed ever higher towards year end (averaging all of Rs.9,080 in December), scrap rose as imports tailed off sharply (notwithstanding all of our caveats about the import data, we believe that the changes were significant enough for us to be confident that imports genuinely did fall). Our information suggests that the high price saw silver imports dip to zero in the case of some importing agencies in the last quarter of 2003. In conclusion, the confluence of these competing forces appears to have left total jewelry and silverware offtake effectively flat year-on-year.

East Asia

For the fifth successive year, jewelry and silverware fabrication demand in **Thailand** has risen. In 2003,

Thai Jewelry and Silverware Fabrication



demand rose by 13% or 4.5 Moz (141 t) to reach 40.0 Moz (1,245 t). Thailand is the third largest fabricator in this category after India and Italy though its importance as regards jewelry alone is greater given the small share of its fabrication devoted to silverware.

The continued success of silver jewelry in penetrating further into gold jewelry's market share and indeed by expanding the retail jewelry market as a whole by attracting the younger generation was chiefly responsible for the double-digit growth in Thai fabrication. Interestingly, higher value pieces, containing stones and with more design/branding emphasis, were definitely the best performing product segment while low-end, high volume pieces did reasonably well but only grew at around half the rate. This trend is good news for jewelry manufacturers searching for ways to achieve better profit margins but it will come at a cost of lower volumes.

Those Thai companies producing low-end, high volume jewelry will also have to be careful of up and coming competition from India and China. Both of these countries exports to the United States rose by around 30% in value terms (according to US trade data) whilst Thailand only managed a 7% increase. This story was repeated more strongly in the United Kingdom with imports from Thailand rising an impressive 20% in value in 2003, but this compares with an over 40% increase for Indian imports and a trebling in silver jewelry from China. Interestingly, Thailand is developing into a silver jewelry wholesaling hub with many sellers coming from India and China to participate in exhibitions and trade fairs. This, combined with the recently announced Free Trade Agreement between Thailand and India, should be watched with interest.

Competition for existing silver jewelry producers is also coming from gold jewelry fabricators, whether in Thailand, Italy or elsewhere. As mentioned earlier, the margins in silver jewelry can be better than in gold, and many jewelry companies are developing or expanding silver product ranges, often as the expense of gold. Part of the reason for higher profits in silver is that the labor cost for producing a similar item in gold or in silver is not the same. It is in fact cheaper in silver because traditionally workers producing gold pieces cost nearly twice that of a silver worker. This is mainly due to a lower quality standard and therefore a lower level of skill, particularly when producing plain silver pieces. However, Thai manufacturers now have to compete at the middle to upper end of the quality scale and this means a higher labor cost.

This is part of the reason why gem-setting pieces have been popular for manufacturers (not just from a retailer/consumer fashion motive) as the profit margin from including gems is higher. Gemset pieces are typically sold at a fixed price with a typical piece, for example, having a silver content in value terms of between 20 - 35% of sale price, with labor being 40% and the gem accounting for the remainder. In contrast, the silver in a plain piece accounts for around 80% of the cost. Plain pieces are also typically sold by the silver content multiplied by the silver price plus a labor charge, allowing little scope for obfuscating the profit margin. In the face of a higher silver price, this year may see wholesale and retail buyers adopt buying rules along the lines of those used in gold jewelry where invoices will be required to contain itemized information concerning weight, silver price, making charge and stone costs.

An important major development in the Thai silver market last year was the change to the VAT laws pertaining to silver (and other raw materials) used in the manufacture of jewelry. Effective from July 2003, these items became VAT exempt. The change has led to a drop in the unofficial silver supplies, particularly among the bigger silver jewelry companies, but there is still demand coming from the 'cash and carry' sector. This sector still has an incentive to keep sales and therefore profits completely outside the VAT and income tax loop.

Finally, the outlook for this year is that the higher silver price and the strengthening baht may eat into

fabricators' profit margins but volumes will again grow, albeit at a single rather double digit rate.

China's silver jewelry and silverware fabrication rose sharply year-on-year, up by over 20% to 11.5 Moz (358 t). It is worth recalling that China was only producing around 1 Moz (32 t) of such items as recently as 1994, so the growth has been nothing short of spectacular.

The impetus for this growth has come from jewelry export markets, as China itself does not have much of an appetite for silver jewelry itself (except in some south western parts of the country). The main destination for Chinese pieces is the United States (both directly and via Hong Kong, which is used as a transhipment point).

Indonesia also recorded year-on-year growth in silver offtake. In 2003, jewelry and silverware demand rose from 4.3 Moz (133 t) to 4.6 Moz (142 t), an increase of 7%. While this rate of increase could be considered impressive, it was severely retarded by the performance of the tourism industry. Tourist arrivals in Bali, the home of the country's silver jewelry manufacturing sector, have never recovered from the bombing that occurred in October 2002. As a result, much of last year's growth came from exports, particularly to the United Kingdom, Germany and Japan.

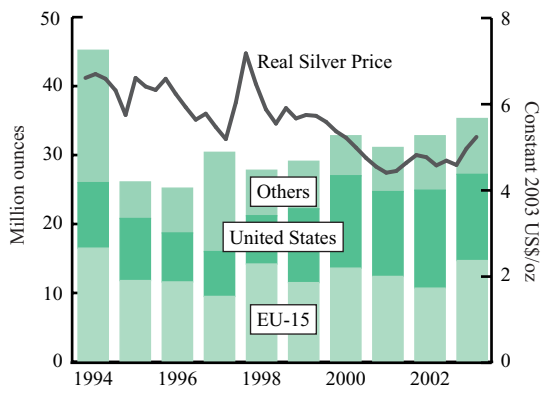
Coins and Medals

- World coin and medals fabrication rose to a nine-year high in 2003 of 35.3 Moz (1,097 t).
- The increase was almost entirely due to sharply higher minting in Germany, which outweighed a fall in the United States.

As an indicator towards global investor interest in physical silver, the overall trend in world coin and medals fabrication may be a little misleading. The fact that this category rose to a nine-year high may suggest an active investor market, but it is worth noting that a sizeable portion of the increase last year was due to a rise in commemorative issues. In addition, a build-up, in some countries, of dealer stocks in 2002 not only boosted demand that year but contributed to weaker minting in 2003.

This was notably true in the **United States** and accounted for a significant share of the fall in silver Eagle bullion coin sales last year to 9.2 Moz (285 t). However, it is worth noting that, although the total was close to 13% lower year-on-year, it still represented the second highest level over the past decade. In addition, last year saw lower commemorative sales in the United States, by virtue of only one coin being

World Coin Fabrication



US Silver Eagle Coin Sales

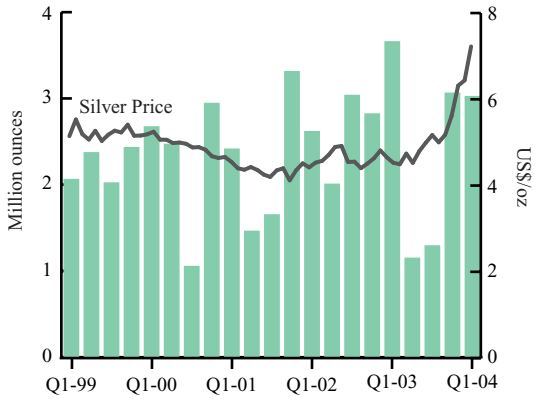


Table 8
Silver Fabrication: Coins and Medals
(including the use of scrap)
Million ounces

