

Chapter 5

Policies of Other Supplier Countries: Japan, France, West Germany, and Britain

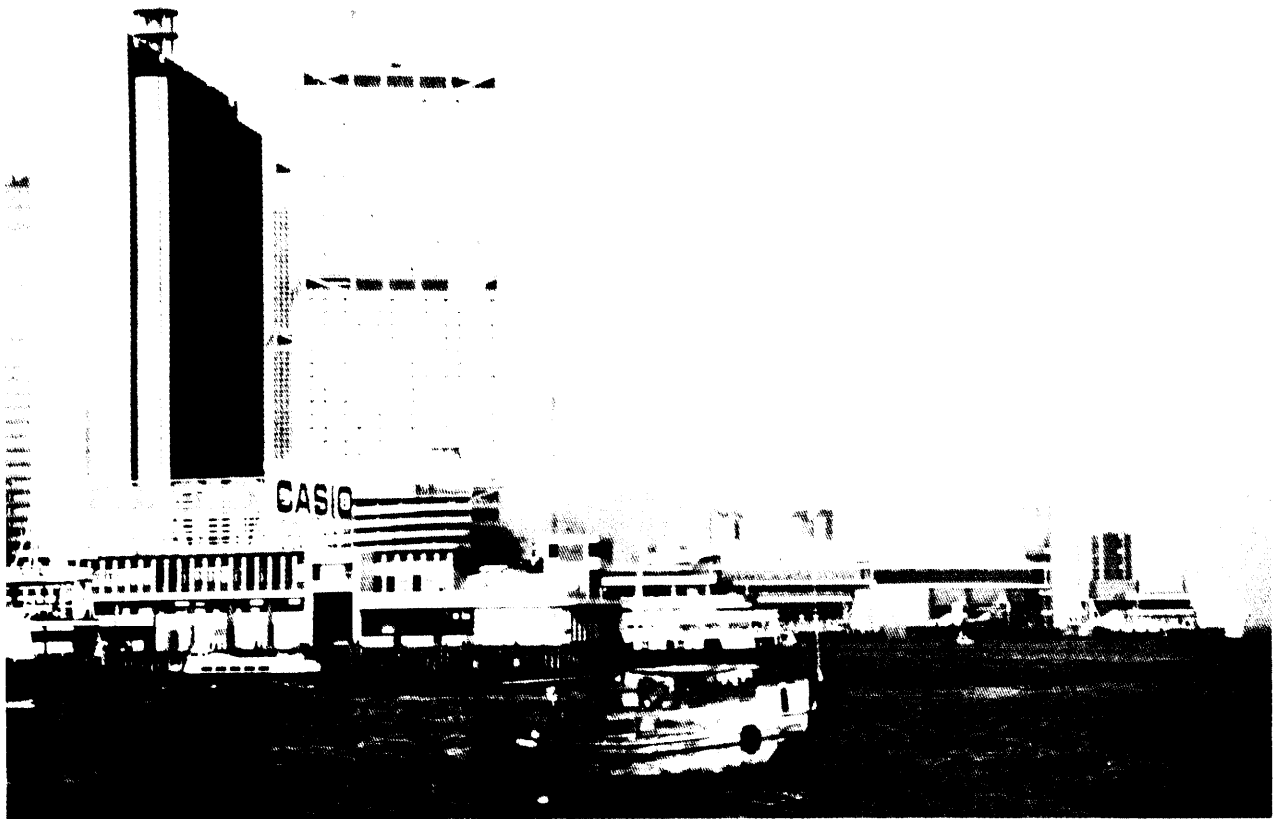


Photo credit: Eric Basques

The old and the new coexist in Hong Kong. Hong Kong will become a special Administrative Zone of China on June 30, 1997, under what Deng Xiaoping calls a "one country/two systems" concept.

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Policies of Other Supplier Countries: Japan, France, West Germany, and Britain

Japan and many European countries are actively assisting China in its modernization programs. Firms from these major supplier countries can supply virtually all the technologies that the United States can and share common Western security interests. Japanese exports to China have in recent years far exceeded those of the United States or any West European country, raising questions about U.S. export performance.

This chapter compares the approaches taken by these major supplier countries in order to identify opportunities and problems for U.S. policy. OTA finds that while competition among these countries for sale of products and technologies to China is generally a healthy process, technology transfers and trade also present policy challenges to the United States and to the Western "alliance" nations collectively. One challenge is to U.S. firms (and to the U.S. Government) to compete effectively in the China market.

Others will require complementary efforts by policy makers in the United States and the other supplier countries. An example is the need to strike a proper balance in assisting China in its modernization while preserving Western strategic interests in Asia. Maintaining this balance may entail further efforts to harmonize export control policies, a process that will increasingly depend upon the participation of other Asian countries such as Singapore. A second challenge is the need to avoid costly competition, propelled by subsidized exports, and to ensure expanded trade with China while avoiding protectionist responses. On a more positive note, there are also opportunities for cooperation in development projects that require financial and other resources so great that they would strain the capacities of any one supplier country.

FOREIGN POLICY PERSPECTIVES

Japan

Japan's official government policy today strongly supports China's economic modernization and growing economic relations. Proximity to China as well as its historic ties and technological prowess helped Japan become China's number-one trading partner. For Japan, now poised for what some see as a larger political and strategic role, China offers an unusual opportunity to contribute to the modernization of an Asian neighbor. Succeeding in this effort could reinforce Japan's growing leadership role in Asian trade and security.

Sino-Japanese economic relations developed over a bumpy path during the postwar period, however, and significant problems remain. Japanese

experts refer to 'political-economic cycles in Sino-Japanese trade. Japan's exports of machinery and equipment to China show peaks during periods of improving bilateral relations and troughs coinciding with political changes such as the Cultural Revolution.¹ Japanese business and government leaders charted a pragmatic policy course that led to expanded economic interaction through unofficial channels before the warming of relations in the 1970s, but at times Chinese stress on political principles was a constraint.

¹Mitsubishi Sogo Kenkyujo, *Nibe Kigyo no Chugoku Shijo Akusesu to Ajia Taihai Chiiki no Kozu* [Structure and Access by Japanese and U.S. Firms to the Chinese Market]. MR1 Projection No. 20, May 24, 1985, p. 34.

In 1978 Japan and China opened a new era in their bilateral relationship by signing a Treaty of Peace and Friendship and a Long-Term Trade Agreement. The establishment of diplomatic relations between the United States and China in 1979 set the stage for rapidly growing Sino-Japanese interaction.¹

Japan's foreign policy toward China is based on the proposition that contributing to China's modernization will allow China to resist Soviet influence better. China is seen as a socialist country, one quite different from the Soviet Union, which poses the greatest threat to Japan's security. While Japan would be wary of a strong military "alliance" with China that was perceived as threatening by the Soviet Union, Japan has determined that helping China modernize will contribute to China's peaceful economic and political integration into Asia. According to this view, economic and technical assistance make it more likely that China's relations with the West expand.

A number of other factors, in addition to U.S.-China rapprochement and Japan's perception of the role that China can play as a counterpower to the Soviet Union, underlie the rapid growth of economic relations since the late 1970s. In a climate of growing trade frictions with the United States and Europe, and a shrinking Middle Eastern market, China appears to hold at least a commercial prospect. China also provides a unique opportunity for Japan to demonstrate its commitment to expand its official development assistance in ways that contribute to Western security interests. The complementarity between China's energy, natural, and human resources and Japan's technological and economic acumen suggests a natural basis for economic exchange. Anxious to develop anew style of constructive leadership in Asia, Japanese government and business find in China a prime testing ground.

¹During the early postwar period, Japan was in no position to establish an independent foreign policy. After the Korean War, worsening U.S.-China relations precluded official Sino-Japanese rapprochement. In the early 1960s, the United States and Taipei persuaded Japan not to use Export-Import Bank financing to support China trade. See Chae-Jin Lee, *China and Japan* (Stanford: Hoover Inst. Press, 1984), p. 6.

But despite the considerable progress that has been made in deepening Sino-Japanese ties, serious points of friction became apparent in 1985. Since the mid-1970s, when Japan established itself as China's prime trading partner, China's leaders have complained about trade deficits with Japan. For years, the two countries attempted to resolve this problem under the rubric of long-term trade agreements that featured increased Japanese commitments to import Chinese oil and coal.² By 1985 the trade deficit had become a prime concern in bilateral relations, as Japan's surplus reached \$6 billion on a total bilateral trade basis of about \$19 billion.³ In late 1985 and early 1986, Chinese officials issued repeated warnings about the trade imbalance.⁴

Particularly noteworthy was the linkage of the trade issue to other points of controversy in the Sino-Japanese relationship. Chinese student demonstrations in late 1985 revealed resentment over Japan's trade "invasion," and Prime Minister Nakasone's unprecedented visit to a shrine to honor war dead awakened memories of Japan's earlier aggression in China. While the causes and significance of the Chinese student demonstrations remain the subject of considerable controversy, those demonstrations previewed a series of attempts by both countries to repair the points of friction. Nakasone announced a cancellation of immediate plans for a second visit to the shrine, and Chinese Communist Party leader Hu Yaobang proposed four points aimed at improving friendship, calling on the two governments to "adopt a correct approach to their serious conflicts of the past."⁵

²Japan nevertheless registered a trade surplus with China every year since 1972, except for 1981 and 1982, when China adopted a policy of restricting imports due to financial difficulties. Neither oil nor coal exports met expectations.

³During 1986, Japan ran a \$4.2 billion trade surplus, reflecting the fact that exports fell 18 percent below the level of the previous year, according to Japanese customs-clearance figures.

⁴In March 1986, China's Ambassador to Japan warned that China was watching the trade picture carefully and was concerned about the trade gap. In April 1986, China's Foreign Minister Wu on a visit to Tokyo called the trade deficit a big problem. China has repeatedly called upon Japan to open its doors to more imports from China and expanded investments in and technology transfer to China.

⁵See "HU Outlines Framework for Friendship with Japan," *China Daily*, Oct. 19, 1985.

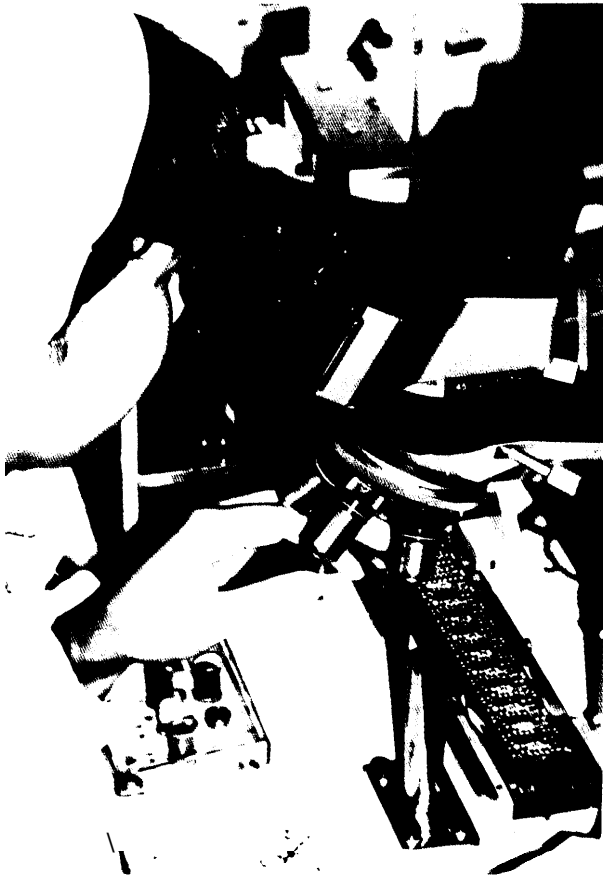


Photo credit: Xinhua News Agency

Checking integrated circuits at the Jiangnan Radio Appliance Factory in Wuxi. This equipment was supplied by Japan.

Quite recently, the Government of Japan apologized to China for statements made by former Minister of Education Masayuki Fujio suggesting that Japan was justified in its aggression in Nanking in 1937.⁷ Thus, while the two countries have attempted to relieve tensions, deep and historic points of friction remain over Japan's past aggression and its relationship with Taiwan. *

⁷ Western and Chinese historians have written about the atrocities committed by the Japanese (known as the "Rape of Nanking" after they captured Nanking in 1937. Apologies were also made to South Korea. See, e.g., John Burgess, "Japan Education Minister Fired for Remarks about World War II," *Washington Post*, Sept. 9, 1986, p. A21.

