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The United States Copper Industry in the World Market: Running Hard Yet Losing Ground

“Now *here*, you see,” said the Red Queen to Alice, “it takes all the running *you* can do, to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that.”¹

I. INTRODUCTION

The United States copper industry has been running hard against its foreign competitors, yet it has lost ground. The industry has significantly reduced production costs while complying with costly environmental regulations and confronting the lowest copper prices this century while witnessing a dramatic increase in imports. Despite these efforts, and the recent spectacular rise in copper prices, imports have penetrated deep into the United States domestic market, and employment in the domestic copper industry has dropped to half of what it was in 1980. The United States copper industry decline is due in part to lower production costs of foreign producers arising from cheaper labor and higher grade ore. However, the failure of the United States to establish a comprehensive and coordinated national copper policy has also contributed to the near demise of the domestic industry. Even though the price of copper improved dramatically in the last half of 1987, reaching record highs, the lack of policy has injured the industry and continues to do so. Moreover, the failure of the United States to establish a national policy also affects broader interests,² such as diplomatic relations between the United States

¹ L. CARROLL, *THROUGH THE LOOKING GLASS*, in *THE COMPLETE WORKS OF LEWIS CARROLL* 166 (1984)(emphasis in original), cited in T. MORAN, *MULTINATIONAL CORPORATIONS AND THE POLITICS OF DEPENDENCE* 71 (1974).

² Industrialized nations are dependent upon critical copper imports. In recent years, the reliance by developed nations has grown to 40% of consumption. D. MEZGER, *COPPER IN THE WORLD ECONOMY* 19 (1980). Likewise, the importance of copper to United States industries cannot be understated. As evidence of its importance, legislators in recent sessions of Congress have introduced bills relating to copper on a wide variety of subjects.

Thus far in the 100th Congress, bills have been introduced on subjects ranging from international lending policies, H.R. Res. 149, 100th Cong., 1st Sess. (1987); S. 1043, 100th Cong., 1st Sess. (1987); to foreign relations, S. 709, 100th Cong., 1st Sess. (1987); H.R. 1561, 100th Cong., 1st Sess. (1987); to international environmental policies, S. 316, 100th Cong., 1st Sess. (1987); S. 321, 100th

and developing copper-exporting countries,³ national defense,⁴ the United States trade deficit,⁵ border relations between the United States

Cong., 1st Sess. (1987); H.R. 1664, 100th Cong., 1st Sess. (1987); H.R. 1679, 100th Cong., 1st Sess. (1987); to international human rights, *see infra* note 3. For a detailed discussion of these legislative initiatives, *see infra* notes 195-202 and accompanying text.

Legislation in the 99th Congress included measures to: require the negotiation of voluntary trade restriction agreements, S. 627, 99th Cong., 1st Sess. (1985); H.R. 1520, 99th Cong., 1st Sess. (1985); H.R. 3714, 99th Cong., 1st Sess. (1985); H.R. 1562, 99th Cong., 1st Sess. § 301 (1985); establish limitations on multilateral assistance to foreign copper producers, S. 2815, 99th Cong., 2d Sess. § 113(c)(1986); *see also* S. Rep. No. 440, 99th Cong., 2d Sess. 6; impose a tariff on imported copper to offset the cost incurred by domestic producers to comply with environmental regulations, S. 353, 99th Cong., 1st Sess. (1985); establish quotas on imported copper, S. 351, 99th Cong., 1st Sess. (1985); and establish an inter-governmental committee on copper, S. 1670, 99th Cong., 1st Sess. (1985); H.R. 3410, 99th Cong., 1st Sess. (1985). *See generally infra* notes 187-93 and accompanying text.

In the 98th Congress, copper-related bills included bills directing copper be purchased for the national stockpile, S. 1544, 98th Cong., 1st Sess. (1983); restricting imports of copper, H.R. 1318 98th Cong., 1st Sess. (1983); and increasing the duty on imported copper to equalize costs incurred by domestic producers in complying with United States environmental regulations, H.R. 2413, 98th Cong., 1st Sess. (1983). *See generally infra* notes 168-86 and accompanying text.

³ Copper is a critical export for several developing countries, particularly Chile, Peru, Zaire, and Zambia. *See infra* notes 98, 99 and accompanying text. "In terms of export value, copper is by far the most important nonfuel export of the developing countries. For example, the average combined value of exports of bauxite, iron ore, manganese, lead, tin, and zinc by the developing countries over the 1970-72 period was \$2.2 billion, as contrasted with \$2.4 billion for the average value of copper exports by developing countries over this period." R. MIKESELL, *THE WORLD COPPER INDUSTRY* 37 (1979). Clearly, United States policies affecting copper are of special import to these copper-dependent, developing countries.

Due to congressional concern over human rights violations in Chile, prohibitions on the importation of Chilean copper are occasionally urged. *See, e.g.*, S. 709, *supra* note 2; H.R. 1561, *supra* note 2. *See also* Proclamation No. 5758, 52 Fed. Reg. 49129 (1987)(suspension of preferential treatment for Chile under Generalized System of Preferences); *U.S. Ending Duty-Free Designation on Copper, Other Chilean Imports*, *Ariz. Daily Star*, Dec. 25, 1987, at A3, col. 1.

⁴ "Because of its conductivity, copper is an essential ingredient in modern electronic warfare. Because of its malleability, it is an essential ingredient in all forms of munitions. . . . Because of its resistance to weathering, it is frequently specified for front-line equipment." T. NAVIN, *COPPER MINING & MANAGEMENT* 5 (1978). Copper is a better electrical conductor than all metals except silver. R. BOWEN & A. GUNATILAKA, *COPPER: ITS GEOLOGY AND ECONOMICS* 1 (1977). "Because copper ranks after steel and explosives as an important item in the nation's warring capability, the United States government has . . . periodically taken a great interest in the administration of the industry." T. NAVIN, *supra*, at 8. "During wartime, copper consumption increases dramatically because of its use in ammunition as shell casings and in other military hardware." R. MIKESELL, *supra* note 3, at 74. Recognizing its importance as a strategic material, the Federal Emergency Management Agency considers copper to be a strategic mineral under 50 U.S.C. § 98 (1982). *See infra* notes 51-57 and accompanying text. *But see U.S. Assistance to Foreign Copper Producers and the Effects on Domestic Industries and Environmental Standards: Hearing Before the Subcomm. on Mining, Forest Management, and Bonneville Power Administration of the House Comm. on Interior and Insular Affairs*, 98th Cong., 1st Sess. 260-61 (1983)("The ability to substitute [materials such as aluminum and plastic for copper] limits the concept of copper as a critical material.") [hereinafter *U.S. Assistance to Foreign Copper Producers*]. *See generally* McClure, *Stockpiling of Strategic and Critical Minerals*, 19 *IDAHO L. REV.* 417 (1983).

⁵ The United States has imported copper in increasing amounts, and its share of worldwide

and Mexico,⁶ and the competitiveness of other domestic industries.⁷

The domestic copper industry is a national one,⁸ directly affected by seemingly unrelated policies, ranging, for instance, from International Monetary Fund ("IMF") and Multilateral Development Bank ("MDB")⁹ lending policies to policies underlying the implementation of the Clean Air Act.¹⁰ Yet the United States has no comprehensive national copper policy. Rather, current policy consists primarily of fragmented decisions made without a broad view of the needs of the nation or the domestic copper industry. This Comment first surveys the world

production has decreased, thus affecting the balance of trade. See *infra* notes 71-72 and accompanying text.

⁶ See, e.g., Agreement on Transboundary Air Pollution Caused by Copper Smelters Along Their Common Border, Jan. 29, 1987, United States-Mexico, 25 INT'L LEGAL MATERIALS 33 (1987); Agreement on Environmental Cooperation in the Border Area, Aug. 14, 1983, United States-Mexico, reprinted in 22 INT'L LEGAL MATERIALS 1025 (1985); Note, *International Agreements*, 25 HARV. INT'L L.J. 239 (1984); S. 321, *supra* note 2; H.R. 1664, *supra* note 2; H.R. 1679, *supra* note 2; U.S., *Mexico Reach Agreement on Smelters, Sewage Treatment Facility in Tijuana Area*, 16 ENV'T. REP. (BNA) 512, July 26, 1985. See generally Bath, *U.S.-Mexico Experience in Managing Transboundary Air Resources: Problems, Prospects, and Recommendations for the Future*, 22 NAT. RESOURCES J. 1147 (1982); Applegate, *A Discussion of U.S.-Mexico Experience in Managing Transboundary Air Resources: Problems, Prospects, and Recommendations for the Future*, 22 NAT. RESOURCES J. 1168 (1982).

⁷ For example:

The United States is the world's largest producer and consumer of brass mill products, including brass strip. Copper and brass mill products . . . are used by thousands of large and small enterprises located throughout the United States in the production of final products. The five major markets for copper and brass mill products are for building and construction, electrical and electronic products, industrial machinery and equipment, consumer and general products, and transportation equipment.

The Effect of Changes in the Value of the U.S. Dollar on Trade in Selected Commodities, USITC Pub. 1423, Inv. No. 1423 (Sept. 1983)[hereinafter *Commodities Investigation*].

⁸ At its 1980 peak, the industry employed some 45,000. NONFERROUS METALS, 1986 U.S. INDUSTRIAL OUTLOOK 20-1 (1985)[hereinafter *NONFERROUS METALS*]. Mines or smelters were operated in eight states: Michigan, Montana, Nevada, Utah, Colorado, New Mexico, Arizona, and Texas. T. NAVIN, *supra* note 4, at 380-83. However, two-thirds of all domestically produced copper is mined in southeastern Arizona, from an area a few miles north of the border between the United States and Mexico. U.S. Assistance to Foreign Copper Producers, *supra* note 4, at 81; U.S. BUREAU OF THE CENSUS, 1986 STATISTICAL ABSTRACT OF THE UNITED STATES (106th ed. 1985) 711 [hereinafter *1986 STATISTICAL ABSTRACT*]. One-third of domestic refiner capacity is located in Texas. Unwrought Copper, USITC Pub. 1549, Inv. No. TA-201-52 (July 1984). The text of Unwrought Copper, without its appendix, is reprinted in 6 INT'L TRADE REP. DECISIONS 1708 (1985). Citations to the text of Unwrought Copper are cited to that reprint. Citations to its appendix are to LEXIS, ITrade library, ITC file.

⁹ Unless otherwise noted, multilateral development banks ("MDBs") include the International Bank for Reconstruction and Development, the International Development Association, the International Finance Corporation, the Inter-American Development Bank, the Inter-American Investment Corporation, the Asian Development Bank, the African Development Bank, and the African Development Fund.

¹⁰ 42 U.S.C. § 7401 (1982).

copper industry, its recent history, and present condition.¹¹ It then addresses the ability of the domestic copper industry to compete on the world market, with focus on market factors, objective business considerations, and United States government policy.¹² Discussion of recent congressional attempts to assist the industry follows.¹³ Finally, the Comment suggests the basic elements necessary for a national copper policy.¹⁴

II. BACKGROUND: THE STRUCTURE OF THE WORLD COPPER INDUSTRY

A. The General Structure of the Industry

The domestic industry has long been dominated by a few United States corporations: Duval, Cyprus, Anaconda, Phelps Dodge, ASARCO, Kennecott, AMAX, and Newmont.¹⁵ With the exception of Newmont, these companies have pursued vertical integration¹⁶ in order to own and control operations in each of the four principal stages of copper production (mining, milling, smelting, and refining).¹⁷ The copper industry produces copper as an intermediate good which is sold to fabricators which then manufacture end or other intermediate products.¹⁸ Only a few companies have integrated forward to the fabrication stage.¹⁹

The world copper industry is in transition.²⁰ From its inception and until about 1970, the world market was in large part controlled by the United States corporations mentioned above. That initial dominance was due in large part to the capital-intensive nature of copper mining: "total investment costs for large open-pit mines are seldom less than several hundred million dollars; in some cases they amount to \$1 billion . . ."²¹

¹¹ See *infra* notes 15-101 and accompanying text.

¹² See *infra* notes 102-61 and accompanying text.

¹³ See *infra* notes 162-98 and accompanying text.

¹⁴ See *infra* notes 199-245 and accompanying text.

¹⁵ See T. NAVIN, *supra* note 4, at 6-9. See generally *id.* at 202-303; R. MIKESSELL, *supra* note 3, at 38-42.

¹⁶ R. MIKESSELL, *supra* note 3, at 16.

¹⁷ T. NAVIN, *supra* note 4, at 8. See also T. MORAN, *supra* note 1, at 40-42 (1974)(vertical integration was pursued by producers for strategic business reasons).

¹⁸ See T. NAVIN, *supra* note 4, at 8.

¹⁹ *Id.*

²⁰ For a survey of the history of the industry from its ancient origins to the 1970s, see R. PRAIN, COPPER—THE ANATOMY OF AN INDUSTRY 63-79 (1975).

²¹ UNITED NATIONS CENTRE ON TRANSNATIONAL CORPORATIONS, TRANSNATIONAL CORPORATIONS IN THE COPPER INDUSTRY, 18 U.N. Doc. ST/CTC/21, U.N. Sales No. E.81II.A.E. (1981)[hereinafter TRANSNATIONAL CORPORATIONS]. Further hampering development of copper mines by developing countries was the factor that

At the same time, “[t]o open up a new mine of any considerable size takes perhaps five years from the date of decision to go ahead—and this decision itself is often deferred for many years after discovery of an ore-body.”²² Over the past twenty years, however, United States dominance has diminished and the recently nationalized copper industries of Chile,²³ Peru,²⁴ Zaire,²⁵ and Zambia²⁶ have captured a large share of the world market.²⁷ A substantial proportion of foreign production is now under

the extent of the capital required depends largely on the degree of existing development in the area in which the new mine is to be located. All too often there is practically no development at all and infrastructure will have to be built up from scratch to include roads, railways, power stations, water supplies, airfields and other services.

R. PRAIN, *supra* note 20, at 186. Developing countries, by definition, have less infrastructure in place, making the cost of opening a mine greater than in developed countries.

²² R. PRAIN, *supra* note 20, at 52-53.

²³ See generally Velasco, *The Mineral Industry of Chile*, in U.S. BUREAU OF MINES, [1985] 1 MINERALS YEARBOOK, Metals and Minerals 195-202 (1986)[hereinafter 1985 MINERALS YEARBOOK]; T. MORAN, *supra* note 1; Unwrought Copper, *supra* note 8, app. (83% of Chile's production is by the state-owned Corporation Nacional del Cobre de Chile (“Codelco”), which was created in 1976); G. INGRAM, EXPROPRIATION OF U.S. PROPERTY IN SOUTH AMERICA 211-321 (1974)(expropriation of copper production facilities by Chile valued in 1971 at \$1 billion from two United States corporations); N. GIRVAN, COPPER IN CHILE (1972); M. LASAGA, THE COPPER INDUSTRY IN THE CHILEAN ECONOMY (1981)(econometric analysis of the Chilean copper industry and economy).

²⁴ See generally U.S. BUREAU OF MINES, *The Mineral Industry of Peru*, in 1985 MINERALS YEARBOOK, *supra* note 23, at 861-86; 1975 MINERALS FACTS AND PROBLEMS 295 (1976).

²⁵ See generally U.S. BUREAU OF MINES, *The Mineral Industry of Zaire*, in 1985 MINERALS YEARBOOK, *supra* note 23, at 967-72 (1986); Unwrought Copper, *supra* note 8, app. (80% of Zairian production is from state-owned mines).

