SILVER

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For what is often called an 'industrial commodity', silver was remarkably resilient last year in the face of adverse economic conditions. Indeed, at US$4.60/oz, its average price was actually up 5% year-on-year. This compares favourably with copper, lead and zinc, which fell 1%, 5% and 12% respectively in 2002. Taken in isolation, one might draw the conclusion that silver, after all, still retains some of the characteristics of a precious metal, including the ability to rise in value during periods of crisis. However, it would be unwise to stretch this point too far. After all, the price comparison is a good deal less flattering when the yardstick is gold, which enjoyed a far more substantial 14% increase in 2002. (On an intra-year basis, the difference is yet starker - gold rising 25% while silver recorded a mere 2% gain.)

For producers, an important factor in 2002 was the decline in their hedge positions, though de-hedging's 3% share of silver demand was dwarfed by the 11% recorded in the gold market. Furthermore, GFMS very much doubts that de-hedging will become an important factor this year in silver.

A review of the supply/demand data in Table 1 provides an explanation for silver's resilience last year and some pointers as to how 2003 might develop. Our conclusion is that the mix of supply/demand factors means silver is unlikely to move substantially outside its 2002 trading range. Any move to the downside would seem to require a severe economic downturn or for holders of bullion stocks to review their price targets dramatically. Neither of which seems very likely. The upside looks set to be constrained though by the weakness of fabrication demand and, in particular, the question mark against its most price sensitive component - India - plus the well documented 'cap' on the market represented by Chinese supply. Notwithstanding this assessment, and returning to the point made in the first paragraph above, silver's residual precious metal status could see some slight bias to the upside in 2003, particularly if gold makes a move and especially if political and financial tensions were to grow again.

Prices

Silver prices missed out on much of the hefty gains that gold saw last year, rising just 5% year-on-year, though they fared better than many base metals, which saw price declines. At less than 2%, silver's gain on an intra-year basis was even smaller. This should not be taken as a sign that prices were stable since average volatilities actually reached a three-year high. This also helped generate a quite wide trading range but only within 2002; silver prices over the past three years have been quite stable, seeing the smallest trading range of the four main precious metals.

Despite the 2002 rise, silver prices remain low historically; excluding 2001, the last time the annual average was lower than 2002's was in 1993. In real (dollar) terms, the situation is yet more brutal; (again excepting 2001), the annual average has not been lower this side of World War II.

The situation as regards prices in other currencies in 2002 was mixed. On the producer side, Australian dollar prices, for example, only just managed a rise year-on-year and fell intra-year whereas silver in Mexican peso terms rose not far off 10% year-on-year. Similarly, on the consumer side, euro and yen prices fell noticeably intra-year but rupee prices rose more than dollar prices both intra-year and year-on-year.

Three key forces dominated the year as a whole. One of the most important was investors' activity (often in sympathy with gold), which was largely responsible for the year's high price volatility whilst their short-termism made it hard for the market to hang on to the gains made on occasions. This was reinforced by the two other key factors, a pick up in Chinese selling towards the US$5 mark and generally weak fabrication.

Speculative activity certainly played a key role. The funds on Comex, for example, sold heavily from mid-July through to mid-October and this was clearly a key force behind that period's price collapse. Others groups showing interest in silver during 2002 included small investors on Comex and US retail investors. It is difficult to argue the metal was a strong direct beneficiary of geopolitical, let alone macro-economic, concerns. Investor interest was, instead, more the product of the favourable speculative climate that spilled over from the impact of these two factors on gold. It was no coincidence that the timing of the gold and silver rallies was broadly the same and it would be hard to argue silver led the way.

Another factor specific to the unwinding of silver's gains was sales from Chinese government stocks. Total disposals from this source last year were in fact a little lower than in 2001 (though still substantial). But the acceleration in the rate of these sales as the price reached the US$5.00/oz mark in early summer was critical in turning the market. Similarly, in the fourth quarter when prices fell below US$4.40/oz, a marked slowdown in Chinese selling helped stop the market sinking further.