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
United States	9.5	9.0	7.1	6.5	7.0	10.7	13.4	12.3	14.2	12.5
Germany	8.7	4.0	6.2	5.3	10.0	7.0	9.5	8.7	7.5	11.2
China	0.7	0.8	1.4	2.8	2.4	2.3	1.2	1.5	2.1	2.4
Australia	1.6	0.7	0.8	0.8	1.0	0.9	1.0	0.8	0.6	1.3
Spain	4.8	4.0	2.8	1.8	1.7	1.5	1.8	1.8	1.5	1.1
Mexico	13.0	0.6	0.5	0.4	0.2	0.4	0.7	1.1	1.1	1.0
Portugal	0.4	0.5	0.8	0.8	1.0	0.9	1.2	0.7	0.0	0.8
France	1.0	1.1	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.5
UK & Ireland	0.8	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5
Austria	0.5	0.6	0.4	0.3	0.3	0.3	0.2	0.3	0.4	0.4
Switzerland	0.3	0.4	0.6	0.6	0.3	0.4	0.4	0.4	0.4	0.4
Russia	0.2	0.1	0.6	0.4	0.2	0.2	0.1	0.2	0.3	0.4
Thailand	0.2	0.3	0.5	0.3	0.2	0.1	0.2	0.2	0.3	0.3
Canada	1.5	0.7	0.7	0.7	1.1	1.4	1.0	0.9	1.0	0.3
Poland	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3
Netherlands	0.3	0.9	0.5	0.4	0.3	0.9	0.0	0.0	0.3	0.2
Other	1.6	1.4	1.2	8.2	1.0	1.0	1.2	1.1	1.8	1.6
World Total	**45.2**	**26.1**	**25.2**	**30.4**	**27.8**	**29.2**	**32.8**	**31.1**	**32.8**	**35.3**

issued in 2003, compared with two the previous year. The 2003 issue, which as usual consisted of 90% silver, marked the 100th anniversary of the Wright brothers' historic flight. However, other areas of US coin minting, with regards to both proof sets and individual proof Eagle bullion coins, were more stable in 2003.

The considerable increase in 2003 **German** coin minting was due to the issue of six commemorative coins last year. Although this equates to only one more issue than the previous year, two of the issues, which were sold in 2002, were actually minted towards the end of 2001. As in the past, the 2003 commemorative coins contained 925 silver and weighed 18 grams. In order of release date, the coins marked: the 100th anniversary of the Munich Museum; the 200th anniversary of the birthday of chemist Justus von Liebig; the 50 year anniversary of the general strike in East Germany on 17th June 1953; the 2006 FIFA soccer world championship in Germany; a celebration of the industrial landscape of the Ruhr district and finally, the 200th anniversary of the birthday of architect Gottfried Semper.

With regards to Germany in particular, it is worth noting that the "call" on the international silver market in 2003 was considerably lower than suggested by the data in Table 8 above, due to the high proportion of old scrapped coins used in the minting of the 2003 issues.

The marginal fall in **Mexican** fabrication was related to two factors. Firstly, it appears as though there was an element of destocking at the dealer level in 2003, including coins purchased (and therefore fabricated) in 2002. Secondly, and perhaps more importantly, the high local price, which reached 55 pesos/ounce in February 2003 discouraged some local purchases. **Portugal** resumed silver coin minting in 2003 and issued a number of commemorative coins. The two most important of these (in terms of the amount of consumed silver) were the Ibero-American Sea Navigation Commemorative Coin, which comprised 50% silver and had a fine weight of 27 grams and, more importantly, the European 2004 Football Championship, again comprising 50% silver, but weighing 21 grams. (Each series was made up of a number of coins but the balance consumed only a modest amount of silver.)

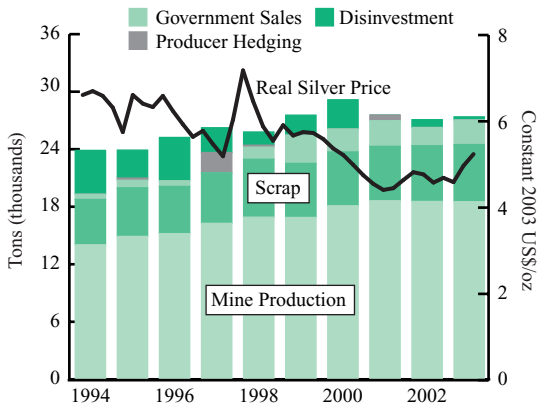
Chinese coin fabrication in 2003 rose to its highest level since 1998, principally as a result of robust commemorative coin sales. Finally, the sharp increase in **Australian** minting was due to two factors. Firstly, exports of bullion coins were noticeably robust last year. And secondly, demand for its Lunar coin series was higher in 2003 year-on-year.

Appendix I

Table 1
World Silver Supply and Demand
Tons

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Supply										
Mine Production	14,029	14,904	15,195	16,271	16,911	16,881	18,101	18,623	18,551	18,525
Net Official Sector Sales	548	788	589	-	1,271	2,960	2,399	2,679	1,903	2,570
Old Silver Scrap	4,729	5,066	4,925	5,265	6,032	5,636	5,611	5,672	5,810	5,958
Producer Hedging	-	233	-	2,118	203	-	-	587	-	-
Implied Net Disinvestment	4,569	2,915	4,518	2,584	1,379	2,075	3,046	-	816	323
Total Supply	**23,876**	**23,906**	**25,227**	**26,238**	**25,796**	**27,552**	**29,157**	**27,561**	**27,080**	**27,376**
Demand										
Fabrication										
Industrial Applications	8,764	9,198	9,260	9,977	9,842	10,549	11,675	10,493	10,620	10,923
Photography	6,311	6,527	6,535	6,761	7,021	7,097	6,903	6,640	6,398	6,098
Jewelry & Silverware	7,087	7,369	8,203	8,533	8,067	8,500	8,707	8,981	8,270	8,605
Coins & Medals	1,405	812	784	945	866	907	1,020	967	1,020	1,097
Total Fabrication	23,567	23,906	24,782	26,216	25,796	27,053	28,305	27,081	26,308	26,723
Net Official Sector Purchases	-	-	-	22	-	-	-	-	-	-
Producer De-hedging	309	-	445	-	-	499	852	-	772	653
Implied Net Investment	-	-	-	-	-	-	-	480	-	-
Total Demand	**23,876**	**23,906**	**25,227**	**26,238**	**25,796**	**27,552**	**29,157**	**27,561**	**27,080**	**27,376**
Silver Price (London US$/oz)	5.285	5.197	5.199	4.897	5.544	5.220	4.951	4.370	4.599	4.879

World Silver Supply



World Silver Demand

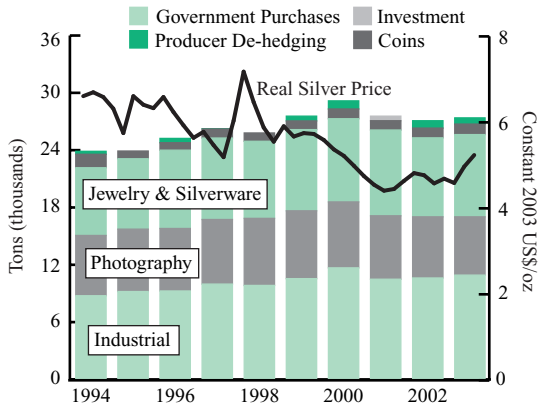


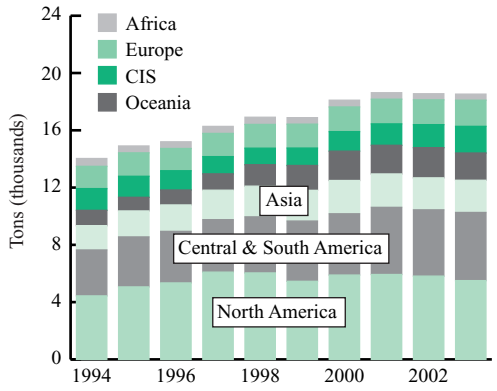
Table 2
World Silver Mine Production
Tons