²⁶ Nationalization in Zambia began in 1969. See generally M. FABER & J. POTTER, TOWARDS ECONOMIC INDEPENDENCE 91-95 (1971); U.S. BUREAU OF MINES, *The Mineral Industry in Zambia*, in 1985 MINERALS YEARBOOK, *supra* note 23, at 975-78 (1986); C. MPHAIISHA, A STUDY OF ZAMBIA'S COPPER POLICY: NATIONALIZATION, MARKET INTERVENTION, DEEP SEABED EXPLOITATION (1979); Ndulo, *Mining Legislation and Mineral Development in Zambia*, 19 CORNELL INT'L L.J. 1, 9-11 (1986). See also C. OBIDEGWU & M. NZIRAMASANGA, COPPER AND ZAMBIA (1981)(econometric analysis of the Zambian copper industry); W. PETERS, ARBITRATION AND RENEGOTIATION OF INTERNATIONAL INVESTMENT AGREEMENTS 33-40 (1986); G. MHONE, THE POLITICAL ECONOMY OF A DUAL LABOR MARKET IN AFRICA (1982).

²⁷ U.S. Assistance to Foreign Copper Producers, *supra* note 4, at 34-35. Until the late 1960s the seven largest copper corporations controlled 70% of copper production. The nationalization of the copper industries in Chile, Zambia, Peru, and Zaire, the lowering of entry costs to the industry (which permitted additional small firms to begin mining), and the entry of oil companies into the copper arena combined to severely reduce this concentration. TRANSNATIONAL CORPORATIONS, *supra* note 21, at 29-43. See R. MIKESSELL, *supra* note 3, at 28-31. See generally T. NAVIN, *supra* note 4, at 335-62. Oil companies, however, are divesting their copper subsidiaries. *Nonferrous Metals*, *supra*, note 8, at 20-1.

There are a number of factors that attracted additional entrepreneurs to the industry, including: 1) “the continuing discovery of large new sources of copper,” T. MORAN, *supra* note 1, at 32; 2) wartime subsidies made by the United States during and following World War II that were offered to finance new companies or help smaller companies expand production, *id.* at 33; 3) the strategy of “smelting, refining, and fabricating companies to integrate backwards to their own supplies . . . [in order] to develop sources at the mining stage,” *id.* at 34; 4) “the willingness of fabricators and consumers of copper to finance the growth of new small copper miners and be paid back in output,”

control of the governments of these countries. In short, the number of producers and world production capacity have increased, and the market share of domestic producers has decreased.²⁸ In 1982 Chile replaced the United States as the world's largest copper producer,²⁹ and reliance by the United States on imports of refined copper set a record high in 1986.³⁰

B. The Market for Copper

Copper is used in durable goods, including electrical production and transmission equipment, automobiles, construction, electrical devices, plumbing, consumer goods, military applications, and coinage.³¹ These are the products of industrialized, developed countries and thus, con-

id.; 5) "a drive on the part of natural resource companies that have not traditionally been associated with copper to diversify by forming or buying a mining subsidiary." *Id.* at 35.

²⁸ T. NAVIN, *supra* note 4, at 6-7. The United States share of the world market declined from 26% in 1970 to 14% in 1984. 1986 STATISTICAL ABSTRACT, *supra* note 8, at 679. In millions of metric tons, mining production was:

	1970	1975	1980	1981	1982	1983	1984	1985	1986	% Change
U.S.	1.56	1.28	1.18	1.54	1.15	1.04	1.10	1.11	1.15	-26
Chile	.71	.83	1.07	1.08	1.24	1.26	1.29	1.23	1.28	+80
Peru	.22	.18	.37	.34	.35	.32	.36	.39	.40	+82
Zaire	.39	.50	.53	.55	.52	.54	.56	.50	.48	+23
Zambia	.68	.68	.60	.59	.57	.54	.53	.52	.50	-26

Source: U.S. BUREAU OF MINES, [1971] 1 MINERALS YEARBOOK, Metals, Minerals, and Fuels 490 (1970); U.S. BUREAU OF MINES, [1976] 1 MINERALS YEARBOOK, Metals and Minerals 517-18 (1977)(1975 data); U.S. BUREAU OF MINES, [1984] 1 MINERALS YEARBOOK, Metals and Minerals (1985)(1980-1981 data); U.S. BUREAU OF MINES, *Copper*, PREPRINT FROM THE 1986 BUREAU OF MINES MINERALS YEARBOOK, 51-2 (1987)(1982-1984 data)[hereinafter 1986 MINERALS YEARBOOK]; AMERICAN BUREAU OF METAL STATISTICS INC., NON-FERROUS METAL DATA 1986 at 9 (1987)(1985-1986 data)[hereinafter NON-FERROUS METAL DATA]. The data was converted, as necessary, to metric tons.

The decline in Zambia's copper production is due to a combination of Zambian policy to reduce production in order to conserve its copper resources, IMF-mandated austerity measures, low copper prices, and labor and social unrest. See *Glory That Was Copper Lets Zambia Down*, N.Y. Times, June 17, 1987, at A18, col. 1; *Millions of Zambians Hit by Economic Hardships*, N.Y. Times, Jan. 22, 1987, at A8, col. 3; 1986 MINERAL YEARBOOK, *supra*, at 27-8. Even the high prices of late 1987 and early 1988 have not helped Zambia significantly. See *Copper a Bright Spot in Zambia's Economy*, Chicago Trib., Nov. 15, 1987, § 7, at 8, col. 1.

²⁹ See 1985 MINERALS YEARBOOK, *supra* note 23, at 373-74.

³⁰ 133 CONG. REC. S5239 (1987)(statement of Senator Domenici). 1985 had also been a record year for imports, NON-FERROUS METAL DATA *supra* note 28, at 336.

³¹ See T. NAVIN, *supra* note 4, at 74; R. MIKESELL, *supra* note 3, at 74, 140. However, because of a change in the copper content of pennies, United States use of copper in coinage has dropped markedly. See *infra* notes 47-49 and accompanying text; D. HARGREAVES, WORLD INDEX OF STRATEGIC MINERALS 66 (1983); D. MEZGER, *supra* note 2, at 33. Consumption in the United States in 1985 by end use was: "electrical, 65%; construction, 18%; machinery, 6%; transportation, 5%; ordnance, 2%; other, 4%." 1985 MINERALS YEARBOOK, *supra* note 23, at 332.

sumption of copper is closely related to the development of a nation.³² While developed nations do consume proportionally more copper than developing nations, their demand has nonetheless leveled off.³³ Indeed, domestic demand for copper is no longer growing in proportion to the growth of the United States Gross National Product ("GNP").³⁴ "The reason for this is easy to understand for there is a limit to the number of motor cars, washing machines, television sets and other equipment designed for ease of living which a family can use"³⁵ Likewise, world demand is down.³⁶ This lessened demand has been attributed to several factors.

First, there are readily available substitutes for copper which, if copper is not price-competitive, may be used in its stead (demand for copper being fairly elastic). For example, aluminum and plastics are increasingly used as substitutes for copper in heat-exchange, electrical, and plumbing applications.³⁷ Similarly, the increasing use of optical fibers and microwave and satellite technologies, coupled with the general miniaturization of electronics, has further reduced demand for copper.³⁸ In

³² "About half of the copper employed for consumer goods is used in durables such as washing machines, refrigerators, radios, televisions, phonographs, tape recorders, and cutlery." R. MIKESSELL, *supra* note 3, at 74. "[C]hanges in the level of industrial production of durable manufacturers are highly correlated with changes in the consumption of refined copper." Unwrought Copper, *supra* note 8, app.

³³ Unwrought Copper, *supra* note 8, at 1723 n.52, app. See generally R. MIKESSELL, *supra* note 3, at 15 (consumption of copper by developed nations ten times that of developing nations).

³⁴ Unwrought Copper, *supra* note 8, app. In fact, domestic consumption of refined copper has decreased since 1973, falling 19.3% by 1983. *Id.* at 1721. See generally *id.* at 1721-23. However, this trend has at least temporarily changed: the demand for copper increasing in 1987 by 7%. *Copper Rally Continues; Price Near 8-Year High*, Chicago Trib., Nov. 12, 1987, § 2, at 6, col. 1 [hereinafter *Copper Rally Continues*].

³⁵ R. PRAIN, *supra* note 20, at 263.

³⁶ See Unwrought Copper, *supra* note 8, at 1723; but see *Copper Rally Continues*, *supra* note 34 (demand up in 1987).

³⁷ Commodities Investigation, *supra* note 7. The threat of substitution by aluminum did not become a major concern of domestic copper producers until after World War II. T. MORAN, *supra* note 1, at 45-49. Aluminum substitutes for copper primarily in applications involving electrical conduction. R. BOWEN & A. GUNATILAKA, *supra* note 4, at 306-07. Plastics threaten copper in plumbing applications. *Id.* at 307.

Copper is not mined as cheaply as is aluminum: "Copper is relatively difficult to extract from the earth [A] bauxite mine may contain 35 percent aluminum; but a copper mine may contain only 0.5 percent copper." T. NAVIN, *supra* note 4, at 1. Copper producing involves separating tremendous amounts of waste material from the ore itself; the higher the ore content, the less waste to remove, the lower the cost to produce. At the same time, the technology of aluminum production has advanced ahead of copper production technology, leading to a decrease in the relative production cost of aluminum. D. MEZGER, *supra* note 2, at 35.

³⁸ Unwrought Copper, *supra* note 8, at 1713. See R. PRAIN, *supra* note 20, at 166 (effects of miniaturization). In addition, substitutes threaten copper in: 1) thinner gauges of wire; 2) multiplexing; 3) telecommunications; 4) digital systems; 5) electronic switching. 1985 MINERALS YEARBOOK, *supra* note 23, at 333.

addition, since 1973 increasing energy costs have motivated manufacturers of equipment and automobiles to utilize lighter alternatives to copper.³⁹ “[C]opper consumption has never recovered from the severe recession of 1974-75 and the increase in energy prices that occurred after the 1973 oil crisis.”⁴⁰

The second factor that operates to reduce demand is price volatility. The price of copper has seen dramatic plunges and spectacular gains.⁴¹ Based primarily on its daily trading price on the London Metal Exchange (“LME”)⁴² and New York Commodity Exchange (“COMEX”),⁴³ the selling price of copper is historically volatile.⁴⁴ As Sir Ronald Prain said:

There are today few illusions about the harmful effects which fluctuating prices can have on the copper industry: they can discourage investment in exploration, the development of new mines and the advancement of technology; they can have an adverse effect on costs of production and they can jeopardize the future of the market, despite the fact that copper is still an incomparable metal with its almost unlimited range of uses.⁴⁵

“The instability of copper prices has perhaps been the most important factor influencing its substitution. Copper is an intermediate product, and large users . . . are concerned with the volatility of supply and

³⁹ Unwrought Copper, *supra* note 8, at 1713. “Between 1977 and 1983, downsizing, material substitution, and increased engine efficiency accounted for a loss of 15.8% of the copper consumed in [the automobile manufacturing] industry . . .” 1985 MINERALS YEARBOOK, *supra* note 23, at 333. Smaller cars use smaller engines that require smaller radiators, and thus less copper. In 1976, the average car contained 32 pounds of copper, but by 1980, only 28 pounds were required. Unwrought Copper, *supra* note 8, at 1713.

⁴⁰ Unwrought Copper, *supra* note 8, at 1722.

⁴¹ See, e.g., G. ROBERTS, GUIDE TO WORLD COMMODITY MARKETS 71 (1985); NON-FERROUS METALS DATA, *supra* note 28. See also *Copper and Aluminum Join the Shake-Out*, Fin. Times, Oct. 21, 1987, at 38, col. 1 (“Copper and aluminum are the most traded metals on the LME. They attract the attention of fund managers and private investors, making them more vulnerable to the general investment climate.”). The recent spectacular changes in the price of copper is a prime example. In February 1987, copper was selling for about 67¢ per pound. Chicago Trib., Feb. 18, 1987, § 3, at 12, col. 6. Yet by November 1987, the price had risen to \$1.07. *Copper Rally Continues*, *supra* note 34. Likewise, predictions for the future of the price vary widely, see *id.*, causing “panic buying,” which drives up the price of copper. See *Waves of Panic Buying Push Copper Prices Up*, N.Y. Times, Nov. 11, 1987, at 40, col. 1 (nat’l ed.); see also *Copper Producers Raise Their Prices*, N.Y. Times, Nov. 11, 1987, at 28, col. 5 (nat’l ed.); *Advance in Copper Prices Is Attributed To Rising Demand, Declining Supply*, Wall St. J., Oct. 28, 1987, at 44, col. 4 (Midwest ed.).

⁴² See generally R. PRAIN, *supra* note 20, at 80-112.

⁴³ See generally *id.* at 99. See also D. MEZGER, *supra* note 2, at 111-16.

⁴⁴ R. MIKESSELL, *supra* note 3, at 81-89; *U.S. Assistance to Foreign Copper Producers*, *supra* note 4, at 198. As a corollary, “[b]ecause of copper’s extensive use in the construction, electrical, and transport industries, the LME spot price . . . is one of the most sensitive indicators of world industrial activity.” IMF SURVEY, Feb 6, 1978, at 34.

⁴⁵ R. PRAIN, *supra* note 20, at 109. See generally *id.* at 151-68.

prices perhaps even more than with the price itself"⁴⁶

The third factor is the elimination of certain existing private and United States government markets for copper and the failure of new markets to materialize. Three government markets have been lost. First, in 1982 the industry saw its government market decrease by 79 million pounds per year (representing 2% of the market in that year⁴⁷) when the United States reduced the copper content of the United States penny from 95% to 2.4%.⁴⁸ While a relatively slight decrease in aggregate, it came at a time when demand had already been in significant decline. Ironically, the change was implemented out of concern that the price of copper, then between 84¢ and 86¢ per pound, would rise to over \$1.12 per pound.⁴⁹ Until the last quarter of 1987, the COMEX price remained near 67¢ per pound, and has only recently (and probably only temporarily) reached \$1.07,⁵⁰ still below forecasts.

The second lost government market is the United States strategic materials stockpile. Although considered a strategic material under the Strategic Materials Stockpile Act,⁵¹ no copper has been purchased for this stockpile. In 1976, the Federal Preparedness Agency of the General Services Administration announced a stockpile goal of 1,299,000 tons of copper.⁵² At that time, only 20,261 tons were being held by the government.⁵³ In 1982, \$85 million was appropriated for the purchase of copper.⁵⁴ Even so, by the end of 1983, the stockpile contained only 29,000 tons, less than 3% of the goal of one million tons as then set by the Federal Emergency Management Agency.⁵⁵ While several bills have

⁴⁶ TRANSNATIONAL CORPORATIONS, *supra* note 21, at 25.

⁴⁷ *The Proposed Change in the Penny: Hearing Before the Subcomm. on Consumer Affairs and Coinage of the House Comm. on Banking, Finance and Urban Affairs, 97th Cong., 1st Sess.* 163 (1981)[hereinafter *Penny Hearings*].

⁴⁸ *Id.* at 4. A new dollar coin, made primarily from copper, has been proposed. H.R. 3348, 100th Cong., 2d Sess. (1987); S. 1742, 100th Cong., 2d Sess. (1987).

⁴⁹ *Penny Hearings, supra* note 47, at 3-4.

⁵⁰ In February 1987, copper was selling for about 67¢ per pound. *See supra* note 41. Chicago Trib., Feb. 18, 1987, § 3, at 12, col. 12. By October, the cash price had risen to about 94¢, *see* Chicago Trib., Oct. 21, 1987, § 3, at 15, col. 4, and the New York Commodity Exchange ("COMEX") futures price hovered near 73¢. *Id.* Comparing futures prices from late 1987 demonstrates that this sharp rise is recent and unexpected: futures prices set in late 1987 were near 63¢. *See* 1986 COMEX STATISTICAL YEARBOOK 87 (1987).