⁸ Japan ended diplomatic relations with Taiwan in 1972. Nevertheless, China raised concerns over the participation by some Liberal Democratic Party leaders in a commemoration of Chiang Kai-shek.

Other constraints stem more from external factors. Prime among these is the need to balance growing ties with China with the desire to preserve good relations with the Association of Southeast Asian Nations (ASEAN) and other Asian countries. Hence, Japan's Foreign Ministry has developed an aid strategy explicitly founded on three principles: (1) balancing aid to China with aid to ASEAN (2) cooperating with Western countries, and (3) providing no military aid. This approach embodies Japan's response to concerns raised by the Organization for Economic Cooperation and Development (OECD) countries about growing Japanese Export-Import Bank financing for energy and other projects for developing infrastructure in China.

Japan thus has a great deal to gain if its policies toward China succeed, but its prestige and influence could be diminished if frictions over trade and technology transfer fester and reactivate older points of controversy. China, more than other developing countries in Asia, appears capable of applying pressure on Japan. Japan's growing involvement in China is, moreover, being carefully watched by other countries in the region. The expanding Sino-Japanese relationship thus holds potential pitfalls as well as opportunities for Japan that extend beyond the bilateral relationship.

Europe

European countries have had centuries of trading experience with China. The value of this trade and China's internal weakness led to intense political interference, starting with the Opium War in 1839-42. The Boxer Rebellion of 1899 began a period of reaction to European imperialism that lasted until about 1920. Actual colonialism was limited to Hong Kong and Macao, but the de facto loss of control to Europe (plus the United States, to much less extent, and later to Japan) left a lasting preoccupation with national sovereignty. This experience also produced business and personal ties that have been useful in expanding trade as relations improved in recent years.

There is considerable commonality among the views of the European trading partners of

China. All are interested in increasing trade. Technology transfer is seen as a natural part of trade, often a crucial part, for competitive reasons. A modernized China is, ~f anything, seen as strategically beneficial vis-a-vis the Soviet Union. At present, there are few significant disputes between China and European countries.

This overall outlook is similar to that of the United States, but differences arise in the degree of concern over certain issues and in the ways in which policies are carried out, both at the government and corporate levels. Since there is little potential for direct strategic conflict between Europe and China, Europe is less concerned about improvements to China's military capability from dual-use technologies or direct military transfers. All members of the Coordinating Committee for Multilateral Export Controls (COCOM) use the same rules, but different interpretations of applicability to specific exports are often possible.

European trade has had its ups and downs, as with Japan, but this has been due more to China's internal economic decisions than to international political factors. The frictions that have marked China's trading relations with Japan and the United States have been much less pronounced in Europe. European countries see China as a promising commercial market that is attractive, considering their own sluggish

economies, but also relatively modest for the foreseeable future. Europe's trade with China exceeds that of the United States (by a widening margin), though it is much less than Japan's.

There is less variation in perspectives on technology transfer to China among the various countries of Europe, than between Europe and the United States or Japan. No grand designs, either strategic or commercial, seem to underlie Europe's approach, and no great controversies impede the relationships. The whole issue is lower key and more matter-of-fact. Within Europe, there are differing approaches to technology transfer, as discussed below, but few disputes between countries over trade with China.

From China's perspective, the European connection offers the best of all worlds. European technology is in most respects equivalent to American or Japanese, but Europeans seem to be readier to transfer it than Americans, with their strategic concerns, or Japanese, with their commercial reluctance. Furthermore, dealing with Europe helps China maintain its independence. These factors may explain why China seems relatively unconcerned with European protectionism and trade surpluses, even though these problems are much more severe than China's problems with the United States.

APPROACHES TO TECHNOLOGY TRANSFER

Western suremit countries have taken different policy approaches to technology transfer, and the China market is no exception. Private firms are the major developers and transferers of technology, but in some fields such as telecommunications, state-owned firms play major roles. All of the Western governments influence the nature and scope of technology transfer, albeit in different ways.'

⁹For an analysis of differing policy approaches to technology transfer in general, see OTA, *Technology Transfer to the Middle East*, September 1984, ch. 12 "Policies of Other Supplier Countries."

Japan

Scope and Type of Technology Transfer to China

There is a sharp contrast between China's criticisms of Japan for not transferring much technology and views often expressed by U.S. businessmen that Japanese firms are actually transferring advanced technologies (sometimes exceeding or circumventing multilateral export controls). While data are not available for a detailed comparison of technology transfer from various sources, distinctive features

of Japanese technology transfer to China are nevertheless apparent.

To set the context for the discussion of technology transfer, it should be noted that Japan has been China's number-one trading partner for more than a decade. Two-way trade reached almost \$19 billion in 1985 (more than double U.S.-China trade), with Japanese exports to China valued at \$12.5 billion dollars. In 1986 China was the fourth largest importer of Japanese products and the fifth largest exporter to Japan.¹⁰ Traditionally, Sino-Japanese trade comprised an exchange of 'machines for oil.'¹¹ At least in terms of Japanese exports, this pattern still prevails: machinery exports made up 57 percent of total Japanese exports to China during 1985. Exports tripled in 1985 in automobiles, motorcycles, televisions, and other consumer appliances. In the first half of 1986, however, Japan's exports to China fell 23 percent from the 1985 level. Exports of automobiles and appliances plummeted after Chinese resentment grew over a growing trade deficit with Japan. Japan's share of telecommunications exports dropped markedly from 77 percent in 1985 to 58 percent in the first half of 1986.

Table 9 outlines the composition of Japanese exports to China. In 1986, exports of steel products constituted more than a quarter of this trade (3 billion dollars' worth). Another major export category is transportation equipment; Japan exported 936 million dollars' to China, down 58% from the 1985 level. After a surge in imports of Japanese automobiles in early 1985, and scandals involving illegal sales and defective parts, the Chinese Government imposed restrictions on imports later in the year. A third major category of exports is industrial machinery and electrical equipment. Television exports (including components) were valued at \$1 billion in 1985, but dropped sharply in 1986. Chemical and textile exports were also

Table 9.—Composition of Japanese Exports to China 1986 (millions of U.S. dollars)

| | Value | Export share (percent of total Japanese exports to China) |
|---|---------|--|
| Chemical goods | 8{ 5 | 8.3 _{0/0} |
| Metals and articles thereof . | 3,163 | 32,1 |
| (Iron and steel sheets and plates) | (1,013) | (10.3) |
| Machinery and mechanical apparatus | 4,979 | 50.5 |
| (TV receivers) | (152) | (1.5) |
| (Motor vehicles) | (612) | (6.2) |
| (Scientific, optical, and precision apparatus) | (506) | (5.1) |
| Textiles and textile articles | (447) | (45) |
| Total | 9,856 | |

NOTE General contrasts with U S exports whch amounted to \$38 blillion (n 1985, are apparent While U S agricultural exports declined they made up a comparatively large share for the Unfiled States Table 52 prov(des a comparison of selected equi pment exports

SOURCE Ministry of Finance Japan

significant. With the completion of the Bao-shan steel mill project in 1985, Japan's exports of large plants dropped. Table 10 compares U.S. and Japanese exports in key sectors.

Official statistics cover direct trade between Japan and China and thus do not show that in recent years Hong Kong has become increasingly important as an alternative channel. Chinese officials express concern about this route, fearing reduced control over imports and prices. One observer estimated that trade through Hong Kong represents 10-15 percent of the value of total official bilateral Sino-Japanese trade.¹²

Product exports do not, of course, constitute technology transfer, but such exports often include training programs and provision of technical services. The sheer volume of Japan's machinery and equipment exports suggests that Japanese firms have played a significant role in helping modernize China's industries. In June of 1986a high-level Chinese official noted that during the past five years 651 Japanese experts had visited China to diagnose 131 factories, and that 400 Chinese had visited factories in Japan.¹³ Trade data alone, therefore,

¹⁰"Japan-China Trade in 1986," *China Newsletter*, No. 67, March-April, 1987, p. 20. Two way trade totaled \$15.5 billion in 1986.

¹¹See Richard K. Nanto and Hong Nack Kim, "Sino-Japanese Economic Relations, Congressional Research Service, Prepared for the Joint Economic Committee, November 1984.

¹²See Charles Smith, "The Ties that Bind," *Far Eastern Economic Review*, Apr. 24, 1986, p. 80.

¹³These numbers include both Japanese government and corporate programs. See *China Newsletter*, no. 64, Sept.-Oct. 1986, p. 10.

Table IO.—Comparison of Selected U.S. and Japanese Exports 1985 (million U.S. dollars)

| | United States | Japan |
|---|---------------|------------------|
| Telecommunications and sound recording equipment | 43.5 | 1,383a |
| Office machinery and equipment, including computers | 187.6 | 122.7 |
| Professional and scientific control instruments | 279 | 683 ^b |

a of which, TV receivers \$1.073

b, Scientific and precision apparatus In Japan's tariff classification

SOURCES U.S. Commerce Dept data, reported in *China Business and Trade*, Feb 23, 1986, Japan Tariff Association data, reported in *JEI Report*, No. 14b

provide an inadequate gauge of technology transfers.

Another approach to determining if technology transfer is occurring is to examine published contract awards. According to one such study of transfers of production technology, Japanese firms were involved in 42 of 183 transactions in 1984, while U.S. firms were involved in 71. Brief descriptions of the contracts indicate that Japanese firms were transferring some advanced technologies (in areas such as electronic control systems, production of spectrophotometers, and electrostatic copiers).¹⁴ Chinese data indicate that whereas Japan was the leading foreign supplier of equipment (hardware), it lagged behind the United States and West Germany in "technology transactions" between 1973 and 1984.¹⁵

A study of Japanese plant exports to China during the period January 1984 to March 1985 identified a total of 172 cases.¹⁶ The largest number (57) involved machinery production facilities. Chemical and food production plant exports ranked second and third. A close examination of the electric machinery plant exports indicates that most involved consumer product manufacturing technology (TVs, re-



Photo credit: Xinhua News Agency

The Fujian Hitachi Television Co. Ltd. in Fuzhou, a China-Japan joint venture. Photo shows a view of the assembly workshop for color and black-and-white TV sets.

frigerators, and washing machines). The total value of these plant exports was \$640 million, indicating the small scale of many of the projects.¹⁷

During the same period, an additional 182 cases of technology transfer unrelated to large plant exports occurred.¹⁸ The number of these contracts rose rapidly in late 1984 and early 1985, a large proportion involving parts supply for knockdown production in China.

About 75 percent of the cases involved technology transfers to machinery-producing firms in China. Fifty cases involved electrical machinery-producing firms primarily involved in consumer goods production.¹⁹ While only 16 cases involved industrial goods production, these included calibration and instrumentation technology needed for "industrial renovation" projects in China. Table 11 provides a summary of technology transfers from Japan to China in the 1984-85 period.

¹⁴Donald R. DeGlopper, "China's Import of Foreign Technology, Survey and Chronology, DDE-1924-2-85, report for the Defense Intelligence Agency, August 1985.

¹⁵See Li Hao, "In Search for a Perfect Balance," *Intertrade*, September 1985, p. 13. By value of transactions, Japan was on a par with West Germany as a supplier, but it lagged in numbers of transactions.

¹⁶These cases all involved exports of manufacturing equipment and technology (rather than simple exports of machinery and equipment).

¹⁷More than 35 percent of the projects were valued at less than \$1 million. Data from Japan Machinery Exporting Association, *Tokutei Shijo no Shoraisei Bunseki Chosa Hokoku*, July 1985, p. 160.

¹⁸In this study, technology transfer is defined as contracts involving any of the following: licensing, software and management, consulting, or parts supply.

¹⁹About 68 percent of the cases in this category (electrical machinery producing firms) involved technology for production of TVs, washing machines, and refrigerators.

