Japan Holds on Tight to Cutting-Edge Technology

TOKYO—Japan, with its mastery of industrial technologies and economic might, has become a role model for Asia's emerging economic powers. In the past decade it has opened its universities and research labs to thousands of foreign students and scientists, it regularly sponsors conferences and study tours for Asian engineers and business executives, and Japanese investment and transfers of technology are vital factors in the region's economic growth. The quid pro quo for Japan: Rising incomes throughout Asia provide markets for Japanese goods.

But although Japan enjoys playing the role of teacher to its Asian neighbors, it has kept tight control of one element that Japanese companies fear might otherwise come back to haunt them: access to leading-edge technology. Indeed, the technology gap is actually widening as government and industry officials try to stave off growing economic competition in the region. For example, Japan remains a net technology importer, paying $6.5 billion for patent licenses, know-how, and other transfers, mostly to Europe and America, while exporting less than $3 billion of its own technology, mostly to Asia, according to Bank of Japan statistics for 1991. Moreover, while most Asian countries run trade surpluses with the United States and Europe, trade deficits with Japan are snowballing.

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Agent of change? Prime Minister Hosokawa.

When Japanese companies license technology to companies in Asia, it is typically older products and processes—for example, dot-matrix printer technology. The newer and more profitable laser printer technology, on the other hand, is not for sale. Although many U.S. companies have a similar policy, a spokesman at the Korean Embassy in Tokyo notes that Korea manages to sell enough goods to the United States to cover the cost of high-tech components and materials it imports, whereas the Japanese market for Asian products is much more restricted.

Semiconductors are a good example. Korean companies have steadily increased their share of the world market despite paying more than $1 billion a year to both Japan and the United States for components and technology. But while Korean industry nearly balances its trade with the United States by selling finished products worth about $1.1 billion in the U.S. market, it sells only about $125 million worth of chips to Japan.

Korean chipmakers face a particularly uphill battle because the market for their strongest products, dynamic random access memory chips, is dominated by Japanese companies. But the pattern is repeated in sector after sector and for country after country. Korean electronics firms and Taiwanese computer makers who have managed to penetrate the U.S. market widely with their own brand-name products have made only minimal inroads into the Japanese market, stymied by the same lack of access to retail and distribution channels that plagues Japan's other trading partners.

The situation may actually have gotten worse in the past several years as Japan's Asian neighbors have boosted their R&D spending. "In the late 1980s Japanese industries worried that the Koreans were coming," says Yakushiji Taizo, professor of international political theory at Keio University. "They didn't overtly impede transfers, but I'm pretty sure they slowed down." Japan still pays lip service to increased cooperation, the latest example being twin private foundations to promote technical cooperation with Korea through training programs and seminars. But a spokesman for the Korean embassy says "we don't see any possibility of getting access to high-technology through this effort."

While Japan's tight grip on its advanced technology has bedeviled high-tech enterprises in rapidly industrializing countries like Korea and Taiwan, the poorer countries of southeast Asia complain about another aspect of its high-tech policies. Japan's direct investments in manufacturing in their countries, they say, do little to advance the technological skills of local companies. Speaking as an individual and not on an official basis, Manoon Aramrattana, minister-counselor for science and technology at the Royal Thai Embassy in Tokyo, says, "Generally speaking, our industrialists feel Japanese companies do not disclose sufficient information to industrial partners to facilitate technical transfer to joint ventures." A 1991 study by Japan's National Institute of Science and Technology Policy supports that contention. The study found that most of the components that Japanese manufacturing plants buy locally—specifically for televisions and cameras—are purchased from subsidiaries of other Japanese firms. "Parts procurement networks are formed by Japanese companies, and there is a wall that prevents technology from being transferred outside this network," the report says.

China is in a class by itself. Nakajima Satoshi, a patent lawyer long involved in licensing negotiations between Chinese and Japanese companies, points to the range of technological abilities in the country—it has rocket technology that probably surpasses Japan's—but adds that China's overall manufacturing capabilities remain low. Nakajima says that the transfer of high-level manufacturing processes has been difficult because of China's lax protection for intellectual property and low technological levels in key industries. The Chinese government also limits the degree of investment, often specifying partners and suppliers, something Japan did during its postwar development era to ensure technology was transferred into the country. "If you look at the long term, that may work," Nakajima says, "but in the meantime there are problems with the products manufactured." However, one benefit of China's firm hand on imports and exports is a positive trade balance with Japan.

Getting Japanese industry to transfer more technology is not going to be easy. A 1989 survey of 497 top Japanese corporate executives by *The Nihon Keizai Shimbun*, Japan's leading economic daily, found that 77% thought Asian companies would prove to be increasingly tough competitors in the 1990s. A newspaper report on the survey claimed some executives felt Japanese industries had already transferred too much technology to South Korea and Taiwan.

But not everyone in Japan thinks that continued protection of the country's technological assets is a wise policy. Kawasaki Masahiro, former head of Japan's National Institute of Science and Technology Policy and now senior vice president of the Research Development Corp. of Japan, says that persistent gaps in technology levels between rich and poor nations could lead to political instability. "We have to go beyond patents and manuals," he says. "That's not the way to transfer living technology." He says Japan's current approach is too subtle: "It's like ikebana (Japanese flower arranging)—after it's all done, you can't see how it was really done."

The new government of Prime Minister Hosokawa Morihiro has promised change in many areas, including pruning the thicket of regulations that hinder importation of many foreign products, and Hosokawa has already made a dramatic break with tradition by apologizing for Japan's wartime behavior. Carrying over this approach to science and technology, say technology experts, could at long last turn Japan into the role model its Asian neighbors have long wanted.

–Dennis Normile