The recent and spectacular increase in the price of copper to over \$1.00 per pound is viewed as a very temporary aberration, and its price is expected to drop to between 65¢ and 70¢ per pound in 1988. *Copper Rally Continues, supra* note 34.

⁵¹ 50 U.S.C. § 98 (1982).

⁵² Unwrought Copper, *supra* note 8, app.

⁵³ *Id.* *See generally* NON-FERROUS METAL DATA, *supra* note 28, at 147-48.

⁵⁴ Pub. L. No. 97-276, § 112, 96 Stat. 1192 (1982).

⁵⁵ *Fiscal Year 1985 Department of Energy Authorization (Nuclear Fission R & D and Waste*

since been introduced which would provide funds to purchase copper for the stockpile,⁵⁶ none has been approved and no copper has been purchased. As of December 31, 1986, the United States stockpile contained 22,000 tons of copper, approximately 2% of the stated goal.⁵⁷

Finally, one potential new United States government market that copper has probably lost involves the use of copper as a canister material in the United States high-level nuclear waste storage program.⁵⁸ While no decision has yet been made as to the actual canister material, it is more likely that steel will be used in the program, because the sites that have been selected for the storage facility are far more appropriate for steel than for copper canisters.⁵⁹ Copper industry analysts had predicted that if copper were used in this application, it would create a market for perhaps as much as two million tons of copper,⁶⁰ in comparison, domestic production in 1986 was 1,269,221 tons.⁶¹

At the same time that these three government markets have been lost, certain private markets for copper have not developed as expected. First, while it had been hoped that copper would find a new, substantial market in OPEC-financed desalinization plants, those plants have not been constructed, and are now at best a long-term opportunity.⁶² Second, the failure of solar energy to gain widespread acceptance also has denied copper a new market as both a conductor of solar-generated electricity and as conduit for solar-heated hot water.⁶³ It is too soon to estimate what impact, if any, the advent of another technology, superconductivity, will have on the market for copper, though a use for

Management): Hearings Before the Subcomm. on Energy Research and Production of the House Comm. on Science and Technology, 98th Cong., 2d Sess. 645 (1984)(statement of Rep. J. McNulty)[hereinafter DOE Oversight Hearings]. See generally NON-FERROUS METAL DATA, supra note 28, at 148-49.

⁵⁶ See, e.g., S. 1544, *supra* note 2; H.R. 2412, 98th Cong., 1st Sess. (1983).

⁵⁷ NON-FERROUS METAL DATA, *supra* note 28, at 148.

⁵⁸ See *infra* notes 169-76 and accompanying text.

⁵⁹ The only site presently under consideration is the Yucca Mountain facility in Nevada. See Budget Reconciliation Act of 1987, Pub. L. No. 100-203 (Dec. 22, 1987), tit. V, § 5011(a), *reprinted in* 133 CONG. REC. H12939, H13006 (1987). Research into crystalline rock as a potential storage site was terminated by Congress, *id.* at § 1512, 133 CONG. REC. at H13700. Therefore, it is unlikely that copper will be used as a canister material because crystalline rock is its best performance environment. See *DOE Oversight Hearings, supra* note 55, at 57.

⁶⁰ *DOE Oversight Hearings, supra* note 55, at 58.

⁶¹ NON-FERROUS METAL DATA, *supra* note 28, at 25.

⁶² TRANSNATIONAL CORPORATIONS, *supra* note 21, at 24. Such plants would require 90 tons of copper per million gallons per day plant capacity. *Id.* See 1985 MINERALS YEARBOOK, *supra* note 23, at 333.

⁶³ Unwrought Copper, *supra* note 8, app. See 1985 MINERALS YEARBOOK, *supra* note 23, at 333.

copper may develop.⁶⁴ Third, demand for copper for electrical transmission development is below expectations. A significant use for copper is as wire in electrical transmission equipment, such as high-tension power lines and electrical generating equipment.⁶⁵ Electrification and industrialization—projects undertaken by developing, not developed, nations—account for a large share of world demand for copper. Developed countries by definition do not need large-scale electrification, and those developing countries in need of such projects, unable to afford them, have been forced to cancel planned projects.⁶⁶ Severe debt problems have discouraged these developing countries from undertaking large-scale electrification or industrialization, resulting in a reduced demand for copper.⁶⁷

The final factor decreasing demand for newly mined copper is the growing market share of recycled copper.⁶⁸ Copper, virtually indestructible, is never actually consumed. For example, when a building is demolished, the copper used in its construction (a major use of metal in pre-twentieth century buildings) becomes available for recycling and can re-enter the market as scrap. Substantial numbers of these buildings are only now being demolished, and thus the market share of recycled copper has only recently become significant.⁶⁹ Thus, as a nation develops and undertakes intensive industrialization and electrification, its demand for copper is highest. As a nation matures, its infrastructure requirements level off and “its requirements for most raw materials per unit of GNP . . . tend[s] to decline.”⁷⁰ That decrease is attributable both to a lessened demand for new infrastructure and to the impact of scrap.

C. The United States Industry: A Smaller Piece of a Smaller Pie.

As a result of declining demand and increasing imports, the domes-

⁶⁴ See 1985 MINERALS YEARBOOK, *supra* note 23, at 333.

⁶⁵ See D. HARGREAVES, *supra* note 31, at 66.

⁶⁶ *Nonferrous Metals*, *supra* note 8, at 20-4.

⁶⁷ *Id.* See also R. BOWEN & A. GUNATILAKA, *supra* note 4, at 14 (“An important factor in the third world is the snail-like pace of economic progress in South America, Africa and Asia coupled with and, in part, caused by a very high rate of increase in population.”).

⁶⁸ See generally R. PRAIN, *supra* note 20, at 142-50; D. MEZGER, *supra* note 2, at 36-40.

⁶⁹ Copper does not deteriorate. When a product is demolished or scrapped, the copper contained therein may be recycled. “[T]he average life of copper in service varies from three to five years for transportation purposes to 40 years or more in power transmission lines and cable giving a pattern to recycling trends.” D. HARGREAVES, *supra* note 31, at 68. “Peacetime recycling of scrap copper did not become important in the United States until the early 1950’s. It now accounts for 40% of apparent copper consumption.” T. NAVIN, *supra* note 4, at 5. See also R. PRAIN, *supra* note 20, at 54-55. Besides reducing long-term demand, the durability of copper affects its pricing. See generally Coase, *Durability and Monopoly*, 15 J.L. ECON. 143 (1972).

⁷⁰ R. PRAIN, *supra* note 20, at 263, quoting Varon & Takeuchi, *Developing Countries and Non-fuel Minerals*, 52 FOREIGN AFF. 497 (1974).

tic copper industry has lost a large share of both the world and domestic markets, perhaps permanently. Imports of refined copper which in 1982 were only about 10% of domestic consumption increased to 28% in 1985.⁷¹ In 1986 imports increased even further.⁷² Combined with a sharp decrease in demand,⁷³ the initial result was widespread and unprecedented unemployment.⁷⁴ Indeed, between 1982 and 1984, the United States copper industry experienced the worst depression in its history. From 1981 to 1982, the price of copper fell to a point at or below the cost of production, its lowest point in real terms this century.⁷⁵ The domestic industry's share of world production fell by 5%;⁷⁶ mine and smelter production fell by 28% and 29%, respectively,⁷⁷ and the value of the copper produced fell by more than 33%.⁷⁸ Between 1981 and 1985,

⁷¹ "As a percentage of apparent consumption of refined copper, U.S. import reliance reached 28% in 1985; this compared with an import reliance of 1% as recently as 1982." 1985 MINERALS YEARBOOK, *supra* note 23, at 336. See *Use of IMF Resources by Major Copper-Producing Countries: Hearing on S. 2524 Before the Subcomm. on International Economic Policy of the Senate Comm. on Foreign Relations*, 98th Cong., 2d Sess. 9-10 (1984)[hereinafter *Use of IMF Resources*]. See also *Unwrought Copper*, *supra* note 8, at 1712 ("In percentage terms, 1983 imports of blister copper and refined copper exceed their 1979 levels by 88 percent and 125 percent, respectively." (footnotes omitted)). "Imported refined copper reached a record of more than half a million metric tons in 1986. This is an increase of 10 to 20 percent, compared to recent years." 133 CONG. REC. S5239 (1987)(statement of Senator Domenici). "Refined copper imports which, as recently as 1979, were only about 10% of domestic consumption, surged to 26% in 1983 and, according to Commerce Department projections, will reach 35.5% in 1989." *Hearings on Reauthorization of Superfund Before Subcomm. on Water Resources of the House Comm. on Public Works and Transportation*, 99th Cong., 1st Sess. 1125 (1985)(footnote and emphasis omitted)[hereinafter *Water Resources Hearings*].

⁷² See *supra* note 71.

⁷³ Copper is used in "generators, motors, electric locomotives, switchboards and telephone and telegraph equipment [and in] its alloyed form . . . building construction . . . automobile manufacturing, ammunition and shipbuilding industries." TRANSNATIONAL CORPORATIONS, *supra* note 21, at 20. See generally T. NAVIN, *supra* note 4, at 70-79. These are durable goods, and the decision to purchase them easily may be postponed by the consumer. *Unwrought Copper*, *supra* note 8, at 1713. Purchases of copper were postponed during the recession, when demand for these end-products declined. See *id.* at 1723. Similarly, foreign demand for such goods decreased and demand for copper by developing countries failed to meet expectations as those countries were forced to cancel electrical and industrial development projects. See *supra* notes 65-67 and accompanying text.

⁷⁴ *U.S. Assistance to Foreign Copper Producers*, *supra* note 4, at 28-30. Moreover, unemployment increased in 1985, the industry employing some 25,000 fewer employees in 1985 than in 1980. NON-FERROUS METALS, *supra* note 8, at 20-1. "Employment in the U.S. copper industry totalled an estimated 9,800 in 1986, compared to more than 30,000 as recently as 1981, and 15,000 in 1984." 133 CONG. REC. S5240 (1987)(statement of C. Hansen, President, Ariz. Mining Ass'n).

⁷⁵ *Use of IMF Resources*, *supra* note 71, at 43. See also [1984] 1 U.S. BUREAU OF MINES, MINERALS YEARBOOK, Metals and Minerals 291 (1985)[hereinafter 1984 MINERALS YEARBOOK].

⁷⁶ 1986 STATISTICAL ABSTRACT, *supra* note 8, at 699.

⁷⁷ *Unwrought Copper*, *supra* note 8, at 1712. See 1986 STATISTICAL ABSTRACT, *supra* note 8, at 694.

⁷⁸ 1986 STATISTICAL ABSTRACT, *supra* note 8, at 695.

the five major domestic producers lost \$3 billion.⁷⁹

While the depression within the copper industry was in part merely a symptom of the general recession affecting the United States and the world economy,⁸⁰ its effects were felt more deeply and for a longer duration in the copper industry than in the general economy.⁸¹ Since many copper mines and smelters are located near small communities, the impact was especially focused.⁸² Moreover, because demand has yet to catch up with this tremendous surplus capacity, the recovery of the domestic industry has lagged behind that of the general economy.⁸³ "Although the U.S. demand for copper and copper products is regaining strength, this demand is being satisfied, by and large, by imports."⁸⁴ Domestic producers have shut down marginal mines and implemented cost-saving measures, actions which lowered production costs by 25% between 1981 and 1985.⁸⁵ Even so, the industry remains depressed, with the price of copper remaining until very recently near domestic production costs.⁸⁶ Furthermore, half of domestic mine capacity is closed and

⁷⁹ *Water Resources Hearings*, *supra* note 71, at 1124.

⁸⁰ See generally ADJUSTMENT, CONDITIONALITY, AND INTERNATIONAL FINANCING 16-29 (J. Muns ed. 1984).

⁸¹ See generally *Water Resources Hearings*, *supra* note 71, at 1124-25. "Domestic copper mine, smelter, and refinery production all declined significantly between 1979 and 1983 Mine output fell 27.6 percent from 1979 to 1983 while smelter production slid 29.3%. Refinery output followed a similar trend dropping 21.3% between 1979 and 1983." Unwrought Copper, *supra* note 8, at 1712 (footnotes omitted). Production and capacity utilization similarly declined: "For mines, the decline was from a 78.5 percent utilization rate in 1979 to 59.8% in 1983. For smelters, the drop was from 77.7% to 56.8%, and for refineries, the decrease was from 86.8% to 62.0%." *Id.* (footnotes omitted).

⁸² The loss of two-thirds of the jobs in the industry has devastated "rural areas in the West where the copper industry was the underpinning of the local economy." 133 CONG. REC. S9378 (1987)(statement of Senator DeConcini). See, e.g., *U.S. Assistance to Foreign Copper Producers*, *supra* note 4, at 17-19 (statement of Jerry Brisbescas, Mayor of Mammoth, Ariz.).

⁸³ The price of copper is set on the world market. See *infra* notes 105-06. Thus, the economic recovery of the United States did not bring about a worldwide copper recovery. See Unwrought Copper, *supra* note 8, at 1722 n.47. Production of copper for 1984 was 1,203,000 short tons, just 59,000 more than in 1983, and except for that year, the lowest production rate since before 1970. 1986 STATISTICAL ABSTRACT, *supra* note 8, at 711.

Recently, consumption has exceeded supply, driving up the price. See *Copper Rally Continues*, *supra* note 34. However, this is viewed as a temporary situation because the extent of the tremendous excess capacity is expected to more than compensate for this temporary tightness by the second half of 1988, pushing prices backdown. *Id.*

⁸⁴ 133 CONG. REC. S9378 (1987).

⁸⁵ *Id.* See also 1985 MINERALS YEARBOOK *supra* note 23, at 321, 323.

⁸⁶ COMEX prices in 1985 averaged 7% below 1982 prices, and 1982 was a year of deep recession. Consequently, production remains down, mines remain closed, and industry employment is less than 50% of its 1980 peak. This despite substantial cost-cutting by the producers. NONFERROUS METALS, *supra* note 8, at 20-1 to 20-4. See also 1985 MINERALS YEARBOOK, *supra* note 23, at 321, 325.

In cents per pound, average LME prices were: 67.192 (1982), 72.153 (1983), 62.562 (1984), and

expected never to reopen.⁸⁷ The long-term result of the 1982 depression seems to be the permanent loss of much domestic production capacity. Consequently, imports are expected to constitute more than 35% of domestic consumption by 1990.⁸⁸

D. Foreign State-owned Producers: Producing Without
Regard to Demand

Nearly 60% of the world's known copper reserves are located in developing countries, and 40% are controlled by state-owned mining interests, all of which belong to the *Conseil Intergouvernemental des Pays Exportateurs de Cuivre* ("CIPEC"), the Intergovernmental Council of Copper Exporting Countries.⁸⁹ Formed in 1967 by Chile, Zambia, Peru, and Zaire—countries then accounting for 40% of world copper production⁹⁰—CIPEC originally sought to follow the market strategies of OPEC,⁹¹ but its efforts had little effect.⁹² The strategy failed for two reasons. First, the individual interests of CIPEC members proved too divergent to permit agreement on production strategies.⁹³ Second, and more importantly, its members are critically dependent on copper for foreign exchange, which severely restricts their abilities to curtail production.⁹⁴ CIPEC now collects and disseminates information to assist member nations in forecasting supply and demand and acts as a consulta-

64.904 (1985). NON-FERROUS METAL DATA, *supra* note 28, at 44. In 1986, LME prices dropped from 64.344 in January to 60.580 by December. *Id.* As noted *supra* note 41, the price has recently, and apparently temporarily, increased to over \$1.00 per pound.

⁸⁷ NONFERROUS METALS, *supra* note 8, at 20-1 to 20-4.