Table 11.—Technology Transfer From Japan to China, 1984-85

| | Number of Cases | Percent of total |
|-----------------------------------|-----------------|------------------|
| Manufacturing | 2 | 1 |
| Construction | 2 | 1 |
| Manufacturing | 169 | 93 |
| Electrical machinery | 50 | 29.6 |
| Industrial | 13 | |
| Consumer | 47 ^a | |
| General machinery | 38 | 22.5 |
| Transportation machinery | 25 | 14.8 |
| Textile machinery | 25 | 14.8 |
| Transportation and communications | 1 | .5 |
| Wholesale, retail | 1 | .5 |
| Services | 7 | 4 |
| Total | 182 | |

a, includes primarily TV, washing machine, refrigerator and other consumer product manufacturing technologies

SOURCE: Japan Machinery Expo-ting Association Tokutei Shijo no Shoratsukai Buokai (Chosa Hokoku July 1985 p. 182)

Joint venture projects involving Japanese and Chinese firms provide another vehicle for technology transfer. China's leaders have indicated their dissatisfaction with the level of foreign investment and have taken a number of steps to attract additional investment. Japan, in particular, has come under criticism. "In view of the large volume of Japanese exports, the argument goes, Japanese firms should be more involved on the ground in investment projects likely to involve technology transfer.

China's data on foreign investment cover a number of categories, including cooperative ventures, joint development projects (particularly in offshore oil development, compensation trade, processing arrangements), and equity joint ventures. "The Japan External Trade Organization (JETRO) data collected by the Ministry of Foreign Economic Relations and Trade indicate that by late 1984 Japanese firms were involved in 26 of 429 equity joint ventures that Chinese firms established with foreign firms. Japanese investments were

"See, for example, "Foreign Investment Placings Fail to Satisfy Chinese, *Financial Times* (London), Jan. 30, 1986, p. 6.

²¹See Nai-Ruenn Chen, *Foreign Investment in China: Current Trends*, U.S. Dept. of Commerce: March 1986, for a discussion of China's investment data. Statistics recorded here indicate that Japan was a close third (following Hong Kong and the United States) in cumulative pledged equity joint investment by the end of 1984. See p. 11.

limited and focused primarily on offshore development projects. An additional 80 investments were reported in 1985, but investments from other countries also grew rapidly. As a result, Japanese investors were involved in only about 3.4 percent of the total number (2,300) of foreign investments reported by China."

A good share of the investment projects outside the oil development field were in service areas such as hotel and restaurant ventures and leasing operations. Joint manufacturing ventures involved primarily production of consumer goods. During 1985 the number of cooperative projects increased, and JETRO'S listing indicates that a greater number involved higher technology and manufacturing operations. Nippon Steel, for example, signed a contract worth \$100 million with a Chinese partner to setup an engineering company. In another case, a Japanese firm contracted with the Chinese Academy of Sciences to establish a joint software development firm.²³ In 1986 Furukawa Electric agreed to a joint venture in Xian for producing optical fibers and cables,

Japan's experience in China is thus extensive, yet technology transfer has been concentrated in certain areas, especially technical consulting and training associated with plant exports. A firm like JGC, for example, has had more than 21 large contracts in China involving oil, petrochemical, and gas production projects. In these projects technology transfer has occurred, often involving firms from other supplier countries, in the sale of patents and the provision of know-how.

Perhaps the prime example is Baoshan, the large steel works completed outside Shanghai in 1985. For Nippon Steel, the major Japanese company involved in this state-of-the-art steel complex, the project offered a chance to train young Japanese engineers in a government-supported effort during a period of intense global competition in the industry. Although

²²See Charles Smith, "The Ties that Bind," *Far Eastern Economic Review* Apr. 24, 1986, p. 74.

²³See, for examples, Japan External Trade organization (JETRO), *China Newsletter*, No. 58, p. 21.

the project has suffered many problems, including a scaleback in the early 1980s, it involves significant technology transfer from Japan to China. More than 1,200 Chinese have been trained in Japan and hundreds of Japanese have been sent to China.²⁴

Firms like the Nippon Electric Co. (NEC) have developed carefully honed technology transfer strategies. NEC has joined with a Chinese partner to produce 16-bit microcomputers. It is also a partner in the Japan-China Software Center. Interestingly, NEC training of 1,000 Chinese software engineers has been a boon to NEC, which faces a shortage of trained personnel.²⁵ NEC'S strategy involves technology transfer to China in certain areas that complement NEC'S own needs and marketing plans.

To summarize, technology transfer from Japan has occurred to a great extent in exports of standardized production facilities for manufacturing consumer goods, and in training and technical consultation for large infrastructure projects.²⁶ Specialized technical exchanges between Japanese and Chinese organizations are also a vehicle. The Industrial Bank of Japan (IBJ) for example, runs seminars on financial services for Chinese trainees. There is a constant movement of specialized personnel between organizations such as the IBJ and the Bank of China.

Technology transfer is fundamentally a people-to-people process, and the establishment of hundreds of branches of Japanese firms in China testifies to the importance of Japan's role. In 1984 more than 41,000 Japanese visited China, or more than 100 daily.²⁷ (Many of these individuals were undoubtedly primarily involved in exports of products and services). China's factory renovation program involves

many Japanese consultants and advisors. On the other hand, the Japanese Government has funded only 300 scholarships for Chinese students although officials have expressed their commitment to increase this number to 500 by 1989.

There is some truth as well as some misperception associated with the commonly held view in China and Japan that not much technology transfer has occurred. The general pattern has been one of product and, to a less extent, service exports, with transfers of technology occurring primarily in standardized consumer product manufacturing or in the context of large projects. Such technology transfers may attract less interest than licensing state-of-the-art technology, but they can be a critical factor in industrial renovation projects.

Organizations and Participants: Technology Transfer Japanese Style

Japan's foreign economic policymaking system is more centralized than that of the United States, but there is a range of perspectives on technology transfer to China. The official Government position, reflected in programs supporting extensive Japanese participation in China's modernization, contrasts with a more cautious approach by private sector firms to technology transfer and investment.

Differences between government and business on technology transfer are, of course, well publicized, and more the norm than the exception in the United States. In Japan a number of institutional mechanisms build consensus between public and private leaders active in technology transfer. While Japanese leaders question the notion that Japan has a national strategy on technology transfer, the generally complementary efforts of public and private officials are certainly assisted by these avenues for information exchange and consensus building.

At a government level, Japanese leaders are committed to building economic ties with China. Yet there is a range of views on specific issues that reflect differing institutional missions. The Ministry of Foreign Affairs

²⁴Ikuo Hirata, "Baoshan Steel Works," *Journal of Japanese Trade and Industry*, No. 5, 1985, p. 17.

²⁵Interview with Yukio Mizuno, Senior Vice President, NEC, November 1985.

²⁶Other Japanese firms like Toyota, which are major exporters of vehicles to China and have extensive service operations there, have foregone equity joint ventures. Many Japanese firms appear wary of China's employment and other requirements on foreign firms.

²⁷Kazuhiko Mitsumori, in *Gendai*, October 1985.

(MOFA), the lead agency in formulating foreign policy, has traditionally been careful to ensure that policies toward China mesh with Japanese policies toward other Asian countries.²⁸ MOFA current policy toward China, based on three principles mentioned earlier, was developed in the late 1970s, in part to clarify debates over whether the Japanese Government should offer official loans and official development assistance to China. In these debates, the Export-Import Bank, the Ministry of Finance, the Ministry of International Trade and Industry (MITI), as well as Liberal Democratic Party (LDP) politicians played key roles.

MITI, the traditional leader of Japan's post-war trade and industry policies, has developed a view that Japan's comparative advantage lies in knowledge-intensive industries and a more internationalist approach. MITI view is that Japan must promote the international transfer of technology through overseas investments and other means to maintain its competitive position and mitigate trade frictions with other countries.²⁹

Debates among key ministries over levels of official development assistance for China have had more to do with the scope and mechanisms for participation in China's modernization than with the fundamental rationale. Whereas U.S. concerns over national security are embodied in export controls, Japan sees expanded economic interaction as the primary avenue for attaining strategic goals vis-à-vis China.

Despite this formal consensus on overall policy directions, Japanese leaders contend that there is no clearcut national strategy on technology transfer. Acknowledging their concern over China's criticisms of Japan for not transferring more technology, Japanese leaders

promise to expand technical cooperation programs and financing of large projects. At the same time, government leaders indicate that China may be pressing too hard for the most advanced technologies.³⁰ Japanese policy makers prefer a step-by-step approach because they believe that during this transition period in China a proper foundation must be built.

Japanese businessmen, in particular, appear cautious about technology transfer to China. They emphasize obstacles to technology transfer such as inadequate infrastructure, bureaucratic sectionalism, limitations on management discretion in hiring and operating enterprises, and China's tendency to undervalue software and training. These concerns explain in part the willingness of Japanese business to sell goods to China while avoiding extensive investments. Acutely aware of the special expectations China has concerning Japan's contribution, they stress differences in Chinese and Japanese negotiating styles and other factors that set constraints on the ability of Japanese businessmen to fulfill expectations.

Distinguishing Japanese approaches to technology transfer are key organizations that bridge the distance between government and business, expanding economic ties to China. One such organization is the Japan China Association for Economy and Trade (JCAET), formed in 1972. JCAET is a hybrid organization that includes many retired government officials (most of them from MITI), businessmen, and China experts from organizations such as the Institute for Developing Economies. JCAET provides a wide range of services to Japanese firms interested in China trade, such as detailed surveys of conditions in China, while facilitating exchanges with Chinese leaders. The boundaries between MITI, JCAET, JETRO, and other key institutions are fluid in the sense that individuals are often detailed from one organization to another to help with specific projects. JCAET is thus part

²⁸Up until 1972, the Foreign Ministry was more reluctant than the Ministry of International Trade and Industry (MITI) to open relations with the People's Republic of China (PRC) and more intent upon preserving diplomatic relations with Taiwan. See Chae-Jin Lee, *China and Japan* (Hoover Press, 1984), p. 12.

²⁹The report was prepared by the Planning Subcommittee of the Industrial Structure Deliberative Council to MITI in preparation for the Tokyo summit in May 1986. See *Mainichi Shinbun*, Feb. 1, 1986, p. 1.

³⁰Official programs carried out by the Japan International Cooperation Agency in the factory renovation area are explicitly designed to promote transfers of standardized (rather than new) technologies.

of a network of organizations that work closely together to increase Japan's knowledge of and exchange with China's economy. The perspectives of individuals and organizations vary, but the network ensures that information is shared and that major participants are cognizant of key problems and issues. The effectiveness and utility of information gathered through an extensive network in China is reflected in statements by Chinese leaders that Japanese understand well the intricacies of China's contract approval process.

The low-profile, consensus-building approach carries over to bilateral exchanges as well. Japan and China have established the Twenty-first Century Committee, composed of 11 members from each country who exchange views on issues of bilateral importance. On the Japanese side the committee is staffed by MOFA, but the discussions are considered unofficial. High-ranking leaders in the China field from business and academe and former government officials make up the Japanese delegation. The committee is a mechanism for frank but high-level and closed-door communications between the two countries. Reportedly, the group has discussed sensitive issues such as Chinese anti-Japanese demonstrations and trade frictions. Interestingly, a major focus of attention has been youth exchange. At the committee's instigation, a youth center is now under construction in Beijing, and a number of exchange programs for young people have been sponsored. The committee is thus more than an advisory group; it can marshal the resources needed to implement projects.

Organizational and personal ties between Japanese business and government leaders with their Chinese counterparts are old and extensive. Yet, uncertainty about Japan's role in technology transfer remains. For both sides, the impacts of this critical period of experimentation with new modes of bilateral interaction will extend beyond the bilateral relationship.

Whether or not Japan will transfer enough technology to meet China's expectations remains an open question. On one hand, Japanese firms may continue to chart a cautious approach to investment, waiting to see how China will implement its policies and gradually building expertise and confidence in their technology transfer capabilities. On the other hand, expanded trade in more sophisticated products and services appears likely now that regulations of the Coordinating Committee for Multilateral Export Controls (COCOM) have been loosened.³² Even if direct equity investments remain comparatively limited, technology transfer from Japan associated with such sales will expand. If a few key Japanese firms demonstrate success in joint ventures involving advanced technology transfer, moreover, others will surely follow. Thus, while Japanese firms and organizations may continue to use different modes and mechanisms for technology transfer, they will likely continue to be the most significant competitors for the China market.

Europe

Technology transfer from Europe to China takes all the forms seen in the transfers from the United States or Japan. Technology is embodied in equipment, sold in conjunction with equipment, sold independently as in licensing arrangements, included in investments such as joint ventures, and transferred by governments and institutions directly to China or in the form of education received by students attending European universities.

Two-way trade between the European Community and China was almost \$7 billion in 1985. Trade increased about 25 percent from 1984, thereby surpassing the U.S.-China level. Table 12 shows the shares of the individual countries.

