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China: Reassessing the Role of Foreign Technology [redacted]

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SUMMARY

After several years of rapidly--and haphazardly--importing Western technology, Beijing is reassessing the role of such technology in China's industrial modernization. Growing concerns about costs, ineffective use, and disruptions in some fledgling industries have led to closer scrutiny and tighter controls over the acquisition of both equipment and know-how. These changes will probably, over time, strengthen Chinese industrial capabilities and export competitiveness. Although Beijing will be more selective in importing technology, market opportunities remain bright in some sectors. [redacted]

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_____ This memorandum was prepared by [redacted] Office of East Asian Analysis. Information available as of 8 May 1987 was used in its preparation. Comments and queries are welcome and may be directed to the Chief, Trade and Technology Branch, China Division, OEA [redacted]

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Emerging Problems

Three concerns prompted Beijing to reassess the role of foreign technology in China's modernization:

- **The decline of China's foreign exchange holdings.** Duplicate and unnecessary technology imports contributed to the dramatic drop in China's foreign exchange holdings from \$17 billion in December 1984 to \$10.5 billion in December 1986. According to Chinese press reports, Chinese traders, for example, imported more than a hundred color television production lines and dozens of washing machine and refrigerator assembly lines. Many of these deals committed China to massive expenditures of foreign exchange well into the future in order to import the components needed for assembly.
- **Disappointing results from imported equipment.** Widely publicized Chinese reports last year indicated that only a fraction of the imported equipment was being used effectively--even in priority areas such as computers, microelectronics, and scientific instrumentation.
- **The harm to infant Chinese industries.** Many factories are strapped because their products cannot compete with lower priced, higher quality imported goods, while--at the same time--purchases of duplicate production lines have created additional surplus production capacity. The Chinese press has also criticized the fact that many of the foreign-equipped production lines have kept China dependent on imported components. [REDACTED]

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New Initiatives

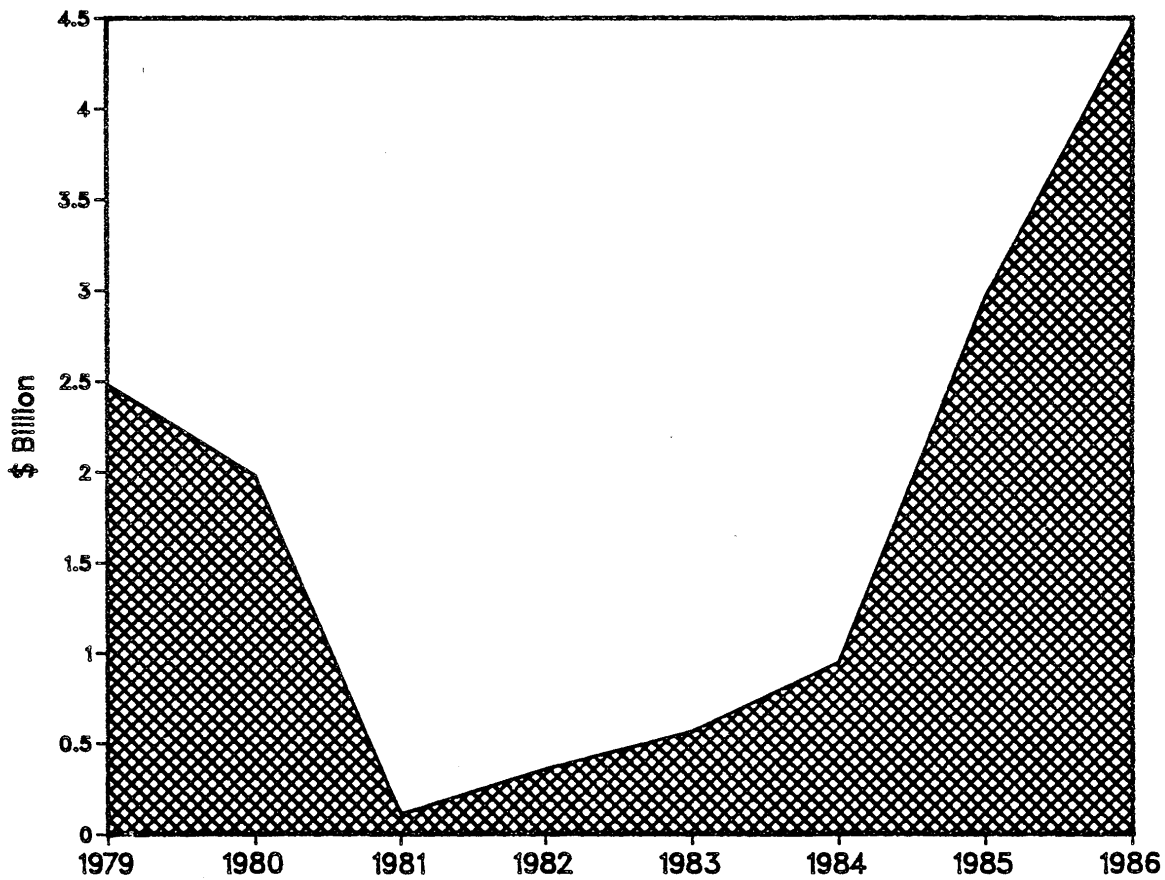
To correct these problems, Beijing aims not to curb total expenditures on foreign technology, but rather to reduce unnecessary purchases and find ways to increase the benefits from the technology it must import (see figure 1). Beijing still believes that foreign technology, if put to good use, provides a cost-effective shortcut to industrial and technological advancement. China also views foreign technology as vital to its competitiveness in export markets, as well as to its goal of eventually substituting domestic products for imports. [REDACTED]