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Europe										
Poland	859	984	953	1,050	1,119	1,115	1,140	1,183	1,211	1,377
Sweden	252	250	241	265	268	275	294	275	293	307
Romania	42	44	44	43	39	39	34	38	32	29
Spain	176	124	103	66	47	95	117	68	36	26
Bulgaria	56	44	35	31	25	21	18	24	25	22
Portugal	32	39	34	34	31	27	21	23	19	22
Ireland	17	14	15	13	11	15	25	19	15	20
Yugoslavia (former)	37	58	92	65	56	31	31	21	16	11
Czech & Slovak Republics	12	10	7	8	8	8	7	8	7	7
Greece	45	45	16	36	45	40	31	62	75	4
France	3	4	3	2	1	1	1	1	1	1
Italy	14	14	9	4	4	2	1	0	0	0
Norway	7	5	4	4	4	0	0	0	0	0
Other	2	2	0	0	0	0	0	0	0	0
Total Europe	1,554	1,636	1,554	1,620	1,658	1,669	1,721	1,723	1,731	1,826
North America										
Mexico	2,215	2,258	2,529	2,701	2,848	2,338	2,747	3,030	2,998	2,916
United States	1,480	1,560	1,570	2,180	2,060	1,950	1,970	1,635	1,445	1,290
Canada	740	1,245	1,243	1,213	1,131	1,166	1,174	1,265	1,373	1,276
Total North America	4,435	5,063	5,341	6,094	6,039	5,454	5,891	5,930	5,816	5,482
Central & South America										
Peru	1,742	1,908	1,968	2,077	2,025	2,231	2,438	2,674	2,761	2,775
Chile	983	1,042	1,145	1,092	1,341	1,381	1,242	1,349	1,210	1,293
Bolivia	351	429	383	386	407	424	437	425	450	465
Argentina	38	37	31	34	69	103	94	176	135	142
Honduras	27	30	38	45	46	49	53	50	56	54
Brazil	18	13	10	7	10	7	7	7	8	7
Dominican Republic	9	21	17	12	7	3	0	0	0	0
Other	39	10	9	10	9	9	6	8	8	8
Total Central & South America	3,207	3,490	3,600	3,663	3,914	4,207	4,277	4,689	4,628	4,743
Asia										
China	1,050	1,080	1,134	1,339	1,350	1,376	1,495	1,452	1,396	1,454
Indonesia	97	238	237	250	311	271	312	374	332	297
Turkey	67	65	90	90	87	108	109	114	114	113
Japan	134	100	89	87	94	94	104	80	81	79
India	50	38	36	50	52	60	56	54	59	68
Papua New Guinea	77	66	60	49	58	59	73	69	64	63
Mongolia	27	28	29	31	33	33	32	36	35	34
North Korea	53	53	40	36	32	26	22	19	20	20
Thailand	4	7	8	3	4	5	5	6	22	18
Saudi Arabia	16	17	16	16	14	11	9	10	10	17
Philippines	31	33	25	20	19	18	23	34	9	7
Malaysia	13	11	10	10	7	3	0	0	0	0
Other	79	78	72	77	83	82	85	85	90	87
Total Asia	1,698	1,815	1,846	2,059	2,145	2,145	2,326	2,333	2,235	2,258
Africa										
Morocco	258	204	200	260	306	278	289	283	263	253
South Africa	192	178	171	163	157	152	144	126	118	106
Namibia	62	66	64	39	14	-	17	19	20	29
Zambia	11	8	9	7	8	5	5	5	6	6
Zimbabwe	11	11	10	10	6	5	5	5	4	4
Other	13	13	13	13	13	13	14	15	18	52
Total Africa	547	480	466	490	503	454	473	453	428	450

Table 2
World Silver Mine Production
Tons

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Oceania										
Australia	1,045	920	1,010	1,106	1,469	1,709	2,024	1,970	2,077	1,872
New Zealand	24	30	31	33	26	24	23	27	29	30
Fiji	1	2	2	2	2	2	2	2	2	2
Total Oceania	1,070	952	1,043	1,141	1,497	1,736	2,048	1,999	2,108	1,903
CIS										
Russia	746	730	758	649	605	617	628	646	756	1,052
Kazakhstan	684	650	482	440	430	499	637	755	757	711
Uzbekistan	66	66	70	77	82	64	62	53	49	53
Armenia	16	16	28	31	31	31	33	38	39	41
Tajikistan	6	6	6	6	6	6	5	4	6	6
Kyrgyz Republic (Kyrgyzstan)	0	0	0	1	1	1	1	1	1	0
Total CIS	1,518	1,468	1,344	1,204	1,155	1,218	1,366	1,497	1,608	1,862
World Total	**14,029**	**14,904**	**15,195**	**16,271**	**16,911**	**16,881**	**18,101**	**18,623**	**18,551**	**18,525**

World Silver Mine Production



Silver Producer Hedging: Outstanding Positions

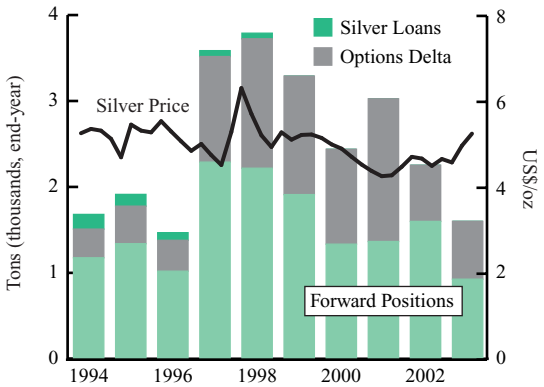


Table 3

Supply of Silver from the Recycling of Old Scrap

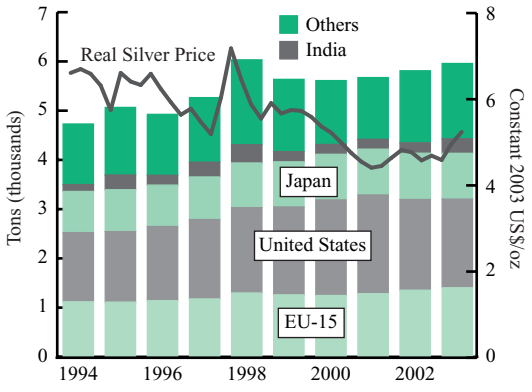
Tons

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Europe										
Germany	480	460	480	500	510	500	520	523	520	592
UK & Ireland	245	231	236	261	337	358	338	346	423	404
France	130	145	140	133	127	124	110	122	120	126
Italy	87	100	110	105	145	105	105	110	113	112
Austria	60	63	55	56	57	52	50	62	58	48
Netherlands	39	35	39	40	40	40	45	42	44	44
Sweden	34	34	34	35	34	34	33	33	32	32
Belgium	20	20	20	20	20	20	20	21	20	20
Denmark	20	19	19	19	19	19	18	18	17	17
Portugal	12	12	13	14	14	14	14	13	14	14
Norway	24	24	30	30	25	29	33	21	21	14
Spain	10	12	14	14	13	12	13	13	13	14
Czech & Slovak Republics	22	23	28	25	22	19	19	14	13	13
Finland	15	15	15	15	15	15	13	13	12	13
Switzerland	19	51	52	24	14	10	10	10	10	10
Other	36	34	36	37	36	36	35	34	36	34
Total Europe	1,253	1,278	1,321	1,328	1,428	1,387	1,376	1,395	1,466	1,506
North America										
United States	1,405	1,432	1,505	1,612	1,733	1,785	1,941	2,005	1,842	1,800
Mexico	70	150	75	134	330	71	48	44	48	60
Canada	41	52	55	50	60	50	45	45	44	47
Total North America	1,516	1,634	1,635	1,796	2,123	1,906	2,034	2,094	1,934	1,907
Central & South America										
Brazil	60	60	60	50	50	55	48	50	32	36
Argentina	20	20	20	20	20	20	20	23	20	20
Chile	14	14	14	14	17	13	12	12	12	12
Other	23	23	23	23	29	27	25	24	24	25
Total Central & South America	117	117	117	107	116	115	105	109	88	93
Middle East										
Saudi Arabia	58	94	40	101	64	232	70	24	224	245
Turkey	70	72	60	50	53	43	40	40	45	55
Egypt	28	25	22	10	13	10	28	35	40	36
Other	16	16	16	16	18	16	15	16	16	16
Total Middle East	172	207	138	177	148	301	153	115	325	353
Indian Sub-Continent										
India	140	300	200	300	370	207	200	200	210	294
Other	6	9	5	10	15	11	13	15	15	15
Total Indian Sub-Continent	146	309	205	310	385	218	213	215	225	309
East Asia										
Japan	836	850	842	865	908	917	927	931	940	930
China	128	135	139	143	180	182	187	192	196	206
South Korea	92	102	107	111	244	164	164	168	172	176
Taiwan	22	22	22	24	26	28	28	28	27	30
Thailand	10	10	11	25	30	12	10	11	14	15
Singapore	12	12	11	11	12	12	12	12	13	13
Hong Kong	8	9	9	11	15	11	11	11	12	12
Indonesia	9	10	11	11	12	13	15	13	10	10
Vietnam	10	11	11	12	12	12	11	10	9	10
Philippines	5	5	6	6	7	7	7	6	6	6
Malaysia	3	3	3	3	4	3	3	3	4	4
Total East Asia	1,135	1,169	1,172	1,223	1,450	1,361	1,374	1,385	1,403	1,412
Africa										
Morocco	11	14	14	16	17	16	16	16	16	16
Other	20	23	20	17	17	17	18	17	17	17
Total Africa	31	37	35	33	34	33	34	33	33	33