The final key area for price sluggishness relates to fabrication demand which last year fell by over 3% (and this follows on from a 4% year-on-year fall in 2001), chiefly as a result of the slowdown in world GDP growth and the price-linked drop of around 23% in Indian demand.

So far in 2003, silver prices have continued to move largely at the whim of short-term speculators, with heavy fund selling and gold's collapse largely responsible for silver's descent from over US$4.90 in early January to back under US$4.40/oz by late March. Chinese selling, however, was also again a significant contributory factor. Fabrication certainly did not stand in the way of this fall, nor did it explain April's modest recovery, as this source of demand has remained weak, a situation that could persist for the rest of the year while the world economy continues sluggish.

Supply

Mine Production

Mine production declined modestly last year (Table 2) by just less than 1% to 585.9 Moz (18,224 t). Primary silver mines contributed 27% of the total, or 161.0 Moz (5,008 t), an 8% increase from the previous year. Silver by-product production declined in all categories, gold (-10%), lead/zinc (-3%) and copper (-1%).

North America

In **Mexico**, the world's biggest silver producer, output was up by just less than 1% to 91.7 Moz (2,852 t). The bulk of the increase was due to higher production from Industrias Peñoles, where production was up 2% from the previous year at 52.7 Moz (1,638 t). At the company's Fresnillo mine alone, production was some 9% higher at 31.2 Moz (972 t). In addition Francisco I. Madero in its first full year of production contributed 1.3 Moz (41 t) to the total. On the other hand, output slipped at La Encantada, which is approaching the end of its life, and at Rey de Plata activities remained on hold (operations were suspended in November 2001 due to the low zinc price). The combined loss in production from these two mines totalled 2.9 Moz (91 t).

In the **US**, silver production was down sharply at 46.4 Moz (1,455 t). The 12% decline represented the second consecutive fall in the country and has taken output to levels last measured in 1994. Much of the drop last year can be accounted for by the closure of Echo Bay's McCoy/Cove gold mine in Nevada. Production at the mine was completed on March 31, 2002 and the property is now in full reclamation mode. As a result, output at the mine was some 5.0 Moz (155 t) lower than the previous year.

There were also noteworthy declines of silver by-product generated at some of the country's copper mines. At Kennecott Utah Copper's Bingham Canyon mine output was 0.8 Moz (25 t) lower year-on-year.

Concerning primary silver operations in the US, there was also evidence of some production curtailments in response to low metal prices. At Lucky Friday, for example, operator Hecla reduced the level of mining activity during 2002 to approximately 50% of full production, and this left output some 38% lower at just over 2.0 Moz (62 t).

Meanwhile at Greens Creek, located on Admiralty Island, near Juneau, Alaska, output was narrowly lower at 10.9 Moz (339 t). Lower grades at the maturing mine impacted results although this was partially offset by an 11% increase in ore throughput.

Mine production in **Canada**, in contrast, actually rose 8%, or by roughly 3.3 Moz (103 t) to 44.0 Moz (1,386 t). Over half of the country's silver is generated at gold mines, with the balance coming from lead/zinc and copper mines in roughly equal proportions. As regards the driver behind last year's growth, record output at Barrick's Eskay Creek gold mine lifted silver production 15% from 2001 to 17.8 Moz (552 t) - the rise was primarily due to higher mining and processing rates.

Central and South America

In **Peru**, the world's number two producer, output was 3% higher at 88.8 Moz (2,761 t). A noteworthy contribution to the rise was made by the new polymetallic Antamina mine, which started production in October 2001 and accounted for 6.1 Moz (190 t) of silver - a 58% increase from the previous year. At Pan American Silver's Huaron mine, meanwhile, the first full year of operation was reported totalling 4.5 Moz (141 t), an increase of 1.6 Moz (51 t). In addition, at the giant Yanacocha mine (the world's second largest gold - producing mine) silver output was up some 23% at 1.9 Moz (58 t).