³¹ For a detailed chart of the contract approval process for Japanese-Chinese joint ventures, see Masao Sakurai, *Kokusai Kyoryoku no Wakugumito Ho* [The Framework and Law for International Cooperation] (Tokyo: Sanshodo, 1985), pp. 202-3.

³² Hitachi won a contract to export large-scale computers to the Bank of China soon after the loosening of COCOM rules. See "Hitachi to Export Computers to China," *Asahi Evening News*, Feb. 14, 1986.

Table 12.—European Trade with China in 1986 (billion U.S. dollars)

| | Total | Percent over 1985 | Exports | Imports | Export/total |
|---------|----------|----------------------|---------|---------|--------------|
| Germany | ..\$4.07 | 31.2 | \$2.87 | \$1.20 | 70 % |
| Britain | 1.41 | 42.4 | 0.78 | 0.62 | 55 |
| France | 1.25 | -2.4 | 0.67 | 0.58 | 54 |
| Italy | 1.68 | 21.2 | 1.00 | 0.68 | 59 |

SOURCE IM F Direction of Trade Statistics as reported in *Ch/a Business Review* Vol. 14 No. 3 May-June 1987

The Federal Republic of Germany

Germany has the largest share of the European trade and the greatest financial involvement in China. China was Germany's largest trade partner in the developing world in 1985, though China's deficit in this trade may limit future growth.³³ China has established its European Trade Center in Hamburg to facilitate China's exports to Europe.

Technology transfer has been an important part of this relationship. For instance, Schloemann-Siemans A.G. successfully competed with Japanese companies for a \$626 million contract to supply a hot-strip mill at the Baoshan steel plant, largely by offering advanced technology with considerable technology transfer. The company has brought many Chinese designers to Bonn for training in modern management techniques. Germany has been particularly strong in transferring production technology such as machine tools and chemical processing plants.

In a study of technologically oriented exports to China in 1984, Germany ranked third, behind the United States and Japan, with 17 of the total of 182 exports.³⁴ In 1985 the value of technology exports from Germany may have exceeded those of both the United States and Japan, even though the number of contracts did not.³⁵ Machinery and production technologies or transportation equipment were the largest components. Electronics have also been important. In 1985 a complete semiconductor production plant was exported, as were facilities for the production of floppy disks and telecommunications equipment.

³³Foreign Broadcast Information Service, Daily China Report, May 13, 1986.

³⁴DeGlopper, op. cit.

³⁵Liu Hu, "Technology Import Reaches New High," *Beijing Review*, No. 10, Mar. 10, 1986.

Twelve joint ventures were established by the end of 1985.³⁶ None of them involves production of high-technology equipment. Most have been with mid-size German companies in areas such as food processing. One joint venture that doesn't involve much technology but may expedite European trade with China is a shipping company that will use the Trans-Siberian Railroad to avoid the long delays in Chinese harbors.

The largest joint venture is the Shanghai Volkswagen Automobile Co. Ltd. (SVIV), which started production of the Santana automobile in 1985. SVW is assembling kits imported from Germany at the rate of 800 cars a month.³⁷ Only a few parts come from China, but it is hoped that eventually all will.³⁸

Many problems have been experienced. The production line for the Santana was added to a factory that had been producing small numbers of a car that had remained essentially unchanged in design for 27 years. The management team and the workforce had to be largely retrained, and the German management found that some of its methods were not applicable to China. Distribution and service of the cars in China have been unexpectedly difficult. China has also had difficulty raising its share of the capitalization, in part because of the plummeting value of the yuan. Estimates of future capital requirements for building the facilities for the local production of parts and supplies have risen sharply, evidently causing some ill will between SVW and Beijing. The shortage of foreign exchange has also ham-

³⁶Foreign Broadcast Information Service, China Daily Report, Sept. 4, 1986.

³⁷Yue Hailao, "How Volkswagen Performs in China," *Beijing Review*, No. 29, July 21, 1986.

³⁸H.L. Stevenson, "Chinese and Germans Team Up To Build VW'S," *Automotive News*, Oct. 21, 1985.

pered China's ability to pay for the kits, a situation similar to that faced by the Beijing Jeep Corporation in its arrangement with American Motors.

Licenses to manufacture have been more important means for technology transfer than joint ventures. For instance, Motoren Werke Mannheim AG has granted a license for the production of diesel engines for agricultural and construction uses, an area where China could derive considerable economic benefit. A more complicated agreement was signed by Dr. Eng. Rudolf Hell Ltd. for the manufacture of color separation scanning chronographs. China will first assemble kits from Germany, but within 5 years the manufacture should be all domestic. The agreement includes training of Chinese engineers in Germany. Siemens AG has granted many licenses, which include training in Germany and startup assistance at the Chinese plant.

The purchase of used equipment has become a significant means for increasing production capacity, though it obviously involves older technology. China has purchased at least two German factories, for motorcycles and bicycles, and a spinning mill and reassembled them in China. These ventures have provided China with manufacturing facilities considerably more modern than the norm in China, at a small fraction of the cost of new equipment.

In another form of technology transfer, the ChineseWest German Technical Training Center has been established in Tianjin with a grant of DM35 million. The center provides training in machinery, computers, electronics, and instrumentation to about 400 trainees.

Germany's program to send retired managers to China to provide advice and assistance resulted in an unusually personal form of technology transfer when one of the volunteers, Werner Gerich, was appointed the manager of the Wuhan Diesel Engine Factory. The factory was having major problems with production, especially in the quality of the engines. Gerich instituted a series of reforms that have significantly improved quality, volume, and profits. With the backing of local officials and the

Party, he implemented an incentive wage system, streamlined the workforce, restructured the management, and improved discipline. Many problems still remain at the plant, but Gerich is instituting a change in thinking that may be a lasting legacy.

Over 1,000 Chinese students are in German universities, and the number is growing. Compared with the 17,000 in the United States, this number seems low. Perhaps the relatively few overseas Chinese in Germany and the dearth of German-speaking Chinese are factors.

Germany has much to offer China. Its technology for production is justly famous, and that is the technology in which China is now most interested. Quality control in particular is a German strength that China can usefully learn. In some areas, such as computers, German technology has lagged behind that of the United States and Japan, but not by so much as to affect the utility of Germany's products to China. It is reasonable to conclude that unless economic factors in China interfere, this relationship will continue to grow. If Germany has been cautious in starting joint ventures or other investments in China, it is not because of particular inhibitions about China but because German industry is cautious in general and does not need new productive capacity.

The German Government's major role in technology transfer is that of facilitator more than participant. The private sector has the lead in making contacts, negotiating the terms, and fulfilling contracts. The Government has signed a large number of accords on science and technology cooperation with China, opening the way for industry. These have been arranged by the Ministry of Research and Technology (BMFT). The Economics Ministry, equivalent to the U.S. Department of Commerce, has an Office of East Asian Affairs and provides information and advice to industry, in part through the Federal Office of Foreign Trade Information (Bundestelle für Aus-senhandelsinformation, or Elf A). BfA, whose closest analog in the United States is the Foreign Commercial Service, analyzes economic, legal, and political information, particularly in

developing countries, to assist German companies in decisions on trade and investment.

The Economics Ministry and the Foreign Office have developed a trade policy supportive though cautious of China's development. China is not seen as either an economic or political threat, whereas technological cooperation is seen as a way of encouraging China to remain open to the West and moderate in its policies. The German Government therefore encourages industry to trade with China and engage in technology transfer. Traditionally, it has not provided direct subsidies for exports, preferring to rely on market forces to reach economically sound decisions. However, this policy is apparently flexible since, as noted below, at least one case of mixed credits has been announced.

The Federation of German Industries, a private-sector organization, provides services to exporters and shares in the governing of the BfA. The Joint Committee for Sino-Federal German Economic Cooperation is a body of government, academic, and industrial representatives that meet with equivalent Chinese representatives annually to discuss economic issues.

France

In general, France has been less successful than Germany in trade with China. Exports to China in 1986 totaled about \$670 million, less than one-quarter that of Germany. Sino-French trade had been approximately balanced but in 1985 China's imports more than tripled, whereas exports were stable.

Major French exports include aircraft (airbuses, helicopters, and eventually, perhaps, fighters), ground transportation equipment (trains, trucks, and river shipping), and telecommunications. Technology transfer appears to be relatively more important for France than Germany. The value of French exports involving technology in 1985 was \$320 million, almost 60 percent of total exports.³⁹ The type of tech-

³⁹U.S. Congress, Office of Technology Assessment, *Technology Transfer to the Middle East*, OTA-ISC-173 (Washington, DC: U.S. Government Printing Office, September 1984).

⁴⁰Liu, *op. cit.*



Photo credit: National Council for U.S./China Trade

Air navigation equipment at the Beijing Airport. This equipment was supplied by France.

nology transfer, however, differs some from Germany's, with less emphasis on setting up manufacturing facilities and more on selling specific equipment with associated technology and training. For instance, France led a European consortium that sold 300 locomotives to China. The \$450 million contract included technologies of design and manufacture (as did the GE contract discussed in ch. 4); manufacturing equipment was included, but it does not appear to have been a major point of the contract.

In another major transaction, CIT-Alcatel (a subsidiary of the state-owned Compagnie Generale d'electricite~ [CGE]) sold a modern telephone switching system capable of handling 100,000 lines. As a precondition, an electronics lab for the testing and manufacture of telecommunications equipment was included. This lab will be used for microwave, laser, and fiberoptic technologies.

China signed a contract for two French nuclear reactors late in 1986. Some opposition has arisen in Beijing (largely because of the drain on foreign exchange) and in Hong Kong, because of safety concerns. Germany's alternative bid would have permitted China to participate in the design of the plant, but China showed little interest. The United States was precluded from competing for this sale because a nuclear cooperation agreement had not yet been signed. The contract does not include ex-

tensive technology transfer, but the experience will help China to advance more rapidly with its own nuclear industry. However, China will require considerable additional assistance before it will be able to produce a world-class reactor independently.

In several negotiations, the French have noticed that China first asked for the latest technology but later realized that older technology would be more suitable. For example, the locomotive technology eventually selected uses continuous traction, a technique that was phased out in France 10 years earlier in favor of synchronous traction. The nuclear reactors were also not the latest that France has to offer. In both cases, the French were willing to transfer the more advanced technology, but the Chinese independently decided to back off.

The French pattern of establishing joint ventures has been remarkably similar to Germany's. None of France's 11 joint ventures has involved high technology. Most have been in food processing, but the largest is in the automobile industry. Peugeot created The Guanzhou Peugeot Automobile Co. to build about 15,000 light trucks (pickups) per year.

One area in which Sino-French cooperation has been very strong is science. A wide range of cooperation agreements has been signed, and many Chinese researchers spend a year or more working in French laboratories. It is likely that this scientific cooperation reinforces the readiness of China to acquire technology from France.

There are about 1,000 Chinese students in France, mostly in science and technology. The total is not growing very rapidly and is likely to remain proportionally well below that in the United States because French scholarships are mostly government sponsored and are neither as flexible nor as generous. Chinese students are frequently funded by their government for only one year; if they wish to remain, they must find their own support.

The French Government plays a much more active role in most aspects of technology transfer than do the German and U.S. Governments.

Most companies involved with high technology are owned by the French Government, such as CGE. While the effect on corporate efficiency and vigor might be questioned, this factor ensures close cooperation between industry and government. Government officials often see themselves as representatives of French business in a way that China is likely to find familiar and comfortable. Although French policy may be changing (the Government has already announced that it intends to divest itself of CGE and other major companies), this arrangement has worked well, at least for initiating technology transfer arrangements. For instance, the nuclear vendor Framatome is Government owned, and the Government made strenuous efforts to win the Daya Bay contract, including direct negotiations and concessionary financing. The French National Railroad will have a permanent representative in Beijing, presumably to encourage transactions such as the contract for the locomotives. However, the overall number of French officials in China is not very high, and theoretically the burden of concluding agreements is on the companies.

United Kingdom

Britain is China's second largest trading partner in Europe and a major supplier of technology. The largest single transaction (250 million pounds) has been the sale of the turbine-generators for the Daya Bay nuclear power plant, in conjunction with the two reactors supplied by France, though little technology transfer was involved. Other major exports include scientific instruments, synthetic fibers, steel products, telecommunications, and coal mining equipment. As with other European countries, China's trade balance with Britain is in significant deficit.