Table 3
Supply of Silver from the Recycling of Old Scrap
Tons

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Oceania										
Australia	78	78	73	71	74	75	76	74	73	65
Total Oceania	78	78	73	71	74	75	76	74	73	65
CIS										
CIS	281	238	230	220	275	240	245	252	263	280
Total CIS	281	238	230	220	275	240	245	252	263	280
World Total	**4,729**	**5,066**	**4,925**	**5,265**	**6,032**	**5,636**	**5,611**	**5,672**	**5,810**	**5,958**

World Silver Scrap Supply



World Scrap Supply, 2003

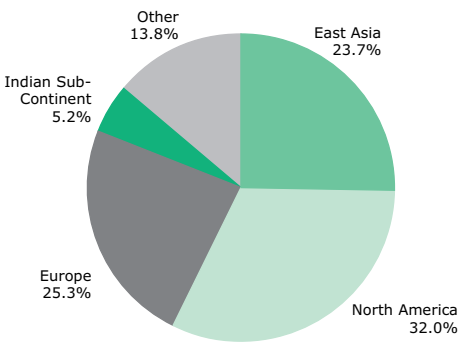


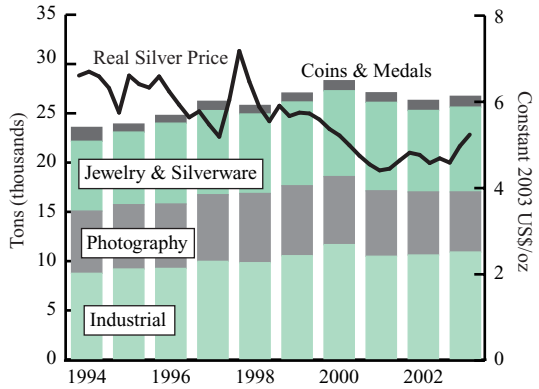
Table 4
World Silver Fabrication
(including the use of scrap)
Tons

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Europe										
Italy	1,619	1,557	1,624	1,757	1,750	1,932	2,033	1,819	1,741	1,712
UK & Ireland	971	1,005	1,071	1,104	1,219	1,241	1,344	1,446	1,359	1,395
Germany	1,692	1,480	1,469	1,481	1,505	1,309	1,283	1,277	1,146	1,264
Belgium	655	728	788	847	1,052	1,167	1,098	999	958	910
France	876	968	845	892	892	837	906	907	860	814
Spain	333	309	288	271	275	234	210	171	161	148
Poland	79	96	94	104	111	117	120	107	100	120
Switzerland	221	229	243	298	332	344	281	108	106	94
Greece	120	118	133	140	126	126	104	94	87	90
Portugal	64	76	88	89	96	100	107	80	53	82
Norway	51	50	45	46	47	94	89	71	60	60
Netherlands	74	92	77	74	70	88	60	57	64	60
Austria	46	51	46	42	42	38	33	34	37	37
Sweden	47	43	46	52	43	42	41	31	33	37
Czech & Slovak Republics	18	24	23	23	28	24	25	31	21	22
Denmark	30	33	31	35	32	31	32	28	24	22
Finland	31	27	30	29	21	21	17	14	14	13
Romania	13	9	13	11	16	13	13	12	12	12
Cyprus & Malta	11	12	13	12	11	12	12	10	10	9
Other	27	27	25	23	24	24	25	24	24	24
Total Europe	6,978	6,934	6,989	7,331	7,691	7,793	7,832	7,318	6,870	6,928
North America										
United States	4,345	4,576	4,592	4,890	5,287	5,792	6,072	5,284	5,509	5,451
Mexico	859	544	646	732	682	675	537	530	564	612
Canada	96	83	83	87	106	109	92	90	96	78
Total North America	5,301	5,202	5,320	5,709	6,075	6,576	6,701	5,905	6,168	6,141
Central & South America										
Brazil	257	291	262	260	253	238	210	204	198	204
Argentina	126	122	118	118	97	84	70	56	58	72
Peru	28	31	34	35	34	32	30	32	32	22
Colombia	33	33	33	33	33	27	24	22	22	22
Chile	15	15	15	15	15	14	13	13	13	13
Ecuador	21	21	21	21	21	17	17	14	14	12
Other	15	19	27	41	50	56	35	27	23	27
Total Central & South America	495	532	510	523	503	468	399	368	360	372
Middle East										
Turkey	169	199	208	215	204	187	229	171	242	253
Israel	95	105	116	125	120	120	112	102	103	101
Egypt	78	67	70	65	58	63	64	55	49	57
Saudi Arabia	10	12	12	20	16	18	20	18	18	18
Other	76	79	83	81	77	80	82	83	78	81
Total Middle East	429	462	489	505	475	466	506	429	490	508
Indian Sub-Continent										
India	2,920	3,152	3,801	3,824	3,567	3,779	4,075	4,789	3,809	3,810
Bangladesh & Nepal	140	160	180	200	160	178	187	185	150	140
Other	88	117	84	127	87	105	98	67	66	66
Total Indian Sub-Continent	3,148	3,429	4,065	4,151	3,814	4,062	4,360	5,041	4,025	4,016
East Asia										
Japan	3,373	3,504	3,487	3,955	3,508	3,809	4,200	3,711	3,693	3,604
China	765	809	890	1,003	1,055	1,030	1,047	1,109	1,327	1,472
Thailand	905	862	859	843	751	829	939	1,013	1,114	1,255
South Korea	510	579	575	579	429	519	641	562	593	643
Taiwan	164	179	198	214	210	210	293	263	279	319

