Copper

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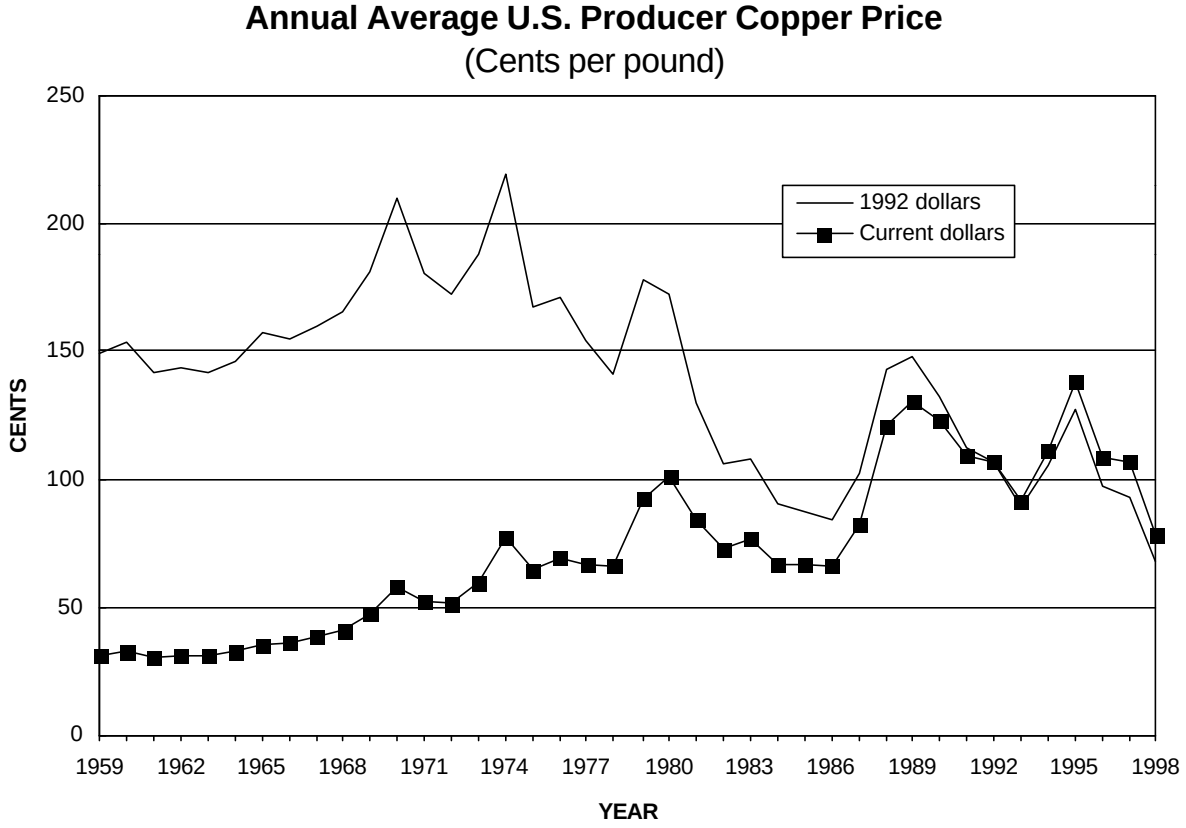

Significant events affecting copper prices since 1958

1959-60	6-month labor strikes cause tight supplies, 17% U.S. consumption growth in 1959 and export growth in 1960
1961-62	Record high production rates balanced by strong consumption
1963	Voluntary production cutbacks reduce oversupply and help stabilize prices
1964-66	Vietnam War begins, accompanied by strong demand growth and stockpile releases
1967-68	Longest, most severe strikes to date; Government stockpile releases, set aside programs, export controls, and production stimulus programs initiated to meet defense needs; formation of the Intergovernmental Council of Copper Exporting Countries (CIPEC)
1970-73	Continued high wartime demand; easing of export controls and set-asides; two-tier pricing generates Government concern; price controls limit rise; nationalization of U.S-owned Chilean properties; the Organization of Petroleum Exporting Countries (OPEC) oil embargo begins
1974	End of price controls and strong demand cause first-half price rise before second-half economic reversal; last stockpile release, 229,000 metric tons; fixed exchange rates abandoned
1975-77	Demand drops precipitously owing to recession, copper inventories rise to record levels, price volatility
1978-80	Record copper consumption and lower stock levels; rising precious metals prices; 5-month labor strike; beginning of Commodity Exchange, Inc. (COMEX)-based pricing
1981	Large growth in domestic and world production; rising inventories
1982-84	Recession; inventory buildup; U.S. production sharply curtailed; expansion of COMEX-based pricing
1985-86	Draw down of high copper inventories; cutback in capacity at U.S. mines; cost-cutting and efficiency moves
1987-89	Historically low inventories; growing world consumption; prices peak at $1.68 in December 1988