Britain is unique among the industrialized trading partners of China in its control of Hong Kong. Hong Kong's trade with both Britain and China greatly exceeds trade between Britain and China, but this does not appear to be a major conduit for British goods relative to other countries. Furthermore, any special rela-

tionship that Hong Kong provides is likely to dissipate over the next decade, when Hong Kong reverts to China.

Appendix 6 in Volume II to this report lists six dual-use technology transfers from Britain (1984-85), compared with three from Germany and four from France, suggesting that Britain has a relative advantage in high-technology exports. The pattern of Britain's technology transfers to China resembles France's more than Germany's. Licensing, training, and sales of specific equipment and information have been more important than production lines, though several of the latter have been supplied. British Rail Engineering has a contract for 5 million pounds to sell three advanced rail coaches and the design technology to the Changchun Railway Passenger Works. Assistance will also be provided in modernizing the plant.⁴¹

Racal Electronics has had several major contracts involving equipment, technology, and coproduction arrangements. It has sold radar for ship and air traffic control and transferred the technology to produce radar equipment. The technology transfer appears to have been a key element in gaining contracts for Racal.⁴²

The production lines that Britain has sold include plastic sheeting and audio and video tape. However, Britain appears to have played a bigger role in helping get other projects completed after they run into trouble.

There have been only about 12 joint ventures, but they have been the result of some of the largest contracts. Lingnam Microelectronics Investment Co. (a consortium of British companies) is building a \$50 million facility to produce large-scale integrated circuits and microcomputers. Pilkington Brothers is constructing a plant near Shanghai in partnership with two Chinese companies to produce high-quality glass using modern technology. The plant will cost \$120 million and will be the largest producer of glass in China when it comes on line in 1987.⁴³ This project, as with

many other large joint ventures, has had foreign exchange and managerial difficulties.⁴⁴ Other joint ventures include heavy truck assembly by Aveling Burford and automobile batteries by the Chloride Group and Singer.

Coproduction is likely to be more acceptable than joint ventures to British companies. Racal Electronics has noted that coproduction offers almost the same benefits to China and avoids many of the problems.⁴⁵

Much of the technology transferred has been fairly basic: pumps to drain coal mines, reinforced concrete pipes, wire-rod mill equipment, technology for foundries, and extrusion equipment for aluminum products. Some have been quite advanced: microelectronics, fiberoptic, telecommunications, and radar.

British companies appear more concerned than French or German companies about future competitiveness, at least for traditional technology industries. As in other countries, many companies have been disappointed following their expectation of the 1970s, especially considering the number of Chinese visitors they have received. Of the 185 Chinese delegations in 1985 who looked at British products and technologies, very few have followed up their visits, and fewer still have produced any business.

One area in which Britain has excelled has been in education and training. Britain has over 1,200 Chinese students, more than in Japan, Germany, or France, and the number is rising rapidly. As with the United States, the popularity of the English language, the reputation of the universities, and the availability of scholarships are major attractions for the Chinese. Moreover, British industry is training over 1,000 Chinese, mostly in technological areas. Training is a standard feature of China trade and investment and will probably increase in the future.⁴⁶

The British Government is more of a facilitator than a participant, as is the case in Germany. Most technology transfer is accom-

⁴¹China Business & Trade, May 23, 1986.

⁴²Nigel Campbell, *China Strategies—The Inside Story*, University of Manchester University of Hong Kong, 1986.

⁴³Kelly Ho Shea, "Modernizing Flat Glass Production" *The China Business Review*, Volume 13, Number 3, May-June 1986.

⁴⁴Nigel Campbell, op. cit.

⁴⁵Ibid.

⁴⁶Sino-British Trade Review, January 1986.

plished by the private sector through commercial contracts. The Government provides information and some financing, part of which is subsidized, and helps create an environment conducive to doing business.

High-level British officials visit China regularly to make contacts, present British capabilities, and negotiate bilateral agreements. Queen Elizabeth toured China in October 1986 while a Sino-British trade and economic cooperation seminar met on the royal yacht. The seminar resulted in the signing of 13 agreements, memoranda, and letters of intent on cooperative projects, including a joint venture on a large steel plant and a major telecommunications project.⁴⁷

The Department of Trade and Industry (DTI) is the major British Government organization involved in export promotion. The regional branch is under the direction of the Assistant Secretary for China, Hong Kong, and Macao. Trade with Hong Kong is about three times that with China, but China probably gets more attention, in part because the trade is growing rapidly and the potential is so great.

The British Overseas Trade Board, a division of DTI composed of government and industry officials, provides market research and intelligence. Much of the information on China comes from the Sino-British Trade Council (SBTC), a semiprivate advisory group (one of 15 such groups) that plays a role somewhat akin to that of the National Council for U. S.-

China Trade. The SBTC is associated with The 48 Group of British Traders with China, which maintains offices in both London and Beijing and provides consulting services and contacts for trade in both directions.

These efforts have produced results, but perhaps much less than had been expected. Britain has several important advantages—the Hong Kong link, the English language, an excellent research and development system, and the distinction of being the first Western country to recognize the People's Republic of China Government—but these have not given Britain a notable head start. Germany has done much better, and Italy moved ahead in 1986.

Several factors suggest themselves to explain this indifferent record, and some of them may have relevance to the United States, also. Britain has not been strong at production, and Germany's success is at least partially due to its excellence in production machinery, which is at the top of China's list of needs. The United States has also lagged in the production of equipment such as machine tools and has not competed well in China. British Government-subsidized financing became significant only recently, as described below, while Italy's exports to China have benefitted from aggressive government financing. Germany's success despite a reluctance to subsidize financing shows that is not a requirement, but it helps. British industries also seem to be unaggressive and less innovative compared with those from other countries. A few are major world players, but Britain is more of a financial center than an industrial one.

⁴⁷FBIS, *China Daily Report*, Oct. 16, 1986.

EXPORT CONTROLS

The major countries supplying advanced technology to China today are all members of COCOM, the voluntary multilateral organization set up to coordinate controls on exports to the Soviet bloc. The goal of joint export-control efforts is to prevent access by the Soviet bloc to weapons and advanced technologies with military significance. COCOM mem-

bers have developed, however, quite different perspectives on and approaches to trade with the Soviet bloc, leading at times to controversies among them.⁴⁸

⁴⁸See OTA, *Technology and East-West Trade* (September 1979); OTA, *Western Technology and Soviet Energy Availability* (November 1981); OTA *Technology and East-West Trade: An Update* (May 1983).

Regulations on exports to China were significantly relaxed by COCOM in late 1985, as discussed more fully in chapter 8. COCOM member countries were authorized to approve certain exports to China of equipment and technology with notification to COCOM.⁴⁹ COCOM review is still required for more sophisticated dual-use technology, for military exports, and for nuclear exports. These changes appear to have been well received by COCOM members and by China. Earlier concerns about “differentiating” China in COCOM policy from Soviet bloc nations have apparently proven to be no obstacle.

Nevertheless, for several reasons, industry in particular remains uncertain about the rationale for multilateral export controls, the functioning of the COCOM system, and the implementation of domestic export administration systems by COCOM countries. Company representatives have at times contended that other participants (firms and governments) are not following the same game rules.

Because the technical underpinnings of the COCOM list are not made public for reasons of national security, and because COCOM procedures and discussions are treated as confidential, there is room for misunderstanding. Furthermore, perceptions tend to lag behind the realities of change in export controls. Businessmen on visits to China see advanced technologies supplied by firms from other countries as signs of COCOM rule-breaking, but such charges are often mistaken. It should be emphasized that these complaints are in no way unique to U.S. exporters; European and Japanese businessmen also question whether the United States uses COCOM to its own advantage.⁵⁰ Competition for sales in the Chi-

nese market thus raises collective problems for Western suppliers.

Several situations could lead to misunderstandings about export controls. The clearest case, from a Western alliance perspective, would be if a COCOM member government willfully circumvented the COCOM rules or “looked the other way” while domestic firms sold to dummy companies that were conduits for illegal trade. But while charges of “cheating” are often heard, OTA has not been able to document such cases.

Another complaint centers on differences in the approaches to export controls taken by various supplier countries. Because the major supplier countries devote different resources to export control, process licenses at different rates, and have different legal bases and diverging traditions of government-business relations, uncertainty abounds concerning the actual workings of the systems of the other countries.

Still another problem stems from different interpretations of the technicalities of export-control specifications for particular products. The concept of “national discretion” is built into the system. Some governments appear to be more willing than others—the United States, in particular—to make more liberal interpretations that are helpful to national firms. Since early 1984, U.S. semiconductor equipment manufacturing firms have complained that U.S. export regulations prohibit them from exporting single-wafer plasma etching systems to China, although other COCOM countries have approved such exports. They have similarly complained that the United States denied exhibition licenses for digital optical transmitters and receivers to U.S. firms, while Japanese firms were able to show similar products at a Shanghai trade show in 1986.⁵¹ Differences in interpretation of regulations may relate to the fact that some COCOM countries have published the changes in COCOM

⁴⁹COCOM member countries now also approve re-exports to China of such equipment and technologies. In such cases, notification to COCOM is made.

⁵⁰This type of complaint occurred, for example, when the United States instituted a liberalized export policy for China in 1983. At that time, certain types of exports (in the “green zone”) were identified as likely to be approved. For those exports (including “green zone” exports) requiring COCOM review, the United States continued to submit cases to COCOM for approval. Others suppliers charged, however, that U.S. export controls for China were loosened prior to COCOM policy changes, giving U.S. firms some advantage.

⁵¹American Electronics Association, Case Study Report: American Electronics Association Export Control Task Force, Mar. 12, 1987, pp. 18-19.

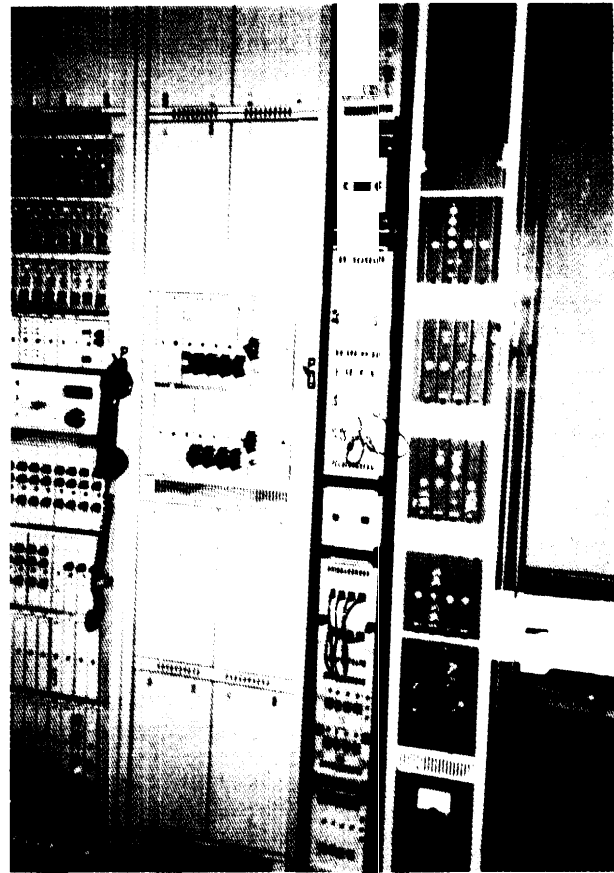
policy concerning exports to China; other countries have not.

To the frustrated businessman, all of these problems stem from differing approaches to export controls. Only the first case constitutes a clear breach of joint understanding among COCOM governments, which would be legitimate cause for multilateral concern. However, other types of differences also cause resentment and misunderstanding even though they are primarily domestic issues. From a public policy perspective, however, it is critical to distinguish these differences in approaches to export controls. Recent changes in COCOM policy on exports to China appear to have brought the policies of these countries closer together, but significant differences in approaches remain. Improved understanding of export-control systems of other COCOM countries could help clarify the complaints that exporters sometimes make about U.S. policymaking.

Japan

The basis of Japan's export control system is the Foreign Exchange and Foreign Trade Control Law. Japanese export controls cover dual-use technologies, ordnance, and atomic materials. The exporter is required to obtain permission from MITI when exporting these items, particularly to Communist bloc countries. MITI has made public a list of strategic goods covered by export controls and an outline of the approval system for exports to various countries.⁶² A Cabinet order stipulates that MITI permission be required for transfers of technology deemed by MITI to present possible hindrances to the maintenance of international peace and security. According to the law, punishment for exporters (including corporations) who ship strategic goods without proper permission is imprisonment for not more than 3 years and/or a fine of not more than 1 million yen (about \$7,000 at an exchange rate of 145 yen to the U.S. dollar).

