

WORLD

SILVER SURVEY



THE SILVER INSTITUTE

1994





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# *WORLD SILVER SURVEY 1994*

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## **THE SILVER INSTITUTE**

A WORLDWIDE ASSOCIATION OF  
MINERS, REFINERS, FABRICATORS AND MANUFACTURERS

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The cover photograph is of the new 10-Peso circulating silver coin from Mexico. Mexico has introduced three silver-bearing circulating coins since the beginning of 1993, using significant amounts of silver and providing a highly visible reminder of silver's enduring value.

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## PREFACE

The Silver Institute is pleased to release the 1994 edition of its *WORLD SILVER SURVEY*. This year's report is the fifth in this series of annual reports, which began in 1990.

In undertaking this program, the Silver Institute seeks to improve the report each year and provide the best available statistics and analysis of silver supply and demand. This year all available data on silver use in jewelry and silverware has been summarized showing this is now the largest and fastest growing segment of demand.

Also, we include a detailed discussion on mine production, distinguishing between silver that comes from primarily silver mines and silver that comes from mines at which it is a by-product or co-product. A brief section deals with the costs of producing silver both at mines and from secondary supplies.

A separate chapter at the end of the report reviews silver mine production and reserve levels in the Commonwealth of Independent States.

The statistics on silver demand continue to improve with each new edition of the *WORLD SILVER SURVEY*. This year's report adds statistics on silver use for Belgium, Austria, Mexico, and Peru, bringing to 16 the total number of countries for which such data are available. The discussion on silver in photography examines trends in silver usage by this industry over the past several years, a topic that became of keen interest in the market in late 1993 and early 1994. Additional information is presented on the number of ounces of silver used worldwide both on a per capita basis and per a given unit of economic activity.

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## SUMMARY

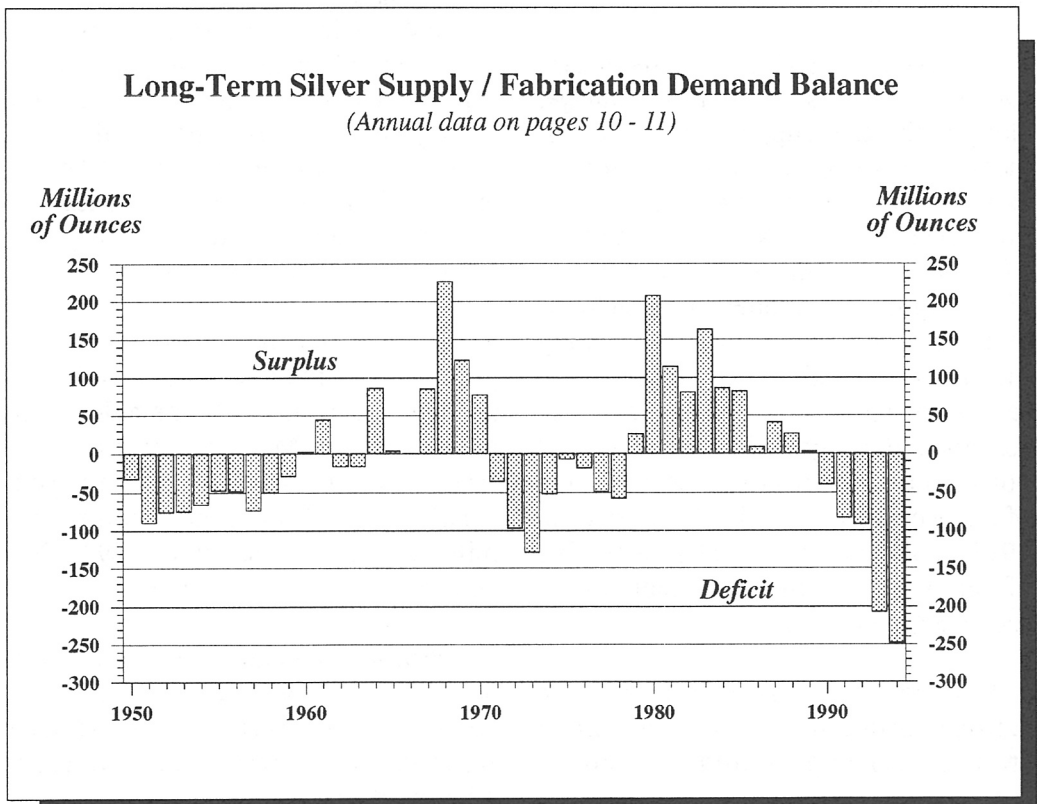
### Market Balance

• Fabrication demand exceeded total new supply by 207.5 million ounces in 1993. That was more than double the shortfall in 1992, when this deficit was a revised 91.7 million ounces. Last year marked the fourth consecutive year in which fabrication demand exceeded total supply. Market and investor inventories, built up during the period from 1979 to 1989, were drawn down sharply last year to compensate for this shortage of newly refined silver entering the market.

• The deficit is expected to expand further. Fabrication demand remains vibrant, while supply is likely to be static this year. Fabrication demand is projected to exceed total new supply by 248.4 million ounces in 1994.

### Supply

• Total new silver supply fell 6.1% to 471.2 million ounces in 1993, from 501.7 million ounces in 1992. This was the lowest level of total supply since 1986.



- In 1994 total supply is projected to rise 1.7% to 479.4 million ounces.
- Mine production fell sharply in 1993, due to reductions in Mexico, the United States, Peru, and Canada -- the four largest producers. It also fell in other countries, notably Chile. The decline was partly due to lower prices for copper, lead, and zinc, which led nonferrous mines that produce by-product silver to close. Most of these operations plan to remain closed for most, if not all, of this year, which will limit any increase in mine production. Silver output is projected to expand at a few mines, which should boost total mine production 2.0% to 337.3 million ounces in 1994.
- The recovery of silver from secondary supplies such as scrap and old coinage, along with other supplies from government stock sales and Eastern European exports rose around 1.2% to 140.6 million ounces in 1993. A slight decrease to 142.1 million ounces, is expected in 1994. Tighter environmental regulations regarding the disposal of silver-bearing materials has led to an expansion in secondary recovery of silver from old scrapped photographic materials and other industrial items since the beginning of the decade. The rise in silver prices in 1993 appears to have had a negligible effect in stimulating any increase in secondary recovery.
- Shipments of silver from Eastern Europe, primarily by-product silver from Polish copper mines, declined

sharply in 1993, and are expected to remain low in 1994.

### **Fabrication Demand**

- Fabrication demand for silver rose 14.4%, to 678.7 million ounces in 1993 from 593.4 million ounces in 1992. The major impetus behind this strong growth rate was a tremendous surge in demand for silver jewelry and decorative objects in India, where the removal of import restrictions on silver led to lower domestic Indian market prices and a rush of purchases. Demand also rose strongly in several other national markets.
- Demand is projected to continue rising in 1994, again being led by further increases in Indian demand in jewelry, silverware, and other sectors. Strong growth is projected for silver use in the Thai jewelry sector as well, along with healthier growth in silver use in industrialized countries. This year demand may rise 7.2%, to 727.8 million ounces.
- Silver use in coinage rose sharply last year, to 38.1 million ounces from 29.4 million ounces in 1992. The bulk of this increase was in Mexico, where the government began issuing silver-bearing circulating coins. These coins absorbed 15.0 million ounces of silver in 1993. Coin demand could be lower in 1994.
- Fabrication demand in this report is the use of refined silver bullion in the manufacture of products such as photographic film and papers, jewelry, silverware, and other products.

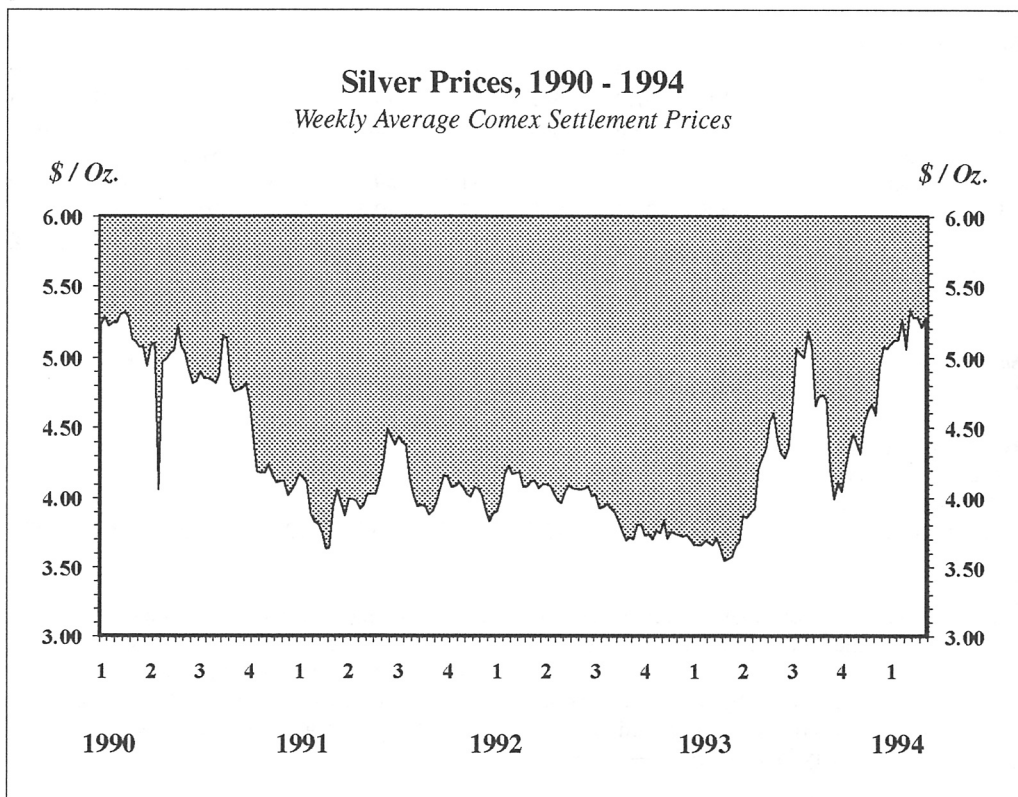


**Investment Demand and Inventories**

- Investor interest in silver revived last year, as a wide range of private and institutional investors bought silver. Investment demand was strongest in the United States, although investors in Asia and the Middle East also were active.
- Reported market inventories declined 16.6 million ounces in 1993, as market stocks were drawn down due to the combined strong demand from both fabricators and investors. Unreported dealer and bank inventories in London were said to have been largely depleted by investors by the end of 1993.

**Prices**

- The price of silver averaged \$4.30 per ounce in 1993, up 9.4% from \$3.93 in 1992. The low for 1993 was \$3.52, in February; the high was \$5.44, in August. The range in nominal silver prices last year was \$1.92, compared with a spread of 40 cents the year before.
- Real silver prices averaged 73 cents last year, in 1950 dollar terms. This was up from 68 cents in 1993, and marked the first increase in annual average inflation-adjusted silver prices since 1987. Even so, the real silver price remained at one of the lowest levels since the 1940s.



**Silver Statistical Position**

*Million Troy Ounces*

	1977	1978	1979	1980	1981	1982	1983	1984	1985
<b>Mine Production</b>									
Mexico	47.0	50.8	49.4	47.3	53.2	49.8	55.0	63.9	69.2
United States	38.2	39.4	37.9	32.3	40.7	40.2	43.4	44.6	39.4
Peru	39.1	37.0	41.9	44.8	42.6	54.4	55.6	53.3	54.9
Canada	42.2	40.7	36.9	34.4	36.3	42.2	38.7	42.0	38.5
Other	96.8	98.9	105.9	107.7	110.4	111.5	120.9	120.8	128.0
<b>Total</b>	<b>263.3</b>	<b>266.8</b>	<b>272.0</b>	<b>266.5</b>	<b>283.2</b>	<b>298.0</b>	<b>313.6</b>	<b>324.5</b>	<b>329.9</b>
<i>% Change Year Ago</i>	—	1.3	1.9	-2.0	6.3	5.2	5.2	3.5	1.7
<b>Secondary and Other Supply</b>									
<b>Total</b>	<b>182.0</b>	<b>168.0</b>	<b>233.0</b>	<b>320.0</b>	<b>196.0</b>	<b>156.0</b>	<b>215.5</b>	<b>151.6</b>	<b>152.9</b>
<i>% Change Year Ago</i>	—	-7.7	38.7	37.3	-38.8	-20.4	38.1	-29.7	0.9
<b>Total Supply</b>									
<b>Total</b>	<b>445.3</b>	<b>434.8</b>	<b>505.0</b>	<b>586.5</b>	<b>479.2</b>	<b>454.0</b>	<b>529.1</b>	<b>476.1</b>	<b>482.8</b>
<i>% Change Year Ago</i>	—	-2.4	16.1	16.1	-18.3	-5.3	16.5	-10.0	1.4
<b>Fabrication Demand</b>									
Photography	129.6	142.9	146.1	123.8	128.1	136.5	140.3	147.3	152.7
Jewelry & Silverware	91.0	91.9	79.1	47.9	43.5	51.9	43.1	42.9	50.9
Electronics	78.7	79.3	80.4	71.2	62.2	62.6	60.9	63.1	67.8
Other Uses	87.5	84.0	82.5	66.6	61.8	58.1	57.4	64.8	63.5
Other Countries, Total	73.1	54.3	60.1	54.8	59.8	52.3	54.8	58.1	52.6
Coinage	34.5	39.5	31.0	15.0	9.5	12.0	10.2	13.7	13.4
<b>Total</b>	<b>494.4</b>	<b>491.9</b>	<b>479.2</b>	<b>379.3</b>	<b>364.9</b>	<b>373.4</b>	<b>366.7</b>	<b>389.9</b>	<b>400.9</b>
<i>% Change Year Ago</i>	—	-0.5	-2.6	-20.8	-3.8	2.3	-1.8	6.3	2.8
<b>Net Surplus/Deficit</b>									
	-49.1	-57.1	25.8	207.2	114.3	80.6	162.4	86.2	81.9
<b>Additional Statistics</b>									
Changes in Reported Stocks at Exchanges and Refineries	10.5	-15.3	-7.8	2.8	-15.7	12.7	52.2	-8.0	37.8

**Notes:** Totals may not equal the sum of categories due to rounding. Excludes transitional economies, except for net exports into the market. Photography, jewelry, and silverware, electronics, and 'other' industrial use includes use by these industries in those countries for which demand by sector statistics are available. Reported stocks include New York Comex, Tocom, Chicago Board of Trade, London Metal Exchange (prior to 1990), and U.S. refinery inventories. p — projections.

**Source:** CPM Group.

1986	1987	1988	1989	1990	1991	1992	1993	1994p	
69.4	69.8	70.0	70.0	67.9	62.7	65.0	61.0	65.0	<b>Mine Production</b>
34.2	39.8	53.4	60.8	66.5	61.0	61.0	56.0	57.0	Mexico
59.9	63.6	47.7	56.8	55.6	56.9	48.0	47.0	49.0	United States
35.0	38.1	44.1	41.3	44.4	40.6	36.3	27.0	26.0	Peru
121.8	126.9	128.8	129.5	135.2	136.9	152.5	139.6	140.3	Canada
									Other
<b>320.3</b>	<b>338.2</b>	<b>344.0</b>	<b>358.4</b>	<b>369.6</b>	<b>358.1</b>	<b>362.8</b>	<b>330.6</b>	<b>337.3</b>	<b>Total</b>
-2.9	5.6	1.7	4.2	3.1	-3.1	1.3	-8.9	2.0	% Change Year Ago
<b>124.9</b>	<b>164.0</b>	<b>158.1</b>	<b>153.2</b>	<b>135.0</b>	<b>134.9</b>	<b>138.9</b>	<b>140.6</b>	<b>142.1</b>	<b>Secondary and Other Supply</b>
-18.3	31.3	-3.6	-3.1	-11.9	-0.1	3.0	1.2	1.1	% Change Year Ago
<b>445.2</b>	<b>502.2</b>	<b>502.1</b>	<b>511.6</b>	<b>504.6</b>	<b>493.0</b>	<b>501.7</b>	<b>471.2</b>	<b>479.4</b>	<b>Total Supply</b>
-7.8	12.8	0.0	1.9	-1.4	-2.3	1.8	-6.1	1.7	% Change Year Ago
157.8	172.1	185.1	185.9	193.2	193.0	195.3	195.9	204.3	<b>Fabrication Demand</b>
70.6	82.8	87.1	105.4	118.6	144.7	161.4	221.6	260.0	Photography
69.5	69.4	74.5	79.9	83.9	83.4	80.9	82.3	83.1	Jewelry & Silverware
61.4	73.2	72.3	85.1	92.4	99.8	101.7	111.0	116.1	Electronics
50.4	33.2	31.8	25.8	26.2	27.5	24.7	29.8	31.2	Other Uses
26.8	30.4	25.3	26.3	29.8	27.7	29.4	38.1	33.0	Other Countries, Total
									Coinage
<b>436.5</b>	<b>461.0</b>	<b>476.1</b>	<b>508.4</b>	<b>544.1</b>	<b>576.2</b>	<b>593.4</b>	<b>678.7</b>	<b>727.8</b>	<b>Total</b>
8.9	5.6	3.3	6.8	7.0	5.9	3.0	14.4	7.2	% Change Year Ago
8.7	41.2	26.0	3.2	-39.5	-83.2	-91.7	-207.5	-248.4	<b>Net Surplus/Deficit</b>
									<b>Additional Statistics</b>
									Changes in Reported
									Stocks at Exchanges
									and Refineries
-38.6	2.9	16.2	51.1	33.3	4.6	5.3	-16.6		

Detailed statistics are available on these pages:

Mine Production, p. 30

Secondary & Other Supply, p. 34

Coinage, p. 55

Fabrication Demand by Sector, p. 56-57

Fabrication Demand by Country, p. 58-59

**World Silver Supply and Fabrication Demand**  
*Million Troy Ounces*

Year	Supply				Demand		
	Mine Output	Secondary	Other	Total	Industrial	Coinage	Total
1950	169.5	NA	NA	169.5	158.8	44.1	202.9
1951	165.5	NA	NA	165.5	164.6	90.5	255.1
1952	180.6	NA	NA	180.6	142.1	114.3	256.4
1953	184.7	NA	NA	184.7	168.3	90.8	259.1
1954	178.6	NA	NA	178.6	160.8	83.4	244.2
1955	187.7	NA	10.3	198.0	192.8	52.6	245.4
1956	189.8	30.5	3.7	224.0	218.1	56.6	274.7
1957	194.6	25.0	3.8	223.4	214.8	84.2	299.0
1958	202.3	17.0	1.3	220.6	193.0	79.5	272.5
1959	195.6	33.4	42.0	271.0	216.0	86.4	302.4
1960	201.8	52.0	90.0	343.8	237.8	103.9	341.7
1961	203.9	65.0	181.0	449.9	269.6	136.0	405.6
1962	210.8	69.0	107.0	386.8	275.5	127.6	403.1
1963	214.0	68.0	147.0	429.0	278.9	166.4	445.3
1964	211.5	86.0	374.0	671.5	318.2	267.1	585.3
1965	218.4	103.0	426.0	747.4	358.5	385.1	743.6
1966	225.2	105.0	217.0	547.2	417.1	129.5	546.6
1967	214.7	126.0	252.0	592.7	401.9	105.3	507.2
1968	230.2	227.0	232.0	689.2	373.9	89.3	463.2
1969	248.7	174.0	119.0	541.7	386.3	32.7	419.0
1970	258.5	127.0	91.0	476.5	376.0	23.4	399.4
1971	247.3	127.0	9.0	383.3	389.5	27.8	417.3
1972	248.9	112.0	14.0	374.9	431.4	38.1	469.5
1973	254.0	122.0	47.0	423.0	522.5	28.5	551.0
1974	236.6	192.0	22.0	450.6	470.0	31.6	501.6
1975	239.0	177.0	21.0	437.0	407.7	33.4	441.1
1976	242.9	235.0	19.0	496.9	484.7	30.0	514.7
1977	263.3	169.0	13.0	445.3	459.9	34.5	494.4
1978	266.8	152.0	16.0	434.8	452.4	39.5	491.9
1979	272.0	216.0	17.0	505.0	448.2	31.0	479.2
1980	266.5	302.0	18.0	586.5	364.3	15.0	379.3
1981	283.2	184.0	12.0	479.2	355.4	9.5	364.9
1982	298.0	155.0	1.0	454.0	361.4	12.0	373.4
1983	313.6	197.5	18.0	529.1	356.5	10.2	366.7
1984	324.5	165.6	-14.0	476.1	376.2	13.7	389.9
1985	329.9	140.9	12.0	482.8	387.5	13.4	400.9
1986	320.3	129.3	-4.4	445.2	409.7	26.8	436.5
1987	338.2	137.9	26.1	502.2	430.6	30.4	461.0
1988	344.0	143.9	14.2	502.1	450.8	25.3	476.1
1989	358.4	136.2	17.0	511.6	482.1	26.3	508.4
1990	369.6	118.0	17.0	504.6	514.3	29.8	544.1
1991	358.1	117.6	17.3	493.0	548.5	27.7	576.2
1992	362.8	125.2	13.7	501.7	564.0	29.4	593.4
1993	330.6	126.8	13.8	471.2	640.6	38.1	678.7
1994 <sub>p</sub>	337.3	126.0	16.1	479.4	694.8	33.0	727.8

**Notes:** Base year for real prices is 1950. p — projections.

Surplus (+) or Deficit (-)	Annual Prices Dollars per Ounce		Year
	Real (Base=1950)	Nominal	
-33.4	0.74	0.74	1950
-89.6	0.83	0.89	1951
-75.8	0.77	0.85	1952
-74.4	0.77	0.85	1953
-65.6	0.76	0.85	1954
-47.4	0.80	0.89	1955
-50.7	0.80	0.91	1956
-75.6	0.78	0.91	1957
-51.9	0.74	0.89	1958
-31.4	0.75	0.91	1959
2.1	0.74	0.91	1960
44.3	0.74	0.92	1961
-16.3	0.86	1.08	1962
-16.3	1.00	1.28	1963
86.2	1.00	1.29	1964
3.8	0.99	1.29	1965
0.6	0.96	1.29	1966
85.5	1.12	1.55	1967
226.0	1.48	2.15	1968
122.7	1.40	2.14	1969
77.1	1.10	1.77	1970
-34.0	0.92	1.55	1971
-94.6	0.97	1.68	1972
-128.0	1.39	2.56	1973
-51.0	2.30	4.71	1974
-4.1	1.97	4.42	1975
-17.8	1.84	4.35	1976
-49.1	1.84	4.62	1977
-57.1	1.99	5.40	1978
25.8	3.68	11.09	1979
207.2	6.02	20.63	1980
114.3	2.78	10.52	1981
80.6	1.98	7.95	1982
162.4	2.76	11.44	1983
86.2	1.89	8.13	1984
81.9	1.37	6.14	1985
8.7	1.20	5.47	1986
41.2	1.48	7.01	1987
26.0	1.33	6.53	1988
3.2	1.07	5.50	1989
-39.5	0.90	4.82	1990
-83.2	0.72	4.03	1991
-91.7	0.68	3.93	1992
-207.5	0.73	4.30	1993
-248.4	—	—	1994p

Sources: CPM Group, industry sources



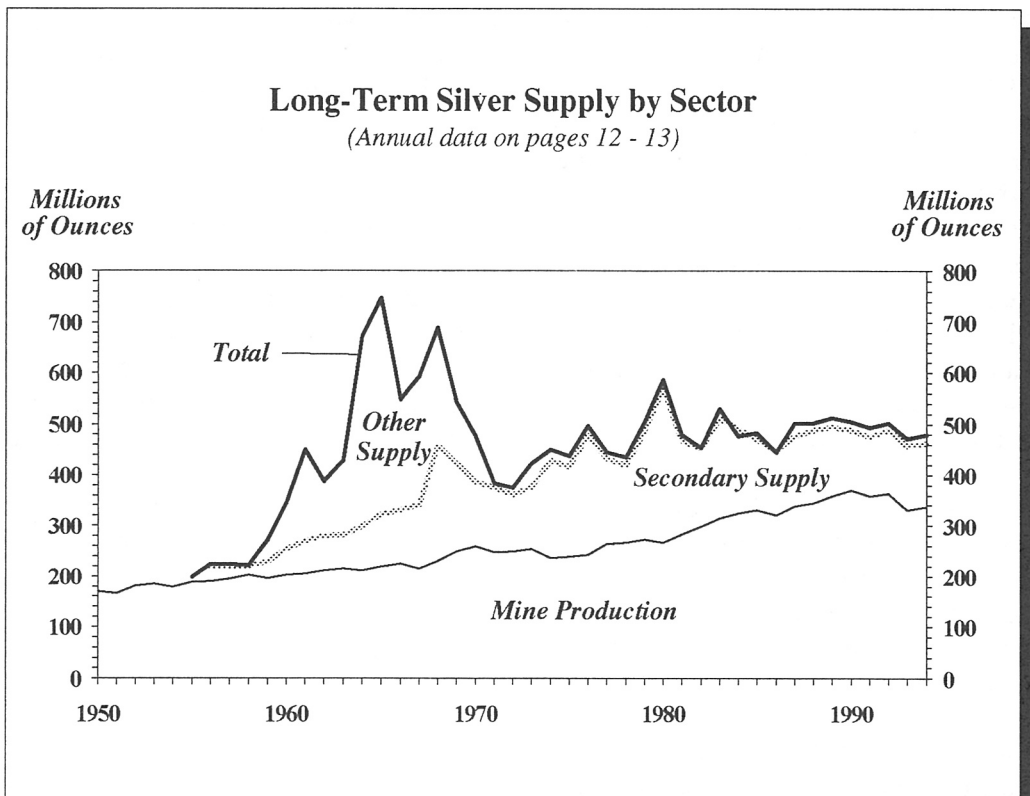
## SUPPLY

The flow of newly refined silver declined 30.5 million ounces, or 6.1% to 471.2 million ounces in 1993 from 501.7 million ounces in 1992. Mine production and transitional economy exports fell sharply, while secondary supplies and disposals from government stocks rose, albeit slowly.

This year mine output could recover somewhat, and silver from government disposals also are projected to rise. Silver from other sources could be flat to slightly lower. Total supply is projected at 479.4 million ounces in 1994, an in-

crease of 1.7%. Even so, total supply would remain well below its levels from 1987 to 1992.

The low silver prices over the past few years have reduced silver supply to some extent, but a good part of the decline in silver mine production in 1993 came from mines at which silver is a by-product. These mines primarily rely on their gold, copper, lead, or zinc output for their revenues. They were closing in 1993 due to low prices for their primary nonferrous metals, even as silver prices were rising.





The results of several research exercises on silver supplies are included in this report.

The production of silver in the Commonwealth of Independent States is discussed in a separate chapter. Based on research by Richard Levine of the U.S. Bureau of Mines, this section includes information on secondary recovery, reserves, and demand.

There has been a shift in silver supply patterns over the past several years due to the cost structure in the silver mining industry, the by-product nature of much mine output, and the increases in recycling efforts due to environmental legislation. Silver supply remained flat for several years in the late 1980s and early 1990s, even as silver prices were falling, because an increasing amount of supply was coming from by-product mines, which continued to operate or came on-stream because it was profitable to mine their primary product -- gold, copper, lead, or zinc. While some primary mines closed due to low silver prices, the more important effect was the curtailment of any new developments or expansions of primary silver mining.

The estimated cost of producing silver from all sources of feed ranges up to \$7.50 per ounce. In considering cost figures, it is imperative to understand the calculations behind them. Radically different cost estimates can be derived by using various accounting methods. Some analysts attribute mining, treatment, smelting, and refining charges to all of the

metals produced at a given mine, based on a formula that reflects the relative value of each metal. Some mining companies do this as well, although a more common approach is to charge the major production expenses against the major products of an operation.

If silver is a relatively insignificant source of revenue at a given mine, and if that mine has a wide profit margin based on the revenues from its major metals, management may not charge mining, treatment, and refining charges against the by-product silver, but rather only charge the costs of refining the silver from the residual sludges left after the major products have been refined and recovered. Many of the gold and copper mines that have come onstream in the past decade with significant by-product silver use this accounting method.

The importance of the differences in accounting methods cannot be over-stated: Allocating total production costs to all of the metals produced at a given mine might show that the production costs for an ounce of silver at that mine might be \$3.50 or more; attributing only the costs of recovering the silver from the tank house slimes to the silver might show a production cost of \$0.25 to \$0.40 per ounce at the same mining operation.

**Mine Production**

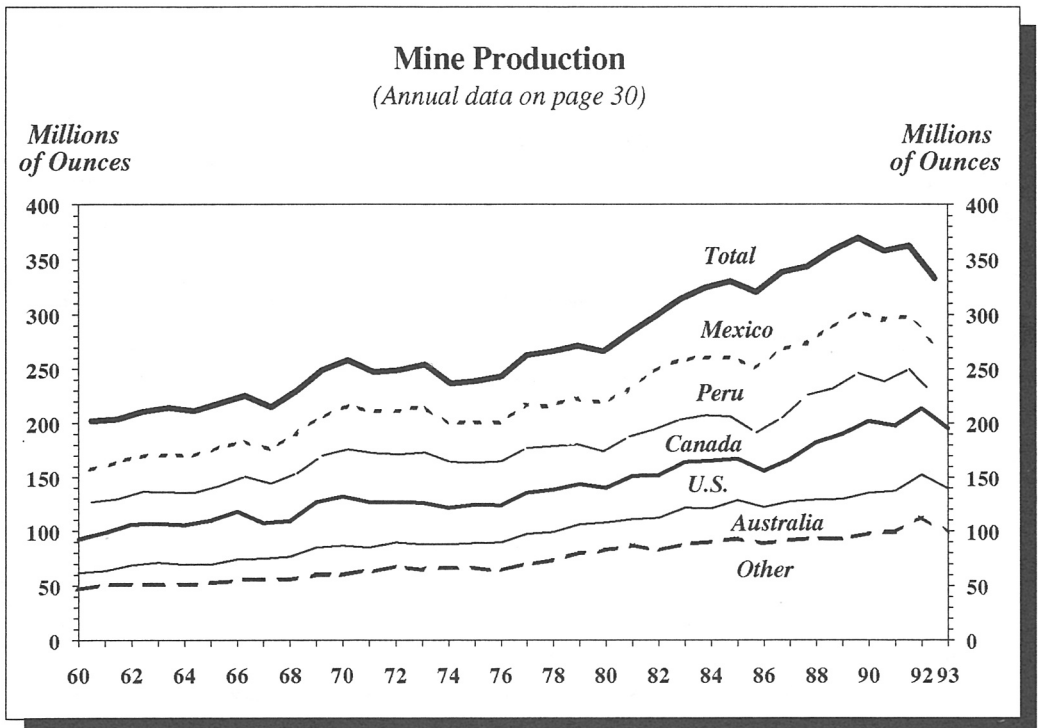
Lower output at primary, by-product, and co-product mining operations worldwide led to a 8.9% decline in silver mine production last year, to 330.6 million ounces from 362.8 million ounces in 1992.

Production is projected to rise 2% in 1994 to 337.3 million ounces. Most of this increase is related to higher output in Chile, as La Coipa mines high-grade ore, and Indonesia. Freeport Indonesia is continuing a major multi-year expansion at its Grasberg copper-gold-silver deposit.

There has continued to be a shift in mine production away from mines at which silver is the primary product toward

mines at which silver is a by-product or co-product. The table on page 19 shows this information by major country. In 1987 34% of market economy silver production came from mines at which silver was the primary product. By 1993 primary silver mines accounted for only 22% of production in the market economies.

Primary output totaled 114.9 million ounces in 1987, but has declined to around 74.7 million ounces in 1993. Silver by-product and co-product output meanwhile has risen from 223.3 million ounces in 1987 to 257.9 million ounces in 1993.

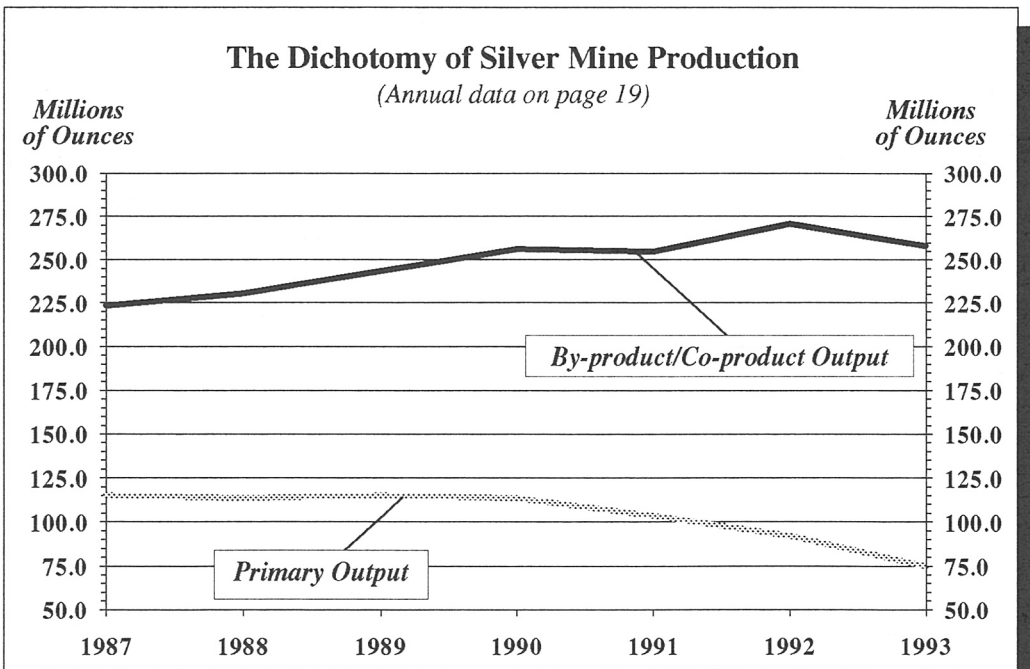


There is little prospect that this shift in mine production trends will reverse. Rather, the share of by-product and co-product silver could widen further as primary silver mines are curtailed or shut because of cost considerations, or are closed due to ore depletion.

As with so much in the silver mining industry, it is important to be careful with definitions of which mines are primary silver mines, which mines produce silver as a by-product, and which mines are mines at which silver is a co-product.

To a large extent these definitions are qualitative and open to debate. In some countries the tax laws are different for base metals mines and precious metals mines, adding a financial incentive for

producers to be considered either a base metals producer or a precious metals miner. The calculations here are based on information from a number of governments and individual mines, and are believed to accurately portray the division between primary silver mines and by-product or co-product operations.



**Silver Mine Production by Source**

*Million Troy Ounces*

	1987	1988	1989	1990	1991	1992	1993
<b>Mexico</b>	69.8	70.0	70.0	67.9	62.7	65.0	61.0
Primary	29.3	29.4	29.4	27.8	25.1	26.0	24.4
<i>% of National Output</i>	42%	42%	42%	41%	40%	40%	40%
By-product/Co-product	40.5	40.6	40.6	40.1	37.6	39.0	36.6
<i>% of National Output</i>	58%	58%	58%	59%	60%	60%	60%
<b>United States</b>	39.8	53.4	60.8	66.5	61.0	61.0	56.0
Primary	23.9	21.9	24.9	25.3	22.0	20.1	18.5
<i>% of National Output</i>	60%	41%	41%	38%	36%	33%	33%
By-product/Co-product	15.9	31.5	35.9	41.2	39.0	40.9	37.5
<i>% of National Output</i>	40%	59%	59%	62%	64%	67%	67%
<b>Peru</b>	63.6	47.7	56.8	55.5	56.9	48.0	47.0
Primary	17.2	12.9	15.3	15.0	14.2	9.6	7.1
<i>% of National Output</i>	27%	27%	27%	27%	25%	20%	15%
By-product/Co-product	46.4	34.8	41.5	40.5	42.7	38.4	40.0
<i>% of National Output</i>	73%	73%	73%	73%	75%	80%	85%
<b>Canada</b>	38.1	44.1	41.3	44.4	40.6	36.3	27.0
Primary	13.3	17.6	13.6	14.2	13.4	9.1	5.4
<i>% of National Output</i>	35%	40%	33%	32%	33%	25%	20%
By-product/Co-product	24.8	26.5	27.7	30.2	27.2	27.2	21.6
<i>% of National Output</i>	65%	60%	67%	68%	67%	75%	80%
<b>Australia</b>	35.9	35.8	37.3	37.8	38.0	40.1	40.0
By-product	35.9	35.8	37.3	37.8	38.0	40.1	40.0
<i>% of National Output</i>	100%	100%	100%	100%	100%	100%	100%
<b>Papua New Guinea</b>	2.0	2.1	2.0	2.6	3.2	3.5	2.7
By-product	2.0	2.1	2.0	2.6	3.2	3.5	2.7
<i>% of National Output</i>	100%	100%	100%	100%	100%	100%	100%
<b>Other Countries</b>	89.0	90.9	90.2	94.9	95.6	108.9	96.9
Primary	31.2	31.8	31.6	31.3	28.7	27.2	19.4
<i>% of National Output</i>	35%	35%	35%	33%	30%	25%	20%
By-product/Co-product	57.9	59.1	58.6	63.6	66.9	81.7	77.5
<i>% of National Output</i>	65%	65%	65%	67%	70%	75%	80%
<b>Total Mine Production</b>	<b>338.2</b>	<b>344.0</b>	<b>358.4</b>	<b>369.6</b>	<b>358.0</b>	<b>362.8</b>	<b>330.6</b>
Primary	114.9	113.6	114.9	113.6	103.3	92.0	74.7
<i>% of Output</i>	34%	33%	32%	31%	29%	25%	23%
By-product/Co-product	223.3	230.4	243.5	256.0	254.7	270.8	255.9
<i>% of Output</i>	66%	67%	68%	69%	71%	75%	77%

Source: CPM Group.