⁸⁸ See *supra* note 71. Domestic capacity has fallen by 33% since 1982. *Copper Rally Continues*, *supra* note 34. In addition, world production capacity has fallen 1.5 million metric tons since 1982. *Id.*

⁸⁹ TRANSNATIONAL CORPORATIONS, *supra* note 21, at 10. The Intergovernmental Council of Copper Exporting Countries ("CIPEC") is also known in Spanish as: Consejo Intergubernamental de Países Exportadores de Cobre. *Use of IMF Resources*, *supra* note 71, at 47.

⁹⁰ TRANSNATIONAL CORPORATIONS, *supra* note 21, at 10. Indonesia, Australia, Papua New Guinea, Yugoslavia, and Mauritania later joined CIPEC. W. GLUSHKE, J. SHAW & B. VARON, *COPPER: THE NEXT FIFTEEN YEARS 20* (1979).

⁹¹ In contrast to OPEC, which sought to raise prices in order to capture a larger market share, CIPEC sought to depress prices by overproducing. *Use of IMF Resources*, *supra* note 71, at 12. For comparisons of OPEC and CIPEC, see R. PRAIN, *supra* note 20, at 255-60; D. MEZGER, *supra* note 2, at 116-19.

⁹² M. LASAGA, *supra* note 23, at 14-15. See, e.g., *Unwrought Copper*, *supra* note 8, at 1723 n.48. See generally R. PRAIN, *supra* note 20, at 248-55.

⁹³ See W. PETERS, *supra* note 26, at 39.

⁹⁴ D. HARGREAVES, *supra* note 31, at 68. "In the CIPEC countries the national economy is almost entirely dependent on a continuing flow of foreign exchange. This is the whole basis of these countries' existence." R. PRAIN, *supra* note 20, at 257. See *infra* notes 98-100 and accompanying text.

tive body to coordinate policies.⁹⁵

The most important development in the world copper market has been the recent nationalizations of the copper facilities of Chile, Peru, Zaire, and Zambia.⁹⁶

At the beginning of the [1960s] copper production in which government held any sort of interest did not amount to more than 2 1/2 per cent of capacity By 1970 this total had risen to some . . . 43 per cent of capacity. More than a quarter of the world's copper was being produced by mines totally owned by government, 12 per cent by companies in which the state had a majority interest, and 5 per cent by companies in which government had minority interests.⁹⁷

Today, the primary competitors of the United States domestic industry are these foreign, state-owned producers. Copper exports are extremely vital to these countries, accounting for 48% of the 1983 export earnings of Chile, 41% of the 1982 export earnings of Zaire, 89% of the 1982 export earnings of Zambia,⁹⁸ and 50% of the 1985 export earnings of Peru.⁹⁹

That the primary competitors of the domestic industry are nations, and not private ventures, is key to understanding the problems confronting the domestic industry. The priorities of these state-owned producers are directed more toward increasing the technical skill of their citizens, creating full employment, and generating maximum amounts of foreign exchange than toward generating profit.¹⁰⁰ For instance, between

⁹⁵ Unwrought Copper, *supra* note 8, app. See generally C. MPHAISHA, *supra* note 26, at 108-37.

⁹⁶ See generally R. PRAIN, *supra* note 20, at 223-27; D. MEZGER, *supra* note 2, at 146-57.

⁹⁷ R. PRAIN, *supra* note 20, at 222-23.

⁹⁸ *Use of IMF Resources*, *supra* note 71, at 45. In 1985 in Chile, "[c]opper alone accounted for . . . about 46% of export earnings. About 77,000 workers were directly employed in the mining sector. Copper production and export is the most important economic activity. . . ." Velasco, *supra* note 23, at 195. "As the major export [of Zambia], copper provides most of the necessary foreign exchange. The copper industry has spurred the growth of other industries that provide services and input to it." C. OBIDEGWU & M. NZIRAMASANGA, *supra* note 26, at 20. Zairian exports in 1984 totalled \$1.6 billion, of which \$544.4 million was earned from copper.

⁹⁹ 1985 MINERALS YEARBOOK, *supra* note 23, at 346.

¹⁰⁰ *Use of IMF Resources*, *supra* note 71, at 48. The strategy of these state-owned producers, which subsidize copper production both directly and indirectly, see, e.g., 133 CONG. REC. S9378 (1987)(Chile), "is to gain and hold on to market share, regardless of the costs involved. Profits are unimportant in this strategy since many of the firms are accountable only to the Government, not profit-motivated shareholders." 133 CONG. REC. S9368 (1987). For example, Zambian "[g]overnment taxation policies are aimed at maximizing government revenues from mining while providing the industry with incentives to expand production and employment of Zambians The mining companies provide training programs for Zambian employees. In addition, they sponsor employees or prospective employees in technical colleges and universities A major concern is upgrading the training and skills of the labor force, since the availability of skilled labor is a constraint on the growth of the economy." C. OBIDEGWU & M. NZIRAMASANGA, *supra* note 26, at 18-19. Indeed, "[t]he copper industry employs over 14 percent of the total Zambian wage factor." *Id.* at

1981 and 1983, when copper prices were below production costs for all producers except Chile, domestic producers followed the dictates of supply and demand and reduced production; Chile, Peru, Zambia, and Zaire increased production.¹⁰¹ Nations, unlike private entities, are not bound by private capital markets, nor by the demands of shareholders, nor by the unavoidable need for profit. This freedom gives foreign producers a distinct advantage. Even so, this Comment will show that United States policy has operated to further disadvantage domestic producers relative to their foreign state-owned competitors.

III. THE COMPETITIVENESS OF THE DOMESTIC INDUSTRY

A. Domestic Copper Competition with Foreign Copper on a Uniform World Market

Prior to 1978, the major United States producers offered their product to customers on the basis of published price lists¹⁰² and set the domestic price of copper near the world price—at a profitable point, but low enough to prevent substitution.¹⁰³ However, in the late 1970s copper imports at a lower price increased, and “both a new lack of control by domestic producers over import levels and the worldwide nature of the copper market” forced domestic producers to base their prices directly on the London Metals Exchange (“LME”) and the New York Commodity Exchange (“COMEX”).¹⁰⁴ Since then,

All . . . copper [produced in the free world] competes in the world markets,

25. See also W. PETERS, *supra* note 26, at 36 (issues of renegotiation of Zambian takeover included localization of labor).

As Senator Domenici said:

The overwhelming production of copper is governmentally owned. Governments subsidize and governments own that production. They do not care about the marketplace concept. It is a social policy to subsidize and grow and employ, thus dropping the price of these commodities not to marketplace levels, but rather to the subsidized levels that come from their insistence on increasing capacity in a subsidized manner for products which are already in a world glut posture.

133 CONG. REC. S9374 (1987).

¹⁰¹ *Use of IMF Resources*, *supra* note 71, at 48. Expansions have continued despite the persistence of depressed prices. Zaire, which produced at nearly full capacity in 1985, planned for a 55% increase in production for 1986. 1985 MINERALS YEARBOOK, *supra* note 23, at 971. Chile increased its 1985 production by 5% over 1984, and planned for additional increases in 1986. *Id.* at 341-43. Peru increased its 1985 copper exports by approximately 20% in 1984. *Id.* at 346-47.

Not surprisingly, when prices remained depressed, eventually these countries reduced production, thus restricting supply and increasing price. Soon that production capacity will once again be utilized, and the price will once again fall to prior levels, reflecting the availability of oversupply. See generally *Copper Rally Continues*, *supra* note 34.

¹⁰² G. ROBERTS, *supra* note 41, at 64.

¹⁰³ Unwrought Copper, *supra* note 8, at 1722 n.42. For a discussion of pricing practices prior to 1978, see R. PRAIN, *supra* note 20, at 94-99.

¹⁰⁴ Unwrought Copper, *supra* note 8, at 1722 n.42. See also G. ROBERTS, *supra* note 41, at 64-65.

directly or indirectly. Copper can be freely shipped anywhere in the world for a few cents per pound and . . . those prices must reflect . . . the prices set by transactions in . . . the London Metal Exchange and the New York Commodity Exchange.¹⁰⁵

Copper has a peculiar status as a fungible world commodity: it is traded at a relatively uniform international price in an open global commodity market.¹⁰⁶ Consequently, even though the United States is virtually self-sufficient in copper, domestic prices reflect world production, sales, and demand. Thus, the price for domestically produced copper is set by the world market, not by domestic producers. The domestic producers are unable to increase prices to cover, for example, increased costs due to United States environmental regulations.¹⁰⁷ Domestic producers must follow the world copper price, so that lower price imports do not take an even larger share of the domestic market. They are price takers, not price makers.

B. Foreign State-Owned Producers' Advantages Over Domestic Producers

Foreign state-owned producers are better able to compete on the world copper market than are United States domestic producers for a variety of reasons. Foremost are two practical business advantages of foreign producers. First, foreign producers' labor costs represent a smaller share of their production costs than in domestically produced copper.¹⁰⁸ Second, the ore content of foreign mines is generally higher than that of domestic mines, a fact greatly reducing costs for production of foreign producers.¹⁰⁹

¹⁰⁵ *U.S. Assistance to Foreign Copper Producers*, *supra* note 4, at 198.

¹⁰⁶ *Unwrought Copper*, *supra* note 8, at 1711.

¹⁰⁷ *See generally infra* notes 147-61 and accompanying text.

¹⁰⁸ *U.S. Assistance to Foreign Copper Producers*, *supra* note 4, at 199. *See also* *Unwrought Copper*, *supra* note 8, at 1721 (wage costs per worker increased by 9.5% per year from 1979 to 1983, but total labor expenditures declined by 33% from 1981 to 1983 because the number of workers employed decreased).

¹⁰⁹ *U.S. Assistance to Foreign Copper Producers*, *supra* note 4, at 221 (statement of Michael Rieber, Professor of Mineral Economics, University of Arizona); M. LASAGA, *supra* note 23, at 11 ("The high grade of proven reserves explains why Chilean mines operate under one of the lowest operating costs in the world.").

Since the average grade of U.S. copper ore is 35 percent below the average grade in foreign countries, U.S. copper mines, to yield the same quantity of copper, must mill and concentrate more than half as much ore as their foreign competitors. Relative costs for U.S. producers will continue to increase over the coming decades

Unwrought Copper, *supra* note 8, at 1720 (footnotes omitted). "U.S. milling costs are 55 percent above the average of foreign countries, and almost all of this difference is attributable to the lower grade of domestic ores." *Id.* at 1720 n.21.

The low ore content of United States copper is clearly a substantial reason why domestic copper is more expensive to produce. In 1985, production costs per pound were: Zaire, 57¢; Chile, 60¢;

"In addition to the marketplace factors . . . another important factor has been Government subsidies to build excess capacity. With the increasing involvement of governments . . . there is a growing tendency to ignore commercial considerations in key business decisions, including decisions to expand capacity."¹¹⁰ Governments compete with the United States copper industry. These governments leave "to the private sector alone the task of curtailing production in an attempt to match reduced demand This practice [of overproduction] continues because many of these same foreign industries are receiving direct monetary subsidies from their governments."¹¹¹ Thus, even when the price of copper falls below the production cost of a foreign mine, a subsidy may enable that mine to continue production when a domestic, private mine could not.¹¹²

In addition to these three factors, which the United States is unable to affect directly,¹¹³ there are several other advantages of foreign producers which are not the result of practical differences between domestic and foreign mines. These factors relate to United States policies that either confer advantages upon foreign producers or impose disadvantages upon domestic producers that affect the price of production, and hence the ability of domestic producers to compete in the world copper market.

1. *United States Foreign Policies Affecting Competitiveness in the Domestic Copper Industry*

Because copper is a globally traded commodity, United States foreign policy affects the ability of the domestic industry to compete. Particularly, two interrelated practices have given distinct advantages to

Zambia, 60¢; United States, 70¢; Peru, 81¢. See 1985 MINERALS YEARBOOK, *supra* note 23, at 351. However, that is not the same as saying that domestic producers are not competitive. Indeed, taking into account that United States labor costs are higher, and that compliance with United States environmental regulations add 10¢ to 15% per pound to the price of domestically produced copper, see *infra* note 149, domestic producers are actually quite competitive. Indeed, the United States has lower mining costs than all but Peru, and smelting costs lower than both Peru and Zaire. See 1985 MINERALS YEARBOOK, *supra* note 23, at 351. It is in the milling stage, when greater amounts of waste must be removed by domestic producers to yield the same amount of ore that domestic costs exceed foreign costs by 55%. See Unwrought Copper, *supra* note 8, at 1720 n.21.

¹¹⁰ 133 CONG. REC. S9368 (1987)(statement of Senator Domenici).

¹¹¹ *Id.* at S9377 (1987)(statement of Senator Domenici).

¹¹² For example, Chile maintained a price of 75¢ per pound for copper when its selling price on the world market was 59¢. *Id.* at S9378.

¹¹³ That is, the United States cannot easily enhance the ore content of its mines, nor reduce the wages of its work force, nor prohibit a foreign government from subsidizing production. That is not to say that the United States government cannot affect the efficiency and productivity of its mines and work force. "The domestic industry has already demonstrated that through improved technology domestic producers have improved their production efficiencies and reduced the cost per pound of production." Unwrought Copper, *supra* note 8, at 1714 (footnotes omitted). See also *infra* notes 243-45 and accompanying text.

foreign producers: 1) participation by the United States in institutions that grant low-interest loans to foreign producers; and 2) the practice of conditioning such loans on the ability of the borrower to increase production.

First, the participation by the United States in lending institutions which provide assistance to foreign copper-producing nations has enhanced the competitive position of these nations relative to that of the United States. While mines in the United States were developed with private domestic capital, most foreign mines were developed with capital foreign to the producer-state—capital which was private as well as organizational and governmental in source.¹¹⁴ The United States has provided financial assistance through participation in a variety of institutions, including the various MDBs and the CFF of the IMF.¹¹⁵ Assistance by the IMF and MDBs has been substantial: between 1975 and 1983, loans on favorable terms totalling nearly \$4.4 billion were made to Chile, Peru, Zaire, and Zambia.¹¹⁶ In contrast, the United States domestic industry spent \$1.3 billion on modernization between

¹¹⁴ Private ventures provided the majority of the developmental capital in the early twentieth century, particularly that used in developing mines in countries which were currently or formerly colonies of the investor's home country. "It is to belabour the obvious . . . that Zambia's copper industry was developed by foreign capital. The dominant firms were the British South Africa Company, the Roan Selection Trust, and the Anglo-American Corporation." C. MPHAISHA, *supra* note 26, at 62. Chile's mines were developed with assistance of British and German capital. T. NAVIN, *supra* note 4, at 10. See also T. MORAN, *supra* note 1, at 119-52. See generally TRANSNATIONAL CORPORATIONS, *supra* note 21, at 55-59; S. CUNNINGHAM, THE COPPER INDUSTRY IN ZAMBIA 63-85 (1981).

Organizational assistance seemingly began in 1957, when the United Nations began to provide low interest loans to assist copper production. TRANSNATIONAL CORPORATIONS, *supra* note 21, at 69-70.

¹¹⁵ See generally *Use of IMF Resources*, *supra* note 71; *U.S. Assistance to Foreign Copper Producers*, *supra* note 4.

¹¹⁶ *Use of IMF Resources*, *supra* note 71, at 9. For example, in 1983 the International Finance Corporation participated in a \$60 million expansion of a Chilean copper mine. *Id.* at 14. Also, the Inter-American Development Bank approved a \$268 million concessionary loan to Chile's Codelco as part of a \$670 million modernization and expansion plan. *Id.* Loans of \$75 million and \$27 million were also recently made from the World Bank and African Development Bank to Zambia. *Id.* at 15. Between 1984 and April 1986, the CFF provided an additional \$404 million to these countries. *Multilateral Development Banks, Hearings Before the Subcomm. on International Development Institutions and Finance of the House Comm. on Banking, Finance and Urban Affairs*, 100th Cong. 1st Sess. 411 (1987)[hereinafter *Multilateral Development Banks*]. In 1985, Peru obtained \$100 million in MDB financing to expand its mining facilities. 1985 MINERALS YEARBOOK, *supra* note 23, at 347.