Output in **Chile** dropped back by a substantial 20% to 34.9 Moz (1,085 t), with the bulk of the losses coming from copper and gold mines. With respect to silver generated at copper operations, both BHP Billiton and state-owned Codelco reduced copper output in response to the weak market. At the former's Escondida mine output was consequently down 28% from 2001 at 2.3 Moz (72 t). Cuts at Codelco's Chuquicamata operation, meanwhile, left the company's total silver production 22% lower at 8.2 Moz (254 t). By-product silver from gold mines also decreased last year with lower output from La Coipa leading the way. Lower silver grades at the mine resulted in a 41% or 5.0 Moz (156 t) decline in production. This was compounded by the cessation of mining at El Indio and to a lesser extent the suspension of mining at Refugio.

Europe

Poland is the most important producer in Europe, accounting for close to 70% of the region's total. The bulk of the country's output is sourced from copper mines operated by the world's third largest silver producer KGHM Polska Miedz. Last year, the company's three underground mines yielded just over 38.3 Moz (1,192 t), a modest 2% increase from the previous year.

China

It is now emerging that the surge in imported copper and zinc concentrates in 2001 into **China** and the maintenance of these high levels in 2002 was primarily a result of the inability of local mine production to keep up with domestic demand. Indeed, estimates suggest that for the past two years copper, lead and zinc production in the country has actually declined. Mine closures were thought to have been the main reason behind the fall. This was, in particular, an issue for the lead/zinc mines last year where, on the heels of the Nandan accident, there was a tightening of regulatory control. As a result, a number of mines which were illegal, or with environmental protection and safety problems, were forced either to close or cut back production. Current estimates for silver output in China consequently show a 4% decline in 2002, with output slipping to 44.9 Moz (1,396 t).

Oceania

Australia, the world's third largest silver producing country and by far the most important producer in the Oceania region recorded a noteworthy 5% increase in production volume, which left output at 66.8 Moz (2,077 t). Much of the growth reflected a stellar performance at the world's largest silver mine, Cannington. Output at BHP Billiton's giant silver-lead-zinc mine surged 27%

year-on-year to reach 38.2 Moz (1,188 t). The rise was due to the combination of higher milling rates (up 18% year-on-year) and a 5% increase in grade. Higher production was also reported at Pasminco's Century mine although this was offset somewhat by a fall in output at the company's Rosebury operation, which was 29% lower, when compared with the previous year, at 2.1 Moz (65 t).

Production Costs

Average cash costs, measured by the sub-set of primary silver mines where cost data are available, declined 23% year-on-year to reach US$2.31/oz. However, it is worth mentioning that GFMS reduced the sample size of costed production in this year's *World Silver Survey*. In the past the report's analysis has attempted to capture the cost of silver production at not only primary mines but also at gold operations where significant volumes of by-product silver are generated. Because of the difficulty in restating the results from a co-product to a by-product basis (revenues from secondary metals are deducted from operating costs), GFMS has shifted focus to concentrate on costs at primary operations.

Last year there was a marked improvement in the economics of mining silver. In fact, all but two mines reported a reduction in cash costs year-on-year while only one operation had costs higher than the average spot price. Furthermore, the addition of three high-grade, low-cost mines to the group dragged the weighted average down further. The lower average production price combined with the higher silver price, which was up over 5% compared to 2001's average, resulted in a 68% widening of cash margins.

The lowest-cost mine in the sample was Coeur d'Alene's new Cerro Bayo operation in Chile (including ore feed from the company's Martha mine in Argentina). Low unit operating charges were also reported at Hecla's new San Sebastian unit in Mexico, where costs came in at just over a US$1.00/oz. Significant gold credits at both operations partly explained the remarkably low costs.

Total production costs for GFMS' sample (including depreciation, depletion and amortisation) declined by close to 20% year-on-year to reach US$3.20/oz.