*Mine Production Costs*

Mining costs are difficult to measure. The accounting methods used by miners to calculate silver production costs vary widely. A specific cost break-out is unavailable for many mines where silver is mined as a co-product or by-product. This accounts for three-quarters of world silver output at present.

In some cases, revenue from silver is shown as a credit for accounting purposes, to offset the costs of the principal product. This has led to some reports being published that discuss how silver has a 'negative cost of production,' that is, that it costs nothing to produce silver at some mines. This obviously is an incorrect way of looking at silver production costs, since there always is at least some cost to recovering silver from mine materials.

For example, there are mines that are primarily copper producers, with costs below 50 cents per pound. These mines sometimes have enormous by-product gold production. The nominal cost of recovering the gold from the copper sludge might be 50 cents an ounce. Because the gold revenue plays a significant part in the companies' overall revenue, however, the mines may be considered co-product copper and gold mines, with some of the mining and treatment costs being attributed to the gold. After the copper and gold have been recovered, large amounts of silver might be left. The cost of recovering this silver again may be no more than 25 to 50 cents per ounce.

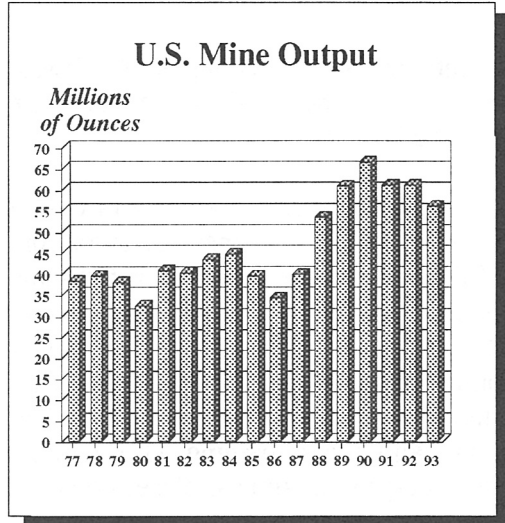
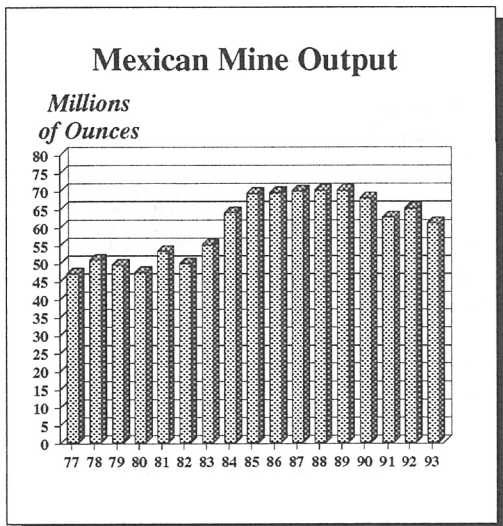
Since the silver revenue is not so important to the overall operation of these mines, however, none of the mining and treatment charges will be attributed to silver except for those specifically related to recovering the silver to refined form at the end of the beneficiation process. Thus, the cost of silver production at these mines will be 25 to 50 cents per ounce, in the eyes of the mines' management.

Primary silver mines are by definition higher cost. Around 48.0 million ounces is produced at costs from \$3.75 to \$4.30, below last year's average silver price. Some 22.0 million ounces of output is estimated to have costs in the \$4.40-\$5.75 range. A relatively small amount of U.S. and Canadian primary silver mine production, around 2.5 million ounces, tops the cost scale at \$7.50, accounting for 0.5% of silver coming into the market.

*Mexico*

Mexican mine production fell to 61.0 million ounces in 1993 from 65.0 million ounces in 1992, largely due to the closure of the Real de Angeles mine. Real de Angeles was reopened in the fourth quarter, and was running at full capacity this January. As a result, Mexico is projected to produce 65.0 million ounces of silver in 1994.

In Mexico the share of primary silver has slipped more gently than in most other countries, reflecting the presence of many high grade, low cost silver deposits in Mexico. During the past seven years the share of Mexican production coming from primary silver mines has fallen from 42% to 40%, with output from these mines falling 4.9 million ounces to 24.4 million ounces.



*The United States*

Silver mine output in the United States declined sharply in 1993 because of the closure of two major mining operations: Kennecott's majority owned Greens Creek lead, zinc, and silver mine, and Asarco's Troy silver and copper mine. Production fell 8.2% to 56.0 million ounces from 61.0 million ounces in 1992.

Production could be flat to slightly higher in 1994, possibly reaching 57.0 million ounces. It could be even higher, depending on the status of currently idled mine capacity. Kennecott has been studying the possible restart of Greens Creek, although there is no official timetable. In view of higher silver, zinc, and lead prices the resumption of mining there cannot be ruled out. The reopening of the Troy mine, and Asarco's previously closed silver-producing operations, appears to be more remote.

Additionally, the flow of by-product silver from U.S. copper mines may rise

slightly in 1994, providing the Southwest avoids weather-related disruptions which occurred in 1993.

In the United States, the share of output from primary silver mines has fallen from 60% in 1987 to 33% in 1993. By-product output from gold mines now accounts for 27% of total U.S. mine supply. Silver output at copper, lead and zinc mines has stabilized at around 29% of total production, with the remaining 11% coming from co-product mines, placer deposits, and other metal mining operations.

*Peru*

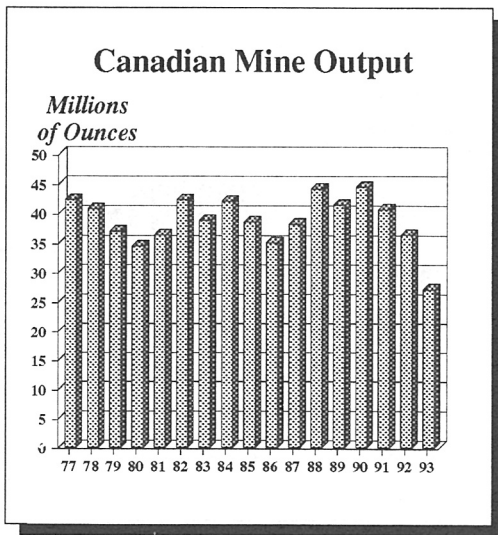
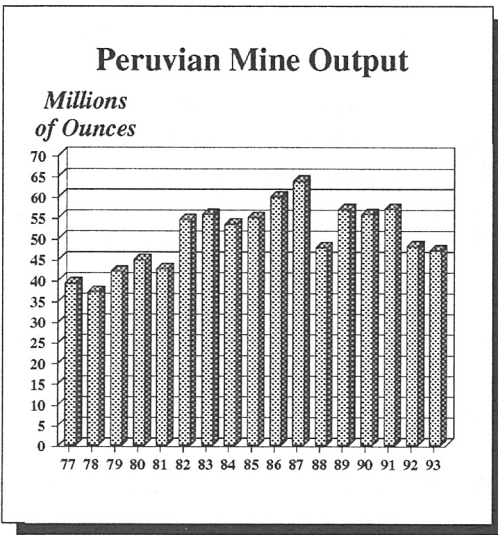
Peruvian mine output fell 1.0 million ounces last year to 47.0 million ounces from 48.0 million ounces in 1992, the lowest level since 1982. There are signs that Peru's mining industry is beginning to recover from two decades of guerrilla war and several years of economic dis-

tress. Peru could produce 49.0 million ounces of silver in 1994.

Peru has seen an even sharper drop in the flow of primary silver during this period, from 17.2 million ounces in 1987 to 7.1 million ounces in 1993, a 58.7% decline. By-product and co-product silver now accounts for 85% of the total, the bulk from lead and zinc output, some from copper mining, and additional amounts from gold properties.

*Canada*

Silver output in Canada fell 25.6% to 27.0 million ounces in 1993, from 36.3 million ounces the previous year. Production at the Equity Mine dwindled, and the mine ceased operations in the fourth quarter of last year. At the same time by-product silver production fell sharply, reflecting a major curtailment of zinc and lead output. Canadian silver production could slip another 1.0 million ounces this year





to 26.0 million ounces, depending on miners' responsiveness to developments in the lead and zinc markets.

The importance of primary output in Canada has declined from 13.3 million ounces (35% of total mine production) in 1987 to 5.4 million ounces (20%) in 1993.

*Other Countries*

In 1993 silver output in other market economies fell 12.2% to 98.6 million ounces from 112.4 million ounces a year earlier.

Australia produced 41.0 million ounces of silver last year, up 2.2% from 40.1 million ounces 1992, and output may be flat this year.

Chilean production fell about 3.4 million ounces to 29.6 million ounces, because of the mining of lower silver-bearing ore at

La Coipa, a situation that will be reversed in 1994.

Silver output in Indonesia continued to climb, rising nearly 15% to 2.6 million ounces from 2.3 million ounces in 1992, with higher output expected this year.

Papua New Guinea produced 2.5 million ounces of silver, down 29.2% from 3.53 million ounces in 1992, as Misima and Porgera produced far less by-product silver. Porgera could produce more silver in 1994.

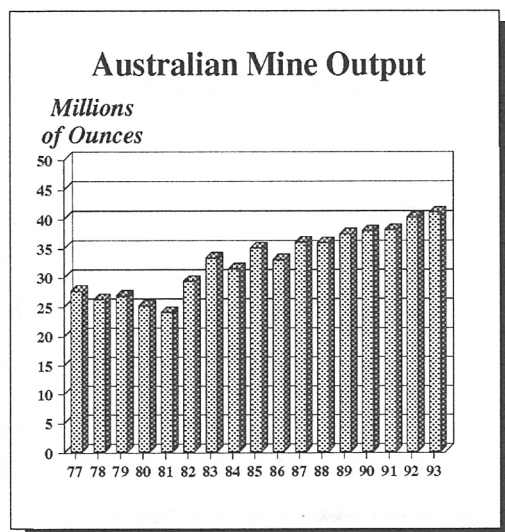
Silver mine production in central Africa and the Philippines also fell further last year, although there are tentative signs output is stabilizing.

Primary output in other countries has declined 38.7% to 19.4 million ounces over the same period, and accounted for 20% of total silver mine supply, down from 35% in 1987.

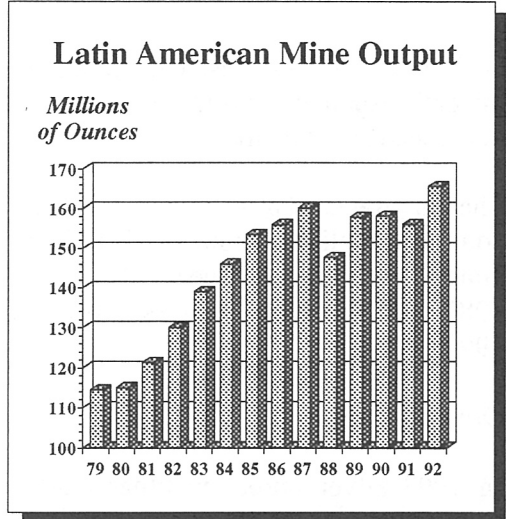
*The Growing Importance of Latin America*

Latin American mine production totals 166.0 million ounces per year at present, representing 46% of total output in the market economies. (If silver mined in China and the transitional economies of the former Soviet Union and Eastern Europe is included in the denominator, Latin America's share of total world production is 37%.)

Silver mine output in Latin America has risen over the past decade. The two tradi-

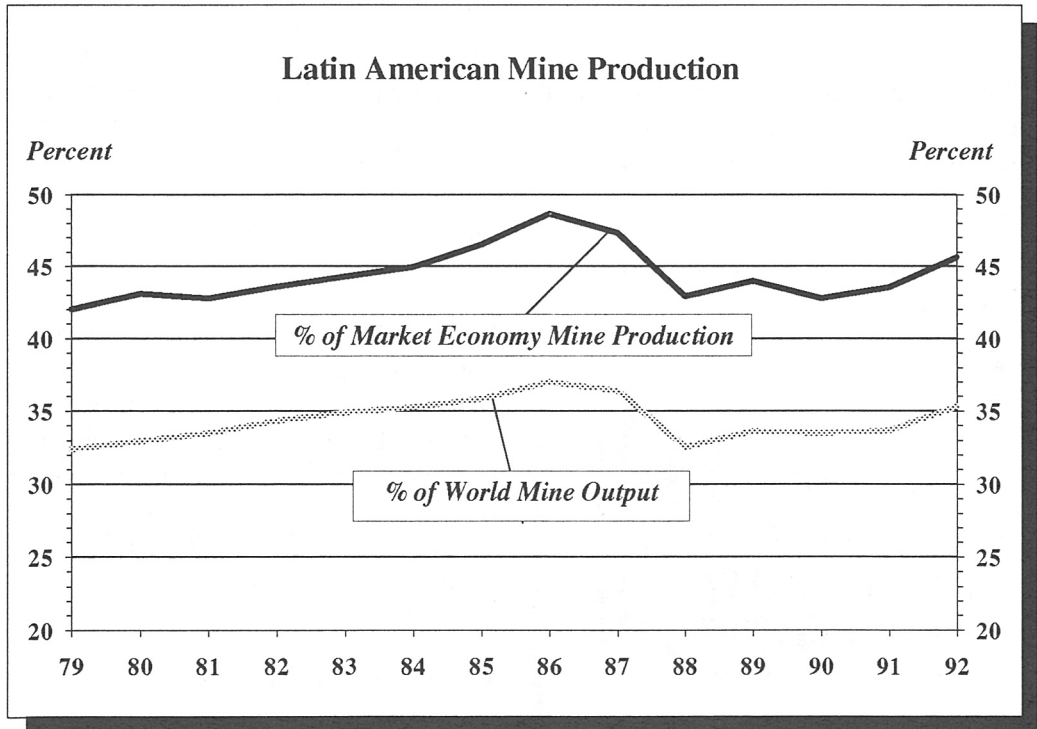


tionally large mining areas for silver in Latin America are Peru and Mexico. Two other countries, Chile and Bolivia, have emerged as significant silver producers in this region. Chilean production has risen from around 9.0 million ounces annually in 1979 to 33.0 million ounces last year. This increase reflects major increases in silver by-product at copper and gold mines. Bolivian silver production has risen from less than 6.0 million ounces per year in the late 1970s to 10.5 million ounces in 1992.



Growth in Latin American silver production has outpaced that in the rest of the world, both over the past 14 years and, more important, over the past five years or so. Even as world silver production

was stagnating and contracting, Latin American production has been increasing. As a result, this region's share of world silver output has risen faster than its volume output levels. Latin American

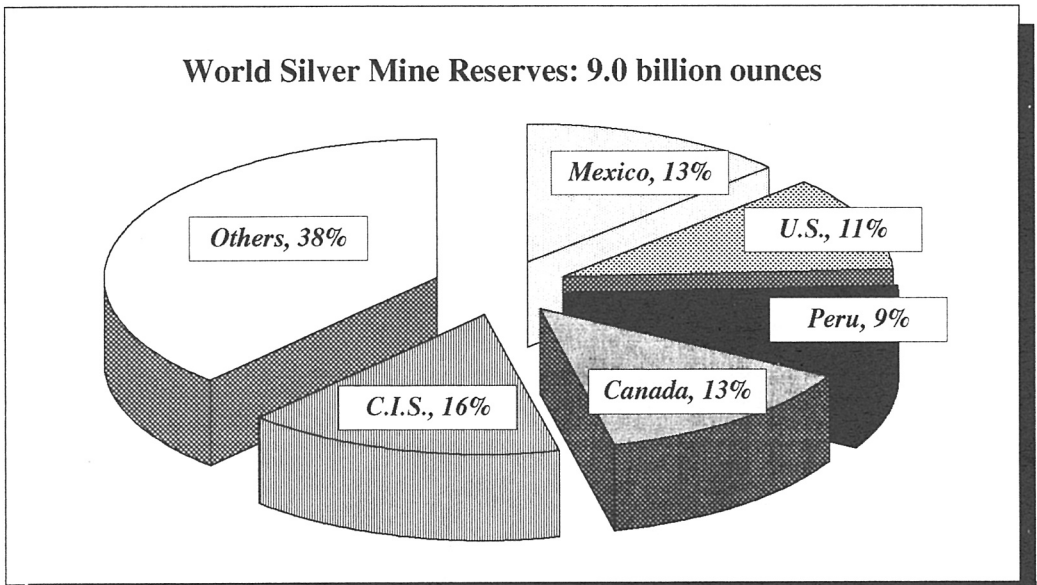


output has risen 45% from 1979 to 1992. Total output in the market economies has risen 33% over the same period. This difference in expansion rates has boosted Latin America's market share from 42% in 1979 to 46% in 1992.

*Reserves and Resources*

Known world silver mine reserves stand at around 9.0 billion ounces, while the reserve base is estimated at 13.5 billion ounces. The economic viability of this potential silver supply is debatable, however.

Most of these deposits are not primary silver ore bodies, but rather are silver-containing gold, copper, lead-zinc, or poly-metallic formations.



**World Silver Mine Production, Reserves, and Reserve Base**  
*Million Troy Ounces*

	<u>Mine Production</u>		<u>% of</u>	<u>Reserves</u>	<u>% of</u>	<u>Reserve Base</u>	<u>% of</u>
	<u>1992</u>	<u>1993</u>	<u>Total</u>		<u>Total</u>		<u>Total</u>
Mexico	65.0	61.0	14.7%	1,189.6	13.2%	1,286.0	9.5%
United States	61.0	56.0	13.5%	996.7	11.1%	2,314.9	17.1%
Peru	48.0	47.0	11.3%	803.8	8.9%	1,189.6	8.8%
Canada	36.3	29.0	7.0%	1,189.6	13.2%	1,511.1	11.2%
CIS	65.4	43.6	10.5%	1,414.6	15.7%	1,607.5	11.9%
Others	193.4	179.6	43.2%	3,408.0	37.9%	5,594.2	41.4%
<b>Total</b>	<b>469.1</b>	<b>416.2</b>	<b>100.0%</b>	<b>9,002.2</b>	<b>100.0%</b>	<b>13,503.3</b>	<b>100.0%</b>

**Notes:** U.S. reserve base data is more developed than data for other countries.  
 Totals may not equal the sum of categories due to rounding.

**Source:** U.S. Bureau of Mines, CPM Group.

**Secondary Supply**

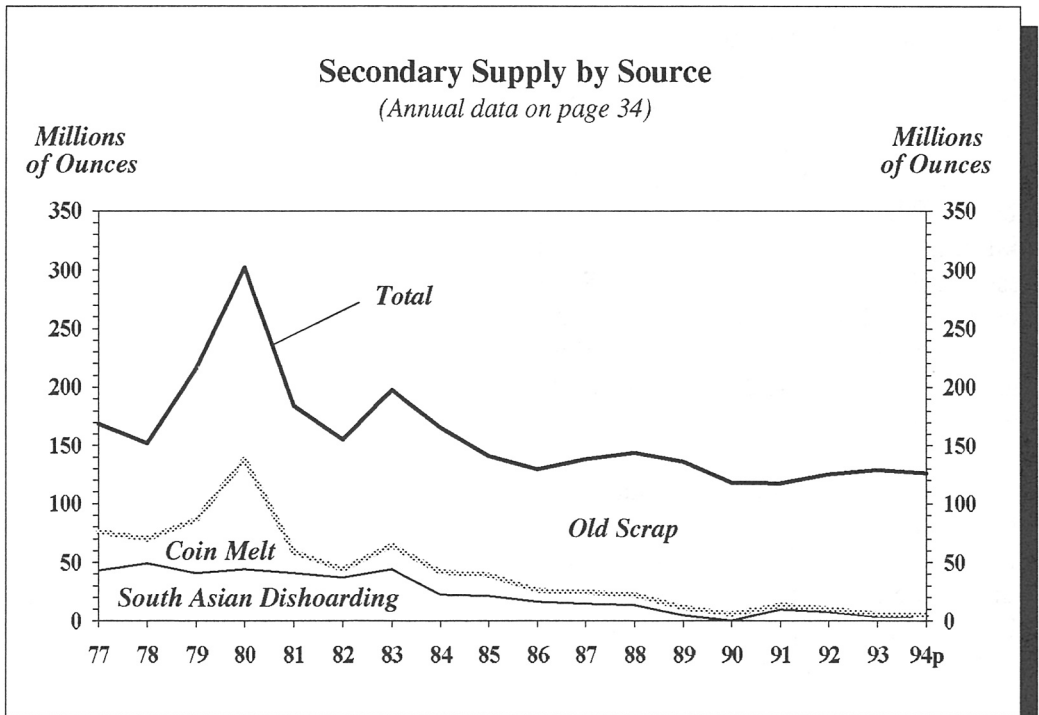
In 1993 secondary supply rose 1.3% to 126.8 million ounces, from 125.5 million ounces the previous year. The amount of secondary material entering the market in 1994 could be flat to slightly lower.

Last year's increase reflected higher old scrap recovery, which expanded 5.2% to 121.0 million ounces from 115.0 million ounces in 1992. The major source of old scrap is used photographic products, which account for perhaps 88% of the old scrap now recovered. That share is expected to increase, as refineries become more reluctant to process environmentally questionable electronic scrap.

Smaller amounts of silver are refined from old electrical equipment, spent chemical catalysts, jewelry, and silverware. The generation of scrap is price sensitive, although it has grown more responsive to environmental regulatory concerns in recent years.

Coin melt continued to fall off in 1993, slipping by one third to 2.0 million ounces from 3.0 million ounces. Silver from this source is forecast to dwindle to 1.3 million ounces this year.

South Asian secondary recovery, centered in India, played a minor role in total silver supply last year, accounting for about 3.8 million ounces. All of this silver came from typical sources of scrap,



mainly used electrical, photo, and jewelry and silverware products. This represents a marked shift in Indian supply patterns.

Through the late 1980s, most of India's silver fabrication requirements were met through disharding, that is distress sales of jewelry and decorative items. By 1989, silver recovered from this source had shrunk to 5.0 million ounces, compared with 12.0 - 23.0 million ounces between 1964 and 1987. In 1990, scrap recovery in India was negligible. In 1991 and 1992, Indian secondary supply stood at 10.0 million ounces and 7.2 million ounces respectively. Most of this silver came from discretionary sales of jewelry and silverware. Last year secondary supply flowed entirely from used silver-containing manufactured material.

Meanwhile, the Indian government's liberalization of silver imports took a significant slice out of the flow of smuggled silver into the country. Imports totaled 114.5 million ounces in 1993, more than double 1992's 50.9 million ounces. Official imports via non-resident Indians reached 91.9 million ounces. The State Bank of India imported 1.4 million ounces for use in jewelry manufacturing. Illegal imports fell to 22.3 million ounces from 50.9 million ounces in 1992.

The lowest cost source of secondary silver is coin scrap. Some of this material is processed for as little as \$0.15-\$0.20 per ounce. The cost of recovering silver from photographic scrap can be as low as \$1.00, for used industrial X-rays and

\$1.50 for amateur film, and as much as \$2.45 for medical X-ray scrap. Recovery of silver from electrical and other scrap costs around \$4.00 per ounce.

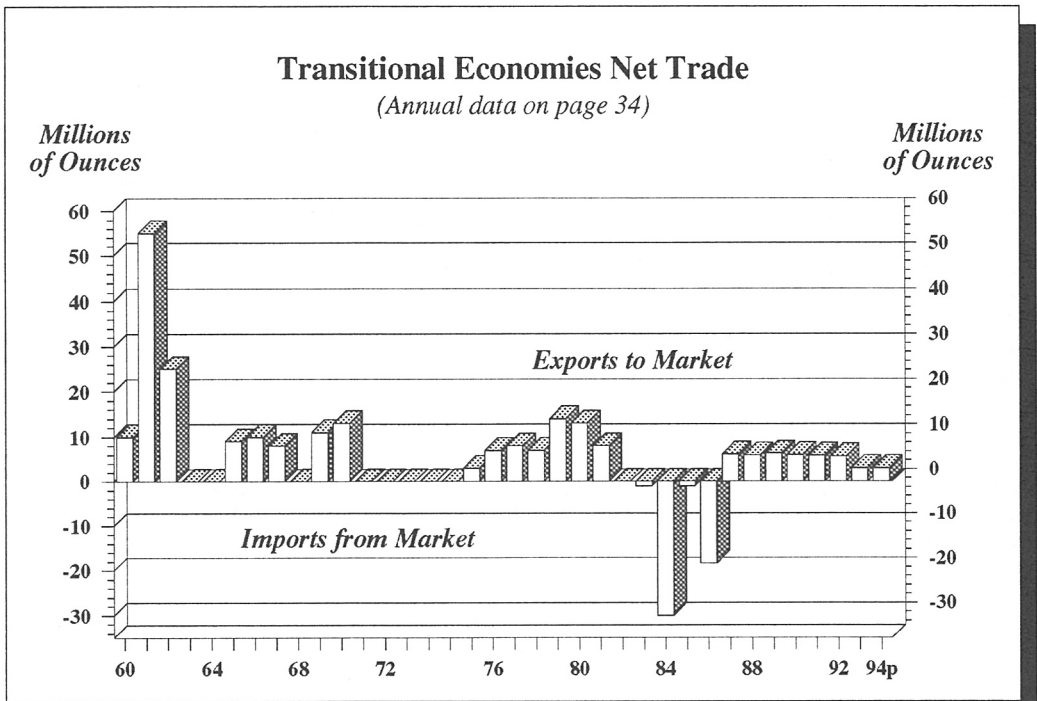
**Other Supply**

The flow of silver from government disposals and net transitional economy exports rose 100,000 ounces in 1993 to 13.8 million ounces from 13.7 million ounces in 1992. This year silver from these sources could rise to 16.1 million ounces.

Government disposals rose to 11.2 million ounces in 1993 from 8.1 million ounces in 1992. Silver from this segment could rise to 13.5 million ounces in 1994. The bulk of that metal is in form of silver from the U.S. National Defense Stockpile used in the U.S. Mint's American Eagle bullion coin and silver commemorative coins.

In addition, the Indian government's plan to sell 12.86 million ounces of bars confiscated from smugglers in 1990-1992 resulted in the auction of more than 2.2 million ounces of silver last year. There is no timetable for completion of the disposal program, and it is unclear whether the 1.4 million ounces of silver seized by government officials last year will be included in future auctions.

Net sales from the transitional economies fell 53.6% in 1993 to 2.6 million ounces from 5.6 million ounces, and exports could be flat this year. Most of this silver is by-product from Polish copper producer KGHM. Last year the company opened a new silver circuit at its refinery.





**Mine Production of Silver, 1960 - 1993**

*Million Troy Ounces*

	Australia	Canada	Mexico	Peru	United States	Other Market Economies	Total Market Economies	Soviet Union	Other Transitional Economies	Total
1960	15.2	34.0	44.5	30.8	30.8	46.5	201.8	25.0	8.5	235.3
1961	13.1	31.4	40.3	34.2	34.8	50.1	203.9	25.0	8.0	236.9
1962	17.6	30.7	41.2	33.1	36.8	51.4	210.8	27.0	8.0	245.8
1963	19.6	29.8	42.8	35.2	35.2	51.4	214.0	28.0	8.0	250.0
1964	18.4	29.9	41.7	34.4	36.3	50.8	211.5	29.0	8.0	248.5
1965	17.3	32.3	40.3	36.5	39.8	52.2	218.4	31.0	8.0	257.4
1966	18.9	32.8	42.0	32.8	43.7	55.0	225.2	33.0	8.5	266.7
1967	19.8	37.2	38.3	32.1	32.3	55.0	214.7	35.0	8.5	258.2
1968	21.3	45.0	40.0	36.4	32.7	54.8	230.2	35.0	9.5	274.7
1969	24.5	43.5	42.9	35.9	41.9	60.0	248.7	37.0	10.0	295.7
1970	26.0	44.3	42.8	39.8	45.0	60.6	258.5	41.8	12.1	312.4
1971	21.8	46.0	36.7	38.4	41.6	62.8	247.3	43.3	13.1	303.7
1972	21.9	44.8	37.5	40.2	37.2	67.3	248.9	44.8	16.3	310.0
1973	22.7	47.5	38.8	42.0	37.8	65.2	254.0	46.4	17.2	317.6
1974	21.5	42.8	37.5	34.9	33.8	66.1	236.6	48.0	19.1	303.7
1975	23.3	39.7	38.0	37.5	34.9	65.6	239.0	49.8	21.1	309.9
1976	25.0	41.2	42.6	35.6	34.3	64.2	242.9	49.8	25.3	318.0
1977	27.5	42.2	47.0	39.1	38.2	69.3	263.3	49.8	28.0	341.1
1978	26.1	40.7	50.8	37.0	39.4	72.8	266.8	49.8	31.4	348.0
1979	26.7	36.9	49.4	41.9	37.9	79.2	272.1	49.8	30.5	352.4
1980	25.0	34.4	47.3	44.8	32.3	82.6	266.5	49.8	32.3	348.6
1981	23.9	36.3	53.2	42.6	40.7	86.5	283.2	50.5	28.1	361.8
1982	29.2	42.2	49.8	54.4	40.2	82.3	298.0	52.0	28.4	378.4
1983	33.2	38.7	55.0	55.6	43.4	87.7	313.6	55.0	29.2	397.9
1984	31.3	42.0	63.9	53.3	44.6	89.5	324.5	57.0	32.1	413.6
1985	34.9	38.5	69.2	54.9	39.4	93.1	329.9	63.0	35.1	428.0
1986	32.9	35.0	69.4	59.9	34.2	88.9	320.3	64.0	36.9	421.2
1987	35.9	38.1	69.8	63.6	39.8	91.0	338.2	64.4	37.1	439.7
1988	35.8	44.1	70.0	47.7	53.4	93.0	344.0	64.5	45.1	453.6
1989	37.3	41.3	70.0	56.8	60.8	92.2	358.4	64.7	45.7	468.9
1990	37.8	44.4	67.9	55.6	66.5	97.5	369.6	64.4	38.1	472.0
1991	38.0	40.6	62.7	56.9	61.0	98.9	358.1	64.5	40.5	463.1
1992	40.1	36.3	65.0	48.0	61.0	112.4	362.8	65.4	41.0	469.1
1993	41.0	27.0	61.0	47.0	56.0	98.6	330.6	65.0	42.0	437.6
1994p	42.0	26.0	65.0	49.0	57.0	98.3	337.3	—	—	—

**Notes:** Totals may not equal the sums of countries due to rounding.

**Sources:** U.S. Bureau of Mines, American Bureau of Metals Statistics, Statistics Canada, The Silver Institute, Andean Report, Consejo de Recursos Minerales Mexico, Australian Bureau of Mineral Resources, government agencies, trade sources, CPM Group.



**Mine Production By Country**  
*Thousand Troy Ounces*

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
<b>Africa</b>														
Algeria	100	100	110	110	120	120	120	120	120	120	120	100	100	100
Ghana	20	18	17	17	14	14	14	14	25	25	25	25	50	50
Morocco	3,283	3,154	2,120	2,640	2,850	2,409	2,733	1,566	4,300	7,273	8,300	12,100	12,000	7,500
Namibia	3,617	3,365	3,456	3,150	3,532	3,255	3,400	3,981	3,331	3,472	4,437	2,958	2,926	2,900
South Africa	3,238	7,458	7,569	6,943	6,513	6,997	6,721	7,143	7,201	5,760	5,720	5,700	5,500	5,500
Tunisia	231	233	85	117	90	85	26	30	30	30	30	30	25	25
Zaire	3,420	2,535	2,575	1,905	1,288	1,499	1,520	1,499	1,400	1,400	1,499	2,700	1,890	950
Zambia	914	764	715	887	933	794	625	842	962	942	890	633	547	465
Zimbabwe	978	948	858	919	938	892	800	843	817	895	774	682	623	561
<i>Total</i>	<i>15,801</i>	<i>18,575</i>	<i>17,505</i>	<i>16,688</i>	<i>16,278</i>	<i>16,065</i>	<i>15,959</i>	<i>16,044</i>	<i>18,186</i>	<i>19,917</i>	<i>21,795</i>	<i>24,928</i>	<i>23,661</i>	<i>18,051</i>
<b>Asia</b>														
Burma	340	430	450	526	558	575	569	443	400	378	321	230	230	250
India	370	366	556	466	508	933	822	1,135	1,221	1,318	1,286	868	900	1,109
Indonesia	793	700	828	1,032	1,047	1,122	1,175	1,371	1,531	1,986	2,012	1,700	2,000	2,300
Japan	8,932	8,195	9,279	9,042	9,877	10,403	10,914	11,307	9,032	8,102	5,008	4,819	5,488	5,500
Malaysia	433	437	473	522	481	470	522	452	497	641	641	410	500	550
Philippines	1,838	1,951	2,021	1,983	1,823	1,574	1,743	1,689	1,638	1,759	1,852	1,523	1,235	926
South Korea	2,823	2,293	3,147	3,523	3,366	3,759	3,990	2,584	2,823	1,571	2,762	1,700	2,250	2,250
Taiwan	84	96	216	505	344	364	366	405	373	268	268	210	250	260
Turkey	250	200	200	220	219	219	224	286	283	513	513	640	600	2,100
<i>Total</i>	<i>15,863</i>	<i>14,668</i>	<i>17,170</i>	<i>17,819</i>	<i>18,223</i>	<i>19,419</i>	<i>20,325</i>	<i>19,672</i>	<i>17,798</i>	<i>16,536</i>	<i>14,663</i>	<i>12,105</i>	<i>13,453</i>	<i>15,245</i>
<b>Europe</b>														
Finland	1,028	1,430	1,215	1,190	980	1,123	1,566	1,193	1,415	997	997	932	964	874
France	2,409	2,374	1,706	986	688	769	866	825	831	678	627	710	739	750
Germany	1,042	1,213	1,263	1,286	1,167	1,225	1,102	884	994	642	700	260	129	65
Greece	1,752	1,671	1,945	1,581	1,797	1,799	1,630	1,726	1,668	1,977	1,668	1,700	1,700	1,700
Greenland	763	771	720	758	607	335	425	385	402	458	470	300	300	300
Ireland	1,058	773	595	352	318	280	277	262	232	177	231	282	338	289
Italy	1,065	1,365	1,779	1,791	2,362	1,560	513	577	449	513	510	360	200	150
Portugal	35	29	23	23	32	29	108	175	120	120	120	620	650	700
Spain	3,168	5,711	6,186	3,789	5,938	5,000	6,405	5,562	6,880	7,298	7,088	7,400	7,500	7,500
Sweden	5,650	5,337	5,171	5,396	5,491	7,677	8,038	7,554	8,520	7,201	6,099	7,000	6,500	7,694
Yugoslavia	5,214	4,789	4,422	3,342	3,987	4,051	5,017	5,702	4,859	4,468	4,276	3,376	2,894	2,894
<i>Total</i>	<i>23,184</i>	<i>25,463</i>	<i>25,025</i>	<i>20,494</i>	<i>23,367</i>	<i>23,848</i>	<i>25,947</i>	<i>24,845</i>	<i>26,370</i>	<i>24,529</i>	<i>22,786</i>	<i>22,940</i>	<i>21,914</i>	<i>22,616</i>

Mine Production By Country, continued  
Thousand Troy Ounces

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
<b>North &amp; Central America</b>														
Canada	36,874	34,390	36,311	42,234	38,692	42,001	38,485	34,980	38,118	44,100	41,310	44,374	40,554	36,277
Costa Rica	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Dominican Republic	2,268	1,642	2,062	2,112	1,270	1,222	1,609	1,318	1,149	1,400	700	700	700	750
El Salvador	152	146	137	86	23	22	20	17	17	17	17	17	17	17
Guatemala	10	10	8	8	3									
Honduras	2,186	1,721	1,665	2,050	2,587	2,698	2,765	1,747	741	796	796	1,000	1,000	1,200
Mexico	49,408	47,344	53,204	49,841	55,000	63,900	69,200	69,400	69,800	70,000	70,000	67,900	62,700	65,000
Nicaragua	388	163	82	76	63	50	52	26	29	23	23	40	50	55
United States	37,896	32,329	40,683	40,248	43,431	44,592	39,357	34,221	39,790	53,402	60,797	66,488	60,984	60,957
<i>Total</i>	<i>129,184</i>	<i>117,747</i>	<i>134,154</i>	<i>136,657</i>	<i>141,071</i>	<i>154,487</i>	<i>151,490</i>	<i>141,711</i>	<i>149,646</i>	<i>169,740</i>	<i>173,645</i>	<i>180,521</i>	<i>166,007</i>	<i>164,258</i>
<b>Oceania</b>														
Australia	26,749	24,981	23,920	29,161	33,212	31,250	34,916	32,890	35,912	35,815	37,295	37,800	38,000	40,123
Fiji	9	9	9	19	12	13	15	15	34	34	34	25	16	20
New Zealand	2	1	1	1			41	41	59	59	156	275	355	400
Papua New Guinea	1,434	1,187	1,365	1,394	1,531	1,426	1,487	1,802	2,004	2,100	1,966	2,600	3,215	3,530
<i>Total</i>	<i>28,194</i>	<i>26,178</i>	<i>25,295</i>	<i>30,575</i>	<i>34,755</i>	<i>32,689</i>	<i>36,459</i>	<i>34,748</i>	<i>37,916</i>	<i>37,974</i>	<i>39,451</i>	<i>40,700</i>	<i>41,586</i>	<i>44,073</i>
<b>South America</b>														
Argentina	2,209	2,357	2,518	2,684	2,502	1,983	2,170	2,135	1,899	1,608	1,547	2,200	2,200	1,500
Bolivia	5,742	6,099	6,394	5,472	6,024	4,559	3,614	3,057	4,565	7,234	7,718	8,900	9,400	10,500
Brazil	1,065	737	765	748	750	2,275	2,301	1,913	1,966	2,252	2,056	1,100	1,000	5,000
Chile	8,740	9,596	11,608	12,288	14,955	15,776	16,642	16,088	16,068	16,301	17,701	20,416	21,733	33,115
Colombia	99	146	134	137	134	128	155	187	167	211	220	210	200	267
Ecuador	70	70	32	9	3	3	2	2	2	2	2	2	2	130
Peru	41,900	44,815	42,553	54,379	55,565	53,257	54,854	59,924	63,576	47,657	56,830	55,548	56,882	48,000
<i>Total</i>	<i>59,825</i>	<i>63,820</i>	<i>64,004</i>	<i>75,717</i>	<i>79,933</i>	<i>77,981</i>	<i>79,738</i>	<i>83,298</i>	<i>88,243</i>	<i>75,265</i>	<i>86,074</i>	<i>88,374</i>	<i>91,415</i>	<i>98,512</i>
<i>Subtotal</i>	<i>272,051</i>	<i>266,451</i>	<i>283,153</i>	<i>297,950</i>	<i>313,627</i>	<i>324,489</i>	<i>329,918</i>	<i>320,318</i>	<i>338,159</i>	<i>343,961</i>	<i>358,414</i>	<i>369,568</i>	<i>358,036</i>	<i>362,755</i>
<b>Transitional Economies</b>														
Bulgaria	805	773	741	805	805	837	837	2,315	2,476	2,733	3,054	3,215	3,054	3,054
China	1,928	1,928	2,091	2,252	2,300	2,600	2,800	3,214	3,214	3,500	4,000	5,500	6,000	6,400
Czechoslovakia	1,126	1,126	1,126	1,062	964	1,029	1,030	1,062	1,100	1,126	1,100	600	580	550
East Germany	1,543	1,511	1,447	1,447	1,382	1,286	1,318	1,318	1,318	1,286	1,298	—	—	—
Hungary	34	34	31	30	30	25	25	25	25	25	25	25	24	24
North Korea	1,543	1,447	1,286	965	1,100	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600
Poland	22,569	24,628	20,577	21,058	21,800	23,900	26,717	26,652	26,717	34,176	34,000	26,750	28,903	28,936
Romania	965	901	805	805	773	805	805	741	642	691	671	386	386	386
Soviet Union	49,834	49,834	50,500	52,000	55,000	57,000	63,000	64,000	64,400	64,500	64,700	64,400	64,500	65,400
<i>Total</i>	<i>80,347</i>	<i>82,182</i>	<i>78,604</i>	<i>80,424</i>	<i>84,186</i>	<i>89,050</i>	<i>98,132</i>	<i>100,927</i>	<i>101,492</i>	<i>109,637</i>	<i>110,448</i>	<i>102,476</i>	<i>105,047</i>	<i>106,350</i>
<b>WORLD TOTAL</b>	<b>352,398</b>	<b>348,633</b>	<b>361,757</b>	<b>378,374</b>	<b>397,813</b>	<b>413,539</b>	<b>428,050</b>	<b>421,245</b>	<b>439,651</b>	<b>453,598</b>	<b>468,862</b>	<b>472,044</b>	<b>463,083</b>	<b>469,105</b>

Sources: U.S. Bureau of Mines; American Bureau of Metals Statistics; Statistics Canada; Chamber of Mines of South Africa; Silver Institute; Central Intelligence Agency; other government and industry sources; CPM Group.