Table 4
World Silver Fabrication
(including the use of scrap)
Tons

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Indonesia	83	97	104	126	84	99	121	132	148	158
Hong Kong	106	107	117	138	112	120	138	100	105	102
Myanmar, Laos & Cambodia	31	33	34	30	25	28	26	28	30	32
Vietnam	16	20	21	22	19	22	22	23	26	28
Malaysia	11	12	12	13	12	15	18	18	19	21
Other	11	12	12	10	11	12	13	14	14	15
Total East Asia	5,975	6,213	6,308	6,931	6,216	6,694	7,456	6,974	7,348	7,648
Africa										
Morocco	14	17	18	20	18	17	18	19	18	18
Tunisia	8	8	9	10	10	10	10	10	10	11
South Africa	12	14	9	8	8	8	8	7	7	8
Algeria	9	9	8	7	6	6	6	6	5	6
Other	16	15	13	12	12	12	12	12	12	12
Total Africa	59	63	57	56	53	53	54	53	52	54
Oceania										
Australia	196	166	162	161	176	180	218	184	180	193
New Zealand	0	0	1	1	1	1	1	1	1	1
Total Oceania	196	166	162	162	177	181	219	186	181	195
CIS										
CIS	983	901	878	846	789	757	775	804	810	859
Total CIS	983	901	878	846	789	757	775	804	810	859
World Total	**23,567**	**23,906**	**24,782**	**26,216**	**25,796**	**27,053**	**28,305**	**27,081**	**26,308**	**26,723**

World Silver Fabrication



World Silver Fabrication, 2003

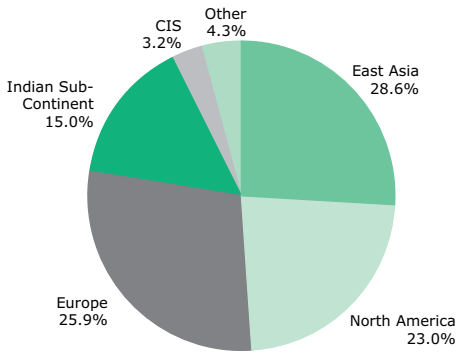


Table 5

Silver Fabrication: Industrial Applications

(including the use of scrap)

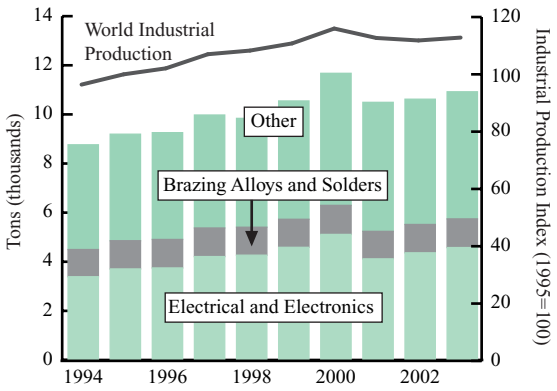
Tons

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Europe										
Germany	560	575	535	555	571	571	647	665	659	675
UK & Ireland	363	371	381	388	506	472	549	480	466	493
France	360	374	363	418	349	362	381	495	453	426
Italy	316	329	348	354	329	331	340	324	324	317
Switzerland	203	206	215	269	311	322	259	85	84	72
Netherlands	54	54	54	52	52	52	52	48	48	47
Spain	54	55	61	91	95	83	62	40	40	38
Poland	24	26	24	23	23	23	23	22	21	21
Norway	13	13	12	12	11	45	37	23	20	19
Austria	19	22	19	18	17	17	17	17	17	17
Sweden	10	10	10	11	11	11	11	10	10	10
Czech & Slovak Republics	13	16	17	13	13	16	8	11	9	9
Belgium	10	10	10	10	10	10	10	8	8	8
Other	23	23	23	23	24	23	23	21	21	22
Total Europe	2,022	2,084	2,071	2,236	2,322	2,338	2,418	2,248	2,179	2,173
North America										
United States	1,886	2,050	2,120	2,343	2,520	2,757	2,928	2,449	2,584	2,675
Mexico	86	79	81	85	92	103	107	94	93	96
Canada	20	23	20	20	17	17	17	16	16	16
Total North America	1,992	2,152	2,221	2,448	2,629	2,877	3,052	2,559	2,693	2,787
Central & South America										
Brazil	100	108	102	105	108	98	98	98	98	94
Argentina	40	38	36	36	36	30	25	20	20	20
Colombia	9	9	9	9	9	7	6	6	6	6
Ecuador	2	2	2	2	2	2	2	2	2	2
Other	12	12	12	12	12	12	12	13	13	12
Total Central & South America	163	169	161	164	167	149	143	139	139	134
Middle East										
Turkey	35	39	38	43	41	38	44	35	41	45
Israel	28	30	33	31	31	30	30	26	24	24
Egypt	3	3	4	3	4	4	4	4	3	3
Other	0	0	0	1	1	1	1	1	1	1
Total Middle East	66	73	74	78	76	72	79	65	69	73
Indian Sub-Continent										
India	999	1,062	1,105	1,120	992	1,180	1,435	1,579	1,381	1,382
Other	15	20	14	22	15	18	16	10	8	8
Total Indian Sub-Continent	1,014	1,082	1,119	1,142	1,007	1,198	1,451	1,589	1,389	1,390
East Asia										
Japan	1,591	1,667	1,622	1,848	1,643	1,890	2,244	1,723	1,839	1,876
China	538	567	593	632	645	651	681	693	795	859
South Korea	311	369	370	382	349	379	489	418	454	499
Taiwan	146	163	181	197	193	196	274	250	270	309
Hong Kong	76	79	88	107	93	101	121	85	93	90
Indonesia	11	12	13	15	16	16	16	14	15	16
Total East Asia	2,673	2,856	2,866	3,181	2,939	3,233	3,825	3,183	3,465	3,649
Africa										
Morocco	2	5	7	7	7	7	8	8	8	8
South Africa	10	10	5	5	5	5	5	4	4	4
Other	7	7	7	5	5	5	5	5	5	5
Total Africa	19	22	19	17	17	17	18	17	17	17
Oceania										
Australia	67	76	70	66	72	76	77	65	66	68
Total Oceania	67	76	70	66	72	76	77	65	66	68

Table 5
Silver Fabrication: Industrial Applications
(including the use of scrap)
Tons

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
CIS										
CIS	746	682	655	642	610	586	609	624	600	630
Total CIS	746	682	655	642	610	586	609	624	600	630
World Total	**8,764**	**9,198**	**9,260**	**9,977**	**9,842**	**10,549**	**11,675**	**10,493**	**10,620**	**10,923**

Main Components of Industrial Demand



World Silver Industrial Fabrication, 2003

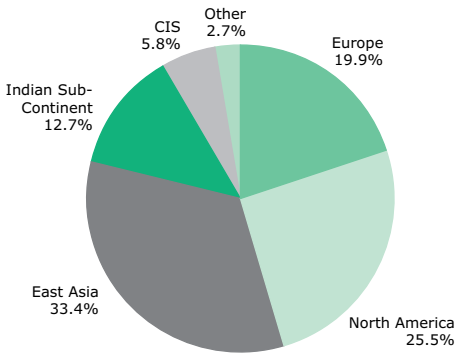


Table 5a
Silver Fabrication: Electrical and Electronics
(including the use of scrap)
Tons

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
United States	983	1,120	1,129	1,303	1,373	1,464	1,573	1,062	1,168	1,228
Japan	701	743	706	804	738	933	1140	828	913	940
Germany	340	370	360	370	380	380	445	488	484	503
China	276	284	293	316	305	308	320	320	340	368
France	168	190	195	238	207	210	228	342	309	297
South Korea	164	200	199	201	188	206	268	237	255	286
Taiwan	102	113	130	146	148	150	216	203	223	260
UK & Ireland	143	145	155	160	210	179	211	153	164	172
India	80	92	100	130	130	140	150	145	151	159
Italy	85	85	103	100	90	92	95	86	87	90
Hong Kong	57	59	68	85	77	90	110	77	87	85
Mexico	38	34	34	36	40	60	64	56	56	58
Brazil	46	49	45	45	45	40	40	40	40	38
Turkey	26	29	28	31	28	24	28	22	26	30
Australia	14	17	16	15	17	18	19	18	20	21
Netherlands	20	20	20	18	18	18	18	16	16	16
Switzerland	108	117	127	172	228	232	165	12	12	14
Austria	7	7	7	7	7	7	7	7	7	7
Romania	3	3	3	3	4	4	4	4	4	4
Egypt	3	3	4	3	4	4	4	4	3	3
Spain	28	28	28	29	30	30	9	0	0	0
World Total	**3,391**	**3,709**	**3,749**	**4,212**	**4,266**	**4,588**	**5,114**	**4,119**	**4,365**	**4,578**