1990-92	Global supply constraints balance recession; dissolution of the Soviet Union and political turmoil in Africa; precarious supply/demand balance leads to price volatility
1993	Stagnant world demand and rising inventories; London Metal Exchange (LME) intervention in market causes sharp price drop in September
1994-95	Strong global demand growth, sharp inventory decline, record high annual price, LME opens U.S. warehouses
1996	Sumitomo Corp. reveals huge trading losses and prices plummet at midyear despite global inventory decline
1997-98	Asian economic crises and rapid expansion of global capacity combine to generate large global surplus

Historically, wirebar was the dominant form of copper traded, and the price for refined copper wirebar was the "bellwether" price for copper. By the middle 1970's, however, technology had changed to continuous casting and drawing of wire rod directly from refined cathode, thus bypassing the need to cast wirebar. Even though more than 50% of primary copper produced in the United States is traded as rod by integrated mine producers, the high-grade copper cathode price is used as the "base" price for most transactions (Jolly, 1991, p. 46).

About 70% of domestic primary refined copper is produced from a multistage process, beginning with the mining and concentrating of ores, and followed by smelting and electrolytic refining to produce a high-grade cathode. The other 30% is produced from acid leaching of copper ores and wastes and solvent extraction and electrowinning of refined copper from the pregnant solution. Though most domestic producers have a high degree of vertical integration, copper products from each stage of processing have their own independent markets and are traded globally. Each product has its own pricing procedure that is linked, for the most part, to its copper content and the market price for refined copper. For example, copper concentrates, which contain between 20% and 35% copper, are purchased on the basis of the refined copper market value of their recoverable copper content, with charges taken for smelting and refining. Penalties may be assessed by the smelter/refiner for unwanted contaminants or low grade, and credits may be given for recoverable byproducts. Even though the smelting and refining charges are driven by processing cost factors, they may fluctuate significantly according to the market balance for concentrates. Similarly, prices for copper scrap are discounted from the refined value of the recoverable copper content to allow for processing costs and profit. Though the discount from refined must be sufficient to account for processing costs, market conditions for each type of scrap will affect their prices.

Until the late 1970's, domestic copper prices were generally referenced to the U.S. producer price. The traditional U.S. producer price, which normally included a charge for delivery and insurance, was based on annually negotiated sales contracts, with prices changing at least quarterly. The producer price system offered stability and served the interests of both the producer and the consumer. Producer prices tended to be above commodity exchange prices during weak markets and below the exchange prices during high demand periods. During periods of tight supply, U.S. mills, most of which were producer-owned subsidiaries, were given allocations assuring them of reasonably priced supplies (Jolly, 1991, p. 46). Although the producer pricing provided stability for contract purchases, it created a two-tiered price structure, where spot purchases and exchange prices were significantly different from producer prices. During the peak demand period of the Vietnam War, 1964-69, the average LME spot price was $0.575 per pound, compared with only $0.38 for the domestic producer price.

Beginning with the nationalization of foreign production in Africa and Chile in the 1960's and early 1970's, the US. producers' influence on domestic and world markets weakened, and domestic producer pricing became more market sensitive, changing frequently to track global prices. Periods of surplus supply, which occurred from the mid-1970's to the mid-1980's also contributed to the decreased influence of U.S. producer prices on world markets as surplus supplies flowed to the exchanges. As a result, U.S. producers abandoned classic producer pricing, some in 1978 and others in the early 1980's, and changed to a COMEX-based pricing system. Using the first-position COMEX price as a base, producers now quote premiums that may include transportation and insurance costs (Jolly, 1991). The current producer price quoted reflects a weighted average of the delivered price of copper to domestic consumers by domestic producers. Since the adoption of COMEX-based pricing, the producer margin has averaged almost $0.05 per pound, generally increasing at times of low prices and decreasing during high prices. During the high-price period from 1994 to 1997, the producer premium averaged less than 4 cents per pound, and contrary to historical trend, remained at that level although prices fell in 1998.