Secondary and Other Supplies

Million Troy Ounces

	Secondary				Other		Total Secondary and Other	U.S. Treasury Sales	U.S. Treasury Coinage	U.S. Total
	Old Scrap	Demone- tized Coin	Indian Scrap used Domestically	South Asian Exports	Gov't Disposals	Net Exports from T.E.				
1960	40.0	10.0	2.0	0.0	12.0	10.0	74.0	22.0	46.0	142.0
1961	43.0	20.0	2.0	0.0	7.0	55.0	127.0	63.0	56.0	246.0
1962	47.0	20.0	2.0	0.0	4.0	25.0	98.0	1.0	77.0	176.0
1963	50.0	15.0	3.0	0.0	10.0	0.0	78.0	25.0	112.0	215.0
1964	54.0	20.0	12.0	0.0	20.0	0.0	106.0	151.0	203.0	460.0
1965	57.0	30.0	16.0	0.0	17.0	9.0	129.0	80.0	320.0	529.0
1966	61.0	28.0	16.0	0.0	10.0	10.0	125.0	143.0	54.0	322.0
1967	59.0	35.0	15.0	17.0	5.0	8.0	139.0	195.0	44.0	378.0
1968	75.0	50.0	16.0	86.0	15.0	0.0	242.0	180.0	37.0	459.0
1969	80.0	50.0	16.0	28.0	0.0	11.0	185.0	89.0	19.0	293.0
1970	55.0	25.0	16.0	31.0	10.0	13.0	150.0	67.0	1.0	218.0
1971	68.0	20.0	16.0	23.0	7.0	0.0	134.0	—	—	134.0
1972	73.0	15.0	13.0	11.0	12.0	0.0	124.0	—	—	124.0
1973	72.0	15.0	13.0	22.0	46.0	0.0	168.0	—	—	168.0
1974	82.0	35.0	15.0	60.0	21.0	0.0	213.0	—	—	213.0
1975	90.0	20.0	13.0	54.0	15.0	3.0	195.0	—	—	195.0
1976	92.0	72.0	18.0	53.0	11.0	7.0	253.0	—	—	253.0
1977	93.0	33.0	18.0	25.0	5.0	8.0	182.0	—	—	182.0
1978	82.0	21.0	21.0	28.0	9.0	7.0	168.0	—	—	168.0
1979	130.0	45.0	23.0	18.0	3.0	14.0	233.0	—	—	233.0
1980	164.0	94.0	23.0	21.0	5.0	13.0	320.0	—	—	320.0
1981	125.0	18.0	27.0	14.0	4.0	8.0	196.0	—	—	196.0
1982	111.0	7.0	23.0	14.0	1.0	0.0	156.0	—	—	156.0
1983	133.4	20.1	23.0	21.0	19.0	-1.0	215.5	—	—	215.5
1984	123.5	20.1	21.0	1.0	16.0	-30.0	151.6	—	—	151.6
1985	101.5	18.4	21.0	0.0	13.0	-1.0	152.9	—	—	152.9
1986	103.4	9.9	16.0	0.0	14.0	-18.4	124.9	—	—	124.9
1987	113.3	10.1	15.0	0.0	20.0	6.1	164.5	—	—	164.5
1988	121.9	8.8	13.0	0.0	8.3	5.9	157.9	—	—	157.9
1989	125.0	6.4	5.0	0.0	10.7	6.3	153.4	—	—	153.4
1990	112.0	6.0	0.0	0.0	11.0	6.0	135.0	—	—	135.0
1991	104.0	4.0	10.0	0.0	11.5	5.8	135.3	—	—	135.3
1992	115.0	3.0	7.2	0.0	8.1	5.6	138.9	—	—	138.9
1993	121.0	2.0	3.8	0.0	11.2	2.6	140.6	—	—	140.6
1994p	120.9	1.3	3.8	0.0	13.5	2.6	142.1	—	—	142.1

**Note:** "Government Disposals" includes silver used in coins from stocks and bullion sales from governments other than the United States for the years through 1970. The U.S. Treasury bullion sales and the use of silver from the U.S. Treasury Stocks in coins during the 1960s are separated. After 1970, U.S. government bullion sales and use of government stocks in coinage are included in the "Government Disposals" category. p — projections.

**Sources:** U.S. Bureau of Mines; Handy & Harman; Samuel Montagu; Silver Institute; trade sources; CPM Group.

## FABRICATION DEMAND

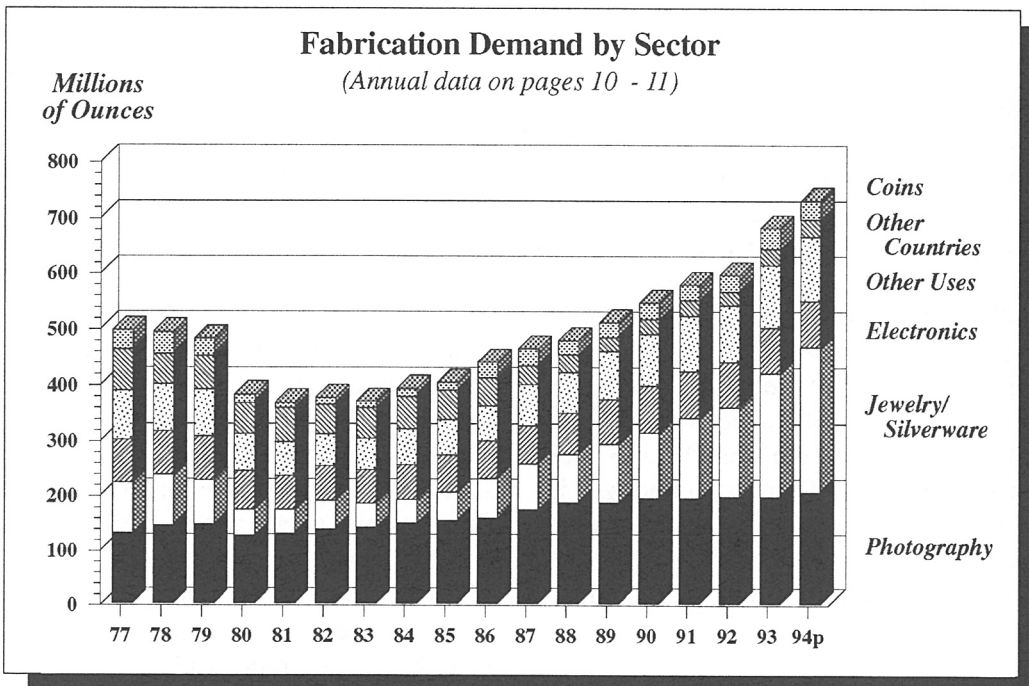
Worldwide fabrication demand rose sharply again in 1993. The increase was powered almost exclusively by sharply higher demand in the developing countries. Total silver use rose to 678.7 million ounces from 593.4 million ounces in 1992, an increase of 14.4%.

This year silver use is forecast to expand at a less forceful rate, perhaps reaching 727.8 million ounces, up 7.2%.

Total fabrication demand statistics have been revised upward from 1982 to reflect more complete data for several newly

industrialized countries. In past reports fabrication demand has been broken down by industrial sector -- photography, jewelry and silverware, electronics, and other industrial uses -- for the industrialized countries of Europe, Japan, and the United States. While data on silver use by industry in some other countries such as India and Mexico were available, demand outside of the industrialized nations was grouped into an "Other Countries" category.

Beginning with this report, demand by industrial sector in these countries is now



**Note:** Photography, jewelry & silverware, electronics, and other uses includes Mexico from 1982, Hong Kong from 1985, Thailand from 1986, India from 1987, Korea from 1989, and Taiwan from 1990.

included in the industrial categories. The "Other Countries" section remains for those countries for which demand by end use statistics are not available, but the size of this sector is considerably smaller.

The demand statistics by industrial end use include silver demand in Mexico from 1982, Hong Kong from 1985, Thailand from 1986, India from 1987, Korea from 1989, and Taiwan from 1990. The following chapter, Country Reports, discusses silver use in each of the major countries for which statistics by end use are available. Silver statistics for Belgium and Austria also are included in that chapter for the first time. Silver use in Peru, the third largest producer but a small consumer of silver bullion, also is discussed in that chapter.

Silver fabrication demand in the major developed economies was slightly higher in 1993, with use firmer in the United States and Japan. Industrial use of silver in Europe fell a bit further in 1993, the second year in a row of lower demand. Fabrication demand in the four major silver consuming countries in Europe -- Italy, Germany, the United Kingdom, and France -- continued mixed in 1993. Major OECD countries consumed 0.4% more silver, using 429.0 million ounces in industrial applications, including jewelry and silverware. This year the developed economies could require 447.2 million ounces.

Last year the rapid growth in demand seen in the newly developing economies continued unabated, with India and Thai-

land setting the pace. Demand from these countries rose 104% in 1993, to 210.2 million ounces from 102.9 million ounces the previous year. Most of this increase was in the jewelry and silverware sectors. In 1994 non-OECD demand is projected at 246.9 million ounces, although growth could be even stronger.

Silver use in the developing countries has become much more important to the international market since the middle of the 1980s. Throughout the 1980s silver use in these countries accounted for 13% - 15% of total fabrication demand in the market economies. Demand began rising sharply in the developing countries in 1990, and has continued to rise at a fast rate since then. Demand rose 31% in 1990, and 36% in 1991. Demand in the industrialized nations meanwhile was rising only 0.9% to 3.7% per year, and actually fell in 1992. As a result the share of total silver demand accounted for by the developing countries rose to 31% in 1993.

Much of the growth in silver demand in the developing countries is in the jewelry and silverware sectors, and this expansion has led to these industries exceeding silver use in photography in 1993, for the first time in many years. (Prior to the strong growth in photography in the 1950s and 1960s, jewelry and sterlingware often used more silver in a given year than photography did. For example, in the United States, for which data is available, silver use in jewelry and sterlingware exceeded photographic use of

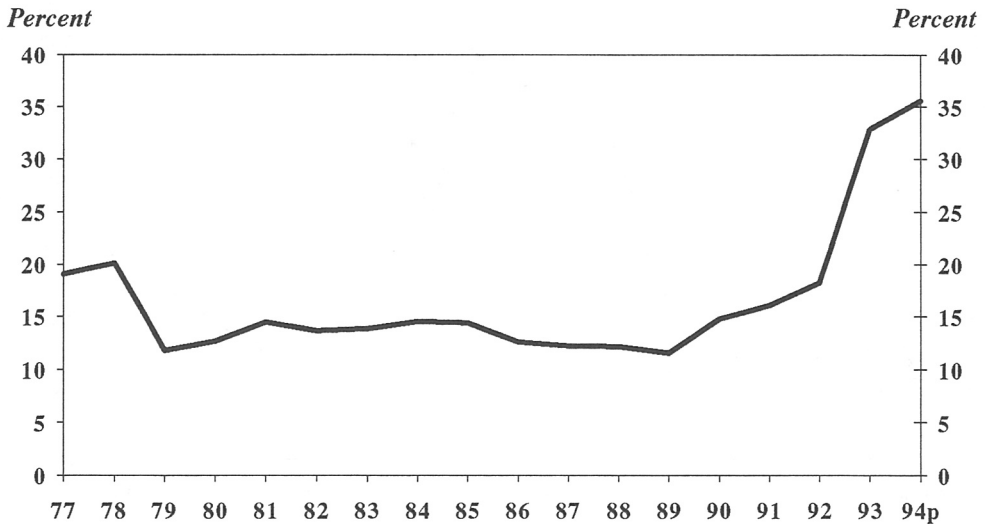
silver until 1969. In 1968, photography used 41.6 million ounces of silver, while sterlingware, silverplated items, and jewelry used a combined 48.2 million ounces.)

Many market analysts assumed that the rise in silver prices would lead to lower demand in 1993. This did not occur for several reasons. First, prices are only one factor affecting demand levels. While fabrication demand for silver is price elastic, it also is income elastic. The revival of the U.S. economy in 1993 led to increased silver use, while the well-documented growth in real incomes in the developing world also stimulated increased silver use. It also responds to fashion trends and technological changes, both of which have boosted silver demand in 1993. Silver jewelry and

decorative items remain extremely popular in North America, Europe, and selected Asian countries, which has led to increased silver usage in these products even as silver prices have risen. Stronger demand for silver in electronics and certain chemical process catalysts, in part because of reviving industrial output in these industries and in part due to technological innovations, also has helped boost silver use in the face of higher prices.

Even regarding silver prices, the situation is not as straightforward as some suggest. India became the second largest national market for silver in 1993, with silver use more than doubling to 119.0 million ounces. One factor behind the strong Indian demand, discussed in detail in the Country Reports chapter, was the removal of import restrictions in January

**Developing Countries Share of Total Demand**





1993. Previous import regulations had led to a situation in which silver prices in the domestic Indian market were at a substantial premium compared to international market prices for years. With the removal of the import ban, domestic Indian silver prices fell 20% in the first few months of 1993. This led to many Indians buying silver jewelry and decorative objects that now were much more affordable than before.

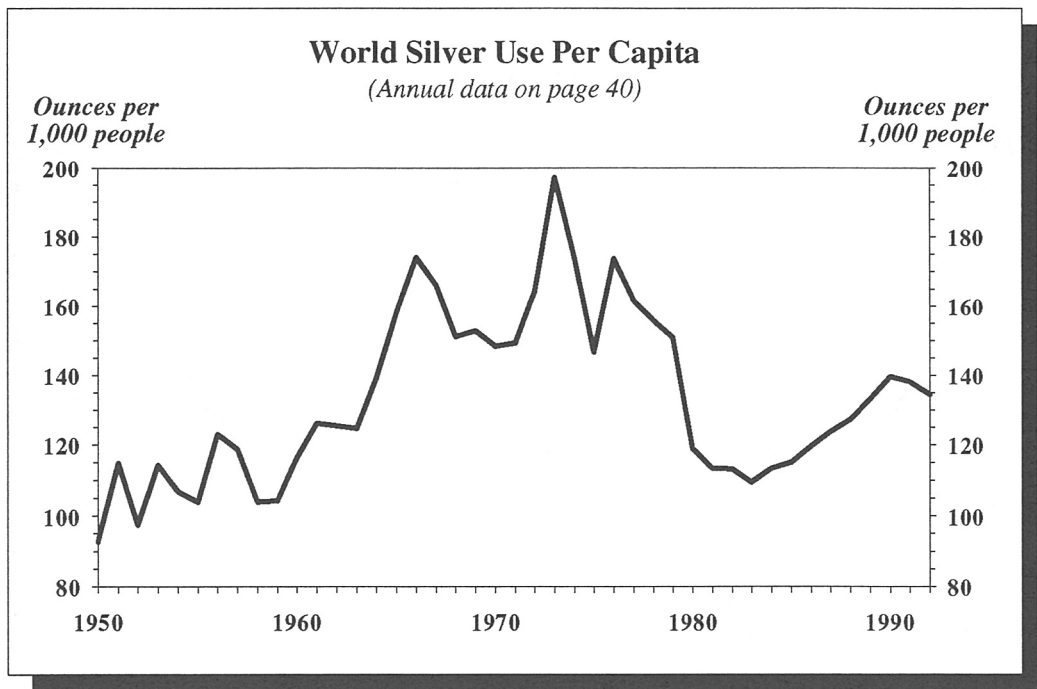
*Intensity of Demand for Silver*

Overall silver use has been rising since 1984. Another way to examine demand trends for silver is to analyze the intensity of demand, which can be measured in one of two ways -- either on a per capita basis or against overall economic output. The latter is measured as the number of

ounces of silver used per unit of gross domestic product. The population, GDP, and fabrication demand statistics used in this study exclude the People's Republic of China, the C.I.S. countries, Eastern Europe, and the centrally planned economies in Asia and Cuba.

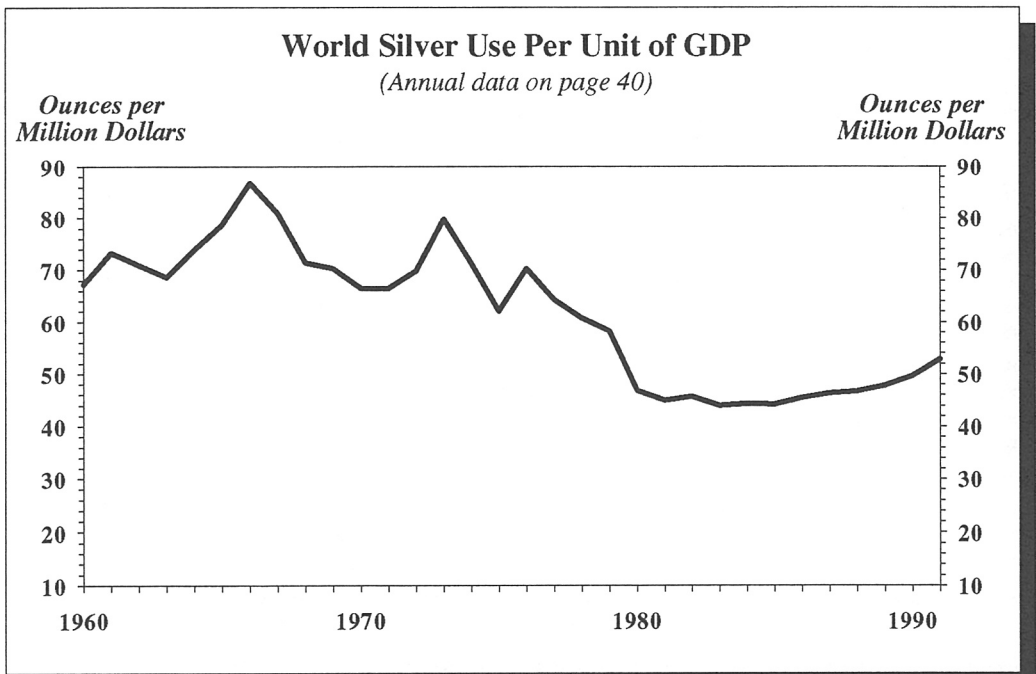
Over the past two decades the intensity of silver usage has undergone two large changes. In the 1970s and early 1980s, silver use fell sharply in both per capita and per unit of GDP terms. Since 1983, both measures have risen.

Silver use per capita peaked at 197.3 ounces per year per 1,000 people in 1973. It fell from there to 109.4 ounces per year per 1,000 people in 1983. Since then, it has rebounded to as high as 139.7 ounces



per 1,000 people in 1990, sliding back to 134.4 ounces per 1,000 people in 1992.

Silver use per unit of GDP peaked earlier, in 1966, at 86.8 ounces per year per million dollars of gross domestic product. From there it fell to a low of 43.9 ounces per million dollars of GDP, in 1983. Since then it has steadily risen, reaching 53.3 ounces per million dollars of GDP in 1992. The GDP figures are real, inflation-adjusted statistics, using 1985 U.S. dollars as the unit of measure.



## Silver Intensity of Demand

*Per capita and per unit of output*

Year	Population Millions	Real GDP Billions 1985 US\$	Demand Mil. Ounces	Intensity of Demand	
				Per capita Ounces/1,000 people	Per Unit of GNP/GDP Ounces/Million Dollars
1950	1,699.0	—	157.4	92.6	—
1951	1,435.8	—	165.0	114.9	—
1952	1,458.6	—	142.1	97.4	—
1953	1,471.7	2,757	168.3	114.4	61.0
1954	1,504.0	2,781	160.8	106.9	57.8
1955	1,854.0	2,968	192.8	104.0	65.0
1956	1,755.7	3,069	215.9	123.0	70.3
1957	1,791.6	3,162	212.6	118.7	67.2
1958	1,832.4	3,186	190.5	104.0	59.8
1959	2,039.8	3,373	212.9	104.4	63.1
1960	2,044.0	3,536	237.8	116.3	67.3
1961	2,141.4	3,684	269.9	126.0	73.3
1962	2,196.4	3,887	275.5	125.4	70.9
1963	2,239.1	4,066	278.9	124.6	68.6
1964	2,284.0	4,307	318.2	139.3	73.9
1965	2,269.0	4,556	358.5	158.0	78.7
1966	2,394.8	4,806	417.1	174.2	86.8
1967	2,420.9	4,969	401.9	166.0	80.9
1968	2,475.0	5,234	373.9	151.1	71.4
1969	2,530.4	5,499	386.3	152.7	70.2
1970	2,534.4	5,655	376.0	148.4	66.5
1971	2,610.8	5,857	389.5	149.2	66.5
1972	2,628.8	6,177	431.4	164.1	69.8
1973	2,648.4	6,550	522.5	197.3	79.8
1974	2,703.7	6,589	470.0	173.8	71.3
1975	2,779.0	6,566	407.7	146.7	62.1
1976	2,789.9	6,893	484.7	173.7	70.3
1977	2,847.0	7,158	459.9	161.5	64.2
1978	2,906.7	7,446	452.4	155.6	60.8
1979	2,969.2	7,688	448.2	150.9	58.3
1980	3,062.0	7,789	364.3	119.0	46.8
1981	3,132.7	7,913	355.4	113.4	44.9
1982	3,194.5	7,906	361.4	113.1	45.7
1983	3,257.3	8,116	356.4	109.4	43.9
1984	3,320.2	8,498	376.7	113.5	44.3
1985	3,372.0	8,778	388.0	115.1	44.2
1986	3,426.0	9,019	410.0	119.7	45.5
1987	3,480.0	9,292	430.7	123.8	46.4
1988	3,547.5	9,674	451.4	127.2	46.7
1989	3,620.0	10,083	481.8	133.1	47.8
1990	3,685.0	10,372	514.8	139.7	49.6
1991	3,975.0	10,399	548.9	138.1	52.8
1992	4,196.4	10,579	564.0	134.4	53.3

**Notes:** Population, real GDP, and demand statistics exclude the People's Republic of China, C.I.S. countries, Eastern Europe, and centrally planned economies in Asia and Latin America. Excludes coinage.

**Source:** CPM Group, CIA World Fact Book (population), OECD Main Economic Indicators(GDP)

**Photography**

The silver market was rattled several times in 1993 and early 1994 by publicity surrounding technical developments related to silverless photography. Most of these products, and enhancements of older technologies, actually will not have any appreciable effect on silver use in the photography sector, however.

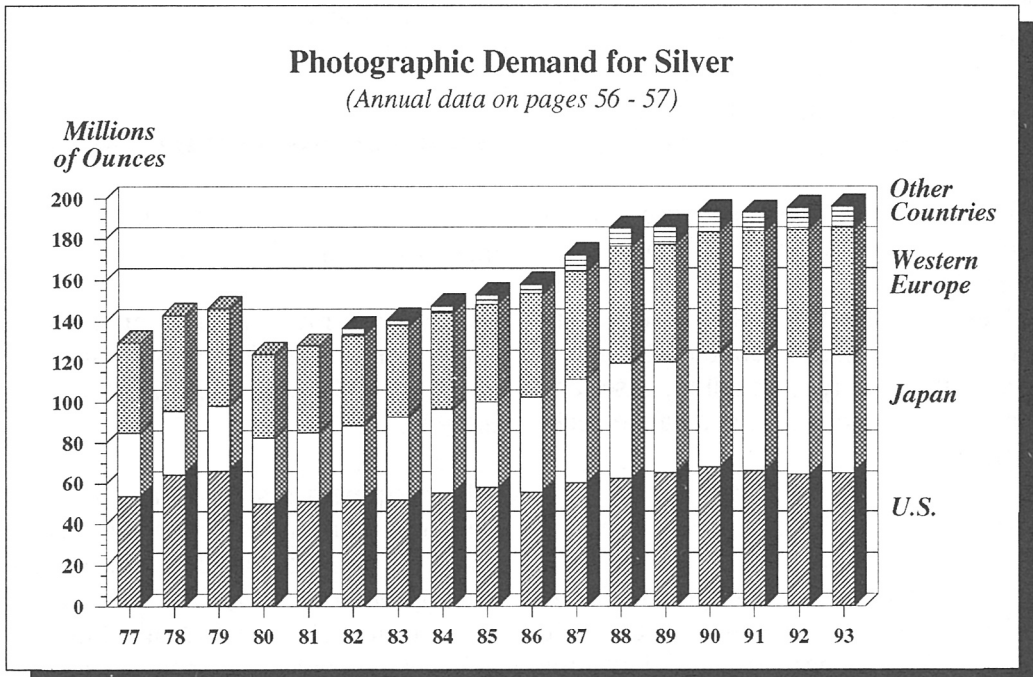
While many in the market were focusing on the prospect of lower silver use in photography, silver demand in photography in fact rose 0.3% in 1993, to 195.9 million ounces from 195.3 million ounces in 1992. Silver requirements in

this end use are expected to rise 4.3% to 204.3 million ounces this year.

Last year photographic use in the United States reversed a two-year decline, rising 0.9% to 65.0 million ounces from 64.4 million ounces.

European photographic demand weakened slightly, to 62.0 million ounces from 62.2 million ounces in 1992.

In Japan, the use of silver in photographic film and papers increased nearly 0.9% to 58.5 million ounces from 58.0 million ounces the previous year.



**Note:** Includes Mexico from 1982, Hong Kong from 1985, Thailand from 1986, India from 1987, Korea from 1989, and Taiwan from 1990.

Photographic demand in other countries including India, Mexico, Taiwan, and Korea, slipped 0.3 million ounces last year to 10.4 million ounces. Thailand does not have a local photography industry of any size.

This year the continued economic recovery in the United States is expected to combine with stronger growth in Europe and improved conditions in Japan to buoy photographic use in those regions.

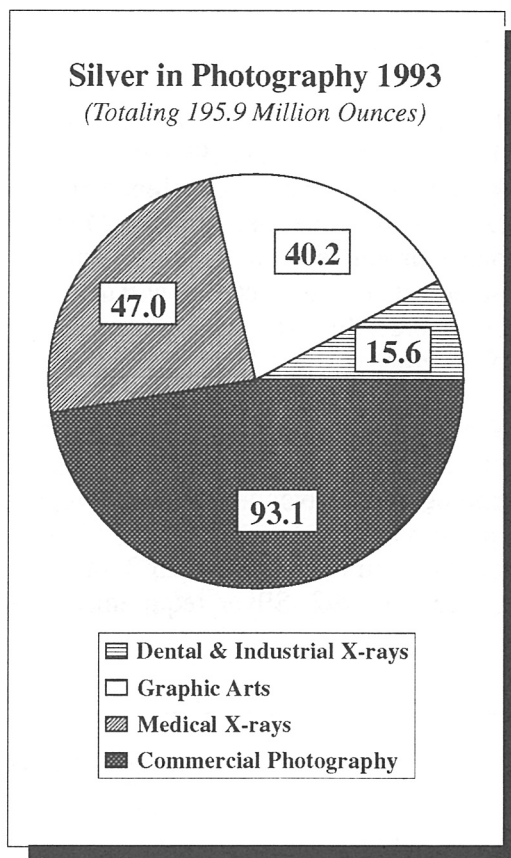
*Commercial Photography*

Commercial photography in this survey includes amateur and professional, using black and white, and color films and papers. Last year this segment accounted for 47.5% of silver use in photography, compared with a 46.9% share in 1992. This year silver requirements in this sector are expected to expand again, as the economic growth improves worldwide.

Silver use in this segment rose to 93.1 million ounces from 91.6 million ounces. Despite efforts to introduce and promote silverless technologies and products (as outlined later in this section) consumers prefer the quality, portability, ease, and prices of traditional silver halide technology.

*X-rays*

Demand for silver in X-ray films fell in 1993, declining 0.5 million ounces to 62.6 million ounces from 63.1 million ounces the previous year. As a result, this



segment's share of the total photographic market slipped to 32% from 32.3%.

Last year X-ray film used in medical applications used 47.0 million ounces of silver, up 1.7% from 46.2 million ounces in 1992.

Silver requirements in X-ray film used for dental and industrial applications declined 7.7% to 15.6 million ounces from 16.9 million ounces in 1992. The use of X-ray film to check industrial welds was off in Germany and Japan because of recessionary conditions there. Addition-

ally, dental X-ray use declined in Germany, due to changes in insurance coverage.

### *Graphic Arts*

Last year 40.2 million ounces of silver were absorbed in photographic products used in the printing of magazines, newspapers, catalogues, and advertisements. This marked a 1.2% decline from 40.6 million ounces in 1992. This sector accounted for 20.5% of total photographic use in 1993, down from 22% the previous year.

### *Trends in Photographic Silver Use*

Much has been written in recent months about the advent of silverless photography. In November 1993 Xerox announced the introduction of a new silver-free film for the graphics arts market. The news sent silver prices lower for a short time. As it turned out, the Xerox product is targeted as a rather small portion of the total photographic products market. Given the strong growth in other photographic sectors, notably standard commercial photography and medical X-rays, the potential loss of some portion of the graphic arts market would likely have the effect of reducing by some small percentage the annual growth rate in the overall silver-halide photographic materials market.

The Xerox press release was followed shortly by an announcement of enhancements in Polaroid's Helios medical imaging product, a silverless technology that

has not made significant inroads into the market since it was introduced several years ago. The Helios product enhancement was not seen by photo industry experts as a major threat to silver-halide technology, for numerous reasons. Still, the announcement sent a chill through the silver market. After December there were several further new product announcements. Kodak and the Associated Press announced a new electronic camera for news organizations in early 1994; previous cameras have met with stiff opposition from photojournalists, however, who complain about the heavy weight of the equipment and the high costs, at a minimum of \$20,000 per camera. Since most photojournalists like to travel with several cameras, the weight and costs of these systems have been severely limiting factors to date. Other electronic cameras have been announced in the first two months of 1994.

The argument for some time has been that the advent of video cameras after 1985 has sliced into the market for silver in photography. The home movie market has been wiped out, but that always was a small sector of the photographic products market. The larger question regards the extent to which video recordings have reduced the use of standard commercial photography, i.e. snapshots. Recent press commentaries suggesting the imminent death of silver-based photography have focused on this issue.

A study of several data series -- the number of pictures taken in the United States, the amount of silver used in photographic

products in the United States, and the amount of silver used in photography worldwide -- does not support either the view that the use of conventional photography has been reduced by the advent of video cameras or the thesis that silver use in photography has been negatively affected by this technology.

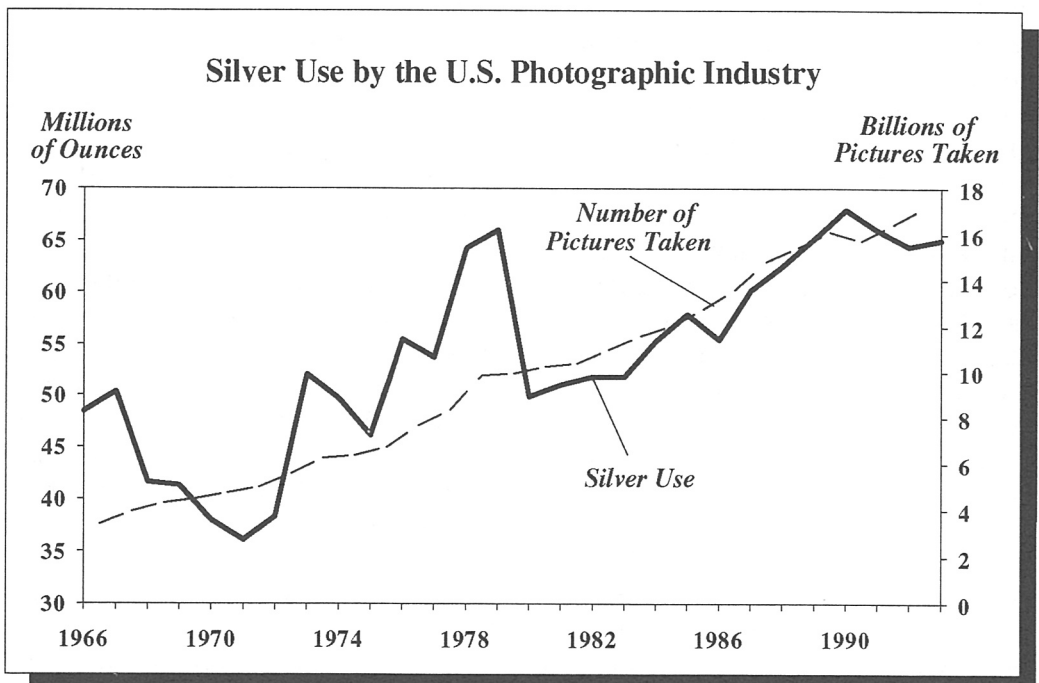
In fact, consumer demand for photo products was more vibrant over the period 1985 through 1992, the time when video cameras purportedly were making inroads into this market, than it was during the preceding seven years. All three measures experienced stronger growth rates in the more recent period than they did in the late 1970s and early 1980s.

As the chart on this page shows, the number of pictures taken annually in the

United States, has continued to rise throughout the recent period, with only a minor interruption due to the economic recession in 1990 - 1991. The most that can be said is that the acceleration in the use of photography by U.S. consumers over the seven years from 1985 through 1992 would have been even greater but for the presence of video recording as an alternative.

*Growth rates in number of pictures taken*

First, the number of pictures taken in the United States has risen strongly in most years over the past four decades. In 1961, Americans took 2.3 billion pictures. By 1978 they were taking 9.9 billion pictures per year. This rose to 12.8 billion pictures in 1985 and 17.2 billion in 1992, the last year for which this data was available.



The compounded growth rate in pictures taken in the United States has slowed over the long run. From 1961 to 1985 the growth rate was 7.4%; extending the period to 1992 shows a slowdown to a 6.7% rate. This slower growth rate is not surprising, reflecting as it does a maturing market, the loss of the graphic arts markets since 1985, and the introduction of video recording.

What is surprising is to compare the most recent seven year period to the previous seven years. The growth rate in the number of pictures taken in the United States was 4.3% per annum from 1985 through 1992, higher than the 3.8% rate of expansion for the period from 1978 through 1985. In other words, the rate of growth in U.S. commercial photography was greater during the time when video cameras were being introduced than it was prior to the introduction of video cameras.

*Growth rates in U.S. and world silver use in photography*

From 1985 through 1992 the use of silver by the U.S. photographic industry rose at a 1.5% per annum rate. This was significantly lower than the growth rate in the number of pictures taken, due to the increased international competition and importation of foreign-made films and papers during this time, as mentioned above.