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

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
China	146	159	170	179	196	198	208	215	247	270
United States	239	249	255	260	269	280	272	258	260	247
Japan	147	150	160	155	130	131	137	109	104	104
Germany	125	110	90	95	97	94	101	88	95	97
UK & Ireland	72	72	72	72	75	68	72	82	72	75
India	50	60	65	50	47	50	55	57	60	64
Italy	58	66	65	59	54	62	65	63	64	63
South Korea	30	38	36	35	25	26	31	38	44	46
Switzerland	56	56	52	52	49	48	50	41	40	42
Taiwan	25	32	35	34	31	32	37	29	31	33
Spain	9	9	18	29	32	33	33	30	30	28
Brazil	26	27	27	25	25	23	23	23	23	22
Australia	20	23	21	20	22	23	24	20	19	20
France	45	40	42	43	32	29	30	29	29	18
Mexico	31	27	27	28	30	20	20	17	16	17
Canada	13	16	13	13	10	10	10	9	9	9
Netherlands	8	8	8	8	8	8	8	7	7	7
Austria	4	4	3	3	3	3	3	3	3	3
Israel	2	2	3	3	3	3	3	2	2	2
World Total	**1,106**	**1,149**	**1,161**	**1,163**	**1,138**	**1,140**	**1,181**	**1,120**	**1,154**	**1,166**

Table 6
Silver Fabrication: Photographic Use
(including the use of scrap)
Tons

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Europe										
Belgium	640	708	770	828	1034	1149	1080	983	944	896
UK & Ireland	495	519	566	592	593	652	678	862	810	835
France	425	495	411	395	452	380	427	315	307	292
Czech & Slovak Republics	0	0	0	3	8	1	9	14	7	7
Hungary	8	8	7	7	6	6	7	6	6	6
Romania	6	2	6	5	8	6	6	5	5	5
Bulgaria	1	1	1	1	0	0	0	0	0	0
Germany	500	460	430	450	307	208	52	49	11	0
Spain	6	3	0	0	0	0	0	0	0	0
Poland	15	15	9	7	0	0	0	0	0	0
Total Europe	2,096	2,210	2,200	2,287	2,408	2,402	2,260	2,235	2,090	2,041
North America										
United States	1,792	1,857	1,863	1,955	2,157	2,295	2,299	2,046	2,057	1,917
Mexico	98	104	107	127	107	91	0	0	0	0
Total North America	1,890	1,961	1,970	2,082	2,264	2,386	2,299	2,046	2,057	1,917
Central & South America										
Brazil	100	123	105	105	100	100	76	70	64	68
Argentina	56	56	56	56	56	49	40	32	34	48
Total Central & South America	156	179	161	161	156	149	116	102	98	116
Indian Sub-Continent										
India	50	20	20	20	10	10	10	10	10	10
Other	7	8	9	10	12	12	12	4	4	4
Total Indian Sub-Continent	57	28	29	30	22	22	22	14	14	14
East Asia										
Japan	1,713	1,770	1,800	1,822	1,810	1,864	1,902	1,935	1,799	1,677
China	174	174	180	187	190	114	120	140	176	180
Taiwan	3	1	1	1	1	1	0	0	0	0
Total East Asia	1,890	1,945	1,981	2,010	2,001	1,979	2,022	2,075	1,975	1,857
Oceania										
Australia	60	50	49	51	51	52	85	74	71	64
Total Oceania	60	50	49	51	51	52	85	74	71	64
CIS										
CIS	163	154	145	140	119	107	100	95	92	88
Total CIS	163	154	145	140	119	107	100	95	92	88
World Total	**6,311**	**6,527**	**6,535**	**6,761**	**7,021**	**7,097**	**6,903**	**6,640**	**6,398**	**6,098**

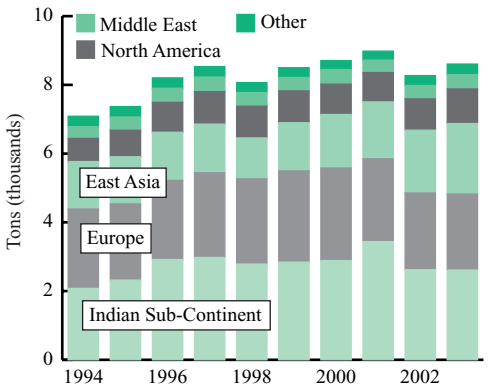
Table 7
Silver Fabrication: Jewelry and Silverware
(including the use of scrap)
Tons

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Europe										
Italy	1,288	1,212	1,260	1,392	1,410	1,592	1,685	1,487	1,413	1,384
Germany	360	320	310	310	315	312	290	292	244	240
Poland	35	49	57	71	83	89	92	78	71	91
Greece	120	118	130	140	126	126	104	94	87	90
France	60	63	62	69	81	85	88	85	83	80
Spain	125	127	140	124	126	105	93	76	74	76
Portugal	47	54	58	59	60	66	66	55	49	52
UK & Ireland	89	92	104	105	102	98	100	90	68	52
Norway	37	37	33	33	35	47	51	46	40	42
Sweden	37	32	35	40	31	30	29	20	22	26
Denmark	27	27	28	32	29	28	29	25	21	19
Finland	27	23	26	26	18	18	14	11	11	10
Switzerland	9	10	10	9	12	10	10	10	10	10
Cyprus & Malta	11	12	13	12	11	12	12	10	10	9
Austria	12	12	13	13	15	11	8	7	7	7
Other	27	27	23	26	25	24	23	23	23	23
Total Europe	2,311	2,215	2,302	2,462	2,480	2,653	2,693	2,410	2,233	2,211
North America										
Mexico	270	343	442	508	477	470	410	401	437	486
United States	373	389	387	389	391	407	427	406	426	469
Canada	30	38	41	47	55	48	45	47	48	52
Total North America	673	770	870	944	923	925	882	854	911	1,007
Central & South America										
Brazil	57	60	55	50	45	40	36	36	36	42
Peru	26	29	32	33	32	30	28	29	29	19
Colombia	24	24	24	24	24	20	18	16	16	16
Ecuador	19	19	19	19	19	15	15	12	12	10
Argentina	30	28	26	26	5	5	5	4	4	4
Other	20	23	31	45	54	59	37	29	25	30
Total Central & South America	176	183	187	197	179	169	139	126	122	121
Middle East										
Turkey	134	160	170	171	163	147	184	135	170	188
Israel	66	72	82	92	88	89	80	74	77	75
Egypt	55	64	67	62	54	58	60	51	46	53
Saudi Arabia	10	12	12	20	16	18	20	18	18	18
Other	75	79	82	80	76	79	81	83	77	79
Total Middle East	341	386	412	425	397	391	425	361	388	414
Indian Sub-Continent										
India	1,871	2,070	2,676	2,684	2,565	2,589	2,630	3,200	2,418	2,418
Bangladesh & Nepal	140	160	180	200	160	178	187	185	150	140
Other	66	89	61	95	60	75	70	53	54	54
Total Indian Sub-Continent	2,077	2,319	2,917	2,979	2,785	2,842	2,887	3,438	2,622	2,612
East Asia										
Thailand	899	852	844	834	744	825	934	1,007	1,104	1,245
China	32	45	75	96	145	195	208	229	291	358
South Korea	199	210	205	197	80	140	152	144	139	144
Indonesia	72	85	92	111	68	83	105	118	133	142
Japan	69	67	65	60	55	55	54	53	52	49
Myanmar, Laos & Cambodia	31	33	34	30	25	28	26	28	30	32
Vietnam	16	20	21	22	19	22	22	23	26	28
Malaysia	11	12	12	13	12	15	17	18	19	21
Hong Kong	30	28	29	31	19	19	17	15	12	12
Taiwan	15	15	16	16	16	13	13	10	9	10