While the traditional producer prices provided a buffer to price shifts, speculative influence on a COMEX-based pricing system can result in price volatility, especially during tight markets, such as from late 1987 through 1989 and 1995 through 1997. Periods of stock surpluses, such as from 1975 to 1987, and the current market tend to create greater price stability. In response to the greater volatility of COMEX-based pricing, producers and consumers have increasingly used futures markets to hedge their sales and purchases.

Strike periods that occur with expiration of labor contracts

have a significant effect on copper prices. The two 6-month strikes in 1946 and 1959, the 9-month strike in 1967-68, and the 5-month strike in 1980, were of particular significance. The 1967-68 strike had the most severe effect because it coincided with a period of high international demand occasioned by the Vietnam war and an unusually high period of worldwide economic growth. Government releases of stockpile material were used to alleviate shortages during each of these incidents, with the exception of the 1980 strike, which took place during a period of high commercial inventories and low Government stocks (Jolly, 1991, p. 47). Because more than 65% of world capacity comprises mines with outputs that are larger than 100,000 tons per year of copper, disruptions to production at any given large mine can affect prices. For example, from 1989 to 1991, a series of events tempered what might have otherwise been a modest oversupply period. These events included political insurgencies and labor strikes at foreign producers that closed a 180,000-ton-per-year mine in Papua New Guinea and severely reduced production in Zaire. The oversupply was further tempered by a smelter bottleneck that developed in late 1991 (Jolly, 1991, p. 47).

Governments' interventions in economic policies or directly in copper markets have had significant effects on copper prices. The U.S. Government has taken action during periods of war and national emergency to control prices and levy tariffs, to impose export quotas, to provide price supports, lend monies for expansion and exploration, to guarantee production purchases, and to buy and sell for the national stockpile. Most of these strategies , including the use of price controls (1971-74) were applied most recently during the Vietnam War. Beginning in the middle 1960's with the nationalization of copper mines in Chile, the Democratic Republic of the Congo (formerly Zaire) and Zambia, the world's private copper-mining industry (principally American) lost a significant share of its net equity and influence in copper and its ability to modulate production at times of surplus. In 1978 and 1983, which were periods of depressed copper prices, the U.S. industry unsuccessfully filed suit with the International Trade Commission to restrict imports of "low-priced" copper. Currency devaluations by copper-exporting counties also served to lower their costs to and maintain production levels. In 1967, the Inter-governmental CIPEC was formed. Its attempt to intervene in the depressed copper market in 1975 by limiting production of member countries to 90% of normal production and by reducing CIPEC-country copper exports by 15% was not fully observed and was unsuccessful in stimulating a price rise (Mikesell, 1979, p. 187-215).

Although the price of copper has been influenced by business cycles, government policy, and technological changes, production costs and the balance between supply and demand have ultimately been the principal determinants. The above influences, combined with the large capital investment and long lead times required to develop new mines, have, in recent decades, resulted in a highly cyclical copper industry. World mine production reached a peak in 1974 at the height of a major economic recession; this followed capacity growth stimulated by the high-demand war years. The resulting oversupply kept prices depressed for 4 years. Strong growth in consumption in the latter part of the 1970's led to tight supplies, high prices, and expansions in global capacity. When a sharp economic recession began in 1981, world mine production and capacity were again reaching peak levels. The resulting oversupply depressed prices for 5 years and resulted in the initial shutdown of about one-third of U.S. mine production. The large surplus and low prices discouraged new production and set the stage for the tight supplies and high prices that ensued from 1987 to 1992. There had been a 3-year shortfall in global production while overhanging inventories were worked off. The rise in price during 1987 was delayed by changing business practices, such as a shift to just-in-time inventories, and the expectations of new capacity. Large capital investments, particularly in the United States, had greatly increased worker productivity and allowed producers to regain profitability at the prevailing low prices.

World copper inventories began to rise in 1990 with the onset of a global recession and, except for a dip in 1992, continued to rise through most of 1993. Though relatively high by historical standards, copper prices declined as copper inventories rose. In 1992, a short-lived dip in inventories that was attributed to a bottleneck in smelter capacity caused prices to spike upward for several months before resuming their downward trend. Despite rising LME inventories, a second spike in prices occurred in mid-1993; a spot shortage of copper developed that was attributed to market control by several large market participants. Prices plummeted in September when the LME intervened to limit price backwardation (forward prices selling at a discount to spot prices).