During the preceding seven years, from 1978 through 1985, the use of silver in

photo products in the United States actually fell 1.5% per year, on a compounded basis. This reflects technical innovations that allowed for a sharp reduction in the amount of silver used per frame of film, beginning in 1979 after silver prices began rising from \$5.00 per ounce to \$48.70. By 1985 the effects of this per unit reduction still were evident in overall photo industry silver use (as were the effects of imports' taking market share).

Similar trends have been apparent on a worldwide basis. From 1985 through 1992 the expansion rate was 3.6%, much greater than the 1.0% per annum growth rate from 1978 through 1985.

A couple of provisos need be noted. First, having to use just U.S. data, because of the lack of worldwide statistics on the number of pictures taken annually, can contribute to statistical problems. Beginning in the early 1980s, the use of silver in photo products in the United States was reduced relative to the overall number of pictures taken by sharply increased international competition, which led to a dramatic increase of consumer use of films and papers manufactured overseas. Second, picking single years can lead to unrepresentative results. For example, 1966 may have been a year of high photography use by consumers, or silver use in photography. Or, 1985 may not be the best starting place to view the effects of video cameras.



### Jewelry and Silverware

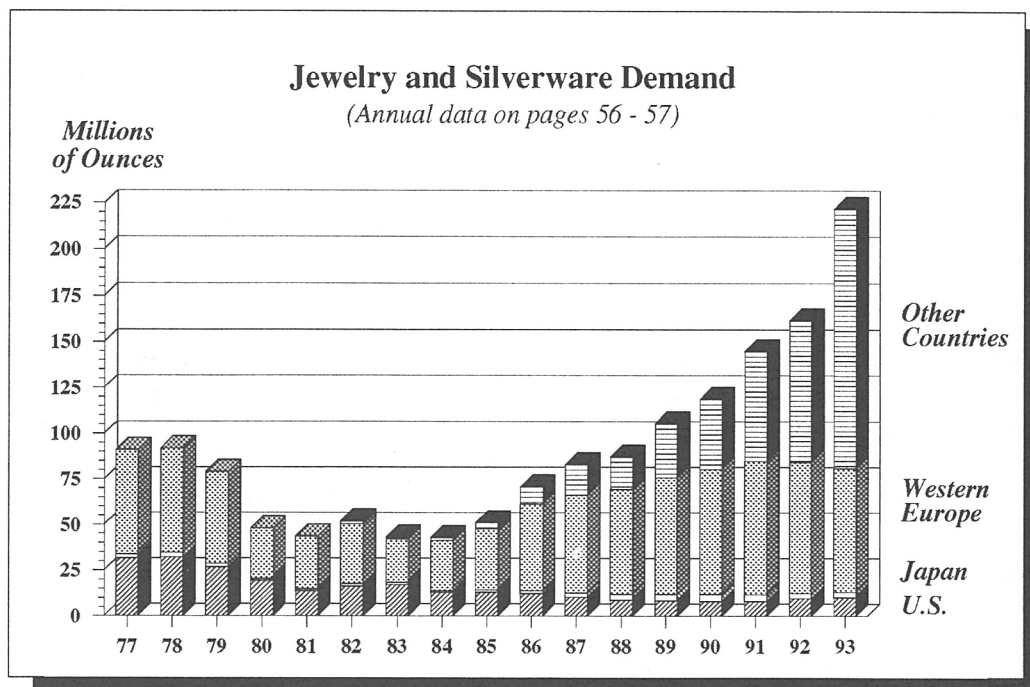
In 1993 221.6 million ounces of silver were used in jewelry and silverware manufacturing in countries where detailed statistics are available. This represents a 37% increase from 161.4 million ounces in 1992.

The surge in silver requirements in the newly industrialized economies has altered the dynamics of this sector in recent years. In 1989, Western Europe, the United States, and Japan accounted for 72% of silver use in this end-use market. This share slipped to 52% in 1992, and then 37% in 1993, with the newly industrialized countries accounting for 63%.

Sterlingware and silverplate absorbed around 123.0 million ounces of silver last year, while jewelry manufacturers required an estimated 98.0 million ounces.

Jewelry and silverware use in the major industrialized countries climbed 2.6% to 80.8 million ounces. The European jewelry and silverware sector absorbed 67.6 million ounces of silver, down 5.8% from 71.8 million ounces in 1992. U.S. demand rose 0.5 million ounces to 10.3 million ounces, and Japanese use increased 0.1 million ounces to 2.9 million ounces.

Silver consumption in these industries in other countries climbed 82.3% in 1993 to



**Note:** Includes Mexico from 1982, Hong Kong from 1985, Thailand from 1986, India from 1987, Korea from 1989, and Taiwan from 1990.

140.8 million ounces from 77.0 million ounces in 1992.

*India*

Silver demand from India's jewelry and silverware sectors rose sharply in 1993 both in volume and percentage terms, taking a combined 86.8 million ounces of silver, up nearly 185% from 30.5 million ounces of silver in 1992. At least some portion of this demand was in the form of stock-building in the fourth quarter, but it appears that much of the metal was quickly fabricated into jewelry and decorative items.

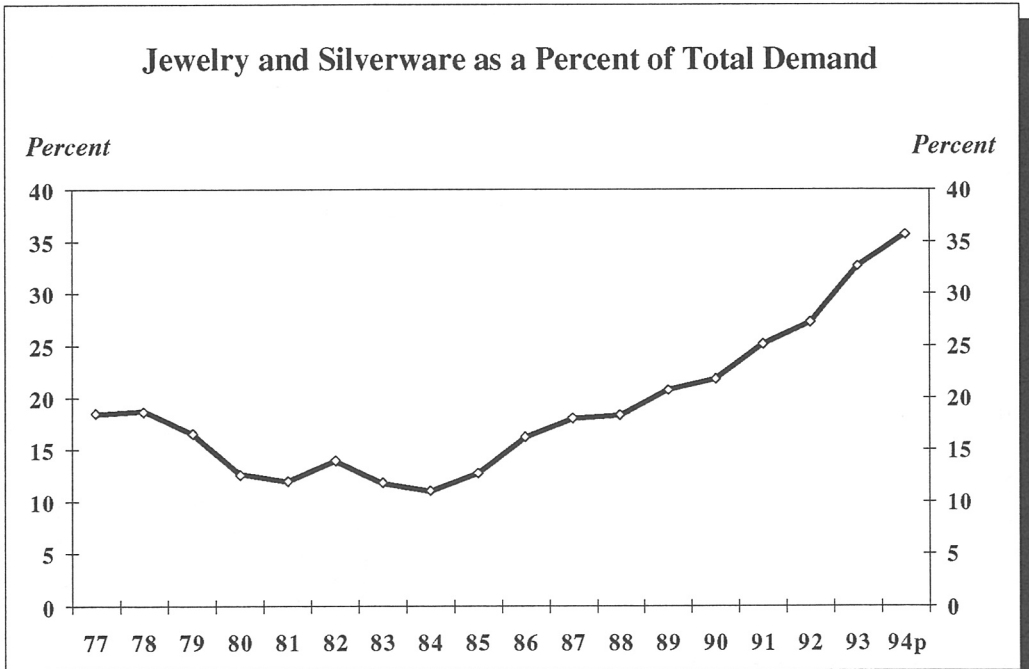
Silverware became the largest end-use market in India, absorbing 45.5 million ounces of silver in 1993, up from 14.4 million ounces the previous year.

Jewelry fabricators required 41.3 million ounces of silver, compared with 16.1 million ounces a year earlier.

*Italy*

Last year Italian sterlingware and jewelry manufacturers were battered by poor economic conditions. These two markets required 7% less silver in 1993. Sterlingware absorbed 36.3 million ounces, down from 38.6 million ounces the previous year, while jewelry off-take dropped 0.3 million ounces to 5.2 million ounces.

Silver use in these two segments was relatively strong in the first two months of last year, fell sharply in the March-July period, then rebounded in the fourth



quarter. This firming trend continued in the first two months of 1994.

*Thailand*

Silver use in Thailand is entirely focused on the jewelry and silverware markets. The jewelry manufacturing sector remains the largest user of silver, absorbing 37.3 million ounces last year compared with 31.0 million ounces in 1992. Jewelry accounts for 90% of total Thai demand. Silverware and decorative items used 4.1 million ounces of silver in 1993, up 0.7 million ounces.

Thailand's Export Promotion Department continues to support increased exports of jewelry and gemstones, providing manufacturers with a variety of incentives.

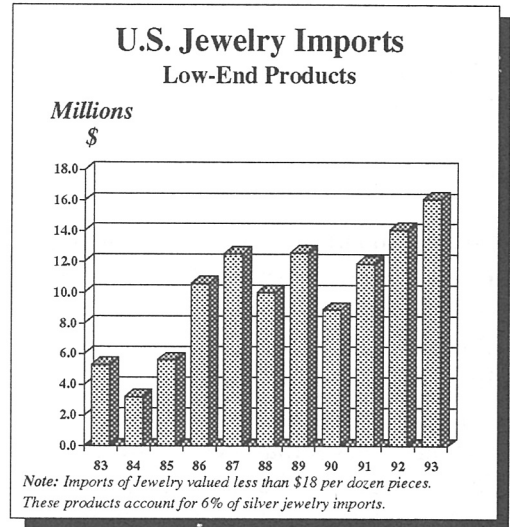
*The United States*

U.S. jewelry, silverplate, and silverware manufacturers used more silver last year. The jewelry sector required 3.3 million ounces of silver, 10% more than in 1992, while sterlingware demand rose 2.6% to 4.0 million ounces. Silverplate absorbed 3.0 million ounces, up from 2.9 million ounces in 1992.

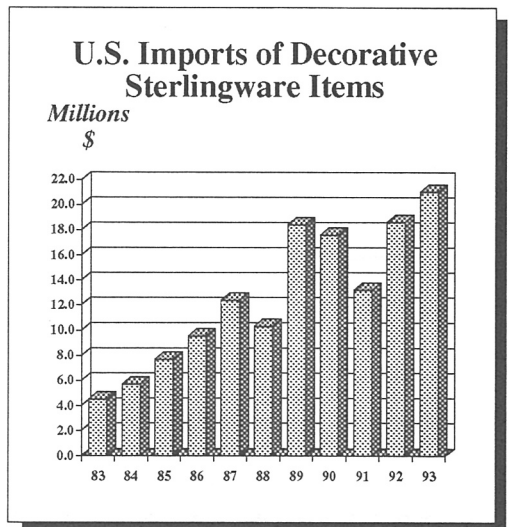
Imports of Sterlingware and Jewelry

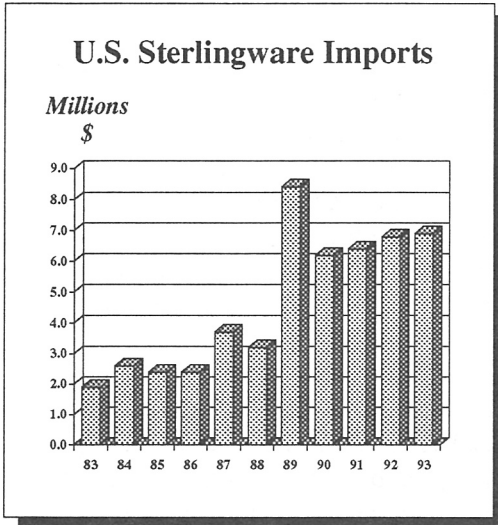
The United States continues to be a large importer of silver products manufactured overseas.

The largest sector of these imports is silver jewelry. The importation of silver



jewelry has been rising at a very strong pace for several years, even during the recession in the United States in the early 1990s. Last year, U.S. imports of silver jewelry totaled \$265.5 million. This was up 20% from \$221.3 million in 1992. The largest single source of these jewelry imports was Thailand, which shipped \$98.7 million worth of jewelry to the United States last year. Italy was the second largest exporter to the U.S., at \$74.8 million.





antiques and not newly manufactured products, a distinction that the government import statistics does not make.

The chart on the previous page only shows the levels of imports for lower priced jewelry; import statistics for the larger market of higher priced jewelry were not published by the U.S. government prior to 1989. Imports of lower priced jewelry rose 14% in 1993, to \$16.1 million from \$14.1 million the year before. Again, Thailand was the major source for these items, shipping \$8.9 million worth of these types of jewelry articles to the United States last year.

The U.S. also imported \$21.0 million of decorative sterling items last year, often called tabletop items in the sterlingware trade. Italy was the major source for these goods, shipping \$4.3 million of the total. The U.S. imported some \$6.9 million of sterling silver dinnerware in 1993, up slightly from \$6.8 million in 1992. The U.K. was the major source of these items. Much of the sterlingware imported into the United States in recent years has been

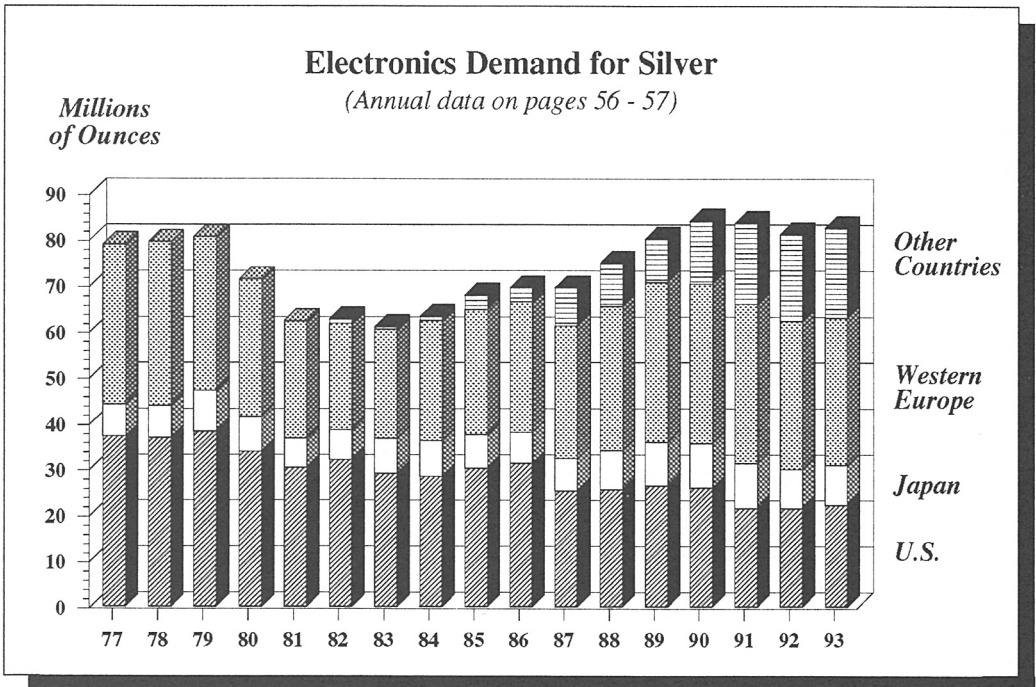
**Electronics**

Silver use in the electronics sector rose at a moderate pace last year, reflecting mixed economic conditions worldwide. Electronic connectors, electrical contacts, and batteries absorbed 82.3 million ounces of silver, a 1.8% increase from 80.9 million ounces in 1992. Even so, silver demand by this industry remained below the levels of 1990 and 1991.

Last year the United States, Western Europe, and Japan used 62.9 million ounces in electronics and batteries, 0.7 million ounces more than 1992.

U.S. silver consumption in electrical and electronics products showed the strongest growth, amounting to 22.1 million ounces, up 3.3% from 21.4 million ounces the previous year. European silver use in this sector fell 0.3 million ounces to 32.1 million ounces. Japanese demand rose to 8.7 million ounces from 8.4 million ounces, a rise of 3.6%

The rate of expansion in the newly industrializing countries slowed considerably last year, but remained relatively healthy. Silver consumption rose more than 2% to 19.4 million ounces from 18.7 million ounces in 1992.



**Note:** Includes Mexico from 1982, Hong Kong from 1985, Thailand from 1986, India from 1987, Korea from 1989, and Taiwan from 1990.

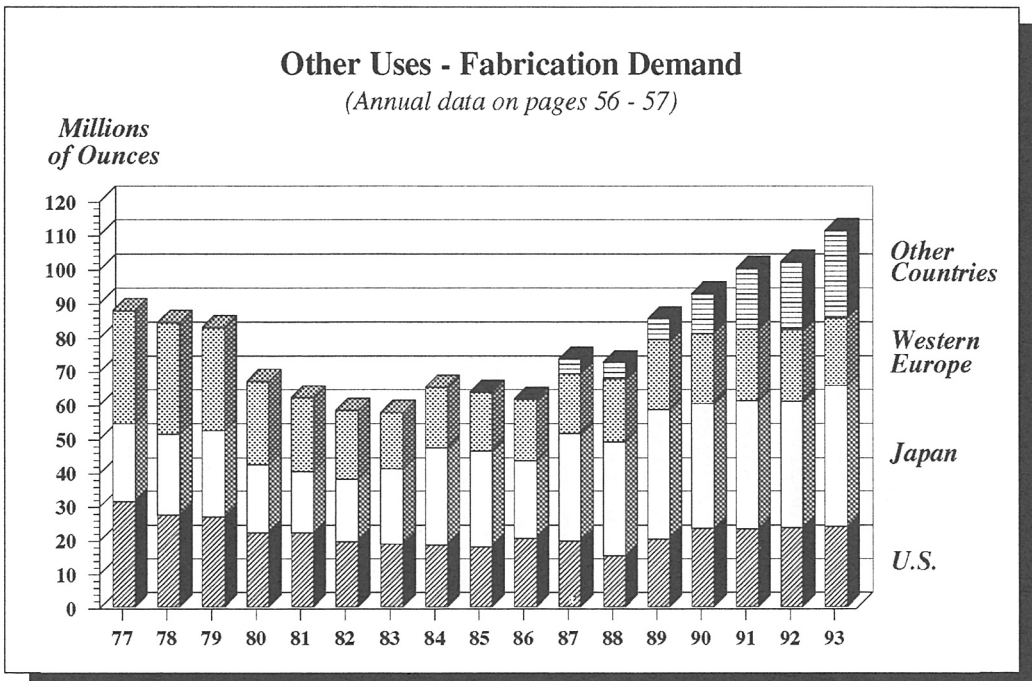
**Other Uses**

Consumption of silver in other applications expanded sharply in 1993, rising 8.5% to 110.4 million ounces from 101.7 million ounces in 1992. Silver is used in brazing alloys, mirrors, dental amalgams, chemical process catalysts, and several other smaller volume industrial end-use markets. In recent years there has been rapid growth of silver use as a reflector in energy-conserving glass windows and doors, and as an anti-bacterial agent in water purification systems.

Demand for silver in the industrialized nations in these applications rose to 85.4

million ounces from 81.9 million ounces the previous year, a 4.3% increase. Japan required 41.6 million ounces, 4.2 million ounces more than 1992. In the United States, silver demand in these markets rose to 23.7 million ounces from 23.3 million ounces. In 1993 Western Europe consumed 20.1 million ounces of silver compared with 21.2 million ounces the previous year.

Other countries used 24.9 million ounces in 1993, up 25.8% from 19.8 million ounces in 1992. India accounted for the bulk of the growth, with several of the Asian nations also increasing the consumption of silver in these uses.



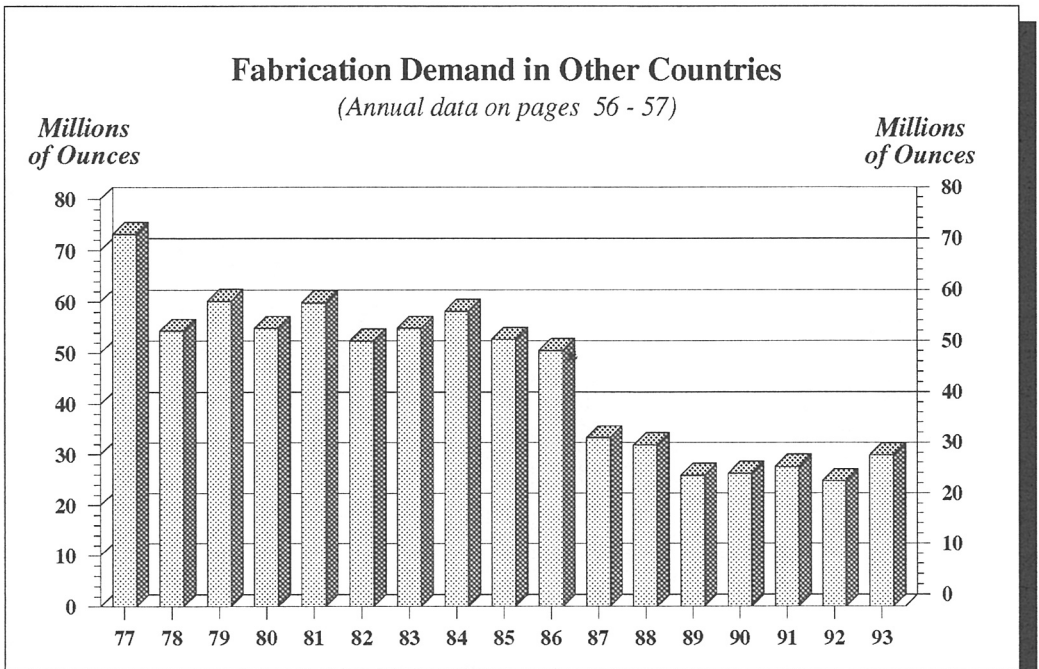
**Note:** Includes Mexico from 1982, Hong Kong from 1985, Thailand from 1986, India from 1987, Korea from 1989, and Taiwan from 1990.

**Other Countries**

Silver use in other countries has been adjusted downward for the years 1982-1993, reflecting the inclusion of demand data from six of the largest silver using countries formerly included in this section in the major end-use markets. Data in the *Fabrication Demand in Other Countries* chart below and related tables have been updated along those lines. The largest change occurred when India was removed in 1987. As the footnote on the chart explains, other reductions in this total were made in various years, depending on when data on silver use by industrial sector were available.

Silver use in Canada, Australia, South America, and other relatively small consumers of silver continues to be included in the other countries category in this report.

Last year these countries used 29.8 million ounces of silver in a variety of applications, up 20.6% from 24.7 million ounces in 1992.



**Note:** Excludes Mexico from 1982, Hong Kong from 1985, Thailand from 1986, India from 1987, Korea from 1989, and Taiwan from 1990.

**Coinage**

Last year silver use in coinage rose 29.3% to 38.0 million ounces from 29.4 million ounces in 1992. Silver demand in coinage may drop to 33.0 million ounces, because of expected lower Mexican use.

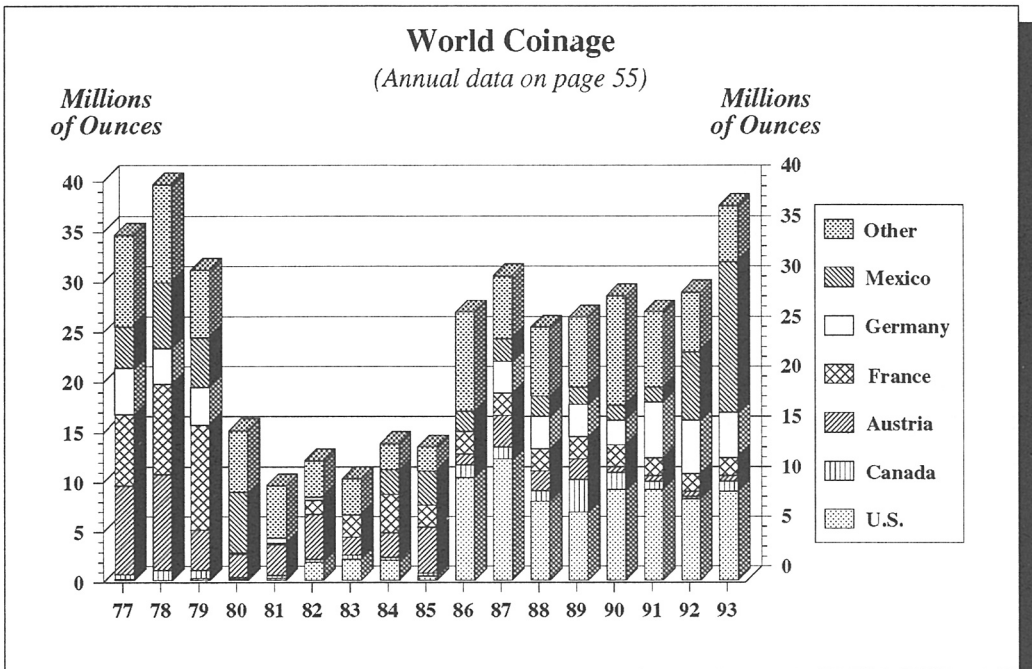
The higher use in 1993 was largely due to the introduction of the 20 peso coin in Mexico, and silver requirements for the 10 peso coin, as well as continued local demand for the Libertad bullion coin. Total silver use in the Mexican coin programs reached 15.0 million ounces. All of this silver was sourced from newly refined Mexican silver mine output.

Additionally, sales of the U.S. Mint's various silver coin products rose 9.5% to 8.9 million ounces last year. Demand for

the U.S. Eagle silver coin rose 6.2% from 5.9 million ounces; proof Eagle sales were about level with the previous year, at 0.5 million ounces. Demand from the U.S. Mint's silver-bearing commemorative coins rose 59.5% to 2.1 million ounces, while sales of its proof coin sets slid 43.2% to 0.4 million ounces.

All of the silver required for the U.S. Mint's coin programs comes from the National Defense Stockpile, rather than from market sources.

Meanwhile sales of the Royal Canadian Mint's silver Maple Leaf coin rebounded, possibly more than tripling to 1.0 million ounces from 0.3 million ounces in 1992. Silver for that coin is purchased from local mines.





Austrian coin demand trended slightly higher, rising to 0.6 million ounces from 0.5 million ounces. German sales weakened to 4.5 million ounces from 5.3 million ounces, while French coin demand was flat at 1.8 million ounces.

Official estimates are that silver use in Mexican coinage may fall to 5.0 million ounces in 1994; independent estimates are that Mexico's Casa de Moneda may use closer to 8.0 million ounces, when silver for the Libertad are included. There are several reasons behind this projected decline. First, Casa de Moneda has a large amount of new, process scrap to use in new coinage this year, and will not need as much newly refined silver. Also, the supply pipeline for 10 peso and 20 peso coins is filled up for now.

Additionally, the 50 peso coin introduced in the first quarter of this year will have a smaller circulation and pipeline, due to its higher face value. The 50 peso coin is not as likely to be hoarded as the smaller circulation coins, according to the Mexican government. This trend already has been seen with the 20 peso coin: Only about half of the 20 peso coins minted and circulated in 1993 have been taken out of circulation by individuals who wish to hoard or collect these coins, compared to at least 80% of the 10 peso coins. Even fewer 50 peso coins are expected to be hoarded.

**Silver Coinage**

*Million Troy Ounces*

Year	United States							Transitional Economies		Total
	United States	Canada	Austria	France	Germany	Mexico	Other	Economies		
1960	46.0	7.5	-i-	12.2	-i-	-i-	38.2	—	103.9	
1961	56.0	5.1	-i-	23.8	-i-	-i-	51.1	—	136.0	
1962	78.0	10.9	-i-	13.7	-i-	-i-	25.0	—	127.6	
1963	112.0	13.0	-i-	12.2	-i-	-i-	29.2	—	166.4	
1964	203.0	13.7	-i-	10.7	-i-	-i-	39.7	—	267.1	
1965	320.3	24.4	2.7	7.2	2.7	-i-	27.8	—	385.1	
1966	53.6	15.5	3.3	8.7	2.9	-i-	45.5	—	129.5	
1967	43.8	8.8	3.2	9.6	3.1	-i-	36.8	—	105.3	
1968	36.8	7.4	2.2	2.9	4.2	-i-	35.8	—	89.3	
1969	19.6	0.0	1.9	0.7	2.9	-i-	7.6	—	32.7	
1970	0.7	0.0	4.0	3.5	7.4	-i-	7.8	—	23.4	
1971	2.5	0.2	3.2	0.4	19.2	-i-	2.3	—	27.8	
1972	2.3	0.1	5.8	0.3	22.6	-i-	7.0	—	38.1	
1973	0.9	6.6	6.3	0.1	7.0	-i-	7.6	—	28.5	
1974	1.0	9.0	5.7	3.6	7.6	-i-	4.7	—	31.6	
1975	2.7	10.4	9.1	1.8	5.4	-i-	4.0	—	33.4	
1976	1.3	8.4	6.9	6.2	1.8	-i-	5.4	—	30.0	
1977	0.1	0.5	8.9	7.1	4.6	4.2	9.1	—	34.5	
1978	0.0	1.0	9.6	9.0	3.6	6.6	9.7	—	39.5	
1979	0.2	0.8	4.0	10.6	3.7	5.0	6.7	—	31.0	
1980	0.1	0.2	2.3	0.1	0.0	6.1	6.2	—	15.0	
1981	0.2	0.3	3.1	0.1	0.5	0.0	5.3	—	9.5	
1982	1.8	0.3	4.5	1.4	0.3	0.0	3.7	—	12.0	
1983	2.1	0.4	1.8	2.2	0.0	0.0	3.7	—	10.2	
1984	2.0	0.3	2.4	3.9	0.0	2.5	2.6	—	13.7	
1985	0.4	0.3	4.6	2.2	0.0	3.5	2.4	—	13.4	
1986	10.3	1.3	1.1	2.2	0.0	2.0	9.9	—	26.8	
1987	12.2	1.2	3.1	2.2	3.2	2.3	6.2	—	30.4	
1988	7.9	1.1	2.0	2.2	3.2	2.0	6.9	—	25.3	
1989	6.8	3.3	2.1	2.2	3.2	1.7	7.0	—	26.3	
1990	9.1	1.7	0.6	2.2	2.4	1.5	10.9	1.4	29.8	
1991	9.1	0.8	0.6	1.8	5.5	1.5	7.5	0.9	27.7	
1992	8.1	0.3	0.5	1.8	5.3	6.8	6.0	0.6	29.4	
1993	8.9	1.0	0.6	1.8	4.5	15.0	5.6	0.6	38.0	

**Notes:** Excludes transitional economies prior to 1990.  
i — included in Other

**Source:** *U.S. Bureau of Mines; Energy, Mines and Resources Canada; The Silver Institute; Handy & Harman; Bank of Mexico; trade sources; CPM Group*

**Annual Fabrication Demand***Million Troy Ounces*

	1977	1978	1979	1980	1981	1982	1983
<b>Photography</b>							
United States	53.7	64.3	66.0	49.8	51.0	51.8	51.8
Japan	31.2	31.4	32.2	32.6	33.9	36.6	40.9
Western Europe	44.7	47.2	47.9	41.4	43.2	44.9	45.6
Other Countries	—	—	—	—	—	3.2	2.0
<i>Subtotal</i>	<i>129.6</i>	<i>142.9</i>	<i>146.1</i>	<i>123.8</i>	<i>128.1</i>	<i>136.5</i>	<i>140.3</i>
<i>% of Total</i>	<b>26.2</b>	<b>29.1</b>	<b>30.5</b>	<b>32.6</b>	<b>35.1</b>	<b>36.6</b>	<b>38.2</b>
<i>% Change Year Ago</i>	—	10.3	2.2	-15.3	3.5	6.6	2.8
<b>Jewelry &amp; Silverware</b>							
United States	31.6	32.0	26.6	19.4	13.7	16.2	17.1
Japan	2.2	2.5	2.2	1.0	1.1	1.3	1.1
Western Europe	57.2	57.4	50.3	27.5	28.7	32.7	23.9
Other Countries	—	—	—	—	—	1.7	1.0
<i>Subtotal</i>	<i>91.0</i>	<i>91.9</i>	<i>79.1</i>	<i>47.9</i>	<i>43.5</i>	<i>51.9</i>	<i>43.1</i>
<i>% of Total</i>	<b>18.4</b>	<b>18.7</b>	<b>16.5</b>	<b>12.6</b>	<b>11.9</b>	<b>13.9</b>	<b>11.8</b>
<i>% Change Year Ago</i>	—	1.0	-13.9	-39.4	-9.2	19.2	-16.9
<b>Electronics &amp; Batteries</b>							
United States	37.1	36.8	38.1	33.8	30.2	31.9	28.9
Japan	6.9	7.0	8.9	7.6	6.4	6.6	7.7
Western Europe	34.7	35.5	33.4	29.8	25.6	23.2	23.8
Other Countries	—	—	—	—	—	0.9	0.5
<i>Subtotal</i>	<i>78.7</i>	<i>79.3</i>	<i>80.4</i>	<i>71.2</i>	<i>62.2</i>	<i>62.6</i>	<i>60.9</i>
<i>% of Total</i>	<b>15.9</b>	<b>16.1</b>	<b>16.8</b>	<b>18.8</b>	<b>17.0</b>	<b>16.8</b>	<b>16.6</b>
<i>% Change Year Ago</i>	—	0.8	1.4	-11.4	-12.6	0.6	-2.6
<b>Other Uses</b>							
United States	31.2	27.1	26.6	21.8	21.8	19.1	18.5
Japan	22.9	24.0	25.5	20.3	18.2	18.7	22.4
Western Europe	33.4	32.9	30.4	24.5	21.8	20.3	16.5
Other Countries	—	—	—	—	—	—	—
<i>Subtotal</i>	<i>87.5</i>	<i>84.0</i>	<i>82.5</i>	<i>66.6</i>	<i>61.8</i>	<i>58.1</i>	<i>57.4</i>
<i>% of Total</i>	<b>17.7</b>	<b>17.1</b>	<b>17.2</b>	<b>17.6</b>	<b>16.9</b>	<b>15.6</b>	<b>15.7</b>
<i>% Change Year Ago</i>	—	-4.0	-1.8	-19.3	-7.2	-6.0	-1.2
<b>Other Countries</b>	73.1	54.3	60.1	54.8	59.8	52.3	54.8
<i>% of Total</i>	<b>14.8</b>	<b>11.0</b>	<b>12.5</b>	<b>14.4</b>	<b>16.4</b>	<b>14.0</b>	<b>14.9</b>
<i>% Change Year Ago</i>	—	-25.7	10.7	-8.8	9.1	-12.5	4.8
<b>Coinage</b>	34.5	39.5	31.0	15.0	9.5	12.0	10.2
<i>% of Total</i>	<b>7.0</b>	<b>8.0</b>	<b>6.5</b>	<b>4.0</b>	<b>2.6</b>	<b>3.2</b>	<b>2.8</b>
<i>% Change Year Ago</i>	—	14.5	-21.5	-51.6	-36.7	26.3	-15.0
<b>TOTAL</b>	<b>494.4</b>	<b>491.9</b>	<b>479.2</b>	<b>379.3</b>	<b>364.9</b>	<b>373.3</b>	<b>366.7</b>
<i>% Change Year Ago</i>	—	-0.5	-2.6	-20.8	-3.8	2.3	-1.8

**Notes:** Totals may not equal the sums of the categories due to rounding. Industrial demand excludes transitional economies; transitional economy coinage included from 1990 onward. Photography, jewelry & silverware, electronics, and other uses includes Mexico from 1982, Hong Kong from 1985, Thailand from 1986, India from 1987, Korea from 1989, and Taiwan from 1990.