In addition, in 1983 the International Finance Corporation ("IFC") was considering participation in a \$450 million loan package to expand Mexico's Cananea mining and smelting facility, a loan the IFC eventually decided against. *Geopolitics of Strategic and Critical Materials, Hearings Before the Senate Comm. on Energy and Natural Resources*, 98th Cong., 1st Sess. 384-85 (1983)[hereinafter *Geopolitics Hearings*].

1979 and 1984.¹¹⁷ Moreover, funds were available to domestic producers only at market rates, not at the favorable terms offered by the MDBs.¹¹⁸

Assistance by the CFF differed in form, though not effect, from that given by the MDBs. The MDBs made loans at favorable and sometimes concessionary terms for specific projects. The CFF, in contrast, provided general balance of payment support rather than funding for specific projects.¹¹⁹ Although there are distinctions between a loan granted by an MDB for a specific project and balance of payment assistance from the CFF, the effect of either type of assistance is similar to the fungibility of capital. In either form, capital which is made available to the producer-nation can be used to expand its production facilities either directly (as in the case of MDB loans) or indirectly (as in the case of CFF assistance).¹²⁰ For the purposes of this analysis, no distinction will be drawn between the two.

A primary purpose of the CFF is to make assistance available to nations experiencing an export earnings shortfall due to declining world prices in a particular commodity.¹²¹ Thus, when the price of copper declined in the early 1980s, the CFF granted balance of payment loans to producers. These countries then continued to produce at levels in excess of demand, reducing the price of copper even further, thereby qualifying for further CFF assistance.¹²² In effect, the CFF subsidized overproduction by foreign copper producers, overproduction which itself operated to further depress the price of copper.¹²³

Assistance by the MDBs consisted of loans for specific projects that increased the production capacity of foreign producers. Between 1975 and 1983 the MDBs provided more than \$1.8 billion to CIPEC produ-

¹¹⁷ *Use of IMF Resources*, *supra* note 71, at 9.

¹¹⁸ *Id.*

¹¹⁹ See *Multilateral Development Banks*, *supra* note 116, at 406-15; Gold, *The Relationship Between the International Monetary Fund and the World Bank*, 11 CREIGHTON L. REV. 499 (1982); Silard, *The Role of the International Monetary Fund*, 32 AM. U.L. REV. 90 (1982); *Use of IMF Resources*, *supra* note 71, at 23.

¹²⁰ See *U.S. Assistance to Foreign Copper Producers*, *supra* note 4, at 258 ("Any loan, for any purpose, makes the transfer [to investments intended to increase copper production] possible.")(statement of Michael Rieber, Professor of Mineral Economics, University of Arizona).

¹²¹ See Finger & Derosa, *The Compensatory Finance Facility and Export Instability*, 14 J. WORLD TRADE L. 14 (1980). See generally R. GOODE, *ECONOMIC ASSISTANCE TO DEVELOPING COUNTRIES THROUGH THE IMF* 6-7 (1985).

¹²² *Use of IMF Resources*, *supra* note 71, at 20-21. In 1985 Chile received \$73.1 million in CFF financing to make up for loss of export earnings. 1985 MINERALS YEARBOOK, *supra* note 23, at 341. "Unfortunately, the more Chile produced the lower copper prices fell." 133 CONG. REC. S9271 (1987).

¹²³ *Use of IMF Resources*, *supra* note 71, at 20-21.

cers at concessionary terms.¹²⁴ In 1984, \$268 million was made available to Chile to expand capacity and enhance efficiency,¹²⁵ and \$300 million was made available to Zambia for rehabilitation of its copper industry.¹²⁶ In 1986, Chile and Zaire received loans totalling \$130 million and \$72.6 million, respectively, for copper production purposes.¹²⁷ Thus, the MDBs lent at favorable terms for projects to increase the production and enhance the efficiency of foreign state-owned mines even during the early 1980s when oversupply and depressed prices existed; at a time when United States producers were curtailing production due to these poor conditions.

Prior to 1981, the United States did not oppose on policy grounds IMF or MDB assistance to nations overproducing copper.¹²⁸ Even since 1981, because loans are made by majority vote of members of the MDB, opposition of the United States does not *ipso facto* defeat a proposed loan.¹²⁹ Indeed, opposition by the United States since 1981 has not prevented the making of a single loan, and five loans totalling over \$600 million have been approved for Chile, Zaire, and Zambia despite opposition by the United States.¹³⁰ Thus, foreign copper producers received and continue to receive favorable loans to modernize and expand.¹³¹ The obvious advantage conferred by these loans is access to comparatively inexpensive capital.

Second, CFF conditionality requiring that the borrowing state increase production in order to obtain CFF assistance has permitted foreign copper producers to expand production even during times of depressed prices and oversupply. In effect, the CFF encourages foreign producers to increase production without regard to profit.¹³² "It is clear

¹²⁴ *Id.* at 45.

¹²⁵ *Id.*

¹²⁶ *Id.* See also 1984 MINERALS YEARBOOK, *supra* note 75, at 315.

¹²⁷ 133 CONG. REC. S9283 (1987).

¹²⁸ Apparently, it was not recognized as a problem until, beginning in 1978, Congress directed that for one year United States representatives to the various MDBs oppose any loans for the production of any commodity in surplus on the world market if the loan would cause substantial injury to a domestic producer. Foreign Assistance and Related Programs Appropriations Act, 1979, Pub. L. No. 95-481, tit. VI, § 609, 92 Stat. 1601 (Oct. 18, 1978). Similar provisions specific to mining and smelting, 22 U.S.C. 262k(c)(Supp. III 1985), and even to copper itself, Supplemental Appropriations Act, 1985, Pub. L. No. 99-88, tit. I, § 501, 99 Stat. 329-30 (Aug. 15, 1985), were enacted. See text following 22 U.S.C. 262k(d)(Supp. III 1985). See also S. 2815, *supra* note 2; S. Rep. No. 440, *supra* note 2.

¹²⁹ See, e.g., *Use of IMF Resources*, *supra* note 71, at 36 (\$268 million loan to Chile approved with only the United States voting against the loan). See generally 133 CONG. REC. S9281-84 (1987).

¹³⁰ 133 CONG. REC. S9283 (1987).

¹³¹ See generally *U.S. Assistance to Foreign Copper Producers*, *supra* note 4; *Use of IMF Resources*, *supra* note 71, at 45.

¹³² *Use of IMF Resources*, *supra* note 71, at 41. See also *U.S. Assistance to Foreign Copper Produ-*

that IMF conditionality . . . has often caused countries to maximize copper production and exports irrespective of the impact on other copper producers”¹³³ By requiring increased production despite prices below cost, the CFF encouraged foreign producers to subordinate market principles to increase production in order to meet debt service requirements and the CFF loan condition.

These two policies, granting favorable loans and providing assistance through CFF conditionality, combined to enhance the ability of state-owned producers (already motivated primarily by factors other than profit) to externalize overproduction. Capital from the MDBs and CFF was available to increase production, CFF assistance was available to meet debt service shortfalls caused by the depressed prices which resulted from that very same increased production.¹³⁴ The CFF condition effectively required overproduction.

Without external aid, these countries and their socialized mines could not over the longer term continue overproducing during periods of such low prices. But they can disregard their losses, in large measure, because the IMF steps in and provides credits to keep these states—and their mines—operating. It is most difficult for any private industry to operate against state-owned enterprise, but the task facing the domestic copper industry becomes close to impossible when its foreign competition is virtually freed from the consequences of its uneconomic behavior by funds which are supplied in significant part by our own government.¹³⁵

Because the price for copper is set on a worldwide basis, state-owned producers were able to shift the effects of their overproduction onto United States producers, thus forcing these domestic producers to curtail production to compensate for foreign overproduction.¹³⁶ Indeed, between 1981 and 1983, while “western world copper production (exclud-

cers, supra note 4, at 204-05. This condition is intended to encourage the developing nation to increase its earnings from exports of copper, thereby lessening its balance of payments problems. *Id.* at 41. See also Pirzio-Biroli, *Making Sense of the IMF Conditionality Debate*, 17 J. WORLD TRADE L. 115, 128 (1982)(Critics argue that CFF funding encourages recipient nations “to move towards payments balance through export expansion rather than import contraction, a policy more appropriate to their needs.”).

¹³³ *Use of IMF Resources, supra* note 71, at 44.

¹³⁴ Overproduction increases supply, thus lowering the price. Domestic producers, bound by the need for profit, could not produce copper when its price fell below the cost of production. Yet, foreign producers produced copper in increased amounts for extended periods of time when the price was below the cost of production. Domestic producers were not able to borrow capital on terms as favorable as foreign producers, nor were they able to obtain CFF assistance, and as a result of this overproduction, domestic producers were forced to layoff workers and close mines. See *Water Resources Hearings, supra* note 71, at 1124-30. Thus, foreign producers externalized the effects of their overproduction (namely, unemployment) onto domestic producers.

¹³⁵ *Geopolitics Hearings, supra* note 116, at 488.

¹³⁶ “Imports are the vehicle transmitting this depressed world price into the U.S. market, requiring producers to peg their prices to the world price.” Unwrought Copper, *supra* note 8, at 1715.

ing the CIPEC nations) decreased by 17.7 percent, . . . mine output from the CIPEC countries increased by 9.8 percent and Chile's output [increased] by 16.3 percent."¹³⁷

A factor further encouraging overproduction by foreign state-owned producers is that Chile, Peru, Zaire, and Zambia have enormous foreign debt service requirements.¹³⁸ Thus, debt service requirements motivated these borrowing producers to increase production in order to acquire the foreign currency necessary to service those debts.¹³⁹ CFF conditionality and the availability of MDB loans, particularly in light of these debt service requirements, encouraged foreign state-owned producers to pursue policies designed to acquire as much foreign currency as possible by producing as much copper as possible.

Overproduction led to the predictable consequence of a worldwide copper glut, further depressing its price.¹⁴⁰ Demand has only recently caught up with supply, and until very recently the price of copper remained below production cost for all but three or four of the world's copper mines.¹⁴¹ "In the absence of a significant and *sustained* increase in prices, total domestic production could fall about 17 percent . . . by 1990."¹⁴²

¹³⁷ *Use of IMF Resources*, *supra* note 71, at 48. While the foreign producer arguably could have over-produced without such loans, inarguably their ability to do so was enhanced by the availability of the IMF and MDB capital. *See id.* at 20-21.

¹³⁸ *See generally* S. CUNNINGHAM, *supra* note 114, at 309; D. MEZGER, *supra* note 2, at 218-35. For example, the annual export earnings of Chile's state-owned copper interest, Codelco, roughly equal the interest Chile pays annually on its national debt. Unwrought Copper, *supra* note 8, app. "Copper accounts for about two-thirds of Chilean exports . . ." M. LASAGA, *supra* note 23, at 1. "The most pronounced direct impact on the Chilean economy from the copper sector is through the balance of payments." *Id.* at 11. *See generally Third World Debt: Hearings on H.R. 3 Before the Subcomm. on International Development Institutions and Finance of the House Comm. on Banking, Finance and Urban Affairs*, 100th Cong. 1st Sess. 1-145 (1987)[hereinafter *Third World Debt*]. Furthermore, "Zaire's debt is so large that it is not expected to be able to service its debt without substantial relief before 1990 at the earliest." *African Debt Crisis: Hearing Before the Subcomm. on African Affairs of the Senate Comm. on Foreign Relations*, 99th Cong., 1st Sess. 29 (1985). *See generally Third World Debt*, *supra*, at 147-244. "Zambia is critically dependent on copper for its livelihood. Copper provides over 90 percent of its export revenue." Unwrought Copper, *supra* note 8, app. As of 1974, the Zambian copper industry provided "94 percent of gross domestic exports, 32 percent of gross domestic product, 53 percent of total government revenue, and 15 percent of paid employment." S. CUNNINGHAM, *supra* note 114, at 16 (footnote omitted). In total, "[O]ver one-half of the total export earnings of Chile, . . . Zaire, and Zambia come from copper . . . [C]utbacks in production would result in sharply higher unemployment in these countries." Unwrought Copper, *supra* note 8, app.

¹³⁹ *See generally supra* notes 94, 98-100 and accompanying text.

¹⁴⁰ *DOE Oversight Hearings*, *supra* note 55, at 57.

¹⁴¹ *Use of IMF Resources*, *supra* note 71, at 43. *See also supra* note 50.

¹⁴² *Nonferrous Metals*, *supra* note 8, at 20-4 (emphasis added). Though significant, the present increase in price is not expected to be sustained. *See supra* note 41.

2. United States Domestic Policy Decisions Which Affect the Domestic Copper Industry's Production Costs

Smelting copper produces significant amounts of sulfur dioxide, a pollutant which has been causally linked to acid rain.¹⁴³ Environmental regulations promulgated by the United States Environmental Protection Agency pursuant to the Clean Air Act require copper smelters to limit emissions of sulfur dioxide.¹⁴⁴ In order to comply with this law, copper producers have added expensive pollution control systems to their smelters in order to remove sulfur dioxide.¹⁴⁵ These systems have created additional costs, because two tons of sulfuric acid are removed for each ton of copper produced.¹⁴⁶ The acid, a virtually worthless byproduct,¹⁴⁷ must often be stored by the producer in large underground tanks, further compounding environmental-rule compliance costs.¹⁴⁸

Environmental regulations add as much as 16% to domestic production costs.¹⁴⁹ Beginning several years prior to the 1982-84 depres-

¹⁴³ See generally *U.S. Assistance to Foreign Copper Producers*, *supra* note 4, at 98-184. But see *Acid Disposition Control Act of 1986 (Part 3): Hearing Before the Subcomm. on Health and the Environment of the House Comm. on Energy and Commerce*, 99th Cong. 2d Sess. 865-950 (1986)[hereinafter *Acid Control Hearing*].

¹⁴⁴ 40 C.F.R. § 50.4 (1986). See generally T. NAVIN, *supra* note 4, at 97-109.

¹⁴⁵ See generally *Acid Control Hearing*, *supra* note 143, at 868-70, 880; Unwrought Copper, *supra* note 8, app.; Rothenberg, *The Impact of Regulation on an Exhaustive Resource Industry: A Methodological Approach and a Model*, 43 LAW & CONTEMP. PROBS. No. 1, 112, 143 (1979) ("air quality regulations have had the most serious regulatory impact on the copper industry." (footnote omitted)).

¹⁴⁶ *U.S. Assistance to Foreign Copper Producers*, *supra* note 4, at 247.

¹⁴⁷ In 1985, emission abatement equipment captured 1,106,509 short tons of sulfuric acid which was valued at a mere \$11,526. U.S. BUREAU OF MINES, [1985] 2 MINERALS YEARBOOK 75 (1987). Nationwide, some 2,230,257 metric tons of sulfuric acid were generated as byproduct from copper smelting. 1985 MINERALS YEARBOOK, *supra* note 23, at 359.

[T]he capture of SO₂ from gases is an expensive and vexing nuisance, but a mandated necessity for air quality . . . [A]cid plants that operate on smelter gases, are capital intensive, temperamental of operation, and yield a low-value product sensitive to the cost of transportation. In fact, the delivered cost of acid may drive the selling expense well beyond the local market price. *Marketing Cogenerated Smelter Acid*, 187 ENG. & MINING J., No. 5, at 31 (1985).