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Beijing seeks policy solutions that are less restrictive than the legislation adopted by Brazil and India to protect their infant electronics industries--yet more stringent than the policies of Taiwan and South Korea, which have nearly eliminated government controls over technology acquisition to speed industrial development and export growth.

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Figure 1
China: Technology Imports by Central Authorities,
1979-86*



* Data from China's Ministry of Foreign Economic Relations
and Trade reflect contracts signed, not actual shipments.

[REDACTED]

China has implemented a combination of direct administrative controls, economic levers, and worker and manager incentives to control the purchase and improve the use of foreign technology, and to encourage greater use of domestic technologies. Beijing has, for example:

- Centralized import decisionmaking, and charged industrial ministries with checking domestic availability to ensure imports are not redundant.
- Issued regulations linking equipment purchases to transfers of know-how, and offered preferential treatment to foreign partners that help China produce for export.
- Encouraged trade corporations and factories to seek the advice of technical consultants and to use feasibility studies.
- Raised tariffs and cut domestic prices to shore up sales of domestically produced goods and to protect infant industries.
- Sponsored technology exhibits and fairs to make Chinese buyers aware of indigenous technologies that could substitute for foreign ones. [REDACTED]

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Beijing Debates Technology Import Policies

In the aftermath of Hu Yaobang's dismissal, Chinese reformers and conservatives have deepened their debate over issues related to economic policy. China's "open door" to Western technology could become one of the focal points for challenges to recent reform policies. [REDACTED]

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Throughout 1986, even when reformers generally had the upper hand, Chinese officials expressed differing opinions on the merits and drawbacks of foreign technology, as well as on the policies most likely to yield maximum economic benefits from technology introduction. The debate has centered on several issues:

- o To make or buy technologies.
- o To centralize import decisionmaking or to increase the factory voice in the decisionmaking process.
- o To regulate imports by administrative means, or through greater use of market mechanisms.
- o To direct purchases toward mature sectors such as textiles and machine building or to high-tech industries such as electronics.

[Redacted]

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- o To purchase state-of-the-art or less advanced but more easily assimilated items. [Redacted]

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We believe that more conservative Chinese leaders favor greater use of indigenously developed technologies and equipment, closer central supervision and greater use of administrative mechanisms to regulate technology imports, and stronger emphasis on less sophisticated but possibly more easily assimilated technologies for backbone industries. Soviet technology would probably meet the requirements of many Chinese conservatives. Reformers, however, have also promoted their policies, which include greater use of market mechanisms to regulate technology import choices and to encourage effective technology use, greater involvement by factory-level decisionmakers, and emphasis on imports of sophisticated Western technology for high-tech industries. [Redacted]

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More Bang for the Import Buck

We expect China's progress in rationalizing technology import decisionmaking and in improving technology use to be gradual. Bureaucratic boundaries--both provincial and ministerial--will continue to result in duplicate or unnecessary purchases. Moreover, shortages of technical personnel, energy supplies, raw materials, spare parts, and funds will continue to hinder technology absorption. [Redacted]