**Source:** CPM Group

1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
55.3	57.9	55.4	60.2	62.5	65.2	68.0	66.0	64.4	65.0
41.3	42.2	47.0	51.3	56.8	54.8	56.5	57.8	58.0	58.5
47.6	48.1	51.1	52.6	57.0	57.1	59.0	60.0	62.2	62.0
3.1	4.5	4.3	8.0	8.8	8.8	9.7	9.2	10.7	10.4
<i>147.3</i>	<i>152.7</i>	<i>157.8</i>	<i>172.1</i>	<i>185.1</i>	<i>185.9</i>	<i>193.2</i>	<i>193.0</i>	<i>195.3</i>	<i>195.9</i>
<b>37.8</b>	<b>38.1</b>	<b>36.2</b>	<b>37.3</b>	<b>38.9</b>	<b>36.6</b>	<b>35.5</b>	<b>33.5</b>	<b>32.9</b>	<b>28.9</b>
5.0	3.7	3.4	9.0	7.6	0.5	3.9	-0.1	1.2	0.3
13.0	13.0	12.3	10.5	9.0	8.5	8.3	8.3	9.8	10.3
1.0	1.4	1.7	2.2	3.0	3.5	3.8	3.5	2.8	2.9
27.3	33.1	47.3	53.3	57.3	63.8	68.3	73.1	71.8	67.6
1.6	3.4	9.2	16.8	17.8	29.6	38.2	59.8	77.0	140.8
<i>42.9</i>	<i>50.9</i>	<i>70.6</i>	<i>82.8</i>	<i>87.1</i>	<i>105.4</i>	<i>118.6</i>	<i>144.7</i>	<i>161.4</i>	<i>221.6</i>
<b>11.0</b>	<b>12.7</b>	<b>16.2</b>	<b>18.0</b>	<b>18.3</b>	<b>20.7</b>	<b>21.8</b>	<b>25.1</b>	<b>27.2</b>	<b>32.7</b>
-0.5	18.8	38.5	17.3	5.2	21.1	12.5	22.1	11.5	37.3
28.3	30.0	31.1	25.2	25.5	26.3	25.8	21.4	21.4	22.1
7.8	7.5	6.8	7.0	8.4	9.5	9.7	9.7	8.4	8.7
26.2	27.2	28.5	28.9	31.5	34.8	34.7	34.8	32.4	32.1
0.8	3.1	3.0	8.3	9.2	9.3	13.7	17.5	18.7	19.4
<i>63.1</i>	<i>67.8</i>	<i>69.5</i>	<i>69.4</i>	<i>74.5</i>	<i>79.9</i>	<i>83.9</i>	<i>83.4</i>	<i>80.9</i>	<i>82.3</i>
<b>16.2</b>	<b>16.9</b>	<b>15.9</b>	<b>15.1</b>	<b>15.7</b>	<b>15.7</b>	<b>15.4</b>	<b>14.5</b>	<b>13.6</b>	<b>12.1</b>
3.6	7.5	2.4	-0.1	7.4	7.3	5.0	-0.6	-3.0	1.8
18.3	17.7	20.1	19.4	15.0	20.0	23.2	23.0	23.3	23.7
28.7	28.3	23.1	31.8	33.8	38.2	36.9	37.9	37.4	41.6
17.8	17.3	18.0	17.7	18.5	20.9	20.7	21.3	21.2	20.1
—	0.2	0.2	4.3	4.9	6.0	11.6	17.6	19.8	25.5
<i>64.8</i>	<i>63.5</i>	<i>61.4</i>	<i>73.2</i>	<i>72.3</i>	<i>85.1</i>	<i>92.4</i>	<i>99.8</i>	<i>101.7</i>	<i>111.0</i>
<b>16.6</b>	<b>15.8</b>	<b>14.1</b>	<b>15.9</b>	<b>15.2</b>	<b>16.7</b>	<b>17.0</b>	<b>17.3</b>	<b>17.1</b>	<b>16.3</b>
12.9	-2.1	-3.3	19.2	-1.2	17.7	8.7	8.0	1.8	9.1
58.1	52.6	50.4	33.2	31.8	25.8	26.2	27.5	24.7	29.8
<b>14.9</b>	<b>13.1</b>	<b>11.5</b>	<b>7.2</b>	<b>6.7</b>	<b>5.1</b>	<b>4.8</b>	<b>4.8</b>	<b>4.2</b>	<b>4.4</b>
6.0	-9.5	-4.2	-34.1	-4.2	-18.9	1.6	5.0	-10.2	20.6
13.7	13.4	26.8	30.4	25.3	26.3	29.8	27.7	29.4	38.0
<b>3.5</b>	<b>3.3</b>	<b>6.1</b>	<b>6.6</b>	<b>5.3</b>	<b>5.2</b>	<b>5.5</b>	<b>4.8</b>	<b>5.0</b>	<b>5.6</b>
34.3	-2.2	100.0	13.4	-16.8	4.0	13.3	-7.0	6.1	29.3
<b>389.9</b>	<b>400.9</b>	<b>436.4</b>	<b>461.0</b>	<b>476.0</b>	<b>508.4</b>	<b>544.2</b>	<b>576.2</b>	<b>593.4</b>	<b>678.7</b>
6.3	2.8	8.9	5.6	3.3	6.8	7.0	5.9	3.0	14.4

## Fabrication Demand by Country, 1950 - 1993

Million Troy Ounces

	Europe					Subtotal
	Germany	Italy	U.K.	France	Other Europe	
1950	7.6	-i-	12.4	1.3	-i-	21.3
1951	10.0	-i-	16.6	10.0	-i-	36.6
1952	10.4	-i-	9.1	10.5	-i-	30.0
1953	11.9	-i-	11.9	14.5	-i-	38.3
1954	24.2	-i-	12.6	15.0	-i-	51.8
1955	28.1	-i-	14.2	15.7	-i-	58.0
1956	33.1	-i-	13.8	15.9	-i-	62.8
1957	31.5	-i-	14.7	17.9	-i-	64.1
1958	31.1	-i-	14.8	14.1	-i-	60.0
1959	33.3	-i-	17.5	10.6	-i-	61.4
1960	40.2	-i-	16.5	25.2	-i-	81.9
1961	43.5	20.0	20.0	37.8	-i-	121.3
1962	41.8	22.0	20.0	27.2	-i-	111.0
1963	40.5	25.0	20.0	26.1	-i-	111.6
1964	46.3	25.0	23.0	25.5	-i-	119.8
1965	57.3	25.0	25.0	21.2	-i-	128.5
1966	51.1	30.0	25.0	23.4	-i-	129.5
1967	51.3	28.2	24.0	24.3	-i-	127.8
1968	54.2	22.5	23.0	20.9	-i-	120.6
1969	52.9	29.0	24.5	20.0	-i-	126.4
1970	51.7	32.0	25.0	19.0	-i-	127.7
1971	79.1	30.5	25.0	16.0	-i-	150.6
1972	82.6	32.0	27.0	16.8	-i-	158.4
1973	67.0	33.5	31.5	22.6	-i-	154.6
1974	62.6	30.0	33.0	24.6	-i-	150.2
1975	44.3	28.9	28.0	22.8	-i-	124.0
1976	54.7	38.5	27.6	38.0	-i-	158.8
1977	52.7	36.3	29.4	39.7	-i-	158.1
1978	45.6	31.0	29.0	33.6	-i-	139.2
1979	43.5	33.3	27.6	34.7	37.2	176.3
1980	31.9	21.8	19.5	19.9	30.2	123.3
1981	29.8	21.5	18.4	19.0	31.2	119.9
1982	33.0	20.8	18.1	18.5	32.4	122.8
1983	30.3	15.0	17.7	18.7	30.3	112.0
1984	32.2	19.4	19.2	21.0	31.5	123.3
1985	34.6	24.0	19.1	19.1	31.6	126.2
1986	36.3	33.5	19.1	19.2	39.5	145.4
1987	42.3	38.6	21.1	19.8	36.1	152.5
1988	47.3	43.0	22.7	23.5	33.7	164.8
1989	50.1	45.7	24.5	24.3	37.9	177.1
1990	50.8	47.9	24.4	24.6	40.1	183.2
1991	57.8	53.0	21.7	23.7	40.8	189.7
1992	54.4	54.9	21.7	23.5	41.1	188.5
1993	50.3	52.3	22.1	23.8	40.2	182.4

**Notes:** Includes coinage, where available, 1960 onward. Coinage prior to 1960 is included in "other." Small amounts of Italian and U.K. coinage also are included in "other." Prior to 1965 U.S. silver coinage was circulating coinage. Excludes transitional economy industrial use; transitional economy coinage included from 1990 onward. Totals may not equal the sums of countries due to rounding.

U.S.	Japan	India	Canada	Mexico	Other	Total	
120.0	-i	-i	5.2	3.8	52.6	202.9	1950
110.0	3.5	-i	4.4	-i	100.6	255.1	1951
95.0	3.5	-i	3.8	-i	124.1	256.4	1952
105.0	5.6	4.0	4.7	-i	101.5	259.1	1953
85.0	5.8	3.0	3.9	-i	94.7	244.2	1954
100.0	6.2	3.0	4.6	-i	73.6	245.4	1955
100.0	7.9	17.5	3.8	6.1	76.6	274.7	1956
95.0	8.8	15.0	5.8	6.1	104.2	299.0	1957
85.0	8.2	3.3	4.6	6.9	104.5	272.5	1958
103.0	13.6	2.0	4.5	8.5	109.4	302.4	1959
56.0	21.6	1.5	11.8	6.8	162.1	341.7	1960
161.5	19.1	1.5	8.5	5.3	88.4	405.6	1961
188.4	19.6	1.5	14.2	5.2	63.2	403.1	1962
222.0	20.0	2.5	16.2	5.0	68.0	445.3	1963
326.0	20.0	12.0	17.8	6.4	83.3	585.3	1964
457.3	25.8	16.0	30.1	7.4	78.5	743.6	1965
237.3	31.5	16.0	21.3	6.1	104.9	546.6	1966
214.8	33.2	15.0	14.6	7.9	93.9	507.2	1967
182.1	35.0	16.0	13.6	7.9	88.0	463.2	1968
161.1	41.5	16.0	5.7	6.9	61.4	419.0	1969
129.1	46.0	16.0	6.0	8.5	66.1	399.4	1970
131.6	46.5	16.0	7.0	8.0	57.6	417.3	1971
154.0	54.3	13.0	8.4	11.0	70.4	469.5	1972
197.3	69.0	13.0	17.0	16.5	83.6	551.0	1973
177.0	57.7	14.0	19.3	10.2	73.2	501.6	1974
160.4	46.4	13.0	20.7	8.8	67.8	441.1	1975
171.9	60.8	18.0	17.7	10.2	77.3	514.7	1976
153.7	63.2	17.6	9.6	12.8	79.4	494.4	1977
160.2	64.9	21.0	10.6	15.7	80.3	491.9	1978
157.5	68.8	22.5	8.1	13.6	32.4	479.2	1979
124.8	61.5	22.5	8.9	11.0	27.3	379.3	1980
116.9	59.6	26.5	8.8	5.0	28.2	364.9	1981
120.6	63.2	23.0	9.3	5.7	28.8	373.4	1982
118.4	72.1	22.5	9.3	3.5	28.9	366.7	1983
117.5	78.8	20.9	9.6	8.0	31.8	389.9	1984
119.0	72.6	21.0	9.4	11.5	41.3	400.9	1985
129.2	85.0	19.3	10.9	9.7	31.1	436.5	1986
127.5	92.3	20.1	11.6	9.2	40.4	461.0	1987
119.9	102.0	22.4	12.1	9.1	37.6	476.1	1988
126.8	102.5	27.0	15.3	8.8	39.7	508.4	1989
134.2	115.8	41.8	14.2	8.7	35.2	544.1	1990
127.8	108.9	44.5	13.9	13.2	47.8	576.2	1991
127.0	106.5	57.8	13.9	21.5	43.7	593.4	1992
130.0	111.7	119.0	14.8	29.7	49.7	678.7	1993

i — included in "other".

Sources: CPM Group, industry sources.

## COUNTRY REPORTS

### The United States

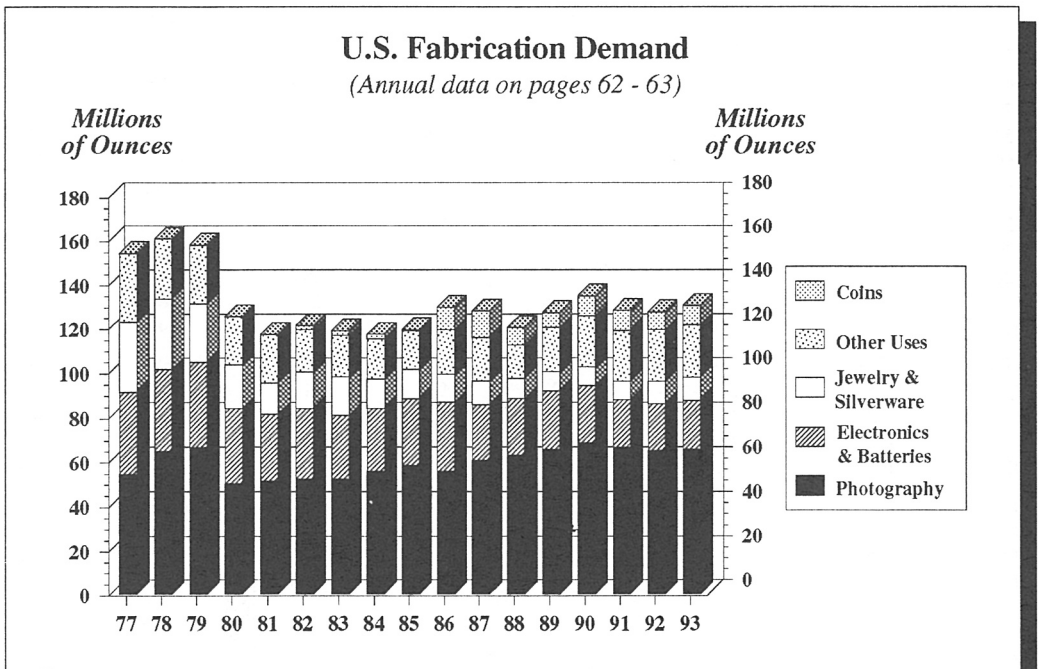
U.S. fabrication demand expanded across the board in 1993, totaling 130.0 million ounces, an increase of 2.4% from 127.0 million ounces in 1992. Excluding coinage, silver use rose 1.9% to 121.1 million ounces from 118.9 million ounces the previous year. The United States still was the largest national market for silver, but soon may be displaced by India as the world's largest silver consumer.

Silver requirements from the U.S. photographic industry rose 0.9% to 65.0 million ounces from 64.4 million ounces in 1992. Increased sales and manufacture of disposable cameras, and higher sales of

amateur film, led to additional silver use in this sector.

Meanwhile, demand for silver in electrical contacts and connectors showed even more resilience in 1993, climbing 2.7% to 18.8 million ounces from 18.3 million ounces in 1992. Batteries absorbed 3.3 million ounces, up 0.2 million ounces from 1992. U.S. jewelry manufacturers also required 3.3 million ounces of silver, 10% more than in 1992, while sterlingware demand rose 2.6% to 4.0 million ounces. Silverplate absorbed 3.0 million ounces, up from 2.9 million ounces in 1992.

Catalysts continued their strong growth, with silver use expanding 5.3% to 4.0



million ounces. More silver went into mirrors, which required 1.3 million ounces, compared with 1.2 million ounces in 1992. Silver use in other applications, including brazing alloys and solders, dental and medical supplies, reflective glass, water filters, and bearings, rose 0.1 million ounces to 18.4 million ounces.



Annual U.S. Fabrication Demand, 1977 - 1986

Million Troy Ounces

	1977	1978	1979	1980	1981
Photography	53.7	64.3	66.0	49.8	51.0
Electrical Contacts and Conductors	31.3	30.8	33.5	27.8	26.4
Batteries	5.8	6.0	4.6	6.0	3.8
Sterlingware	16.7	17.9	13.1	9.1	4.4
Jewelry	8.1	6.8	5.4	5.9	5.4
Silverplate	6.8	7.3	8.1	4.4	3.9
Brazing Alloys and Solders	12.4	11.0	10.9	8.5	7.7
Catalysts	8.9	8.2	5.6	3.0	3.8
Medallions and					
Commemorative Objects	4.3	2.7	4.7	4.7	2.6
Dental and Medical Supplies	2.2	2.0	2.3	2.2	1.7
Mirrors	2.1	1.9	1.9	0.7	0.6
Bearings	0.5	0.4	0.3	0.6	0.3
Miscellaneous	0.9	1.0	1.0	2.0	5.0
<b>Total Industrial</b>	<b>153.6</b>	<b>160.2</b>	<b>157.3</b>	<b>124.7</b>	<b>116.7</b>
% Change Year Ago	-9.9	4.3	-1.8	-20.7	-6.4
Coinage	0.1	0.0	0.2	0.1	0.2
<b>Total Fabrication</b>	<b>153.7</b>	<b>160.2</b>	<b>157.4</b>	<b>124.8</b>	<b>116.8</b>
% Change Year Ago	-10.6	4.2	-1.7	-20.7	-6.3
	<b>1982</b>	<b>1983</b>	<b>1984</b>	<b>1985</b>	<b>1986</b>
Photography	51.8	51.8	55.3	57.9	55.4
Electrical Contacts and Conductors	27.7	26.3	25.6	27.5	27.4
Batteries	4.2	2.6	2.7	2.5	3.7
Sterlingware	6.6	7.0	3.6	3.5	3.9
Jewelry	6.3	6.9	5.8	5.8	4.6
Silverplate	3.3	3.2	3.5	3.7	3.7
Brazing Alloys and Solders	7.4	5.8	5.9	5.6	6.4
Catalysts	2.4	2.4	2.4	2.4	2.3
Medallions and					
Commemorative Objects	1.8	3.0	2.6	2.5	4.0
Dental and Medical Supplies	1.7	1.5	1.6	1.5	1.5
Mirrors	1.0	1.0	1.0	1.0	1.0
Bearings	0.2	0.2	0.3	0.2	0.4
Miscellaneous	4.6	4.6	4.6	4.6	4.6
<b>Total Industrial</b>	<b>118.8</b>	<b>116.3</b>	<b>114.8</b>	<b>118.6</b>	<b>118.9</b>
% Change Year Ago	1.9	-2.1	-1.2	3.2	0.3
Coinage	1.8	2.1	2.7	0.4	10.3
<b>Total Fabrication</b>	<b>120.7</b>	<b>118.4</b>	<b>117.5</b>	<b>118.9</b>	<b>129.2</b>
% Change Year Ago	3.3	-1.9	-0.8	1.2	8.7

**Notes:** Totals may not equal the sums of components due to rounding. Categories marked with dashes are included in miscellaneous.

**Sources:** U.S. Bureau of Mines, trade sources, CPM Group.

**Annual U.S. Fabrication Demand, 1987 - 1993**

*Million Troy Ounces*

	1987	1988	1989	1990	1991
Photography	60.2	62.5	65.2	68.0	66.0
Electrical Contacts and Conductors	22.7	23.0	23.5	22.8	18.3
Batteries	2.4	2.5	2.8	3.0	3.1
Sterlingware	3.8	3.5	3.4	3.5	3.5
Jewelry	4.2	2.9	2.4	2.0	2.0
Silverplate	2.5	2.6	2.7	2.8	2.8
Brazing Alloys and Solders	5.6	—	—	—	—
Catalysts	2.4	2.6	2.8	3.0	3.3
Medallions and Commemorative Objects	4.2	—	—	—	—
Dental and Medical Supplies	1.3	1.4	1.7	1.8	—
Mirrors	1.0	1.1	1.1	1.2	1.1
Bearings	0.3	—	—	—	—
Miscellaneous	4.5	9.9	14.4	17.2	18.6
<b>Total Industrial</b>	<b>115.3</b>	<b>112.0</b>	<b>120.0</b>	<b>125.3</b>	<b>118.7</b>
<i>% Change Year Ago</i>	-3.1	-2.8	7.1	4.4	-5.3
Coinage	12.2	7.9	6.8	9.1	9.1
<b>Total Fabrication</b>	<b>127.5</b>	<b>119.9</b>	<b>126.8</b>	<b>134.4</b>	<b>127.8</b>
<i>% Change Year Ago</i>	-1.4	-5.9	5.8	6.0	-4.9
	<b>1992</b>	<b>1993</b>			
Photography	64.4	65.0			
Electrical Contacts and Conductors	18.3	18.8			
Batteries	3.1	3.3			
Sterlingware	3.9	4.0			
Jewelry	3.0	3.3			
Silverplate	2.9	3.0			
Brazing Alloys and Solders	—	—			
Catalysts	3.8	4.0			
Medallions and Commemorative Objects	—	—			
Dental and Medical Supplies	—	—			
Mirrors	1.2	1.3			
Bearings	—	—			
Miscellaneous	18.3	18.4			
<b>Total Industrial</b>	<b>118.9</b>	<b>121.1</b>			
<i>% Change Year Ago</i>	0.2	1.9			
Coinage	8.1	8.9			
<b>Total Fabrication</b>	<b>127.0</b>	<b>130.0</b>			
<i>% Change Year Ago</i>	-0.6	2.4			

**Notes:** Totals may not equal the sums of components due to rounding. Categories marked with dashes are included in miscellaneous.

**Sources:** U.S. Bureau of Mines, trade sources, CPM Group.

**India**

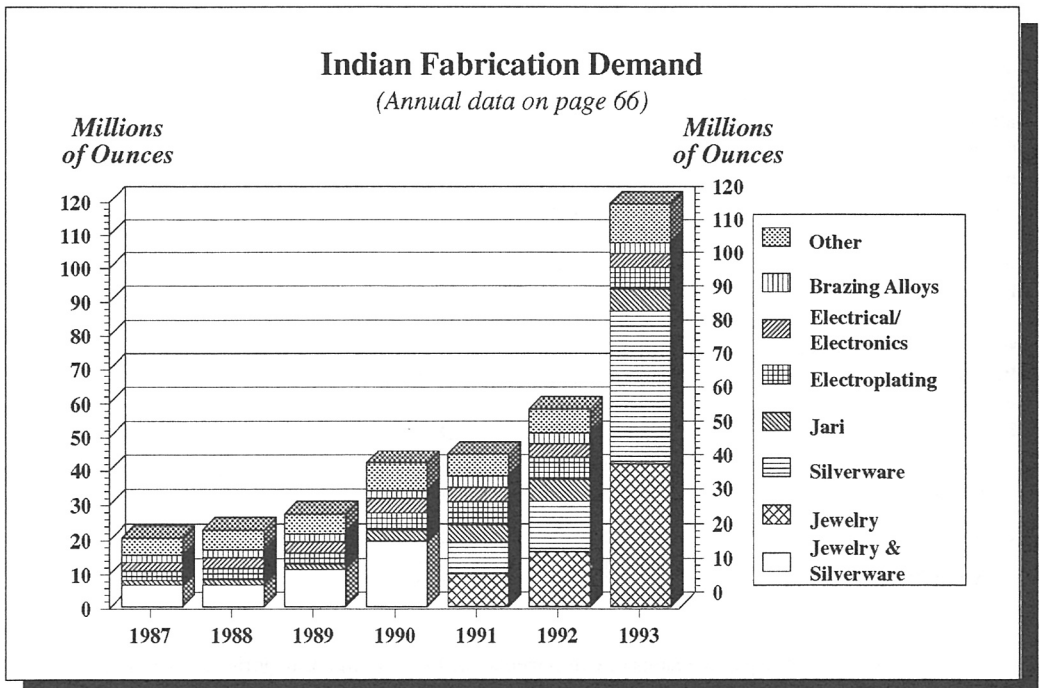
In 1993 India became the second largest national market for silver, as consumption reached 119.0 million ounces, more than double the 57.8 million ounces used the previous year. The jewelry and silverware sectors showed the greatest growth, using 86.8 million ounces of silver. This was 185% more than the 30.5 million ounces of silver these sectors used in 1992.

Silver requirements in Indian industrial applications also rose forcefully, climbing 17.7% to 32.1 million ounces from 27.3 million ounces in 1992. All of this growth was due to higher silver use in

foil, which rose 248% to 8.0 million ounces from 2.3 million ounces in 1992. Consumption in all other applications was flat to somewhat lower.

This year Indian demand is forecast to expand further, albeit at a more moderate pace. Legal imports via non-resident Indians amounted to 2.47 million ounces in January of 1994; illegal imports totaled 2.25 million ounces. In the same 1992 period supply from all sources was just 1.85 million ounces. Additionally, January traditionally is a slow month for Indian precious metals demand.

The Indian government may further liberalize the silver market in 1994, allow-



**Note:** Silver use in photography and foils is included in "Other."

ing all Indians to import silver. The government also is expected to reduce its import duty, following similar steps by Nepal and Pakistan.

If these measures go through, local silver prices should move closer in line with world prices. Indian silver prices averaged \$6.42 in January of 1993 compared with \$3.67 on the Comex. Imports were liberalized the following month, which lead to lower domestic prices. Local prices averaged around \$5.90 in December, compared with \$4.99 on the Comex.

**Indian Fabrication Demand**

*Million Troy Ounces*

	1987	1988	1989	1990	1991	1992	1993
<b>Industrial Uses</b>							
Photography	4.1	4.8	4.8	5.6	2.6	2.6	2.3
Electroplating	2.7	3.2	3.2	4.8	6.4	6.4	6.4
Electrical/Electronics	2.7	3.2	3.2	4.0	4.2	4.2	4.2
Brazing Alloys	2.2	2.4	2.4	2.4	3.2	3.2	3.2
Jari	1.4	1.6	1.6	3.2	5.1	6.4	6.4
Foils	—	—	—	1.0	1.6	2.3	8.0
Other	0.7	0.8	0.8	1.4	2.6	2.3	1.6
<b>Subtotal</b>	<b>13.8</b>	<b>16.0</b>	<b>16.1</b>	<b>22.5</b>	<b>25.7</b>	<b>27.3</b>	<b>32.2</b>
<i>% Change Year Ago</i>	—	15.9	0.5	40.0	14.3	6.3	17.7
<b>Jewelry and Silverware</b>							
Jewelry	—	—	—	—	9.6	16.1	41.3
Silverware	—	—	—	—	9.2	14.4	45.5
<b>Subtotal</b>	<b>6.3</b>	<b>6.4</b>	<b>10.9</b>	<b>19.3</b>	<b>18.8</b>	<b>30.5</b>	<b>86.8</b>
<i>% Change Year Ago</i>	—	1.6	70.3	77.1	-2.6	62.2	184.6
<b>Total</b>	<b>20.1</b>	<b>22.4</b>	<b>27.0</b>	<b>41.8</b>	<b>44.5</b>	<b>57.8</b>	<b>119.0</b>
<i>% Change Year Ago</i>	—	11.4	20.4	55.0	6.5	29.9	105.7

Sources: Indian trade sources, CPM Group.

**Japan**

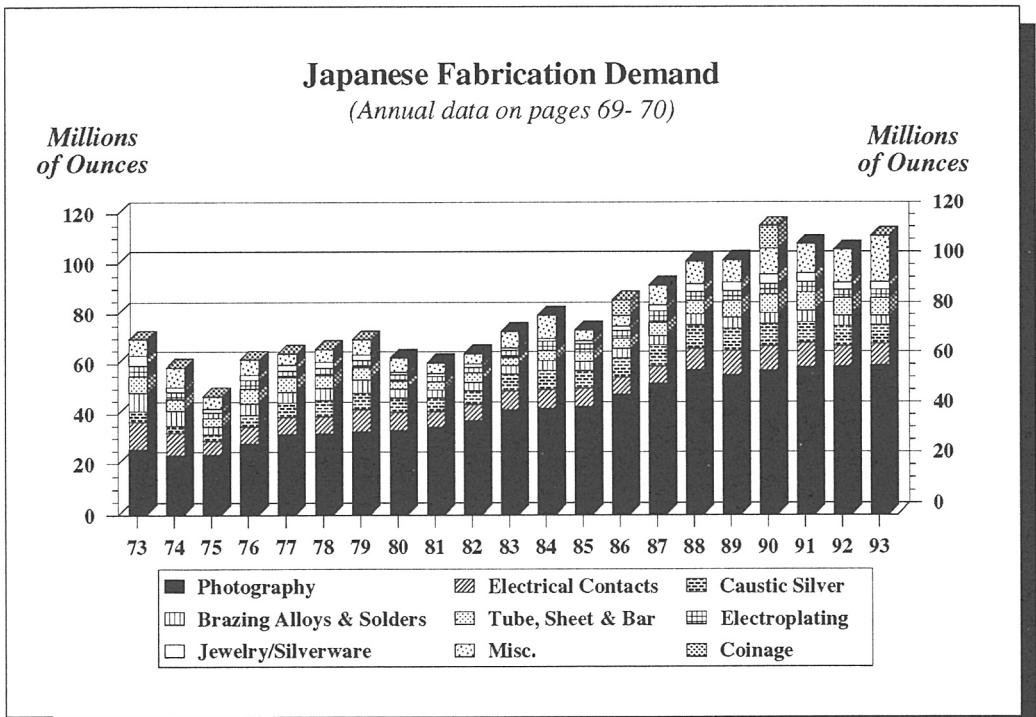
Despite recessionary conditions, Japanese silver use increased at a relatively strong pace in 1993. Demand rose 4.9% to 111.7 million ounces from 106.5 million ounces in 1992. Silver use in Japan could expand at a somewhat faster rate this year, as the overall economy picks up.

Last year the Japanese photographic sector consumed 58.5 million ounces, up 0.5 million ounces from 1992. Commercial photography was stronger, while use of silver in industrial X-rays fell off due to weak economic conditions.

Demand from other end-use markets was uneven. Silver use in electrical contacts

rose to 8.7 million ounces from 8.4 million ounces. Electroplating expanded 2.9% to 3.5 million ounces from 1992. Silver use in brazing alloys and solders declined 9.5% to 3.8 million ounces. Jewelry and silverware stood at 2.9 million ounces, up 0.1 million ounces. Demand for silver in dental amalgams slid 0.2 million ounces to 1.4 million ounces. Caustic silver continued to fall, albeit more gradually, declining 5.1% to 7.5 million ounces after a 6% decline to 8.4 million ounces a year earlier. Japanese silver use in bearings, catalysts, mirrors, and other applications leapt 40% to 18.2 million ounces from 13.0 million ounces.

Interestingly, total reported Japanese silver inventories have been falling since 1991, following a 79.5% increase in the



prior three years, from 25.03 million ounces in 1987 to 44.93 million ounces in 1990. Stocks fell to 35.47 million ounces at the end of November, off 20.5% from 1990.

During the same period there was a shift in the amount of silver held by consumers, producers, and merchants. At the end of 1990, producer inventories stood at 3.7 million ounces. These stocks rose to 4.9 million ounces in 1992; by the end of November 1993, silver in producer hands had fallen back 35% to 3.2 million ounces. Merchant stocks have fallen sharply since 1990 -- from 18.6 million ounces to less than half that level -- 7.4 million ounces -- as of November. Conversely, silver in consumer inventories stood at 24.9 million ounces at end-November 1993, up 10% from 22.6 million ounces in 1990.

**Japanese Fabrication Demand 1977 - 1988**

*Million Troy Ounces*

	1977	1978	1979	1980	1981	1982
Photography	31.2	31.4	32.2	32.6	33.9	36.6
Electrical Contacts	6.9	7.0	8.9	7.6	6.4	6.6
Caustic Silver	5.8	6.5	6.6	5.6	5.6	5.5
Brazing Alloys and Solders	4.3	4.7	5.3	3.5	3.1	3.3
Tube, Sheet, and Bar	5.6	5.1	4.9	3.2	3.0	3.6
Electroplating	2.8	2.9	2.8	2.5	2.4	2.3
Jewelry and Silverware	2.2	2.5	2.2	1.0	1.1	1.3
Miscellaneous	4.4	4.8	5.9	5.5	4.1	4.0
<b>Total</b>	<b>63.2</b>	<b>64.9</b>	<b>68.8</b>	<b>61.5</b>	<b>59.6</b>	<b>63.2</b>
<i>% Change Year Ago</i>	3.9	2.7	6.0	-10.6	-3.1	6.0
Coinage				—	—	—
<b>Total Including Coinage</b>				<b>61.5</b>	<b>59.6</b>	<b>63.2</b>
<i>% Change Year Ago</i>				-10.6	-3.1	6.0
	1983	1984	1985	1986	1987	1988
Photography	40.9	41.3	42.2	47.0	51.3	56.8
Electrical Contacts	7.7	7.8	7.5	6.8	7.0	8.4
Caustic Silver	6.7	7.6	6.8	7.6	8.3	9.6
Brazing Alloys and Solders	3.2	3.9	3.7	3.7	3.8	4.4
Tube, Sheet, and Bar	3.2	3.9	3.6	4.1	5.3	5.6
Electroplating	2.8	3.7	3.2	3.2	4.9	3.6
Jewelry and Silverware	1.1	1.0	1.4	1.7	2.2	3.0
Dental					1.4	1.6
Miscellaneous	6.5	9.6	4.2	4.4	8.1	9.0
<b>Total</b>	<b>72.1</b>	<b>78.8</b>	<b>72.6</b>	<b>78.6</b>	<b>92.3</b>	<b>102.0</b>
<i>% Change Year Ago</i>	14.1	9.3	-7.8	8.2	17.5	10.5
Coinage	—	—	—	6.4	—	—
<b>Total Including Coinage</b>	<b>72.1</b>	<b>78.8</b>	<b>72.6</b>	<b>85.0</b>	<b>92.3</b>	<b>102.0</b>
<i>% Change Year Ago</i>	14.1	9.3	-7.8	17.0	8.7	10.5



**Japanese Fabrication Demand 1989 - 1993**

*Million Troy Ounces*

	<b>1989</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>
Photography	54.8	56.5	57.8	58.0	58.5
Electrical Contacts	9.5	9.7	9.7	8.4	8.7
Caustic Silver	9.0	9.0	8.4	7.9	7.5
Brazing Alloys and Solders	4.6	4.5	4.8	4.2	3.8
Tube, Sheet, and Bar	6.9	7.6	7.5	7.2	7.2
Electroplating	3.8	4.1	4.1	3.4	3.5
Jewelry and Silverware	3.5	3.8	3.5	2.8	2.9
Dental	1.7	1.4	1.7	1.6	1.4
Miscellaneous	8.7	10.3	11.4	13.0	18.2
<b>Total</b>	<b>102.5</b>	<b>106.9</b>	<b>108.9</b>	<b>106.5</b>	<b>111.7</b>
<i>% Change Year Ago</i>	<i>0.5</i>	<i>4.3</i>	<i>1.9</i>	<i>-2.2</i>	<i>4.9</i>
Coinage	—	8.9	—	—	—
<b>Total Including Coinage</b>	<b>102.5</b>	<b>115.8</b>	<b>108.9</b>	<b>106.5</b>	<b>111.7</b>
<i>% Change Year Ago</i>	<i>0.5</i>	<i>13.0</i>	<i>-6.0</i>	<i>-2.2</i>	<i>4.9</i>

**Notes:** Totals may not equal the sums of components due to rounding. There was no silver use in coinage in Japan prior to 1986.

**Sources:** *Japanese trade sources, CPM Group.*

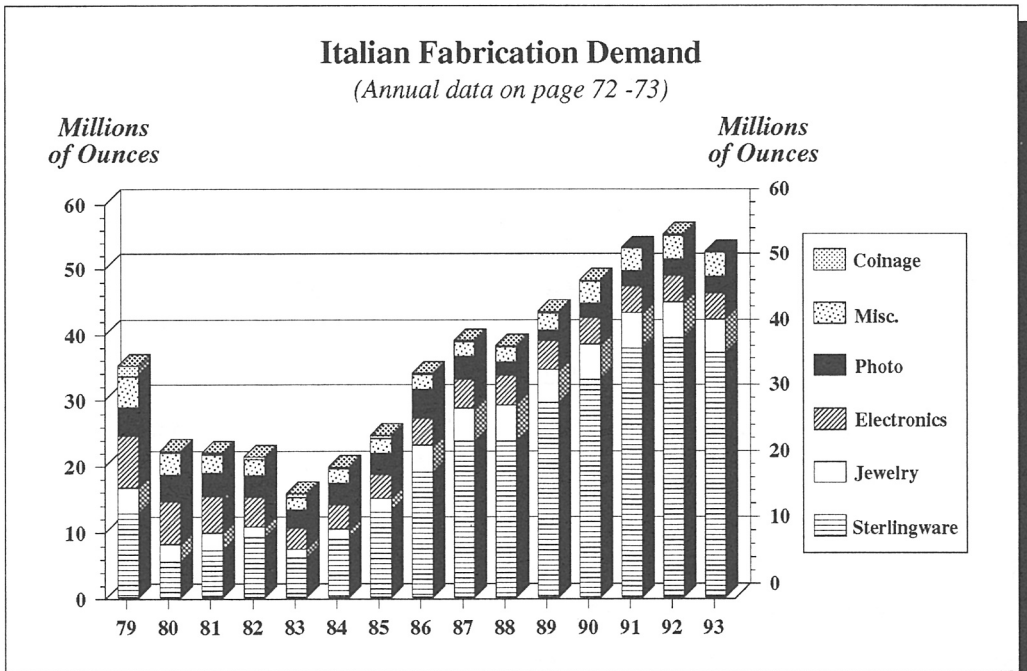
**Italy**

Last year silver use in Italy declined 5.1% to 52.3 million ounces from 55.1 million ounces in 1992. Excluding coinage, industrial demand fell 4.7%. Italy remained the largest silver consumer in Europe.

Italy's weak economy and political uncertainties limited domestic demand for Italian sterlingware last year. Sterlingware manufacturing used 36.3 million ounces of silver last year, down 6% from 1992's level. It was the first decline in silver use in this sector since 1983, when Italian silversmiths used only 5.5 million ounces of silver. Silver use in jewelry, a smaller sector, also was reduced last year, falling 5.5% to 5.2 million ounces. Demand fell most sharply in the March -- July 1993 period, when

higher prices, a lower lire, and rising economic uncertainty all hit consumers and fabricators at once. Demand recovered in the fourth quarter. Silverware and jewelry demand continued strong in the first two months of 1994. Italian silver use may match 1992's record 54.9 million ounce level this year.

Meanwhile silver use in other sectors was stable.



**Italian Fabrication Demand 1979 - 1988**

*Million Troy Ounces*

	1979	1980	1981	1982	1983
Sterlingware	12.0	4.7	6.4	8.4	5.5
Silverplate	0.6	0.7	0.7	0.6	0.5
Jewelry	3.9	2.6	2.6	1.6	1.3
Photography	4.2	4.0	3.5	3.2	2.6
Electronics	8.0	6.4	5.5	4.5	3.2
Brazing Alloys/Solders	2.7	2.3	1.5	1.2	1.0
Mirrors	0.6	0.6	0.5	0.5	0.3
Miscellaneous	1.3	0.5	0.8	0.8	0.6
<b>Total</b>	<b>33.3</b>	<b>21.8</b>	<b>21.5</b>	<b>20.8</b>	<b>15.0</b>
<i>% Change Year Ago</i>	—	-34.5	-1.4	-3.3	-27.9
Coinage	1.6	0.3	0.3	0.4	0.6
<b>Total Including Coinage</b>	<b>34.9</b>	<b>22.1</b>	<b>21.8</b>	<b>21.2</b>	<b>15.6</b>
<i>% Change Year Ago</i>	—	-36.7	-1.4	-2.8	-26.4
	<b>1984</b>	<b>1985</b>	<b>1986</b>	<b>1987</b>	<b>1988</b>
Sterlingware	8.2	12.3	18.5	23.2	23.2
Silverplate	0.5	0.5	0.4	0.4	0.4
Jewelry	1.6	2.0	4.1	5.0	5.4
Photography	3.2	3.2	4.2	3.5	1.9
Electronics	3.7	3.7	4.2	4.2	4.5
Brazing Alloys/Solders	1.0	1.0	1.1	1.1	1.2
Mirrors	0.3	0.3	0.3	0.3	0.3
Miscellaneous	0.9	0.9	0.9	0.9	1.0
<b>Total</b>	<b>19.4</b>	<b>24.0</b>	<b>33.5</b>	<b>38.6</b>	<b>37.9</b>
<i>% Change Year Ago</i>	29.5	23.4	39.9	15.2	-2.0
Coinage	0.2	0.5	0.2	0.2	0.2
<b>Total Including Coinage</b>	<b>19.6</b>	<b>24.5</b>	<b>33.7</b>	<b>38.8</b>	<b>38.0</b>
<i>% Change Year Ago</i>	25.8	24.6	37.9	15.1	-2.0

**Notes:** Totals may not equal the sums of categories due to rounding. Consumption of silver in semi-fabricated form is excluded.