¹⁴⁸ See generally *U.S. Assistance to Foreign Copper Producers*, *supra* note 4, at 42-43. "The isolation of western U.S. copper producers from the industrial markets in the East and the availability of low-cost Frasch sulfur made SO₂ [sulfur dioxide] recovery uneconomic in the United States, except in special cases." R. MIKESSELL, *supra* note 3, at 67-68.

¹⁴⁹ Compliance with environmental regulations added between 10¢ and 15¢ per pound to the price of domestically produced copper, see *U.S. Assistance to Foreign Copper Producers*, *supra* note 4, at 199, which averaged 76.5¢ per pound in 1983. 1986 STATISTICAL ABSTRACT, *supra* note 8, at 481. In 1983, regulatory expenditures amounted to 46.2% of all capital expenditures made by the copper industry. Unwrought Copper, *supra* note 8, at 1721 n.27. The impact of environmental regulations on the competitiveness of the domestic copper industry in the world market cannot be exaggerated.

[C]opper industry capital expenditures on pollution control represented about 41 percent of the industry's total capital expenditures between 1973 and 1977. This compares with the 5-percent

sion, domestic producers were forced to divert capital from investments designed to improve productivity and competitiveness to nonproductive investments for pollution control devices.¹⁵⁰ This compliance with environmental regulations increased the production cost of domestic producers relative to their foreign competitors—a cost which they were unable to pass on to the copper consumer due to the uniform world price of copper—thereby reducing their ability to compete on the world market.

The tremendous compliance costs of these environmental regulations has forced the closing of many domestic smelting facilities, including the Phelps Dodge smelter at Douglas, Arizona, a small town in southeastern Arizona near the Mexican border.¹⁵¹ The Douglas smelter is a prime example of the externality¹⁵² created by the simple fact that United States environmental laws apply only to domestic producers. In

average for all U.S. industries [T]he largest regulatory costs . . . are those related to improving air quality through the recovery of sulfur dioxide exhaust gases [These costs] cannot be passed forward to the consumer because the domestic price of copper closely follows the world copper price quoted on the London Metal Exchange. Therefore, the increased costs must be passed back to the mine . . . reducing the competitiveness of domestic copper.

U.S. Assistance to Foreign Copper Producers, supra note 4, at 41.

In absolute terms, domestic copper producers have spent more than \$2 billion to comply with environmental regulations. See *U.S. Assistance to Foreign Copper Producers, supra* note 4, at 41. For a comparison of the pollution control as a percentage of capital spending, see *Acid Control Hearing, supra* note 143, at 880.

¹⁵⁰ "Expenditures for environmental, safety, and health considerations have grown from 17 percent of all copper expenditures at FYE 1979 to 46 percent by FYE 1983." Unwrought Copper, *supra* note 8, app. In turn,

the proportion of mining and milling expenditures declined from 61.9 percent in 1979 to 51.2 percent in 1983, and such expenditures decreased by 18 percent in absolute terms. During the same period, smelting expenditures increased by 87 percent in absolute terms and by 1983 represented a 42-percent share of total capital expenditures by copper producers. Expenditures on copper-refining facilities decreased by 56.8 percent from 1979 to 1983 in absolute terms and as a share of total copper expenditures declined from 16.0 percent of the total to 6.9 percent.

Id.

Another factor affecting the ability of U.S. producers to supply the market is the condition of smelting facilities. Although some U.S. producers have invested in the more modern flash furnaces, a number of firms still utilize older, less efficient, reverberatory furnaces. This results not only in efficiency losses, but also in increased costs to bring these furnaces into compliance with environmental regulations.

Id. With higher prices, and thus more capital, these investments could be made. See *infra* notes 243-45 and accompanying text.

¹⁵¹ See, e.g., 1985 MINERALS YEARBOOK, *supra* note 23, at 321-26; *Phelps Dodge Morenci Smelter Closes; High Costs of Pollution Controls Cited*, 15 Env't Rep. (BNA) 1447 (Jan. 4, 1985); *Miller v. Donovan*, 620 F. Supp 712, 718 (U.S. Ct. Int'l Trade 1985)(environmental compliance costs primary cause of closing of refinery and smelter). See *Notice, Lodging of Consent Decree Pursuant to Clean Air Act; Phelps Dodge Corp.*, 51 Fed. Reg. 28,634 (1986)(Douglas smelter closing).

¹⁵² An externality is a cost that "profit-maximizing behavior involuntarily imposes on others Examples are tobacco smoking and air pollution. The . . . firm that imposes these costs does not take them into account when deciding how much to . . . produce." R. COOTER, *LAW & ECONOMICS* 47 (1988). "[T]he externality-generating producer produces too much output and the associated harm because there is a difference between private marginal cost and social marginal cost." *Id.* at 46. Applying this, the fact that the Clean Air Act applied only to domestic smelters enabled Mexican

light of the depressed selling price of copper, Phelps Dodge deemed it uneconomical to equip the Douglas smelter with pollution control devices efficient enough to bring the smelter into compliance with United States law.¹⁵³ At the same time, Mexico planned to expand its smelters at Cananea and Nacozari. These Mexican smelters did not have pollution control systems, were much larger than the Douglas smelter, and were located just a few miles south of and just across the border from Douglas.¹⁵⁴ Without pollution abatement, not only would the Mexican smelters emit more sulfur dioxide than had the Douglas smelter, but they would emit more than all smelters in Arizona combined.¹⁵⁵

Fortunately, the United States and Mexico have agreed that by June 1988 the Nacozari smelter and any new border smelter facilities must meet United States emissions standards.¹⁵⁶ However, unless and until such standards are met, Mexico will externalize the cost of not equipping its smelters with pollution control systems onto the United States. Mexico is able to export more copper, made cheaper by the lack of those systems.¹⁵⁷ Also, Mexico will be literally externalizing pollution costs for this cheaper production because emissions from the Cananea and Nacozari smelters flow north into the United States.¹⁵⁸ The agreement with Mexico forces it to internalize those costs only with respect to Cana-

smelters to operate at a lower private cost, externalizing actual pollution and lower smelter employment onto the United States.

¹⁵³ *U.S. Assistance to Foreign Copper Producers*, *supra* note 4, at 37.

¹⁵⁴ See 1985 MINERALS YEARBOOK, *supra* note 23, at 345-46. Ironically, the expansion was planned to be financed in part by an MDB. See *supra* note 116.

¹⁵⁵ See *U.S. Assistance to Foreign Copper Producers*, *supra* note 4, at 89 (article by Congressman McNulty). In effect, the United States used imposition of the Clean Air Act on the Douglas facility as a bargaining chip to extract a "firm commitment" that the Nacozari and Cananea smelters be equipped with pollution control devices. *U.S., Mexico Reach Agreement on Smelters, Sewage Treatment Facility in Tijuana Area*, 16 *Env't Rep. (BNA)* 512 (July 26, 1985); *Governors Urge Mexican Smelter Controls, Call on EPA to Control Phelps Dodge Facility*, 16 *Env't Rep. (BNA)* 356 (July 5, 1985). Recently, the United States and Mexico agreed to emissions limitations on border copper smelters. See *infra* note 160 and accompanying text.

¹⁵⁶ Copper Smelters Transboundary Air Pollution Agreement, Jan. 29, 1987, reprinted in 26 *INT'L LEGAL MATERIALS* 33 (1987)[hereinafter *Smelter Treaty*]. The *Smelter Treaty* ultimately requires the Nacozari smelter and any new facility to meet the requirements of the Clean Air Act. Compare 40 C.F.R. § 60.163 with *Smelter Treaty*, *supra*, art. I, §§ 3-4. However, only expansions of Cananea are required to meet the standards. *Smelter Treaty*, *supra*, art. I, § 4.

Even though copper smelted at Cananea and Nacozari will soon be required to meet the same standards as domestically produced copper, the *Smelter Treaty* is obviously an incomplete solution: its purpose and effect go more toward preventing transboundary air pollution than toward equalizing environmental costs of production. More importantly, the transaction costs required to negotiate a treaty make it a device ill-suited to the purpose of equalizing environmental compliance costs. In short, the treaty is a fine environmental measure but it falls far short of being an adequate industrial remedy.

¹⁵⁷ See generally *U.S. Assistance to Foreign Copper Producers*, *supra* note 4, at 89.

¹⁵⁸ *Id.* See also *Acid Control Hearing*, *supra* note 143, at 876.

nea and Nacozari. Only those two smelters are required to bear (as are United States producers) the cost of compliance with United States environmental regulations. The ability of all other copper producers to externalize remains unimpaired. The high transaction costs necessary both to establish a similar treaty with each of the several foreign copper producers, and to police any that are reached, cast doubt on the efficiency of using such agreements as a means to achieve equalization and internalization of environmental costs.

Another United States policy decision affecting the domestic market is that of the United States government to reduce its copper purchases. The change in the copper content of the penny lessened demand by 79 million pounds per year, a 2% market share.¹⁵⁹ The United States has historically failed to purchase copper for the strategic stockpile, purchases which could amount to one million tons of copper, an amount equal to half of annual apparent domestic consumption.¹⁶⁰ Finally, the apparent failure of copper to be utilized as the high-level nuclear waste canister material means the loss of a market for up to two million tons of copper, an amount equal to apparent annual domestic consumption.¹⁶¹

IV. RECENT CONGRESSIONAL AND EXECUTIVE ACTION: FINDING INJURY, DENYING RELIEF

The domestic copper industry does not wield great political power in Congress. Copper is produced or smelted in only eight states which are not widely represented in the United States House of Representatives.¹⁶² Further diminishing the political power of the industry is that two-thirds of domestically produced copper is mined from a single congressional district in southeastern Arizona.¹⁶³ Despite this lack of broad congressional support, however, the industry has achieved some legislative success. Yet, congressional success has often been met by presiden-

¹⁵⁹ See *supra* notes 47-50 and accompanying text.

¹⁶⁰ See *supra* notes 51-57 and accompanying text.

¹⁶¹ See *supra* notes 58-61 and accompanying text; see *infra* notes 169-76 and accompanying text.

¹⁶² Sparsely populated, these eight states are represented by comparatively few members of Congress including, of course, sixteen Senators. Also, copper facilities tend to be located in rural areas, a fact which further diminishes the political power of the industry. See 133 CONG. REC. S9378 (1987). Likewise, opposition to copper production by environmental groups is a factor. See, e.g., *U.S. Assistance to Foreign Copper Producers*, *supra* note 4.

¹⁶³ Even further compounding the industry's problems is that the Congressman from that district (the Fifth Congressional District of Arizona), James Kolbe, is a member of the minority in the House. To make themselves more effective, members from the copper-producing states formed the Congressional Copper Caucus, which in the 99th Congress had as members 13 senators and 19 representatives (including the entire Arizona delegation). See generally *Bipartisan Congressional Caucus Hopes to Aid U.S. Ailing Copper Industry's Revival Effort*, 2 Int'l Trade Rep. (BNA) 212 (1985).

tial opposition, and most major initiatives or opportunities for assistance to the domestic copper industry remain unenacted. The following section analyzes congressional efforts made since the 1982-84 depression.

A. Congressional and Executive Action During the 98th Congress

The 98th Congress was in session during the depth of the depression in the copper industry, from 1982 to 1984. Two important legislative initiatives emerged from this Congress, one at least potentially opening a new market to copper, the other further restricting the use of MDB funds for expansion of copper production by borrowing nations. Other more substantial measures however, were left unenacted.¹⁶⁴

Even though the first initiative failed to become law, it reopened a potential new market for copper relating to the United States high-level nuclear waste storage program.¹⁶⁵ At the time, studies were being conducted to identify a material which could be used to construct hundreds of huge, thick metal canisters into which nuclear wastes could be encased prior to underground storage.¹⁶⁶ The United States Department of Energy ("DOE") had determined in its preliminary investigations that stainless steel was the best material in which to encase the wastes.¹⁶⁷ Citing the determination of the Swedish government that wastes stored in copper canisters were absolutely safe for hundreds of thousands of years, the copper industry argued that copper was superior to steel for this purpose.¹⁶⁸ The DOE Secretary stated that the use of copper as a canister material had been rejected without sufficient consideration and would be reexamined.¹⁶⁹ Subsequently, a measure was introduced to authorize a \$4 million study of the feasibility of copper as a canister material,¹⁷⁰ a study that was never authorized. Nevertheless, DOE subsequently awarded a \$6 million contract to study this application to the Copper

¹⁶⁴ See, e.g., S. 1544, *supra* note 2 (directing that copper be purchased for the National Defense stockpile); H.R. 1318 98th Cong., *supra* note 2 (restricting imports of copper); H.R. 2413, *supra* note 2 (increasing duty on imported copper to account for domestic environmental costs).

¹⁶⁵ See generally *DOE Oversight Hearing*, *supra* note 55, at 25-28, 55-73, 105-211.

¹⁶⁶ See generally *id.* at 61-64.

¹⁶⁷ *Id.* at 110.

¹⁶⁸ *Id.* at 56 (statement of Representative McNulty). Stainless steel containers, in comparison, would be expected to corrode in less than 300 years. At that time the radioactive waste would be discharged into the surrounding geological formation, which would thus be the only barrier between the radioactivity and the biosphere. *Id.*

¹⁶⁹ *Id.* at 11 (statement of DOE Secretary Hodel). It is worth noting that Congressman Udall, Committee Chairman, represented the southwestern portion of Arizona, an area of significant copper production, and had formerly represented southeastern Arizona.

¹⁷⁰ H.R. 5369, 98th Cong., 2d Sess. (1984); H.R. 5244, 98th Cong., 2d Sess. (1984); H.R. 5245, 98th Cong., 2d Sess. (1984).

Development Association.¹⁷¹ Estimates of the potential annual demand that the use of copper canisters would require vary greatly—from 700,000 to over two million tons.¹⁷²

The second measure continued for an additional year a temporary instruction to the United States representatives to the MDBs. They were advised to oppose loans “for the production of any commodity for export, if it is in surplus on world markets and if the assistance will cause substantial injury to the United States producers of the same, similar, or competing commodity.”¹⁷³ Existing law had been enacted only temporarily as part of an appropriations bill.¹⁷⁴

Near the end of the 98th Congress, in a proceeding brought by several domestic copper producers under Section 201 of the Trade and Tariff Act of 1974 (“§ 201”),¹⁷⁵ the International Trade Commission (“ITC”) unanimously found that copper was being “imported into the United States in such increased quantities as to be a substantial cause of serious injury to the domestic industry”¹⁷⁶ However, the commissioners were not in agreement as to the appropriate relief: two recommended a five year tariff on imported copper,¹⁷⁷ two recommended import quotas,¹⁷⁸ and one recommended that no relief be granted.¹⁷⁹ President Ronald W. Reagan denied any relief, stating that “granting import relief is not consistent with our national economic interest,” believing that import restrictions would harm United States copper fabricators more than they would benefit producers.¹⁸⁰ This outcome was identical to a 1978 § 201 proceeding in which the ITC found injury to the domestic industry¹⁸¹ and President Carter denied any relief.¹⁸²

¹⁷¹ 1985 MINERALS YEARBOOK, *supra* note 23, at 333.

¹⁷² Estimates range from 700,000, *DOE Oversight Hearing*, *supra* note 55, at 67, to 1.3 million tons, *id.* at 28, to two million tons, *id.* at 58.

¹⁷³ Foreign Assistance and Related Programs Appropriations Act, 1985, Pub. L. No. 98-473, tit. V, § 524, 98 Stat. 1899 (Oct. 12, 1984).

¹⁷⁴ Foreign Assistance and Related Programs Appropriations Act, 1985, Pub. L. No. 97-121, tit. V, § 552, 95 Stat. 1656 (1981).