Producer Hedging

Last year witnessed a dramatic decline in outstanding producer positions, which left the total hedge book some 24.8 Moz (772 t) lower from the prior year-end. Taken in combination with the fall in mine production, the total supply from the mining industry was therefore significantly lower than in 2001 (when there was some growth in positions). Last year, producers generated a net 561.1 Moz (17,452 t) of supply to the physical market, an 8% or 47.0 Moz (1,462 t) decline year-on-year.

As regards the net decline in the hedge book, the drop was entirely due to a sharp fall in open options positions which, to a large extent, had been put in place at the end of the December 2001 quarter during a period of backwardation in the market. With the silver price a full 5% higher year-on-year, and at times trading at above US$5.00/oz, producers moved away from the more defensive options strategies and, instead, locked in higher prices with forward sales agreements (particularly in the second quarter). The increase in forward contracts was not, however, sufficient to negate the collapse in options and overall the book contracted by 26% year-on-year.

The short-term nature of the options contracts meant that by the end of last year many of the open positions built up in 2001 had either expired or been closed out. Producers did not, however, aggressively replace these contracts. Instead, they added ounces to forward positions. In fact, it was no surprise that the biggest quarterly increase to forward contracts was measured in the second quarter. The average spot price in the three months to June was US$4.72/oz. Moreover, it breached the US$5.00/oz level at the end of May, representing considerably stronger prices than it had been possible to lock in throughout the preceding nineteen months.

Scrap

Scrap supply increased by 1.2% in 2002, rising by 2.2 Moz (68 t) to a total of 184.9 Moz (5,751 t). The level of recycling in the US, which accounts for nearly a third of the global total, fell by a little over 8% last year. However, the decline owed more to the increase in scrap volumes the year before, during which time a significant amount of industrial inventory was effectively cleaned out. Offsetting the fall in US scrap was a 6.4 Moz (200 t) jump in scrap supply in Saudi Arabia and Yemen, due to increased shipments of the old Maria Theresa Taler coins that have become increasingly demonetised.

Government Stocks

At the end of 2002, government stocks are estimated by GFMS to have totalled around 267 Moz (8,300 t), compared with a revised 338 Moz (10,520 t) at end-2001. (Figures have been revised due mainly to a reassessment of Chinese Government holdings and, to a lesser extent, larger official coin stocks in Europe than were formerly allowed for.)

Net sales out of government stocks were reduced in 2002. GFMS estimates that they fell last year to 71 Moz (2,200 t) compared with 87 Moz (2,700 t) and 78 Moz (2,400 t) in 2001 and 2000. If last year's sales rate were maintained in future, government stocks would be exhausted by the end of 2006.

Chinese sales are estimated to have totalled 51 Moz (1,600 t) last year. This figure is well down on the 68 Moz (2,100 t) of net official sales that GFMS estimates took place in 2001. We believe that the reduction owed more to the low silver price and a consequent lack of selling opportunities rather than stocks having been exhausted. Indeed, a reappraisal of the outstanding level of Chinese official holdings is the main reason for the upward revision to government stocks referred to above.

Net sales from other countries (ie, excluding China) came to a little under 20 Moz (600 t) in 2002. Around 60% of this figure was accounted for by the US, which has used official stocks to supply the US Mint's silver coinage programmes. Coin sales by the US Mint required just over 13 Moz (400 t) last year, and most of the raw material required came from stocks that had been transferred to the US Mint out of the National Defense Stockpile. It seems that this source has now been exhausted (assuming the 0.66 Moz reported as held at end-September 2002 was consumed in the fourth quarter). The US Mint still holds some custodial silver reserves on behalf of the US Treasury but it is our understanding that these are currently not available for the Mint's coin programmes. As a result, since the fourth quarter of 2002, the US Mint has had to source silver from the open market.

Excluding the US and China, other sales totalled 8 Moz (250 t). This number has two main components, first, government bullion stock sales from the former Soviet Union and, second, the melting of demonetised coins in Europe. The latter continued to be important last year and will still be so in 2003, largely because of the public handing in coins denominated in the old national currencies, which have been supplanted by the euro.