**Sources:** *European trade sources, CPM Group.*

**Italian Fabrication Demand 1989 - 1993**

*Million Troy Ounces*

	<b>1989</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>
Sterlingware	28.9	32.2	37.0	38.6	36.3
Silverplate	0.4	0.6	0.6	0.6	0.6
Jewelry	5.0	5.5	5.5	5.5	5.2
Photography	1.6	2.3	2.3	2.5	2.5
Electronics	4.5	4.0	4.1	4.0	4.0
Brazing Alloys/Solders	1.3	1.6	1.8	1.9	1.9
Mirrors	0.3	0.8	0.8	0.8	0.8
Miscellaneous	1.1	1.0	1.0	1.0	1.0
<b>Total</b>	<b>43.0</b>	<b>47.9</b>	<b>53.0</b>	<b>54.9</b>	<b>52.3</b>
<i>% Change Year Ago</i>	<i>13.7</i>	<i>11.3</i>	<i>10.6</i>	<i>3.6</i>	<i>-4.7</i>
Coinage	0.2	0.1	0.0	0.2	0.0
<b>Total Including Coinage</b>	<b>43.3</b>	<b>48.0</b>	<b>53.0</b>	<b>55.1</b>	<b>52.3</b>
<i>% Change Year Ago</i>	<i>13.8</i>	<i>10.9</i>	<i>10.4</i>	<i>4.0</i>	<i>-5.1</i>

**Notes:** Totals may not equal the sums of categories due to rounding. Consumption of silver in semi-fabricated form is excluded.

**Sources:** *European trade sources, CPM Group.*

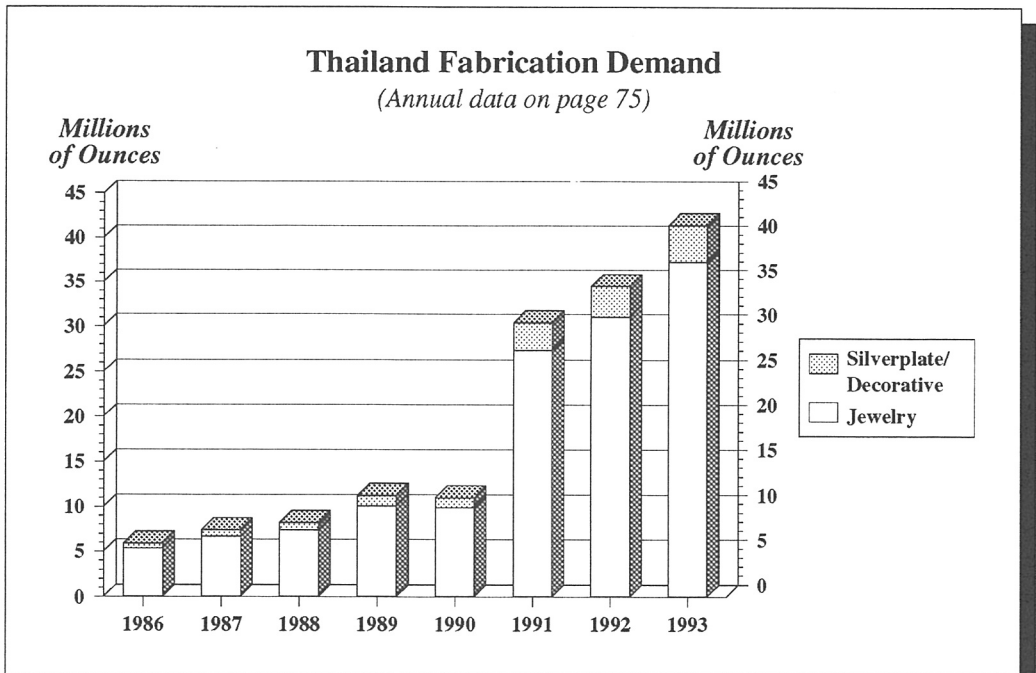
**Thailand**

Fabrication demand continued to rise in Thailand, fueled by government policy. Total consumption reached 41.4 million ounces in 1993, up 20% from 34.5 million ounces in 1992. This year demand could rise at a more rapid pace.

Jewelers represent 90% of total Thai silver use. Jewelry used 37.3 million ounces up from 31.0 million ounces in 1992.

The rest of Thai silver use is in decorative objects and silverplate items. As was discussed in previous reports, Thailand has developed a vibrant export trade in gold and silver jewelry and decorative objects over the past four years, shipping jewelry to the United States, Germany, Japan, and other major consumer markets.

The government aggressively supports this export business. Local gold and silver users are lobbying the government for full liberalization of the precious metals markets, with some limited success to date in lowering import duties.



**Thai Fabrication Demand**

*Million Troy Ounces*

	<b>1986</b>	<b>1987</b>	<b>1988</b>	<b>1989</b>
Jewelry	5.3	6.6	7.4	10.1
Silverplate/Decorative	0.6	0.7	0.8	1.1
<b>Total Demand</b>	<b>5.9</b>	<b>7.4</b>	<b>8.2</b>	<b>11.2</b>
<i>% Change Year Ago</i>	—	25.0	11.1	36.7
	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>
Jewelry	9.9	27.3	31.0	37.3
Silverplate/Decorative	1.1	3.0	3.4	4.1
<b>Total Demand</b>	<b>11.0</b>	<b>30.4</b>	<b>34.5</b>	<b>41.4</b>
<i>% Change Year Ago</i>	-1.9	176.2	13.5	20.0

**Notes:** Totals may not equal the sums of categories due to rounding.

**Sources:** *Thai trade sources, CPM Group.*

**Other European Countries**

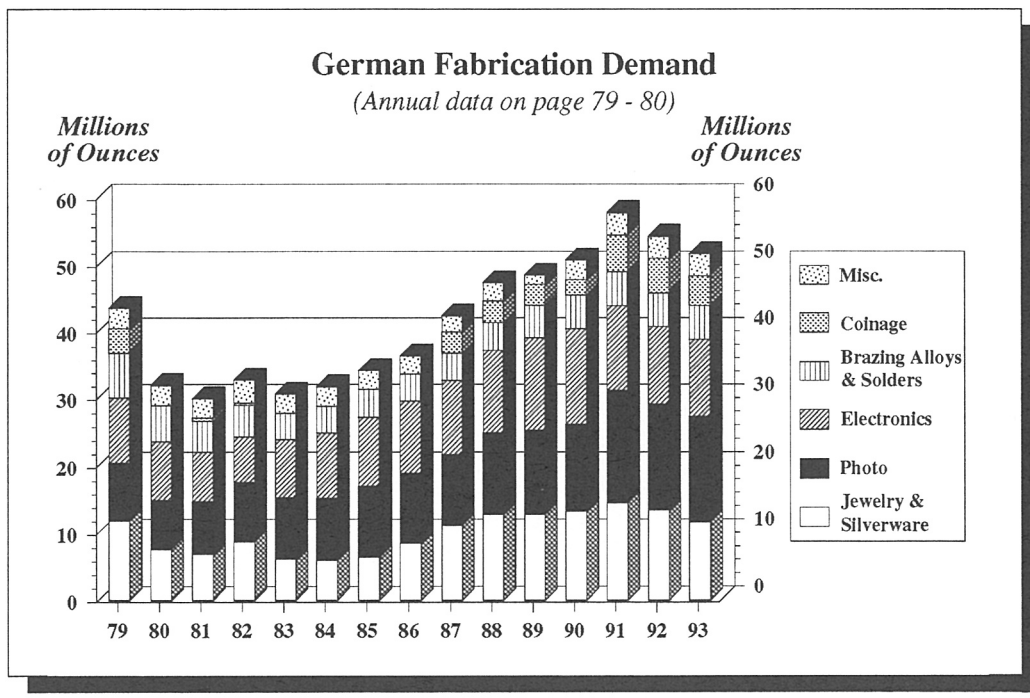
Apart from Italy, silver use in the other national markets in Europe was spotty in 1993.

Total *German* off-take declined 7.5% to 50.3 million ounces from 54.4 million ounces in 1992. Industrial demand was down 6.7%, falling to 45.8 million ounces from 49.1 million ounces. The recession in Germany eroded demand in the three largest end-use markets: Silver use in jewelry and silverware fell 14.1% to 11.6 million ounces; the photographic sector absorbed 15.1 million ounces, off 4.2% from the previous year; and electronics fell 2.6% to 11.3 million ounces. Coinage absorbed 4.5 million ounces, down 15.1% from 5.3 million ounces in 1992. German economic conditions are

improving gradually this year, and silver demand could rebound moderately.

*French* silver fabrication demand rose 1.3% in 1993 to 23.8 million ounces from 23.5 million ounces in 1992, and is to be somewhat firmer in 1994.. Excluding coinage, consumption in industrial use was 1.4% higher, amounting to 22.0 million ounces. The photographic sector required 2.7% more silver, and used 11.6 million ounces last year. Silver demand in all other industrial applications, as well as coinage, was level with 1992.

Last year the *United Kingdom* used 22.1 million ounces of silver, up 1.8% from 1992. Although real GDP rose fairly strongly in 1993, and is expected to expand further this year, the U.K. silver market is mature and demand is rising



modestly. Silver use in photographic materials rose 1.5% to 13.2 million ounces in 1993.

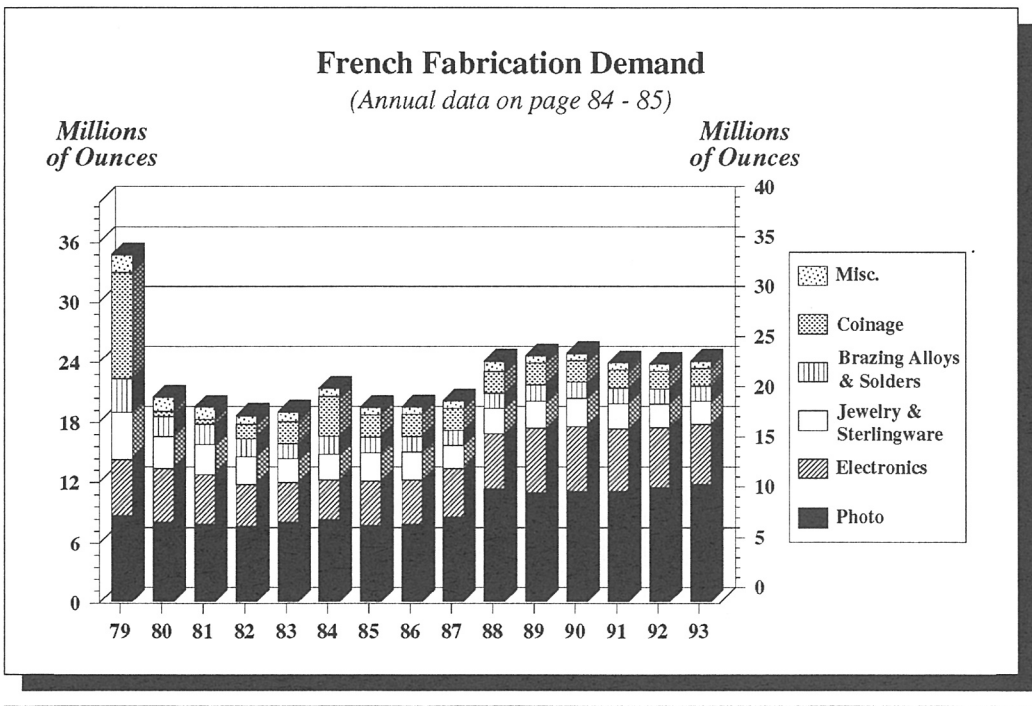
Brazing alloys and solders absorbed 2.1 million ounces, an increase of 5%. Silver used in mirrors jumped 25% to 0.5 million ounces. Demand in other industrial applications was flat.

Belgium is the fifth largest national market in Europe. A sectoral break-out of Belgian silver demand appears for the first time in this issue of the *WORLD SILVER SURVEY*. Silver use in Belgium grew strongly between 1979 and 1988, from 14.8 million ounces to 19.2 million ounces, an increase of 29.7%, and demand has remained above 19.0 million ounces over the past five years. In 1993

consumption rose 7.3% to 21.9 million ounces from 20.4 million ounces in 1992.

Photographic products absorb the bulk of this silver, accounting for 98.2% of Belgian demand last year. Silver requirements in this sector rose 7.5% in 1993 to 21.5 million ounces from 20.0 million ounces the previous year.

Meanwhile fabrication demand in the *Netherlands* fell sharply in 1993, declining 27.3% to 1.0 million ounces from 1.3 million ounces in 1992. The drop mirrored the country's weakening economic conditions. Silver use in sterlingware and jewelry slid 40% to 0.3 million ounces from 0.5 million ounces, while electronics requirements fell to 0.5 million ounces to 0.6 million ounces, off 16.7%.





*Austria* used more silver last year than in 1992. This issue of the **WORLD SILVER SURVEY** includes the first detailed statistics on Austrian silver demand. Total fabrication use has shown sharp swings over the past 15 years, following coin usage. Silver requirements in Austrian industrial applications have been fairly steady, ranging between 0.6 million ounces and 0.8 million ounces. Silver is used in a variety of applications, including sterlingware and jewelry, electronics, and brazing alloys and solders. In 1993, Austrian silver demand excluding coinage fell 2% to 0.76 million ounces. Last year coinage rose 20% to 0.6 million, and total demand was around 1.4 million ounces up 5.2% from 1.3 million ounces in 1992.

**German Fabrication Demand 1979 - 1988**

*Million Troy Ounces*

	1979	1980	1981	1982	1983
Jewelry/Silverware	11.8	7.6	6.9	8.7	6.1
Photography	8.7	7.3	7.8	8.9	9.2
Electronics	9.6	8.7	7.4	6.7	8.6
Brazing Alloys/Solders	6.7	5.3	4.5	4.7	3.9
Dental	0.5	0.7	0.5	0.5	0.4
Mirrors	0.5	0.5	0.5	0.5	0.5
Miscellaneous	2.0	1.8	1.8	2.4	1.9
<b>Total</b>	<b>39.8</b>	<b>31.9</b>	<b>29.3</b>	<b>32.7</b>	<b>30.3</b>
<i>% Change Year Ago</i>	—	-19.8	-8.2	11.6	-7.3
Coinage	3.7	—	0.5	0.3	—
<b>Total Including Coinage</b>	<b>43.5</b>	<b>31.9</b>	<b>29.8</b>	<b>33.0</b>	<b>30.3</b>
<i>% Change Year Ago</i>	—	-26.7	-6.6	10.7	-8.2
	<b>1984</b>	<b>1985</b>	<b>1986</b>	<b>1987</b>	<b>1988</b>
Jewelry/Silverware	5.9	6.4	8.5	11.2	12.7
Photography	9.2	10.6	10.4	10.5	12.1
Electronics	9.7	10.1	10.6	10.9	12.3
Brazing Alloys/Solders	4.0	4.2	4.0	4.1	4.2
Dental	0.3	0.3	0.4	0.3	0.3
Mirrors	0.5	0.5	0.5	0.5	0.5
Miscellaneous	2.1	2.0	1.9	1.6	1.9
<b>Total</b>	<b>32.2</b>	<b>34.6</b>	<b>36.3</b>	<b>39.1</b>	<b>44.1</b>
<i>% Change Year Ago</i>	6.2	7.5	5.0	7.6	12.8
Coinage	—	—	—	3.2	3.2
<b>Total Including Coinage</b>	<b>32.2</b>	<b>34.6</b>	<b>36.3</b>	<b>42.3</b>	<b>47.3</b>
<i>% Change Year Ago</i>	6.2	7.5	5.0	16.5	11.8

**Notes:** Totals may not equal the sums of categories due to rounding.

**Sources:** *European trade sources, CPM Group.*

**German Fabrication Demand 1989 - 1993***Million Troy Ounces*

	<b>1989</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>
Jewelry/Silverware	12.7	13.2	14.5	13.5	11.6
Photography	12.5	12.9	16.7	15.7	15.1
Electronics	13.8	14.3	12.7	11.6	11.3
Brazing Alloys/Solders	4.8	5.0	5.1	5.0	4.5
Dental	0.3	0.4	0.5	0.5	0.4
Mirrors	0.5	0.5	0.5	0.5	0.5
Miscellaneous	2.1	2.1	2.3	2.4	2.4
<b>Total</b>	<b>46.9</b>	<b>48.4</b>	<b>52.3</b>	<b>49.1</b>	<b>45.8</b>
<i>% Change Year Ago</i>	6.2	3.3	8.1	-6.1	-6.7
Coinage	3.2	2.4	5.5	5.3	4.5
<b>Total Including Coinage</b>	<b>50.1</b>	<b>50.8</b>	<b>57.8</b>	<b>54.4</b>	<b>50.3</b>
<i>% Change Year Ago</i>	5.8	1.5	13.9	-6.0	-7.5

**Notes:** Totals may not equal the sums of categories due to rounding.

**Sources:** *European trade sources, CPM Group.*

## United Kingdom Fabrication Demand 1979 - 1988

*Million Troy Ounces*

	1979	1980	1981	1982	1983
Jewelry/Silverware	4.9	2.1	2.3	2.2	1.5
Photography	10.2	6.7	6.9	6.8	7.7
Electronics	7.3	6.4	5.4	5.5	5.3
Brazing Alloys/Solders	3.9	3.0	2.6	2.6	2.0
Dental	0.3	0.4	0.4	0.4	0.3
Mirrors	0.5	0.4	0.4	0.4	0.4
Miscellaneous	0.5	0.5	0.4	0.3	0.3
<b>Total</b>	<b>27.6</b>	<b>19.5</b>	<b>18.4</b>	<b>18.1</b>	<b>17.7</b>
<i>% Change Year Ago</i>	--	-29.3	-5.6	-1.6	-2.2
Coinage	2.0	2.1	2.2	0.9	0.6
<b>Total Including Coinage</b>	<b>29.6</b>	<b>21.6</b>	<b>20.6</b>	<b>19.1</b>	<b>18.3</b>
<i>% Change Year Ago</i>	--	-27.0	-4.6	-7.3	-4.2
	<b>1984</b>	<b>1985</b>	<b>1986</b>	<b>1987</b>	<b>1988</b>
Jewelry/Silverware	1.4	1.8	1.7	2.0	2.0
Photography	8.6	8.3	8.1	10.4	12.3
Electronics	5.9	5.9	5.8	5.5	5.4
Brazing Alloys/Solders	2.2	2.1	2.3	2.0	1.9
Dental	0.3	0.3	0.4	0.5	0.5
Mirrors	0.4	0.4	0.4	0.4	0.4
Miscellaneous	0.3	0.3	0.3	0.3	0.3
<b>Total</b>	<b>19.2</b>	<b>19.1</b>	<b>19.1</b>	<b>21.1</b>	<b>22.7</b>
<i>% Change Year Ago</i>	8.3	-0.5	0.2	10.5	7.7
Coinage	0.3	0.4	0.8	1.3	1.6
<b>Total Including Coinage</b>	<b>19.5</b>	<b>19.5</b>	<b>19.8</b>	<b>22.4</b>	<b>24.3</b>
<i>% Change Year Ago</i>	6.4	-0.1	1.8	13.1	8.7

**Notes:** Totals may not equal the sums of categories due to rounding.

**Sources:** *European trade sources, CPM Group.*

**United Kingdom Fabrication Demand 1989 - 1993**

*Million Troy Ounces*

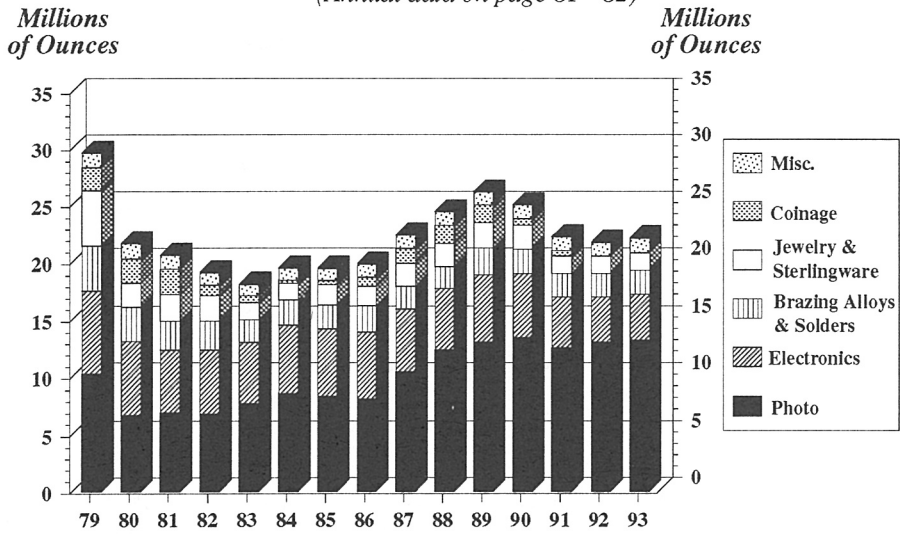
	1989	1990	1991	1992	1993
Jewelry/Silverware	2.2	2.1	1.5	1.5	1.5
Photography	13.0	13.4	12.5	13.0	13.2
Electronics	5.9	5.6	4.5	4.0	4.0
Brazing Alloys/Solders	2.3	2.1	2.0	2.0	2.1
Dental	0.5	0.5	0.5	0.5	0.5
Mirrors	0.4	0.4	0.4	0.4	0.5
Miscellaneous	0.3	0.3	0.3	0.3	0.3
<b>Total</b>	<b>24.5</b>	<b>24.4</b>	<b>21.7</b>	<b>21.7</b>	<b>22.1</b>
<i>% Change Year Ago</i>	<i>7.9</i>	<i>-0.5</i>	<i>-11.1</i>	<i>0.0</i>	<i>1.8</i>
Coinage	1.6	0.3	0.2	NA	NA
<b>Total Including Coinage</b>	<b>26.1</b>	<b>24.7</b>	<b>21.9</b>	<b>NA</b>	<b>NA</b>
<i>% Change Year Ago</i>	<i>7.4</i>	<i>-5.5</i>	<i>-11.3</i>		

**Notes:** Totals may not equal the sums of categories due to rounding.

**Sources:** *European trade sources, CPM Group.*

### United Kingdom Fabrication Demand

(Annual data on page 81 - 82)



**French Fabrication Demand 1979 - 1988**

*Million Troy Ounces*

	1979	1980	1981	1982	1983
Jewelry/Silverware	4.7	3.2	3.0	2.8	2.4
Photography	8.5	7.9	7.7	7.5	7.9
Electronics	5.6	5.3	4.9	4.1	3.9
Brazing Alloys/Solders	3.4	2.0	2.0	1.8	1.5
Dental	*	*	*	*	0.1
Mirrors	0.4	0.4	0.4	0.4	0.3
Miscellaneous	1.4	1.0	0.8	0.5	0.4
<b>Total</b>	<b>24.1</b>	<b>19.8</b>	<b>18.9</b>	<b>17.1</b>	<b>16.5</b>
<i>% Change Year Ago</i>	—	-17.8	-4.5	-9.5	-3.5
Coinage	10.6	0.1	0.1	1.4	2.2
<b>Total Including Coinage</b>	<b>34.7</b>	<b>19.9</b>	<b>19.0</b>	<b>18.5</b>	<b>18.7</b>
<i>% Change Year Ago</i>	—	-42.7	-4.5	-2.6	1.1
	<b>1984</b>	<b>1985</b>	<b>1986</b>	<b>1987</b>	<b>1988</b>
Jewelry/Silverware	2.6	2.8	2.8	2.3	2.5
Photography	8.1	7.6	7.7	8.4	11.2
Electronics	3.9	4.4	4.4	4.8	5.5
Brazing Alloys/Solders	1.8	1.6	1.6	1.5	1.5
Dental	0.1	0.1	0.1	0.1	0.1
Mirrors	0.3	0.2	0.2	0.2	0.2
Miscellaneous	0.3	0.3	0.3	0.3	0.3
<b>Total</b>	<b>17.1</b>	<b>16.9</b>	<b>17.0</b>	<b>17.6</b>	<b>21.3</b>
<i>% Change Year Ago</i>	3.7	-0.9	0.4	3.4	20.9
Coinage	3.9	2.2	2.2	2.2	2.2
<b>Total Including Coinage</b>	<b>21.0</b>	<b>19.1</b>	<b>19.2</b>	<b>19.8</b>	<b>23.4</b>
<i>% Change Year Ago</i>	12.3	-8.9	0.3	3.0	18.5

**Notes:** Totals may not equal the sums of categories due to rounding. Asterisks indicate that consumption in individual industries totaled less than 100,000 ounces.

**Sources:** *European trade sources, CPM Group.*

**French Fabrication Demand 1989 - 1993**

*Million Troy Ounces*

	<b>1989</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>
Jewelry/Silverware	2.7	2.8	2.5	2.3	2.3
Photography	10.8	10.9	10.9	11.3	11.6
Electronics	6.4	6.5	6.3	6.0	6.0
Brazing Alloys/Solders	1.6	1.6	1.6	1.5	1.5
Dental	0.1	0.1	0.1	0.1	0.1
Mirrors	0.2	0.2	0.2	0.2	0.2
Miscellaneous	0.3	0.3	0.3	0.3	0.3
<b>Total</b>	<b>22.1</b>	<b>22.4</b>	<b>21.9</b>	<b>21.7</b>	<b>22.0</b>
<i>% Change Year Ago</i>	<i>3.9</i>	<i>1.4</i>	<i>-2.4</i>	<i>-0.8</i>	<i>1.4</i>
Coinage	2.2	2.2	1.8	1.8	1.8
<b>Total Including Coinage</b>	<b>24.3</b>	<b>24.6</b>	<b>23.7</b>	<b>23.5</b>	<b>23.8</b>
<i>% Change Year Ago</i>	<i>3.6</i>	<i>1.3</i>	<i>-3.8</i>	<i>-0.7</i>	<i>1.3</i>

**Notes:** Totals may not equal the sums of categories due to rounding. Asterisks indicate that consumption in individual industries totaled less than 100,000 ounces.

**Sources:** *European trade sources, CPM Group.*



**Belgian Fabrication Demand 1979 - 1988**

*Million Ounces*

	1979	1980	1981	1982	1983
Photography	14.2	14.1	15.5	16.6	15.9
Mirrors	0.1	0.1	0.1	0.3	0.3
Sterlingware/Jewelry	0.1	0.1	0.1	0.0	0.0
Electronics	0.1	0.1	0.0	0.0	0.0
Dental	0.0	0.0	0.0	0.0	0.0
Miscellaneous	0.2	0.2	0.2	0.1	0.1
<b>Total</b>	<b>14.8</b>	<b>14.6</b>	<b>16.0</b>	<b>17.0</b>	<b>16.3</b>
<i>% Change Year Ago</i>	—	-1.4	9.5	6.4	-4.1
	<b>1984</b>	<b>1985</b>	<b>1986</b>	<b>1987</b>	<b>1988</b>
Photography	16.4	16.0	17.2	17.4	18.8
Mirrors	0.3	0.3	0.3	0.3	0.3
Sterlingware/Jewelry	0.0	0.0	0.0	0.0	0.0
Electronics	0.0	0.0	0.0	0.0	0.0
Dental	0.0	0.0	0.0	0.0	0.0
Miscellaneous	0.1	0.1	0.1	0.2	0.1
<b>Total</b>	<b>16.8</b>	<b>16.4</b>	<b>17.6</b>	<b>17.9</b>	<b>19.2</b>
<i>% Change Year Ago</i>	3.4	-2.4	7.3	1.7	7.3

**Notes:** Totals may not equal sums of categories due to rounding.

**Sources:** *European trade sources, CPM Group.*

**Belgian Fabrication Demand 1989 - 1993***Million Ounces*

	<b>1989</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>
Photography	18.8	19.0	19.3	20.0	21.5
Mirrors	0.3	0.3	0.3	0.3	0.3
Sterlingware/Jewelry	0.0	0.0	0.0	0.0	0.0
Electronics	0.0	0.0	0.0	0.0	0.0
Dental	0.0	0.0	0.0	0.0	0.0
Miscellaneous	0.1	0.1	0.1	0.1	0.1
<b>Total</b>	<b>19.2</b>	<b>19.4</b>	<b>19.7</b>	<b>20.4</b>	<b>21.9</b>
<i>% Change Year Ago</i>	<i>-0.2</i>	<i>1.0</i>	<i>1.5</i>	<i>3.6</i>	<i>7.4</i>

**Notes:** Totals may not equal sums of categories due to rounding.

**Sources:** *European trade sources, CPM Group.*

**Netherlands Fabrication Demand 1979 - 1988**

*Million Troy Ounces*

	1979	1980	1981	1982	1983
Sterlingware/Jewelry	0.5	0.3	0.4	0.6	0.5
Electronics	0.6	0.7	0.7	0.7	0.7
Mirrors	0.0	0.0	0.0	0.0	0.0
Dental	0.1	0.1	0.0	—	—
Miscellaneous	0.1	0.1	0.1	0.1	0.1
<b>Total</b>	<b>1.3</b>	<b>1.2</b>	<b>1.3</b>	<b>1.4</b>	<b>1.3</b>
<i>% Change Year Ago</i>	—	-6.5	10.0	8.3	-5.7
Coinage	0.1	0.0	0.0	0.0	—
<b>Total Including Coinage</b>	<b>1.4</b>	<b>1.2</b>	<b>1.3</b>	<b>1.5</b>	<b>1.3</b>
<i>% Change Year Ago</i>	—	-8.5	7.5	8.9	-7.8
	<b>1984</b>	<b>1985</b>	<b>1986</b>	<b>1987</b>	<b>1988</b>
Sterlingware/Jewelry	0.4	0.5	0.5	0.5	0.5
Electronics	0.5	0.5	0.7	0.6	0.6
Mirrors	0.0	0.0	0.0	0.0	0.0
Dental	—	—	—	—	—
Miscellaneous	—	—	0.1	0.1	0.1
<b>Total</b>	<b>0.9</b>	<b>1.0</b>	<b>1.3</b>	<b>1.3</b>	<b>1.2</b>
<i>% Change Year Ago</i>	-34.4	11.5	32.1	-3.0	-1.4
Coinage	0.9	—	—	1.2	—
<b>Total Including Coinage</b>	<b>1.8</b>	<b>1.0</b>	<b>1.3</b>	<b>2.5</b>	<b>1.2</b>
<i>% Change Year Ago</i>	30.8	-44.0	32.1	90.8	-49.9

**Notes:** Totals may not equal components due to rounding.

**Sources:** *European trade sources, CPM Group.*

**Netherlands Fabrication Demand 1989 - 1993**

*Million Troy Ounces*

	<b>1989</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>
Sterlingware/Jewelry	0.5	0.5	0.5	0.5	0.3
Electronics	0.6	0.6	0.6	0.6	0.5
Mirrors	0.0	0.0	0.0	0.0	0.0
Dental	—	—	—	—	—
Miscellaneous	0.1	0.1	0.1	0.1	0.1
<b>Total</b>	<b>1.3</b>	<b>1.3</b>	<b>1.3</b>	<b>1.3</b>	<b>1.0</b>
<i>% Change Year Ago</i>	<i>1.2</i>	<i>0.6</i>	<i>3.3</i>	<i>0.5</i>	<i>-27.3</i>
Coinage	—	—	0.7	—	NA
<b>Total Including Coinage</b>	<b>1.3</b>	<b>1.3</b>	<b>2.0</b>	<b>1.3</b>	<b>NA</b>
<i>% Change Year Ago</i>	<i>1.2</i>	<i>0.6</i>	<i>56.7</i>	<i>-33.7</i>	<i>NA</i>

**Notes:** Totals may not equal components due to rounding.

**Sources:** *European trade sources, CPM Group.*

**Austrian Fabrication Demand 1979 - 1988**

*Million Troy Ounces*

	1979	1980	1981	1982	1983
Sterlingware/Jewelry	0.4	0.3	0.2	0.3	0.3
Dental	0.1	0.1	0.1	0.1	0.1
Electronics	0.1	0.3	0.3	0.2	0.2
Brazing Alloys/Solders	0.0	0.1	0.1	0.1	0.1
Medals/Medallions	0.0	0.0	0.0	0.0	0.0
Miscellaneous	0.0	0.0	0.0	0.0	0.0
<b>Total</b>	<b>0.6</b>	<b>0.7</b>	<b>0.6</b>	<b>0.6</b>	<b>0.7</b>
<i>% Change Year Ago</i>	—	9.4	-14.9	-2.1	14.7
Coinage	3.9	2.1	2.2	1.5	1.8
<b>Total Including Coinage</b>	<b>4.5</b>	<b>2.8</b>	<b>2.8</b>	<b>2.1</b>	<b>2.5</b>
<i>% Change Year Ago</i>	—	-37.6	-0.3	-26.0	18.8
	<b>1984</b>	<b>1985</b>	<b>1986</b>	<b>1987</b>	<b>1988</b>
Sterlingware/Jewelry	0.3	0.2	0.2	0.2	0.2
Dental	0.1	0.1	0.1	0.1	0.1
Electronics	0.2	0.3	0.3	0.3	0.3
Brazing Alloys/Solders	0.1	0.1	0.1	0.1	0.1
Medals/Medallions	0.0	0.0	0.0	0.0	0.0
Miscellaneous	0.1	0.0	0.0	0.0	0.0
<b>Total</b>	<b>0.7</b>	<b>0.7</b>	<b>0.7</b>	<b>0.7</b>	<b>0.8</b>
<i>% Change Year Ago</i>	7.6	-8.4	9.6	1.3	5.2
Coinage	1.7	4.9	1.2	0.6	0.6
<b>Total Including Coinage</b>	<b>2.4</b>	<b>5.6</b>	<b>1.9</b>	<b>1.4</b>	<b>1.4</b>
<i>% Change Year Ago</i>	-0.8	129.6	-65.3	-28.8	2.8

**Notes:** Totals may not equal the sums of categories due to rounding.  
Consumption of silver in semi-fabricated form is excluded.

**Sources:** *European trade sources, CPM Group.*

**Austrian Fabrication Demand 1989 - 1993**

*Million Troy Ounces*

	<b>1989</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>
Sterlingware/Jewelry	0.2	0.3	0.3	0.3	0.3
Dental	0.1	0.1	0.0	0.0	0.0
Electronics	0.3	0.3	0.2	0.2	0.2
Brazing Alloys/Solders	0.2	0.2	0.2	0.2	0.2
Medals/Medallions	0.0	0.0	0.0	0.0	0.0
Miscellaneous	0.0	0.0	0.0	0.0	0.0
<b>Total</b>	<b>0.8</b>	<b>0.8</b>	<b>0.8</b>	<b>0.8</b>	<b>0.8</b>
<i>% Change Year Ago</i>	<i>0.4</i>	<i>0.8</i>	<i>-1.7</i>	<i>-1.3</i>	<i>-1.6</i>
Coinage	0.4	0.5	0.6	0.5	0.6
<b>Total Including Coinage</b>	<b>1.2</b>	<b>1.3</b>	<b>1.4</b>	<b>1.3</b>	<b>1.4</b>
<i>% Change Year Ago</i>	<i>-14.1</i>	<i>2.6</i>	<i>11.6</i>	<i>-8.1</i>	<i>5.3</i>

**Notes:** Totals may not equal the sums of categories due to rounding.  
Consumption of silver in semi-fabricated form is excluded.

**Sources:** *European trade sources, CPM Group.*

**Other Countries**

*Silver Use in Other Asian Countries*

Thailand is by far the largest consumer of silver among the newly developed countries in Southeast Asia, accounting for 41.4 million ounces (66.3%) of the 62.4 million ounces of silver used in the region last year. South Korean, Taiwan, and Hong Kong used 21.0 million ounces. All three countries increased their silver off-take in 1993.