⁶²Nihon Boeki News, *Bueki Tetsuzuki Zenkai*, vol. 30, 1987, p. 163ff.



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An optical fiber waveguide technical equipment bay with 120 channels in Wuhan. China has imported optical fiber technology from several countries and is rapidly gaining proficiency. U.S. companies have been refused export licenses.

Several MITI offices are involved in reviewing exports. Most exports are first reviewed by the Machinery and Information Industries Bureau, where preliminary approval is given. In practice, most firms consult with MITI routinely and informally before drawing up a formal contract. The formal review often takes place quite quickly, since preliminary discussions have already taken place and any obvious problems have been worked out. The second-stage review is handled by the Export Division of the Trade Bureau, where the legal aspects of the contract are considered and a detailed payment schedule reviewed. MITI's Security Export Control Office reviews appli-

cations for export of strategic goods and technologies to the Soviet bloc and China.

There is evidence that Japan has placed more stress on export controls in recent years, augmenting MITI capabilities in this area. In particular, Japan has identified firms illegally exporting to the Soviet Union and published their names and imposed orders to stop exports.⁵³ In May 1987, the government of Japan ordered Toshiba Machine Co. and C. Itoh to suspend sales to the communist bloc after it was discovered that these firms had made unauthorized sales of militarily critical machine tools to the Soviet Union.⁵⁴

MITI has recently established guidelines to regulate Japanese exhibits at trade fairs in Communist bloc countries. Also indicative of growing commitment among Japan's leadership to restrict Soviet access to sensitive information is LDP sponsorship of a bill that imposes stiff penalties on disclosure of official secrets, despite opposition from other parties that fear the effect could be to limit freedom of speech.⁵⁵

Soon after COCOM controls were relaxed, there were reports of new high-technology sales of semiconductor manufacturing equipment and large-scale computer systems by Japanese firms to China. The speed with which these exports were approved by the Japanese Government indicates a general predisposition to support high-technology transfers that are not clearly among the items controlled by COCOM. However, Japan is unlikely to participate in military sales.

While Japan's export approval process generally operates quite rapidly, a few cases involving exports to China have met with some delay and controversy. In one case, the export

of VCR manufacturing equipment was permitted, but with modifications that protected the sensitive technologies.⁵⁶ In another case, it was reported that MITI forced changes in a training program for computer software because part of the course related to militarily useful computer graphics.⁵⁷

The Japanese Government, if not some private Japanese companies and individuals, appears to have supported COCOM controls.⁵⁸ OTA was unable to obtain evidence of instances where the Japanese Government knowingly evaded COCOM review of items on the control lists. Because of its peace constitution, Japan has prohibited most exports of military equipment and technology.⁵⁹

Japan's approach to exports and extraterritoriality is more similar to that of Western Europe than the United States. Japan takes a negative view toward extraterritorial applications of laws. The Japanese Government requires documentation when strategic goods or technologies are exported, but no attempt is made to ascertain whether retransfer has occurred.⁶⁰ In light of the large volume of trade within Asia, strategic goods and technologies could thus be diverted through third countries.

Europe

European countries have historically been more export dependent than the United States, and some governments have attempted to expand economic interactions with the Soviet bloc even during periods when political relations were cold. Economic sanctions against the Soviet Union, as proposed by the United States from time to time, have often been

⁵³See *Nihon Keizai Shimbun*, Dec. 27, 1984, for a report of an interception by Japanese customs of an export of a sonar system to the Soviet Union.

⁵⁴See "Firms Barred from Exporting to Communist Nations," *Kyodo*, May 15, 1987, FBIS, *Daily Report: Asia & the Pacific*, May 19, 1987, p. C2.

⁵⁵Such a bill was submitted to the Diet in 1985, but was abandoned after opposition parties entered into prolonged debate. In November 1986 a special LDP committee was considering whether to resubmit the bill.

⁵⁶The *Yomiuri Shimbun* reported on Mar. 28, 1987 that MITI had issued warnings to firms involved in illegal exports of electronic equipment to China.

⁵⁷See *Nihon Keizai Shimbun*, Jan. 26, 1985, p. 7.

⁵⁸See "Japanese Held for Selling U.S. Fighter Secrets," *Financial Times* (London) May 21, 1987, p. 3.

⁵⁹The United States and Japan have, however, recently worked out an arrangement to permit the export of such technology to the United States. See U.S. Department of Defense, *Japanese Military Technology: Procedures for Transfers to the United States*, Feb. 1986.

⁶⁰Import certificate from the foreign government and delivery verification.

viewed by Europeans as naive and futile, however sympathetic they may be to the motivation. Efforts to withhold gas pipeline technology in 1981 were rejected even by the closest U.S. allies. There is, nevertheless, a general feeling by major European governments that COCOM has proved a valuable tool for thwarting the Soviet bloc's acquisition of advanced Western technology because COCOM focuses on an agreed upon list of technologies with clear security implications for all members.

Europe's export policies have evolved in keeping with this philosophy. Exports will be approved unless there is a good reason to refuse them. This evolution has led to a recognition that China can be treated quite differently from the Soviet Union without affecting international security. China is technologically far behind the Soviet Union and so could not achieve the same strategic advantage from sophisticated imports; it will have limited ability to threaten even its neighbors for the next few decades. Furthermore, unlike Eastern European countries, China is quite unlikely to pass technology on to the Soviet Union.

When OTA first studied this topic in 1979, the potential for differentiation was recognized, but concern over repercussions from the Soviet Union prevented the implementation of preferential treatment.⁶¹ However, distinguishing China from the Soviet bloc has actually proceeded rapidly. In recent months there has been informal talk in Europe of removing exports to China from the COCOM process. The prevailing sense is that, in general, strengthening China is good for international security because China will counterbalance the Soviet Union, but also that caution should still be taken about advanced technologies with strategic implications.

In all the countries studied here, the export control system is organized to respond quickly, and relations between business and government appear to be less confrontational than in the United States. Each country has a list of technologies, evidently similar or identical

to the COCOM list. As mentioned earlier, however, different countries have adopted different approaches to publishing changes to export policies stemming from the 1985 COCOM agreement.

Companies in *Germany* are free to export except under certain conditions; for example, when the technology is controlled by COCOM. Industry is well aware of which technologies are controlled. When a company has such a contract, it applies for an export license. The Foreign Office (Auswärtiges Amt) and the Economics Ministry (Bundesministerium für Wirtschaft) review the applications and decide if the license has to go to COCOM. If not, the application is completed in a few weeks. German companies can sue the German government if they are not satisfied that a denial was based on a threat to national security.⁶²

France has a somewhat more complicated system, perhaps partly because France exports large quantities of weapons and Germany does not. Control is facilitated by the close relationship between government and industry. Export applications are submitted by industry to the Customs Office. If the application involves sensitive technology, it is sent to the Ministry of External Relations and the Ministry of Defense. Some of the criteria used for evaluating an application are:

1. the impact on national security,
2. the impact on international undertakings, such as COCOM,
3. nuclear proliferation, and
4. private-sector concerns, including the impact on industry.

The Directorate of External Economic Relations may play a more promotional role in the considerations. An interministerial committee has been established to assess overall commercial and strategic concerns. Discussions are frequent, perhaps several times a week.

The United Kingdom uses a system similar to the German approach in that companies are

⁶¹OTA, Technology and East-West Trade, November 1979.

⁶²For a more detailed description of European countries export control practices, see OTA, Technology and East-West Trade, November 1979.

free to export unless told otherwise. License applications are handled by the Department of Trade and Industry. An interdepartmental committee, including the Ministry of Defense and the Foreign and Commonwealth Office, discusses the implications of each case of sensitive technology. The committee usually reaches a consensus quickly, but occasionally sends the case to the ministers for resolution. The prevailing philosophy appears to be that exports are good except for a relatively few cases where the reasons to hold back are compelling. Technology transfer to China rarely involves such reasons, though Britain is not prepared to send large quantities of military technology.

In general, these systems are more collegial and less legalistic than in the United States, and are more attuned to approving exports. These differences may result in approval of some exports that would be denied in the United States, but OTA has not been able to document any pattern of major differences in the level of control. Each country (and especially its exporting community) appears to be somewhat suspicious of the others, especially about the interpretations of technical stipulations on exports and the tactics used at COCOM. These suspicions apply to the United States, as well.

AID AND EXPORT FINANCING

Countries supplying technology to China have also developed different approaches to promoting trade and technology transfer. Some countries, such as Japan, have established extensive aid and financing programs, whereas the United States has no aid program and only limited official financing.

These diverging approaches stem from different views about the proper role of government in trade and technology transfer. While the general predilection in the United States has been to limit the role of government in technology transfer, except where national security is at stake, in practice many reasons have been used to justify positive intervention. Strengthening the economies of developing countries friendly to the United States and promoting U.S. commercial interests are among those that have been applied to support large aid programs in countries like Egypt or export financing for sales of U.S. aircraft overseas.

Although some of the major suppliers appear more willing to use aid and financing, these policies are the subjects of ongoing debate and revision. There is a good deal of variation in the mechanisms used. Britain, for example, has recently inaugurated a large financing program for China. Science and tech-

nology and student exchanges have been prominent in U.S. Government policies. As with export controls, however, differences in promotional policies are much more differences of degree than kind.

It is difficult to evaluate the commercial advantage accruing from promotional programs. However, in some cases large aid or financing programs have opened the door for national firms to contracts that probably would not have been possible otherwise.

Still, the interplay of commerce and aid raises some knotty questions. There is a danger that the supplier governments, by providing extensive financial support or "tied" aid programs, up the ante for participation by all foreign firms. The Organization for Economic Cooperation and Development (OECD) countries have attempted to deal with the problem by setting guidelines for export credits. Such agreements, however, are hardly all-encompassing. The United States, in particular, has pressed for a higher grant element in mixed credits that combine official export financing with overseas development assistance.⁶³ Given

⁶³In 1986 there were numerous reports of disagreements among the OECD countries on mixed credits. See "Aid, Trade and Subsidies," *Financial Times* (London), May 3, 1986, p. 16.

the severe budgetary constraints in the United States, large-scale financing programs abroad (especially those involving mixed credits) are viewed with concern.

Development Assistance

Japan

Since 1979 Japan has supplied more than \$1.5 billion of official development assistance (ODA) to China, 52 percent of the aid from all sources, including multilateral organizations.⁶⁴ The International Development Association of the World Bank was the second largest source of aid (14.6 percent); the third was West Germany (13.2 percent).⁶⁵ The United States provides no bilateral ODA to China.

By 1982 China had become the number-one recipient of Japanese ODA. In 1985 Japan provided China with \$388 million of ODA (on a net disbursement basis). Japan's large aid program in China reflects not only the Japanese Government's high priority on aid to China, but also the growth of its aid program worldwide. By 1984 Japan took second place behind the United States among the major development assistance countries (DACs).⁶⁶ Japanese leaders pledged to double ODA again during the next 7 years. In 1985, however, Japan's ODA fell by 12.1 percent from the previous year.⁶⁷

The level of ODA, however, continues to be a point of some dispute among government agencies, one fought out in annual budget cycles. The four key agencies are the Ministries of Foreign Affairs (MOFA) and Finance, MITI,

⁶⁴“Chugoku ni tai suru Gaikoku Enjo no Doko” [Trends in Foreign Aid to China], *Kikin Chosa Kiho* [The OECF Research Quarterly], No. 49, June 1986, p. 185. (Based on OECD data.)

⁶⁵ Between late 1981 and early 1985 the World Bank loaned China more than \$2.3 billion (\$1.3 from International Bank for Reconstruction and Development and \$1.0 from International Development Agency). See *Nihon Kogyo Ginko* [Industrial Bank of Japan], *Saikin no Chugoku no Seiji Keizai Doko* [Recent Political and Economic Trends in China], Oct. 24, 1984, p. 33.

⁶⁶Development assistance countries, as designated by the OECD.