Prices rose precipitously in 1994 following a strong growth in world demand, which had stagnated during the preceding 3 years, and development of a supply deficit. Beginning in 1994, numerous factors combined to stimulate a surge in new capacity development: a rapid growth in world demand fueled by the United States and Asia; changing political/investment climates, including increased government stability and privatization efforts, particularly in South America, made foreign investment more attractive; environmental restrictions made investment in North America less attractive; and companies sought to protect themselves from future downturns by investing in lower cost production. An anticipated surplus in production was delayed, in part, by higher-than-expected consumption and by production disruptions, including political strife in Africa, that reduced expected output. In June 1996, copper prices plummeted from the high level of the previous 18 months, the producer price falling to $0.94, following revelations by Sumitomo that it had lost several billion dollars on unauthorized copper trades

and speculation by industry that Sumitomo held large unreported copper inventories (Platt's Metals Week, 1996). Following the sharp drop in prices, however, an increasingly tight copper supply caused prices to rise, recovering to $1.20 per pound. With the onset of the Asian economic crises in 1997, demand failed to keep pace with production increases and an anticipated global copper surplus developed. The constant dollar copper price in 1998 fell to the lowest level since the Great Depression of the 1930's.

References Cited

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Annual Average U.S. Producer Copper Price

(Cents per pound[1])

Year	Price	Year	Price	Year	Price	Year	Price
1850	22	1888	16.8	1926	14.05	1964	32.35
1851	17	1889	13.5	1927	13.05	1965	35.36
1852	22	1890	15.6	1928	14.81	1966	36.00
1853	22	1891	12.8	1929	18.35	1967	38.10
1854	22	1892	11.6	1930	13.23	1968	41.17
1855	27	1893	10.8	1931	8.37	1969	47.43
1856	27	1894	9.5	1932	5.79	1970	58.07
1857	25	1895	10.7	1933	7.28	1971	52.09
1858	23	1896	10.8	1934	8.66	1972	51.44
1859	22	1897	11.29	1935	8.88	1973	59.49
1860	23	1898	12.03	1936	9.71	1974	77.27
1861	22	1899	16.70	1937	13.39	1975	64.16
1862	22	1900	16.19	1938	10.22	1976	69.59
1863	34	1901	16.10	1939	11.20	1977	66.77
1864	47	1902	11.63	1940	11.53	1978	65.81
1865	39.2	1903	13.20	1941	12.00	1979	92.19
1866	34.2	1904	12.80	1942	12.00	1980	101.31
1867	25.4	1905	15.60	1943	12.00	1981	84.21
1868	23.0	1906	19.30	1944	12.00	1982	72.80
1869	24.2	1907	20.00	1945	12.00	1983	76.53
1870	21.2	1908	13.20	1946	14.04	1984	66.85
1871	24.1	1909	13.11	1947	21.27	1985	66.97
1872	35.6	1910	12.88	1948	22.32	1986	66.05
1873	28.0	1911	12.55	1949	19.50	1987	82.50
1874	22.0	1912	16.48	1950	21.58	1988	120.51
1875	22.7	1913	15.52	1951	24.50	1989	130.95
1876	21.0	1914	13.31	1952	24.50	1990	123.16
1877	19.0	1915	17.47	1953	29.05	1991	109.33
1878	16.6	1916	28.46	1954	29.94	1992	107.42
1879	18.6	1917	29.19	1955	37.51	1993	91.56
1880	21.4	1918	24.68	1956	42.00	1994	111.05
1881	19.2	1919	18.19	1957	30.17	1995	138.33
1882	19.1	1920	17.50	1958	26.31	1996	109.04
1883	16.5	1921	12.65	1959	30.99	1997	106.92
1884	13.0	1922	13.56	1960	32.34	1998	78.64
1885	10.8	1923	14.75	1961	30.32		
1886	11.1	1924	13.28	1962	31.00		
1887	13.8	1925	14.30	1963	31.00		

[1] To convert to cents per kilogram, multiply by 2.20462.

Note:

1850-96, New York price for Lake copper (99.9%-pure copper), *in* Loughlin, G.F., Prefatory note on the report on gold, silver, copper, lead, and zinc, Mineral Resources of the United States 1922, Part I, U.S. Geological Survey, 1925, p. 127a.

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1923-72, Electrolytic (99.9%-pure copper) domestic delivered to Connecticut price, *in* American Metal Market.

1973-77, U.S. producer electrolytic (99.9%-pure copper) wirebar, *in* Metals Week.

1978-98, U.S. producer cathode (99.99%-pure copper), *in* Metals Week (1978-92) and Platt's Metals Week (1993-98).