

## SILVER

*By GFMS Ltd, London, UK*

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 March quarter 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 US\$4.88/oz was a more modest 6%. The annual data, presented in the table below, hint at the supply/demand shifts that eventually produced the December 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.

Another factor operating on the demand in 2003 was producer de-hedging. We suspect, however, that the reduction of 21.0 Moz (653 t) in mining companies' global hedge books 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 with 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.

Mine production was, for the third year in succession, broadly unchanged year-on-year. It is, however, like the proverbial super-tanker – it takes time to turn but, when it does, the impact can be massive. That much is clear when looking back ten years, where the data show that mine output in 1994 was well over 100 Moz lower than the average of the past 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.

Looking forward, the key variables over the rest of 2004 for the price will be fabrication, investment demand and government stock sales. The latter is most unlikely to increase from its 2003 level and 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 be a little less certain towards the end of the year if our expectations of renewed economic weakness are correct. 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. (Table 1)

### Prices

Silver prices ended 2003 on a buoyant note, achieving their high for the year (US\$5.97/oz) 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 US\$4.05/oz.

It is easy to forget how late last year the recent rally got under way (sub-US\$5/oz levels still being posted in early November) and that, for much of 2003, prices were rangebound between US\$4.50 and US\$5.00/oz. 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, US\$4.88/oz, into an historical context. In real terms, this average 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 December 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 rupee price) or, in some cases, actually falling (the case importantly for the yen and euro price). The main exception was the Mexican peso price, which rose 19.3%.

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

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 which give this factor greater significance. First, fabrication is typically quite price inelastic, which meant the December quarter rally could co-exist with growing offtake due to the general rise in industrial production. Second, the 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.

Once again, the bulk of government sales 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 t). Part of the reason for the discrepancy is that there were some additional option-related sales from stocks. The perception of sluggish sales must have helped prices, whilst the reality of their actual increase could undermine levels.

Finally, 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 being the driving force behind the implosion of the Iraq war premium in the March 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 over US\$2/oz rise and fall in prices. 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 price spike.

### Supply

#### Mine production

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 while primary silver output and silver produced at copper mines actually increased year-on-year. (Table 2)

#### North America

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. Consequently, 2003 production in the country was 3% lower at 93.8 Moz (2,916 t). Industrias Peñoles, the world's biggest silver producer, reported a sharp 8% drop in output (from record levels in the previous year) to 48.4 Moz (1,506 t). Planned mine closures explained the bulk of the reported losses – La Encantada completed mining operations in the June quarter of 2002, El Monte in the March quarter of 2003 and later, in September, mining was suspended at Las Torres (after 27 years of operations). Concerning production gains, Frisco, Luismin and 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 **US**, 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 2001-03 has totalled 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 the Bingham Canyon copper mine where grades dropped by 7% in 2002 year-on-year and by 12% in 2003. Concerning primary silver output, there were declines at Coeur d'Alene's Rochester and Galena mines although, elsewhere, higher grades at Hecla's Lucky Friday boosted production levels by 15% year-on-year (albeit from a low level in 2002), and the company's joint venture Greens Creek unit in Alaska registered a 7% improvement to reach 11.7 Moz (364 t).

Operational difficulties and mine closures explained the sizeable 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. 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 levels and a delay in stope rehabilitation in the lower portion of the mine.

### **Central and South America**

**Peru**, the region's most important producer, produced 89.2 Moz (2,775 t) of silver in 2003, a rise from the previous year of less than 0.5%. The modest increase was in contrast to the growth measured in the preceding four years, which averaged 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. In addition, a further boost to the country's output was provided by an increase in silver production at the Yanacocha gold operation.

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

### **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.

### **CIS**

Silver production increased for the fourth consecutive year from the countries that constitute the Commonwealth of Independent States. Last year, a surge in output from Russia helped lift the region's total by 16% year-on-year to reach 59.9 Moz (1,862 t). Russia's output rose mainly as a result of the commencement of mining at Polymetal's Lunnoye silver-gold deposit in the Madagan region.

### **China**

Asia's largest producer, increased production by some 4% in 2003, to reach 46.8 Moz (1,454 t). The bulk of output 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 by an estimated 4% year-on-year. Lead output, on the other hand, declined by just over 1%.

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.

### **Australia**

Australia produced 60.2 Moz (1,872 t) of silver last year, roughly 10% of global production. However, the world's third-largest producer recorded a marked 10%, or 6.6 Moz (205 t), cut in output compared with 2002. Needless to say, a sizeable 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 Ag in 2002 to 552 g/t Ag in 2003.

### **Production costs**

Cash costs calculated for the sub-set of primary silver mines where cost data are available declined 8% year-on-year to US\$2.12/oz. Combined with the 6% increase in the average silver price, average margins (in US dollar terms) widened by 21% to US\$2.75/oz. Only one of the mines in the sub-set reported cash costs above the average spot price for the period, and two operations stated costs at <US\$1.00/oz 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 US\$0.60/oz) and Hecla's San Sebastian unit in Mexico (negative US\$0.25/oz), the low unit operating charges were a consequence of significant gold credits. Total production costs (including depreciation, depletion and amortisation) declined by a sizeable 17% year-on-year to US\$2.66/oz.

### **Producer hedging**

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 December 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 put options, 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 1.0, whereas the delta against the bought puts at the end of 2003 was measured at 0.18).