⁶⁷One reason for the decline was that committed loan funds were not used in many cases because recipient nations were unable to provide matching funding. The decline in Japanese aid during 1985 probably pushed Japan back into third place behind France (and the United States) in terms of aid contributions.

and the Economic Planning Agency (EPA). The Overseas Economic Cooperation Fund (OECF), which administers loans, reports to EPA, whereas the Japan International Cooperation Agency (JICA), which provides grants and technical assistance, is under the jurisdiction of MOFA. The Export-Import Bank also plays a role in that it provides loans to Chinese and Japanese corporations involved in development projects. Not surprisingly, the cost-conscious Ministry of Finance tries to keep a lid on expenditures, while MOFA advocates a stronger aid program.⁶⁸

Japan increased technical assistance by 14 percent. Multilateral aid increased, but the grant element fell slightly and remained below the OECD goal. The OECF provided \$308 million in direct loans for projects in China.⁶⁹ Loans for commodity purchases made up about \$133 million of this total. Between 1981 and 1984 more than \$522 million of such commodity loans were provided by OECF for China.⁷⁰ These loans have generally been provided at 3 percent interest, with repayment over 30 years. Such commodity loans supported purchases of equipment at the Baoshan steel plant and the Daqing petrochemical refinery. The purpose of commodity loans is to assist countries facing severe balance-of-payments imbalances or shortages of hard currency.

The bulk of Japan's official direct loans to China, however, were in the form of project loans to support development of economic and social infrastructure, such as telecommunications and transportation systems. These loans cover procurement of goods and services for specific projects. Between 1980 and late 1983, Japan provided support for six large projects in the first round of project aid. Total funding

⁶⁸In late 1985, the Ministry of Finance argued that Japan's ODA should be reduced by the same margin as the yen's appreciation against the dollar. See *Asahi Evening News*, Dec. 5, 1985.

⁶⁹Kaigai Keizai Kyoryoku Kikin [OECF], *Gyomu Hokokusho* [Administrative Report], Mar. 31, 1985, p. 10, calculated at \$US1 = 231.5 yen.

⁷⁰Calculated at \$US1 = 249 yen (1982 rate). See Kaigai Kyoryoku Kikin [OECF], *Chugoku En Shakkin no Gaiyo* [Summary of Yen Loans for China], November 1984.

for these projects came to over \$800 million. The projects include three: to develop railroads, a hydroelectric plant, and two ports. Under the second round of projects, Japan has pledged to provide another \$2 billion to support seven large projects. Among these is one to develop telecommunications in Shanghai and other cities.

In principle, Japan's loans for Chinese projects are "untied." That is, firms from other countries are eligible for participation in the projects. Since the early 1980s all announcements for bidding on projects supported by Japanese aid in China have been open in this sense.⁷¹ However, in the early 1980s, significant portions of OECF-supported projects were tied, although in recent years the percentage of tied-aid funding has reportedly dropped to 5 percent. In earlier years, Japanese firms probably won about 60 percent of the goods and services for projects supported by OECF in China. There have been cases however, where U.S. firms have supplied equipment for projects in China that were supported by official Japanese financing.⁷² In late 1986, MITI officials were suggesting the expansion of 'export-promoting' aid to Asia, a plan that some observers suspected would help primarily Japan's own consultants, builders, and suppliers.⁷³

The major thrust of Japan's aid to China has thus been large projects designed to build infrastructure. Generally speaking, these are viewed with pride as examples of successful cooperation. The projects are selected in a process that involves the Chinese first providing a ranked list and Japan responding.⁷⁴ There has been at least one case (a dam project) where problems developed that resulted in cancella-

tion, and there have been problems associated with high costs arising from local content and employment requirements. The overall evaluation, from the Japanese side, has been positive, but a report prepared by OECF in 1985 noted bottlenecks in Chinese economic development and called on the government of Japan to improve the efficiency of aid projects in China by focusing on priority projects.⁷⁵

Technical cooperation remains a small part of overall ODA but is growing in importance.⁷⁶ These programs are carried out by JICA. More than 200 Chinese have been trained by JICA programs in Japan for up to 1 year, and Japanese experts have been dispatched to China to provide technical assistance. In some cases, materials and equipment are also provided.

An agreement made in late 1985 to send young volunteers aged 20-30 to China for 2-year periods indicates the evolution and expansion of such projects. A "silver volunteers' association has also been set up to support the dispatch of retired Japanese engineers.

Japanese aid officials see "project-type" technical cooperation as their most effective vehicle and have slated these programs for expansion in China. Currently, such programs include a hospital, family planning education, an enterprise management center, a wood utilization project, and a food research center. New starts include a telecommunications training program in Beijing, a fish research center in Shanghai, and an agricultural research center in Mongolia.

Japanese cooperation in China's factory renovation programs has been comparatively extensive, and JICA officials have established ties with the State Economic Commission and gained good knowledge of the status of China's industries in rural areas. However, JICA provides only surveys, and confines its activities to projects that involve transfer of standardized technologies. The Japanese Government thus explicitly leaves transfer of "new" technologies to the private sector. During 1985,

⁷¹Ministry of International Trade & Industry, *Keizai Kyoryoku no Genjo to Mondaiten* [The Status and Problems Related to Economic Assistance], 1984. Only a portion of the commodity loans have been "LDC untied" -with participation limited to less developed countries (LDCs) and Japanese firms. See OECD, *Chugoku*, p. 7.

⁷²Discussion with U.S. Trade & Development Program, November 1986.

⁷³See Susumu Awanohara, "Meeting the Need," *Far Eastern Economic Review*, Nov. 6, 1986, p. 66.

⁷⁴The Japanese Government has upon occasion refused a project, such as a chemical plant.

⁷⁵Overseas Economic Cooperation Fund report, June 13, 1985.

⁷⁶In 1984 technical cooperation made up only about 3 percent of all ODA.

JICA survey projects in China included three steel plants, one piston factory, and an electric cable manufacturing factory, for a total of five.

Europe

Even collectively, European ODA has been far smaller than Japan's. Table 13 shows the total net ODA contributions of European countries and the subtotals of loans and grants.

European ODA to China increased rapidly from a low base in 1981, but future increases are likely to be more modest. Most European countries already contribute a substantially higher fraction of their national income to foreign aid than do either the United States or Japan, and their rate is not expected to rise greatly. Some, such as France and Britain, are particularly generous with their former colonies or countries, leaving less for others.

Germany is likely to remain the largest donor, in keeping with its position as the largest trader. In 1986 China is scheduled to receive approximately \$35 million in financial assistance and an additional \$20 million in technology.⁷ Typical German projects in China include pipemaking and building materials manufacturing. Other activities support feasibility studies and training.

Most bilateral aid is tied (informally, if not explicitly), or spent on goods and services from the donor country. Typically, 70 percent of the aid is delivered in goods and services, while the rest is spent in other countries. Thus, aid stimulates exports even when the main intent is humanitarian.

Other Types of Financing

Japan

The Japanese Government supports trade and technology transfer to China with official financing made available from the Export-Import (ExIm) Bank. The first loan agreement involving ExIm credits was signed in 1979 and provided \$2 billion. But China was forced to

scale back its development plans in the early 1980s. In 1981 a financial aid package was arranged that included \$430 million in suppliers credit guaranteed by the ExIm Bank, as well as commodity loans (through OECF) totaling \$560 million and commercial loans of \$30 million. More recently, in 1984 the ExIm Bank agreed to provide \$2.4 billion to finance oil and coal development projects. The ExIm Bank has also provided considerable funding to assist small Chinese businesses to import small-scale machinery and equipment from Japan.⁷⁸

Official export financing has contributed significantly to the growth of Sino-Japanese trade. Suppliers' credits are one form that this financing takes. In 1984, for example, the ExIm Bank provided \$85 million in suppliers' credits for the export of technical services required for the Baoshan Steel Works. In this case, the credits were provided directly to the Japanese companies supplying the technology and training programs. In another example, the bank was reported to have provided \$300 million for the Japan-China Oil Development Company for the Bohai project.⁷⁹

The ExIm Bank gives no particular preference to projects involving technology transfer.⁸⁰ Rather, the goal of bank officials is to serve the political ends of Japan's foreign policy by ensuring that those official projects selected have sufficient funding. Therefore, while technology transfer is not an explicit goal, ExIm funding has importantly supported it. In the early 1980s ExIm funding was crucial to the financing of some projects even as overall funding was scaled back.

Private sources are also providing considerable financing. In 1980a consortium of Japanese banks offered \$8 billion in credits. In early 1985 the Bank of Tokyo and related Japanese private banks signed a \$2 billion loan

⁷⁸For an excellent review of Japanese financing for projects in China, see Hong K. Kim and Ricard K. Nanto, "Emerging Patterns of Sino-Japanese Cooperation," *Journal of Northeast Asian Studies*, Fall 1985.

⁷⁹Tokyo Grants Soft Loan for China Oil Project, *Financial Times* (London), Jan. 15, 1986.

⁸⁰Interview with Export-Import Bank Of Japan, November 1985.

⁷China Business & Trade, Vol. VII, Issue 23, June 9, 1986.

Table 13.—European Official Development Assistance to China (million U.S. dollars)

| | Total ODA net | | | Loans net | | | Grants | | | Tech. coop grants | | |
|--------------------------|---------------|-------|-------|-----------|-------|-------|--------|------|------|-------------------|------|------|
| | 1983 | 1984 | 1985 | 1983 | 1984 | 1985 | 1983 | 1984 | 1985 | 1983 | 1984 | 1985 |
| Belgium | 6.0 | 5.6 | 6.8 | 5.9 | 5.2 | 6.1 | 0.2 | 0.4 | 0.8 | 0.1 | 0.3 | 0.4 |
| Denmark | 5.2 | 2.2 | 8.3 | 4.3 | 1.5 | 6.7 | 0.9 | 0.6 | 1.6 | 0.9 | 0.6 | 0.7 |
| France | 4.7 | 6.0 | 6.3 | — | — | — | 4.7 | 6.0 | 6.3 | 4.7 | 6.0 | 6.3 |
| Germany. | 96.7 | 57.5 | 97.6 | 84.1 | 41.5 | 77.0 | 12.6 | 16.0 | 20.6 | 12.6 | 16.0 | 20.6 |
| Italy | 11.1 | 9.9 | 14.4 | 1.0 | 3.9 | 3.2 | 10.2 | 6.1 | 11.2 | 3.0 | 6.1 | 6.0 |
| Norway | 5.8 | 11.9 | 3.6 | — | — | — | 5.8 | 11.9 | 3.6 | 0.9 | 0.7 | 0.6 |
| Sweden | 0.6 | 0.8 | 11.4 | — | — | — | 0.6 | 0.8 | 11.4 | 0.2 | 0.8 | 1.5 |
| United Kingdom | 0.3 | 0.8 | 1.6 | — | — | — | 0.3 | 0.8 | 1.6 | 0.3 | 0.8 | 1.6 |
| Other. | 0.4 | 0.3 | 3.1 | — | — | 2.1 | 1.0 | 1.1 | 0.9 | 0.6 | 0.9 | 0.6 |
| Japan | 350.2 | 389.4 | 387.9 | 299.1 | 347.9 | 345.2 | 51.1 | 41.5 | 42.7 | 20.5 | 27.3 | 31.2 |

SOURCE: Geographical Distribution of Financial Flows to Developing Countries OECD 1987

agreement. The loans are to be repaid over a 10-year period, at interest rates of 0.25 to 0.375 percent over the London Inter-Bank rate. In 1985 it was reported that private Japanese banks had expanded their credit lines to China to \$2.5 billion, from \$1.7 billion in 1984. The Industrial Bank of Japan (IBJ), for example, had credits amounting to \$250 million in 1985, while its Hong Kong-based subsidiary had another \$150 million.⁸¹ In 1985 three Chinese organizations were reported to have raised more than 140 billion yen on Tokyo capital markets by issuing bonds.

In addition, China has concluded hundreds of compensation trade agreements with firms from Japan, the United States, and West Germany, among others. In the late summer of 1986, it was reported that Japan's trading houses anticipated that they would have to accept Chinese goods in return for about 30 percent of all exports, and that by 1987 such trade would reach more than 50 percent of total exports.⁸⁴ The rise of such indirect financing can

be explained by scarce foreign exchange in China, the emergence of regional borrowers in China, and limited foreign response to appeals for direct investment. Private Japanese banks are adopting new approaches in China. At least two leasing companies have been formed as joint ventures, with Japanese banks participating.⁸⁵

The interrelationship of aid and trade is complex and controversial. At the heart of the controversy is a tension between the principle that aid be primarily motivated by altruism and the obvious commercial spinoffs that often accrue to firms from donor countries. Large OECF-financed Chinese projects, for example, are generally viewed as Japanese projects in China, despite their official untied status.