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Nonetheless, we believe that China will, over time, substantially reduce the incidence of duplicate imports and the purchase of equipment China can supply domestically. Some successes are already evident. Last year, for example, China's Ministry of Machine-Building Industry canceled 88 import projects that did not meet the new criteria, according to Chinese press reports. [Redacted]

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We also believe Beijing will improve the match between imported technology and the needs and capabilities of users, gradually boosting the economic payoffs to factories introducing foreign technology. Import decisions by central agencies such as the State Economic Commission or the Ministry of Foreign Economic Relations and Trade will begin to reflect what these agencies have learned from surveys undertaken in 1986 about why past import projects succeeded or failed. Factories will make better use of imported technology as they gain experience using feasibility studies to guide both equipment selection and related adjustments in factory conditions, resource supplies, and training. Managers will probably become increasingly sensitive to the benefits of technology introduction--and the costs of poor technology use--as a result of recent factory management reforms designed to make individual factories managers responsible for the profitability of their enterprises. Political uncertainties in Beijing following Party Chairman Hu Yaobang's ouster in January that have put related wage and price reforms on hold will limit the effectiveness of managerial reforms, however.

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[Redacted]

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We believe the sectors likely to benefit most from improved use of foreign technology are textiles, food processing, household appliances, consumer electronics, packaging, metallurgy, printing, and plastics. Because Beijing is aggressively promoting exports--and favors technology imports for projects that will generate exports rather than improve production solely for the domestic market--we expect Chinese goods in these sectors to be increasingly competitive in international markets. Foreign technology will help China improve quality control and upgrade packaging, factors that have limited China's penetration of many export markets. [REDACTED]

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Barriers to Technology Assimilation

- o **The vertical structure of Chinese industry** continues to make it difficult for users of imported technology to obtain needed raw materials, components, trained managerial and technical personnel, and energy supplies controlled by other ministries or by the Academy of Sciences. Calls for increased "horizontal linkages" between factories, and between enterprises and research units show Beijing's awareness of the bureaucratic barriers that now exist, but Beijing continues to have difficulty implementing the concept.
- o **Too few skilled technical personnel** are available to handle the difficult task of assimilating foreign technology. Although links with universities and research institutes are growing as a result of Beijing's encouragement of domestic trade in technology, we believe that progress has been slow, and that few factories have hired technical consultants to work specifically on assimilation of foreign technology.
- o **Insufficient funds for the assimilation phase.** Most allocations for technology imports do not provide a cushion for maintenance or repair services, additional training, or spare parts purchases after installation, [REDACTED] Chinese proponents of such funding changes argue that Japan spends five to seven times more to assimilate an imported technology than to acquire it initially. [REDACTED]

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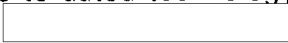
Consequences for Technology Suppliers

Despite Beijing's attempts to cut back duplicate purchases, many foreign technology suppliers will find improved opportunities to sell to China during the current Five-Year Plan (1986-90). Overall spending on foreign technology is slated to increase, accelerating in the latter years of the plan. The focal areas for technology import will be the energy, transport, telecommunications, raw materials processing, textile, light industry, machine-building, and electronics sectors. We also expect China to make greater use of foreign experts to conduct feasibility studies, consult on technology


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import needs, and provide managerial and financial advice. We believe that the shortage of foreign exchange will prove to be the limiting factor on China's technology imports for the remainder of the decade. Chinese buyers will probably look for ways to acquire foreign technology without making large outlays of foreign exchange--for example, buying used equipment or the rights to dated technology processes, or leasing equipment instead of purchasing it. 

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Beijing's new policies will probably create additional layers of bureaucracy with whom foreign suppliers must negotiate, prolonging negotiations. Foreign technology suppliers also will face greater pressure to engage in cooperative production projects, such as joint ventures and license agreements. The ability to provide government-backed concessional financing--already a decisive factor--will become increasingly important to foreign firms selling technology to China. 