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, because it is more than likely that the data used to calculate the global position do not reflect all silver transactions, the above discussion can only be regarded as broadly indicative of the market trends.

Looking at the current year, and despite the surge in prices above US\$8/oz in early April, there is no guarantee that producers' hedging activities will appear, once again, on the demand side. First, silver contracts are, in the main, near dated, so any positions put in place now could have expired by the end of the year. Second, 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. Finally, without any new (significant) projects requiring hedging in the current year, it is considered that fresh supply from this source could be limited.

### **Scrap**

The supply of scrap silver rose by 2.6% last year to 191.6 Moz (5,958 t). The reason for the increase, however, owed almost nothing to the rise in silver prices during the course of 2003. It was in large measure due to a higher figure for India and a rise in German coin scrap (which arguably could instead have been classified as a government sale). Indeed, there are two general comments worth making about scrap supply. The first is that there is a tendency now for it to decline because such a large share of it is coming from recycled photographic waste (mainly spent fixer solutions and old x-ray films). The second is that scrap supply of silver is relatively price-insensitive, in contrast to, for example gold, because of the very different composition of the above-ground stocks of fabricated products in the two metals.

### **Government stocks**

GFMS estimates that at the end of 2003 government-held silver bullion stocks totalled some 206 Moz (6,410 t), compared with a revised 289 Moz (8,990 t) at the end of 2002. (In last year's World Silver Survey, GFMS 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 which are difficult to analyse statistically. There are several reasons for this. Perhaps the most important is that, unlike gold, there are no official statistics published by, for example, 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 'demonetisation' 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). Excluding China, the bulk of the remaining 25.3 Moz (786 t) of silver sales was accounted for by a number of European countries' disposals of old coins and a reduction in official Russian bullion stocks.

### **Demand**

#### **Industrial applications**

Industrial demand for silver posted a relatively strong increase in 2003, rising by 2.9% to 351.2 Moz (10,923 t). The rise in industrial silver usage came mostly from the steady acceleration in demand for silver-plating materials in the electronics sector, particularly during the latter part of 2003. This, in turn, 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 signalled a return of increased IT spending by industry.

On a geographical basis, the largest gains were seen in East Asia where offtake rose by 5.3%. North American demand also performed strongly, rising by 3.5%. The increase in the US came mostly in the last quarter of 2003, with offtake up only marginally during the first nine months. The above-mentioned gains in Asia and North America were dragged downwards by flat offtake levels in Europe and India.

#### **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 by a combined 8.4 Moz (262 t) last year. The fourth of the majors, the UK, in contrast, saw a rise.

Falling photographic demand remains an important issue in the short to medium term for silver. 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.

#### **Jewelry and silverware**

One of the key factors behind the increase in total silver fabrication in 2003 was the recovery in jewelry and silverware demand. After falling by 8% in

2002, mainly because of plummeting demand in India, jewelry and silverware offtake staged an impressive turnaround last year, growing by 4.1%. Further strong growth in Thailand and China was behind much of the global increase, and North American fabrication demand recorded the second-largest regional gain, rising by an impressive 11% year-on-year. After falling by 28% in 2002, Indian fabrication was flat last year at 77.7 Moz (2,418 t). Much of the softness in demand in 2002 and 2003 can be explained by a combination of higher local prices (or more precisely the timing of price rallies) and the agricultural cycle (rural areas accounting for a high share of jewelry consumption in the country).

Robust consumer demand for silver jewelry in Europe and the US was again a critical reason underpinning the strong growth in fabrication. 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. This fairly widespread phenomenon is also being assisted by another market feature, namely the development of a top end segment, with a new wave of designs at price points once reserved for gold.

### **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 a result of sharply higher minting in Germany, which outweighed a fall in the US.

Tables on following pages.

**Table 1: World silver supply and demand (Moz)**

	2002	2003
<b>Supply</b>		
Mine Production	596.4	595.6
Net Government Sales	61.2	82.6
Old Silver Scrap	186.8	191.6
Producer Hedging	-	-
Implied Net Disinvestment	26.2	10.4
<b>Total Supply</b>	<b>870.7</b>	<b>880.2</b>
<b>Demand</b>		
Fabrication		
Industrial Applications	341.4	351.2
Photography	205.7	196.1
Jewelry & Silverware	265.9	276.7
Coins & Medals	32.8	35.3
Total Fabrication	845.8	859.2
Producer De-hedging	24.8	21.0
Implied Net Investment	-	-
<b>Total Demand</b>	<b>870.7</b>	<b>880.2</b>

Totals may not add due to rounding.

Net hedging incorporates producer forward sales, options and loans.

**Table 2: Top 20 producing countries (Moz)**

	2002	2003
Mexico	96.4	93.8
Peru	88.8	89.2
Australia	66.8	60.2
China	44.9	46.8
Poland	38.9	44.3
Chile	38.9	41.6
US	46.4	41.5
Canada	44.2	41.0
Russia	24.3	33.8
Kazakhstan	24.3	22.9
Bolivia	14.5	15.0
Sweden	9.4	9.9
Indonesia	10.7	9.6
Morocco	8.5	8.1
Argentina	4.3	4.6
Turkey	3.7	3.6
South Africa	3.8	3.4
Iran	2.6	2.6
Japan	2.6	2.5
India	1.9	2.2

This extract is taken from World Silver Survey 2004  
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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.



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