Research Department
Federal Reserve
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San Francisco

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Business & Financial Letter

Congo Copper and Cobalt

There is a battle raging in Zaire, formerly known as Congo-Kinshasa and, before that, the Belgian Congo. The essential fact is that the southeastern mineral-rich province of Shaba (many of us remember it as Katanga) was invaded last month by troops streaming across the Angolan border. No one knows much about the operation, but the situation has unsettled the world's metals markets, demonstrating once again the importance to commodity markets of events in far-off corners of the world.

Shaba's role

According to headline reports, the current conflict can be viewed from at least three different perspectives: as an African manifestation of cold-war intrigue, as a personal conflict between leaders of neighboring states, or as a re-emergence of domestic political and tribal rivalries. However that may be, Shaba's fate is important because it is truly Zaire's horn of plenty. It produces all of the country's copper, cobalt, zinc, manganese, coal, cadmium and germanium, as well as a good portion of its gold, silver, palladium, platinum and cassiterite (which is to tin what bauxite is to aluminum). Shaba is also the site for much of the country's industrial production. In short, about three-quarters of the country's exports—predominatly copper—originate in Shaba. In fact, the word Shaba means copper in Swahili.

Zaire's recent financial problems can be traced in part to the difficulty of access to landlocked Shaba province. When Angola was a Portuguese colony, Shaba's imports and mineral exports traveled over Angola's Benguela railway to and from Atlantic ports. This important artery was cut during Angola's civil war and was not restored. Alternative routes through Rhodesia and Tanzania have proven to be costly and unreliable. Thus, shortages of everything from railroad cars to gunny sacks have taken a toll on Shaba mine productivity, and have thwarted plans to complete a major power-transmission line designed to boost future production.

Zaire's external debt has become quite large in recent years, reflecting the 1974 decline in copper prices as well as Angola's closing of the Benguela railway. During the past two years, the country's non-Shaba export earnings have done little more than service this foreign debt. Thus, interest and amortization as a percentage of export earnings rose from 5.7 in 1971 to 19.9 in 1975.

Copper's role

Zaire (Shaba) produces about 6 percent of world copper output, and it

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ranks sixth in total world production, behind the U.S., USSR, Chile, Canada and Zambia. Although 6 percent may seem a relatively small figure, it amounts to a considerable sum in the world copper market of \$7-billion dimensions—and especially in the \$2-billion Zairian economy.

The United States does not directly import any Zairian copper, most of which goes to Western Europe, but the copper market is fundamentally a world market and any interruption of shipments thus tends to affect U.S. prices. (Being the world's largest producer, the U.S. imports relatively little copper, and obtains that mostly from Canada, Peru and Chile.) Under normal conditions, when stocks are equal to about 10 percent of world copper deliveries, a 1.0-percent decline in output is typically associated with a 4.8-percent rise in price. Thus, a loss of Zaire's 6 percent of world production would normally be accompanied by a price increase of about 29 percent.

However, the copper market has been anything but normal in recent years. Despite the world recession's impact on copper demand, producers reduced output only marginally and consequently watched stocks climb to record levels. Today, inventories amount to roughly 1.6 million short-tons, or 30 percent of annual production. Since Zaire produces less than a half-million tons annually, current world inventories could offset a full year's interruption in Zairian copper deliveries without creating any significant price pressures.

Cobalt's role

Even though copper is king in Zaire, the Zairian metal of most concern could be cobalt. About 60 percent of the world's cobalt originates with one government-owned firm in Shaba Province. Furthermore, roughly 80 percent of all cobalt consumed in the U.S. comes from Zaire, either directly or through Belgium.

Cobalt is one of those metals whose best-known use, for radioactive treatment of cancer, is actually one of its least important in terms of volume. Its single most important use is in superalloys—i.e., those alloys resistant to very high temperatures and thus useful in jet engines and similar mechanisms. Substantial amounts of the metal also find their way into magnetic alloys, wear-resistant alloys, and drying agents in varnishes, lacquers and paints.