Table 7
Silver Fabrication: Jewelry and Silverware
(including the use of scrap)
Tons

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Other	7	8	9	9	9	9	10	11	11	11
Total East Asia	1,381	1,375	1,401	1,418	1,191	1,404	1,558	1,656	1,826	2,052
Africa										
Morocco	12	12	11	13	11	10	10	11	11	10
Tunisia	7	7	8	9	9	9	9	9	9	10
Algeria	7	7	7	6	5	5	5	5	4	5
Other	14	15	12	11	11	11	12	11	11	12
Total Africa	40	41	38	39	36	35	36	36	35	37
Oceania										
Australia	19	19	17	18	22	23	24	22	23	22
New Zealand	0	0	1	1	1	1	1	1	1	1
Total Oceania	19	19	18	19	23	24	25	23	24	23
CIS										
CIS	68	61	59	52	54	57	62	78	109	129
Total CIS	68	61	59	52	54	57	62	78	109	129
World Total	**7,087**	**7,369**	**8,203**	**8,533**	**8,067**	**8,500**	**8,707**	**8,981**	**8,270**	**8,605**

World Silverware and Jewelry Fabrication



World Silverware and Jewelry Fabrication, 2003

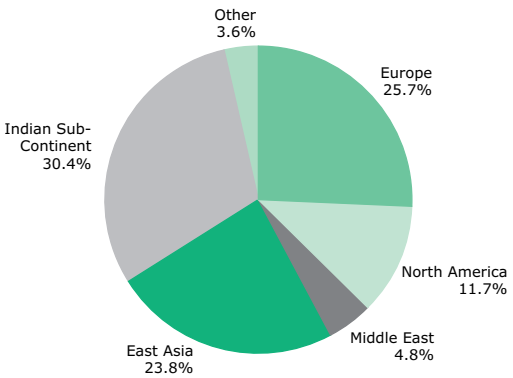


Table 8
Silver Fabrication: Coins and Medals
(including the use of scrap)
Tons

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
United States	295	280	222	203	219	333	418	384	441	390
Germany	272	125	194	166	312	218	294	270	232	350
China	21	24	43	88	75	71	38	47	65	75
Australia	50	21	26	26	31	29	31	23	20	40
Spain	148	124	87	56	54	46	55	55	47	34
Mexico	405	18	16	12	6	11	20	35	34	30
Portugal	12	17	25	25	31	29	36	21	0	26
France	31	36	9	10	10	10	11	13	16	17
UK & Ireland	24	23	20	19	19	19	17	14	16	15
Austria	15	17	14	11	10	10	8	10	13	13
Switzerland	9	13	18	20	9	12	12	13	12	12
Russia	6	4	19	12	6	7	4	7	9	12
Thailand	6	10	15	9	7	4	5	6	10	10
Canada	46	22	22	20	34	44	30	27	32	10
Poland	5	6	4	3	5	5	5	7	8	8
Netherlands	11	29	15	12	8	27	0	0	8	5
Other	49	45	38	254	31	32	37	34	57	50
World Total	**1,405**	**812**	**784**	**945**	**866**	**907**	**1,020**	**967**	**1,020**	**1,097**

Appendix II

Silver Prices, 1983-2003
The Effects of Exchange Rates and Inflation

1. Actual Prices *(money of the day)

	London US$/oz	India * Rupee/kg	Thailand Baht/oz	Japan Yen/10g	Korea Won/10g	Eurozone** Euro/kg	Mexico Peso/oz
1983	11.430	3,435	262.89	873	2,851	479	1.37
1984	8.145	3,514	192.54	622	2,111	382	1.38
1985	6.132	3,880	166.54	470	1,715	296	1.59
1986	5.465	4,105	143.72	296	1,549	195	3.33
1987	7.016	5,124	180.44	326	1,855	208	9.68
1988	6.532	6,231	165.21	269	1,536	189	14.83
1989	5.500	6,803	141.35	244	1,187	170	13.53
1990	4.832	6,779	123.64	225	1,099	129	13.58
1991	4.057	6,993	103.52	176	956	111	12.25
1992	3.946	7,580	100.24	161	991	101	12.19
1993	4.313	6,163	109.21	154	1,113	117	13.46
1994	5.285	6,846	132.92	174	1,365	141	17.86
1995	5.197	6,864	129.51	157	1,289	122	33.37
1996	5.199	7,291	131.75	182	1,345	128	39.52
1997	4.897	7,009	153.58	191	1,498	139	38.79
1998	5.544	8,016	229.31	233	2,498	160	50.67
1999	5.220	8,022	197.36	191	1,995	158	49.90
2000	4.951	8,002	198.60	172	1,800	173	46.84
2001	4.370	7,420	194.14	171	1,814	307	40.81
2002	4.599	7,934	197.57	185	1,850	157	44.43
2003	4.879	8,138	203.71	181	1,882	139	52.99

* 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 1983-1998 DM/kg price is expressed in Euro/kg at the official exchange rate of 1.95583.

2. Real Prices ***(Constant 2003 money)

	London US$/oz	India* Rupee/kg	Thailand Baht/oz	Japan Yen/10g	Korea Won/10g	Eurozone** Euro/kg	Mexico Peso/oz
1983	21.111	15,641	532.20	1,037	7,069	702	316.68
1984	14.420	14,772	386.43	723	5,115	546	193.11
1985	10.483	15,451	326.32	536	4,057	415	140.96
1986	9.172	15,034	276.51	335	3,565	273	158.25
1987	11.351	17,250	338.70	369	4,145	290	198.26
1988	10.162	19,177	298.73	302	3,203	261	141.79
1989	8.161	19,722	242.59	268	2,342	228	107.80
1990	6.803	18,035	200.29	240	1,997	168	85.41
1991	5.479	16,338	158.61	181	1,590	142	62.83
1992	5.174	15,842	147.57	163	1,549	124	54.15
1993	5.492	12,110	155.53	154	1,661	137	54.44
1994	6.559	12,206	180.22	173	1,918	161	67.57
1995	6.274	11,103	165.97	157	1,733	137	93.48
1996	6.098	10,822	159.48	181	1,723	142	82.39
1997	5.612	9,708	176.07	186	1,838	151	67.04
1998	6.257	9,805	243.24	227	2,851	173	75.55
1999	5.765	9,375	208.71	186	2,258	168	63.82
2000	5.290	8,991	206.81	168	1,993	181	54.71
2001	4.540	8,041	198.86	169	1,929	314	44.82
2002	4.703	8,236	201.16	184	1,916	158	46.45
2003	4.879	8,138	203.71	181	1,882	139	52.99

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

Appendix III

Silver Prices, in US dollars per ounce

1. London and US Prices

	London Silver Market - Spot			Comex Spot Settlement		
	High	Low	Average	High	Low	Average
1978	6.2640	4.8180	5.4218	6.3170	4.8110	5.4068
1979	32.2000	5.9350	11.0679	34.4500	5.9230	11.1135
1980	49.4500	10.8900	20.9837	48.7000	10.8000	20.6568
1981	16.3030	8.0300	10.4869	16.2900	7.9850	10.5014
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

2. US Prices in 2003

	Comex Spot Settlement		
	High	Low	Average
January	4.9100	4.7650	4.8372
February	4.9180	4.5070	4.6398
March	4.6780	4.3460	4.5132
April	4.6450	4.4020	4.5167
May	4.8640	4.6190	4.7439
June	4.6120	4.4700	4.5349
July	5.1950	4.5740	4.8418
August	5.1310	4.8620	5.0071
September	5.3270	4.9880	5.1748
October	5.1920	4.8150	5.0154
November	5.4150	4.9270	5.2094
December	5.9930	5.4450	5.6652