Differences in perspective are apparent both within Japan and between the major summit countries. In late 1985 MITI and MOFA disagreed over the use of mixed credits for a coal-fired thermal power generation project in Tianjin. MITI favored using mixed credits to support the bid by C. Itoh and Hitachi to win an international tender against foreign firms. MOFA, however, objected on the grounds that an annual ceiling for yen loans to China had already been fixed and that the use of such loans would likely stimulate foreign criticism. MOFA won this interagency dispute, but the two ministries continue to disagree on this issue.

⁸¹ "Japanese Financial Institutions Increase Credit Lines to China," *Japan Economic Journal*, May 14, 1985.

⁸² An agreement between Japan and China permits buyers of Chinese bonds issued in Tokyo to claim a tax credit of 10 percent of the value of the coupon rate. China does not tax the income paid to subscribers of such bonds. Therefore, the effect is to raise by 10 percent the real value. See Charles Smith, "Borrowers of Last Resort," *Far Eastern Economic Review*, Apr. 24, 1986, p. 79.

⁸³ See U.S. International Trade Commission, *Assessment of the Effects of Barter and Countertrade Transactions on U.S. Industries*, October 1985, pp. 47, 129.

⁸⁴ In a growing number of cases third country barter is also involved. The same article reported that a major Japanese trading house began purchases of Indonesian plywood for reshipment to China, and was reportedly paid in raincoats. See Bruce Roscoe, "Demonetised Deals," *Far Eastern Economic Review*, Aug. 28, 1986, p. 48.

⁸⁵ The Daiichi Kangyo Bank expanded its control of stock and management of the Shejiang First Bank, a leading Hong Kong bank with Shanghai participation.

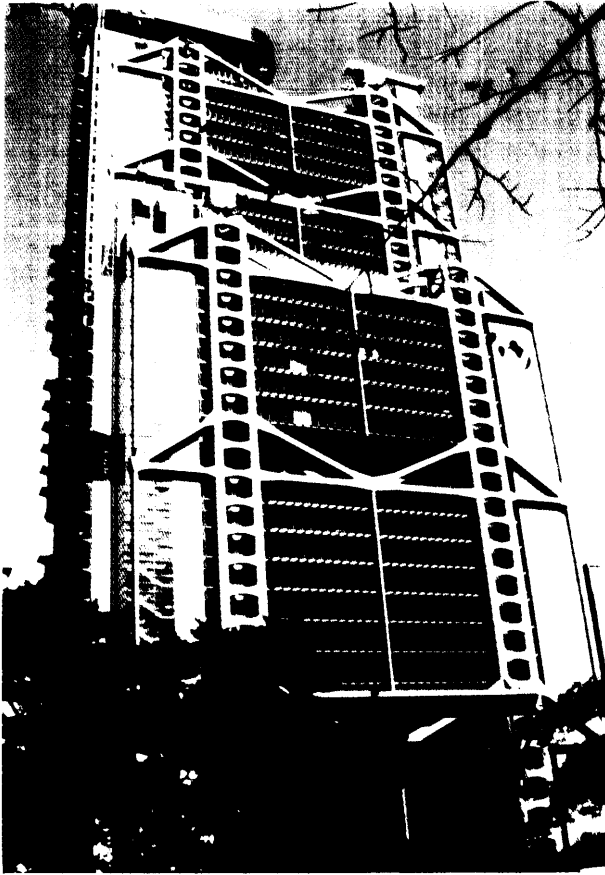


Photo credit E/c Basques

Hong Kong headquarters for the Hong Kong and Shanghai Banking Corp., an economic powerhouse in the region. This building, recently completed, cost over \$1 billion to build.

Europe

All major European countries offer official financing but differ greatly in the degree of involvement and in the use of subsidies. In Germany most financing has been done privately, but the Kreditanstalt für Wiederaufbau supplies long-term export credits and aid for developing countries.⁸⁶ Typical German export-financing interest rates are at or above the negotiated OECD rate. Germany has opposed the use of subsidies for exports but has also been known to resort to them in highly competitive situations.

⁸⁶For a more complete description of all these financing systems see: OTA, "Technology Transfer to The Middle East," September 1984, or "Report to the U.S. Congress on Export Credit Competition and the Export-Import Bank of the United States," Export-Import Bank, September 1985.

France has been much more aggressive in the use of official financing. Virtually any export is eligible for official financing and, frequently, subsidies. Often, some of the money is provided by a commercial bank at prevailing rates and the rest (50 to 70 percent) by the Banque Française du Commerce Extérieur (BFCE) or the Banque de France at a subsidized rate of 6 percent. In 1979 BFCE offered one of the first credit lines to China, over \$3 billion. At that time, however, China was very reluctant to assume debt, and only 6 percent was used.⁸⁷ France is the initiator and the greatest user of mixed credits.

Great Britain also has a comprehensive program to provide export credits, but it makes greater use of commercial banks and has reduced the prevalence of subsidies. The Exports Credit Guarantee Department of the Ministry of Trade and Industry is the major contributor for both financing and investment insurance protection. Loans are generally at the OECD rate, but in recent years the market rate has been higher, as in Germany. Thus a subsidy is applied to the difference for the commercial bank. The turbine-generators for the Daya Bay nuclear plant will be financed with 200 million pounds from a consortium of banks. Britain has a mixed credit program under the Overseas Development Administration, even though Britain officially opposes the concept.

Many European commercial banks have established branches in China in hopes of increasing business. Few of these hopes have been realized. Not only has borrowing grown slowly, but most foreign funds have been funneled through Hong Kong banks. However, Chinese policy on debt has been changing, and it appears likely that borrowing will be increased significantly, though not to the extent of other developing countries. A large fraction of this debt would have to be with commercial banks, since official financing is limited.

China is also starting to raise money by selling bonds. In 1986 the Bank of China issued \$200 million Eurodollar floating-rate bonds through a German bank syndicate. The Bank

⁸⁷Dennis Phillips, "Mixed Credits Key to Success," China Trade Report, June 1985.

of England had opposed the sale in Britain because China was still in default on prorevolutionary bonds issued in London.

The Mixed Credit Controversy

Subsidized financing—soft loans—has been used for years. Mixed credit financing, the blending of foreign aid and official export credit, has been used by many European countries and Japan to support their exports to China. The high unemployment rate in most European countries has been a strong incentive to seek means to promote exports.

The reported use of mixed credits increased in 1982 to \$4.6 billion worldwide,⁸⁸ a small fraction of both total aid and financing. Nevertheless, the potential that mixed credit has for distorting economic decisionmaking is considerable (developmental projects could be ranked on the basis of commercial benefits to the donor nation), and the appearance of receiving discounts may lead to rapidly increasing demand by recipients.

China has pressed Western governments to use soft financing, and mixed credits are a convenient way to comply.⁸⁹ However, when almost all suppliers offer them, the result can be intense competition that benefits no one, not even recipients, since presumably the total amount of foreign aid may not rise appreciably. A total of 15 OECD countries now offer mixed credits.⁹⁰

France has been at the forefront in the use of mixed credits. France first used mixed credits (\$190 million) in China in 1985 to win a contract to refurbish China's telecommunications system, a project that could lead to a total of about \$400 million in telephone and telecommunications contracts.⁹¹ It also used mixed credits to sell three A310-200 airbuses

in 1985 for \$272 million.⁹² France argues that mixed credits help stretch foreign aid, especially in countries that cannot afford to fund projects commercially.⁹³

Great Britain has pledged 300 million pounds in soft loans at 5 percent interest for Chinese trade.⁹⁴ Britain feels this program is necessary because of the increasing use of mixed credits by its competitors. Some of the first uses will be for a diesel engine plant and telecommunications projects. Belgium, Denmark, Sweden, and Italy have made loans at interest rates as low as zero percent. Italy has been one of the biggest users of mixed credits in China. Two projects are being financed from a combination of \$40 million in soft loans and a grant of \$10 million: the construction of a tractor plant by Fiat and a power transmission line.⁹⁵ Even West Germany has overcome its aversion and is subsidizing a loan of DM 140 million for the construction of several plants. In most cases, the subsidization for all these soft loans will be in the form of mixed credits, or the differences will be procedural more than substantive.

After prolonged disagreement, the OECD countries reached an agreement on mixed credits in March 1987. The new rules make it more expensive for countries to subsidize export credits by raising the minimum level of grant (concessional) financing allowed. The minimum permissible level of aid in a mixed credit will rise from 25 percent to 30 percent in July of 1987 and to 35 percent in July 1988. Minimum interest rates for commercial loans that benefit from mixed credits have also been modified to eliminate or reduce subsidies for certain groups of developing nations.⁹⁶

As discussed in chapter 8, the United States established a "war chest" that permits the U.S. Government to use such credits in cases where

⁸⁸OECD, "Twenty-five Years of Development Co-operation," 1985.

⁸⁹See Robert Thomson, "China in Bid to Set Up Steel Plant Venture," *Financial Times* (London), Apr. 24, 1986, p. 8.

⁹⁰Janet Robson, "Can America Win La Guerre?," *Euromoney*, March 1986.

⁹¹See David Housego, "France Paves Way for China Telecom Deal," *Financial Times* (London), Apr. 17, 1985, p. 1.

⁹²*China Business & Trade*, Apr. 23, 1985.

⁹³*Euromoney*, op. cit.

⁹⁴Christian Tyler, "UK Cheap Credit for China Proves Hard to Allocate," *Financial Times* (London), May 2, 1986.

⁹⁵*China Business & Trade*, June 23, 1985.

⁹⁶See "OECD Nations Ratify Agreement to Limit Use of Tied Aid in Subsidized Official Credits," *International Trade Reporter*, Mar. 18, 1987, p. 366.

other countries offer "predatory" financing. To date, however, the United States has not used mixed credits to support China trade. The OECD agreement may serve to set limits on mixed credit financing by the major supplier countries. In the past, it has been difficult to ascertain the actual extent of mixed credit financing, much less to evaluate the impacts on a country's export performance. The agreement addresses one type of export financing competition, but supplier countries remain free to provide high levels of aid funding or official

credits. Japan's projects indicate that even in the case where aid is "untied, domestic firms stand to benefit. Chinese officials have indicated their intention to seek more soft loans from foreign governments.⁹⁷ Therefore, linkages between aid and commerce are likely areas of competition among the major supplier countries doing business in China.

⁹⁷The *China Economic News* reported on Jan. 5, 1987 that Ministry of Foreign Economic Relations and Trade announced that China has recently borrowed soft loans from 15 developed countries and had put to use loans totalling \$5 billion in 1986.

MULTILATERAL POLICY CHALLENGES

Large technology transfer projects to China often involve firms from a number of different countries. The requirements of large projects for finance and specialized technology make technology transfer increasingly a multilateral effort. There are thus opportunities for participation by a number of supplier countries with somewhat different approaches to technology transfer.

In the future, however, the multilateral nature of technology transfer to China may also pose some policy challenges. If China's economy is to develop, exports will increase. A pending issue is whether the supplier countries will be equally willing to permit imports from China, or whether protectionist measures will be taken in some cases.

Another set of questions concerns the strategic dimensions of high-technology trade in the Pacific. As Singapore and other third countries play a growing role (along with China), it maybe more important to revise and extend the system of multilateral export controls to ensure their effectiveness in slowing the transfer of technologies with military significance to the Soviet bloc.

The challenge of the future will be to encourage China's smooth integration into the Asian and global marketplace. This will occur in the context of China's entry into multilateral institutions such as the Asian Development



Photo credit A/ice Davenport, and The China Business Review

The Nanjing Construction Machinery Plant has contracted with a Swedish firm to assemble these drilling and boring machines in China, using a mix of Chinese and foreign parts.

Bank and the General Agreement on Tariffs and Trade. Each such step brings with it new policy challenges for the Western countries, since there will be important implications for global trade patterns and political as well as economic effects on other Asian countries.

Growing economic interdependence between the developed and the developing countries underscores the critical need to promote economic growth in the developing world markets. Increasingly, this task requires international cooperation, with Japan taking on a growing

role as a capital-rich country. Indicative of these changes was the International Monetary Fund's announcement of its first loan of about \$700 million to China in late 1986. While the

major Western suppliers will continue to compete for the Chinese market, they may also have to cooperate in certain areas in order to promote China's full economic integration.