Nonetheless, the United States could probably survive an interruption in cobalt shipments without major hardship. Available private inventories may be equivalent to about six months' consumption. Also, cobalt is one of the 93 minerals and materials that the General Services Administration maintains in strategic stockpiles, and about two years' supply of the metal (in excess of the military target) is available from that source.

Recycling could provide another source. Under normal conditions, secondary recovery or recycling is not profitable because of the small amount of cobalt typically found in most manufactured goods. But when supplies are limited, recycling becomes an economic proposition—during the Korean War, for example, when the production of recycled cobalt rose from almost nothing to 1.5 million pounds per year.

Long vs. short term

Over the longer term, the U.S. could return to mining its own cobalt. Although this country has produced little or no cobalt since the early 1960's, it previously provided from a quarter to a half of its domestic requirements. In fact, domestic resources of cobalt are estimated at no less than 100 times current annual consumption, so the U.S. could produce its own metal if the price situation justified it. In addition, deep-sea mining of cobalt is an eventual possibility if the forthcoming Law of the Sea Treaty permits.

Despite this nation's generally favorable supply situation, there is little doubt that the world price of cobalt would skyrocket if 60 percent of total production were taken off the market. One estimate pegs cobalt's short-run demand elasticity at about .34, which suggests that prices would almost triple if Shaba supplies were cut off. That figure could only be a rough estimate, however, since elasticity estimates are typically based upon only small fluctuations in price and quantity.

Under this worst-case scenario, world metals markets could be seriously affected if Shaba's copper and cobalt supplies were lost. Yet over the long-term, other sources of supply could be developed to fill the gap. And for that matter, the worst case might not be realized; optimistic observers point out, for example, that oil production quickly resumed in Angola after the conclusion of that country's civil war.

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BANKING DATA—TWELFTH FEDERAL RESERVE DISTRICT
(Dollar amounts in millions)

Selected Assets and Liabilities Large Commercial Banks	Amount Outstanding 4/13/77	Change from 4/6/77	Change from year ago Dollar	Percent
Loans (gross, adjusted) and investments*	97,591	- 150	+ 8,820	+ 9.94
Loans (gross, adjusted)—total	73,760	- 398	+ 7,654	+ 11.58
Security loans	1,819	- 323	- 392	- 17.73
Commercial and industrial	23,673	+ 92	+ 1,625	+ 7.37
Real estate	22,422	+ 99	+ 2,584	+ 13.03
Consumer instalment	12,589	+ 61	+ 1,645	+ 15.03
U.S. Treasury securities	10,484	- 173	+ 443	+ 4.41
Other securities	13,347	+ 421	+ 723	+ 5.73
Deposits (less cash items)—total*	96,106	- 378	+ 7,428	+ 8.38
Demand deposits (adjusted)	28,606	+ 238	+ 3,477	+ 13.84
U.S. Government deposits	300	- 188	- 131	- 30.39
Time deposits—total*	65,585	- 226	+ 4,085	+ 6.64
States and political subdivisions	5,313	+ 137	- 1,346	- 20.21
Savings deposits	32,066	- 195	+ 6,363	+ 24.76
Other time deposits‡	26,030	- 79	- 761	- 2.84
Large negotiable CD's	9,504	- 184	- 2,348	- 19.81

Weekly Averages of Daily Figures	Week ended 4/13/77	Week ended 4/6/77	Comparable year-ago period
Member Bank Reserve Position			
Excess Reserves (+)/Deficiency (-)	- 4	+ 6	+ 3
Borrowings	0	1	16
Net free(+)/Net borrowed (-)	- 4	+ 5	- 13
Federal Funds—Seven Large Banks			
Interbank Federal fund transactions			
Net purchases (+)/Net sales (-)	+ 1,468	+ 49	+ 1,338
Transactions with U.S. security dealers			
Net loans (+)/Net borrowings (-)	+ 1,105	+ 280	+ 1,419

*Includes items not shown separately. ‡Individuals, partnerships and corporations.

Editorial comments may be addressed to the editor (William Burke) or to the author. . . . Information on this and other publications can be obtained by calling or writing the Public Information Section, Federal Reserve Bank of San Francisco, P.O. Box 7702, San Francisco 94120. Phone (415) 544-2184.