Demand

Industrial Applications

Total industrial demand rose by 1.3% in 2002 to 342.5 Moz (10,651 t) though this remains substantially lower than 2000's 376.3 Moz (11,705 t). There were sizeable gains in Japanese and US demand, in part due to restocking, but this was countered by heavy losses in India.

On a non-India basis, industrial fabrication fell by 13% in 2001 but then rose by a healthy 4% last year. That it remains substantially below its 2000 peak illustrates how the general slowdown in the world economy and the specific collapse in such industries as IT and telecommunications are still hurting offtake. The start of a healthier recovery last year was mainly the result of an end to, and partial reversal of, 2001's damaging destocking, for example in the US, and through robust demand for consumer durables in East Asia. The 13% slump in India's industrial demand (chiefly non-traditional quasi-industrial products) in 2002 was mainly due to a quite separate factor, the weakness of its agricultural sector.

Photography

Photographic demand for silver fell by 4% in 2002 to 205.3 Moz (6,386 t). This was its third consecutive annual fall and this could be taken as a sign that the decline has now become structural due to digital inroads. This factor is most pronounced in Japan (where offtake fell by 7% last year) though it is also important in North America and in Europe. Outside these regions, silver nitrate consumption is faring better, in some cases rising. The fall in photographic demand last year, however, was also the result of cyclical or one-off factors such as the sluggish world economy, a terrorism-derived reluctance to travel, especially in the US, and a very hot summer in Japan.

Jewellery and Silverware

Total jewellery and silverware fabrication fell by 9% last year to 259.2 Moz (8,061 t) with India's 28% or 29.0 Moz (900 t) drop accounting for much of this. European offtake also fell whereas most other regions saw gains.

Rural sector economic weakness and silver's price volatility were the key contributors to the large fall in India's jewellery and silverware fabrication in 2002. As before, this performance masks improvements elsewhere and, excluding India, this category of fabrication rose by 1% last year (versus the 9% global fall). Much of this gain was concentrated in Thailand and then China, the CIS, Mexico and Turkey. These gains were due mainly to buoyant silver jewellery consumption and also to market share gain, through low labour cost advantages, from European producers, Europe being the only other major jewellery fabricating region to show a fall last year. The health of jewellery consumption (excluding India) last year was partly due to the fashionability of silver though there was also an element of consumers trading down from gold in economically-depressed times. This robustness, however, did not extend to silverware where consumption is again estimated to have fallen sharply, chiefly through ongoing secular changes to consumer spending patterns.

Coins and Medals

World silver coin fabrication rose by a modest 2.6% in 2002, as higher North American demand more than compensated for lower minting in Europe.

Table 1
World Silver Supply and Demand (Moz)

	2001	2002
Supply		
Mine Production	589.2	585.9
Net Government Sales	87.2	71.3
Old Silver Scrap	182.7	184.9
Producer Hedging	18.9	-
Implied Net Disinvestment	-	20.9
Total Supply	878.0	863.0
Demand		
Fabrication		
Industrial Applications	338.1	342.4
Photography	213.9	205.3
Jewellery & Silverware	286.0	259.2
Coins & Medals	30.5	31.3
Total Fabrication	868.5	838.2
Producer Hedging	-	24.8
Implied Net Investment	9.5	-
Total Demand	**878.0**	**863.0**

Totals may not add due to rounding.
Net hedging incorporates producer forward sales, options and loans.

Table 2
Top 20 Producing Countries' Output (Moz)

	2001	2002
Mexico	90.8	91.7
Peru	86.0	88.8
Australia	63.3	66.8
US	52.6	46.4
China	46.7	44.9
Canada	40.7	44.0
Poland	38.0	38.9
Chile	43.4	34.9
Russia	20.8	25.0
Kazakhstan	24.3	24.9
Bolivia	13.7	14.5
Sweden	8.8	9.4
Morocco	9.1	8.5
Indonesia	9.3	8.2
Argentina	5.6	4.3
South Africa	4.1	3.7
Turkey	3.7	3.7
Japan	2.6	2.6
Iran	2.6	2.5
Greece	2.0	2.4