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Beijing will continue to find technology from Western Europe and the United States more desirable than that from Japan, in our judgment, but the Soviet Union is also emerging as an important source of China's technology (see figure 2):

- We expect the US share of China's technology imports at least to stabilize--and probably to increase--over the next five years. US firms will benefit from policies linking equipment purchases to cooperative production, but will face keen competition from European firms, which often include attractive financing with their bids to supply equipment and production technology.
- The market position of West European technology suppliers will remain strong. In the last three years, West German and French suppliers have won several large contracts on the basis of favorable technology and financing packages, a trend we expect to continue. West European suppliers have also benefited from Beijing's desire to diversify sources of technology, and reduce dependence on Japan and the United States.
- Japan's share of China's technology purchases will probably continue to erode for the next few years, as China's central trade corporations enforce Beijing's instructions to direct imports away from Japan--a policy first formulated in 1985 out of frustration with a ballooning trade deficit and the relatively low level of Japanese investment,  Japanese sales figures will also begin to reflect China's suspension of imports of consumer goods production lines through 1990 and the effect of the yen's appreciation.
- The Soviet Union's share of China's technology imports rose sharply in 1986 and will probably continue to grow over the next few years, as Beijing and Moscow implement a July 1985 agreement on technical cooperation, and as China's interest in acquiring technology through barter--rather than with hard-currency expenditures--grows. Most of the 24 projects covered by the 1985 agreement are in the energy or heavy industry sectors; Beijing welcomes Soviet assistance in energy because Soviet technology is relatively advanced, and for heavy industry because it is a sector that Western investors generally avoid. Most of the joint projects under consideration involve renovation of sites built with Soviet help in the 1950s. 

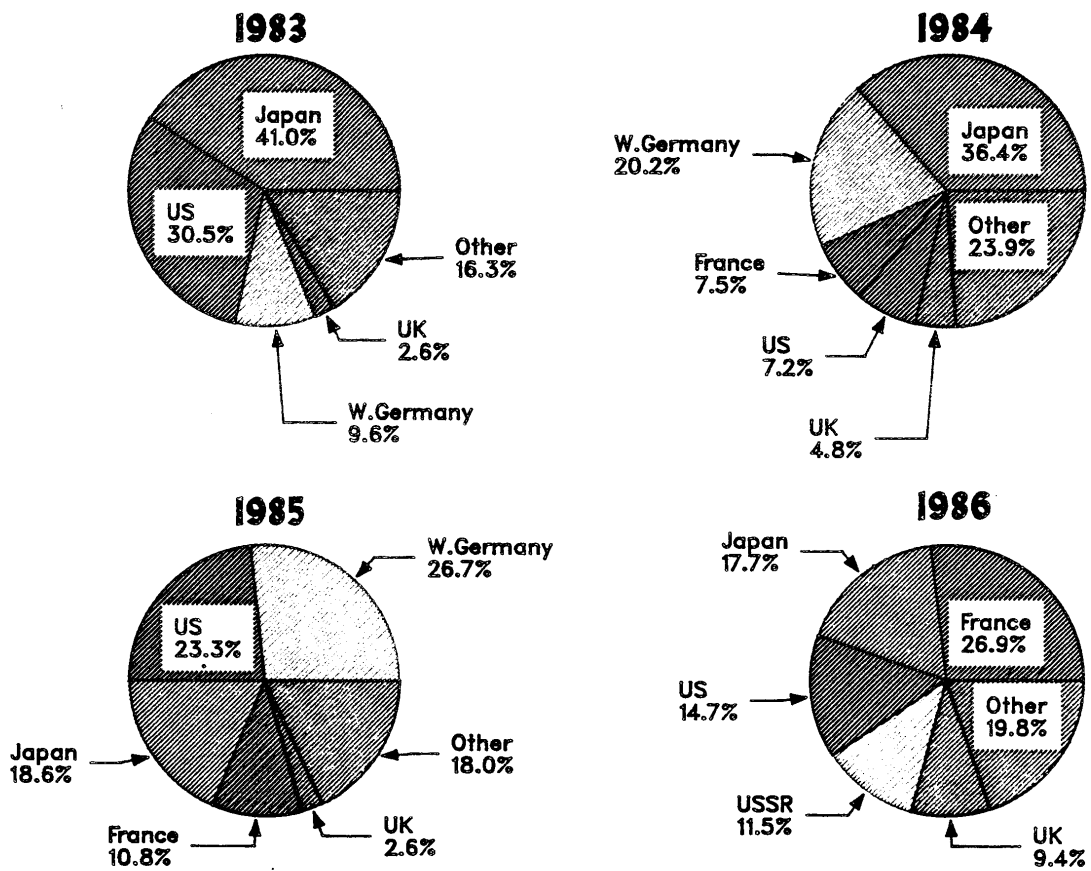
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Figure 2
China's Major Technology Suppliers, 1983-86





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