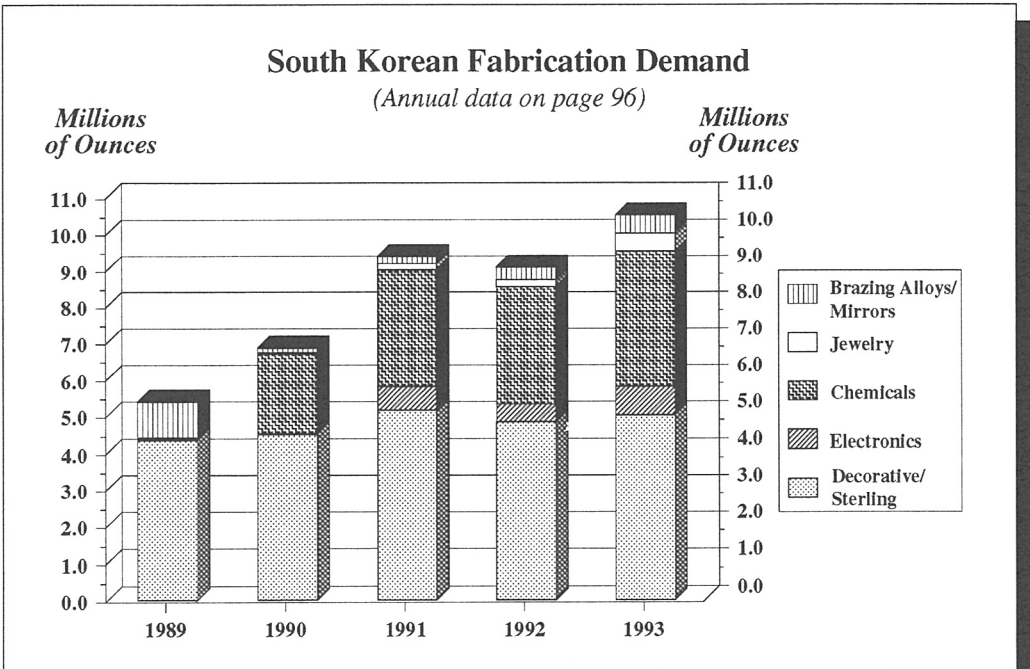
Last year *Korean* silver use expanded 15.8%, to 10.5 million ounces from 9.1 million ounces in 1992. Demand grew in all applications. Decorative items and sterling gifts continue to be the major use of silver in Korea. Silver use in decorative items rose 4.2% to 5.0 million

ounces; silver use in chemicals rose 15.6% to 3.7 million ounces; and electronics demand was 0.8 million ounces, up 60%. Brazing alloys increased by 67% to 0.5 million ounces, while jewelry absorbed 0.5 million ounces, an increase of 150%.

This is in sharp contrast to market conditions suggested by Korean import statistics.

Korean imports of unwrought silver rose sharply in the late 1980s, from 18,000 ounces in 1986 to 8.9 million ounces in 1991. Imports totaled 8.8 million ounces in 1992, but fell 99% last year, to an estimated 98,000 ounces.

*Taiwan* also consumed more silver in 1993, but the growth rate slowed consid-



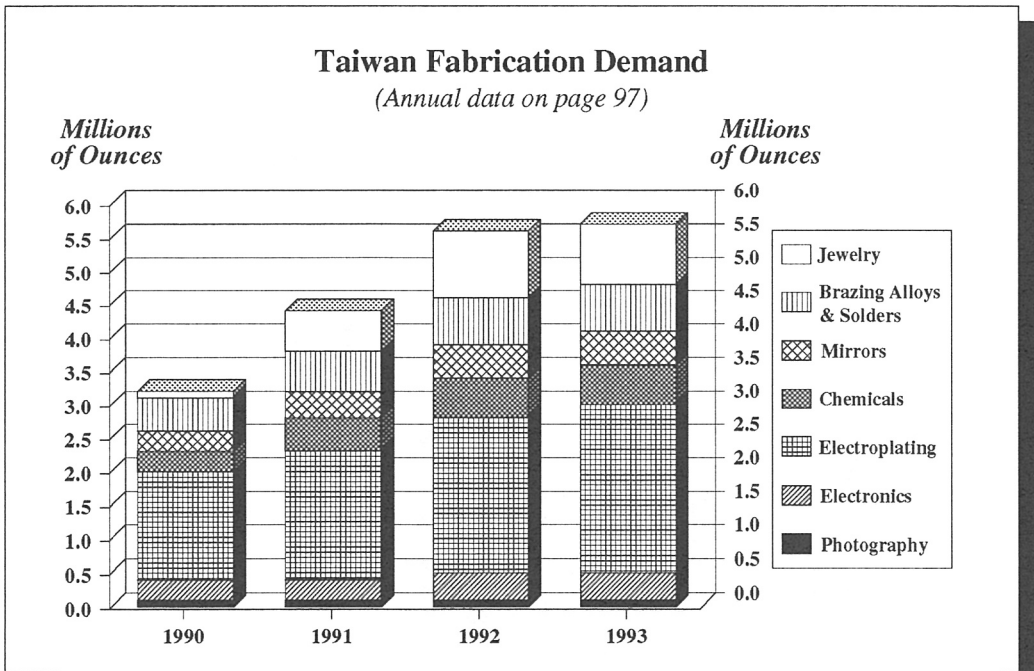
erably. Fabrication demand stood at 5.6 million ounces, an increase of 2.2% from 5.5 million ounces in 1992 when silver use rose 23%. Electroplating for both electronics and decorative products remains the largest market for silver in Taiwan, accounting for 44.6% of total demand. This sector was the only one requiring more metal in 1993. Silver use in electroplating increased 8.7% to 2.5 million ounces. Jewelry manufacturers required 10% less silver, around 0.9 million ounces, while use in other applications was unchanged.

Last year fabrication demand in *Hong Kong* rose 7.5% to 4.9 million ounces from 4.6 million ounces in 1992. The electronics sector still is the largest user of silver in Hong Kong, taking 2.9 million ounces in 1993, up 3.6% from the pre-

vious year. Jewelry demand grew at a more rapid rate, reaching 1.4 million ounces, 7.7% higher than in 1992. Silver-plate and decorative products absorbed 0.4 million ounces, up more than 33%. Silver use in mirrors and other applications rose 50% to 0.3 million ounces. Fabrication demand in Hong Kong is expected to trend upward over the next few years, but at a more modest 2%-5% rate, as manufacturers expand into mainland China.

*Silver Use in Latin America*

Little is said or written about silver use in Latin America. Over the last several years a better statistical portrait and overall understanding of the Mexican silver market has emerged. Additionally, CPM





Group has been researching demand levels and trends in the rest of the region.

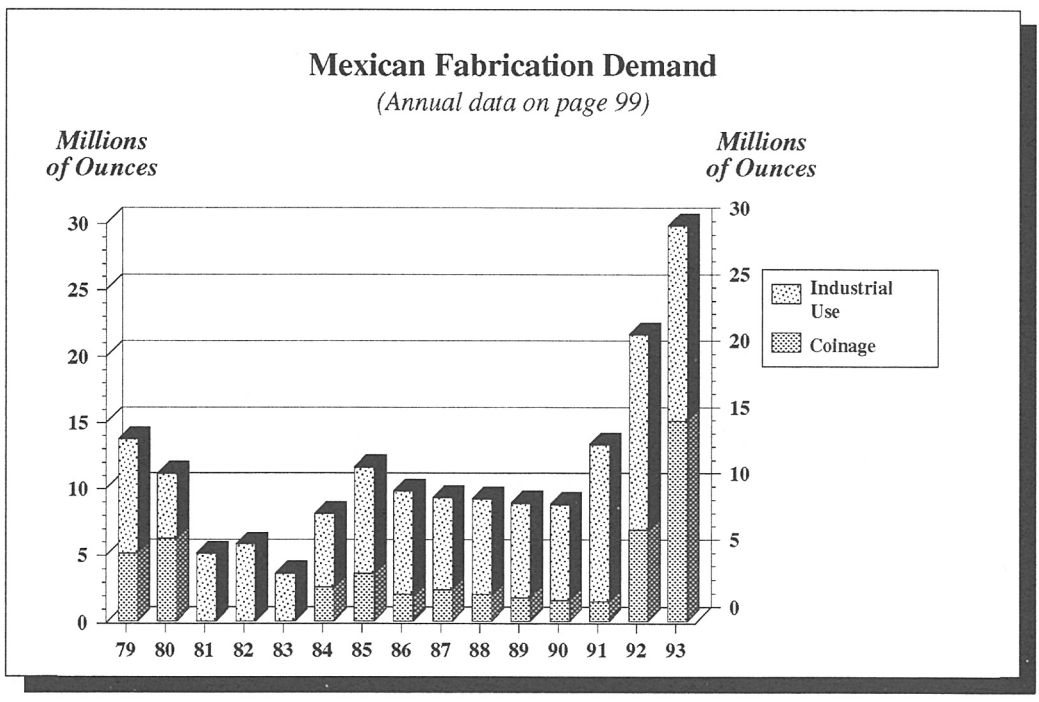
There are relatively small amounts of silver being used in measurable markets in Latin America.

Additional undetermined amounts of silver are being used in so-called "indigenous markets." By this, we are referring to silver that is either mined from small, informal operations or, more often, recovered from old scrapped jewelry and decorative items. This silver is remelted, not even actually refined, by local remelters, and then is sold back into the local market for use by jewelers and silver-smiths. This silver never appears in the international market. These markets tend to be self-sufficient, with supply and fabrication essentially in balance.

The role of imports of semi-fabricated and fabricated products from other regions, where it is measured, also is important in determining Latin American silver use. In jewelry and sterlingware, this means the importation of silver sheet, wire, and other semi-fabricated forms for use by local manufacturers. In electronics, it means the importation of contacts and connectors bearing silver manufactured overseas.

There also is a vibrant trade in fabricated products, including jewelry and sterlingware, and photographic materials.

Some 33.0-40.0 million ounces per year of silver bullion now is being used in Latin America in "measurable" markets. Much of this is in Mexico, with additional volumes in Peru and Brazil. Smaller



amounts are used in other countries, including Venezuela, Argentina, and Chile. Another 20.0 to 30.0 million ounces of silver may be locally recycled and re-used throughout the region each year.

As mentioned above, much of the measurable silver use in Latin America occurs in *Mexico*. Total Mexican silver demand rose 38.1% in 1993 to 29.7 million ounces from 21.5 million ounces in 1992.

Silver use in industrial applications was unchanged at 14.7 million ounces. Of that total, the largest amount, some 8.1 million ounces, was used in photographic products. Jewelry and decorative objects absorbed another 4.4 million ounces, while electronics and electrical contacts used around 2.2 million ounces. Coinage has become important in Mexico, with the introduction in late 1992 of silver-bearing New Peso circulating coins. Some 6.8 million ounces of silver were used in Mexican coins in 1992. In 1993 around 15.0 million ounces was used, up 121% from the previous year.

*Peruvian* silver demand levels have fallen sharply over the past few years, from 2.6 million ounces in 1990 to around 0.4 million ounces in 1992. Silver consumption rebounded to 0.5 million ounces last year. Jewelry manufacturing accounts for more than 90% of silver use in Peru, with demand from that sector rising 44% to nearly 0.5 million ounces last year.

**South Korean Fabrication Demand***Million Troy Ounces*

	<b>1989</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>
Decorative/Sterling	4.3	4.5	5.1	4.8	5.0
Electronics	0.0	0.0	0.6	0.5	0.8
Chemicals	0.0	2.2	3.2	3.2	3.7
Mirrors	0.0	0.0	0.0	0.0	0.0
Brazing Alloys	1.0	0.1	0.2	0.3	0.5
Jewelry	0.0	0.0	0.2	0.2	0.5
<b>Total</b>	<b>5.4</b>	<b>6.8</b>	<b>9.4</b>	<b>9.1</b>	<b>10.5</b>
<i>% Change Year Ago</i>	—	27.4	36.7	-3.1	15.8

**Notes:** Totals may not equal sums of categories due to rounding.

**Sources:** *Trade sources, CPM Group*

**Taiwan Fabrication Demand**

*Million Troy Ounces*

	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>
Photography	0.1	0.1	0.1	0.1
Electronics	0.3	0.3	0.4	0.4
Electroplating for				
electronics and decorative	1.6	1.9	2.3	2.5
Chemicals	0.3	0.5	0.6	0.6
Mirrors	0.3	0.4	0.5	0.5
Brazing Alloys and Solders	0.5	0.6	0.7	0.7
Jewelry	0.1	0.6	1.0	0.9
<b>Total</b>	<b>3.2</b>	<b>4.5</b>	<b>5.5</b>	<b>5.6</b>
<i>% Change Year Ago</i>	—	40.5	23.0	2.2

**Notes:** Totals may not equal sums of categories due to rounding.

**Sources:** Trade sources, CPM Group.

**Hong Kong Fabrication Demand**

*Million Troy Ounces*

	1985	1986	1987
Jewelry	0.9	0.9	0.9
Silverplate/decorative	0.2	0.2	0.2
Electronics	1.9	1.9	1.9
Mirrors/other	0.2	0.2	0.2
<b>Total Demand</b>	<b>3.2</b>	<b>3.1</b>	<b>3.1</b>
<i>% Change Year Ago</i>	—	-3.0	-1.0
	<b>1988</b>	<b>1989</b>	<b>1990</b>
Jewelry	0.8	0.9	0.9
Silverplate/decorative	0.2	0.2	0.2
Electronics	1.8	1.8	1.9
Mirrors/other	0.1	0.2	0.2
<b>Total Demand</b>	<b>3.0</b>	<b>3.1</b>	<b>3.2</b>
<i>% Change Year Ago</i>	-4.2	3.3	5.3
	<b>1991</b>	<b>1992</b>	<b>1993</b>
Jewelry	1.0	1.3	1.4
Silverplate/decorative	0.3	0.3	0.4
Electronics	2.2	2.8	2.9
Mirrors/other	0.2	0.2	0.3
<b>Total Demand</b>	<b>3.7</b>	<b>4.6</b>	<b>4.9</b>
<i>% Change Year Ago</i>	15.0	24.4	7.5

**Notes:** Totals may not equal the sums of categories due to rounding.

**Sources:** *Hong Kong trade sources, CPM Group.*

**Mexican Fabrication Demand**

*Million Troy Ounces*

	1982	1983	1984	1985	1986	1987
<b>Industrial</b>						
Photography	3.2	2.0	3.1	4.5	4.3	3.9
Jewelry and Decorative	1.7	1.0	1.6	2.3	2.2	2.0
Electronics and Electrical Contacts	0.9	0.5	0.8	1.2	1.2	1.0
<b>Subtotal</b>	<b>5.7</b>	<b>3.5</b>	<b>5.5</b>	<b>8.0</b>	<b>7.7</b>	<b>6.9</b>
<i>% Change Year Ago</i>	—	-38.6	57.1	45.5	-3.8	-0.1
Coinage	0.0	0.0	2.5	3.5	2.0	2.3
<i>% Change Year Ago</i>	—	NM	NM	40.0	-42.9	0.2
<b>Total Fabrication Demand</b>	<b>5.7</b>	<b>3.5</b>	<b>8.0</b>	<b>11.5</b>	<b>9.7</b>	<b>9.2</b>
<i>% Change Year Ago</i>	—	-38.6	128.6	43.8	-15.7	-0.1
	1988	1989	1990	1991	1992	1993
<b>Industrial</b>						
Photography	4.0	4.0	4.0	6.6	8.1	8.1
Jewelry and Decorative	2.1	2.1	2.1	3.4	4.4	4.4
Electronics and Electrical Contacts	1.0	1.1	1.1	1.8	2.2	2.2
<b>Subtotal</b>	<b>7.1</b>	<b>7.1</b>	<b>7.2</b>	<b>11.8</b>	<b>14.7</b>	<b>14.7</b>
<i>% Change Year Ago</i>	2.9	0.0	1.4	63.2	25.1	0.0
Coinage	2.0	1.7	1.5	1.5	6.8	15.0
<i>% Change Year Ago</i>	-13.0	-15.0	-11.8	-3.3	369.0	120.6
<b>Total Fabrication Demand</b>	<b>9.1</b>	<b>8.8</b>	<b>8.7</b>	<b>13.2</b>	<b>21.5</b>	<b>29.7</b>
<i>% Change Year Ago</i>	-1.1	-3.3	-1.1	51.7	62.9	38.1

**Notes:** Totals may not equal the sums of categories because of rounding. NM — Not Meaningful.

**Sources:** *Industry sources, CPM Group.*

**Peruvian Silver Fabrication Demand***Million Troy Ounces*

	<b>1989</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>
Jewelry	1.2	2.4	0.7	0.3	0.5
Silverplate/ Decorative	0.1	0.3	0.1	0.0	0.1
<b>Total</b>	<b>1.4</b>	<b>2.6</b>	<b>0.8</b>	<b>0.4</b>	<b>0.5</b>
<i>% Change Year Ago</i>		<i>92.0</i>	<i>-69.5</i>	<i>-56.0</i>	<i>45.5</i>

**Sources:** *Centromin, CPM Group.*

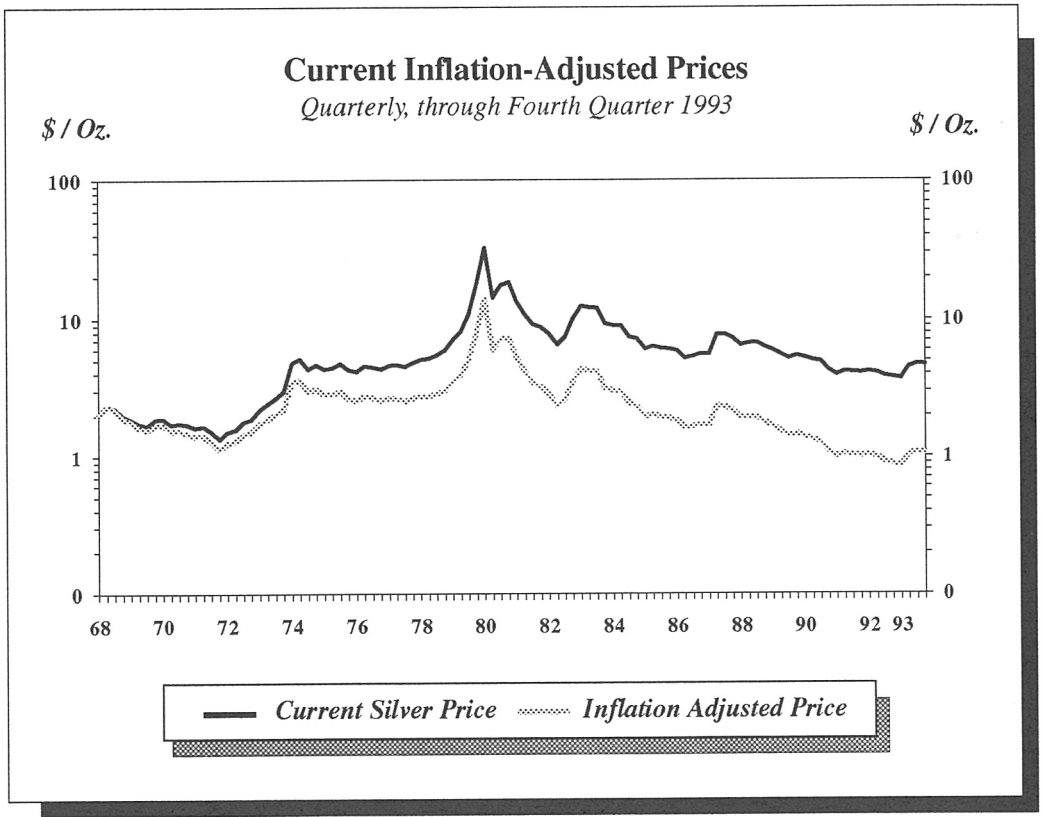
## INVESTMENT DEMAND AND INVENTORIES

The diverging trends in the investment market continued in 1993. Stronger demand for coins and small bars from funds, institutions, and large individual investors supported the move to higher prices, while small investors forcefully re-entered the market periodically. Meanwhile, disposals of pre-1983 investor stocks and some dealer inventories continued.

Despite the price rally that began last March, silver prices remained low in real and nominal terms. As a result a significant amount of pent-up demand from in-

vestors found its way back into the market. Coin and bullion dealers reported strong physical and futures sales to individual investors as prices fell in the middle of September, with investors taking advantage of the buying opportunities that the new low silver prices offered. In fact, coin and bullion dealers reported heavy demand during several major price retracements in 1993, with investors using these brief price dips as occasions to add to their physical holdings.

Overall, investors remained net sellers of silver on a net basis, however. Firm fig-





ures are not available, with sales by bullion dealers of market stocks making it difficult to assess how much silver actually entered the market from investor inventories. It is clear, however, that the level of investor selling declined in 1993.

Since 1990 much of the gap between supply and fabrication demand has been met by disposals of silver bullion acquired between 1979 and 1989. Now the holders of this silver appear more willing to wait to sell, with the expectation that silver prices are rising.

Last year also saw a trend toward large institutional investors become increasingly involved in the futures, options, and physical markets for silver. This trend is at least partly reflected in futures market statistics. Trading volume on the New York Comex rose more than 28% last year, with the equivalent of 25.3 billion ounces changing hands over the course of the year. This was the highest level of activity since 1984. Year-end open interest stood at 578.9 million ounces, the highest level since 1979.

The resurgence in investment demand has not been limited to this sector. There has been fairly strong physical demand from investors in the Middle East, India, Europe, and the United States. Dealer stocks in London and Zurich reportedly were greatly depleted by late 1993, with a good deal of that silver having been shipped to Asian and Middle Eastern investors.

### *The Inventory Question*

The silver market remains dampened to some small extent by public comments suggesting that the fundamentals of silver were not supportive of higher prices, and alluding to enormous above-ground stocks of silver available to meet demand. These comments usually refer to a billion ounces of silver in such inventories.

That number derives from the cumulative supply demand balance, with most analyses taking as their starting point work appearing in the *WORLD SILVER SURVEY*.

The 1990 edition of the *WORLD SILVER SURVEY* pointed out that persistent supply surpluses between 1979 and 1990 led to a cumulative supply overhang of slightly more than one billion ounces. It noted that the silver stocks that remained from prior to 1979 were somewhat redundant, and appeared unlikely to be readily available to the market.

These inventories had not been sold when prices rose ten-fold, from \$5 to \$50, in 1979 and 1980, nor when silver prices fell more than 90% over the subsequent 13 years.

This would indicate these stocks were not particularly price sensitive, and thus could be considered to be relatively unavailable to the market at any price. In fact, some of this silver has been disposed of through estate sales in recent years, as the estates of the original purchasers in

the 1960s and 1970s have liquidated these holdings.

To calculate world stocks of bullion and quasi-bullion, the 1990 *WORLD SILVER SURVEY* suggested it was best to examine the cumulative supply/demand balance since 1979. This totaled around 1.1 billion ounces, as of 1990.

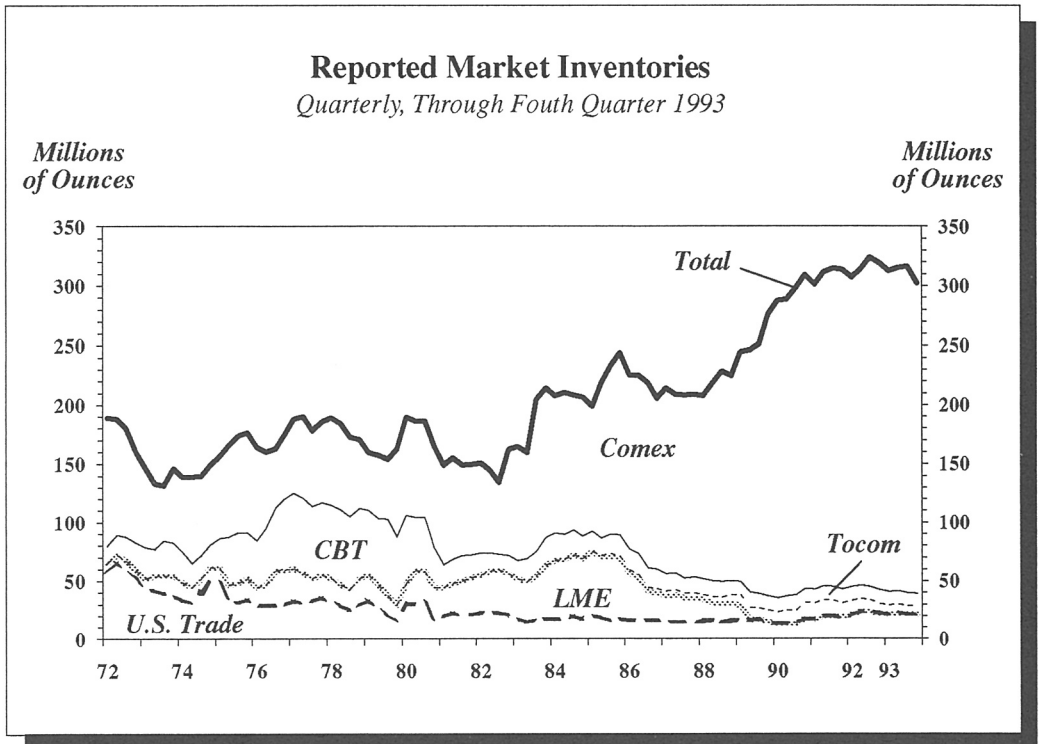
Over the past three years around 290.0 million ounces have been drawn down from inventories. This means that the total would have been closer to 810.0 million ounces by the end of 1993. The rate of diminution had been around 8% per annum over the past three years, accelerating over time. Stocks could be drawn down to less than 620.0 million ounces at

the end of this year, a 25% decline from the end of 1993.

*Reported Stocks are Falling*

Reported inventories (including Comex warehouse stocks, Tocom inventories, CBT stocks, and silver held by U.S. dealers, importers, and refiners) fell to 302.3 million ounces at the end of 1993, from 318.9 million ounces a year earlier. This trend continued through the first two months of 1994. Comex stocks fell from 263.1 million ounces at the end of December 1993 to 250.7 million at the end of February, a 4.7% decline.

Another way to measure inventories is to compare reported market stocks to an-

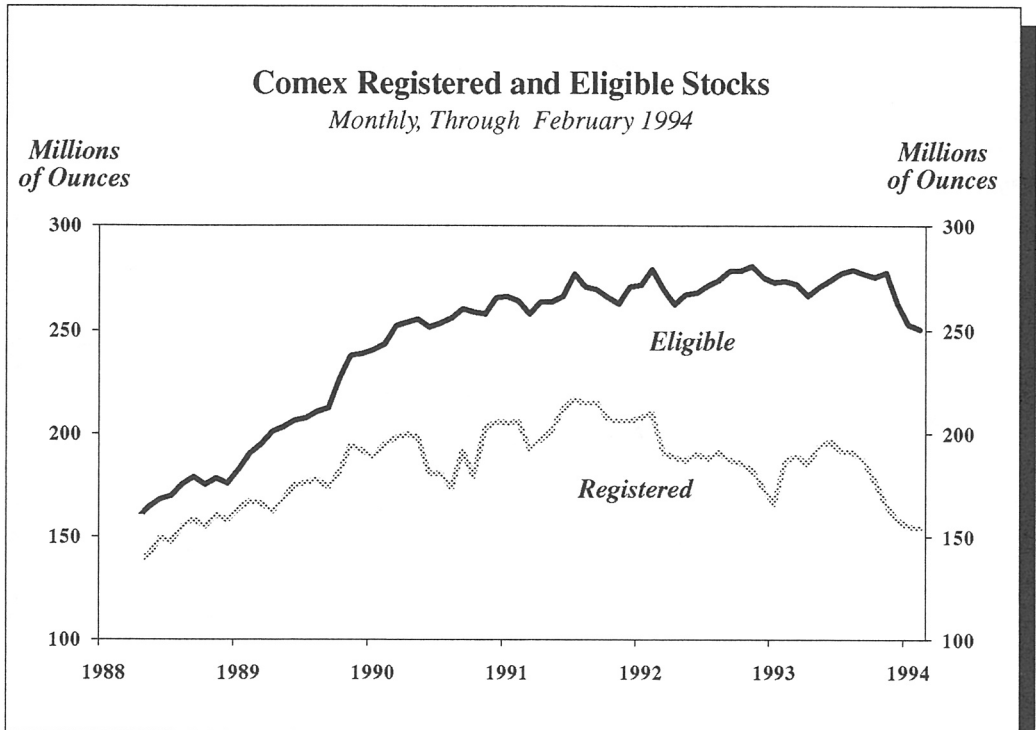


nual fabrication demand, expressing reported stocks as a percent of annual demand. The chart on the next page illustrates this. Total reported stocks rose from 30% - 40% of annual demand in the middle of the 1970s to more than 60% by the middle of the 1980s.

The numbers on a gross basis indicate that stocks remained between 50% and 60% between 1989 and 1992. These gross figures are skewed by the influx into reported stocks held in New York, beginning in 1988, of large volumes of private investor stocks. These stocks are counted by virtue of the fact that they are held in New York banks, but they should be excluded since, as investor holdings, they are not market stocks and are not

necessarily readily available to the market at near-current prices. These stocks are not registered with the Comex, but merely are stored in New York. There has been a shift in the location of silver holdings, away from Delaware and Europe to New York, by some investors. As a result of this shift, there are 96.5 million ounces of silver stored in New York by investors that appears in the total reported Comex silver inventory figure that is not actually registered with the Comex. This is up from 17.8 million ounces at the end of 1988.

Adjusting for these stocks, reported market inventories have fallen steadily relative to fabrication demand since the middle of the 1980s. Currently reported



market inventories are equivalent to less than 30% of annual fabrication requirements for silver, the lowest level since 1973, as the chart below shows. Even total reported stocks, including the investor inventories in New York banks, have fallen and now equal just 42% of silver use, the lowest level since 1982.

*Dealer Stocks Decline*

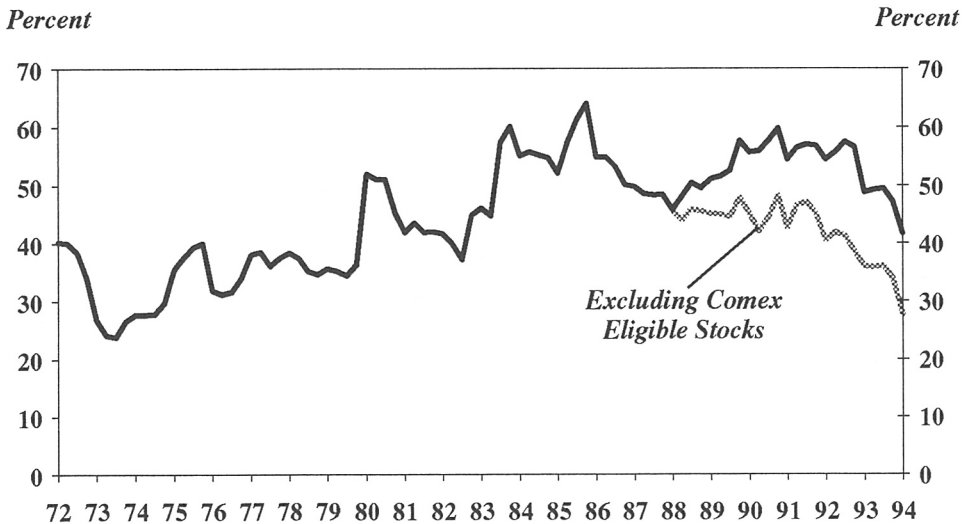
Meanwhile, as investors have grown more reluctant to sell their stocks at current prices, unreported dealer stocks have played an increasing role in meeting fabricator needs. In addition to investor buying, a good deal of silver went into dealer stocks in the 1980s, which were hedged with futures contracts. In the past two

years much of these dealer stocks have been drawn down.

By early November 1993 banks in London were reporting extremely low stock levels. Some of the silver they formerly held continues to be owned by investors, who added to their stocks and repatriated their holdings to the Middle East or Asia from Europe. A sizable amount of this silver also found its way to fabricators in India. Other stocks have shifted from London to Zurich, New York, or other major market centers.

**Market Inventories as a Percent of Industrial Demand**

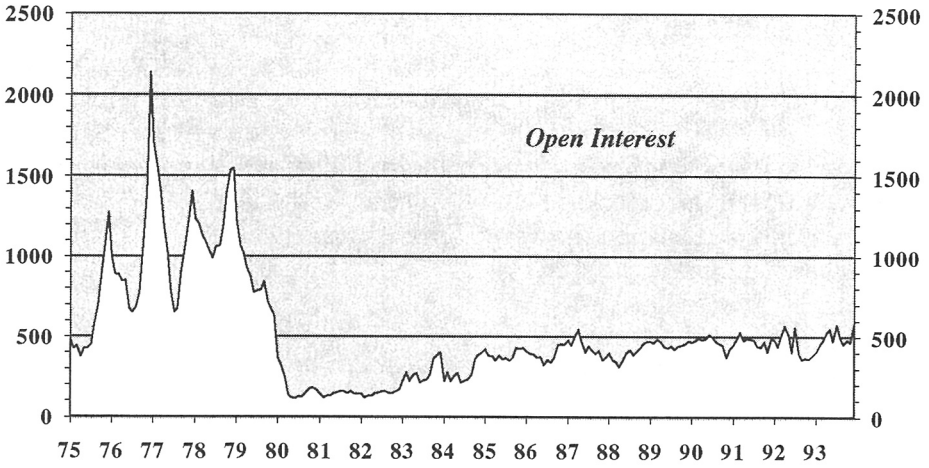
*Through February 1994*



## New York Commodity Exchange Activity Through December 1993

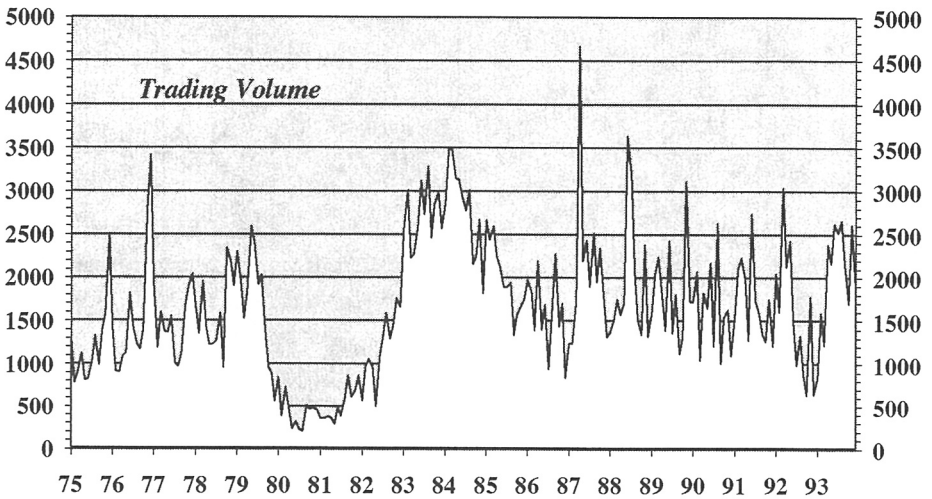
Millions  
of Ounces

Millions  
of Ounces

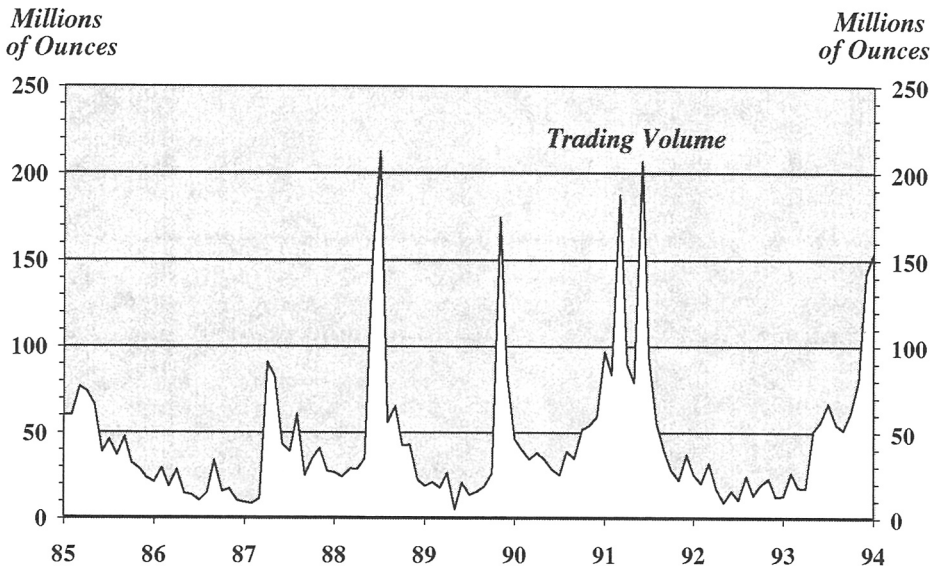
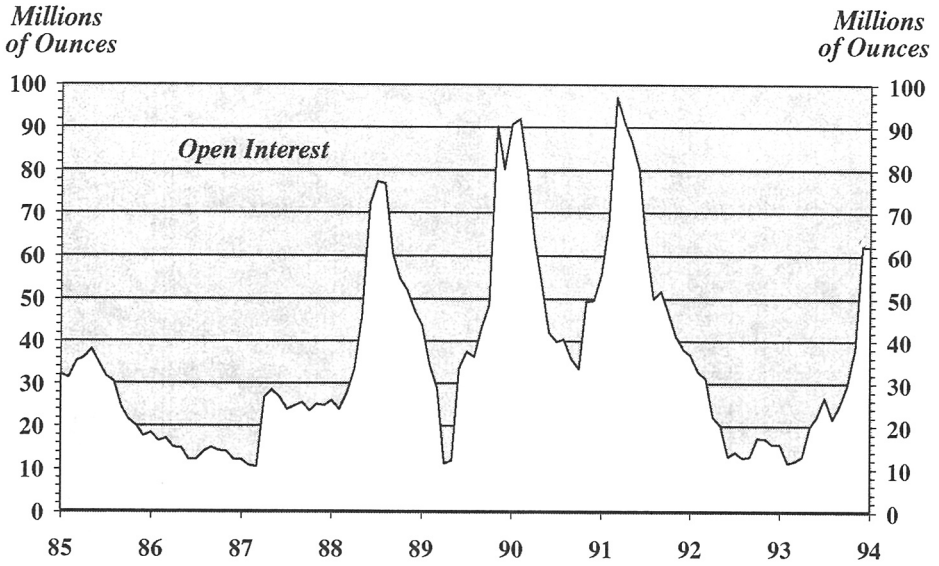


Millions  
of Ounces

Millions  
of Ounces



### Tokyo Commodity Exchange Activity Through January 1994



**Reported and Unreported Silver Holdings***Million Troy Ounces*

	Reported Stock Levels				Year-to-Year Changes		
	Gov't.	Market		Total	In Market Stocks	In Unreported Stocks	Total
		Exchange	Dealer				
1970	357.7	135.0	82.2	574.9	NA	NA	NA
1971	311.9	135.7	57.1	504.7	-24.4	-9.6	-34.0
1972	333.6	107.9	51.9	493.4	-33.0	-61.6	-94.6
1973	277.2	108.0	38.4	423.6	-13.4	-114.6	-128.0
1974	319.2	99.5	49.3	468.0	2.4	-53.4	-51.0
1975	250.8	142.0	34.6	427.4	27.8	-31.9	-4.1
1976	257.0	144.3	30.6	431.9	-1.7	-16.1	-17.8
1977	319.0	149.8	35.6	504.4	10.5	-59.6	-49.1
1978	318.8	141.1	29.0	488.9	-15.3	-41.8	-57.1
1979	314.6	146.2	16.1	476.9	-7.8	33.6	25.8
1980	326.5	148.1	17.0	491.6	2.8	204.4	207.2
1981	322.5	128.7	20.7	471.9	-15.7	130.0	114.3
1982	321.5	141.4	20.7	483.6	12.7	67.9	80.6
1983	302.5	196.6	17.7	516.8	52.2	110.2	162.4
1984	286.5	189.2	17.1	492.8	-8.0	93.7	85.7
1985	273.5	227.0	17.1	517.6	37.8	43.6	81.4
1986	259.5	189.2	16.3	465.0	-38.6	47.0	8.4
1987	239.5	193.3	15.0	447.8	2.8	38.4	41.2
1988	231.6	209.4	15.2	456.2	16.3	7.2	23.5
1989	220.6	261.1	14.6	496.3	51.1	-43.8	7.3
1990	209.6	291.9	17.1	518.6	33.3	-74.5	-41.2
1991	198.1	294.9	18.7	511.7	4.6	-87.8	-83.2
1992	190.0	297.1	21.8	508.9	5.3	-97.0	-91.7
1993	178.8	281.3	21.0	481.1	-16.6	-190.9	-207.5

**Notes:** Changes in total stocks represents the change in the supply/demand balance of new metal. Market stocks include reported U.S. dealer inventories and exchange registered stocks. New York Commodity Exchange stocks also include eligible stocks. Changes in unreported stocks is the change in the supply/demand balance of new metal, adjusted for changes in reported inventories. End of year data.