¹⁷⁵ 19 U.S.C. § 2251 (1982).

¹⁷⁶ Unwrought Copper, *supra* note 8, at 1709.

¹⁷⁷ *Id.* at 1725.

¹⁷⁸ *Id.* at 1716.

¹⁷⁹ *Id.* at 1733.

¹⁸⁰ 49 Fed. Reg 35,609 (1984).

¹⁸¹ Unalloyed, Unwrought Copper, USITC Pub. 905, Inv. No. TA-201-32 (Aug. 1978).

¹⁸² President Carter denied relief on the basis that it was “not in the national economic interest” because: 1) such relief “would impose significant costs on U.S. consumers;” 2) “domestic copper market conditions have improved [since the investigation];” 3) such “relief would subject U.S. jobs in other industries to possible foreign retaliation,” and 4) relief would adversely affect United States relations with Chile, Zambia, and Peru. President’s Message to Congress Transmitting his Decision Against Import Relief on Unwrought, Unalloyed Copper, I PUB. PAPERS 1804 (Oct. 20, 1978).

Thus, twice in six years the industry was found to have been injured by increased imports, yet relief was denied.

B. Congressional and Executive Action During the 99th Congress

As in the 98th Congress, the industry achieved some success in the 99th Congress. That Congress approved two limited measures designed to provide assistance to the domestic copper industry through production restraints negotiated with foreign copper producers. President Reagan rejected both. At the same time, significant bills remained unexamined.¹⁸³

The 99th Congress approved a bill conveying the sense of Congress that the President should negotiate “with the principal foreign copper-producing countries to conclude voluntary restraint agreements with those governments for the purpose of effecting a balanced reduction of total annual foreign copper production for a period of between three and five years”¹⁸⁴ President Reagan decided not to negotiate voluntary production restraints, stating that such restraints: 1) would be “inconsistent with the overall, market-oriented trade and economic policy objectives of this Administration;” 2) “would raise serious antitrust concerns;” 3) “would . . . be inefficient and expensive for the U.S. economy; . . . incur[ring] losses to U.S. consumers substantially in excess of any gains accruing to U.S. producers;” and, 4) would not “be feasible either to conclude or implement”¹⁸⁵ As his alternative, the President stated that “the Department of Labor has developed, and begun to implement, a plan for a special effort to assist workers displaced from the copper industry.”¹⁸⁶

After President Reagan rejected the recommendation by Congress that he negotiate production restraints, Congress passed a bill requiring the President to negotiate with principal foreign copper producers in order to obtain voluntary production restraints.¹⁸⁷ The President vetoed

¹⁸³ For bills from the 99th Congress, see *supra* note 2.

¹⁸⁴ Section 247(c)(2) of the Trade and Tariff Act of 1984, Pub. L. No. 98-573, 98 Stat. 2997 (1984).

¹⁸⁵ President’s Message to Congress Transmitting His Decision Not to Negotiate Voluntary Production Restraints on Copper, 21 WEEKLY COMP. PRES. DOC. 1326, 1327 (Oct. 30, 1985)[hereinafter President’s Decision Not To Negotiate].

¹⁸⁶ *Id.* at 1327. Curiously, the Secretary of Labor has sought to deny benefits to workers in copper industries on the grounds that increased imports did not harm them. See, e.g., *United Steelworkers of Am. v. Donovan*, 632 F. Supp. 17 (Ct. Int’l Trade 1986); *Miller v. Donovan*, 620 F. Supp. 712 (Ct. Int’l Trade 1985). Arguably, the position of the Secretary contradicts both the 1978 and 1984 ITC investigations, and is at odds with the apparent intent of President Reagan.

¹⁸⁷ H.R. 1562, *supra* note 2, § 304(a)(2).

this bill.¹⁸⁸ The President believed that the bill, if enacted, "would invite immediate retaliation against our exports resulting in a loss of American jobs in other areas. Because this bill is so sweeping in its provisions, we could expect that retaliation to be extensive."¹⁸⁹

C. Congressional and Executive Action During the 100th Congress

As in the 98th and 99th Congresses, most bills related to copper remained unexamined in the 100th Congress.¹⁹⁰ The only provisions relating to copper being acted upon were certain sections of the omnibus trade bill—H.R. 3, the Industrial Competitiveness Act of 1987¹⁹¹—which now has been vetoed. As approved by the Senate, H.R. 3 contained two provisions relating to copper. First, the bill would have imposed additional restrictions on the use of MDB funds for the expansion of foreign copper production capacity.¹⁹² Significantly, if over the objection of the United States an MDB or the IMF approved a loan for a commodity in surplus, the United States would have reduced its future contributions to that institution.¹⁹³ Apparently, the belief was that the threat of reduced United States contributions would have motivated other members of the institution to vote against such loans. Second, H.R. 3 would have expanded the definition of what the ITC could have found to constitute an unreasonable trade practice, under § 301 of the Trade Act of 1974("§ 301")¹⁹⁴ The new definition would have included subsidizing production of commodities which were in excess on the world market.¹⁹⁵ A domestic copper producer would have thus been able to petition the ITC for relief from such practices. Even so, the subsequent decision of whether and in what form to grant relief would have

¹⁸⁸ President's Message to Congress Vetoing H.R. 1562, 21 WEEKLY COMP. PRES. DOC. 1510 (Dec. 17, 1985)[hereinafter Veto Message].

¹⁸⁹ *Id.* at 1511.

¹⁹⁰ The unexamined bills are: S. 316, *supra* note 2, § 4(a); S. 321, *supra* note 2, § 6(d); H.R. 1664, *supra* note 2, § 187; H.R. 1679, 100th Cong., 1st Sess. § 187.

¹⁹¹ H.R. 3, 100th Cong., 1st Sess. (1987)(Senate version).

¹⁹² See generally 133 CONG. REC. S9270-92 (1987).

¹⁹³ H.R. 3, *supra* note 191, § 2178-80. The United States would not increase its capital share of such institution nor replenish funding for that institution, nor permit the letting of a note of credit by that institution in the United States. *Id.* § 2179. In addition, in future years the amount paid in by the United States would be reduced by the amount which the institution had lent over the opposition of the United States. *Id.* § 2180. See generally 133 CONG. REC. S9281-84 (1987). Cf. S. 220, 100th Cong. 1st Sess. §§ 2-3 (1987); H.R. 306, 100th Cong., 1st Sess. §§ 2-3 (1987).

¹⁹⁴ 19 U.S.C. 2411(a)(Supp. III 1985).

¹⁹⁵ H.R. 3, *supra* note 191, § 307(c)(3)(B)(i). See generally 133 CONG. REC. S9367-84. The approach of H.R. 3 is far from comprehensive. Cf. S. 1042, 100th Cong., 1st Sess (1987). See generally 133 CONG. REC. S5239-42.

remained within the discretion of the President.¹⁹⁶ Thus, the familiar scenario remained possible under the vetoed legislation: a favorable determination by the ITC, followed by denial of relief by the President.

Thus far during the 100th Congress the President has not denied relief of any form to the copper industry, if only because no such relief has been recommended. Indeed, the executive branch has proposed to the United Nations Conference on Trade and Development (“UNCTAD”) the creation of an intergovernmental forum to monitor world copper trade and to quicken the exchange of trade information.¹⁹⁷ The potential effectiveness and precise role of this agency, should it be created, is unclear. Apparently, the forum would function to assist copper-producing nations to forecast supply and demand more accurately, with the hope that they will react to such forecasts. There is also the agreement that the United States negotiated with Mexico to reduce trans-boundary air pollution, which to a slight degree assists the domestic industry.¹⁹⁸

IV. CURRENT PROPOSALS AND PROMISING ALTERNATIVES

The industry has had its successes in Congress and its defeats in the White House. Over the past decade, two Presidents have denied import relief to the domestic copper industry despite two determinations by the ITC and two additional determinations by Congress to the contrary. The only measures to become law—the restrictive instructions to the United States representatives to the various MDBs—work, if at all, only prospectively. They eliminate neither the advantage already conferred by past loans, nor the incentive of borrower nations to overproduce copper in order to earn foreign capital to meet existing debt service requirements. Thus, the industry remains standing in place in terms of remedies, and it has lost ground (in terms of market share) despite efforts by the industry that cut production costs by 18%.¹⁹⁹ If the industry is to regain its vitality, additional measures are required. Two bills each from

¹⁹⁶ See 133 CONG. REC. S9374 (1987).

¹⁹⁷ 4 Int'l Trade Rep. (BNA) 24 (Jan. 7, 1987). See also 4 Int'l Trade Rep. (BNA) 1127, 1128 (Sept. 16, 1987)(United States supports Organization of American States resolution that the United States continue to oppose efforts to restrict imports of copper into the United States).

¹⁹⁸ See *supra* notes 156-58 and accompanying text.

¹⁹⁹ *Water Resources Hearing, supra* note 71, at 1128. A more recent estimate is that domestic production costs have been reduced 25% between 1981 and 1985. 133 CONG. REC. S9378 (1987). Specifically, “[p]roductivity in terms of employee-hours per ton of copper produced at mines increased from 27.4 hours per ton in 1983, to 20.7 hours per ton in 1984, to 17 hours per ton in 1985.” 1985 MINERALS YEARBOOK, *supra* note 23, at 321. The average United States production cost in 1986, including a reasonable return on capital, was 67¢ per pound. 1986 MINERALS YEARBOOK, *supra* note 28, at 5.

the 99th (H.R. 3714²⁰⁰ and S. 353²⁰¹) and 100th (S. 1043²⁰² and S. 1042²⁰³) Congresses could achieve workable solutions by recognizing the problems peculiar to the copper industry, and deserve greater attention.²⁰⁴

Had H.R. 3714 become law, it would have provided a flexible solution first, by requiring the President to negotiate with foreign copper producers to limit production to 1983 levels.²⁰⁵ If those negotiations were unsuccessful,²⁰⁶ or if the agreement were reached but not complied with,²⁰⁷ then the President would have been authorized to impose a 15¢ per pound surcharge on imports of copper for a five-year period.²⁰⁸ While the primary benefit of requiring the President to undertake the negotiations while only authorizing him to impose surcharges should

²⁰⁰ H.R. 3714, *supra* note 2.

²⁰¹ S. 353, *supra* note 2.

²⁰² S. 1043, *supra* note 2.

²⁰³ S. 1042, *supra* note 195. *See generally* 133 CONG. REC. S5239-42 (1987)

²⁰⁴ In addition, had a third measure from the 99th Congress, S. 2815, *supra* note 2, become law, its three provisions relating to copper would have substantially benefited the industry. The first provision provided that the Export-Import Bank "may not guarantee, extend credit, or participate in an extension of credit in connection with a transaction involving the export of equipment to be used in copper extraction, production, manufacturing, or smelting operations." *Id.* § 113(b). The second provision authorized the President "to enter into negotiations with members of the Organization for Economic Cooperation and Development to agree to eliminate official financing or support for new mining or production facilities, and, where possible, to encourage the reduction of commodities from such facilities, where the commodity is in oversupply . . ." *Id.* § 113(c). The third provision authorized the President "to enter into negotiations with the members of each multilateral development bank to reach an agreement prohibiting the furnishing of assistance by such bank for any new mining or production facility for a commodity that is in oversupply . . ." *Id.* § 113(d)(1). In short, the bill was intended to ensure that loan proceeds were used to "support growth and appropriate policy reform in developing countries and not wasted on expanded production of primary commodities already in global oversupply and facing shrinking markets and falling prices." *Export Revitalization Act: Report of the Senate Comm. on Banking, Housing, and Urban Affairs on S. 2815*, 99th Cong., 2d Sess. 7 (1986).

Compare these five bills with, for example, S. 1670, *supra* note 2 and H.R. 3410, *supra* note 2, which would have created a government-to-government International Copper Action Commission. That commission's purpose would have been to "promote understanding and cooperation," "serve as a forum for consultations," "develop guidelines for trade," "develop forecasts," and "promote . . . copper consumption, research, . . . and . . . market development." While recognizing the worldwide commodity status of copper, the problem with such an approach is simple. A foreign, state-owned producer which is motivated primarily by its debt service needs has no rational reason to agree voluntarily to "develop guidelines for trade" that restrict its ability to export copper to the United States. Such an approach would also be of dubious value to domestic producers if promotions create new demand which is then filled by imports.

²⁰⁵ H.R. 3714, *supra* note 2.

²⁰⁶ *Id.* § 5(a)

²⁰⁷ *Id.* § 5(b).

²⁰⁸ *Id.* § 5(c).

those negotiations fail is political,²⁰⁹ authorizing the President to impose copper surcharges would be a useful bargaining tool. The possibility of a surcharge might be sufficient to bring foreign producers to voluntarily reduce production. In addition, the bill seems "fair," as the 15¢ per pound surcharge is equal to the cost borne by domestic producers as a result of the myriad of environmental regulations affecting copper production.²¹⁰ The bill would put domestic producers on equal footing with foreign producers who are not bound by the environmental regulations of the United States. Thus the bill would prevent the externalization of pollution, exemplified by the closing of the Douglas smelter and simultaneous expansion of the Mexican facilities.²¹¹

Similarly, had S. 353 become law, the costs incurred by domestic producers in meeting environmental regulations would have been offset by imposing, initially, a 15¢ per pound surcharge on imported copper.²¹² Subsequently, the surcharge would vary, depending upon the actual difference between foreign and domestic environmental compliance costs.²¹³ As with H.R. 3714, the externalization of environmental abuse would be prevented. In addition, the bill arguably would encourage environmental goals: foreign producers wishing to adopt more stringent environmental standards would be able to offset the increase in costs arising from more stringent standards by tariff-free exportation to the United States.

If the 100th Congress approves S. 1043,²¹⁴ incentives created by the CFF to overproduce copper²¹⁵ would be eliminated by ensuring that CFF funding would not be available to a country with an earnings shortfall if that "shortfall was produced by declining prices of a nonagricultural fungible commodity in surplus on world markets, unless the borrowing country . . . [agrees] to adjust production and not to add further to excess capacity and to take other necessary action to stabilize the market for such commodity."²¹⁶ Such a restructuring of the incentives facing countries receiving balance of payment assistance, away from overproduction and toward production policies sensitive to supply and demand, would partially reduce the ability of foreign state-owned copper producers to overproduce.

²⁰⁹ Because H.R. 3714 is permissive in that it does not require imposition of a tariff or quota, it may be more palatable to the President.

²¹⁰ *Supra* note 149.

²¹¹ *See supra* notes 150-54 and accompanying text.

²¹² S. 353, *supra* note 2.

²¹³ *Id.* § 4(b).

²¹⁴ S. 1043, *supra* note 2.

²¹⁵ *See supra* notes 132-35 and accompanying text.

²¹⁶ S. 1043, *supra* note 2, § 1(a). Section 501 of S. 1042, *supra* note 195, is identical.

By far the most comprehensive bill introduced thus far in the 100th Congress is S. 1042,²¹⁷ a comprehensive trade bill that is intended to aid the copper industry, although by its terms it affects all nonagricultural, fungible commodities that are in oversupply.²¹⁸ In addition to imposing restrictions identical to S. 1043 on the use of CFF funds,²¹⁹ the bill would make several substantive changes. First, the provision of a direct or indirect subsidy to increase production of a nonagricultural, fungible commodity "for which the existing worldwide production capacity . . . significantly exceeds existing worldwide demand" would be defined as an unreasonable trade practice in a § 301 action.²²⁰ If the United States Trade Representative determines that such overcapacity is being subsidized, then the President *must* impose an import quota and *may* grant other relief.²²¹ In this respect, S. 1042 differs significantly from H.R. 3 in that it reduces the discretion of the President with respect to a remedy.