3. Leasing Rates in 2003

	Monthly averages		
	3-month	6-month	12-month
January	0.12%	0.23%	0.39%
February	0.31%	0.44%	0.52%
March	0.23%	0.31%	0.46%
April	0.12%	0.23%	0.34%
May	0.11%	0.19%	0.33%
June	0.10%	0.17%	0.35%
July	0.37%	0.46%	0.61%
August	0.31%	0.54%	0.93%
September	0.41%	0.74%	1.23%
October	0.39%	0.66%	1.10%
November	0.36%	0.58%	0.96%
December	0.28%	0.45%	0.84%

Appendix IV

Leading Primary Silver Mines

Rank	Mine	Country	Operator	2002 Moz	2003 Moz
1	Cannington	Australia	BHP Billiton	38.18	34.40
2	Fresnillo (Proaño)	Mexico	Industrias Peñoles SA de CV	31.25	31.97
3	Greens Creek	United States	Kennecott Minerals/Hecla Mining Company	10.95	11.71
4	Uchucchacua	Peru	Compañia de Minas Buenaventura SA	9.39	9.58
5	Dukat	Russia	Polymetal	-	9.00
6	Imiter	Morocco	Société Métallurgique d'Imiter	7.06	7.07
7	Rochester	United States	Coeur d'Alene Mines Corporation	6.42	5.60
8	Huaron	Peru	Pan American Silver Corp	4.53	5.00
9	Lunnoe	Russia	Polymetal	1.77	4.28
10	San Sebastian	Mexico	Hecla Mining	3.43	4.10
11	Galena	United States	Coeur d'Alene Mines Corporation	5.30	3.70
12	Arcata	Peru	Minas de Arcata SA	2.86	3.46
13	Tizapa	Mexico	Industrias Peñoles SA de CV	7.99	3.24
14	Cerro Bayo	Chile	Coeur d'Alene Mines Corporation	1.85	3.22
15	Quiruvilca	Peru	Pan American Silver Corp	2.51	3.03

Silver Mine Production by Source Metal

Million ounces

		2000	2001	2002	2003
Primary					
	Mexico	42.5	51.2	53.9	52.9
	Australia	32.5	30.0	38.2	34.4
	Peru	21.5	26.1	25.1	30.2
	Other	49.7	47.7	52.0	60.4
	Total	146.2	154.9	169.2	177.9
Gold					
	Canada	17.5	20.1	23.0	23.2
	Chile	22.6	22.2	17.6	16.9
	Mexico	10.4	9.8	9.5	9.4
	Other	43.3	38.7	33.7	29.8
	Total	94.3	91.1	83.7	79.1
Copper					
	Poland	36.0	37.4	38.3	43.7
	CIS	25.4	28.7	29.3	27.3
	Chile	17.2	20.7	18.4	20.0
	Other	59.3	63.1	62.6	62.9
	Total	137.8	150.2	148.8	154.0
Lead/Zinc					
	Peru	43.9	43.4	45.3	41.5
	Mexico	31.6	33.1	30.5	29.2
	Australia	31.6	31.8	27.6	24.4
	Other	90.0	86.7	83.4	84.1
	Total	197.2	195.2	187.0	179.3
Other		6.5	7.4	7.9	5.3
World Total		**582.0**	**598.8**	**596.4**	**595.6**

Silver Mine Production by Main Region and Source Metal

Million ounces

		2000	2001	2002	2003
North America					
	Primary	74.5	79.8	83.2	79.7
	Lead/Zinc	44.8	45.8	42.3	40.1
	Copper	22.9	22.1	21.3	17.9
	Gold	45.5	41.2	38.4	37.1
	Other	1.7	1.8	1.9	1.5
	Total	189.4	190.7	187.0	176.2
Central & South America					
	Primary	21.5	27.8	28.9	36.0
	Lead/Zinc	60.1	59.3	61.5	58.0
	Copper	24.3	31.5	30.6	33.0
	Gold	31.5	32.1	27.6	25.3
	Other	0.1	0.1	0.1	0.1
	Total	137.5	150.7	148.8	152.5
Asia & CIS					
	Primary	9.7	9.7	11.8	20.6
	Lead/Zinc	45.2	43.8	41.8	43.7
	Copper	47.4	52.1	52.3	51.5
	Gold	12.9	14.2	14.3	13.3
	Other	3.5	3.3	3.3	3.3
	Total	118.7	123.1	123.5	132.5
Rest of the World					
	Primary	40.4	37.7	45.3	41.5
	Lead/Zinc	47.2	46.3	41.4	37.5
	Copper	43.1	44.4	44.5	51.6
	Gold	4.3	3.6	3.3	3.5
	Other	1.2	2.2	2.6	0.3
	Total	136.2	134.2	137.1	134.4
World Total		**582.0**	**598.8**	**596.4**	**595.6**

Appendix V

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

	Comex				LBM Clearing Turnover[3]		
	No. of Contracts						
	Futures		Options				
	Turnover[1]	Open Interest[2]	Turnover[1]	Open Interest[2]	Ounces transferred (millions)	Value (US$bn)	Number of transfers
Jan-01	258,053	66,618	73,327	60,831	105.1	0.5	229
Feb	302,035	74,920	35,260	46,203	102.0	0.5	233
Mar	155,658	75,354	35,147	55,464	131.3	0.6	260
Apr	252,486	65,061	20,634	47,479	121.6	0.5	246
May	204,552	67,954	39,740	61,344	110.2	0.5	252
Jun	281,846	67,122	32,332	54,814	99.8	0.4	224
Jul	112,956	77,616	43,585	69,912	99.5	0.4	212
Aug	267,711	72,236	47,326	68,697	89.4	0.4	227
Sep	160,329	64,563	36,537	76,814	96.7	0.4	235
Oct	210,266	67,744	53,024	84,060	101.9	0.5	242
Nov	266,077	71,967	48,712	61,414	91.4	0.4	225
Dec	180,256	63,101	42,678	69,149	147.3	0.6	312
Jan-02	265,773	65,480	40,685	59,528	175.7	0.8	355
Feb	271,293	63,905	44,371	61,029	108.7	0.5	257
Mar	163,898	77,425	39,943	67,311	77.9	0.4	239
Apr	325,889	73,618	43,928	57,896	68.8	0.3	230
May	243,475	99,220	61,876	77,477	99.9	0.5	307
Jun	389,798	92,790	56,055	66,347	107.2	0.5	262
Jul	281,214	82,413	46,648	68,950	72.9	0.4	224
Aug	296,579	77,944	45,724	68,312	66.2	0.3	214
Sep	164,537	81,170	24,499	71,109	61.7	0.3	184
Oct	209,249	87,202	34,241	78,913	67.5	0.3	243
Nov	292861	78,974	24,042	40,520	58.2	0.3	168
Dec	230,998	80,920	29,566	48,027	79.1	0.4	208
Jan-03	291,120	103,510	40,685	59,528	89.7	0.4	216
Feb	409,737	84,202	53,682	57,466	107.5	0.5	247
Mar	216,660	88,711	34,079	64,726	90.0	0.4	215
Apr	315,240	78,337	26,530	54,820	79.2	0.4	178
May	251,096	78,871	35,606	62,237	78.9	0.4	228
Jun	352,564	79,156	21,939	47,517	61.3	0.3	193
Jul	407,931	112,011	79,976	75,341	108.3	0.5	251
Aug	442,762	106,251	41,053	71,554	97.8	0.5	233
Sep	335,508	105,542	54,298	83,031	96.2	0.5	267
Oct	373,493	94,349	57,230	92,444	101.3	0.5	268
Nov	464,244	104,122	58,403	48,585	89.6	0.5	248
Dec	250,835	102,250	44,274	60,865	110.1	0.6	246

1 Monthly total; 2 Month-end; 3 Daily average

Source: LBMA, Comex