**Sources:** *U.S. Bureau of the Mint; U.S. Bureau of Mines; New York Commodity Exchange; London Metal Exchange; Chicago Board of Trade; Tokyo Commodity Exchange; CPM Group.*

**Silver Futures Exchange Activity***Million Troy Ounces*

	Trading Volume				Open Interest			
	Comex	CBT	Tocom	Total	Comex	CBT	Tocom	Total
1970	3,468.5	1,813.1	—	5,281.6	230.9	191.2	—	422.1
1971	3,081.2	2,520.5	—	5,601.7	245.5	366.7	—	612.2
1972	4,074.5	3,770.2	—	7,844.7	327.8	544.7	—	872.5
1973	6,189.3	8,153.0	—	14,342.3	428.0	981.6	—	1,409.6
1974	6,829.6	7,314.0	—	14,143.6	658.4	623.5	—	1,281.9
1975	14,511.6	9,763.5	—	24,275.1	1,276.4	864.5	—	2,140.9
1976	18,709.5	10,055.2	—	28,764.7	2,138.7	680.3	—	2,819.0
1977	17,700.2	11,285.3	—	28,985.5	1,404.9	1,409.8	—	2,814.7
1978	19,110.4	13,289.2	—	32,399.6	1,549.0	1,343.9	—	2,892.9
1979	20,403.1	13,602.9	—	34,006.0	636.8	468.7	—	1,105.5
1980	5,293.7	1,705.2	—	6,998.9	166.2	143.1	—	309.3
1981	6,203.6	1,257.3	—	7,460.9	140.0	56.3	—	196.3
1982	14,188.1	1,163.6	—	15,351.7	169.0	34.8	—	203.8
1983	32,619.9	2,750.5	—	35,370.4	301.7	32.4	—	334.1
1984	33,712.5	1,887.3	—	35,599.8	401.5	26.8	—	428.3
1985	24,106.0	1,034.8	591.1	25,731.9	430.7	18.5	17.6	466.8
1986	19,248.4	511.2	227.1	19,986.7	449.1	12.7	12.3	474.1
1987	25,278.3	597.0	473.2	26,348.5	371.2	11.2	24.8	407.2
1988	23,323.3	502.4	740.2	24,565.8	470.0	13.5	47.2	530.7
1989	21,833.1	266.7	420.8	22,520.6	474.2	9.7	80.2	564.1
1990	19,568.5	192.0	486.4	20,246.9	421.7	10.9	49.8	482.3
1991	20,773.5	117.5	1,020.1	21,911.1	488.8	6.1	38.0	532.9
1992	18,941.6	55.1	223.6	19,220.3	381.3	6.1	15.7	403.2
1993	24,279.6	94.3	639.9	25,013.8	578.9	7.0	62.1	648.0

**Notes:** Trading volume is the total for the year. Open interest is year end.

**Sources:** *New York Commodity Exchange, Chicago Board of Trade, Tokyo Commodity Exchange.*





## PRICES

Last year the price of silver traded between \$3.52 and \$5.44, and averaged \$4.30, up 9.4% from \$3.93 in 1992.

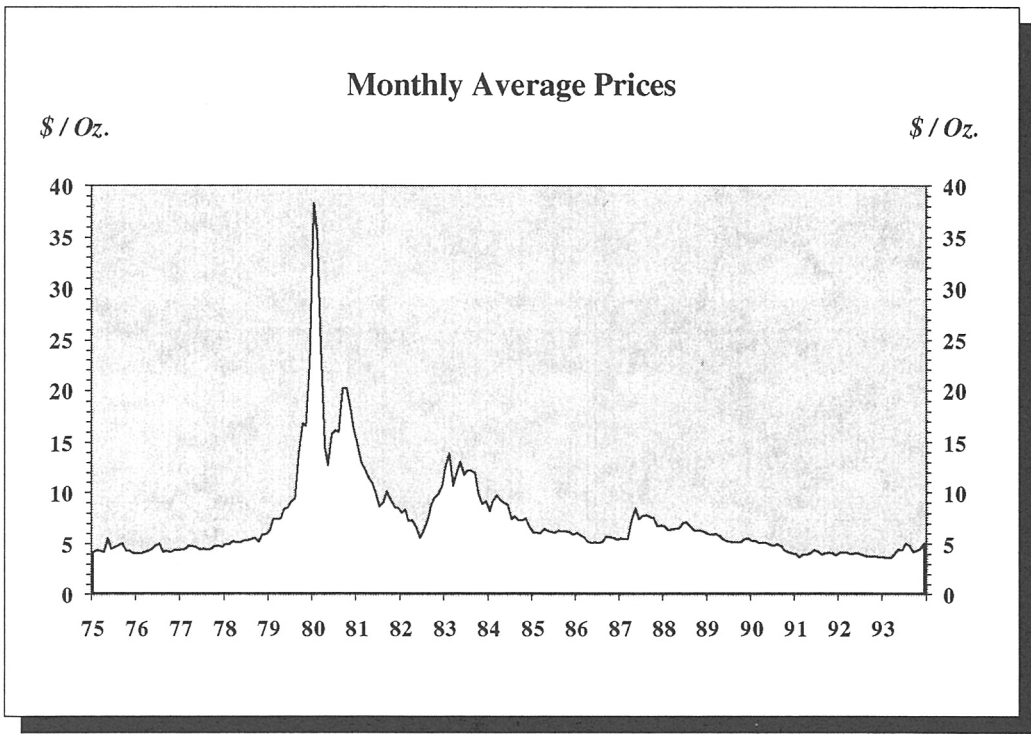
Silver prices rose 55% from \$3.52 in February of 1993 to \$5.46 in February of 1994, their highest level since December of 1989. There are clear signs that the silver market has moved into a period of higher prices.

The rally that began in March 1993 has been accompanied by several sharp, brief price retracements, with silver dropping below \$4.00 for a short time last September. These sell-offs have been relatively short in duration.

### *A More Volatile Market*

Volatility, measured here as the range between high and low prices as a percentage of the low, rose sharply after the first quarter of last year. The increasingly volatile market attracted investors back to silver.

In the second quarter of 1993 silver price volatility increased to 7.6% from 4.8% during the previous period. Volatility peaked at 18% in the third quarter, the highest level since the second quarter of 1987. Silver prices traded in a somewhat narrower band in the final quarter of last year, and volatility declined to 11.8%. In



the first two months of 1994 volatility cooled off to 6.5%.

During 1993, the range between the high and low prices was \$1.92, compared with 39.6 cents the previous year.

*Silver and Gold*

Some traders and investors continue to follow the relationship between gold and silver prices.

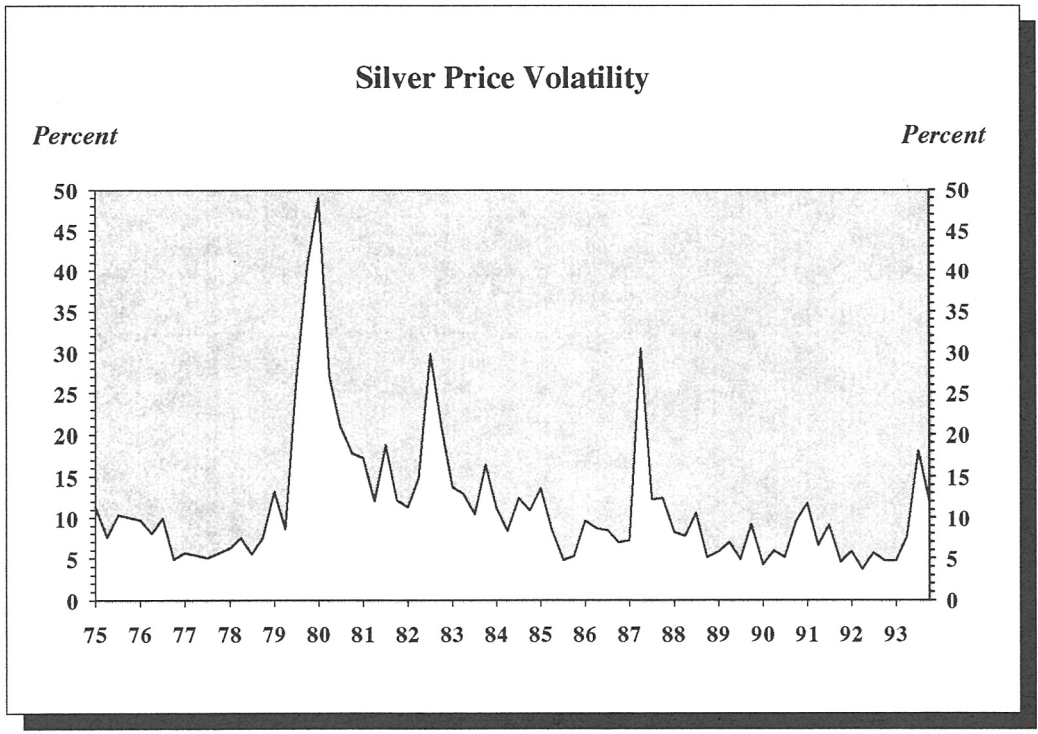
Last year this ratio narrowed, a trend that persisted in January and February of 1994. In March of 1993 the ratio between gold and silver prices stood at 91:1. By December the ratio had fallen to 77:1. This February the ratio between gold and

silver moved to 72:1, the lowest since November of 1989.

*Economic Factors*

There is little statistical correlation between economic indicators and silver prices, although shifts in interest rates, consumer prices, and currency values are followed with varying degrees of attention by investors.

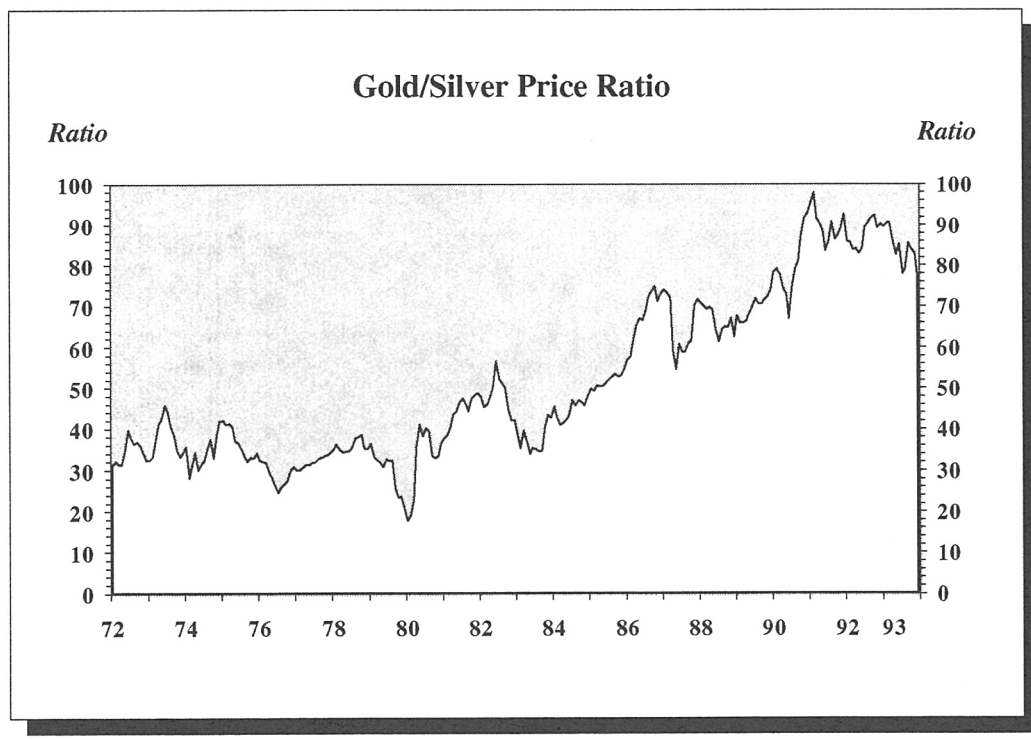
In fact, inflationary concerns were a factor in drawing some investors back to the silver market over the past two years, especially in Asia, where silver often is regarded as a surrogate for gold. These worries played less of a role in spurring investor interest in 1993.



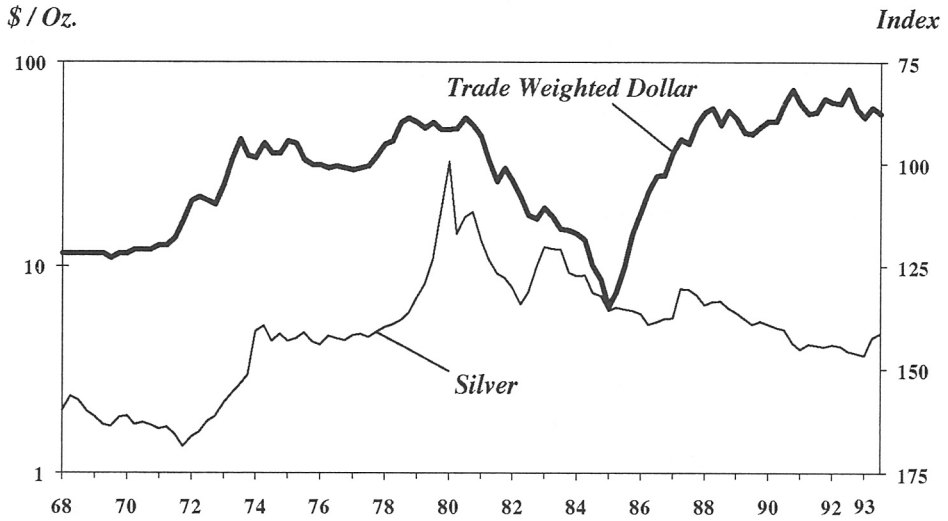
There is little relationship between silver prices and changes in U.S. consumer prices, however. Econometric studies show a 1.3% statistical correlation between silver and shifts in the U.S. Consumer Price Index over the past two years.

Meanwhile, there is no measurable statistical relationship between silver prices and nominal U.S. interest rates. Inflation-adjusted interest rates have been inversely related to silver prices since 1980, however.

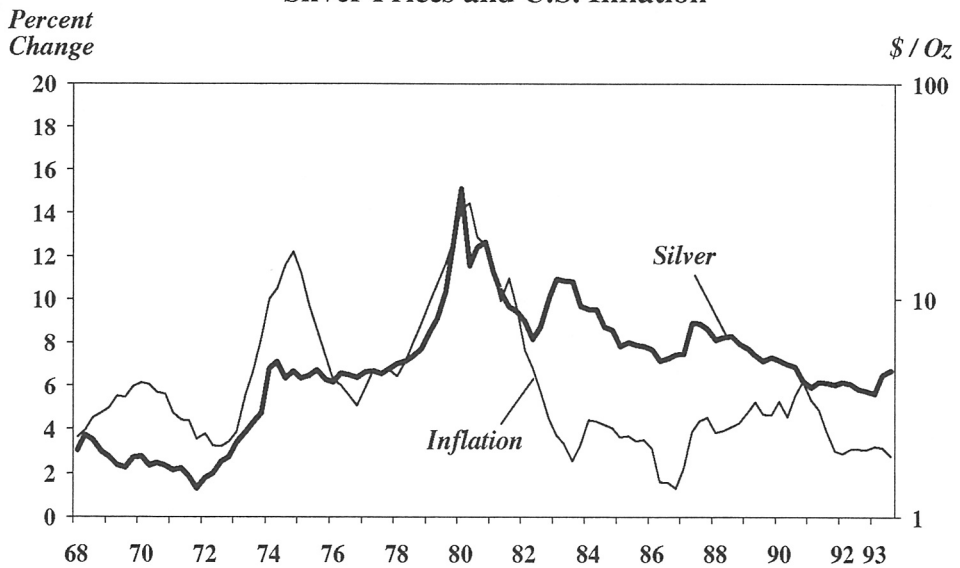
The correlation between silver prices and fluctuations in the trade-weighted U.S. dollar has been somewhat stronger during the same period, running at around 2.9%. This still is a statistically weak association. Additionally, exchange rate fluctuations periodically have affected silver investment demand in individual countries.



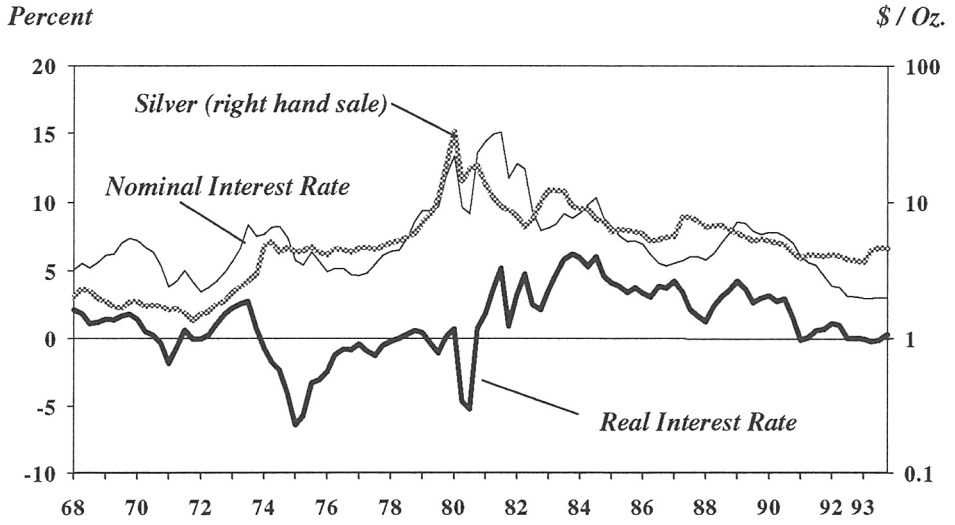
### Silver Prices and the Trade Weighted Dollar



### Silver Prices and U.S. Inflation



### Silver Prices and U.S. Interest Rates



**Monthly Average Silver Prices**

*Comex Spot Settlement Price*

	<b>1977</b>	<b>1978</b>	<b>1979</b>	<b>1980</b>	<b>1981</b>	<b>1982</b>
January	\$4.41	\$4.94	\$6.25	\$38.28	\$14.78	\$8.03
February	4.54	4.94	7.43	35.28	12.97	8.29
March	4.85	5.28	7.42	23.95	12.35	7.23
April	4.78	5.11	7.49	14.45	11.48	7.28
May	4.69	5.13	8.40	12.69	10.90	6.66
June	4.44	5.31	8.54	15.82	9.96	5.61
July	4.50	5.35	9.18	16.15	8.63	6.20
August	4.45	5.49	9.40	16.00	8.99	7.15
September	4.54	5.57	14.02	20.20	10.05	8.74
October	4.77	5.19	16.85	20.18	9.27	9.51
November	4.83	5.88	16.59	18.61	8.54	9.82
December	4.71	5.93	22.81	16.28	8.47	10.62
<b>Annual</b>	<b>\$4.63</b>	<b>\$5.34</b>	<b>\$11.20</b>	<b>\$20.65</b>	<b>\$10.53</b>	<b>\$7.93</b>
<i>% Change Year Ago</i>	5.87	15.49	109.59	84.40	-48.99	-24.73
	<b>1983</b>	<b>1984</b>	<b>1985</b>	<b>1986</b>	<b>1987</b>	<b>1988</b>
January	\$12.51	\$8.20	\$6.11	\$6.07	\$5.54	\$6.73
February	13.83	9.17	6.07	5.86	5.49	6.33
March	10.66	9.69	6.03	5.64	5.43	6.43
April	11.76	9.24	6.46	5.22	7.36	6.46
May	13.02	8.97	6.27	5.11	8.44	6.55
June	11.73	8.73	6.18	5.15	7.43	7.03
July	12.13	7.41	6.11	5.05	7.72	7.12
August	12.14	7.65	6.26	5.21	7.81	6.70
September	11.89	7.28	6.20	5.69	7.61	6.35
October	9.85	7.30	6.20	5.67	7.56	6.29
November	8.88	7.50	6.13	5.57	6.71	6.29
December	9.14	6.65	5.88	5.37	6.79	6.13
<b>Annual</b>	<b>\$11.46</b>	<b>\$8.15</b>	<b>\$6.15</b>	<b>\$5.47</b>	<b>\$6.99</b>	<b>\$6.53</b>
<i>% Change Year Ago</i>	44.58	-28.90	-24.58	-11.06	27.84	-6.53
	<b>1989</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>
January	\$5.98	\$5.24	\$4.03	\$4.13	\$3.67	5.14
February	5.87	5.27	3.72	4.13	3.64	5.28
March	5.94	5.06	3.96	4.11	3.65	
April	5.78	5.05	3.97	4.03	3.97	
May	5.44	5.08	4.04	4.07	4.45	
June	5.28	4.90	4.39	4.05	4.37	
July	5.23	4.85	4.29	3.95	5.04	
August	5.18	4.97	3.93	3.79	4.80	
September	5.14	4.78	4.04	3.76	4.16	
October	5.14	4.34	4.10	3.74	4.34	
November	5.49	4.16	4.05	3.76	4.51	
December	5.52	4.08	3.91	3.71	4.99	
<b>Annual</b>	<b>\$5.50</b>	<b>\$4.82</b>	<b>\$4.03</b>	<b>\$3.93</b>	<b>\$4.30</b>	
<i>% Change Year Ago</i>	-15.84	-12.42	-16.21	-2.75	9.26	

Source: New York Commodity Exchange, Metals Week.

## SILVER IN THE C.I.S.

*The following section is based on work by Richard M. Levine, Central Eurasia Specialist at the U.S. Bureau of Mines.*

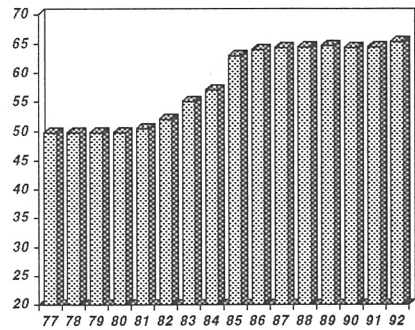
For many years the former Soviet Union was one of the world's leading producers and exporters of precious metals, including gold and platinum group metals. At the same time, the country was experiencing shortages of silver, requiring imports that at times reached about 9.65 million ounces annually. It also was one of the world's largest silver producers, with yearly output of over 64.0 million ounces.

This supply shortage has been exacerbated with the break-up of the Soviet Union. About 50% of Commonwealth of Independent States (C.I.S.) silver output comes from Kazakhstan, which can now exercise discretion in the amount of silver it exports to Russia. Russia's State Committee on Subsoil Resources (Roskomnedra) has warned that Russia faces a mounting shortage of silver, with potential demand exceeding output by as much as 25% in 1993.

The reason cited for this potential shortage was the disruption of shipments from Kazakhstan. To meet this short-fall, Roskomnedra has proposed an ambitious long term program of domestic silver production increases. However, in the face world silver market conditions, Russia will have to look closely at the economic trade-off between the price of domestic development and the cost of imports.

### Silver Production in the C.I.S.

Millions of Ounces



### Mine Output

Recent information from the C.I.S. indicates that the former Soviet Union and Mexico were the world's leading silver producers in the mid-1980s, followed by the United States, Peru, and Canada. When estimated geologic reserves are considered, the C.I.S. possessed 15.7% of the world total in 1992, more than any other single country.

Kazakhstan was the largest producer of C.I.S. silver in 1992, its 32.15 million ounces accounting for 49.1% of total mine output. Most of this silver is in the form of smelter residue from lead-zinc mining and processing operations at Ostkamen, Shymkent, and Leninogorsk.

Since the autumn of 1987, some silver-bearing material from Ostkamen and Shymkent also has been transported to



the Balkhash metallurgical center in Kazakhstan for further processing; previously Balkhash had focused entirely on the production of copper and other non-ferrous metals.

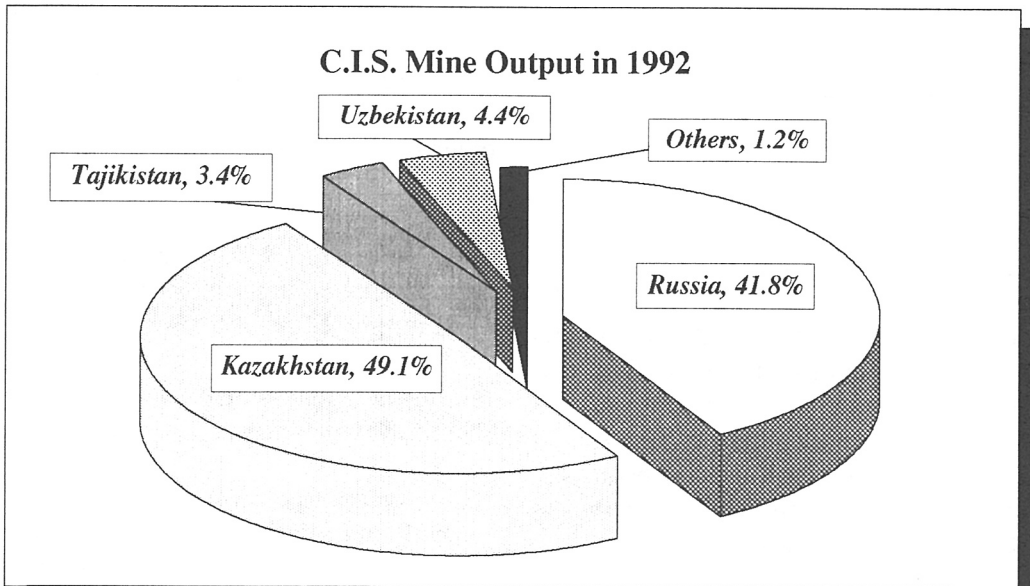
Russia produced 27.33 million ounces in 1992, representing 41.8% of C.I.S. silver output, although its reserves are considerably higher (38% of C.I.S. reserves compared with 25.9% for Kazakhstan). Although Russian deposits are widely scattered, the bulk of production is concentrated in relatively few locations. Three-quarters of mine output comes from complex metallic deposits, where silver is mined as a by-product, and most of the future development is expected to be from these sources.

Specific information regarding individual deposits in Russia is not generally available. However, it is possible to as-

certain the location of major producing areas. The Dukat gold-silver deposit, northwest of Omsukchan in Magadan, currently produces nearly 25% of Russia's silver. Plans now are underway to double output at Dukat.

The mining of poly-metallic ore accounts for approximately 50% of Russian silver output. A major source of this by-product silver is copper-nickel sulfide ore at the Norilsk-Talnakh complex in northern Krasnoyarsk Kray. This output is centered in the relatively more recently developed Talnakh district, at the Oktyabr' mine, rather than Norilsk proper.

Silver also comes from Russia's Far East lead-zinc mines (the Sikhote-Alin district of Primorskiy Kray), and from the Solnechnoye tin mines near Khabarovsk. Copper and other deposits in the Urals yield by-product silver as well.



The remaining 25% of Russian silver output occurs at silver-only vein deposits, scattered across the Okhotsk seaboard in the Chukchi region and in the eastern Sikhote-Alin range. Small deposits have been explored in Altay Kray and the Skha and Buryat republics, but it is not known whether any of these deposits are producing mines.

Silver production Tajikistan, Uzbekistan, and Armenia totaled 5.62 million ounces in 1992, accounting for around 8% of C.I.S. silver output. The Kanemansur mine in Tajikistan has been described as the "former Soviet Union's largest silver deposit" by Interfax Mining Report. This may be the case, as Tajikistan, although much smaller in area than Russia or Kazakhstan, accounts for 21.8% of C.I.S. reserves (308.39 million ounces). The country produced 2.25 million ounces of silver in 1992.

In Uzbekistan, silver is recovered as a by-product at the Almalyk copper-lead-zinc complex. Silver output at Almalyk totaled 2.89 million ounces in 1992. Reserves are estimated at 130.15 million ounces.

Armenia also recovers silver as a by-product, although actual production sites have not been revealed. Copper mines at Akhtaka and Shamlung, near the large, deactivated smelter at Alaverdi, were known to have produced silver as early as the ninth century. In 1992, Armenia produced 480,000 ounces, while reserves are put at 31.12 million ounces.

## Development Plans

Russia's State Committee on Subsoil Resources (Roskomnedra) has announced plans to revitalize Russia's silver supply pipeline through a program of accelerated exploration, mine development, and construction of ore treatment and refining facilities, coupled with international tenders intended to attract market economy investment.

Roskomnedra's immediate goal is to reduce imports of silver concentrate, refined silver, and fabricated silver products, mitigating the country's foreign exchange problems to a small extent, and more importantly lessening the likelihood of unexpected disruptions in supply if hard currency is unavailable or there are barter disputes.

Given the importance of outside investment as a source of funding for the silver development program, with repayment presumably in the form of the right to market a portion of the projects' output, the plan's viability must be assessed in terms of both the domestic and global silver markets. The major complication in Russia's silver strategy is the fact that most of the country's silver mine output is in the form of by-product recovery. Conditions in the copper, lead, zinc, and gold markets thus will play a crucial role in deliberations over the development of Russian silver-bearing deposits.

Silver demand in Russia and the other C.I.S. countries has remained relatively strong. Recycling is far less advanced

than in the market economies. Mine production in the C.I.S. thus is a much more important source of supply than it is in the industrialized countries.

*C.I.S. Silver Reserves*

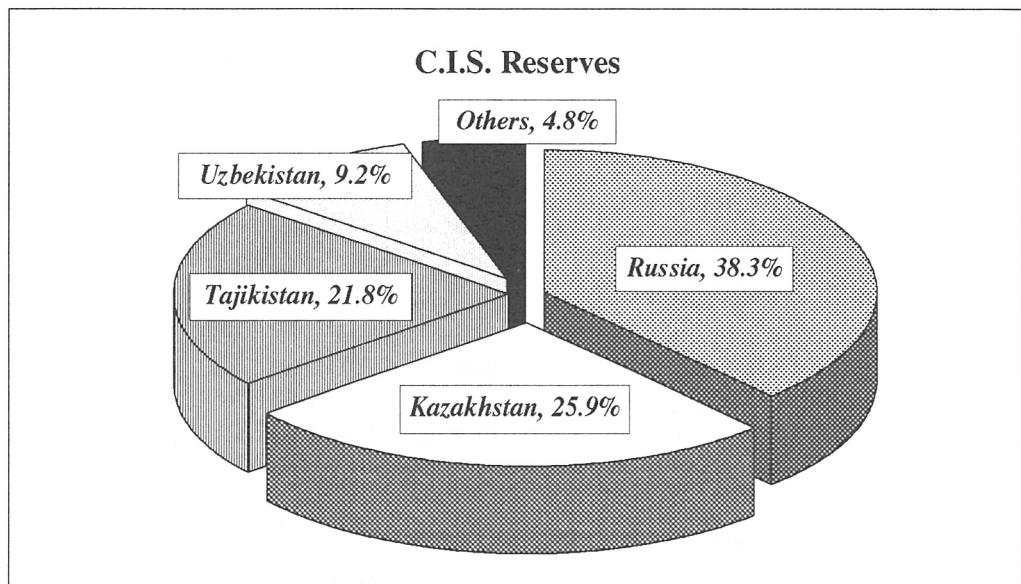
Russia's reported silver reserves are quite substantial, but the country faces the challenge of developing new deposits in remote areas with complex geology. It should be noted that the reserve figures shown here are based on the old Soviet system of reserve calculations, and do not necessarily correspond to market economy assessments, which are based on analyzing material economically exploitable under present market prices using best available technology.

For years miners at Norilsk-Talnakh, Gay, and Molodezhnyy have been recovering silver from deposits containing

three to five times more silver than average Russian ore grade. These higher-grade deposits are being depleted, and an increasingly large share of output is coming from lower-grade ore.

Around 56% of complex silver-bearing reserves are found in eastern Siberia. This region consists of the Norilsk-Talnakh copper sulfide depots, the Udokan copper deposit in Chita (east of Lake Baikal), and lead-zinc deposits in the Buryat republic (also east of Lake Baikal).

A second region in the Urals contains 24% of Russia's silver ore reserves, largely in copper and copper pyrite deposits at Gay, Uzelga, and Podolsk. The Russian Far East holds a further 9% of the country reserves, with silver-bearing ore in the Sikhote-Alin lead-zinc district and in various gold deposits scattered through



the area (at Nataalkino, Agat, Kubaka, Rodnik, Ametist, Dukat, and Karamken).

Roskomnedra has slated 23 complex silver-bearing deposits for priority development in the near future, including sites in Magadan, Khabarovsk Krai, the Sakha republic, and Primorskiy Krai. These projects would use existing Russian technology. The agency is committed to the speedy completion of the second section of the Dukat mining and processing complex.

Further, Roskomnedra has completed (or is contemplating) international tenders for developing several deposits with more complex geology or ore mineralogy the agency believes require more advanced technology for development. Among these deposits are the Mayskoye gold sulfide property in Chukhotka; the Nezhdanino gold-silver deposit in the Sakha republic; the Evenskoye gold-silver ore body, located in Magadan; the Pokrovskoye gold deposit, in Amur; the Tala-Too poly-metallic deposit, in Chita; the Sultanovo copper deposit in the Urals; and the Tarutino poly-metallic ore body, also located in the Urals. The first five prospective developments could produce 6.5 million ounces of silver annually. The Ural deposits contain reserves estimated at 12.4 million ounces.

Aside from possible new mine developments, significant amounts of silver could be leached from mine tailings at Russia's operating mines; currently no silver is recovered from tailings at the silver-rich Blayvinsk copper mine in Bu-

ryatia, the Khovu-Aksi poly-metallic mine in the Tuva republic, the Sherlovaya Gora tin mine in Chita, or the Sarylakh antimony mine in the Sakha republic.

Russia also must add significantly to its ore treatment and refining capacity. Prior to the break-up of the Soviet Union, Russia shipped 36% of its mine output for processing at the Balkhash, Ostkamen, and Shymkent facilities in Kazakhstan, 3% to Uzbekistan, and 1% to Armenia.

#### *Uncertain Prospects*

The chances that Russia's 'silver plan' will be achieved appear remote in the short run. The lack of contract law protection, and general social, political, and economic uncertainties have made foreign investors reluctant to pursue large-scale investments in Russia. Higher transportation costs to end-use markets, the need for infrastructure development, and political risks associated with the tenders issued by Roskomnedra also pose barriers to market economy investment. Still, some gold and high-grade copper deposits could attract foreign mining companies, resulting in a modest increase in silver output by the end of the decade.

Even this may not mean a net addition to Russian silver production, however. The amount of silver recovered as a by-product of operating gold and nonferrous mines will decline as a result of disrupted economic ties between C.I.S. countries, and the evaporation of capital for mine and plant maintenance and mine development.

**Silver Production and Reserves in the C.I.S. in 1992***Million Troy Ounces*

	<b>Production</b>	<b>% of Total</b>	<b>Reserves</b>	<b>% of Total</b>
Russia	27.33	41.8%	541.80	38.3%
Kazakhstan	32.15	49.1%	366.39	25.9%
Tajikistan	2.25	3.4%	308.39	21.8%
Uzbekistan	2.89	4.4%	130.15	9.2%
Armenia	0.48	0.7%	31.12	2.2%
Azerbaijan	NP	0.0%	32.54	2.3%
Kyrgyzstan	NP	0.0%	1.41	0.1%
Others	0.32	0.5%	2.83	0.2%
<b>Total</b>	<b>65.43</b>	<b>100.0 %</b>	<b>1,414.63</b>	<b>100.0 %</b>

**Notes:** *NP - No known production.***Sources:** *Interfax, U.S. Bureau of Mines, CPM Group.*







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