The bill would also expand the availability of relief in a § 201 petition in three ways. First, the concept of "serious injury" would be expanded to include situations where there is a decline in domestic sales, a growing domestic inventory, decreasing production, and an increase in worldwide production capacity if such increase is likely to result in increased imports or suppression of the worldwide price of the commodity.²²² Second, the concept of "substantial cause" would be expanded to include situations involving increasing imports, a declining proportion of the domestic market produced by domestic producers, and increasing worldwide production capacity if that increase would decrease or suppress the price of the commodity.²²³ Third, the bill would expand the list of available remedies to permit the President to choose, or the ITC to recommend, bilateral negotiations to prevent an injury "if the injury . . . is not susceptible to unilateral solution by the United States . . ."²²⁴

Thus broadened, the likelihood that the ITC would determine that the domestic copper industry had been "seriously injured" by nonresponsive production decisions would be increased.

However, given that the ITC has twice made such a determination under existing statutory definitions, it is not clear that such changes are

²¹⁷ S. 1042, *supra* note 195. See generally 133 CONG. REC. S5239-42 (1987)

²¹⁸ See 133 CONG. REC. S 5239-40 (statement of Senator Domenici).

²¹⁹ S. 1042, *supra* note 195, § 501.

²²⁰ *Id.* § 102.

²²¹ *Id.* § 101(a).

²²² *Id.* § 301(a). Section 201 of the Trade Act of 1974 is found at 19 U.S.C. § 2251 (1982 & Supp. 1985).

²²³ S. 1042, *supra* note 195, § 301(a).

²²⁴ *Id.* § 303.

indeed necessary: the problem the copper industry has faced before the ITC has not been in determining whether an injury has occurred. Indeed, in 1984 the occurrence of injury was unanimously agreed upon.²²⁵ The problem that § 201 proceedings have raised to copper producers relates not to whether there has been sustained an injury, but rather to the granting of a remedy. In this regard, another provision of S. 1042 would require that the President, when determining whether to grant relief to a § 201 petitioner, consider both the impact on domestic employment and the extent to which workers in the industry are likely to receive trade adjustment assistance.²²⁶ In addition, the President would be required to consider the potential benefits of import relief and efforts being made by the industry to adjust to increased imports,²²⁷ considerations which are not now part of the President's determination. To that extent, S. 1042 would increase the likelihood that a successful § 201 petitioner would actually obtain relief.

Each of these four legislative proposals presents practical problems. Those from the 99th Congress would raise the price of copper for domestic consumers by increasing the cost of copper to downstream, intermediate manufacturers, which is the primary reason President Reagan rejected such relief. Therefore, similar proposals are probably incompatible with the President's economic policy, and not likely to become law. The two bills before the 100th Congress are quite broad, and have not garnered much support. Traditional forms of import relief (such as tariffs and quotas) are not likely to receive presidential approval. Given the lack of a broad base of support in Congress for copper, the possibility of a congressional override of a presidential veto seems slight. Raising the price of copper, however, is the most effective solution. Domestic copper producers need additional capital to increase productivity and efficiency in order to make up for capital that in recent years has been diverted to the nonproductive purpose of meeting environmental regulations.²²⁸

²²⁵ See *supra* text accompanying note 176. In addition, an important and seemingly axiomatic question is, why would a foreign, state-owned producer voluntarily agree to limit production? For similar reasons, the additional remedy of seeking a bilateral agreement to reduce overcapacity would probably prove, in practice, meaningless. See *supra* note 204.

Finally, S. 1042 would establish as a "principal negotiating objective . . . [obtaining] an agreement as a part of the General Agreement on Tariffs and Trade [GATT] that imposes sanctions against the provision . . . of government subsidies . . . to increase the capacity to produce a nonagricultural, fungible good for which the existing worldwide production capacity . . . significantly exceeds existing worldwide demand . . ." S. 1042, *supra* note 195, § 201(a).

²²⁶ S. 1042, *supra* note 195, § 302(c). The bill would also enhance the ability of a § 201 petitioner to obtain information from foreign countries. See *id.* § 103(d).

²²⁷ *Id.* § 302(c).

²²⁸ Of course, the price of copper may be raised only to the point just below that at which substantial substitution would occur. See *generally* notes 37-40 and accompanying text.

Thus, nontraditional forms of relief are needed.

V. OUTLINE OF A NATIONAL COPPER POLICY: COMPREHENSIVE COORDINATION AND COOPERATION

To solve the problems confronting the domestic copper industry and to enable it to regain competitiveness, it is necessary to establish a comprehensive national copper policy requiring the efforts of both industry and government. The domestic copper industry can cooperate and coordinate its actions with the United States government to be more efficient and productive. The following constitutes an outline of such a policy.

A. Development of New Markets

An increase in demand is critical both as a short-term means of utilizing the existing surplus production capacity of copper and in the long term to ensure a continuing market. To that end, any government determination regarding whether to use copper in a particular application should be slightly weighted toward using copper. That is, the government should take into consideration in such a decision not only any additional cost or other detriment that the use of copper may represent in that particular application, but also that the use of copper may eliminate other costs which are only indirectly related to the particular application. Simply put, the "cost" of using copper can be defined narrowly (that is, nearly synonymously with "expenditures") or broadly (that is, more in line with the idea of "social costs"). The government should look at the broad definition.²²⁹ For instance, the main disadvantage cited by the Department of Energy for using copper as a nuclear waste canister material was that copper canisters would add approximately 10% to the program cost (a narrow view).²³⁰ Yet, using copper would create a new demand for two million tons of copper, demand which would eliminate direct costs, such as unemployment benefits and retraining programs for former copper workers.²³¹ It would also provide indirect savings by avoiding a

²²⁹ Compare this approach to S. 1042, *supra* note 195, § 302, discussed *infra* note 231 and accompanying text, which would require that when the President considers whether or not to grant import relief, the potential impact on domestic employment and the extent to which trade adjustment assistance would be implicated would be taken into account. In these terms S. 1042 § 302 would require the President take the broad view of cost.

²³⁰ *DOE Oversight Hearing*, *supra* note 55, at 58.

²³¹ The use of copper canisters was estimated to add an additional \$1 billion to \$10 billion a project. *Id.* at 28. In comparison, President Reagan noted some \$63 million was available under just the Job Training Partnership Act for displaced copper workers. President's Decision Not to Negotiate *supra* note 185, at 2. See, e.g., 1985 MINERALS YEARBOOK, *supra* note 23, at 321 (\$2.6 million grant to aid unemployed copper miners); see also 2 Int'l Trade Rep. (BNA) 1551 (Dec. 11, 1985)(430 copper and Nickel workers eligible for trade adjustment assistance); 2 Int'l Trade Rep. (BNA) at

more costly alternative—purchasing the more expensive copper might be a less costly alternative than, for example, imposing a surcharge or quota.

For similar reasons, reconsideration of the decision to reduce the copper content of pennies by substituting zinc for copper may be in order, especially in light of the fact that the actual selling price of copper is well below what was predicted.²³² While this does not mean that copper should be utilized wholly without regard to cost, in cases where copper is in other respects more or less equal, some (perhaps slight) extra weight should be given to copper if the primary reason for not selecting copper is related to (in the narrow sense of the concept) its cost.

Further, when demand is otherwise declining or the price is widely fluctuating downward, the government should purchase copper for the strategic stockpile. Not only has the government determined that copper is a strategic material, it has also determined it is in the national interest to have it sufficiently stockpiled. Also, a coordinated purchasing program by the government designed to level the widely ranging demand for copper would decrease its price volatility, a factor greatly deterring its use.²³³ Obviously, this could only operate in the short term and as a limited market.²³⁴ Yet, in times of price volatility, lessened demand, or overproduction, government purchases could at least be used in the short term to stabilize the price of copper.

A third new market could be developed through the initiative of the copper industry working in close coordination with the government to promote new uses for copper.²³⁵ The domestic copper industry should actively support MDB loans for the electrification and industrialization

1161 (Sept. 18, 1985)(1900 copper products workers eligible). That \$63 million was, of course, in addition to other costs directly attributable to the depression in the copper industry, such as unemployment compensation for displaced workers and lost tax revenues caused by shutdowns. Also, under § 222 of the Trade Act of 1974, the group of workers eligible to receive trade adjustment assistance is defined more broadly than only actual copper workers. *See Miller v. Donovan*, 620 F. Supp. 712 (Ct. Int'l Trade 1985)(railway workers claim adjustment assistance because increased imports of copper caused closure of mine; claim denied on basis of lack of causal link to increasing imports). Thus, retraining and unemployment costs are not limited solely to actual copper workers, and this fact should be taken into account.

²³² *See supra* note 50 and accompanying text. Likewise, the costs involved in coining a proposed \$1 coin, to be made primarily of copper, should be carefully examined.

²³³ "A national stockpile may . . . be employed to stabilize the volume of demand and supply in the national market and thereby indirectly contribute to price stabilization." R. MIKESSELL, *supra* note 3, at 201.

²³⁴ Should the government determine to buy 1 million tons of copper, such a program would cost \$1.34 billion at 67¢ per pound.

²³⁵ *See generally* R. PRAIN, *supra* note 20, at 169-84 (history of industry promotion techniques). In addition, private industrial uses for copper should be encouraged. For example, two new potential markets for copper involve applications in electronic vehicles and heat pumps. 1985 MINERALS

of developing countries, and as appropriate, should cooperate with foreign countries to secure such loans to them. For its part, the government must ensure that domestic copper producers are provided with the opportunity to fill the demand created by such new loans by, for example: 1) recommending that MDB executive directors fully inform United States firms of bidding opportunities in recipient nations; 2) assisting those firms in focusing on projects in which they have a special interest or advantage; 3) helping those firms complete and submit bids; 4) investigating complaints relating to the awarding of contracts; and 5) ensuring that contract procedures are observed by the recipient nation.²³⁶

B. Providing Limited Import Relief

Because of the unique global market for copper, a quota or tariff is a necessary, though limited, element in the national copper policy.

The only extant methods of effectively insulating the U.S. market from the price vicissitudes of globally traded commodities are found in the agricultural price-support programs. These in general establish potentially huge buffers of government financed stocks. U.S. prices are carefully controlled by manipulation of the price-support levels. Even with such complex mechanisms, import relief under section 22 is provided as a back-up to protect the programs from interference. No such price support buffer exists for any non-agricultural product. *Very few U.S. industrial products like copper enjoy a world commodity status.*²³⁷

Any national copper policy must recognize this fact. Foreign producers, especially foreign copper producers who have large foreign debt service requirements, have not and will not reduce production voluntarily, even during times when such reductions are economically sound. Therefore, a quota or tariff is a necessary part of a national copper policy.

Tariffs and quotas, however, are extreme measures and should be used only as a last resort. One alternative is first to attempt reaching voluntary production restraints and to impose tariffs or quotas only if such negotiations fail. As noted previously, President Reagan has rejected voluntary negotiations. There is no reason to believe he has changed his policy since rejecting the recommendations of both Congress and the ITC. A second alternative, one that better meets the problem, is to have quotas or tariffs triggered by certain market conditions.²³⁸ For

YEARBOOK, *supra* note 23, at 333. The domestic industry should help to develop such applications. The government, too, should encourage their development.

²³⁶ See S. 2815, *supra* note 2, § 301(c)(1). Cf. H.R. 3, *supra* note 191, § 1801(a).

²³⁷ Unwrought Copper, *supra* note 8, at 1725 n.5 (emphasis added).

²³⁸ An analogous approach can be found at 42 U.S.C. § 2201(v)(1982), which provides that the Department of Energy, "to the extent necessary to assure the maintenance of a viable domestic uranium industry, shall not offer . . . [uranium enrichment] services for source or special nuclear

example, if imports exceed a certain level, or if the LME or COMEX price remains below a certain price for a specified period of time, then a tariff or quota would be triggered. If the purpose of a quota or tariff is to force foreign producers to heed market conditions, then creating artificial and clear delineations of supply and demand (defined by the United States) may encourage foreign producers to produce copper in closer approximation to demand.

C. Limitations on the Use of United States Contributions to the IMF and the MDBs

There are two obvious conditions which should be examined. To reduce supply directly, funding could be made conditional upon limiting production or capacity to a certain level. Such a condition would operate directly to reduce supply. The second alternative is to make funding conditional upon the foreign producers' compliance with the Clean Air Act or some equally stringent standard. This condition would serve both to equalize production costs and to reduce transboundary air pollution and acid rain by reducing the ability of the foreign producer to externalize this pollution.²³⁹

In addition, CFF balance-of-payment financing should be restructured. Not only does the availability of CFF financing enhance the ability of foreign state-owned copper producers to overproduce, it encourages them to do so.²⁴⁰ One seemingly extreme and overinclusive measure would abolish the CFF.²⁴¹ In contrast, S. 1043 would eliminate incentives to overproduce by denying loans to countries producing excess commodities unless they agree to limit production.²⁴² S. 1043, and particularly this provision, deserves serious consideration, especially in light of the vetoed H.R. 3 bill.

materials of foreign origin intended for use in . . . the United States." However, a similar provision relating to copper should carefully define under what circumstances a quota or tariff would be triggered. *Cf.* *Western Nuclear, Inc. v. Huffman*, 825 F.2d 1430 (10th Cir. 1987), *cert. granted*, 56 U.S.L.W. 3459 (Jan. 11, 1988)(No. 87-645).

²³⁹ See *supra* notes 149-55 and accompanying text.

²⁴⁰ See *supra* notes 132-35 and accompanying text.

²⁴¹ H.R. Res. 149, *supra* note 2 (1987). To argue for abolition of the CFF is to argue either that there is no need for general balance of payment assistance or that the value of any such assistance is outweighed by the role of the CFF in encouraging overproduction. There does not seem to be evidence overwhelmingly in support of either proposition. That is not to say that the CFF does not create the wrong incentives: CFF financing should be restructured. But, the issue is not whether, but rather under what circumstances and upon what conditions CFF assistance should be available.

²⁴² S. 1043, *supra* note 2, § 1(a).

D. Research and Development Assistance

“Research is the very last thing that an industry can neglect and hope to survive in an increasingly competitive world.”²⁴³ Relative to foreign producers, the domestic industry is at a distinct advantage because of lower ore content. The resulting extra expense is incurred during the milling stage, when relative to foreign producers, domestic producers must separate greater amounts of waste from the copper ore.²⁴⁴ In all aspects of production, and especially milling, government grants could be made for specific research projects designed to discover methods and practices to lower production costs of domestic producers. Assistance in this area is critical because in the past, there has been insufficient profit to fund research.²⁴⁵

VI. CONCLUSION

The United States copper industry is presently experiencing a recovery from the worst depression in its history. One of the reasons for the recovery is that the industry responded by dramatically lowering its production costs to become a leaner, more competitive producer. However, in order to protect the industry's progress and future health, the United States should adopt a comprehensive national copper policy. The industry has been running hard for nearly a decade, and a national copper policy might very well give it the second wind it needs.

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²⁴³ R. PRAIN, *supra* note 20, at 165.

²⁴⁴ See *supra* note 109 and accompanying text.

²⁴⁵ In late 1987, \$4 million was made available to establish the Center for Advanced Studies for Copper Recovery and Utilization at the University of Arizona. *UA's Share of Federal Package to Build Copper Center, Farm Lab*, Ariz. Daily Star, Dec. 23, 1987, § A, at 4, col. 1. Such efforts should be expanded because “further progress in improving these [production] efficiencies appears to have been hampered by the inability of the domestic industry to generate greater revenues due to the low level of world copper prices.” Unwrought Copper, *supra* note 8, at 1714 n.38. In short, the lack of profitability in the industry has restricted its ability to modernize. *Id.* at 1712.