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Export Controls of High-Technology Goods

The impaired ability of the United States to compete internationally and even at home in high-technology products is a matter for searching examination. Our failures come from many sources. Recently, U.S. procedures for controls of exports of high-technology goods have been added to the list of causes. The National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine have rendered a public service by sponsoring a major study that has illuminated the need for changes in our system of controls.*

Japan, France, and members of NATO have recognized that advanced technology confers military advantages over the Communist Bloc and have cooperated to limit transfer of technology there. However, the United States has imposed controls that go beyond those of its allies. In earlier times, we enjoyed a monopoly on high technology. But that status is gone. Japan and some members of the Common Market have been joined by Hong Kong, Singapore, South Korea, Taiwan, and others as exporters of microelectronics goods. Today, the United States purchases only 30 percent of the high-technology goods sold on the world market. If our manufacturers are to achieve economies of scale, they must distribute their products globally.

In spite of these developments, the United States behaves as if it still had the monopoly it enjoyed 20 years ago. We continue to assert "jurisdiction over goods and technology even outside the territorial United States when (i) the product or technology in question originated in or is to be or has been exported from the United States; (ii) the product or technology incorporates or uses products or technology of U.S. origin; (iii) the exporter is a U.S. national or is owned or controlled by U.S. interests." Thus when a U.S. subsidiary operating in West Germany wishes to export a high-technology item, permission must be sought from Washington.

The machinery for control of exports from the United States is slow and not very discriminating. The interval measured from when the application leaves the company to when the company receives an export license averages 54 days. In Japan, export licenses are processed in 2 to 3 days. Expeditious schedules prevail in other competing countries.

Delays and uncertainties handicap U.S. firms. Competitors can supply many of the high-technology items at lower prices or with better quality than can the U.S. firms and without delays. A survey conducted showed that many erstwhile customers of U.S. suppliers are turning to other sources.

An example from the report illustrates effects of U.S. export controls. In March 1983, a U.S. company sought a license to export a $450,000 nuclear magnetic resonance spectrometer to a medical research institute in Eastern Europe. The application was not approved until November 1985. Although U.S. firms pioneered the development of NMR, German and Japanese companies now hold two-thirds of the world market for such instruments. During the review period in Washington, a German competitor sold several similar NMR systems to Communist Bloc customers. The NMR instruments do not appear on the U.S. control list, but the equipment was subject to licensing because it contained 32-bit array microprocessors and 30-megabyte Winchester disk drives.

To obtain information for the report, teams were sent to Europe and Asia. They heard many comments about deleterious effects of delays of processing export licenses and were reminded of the problem of the "$2 microchip in the $20,000 machine." When the U.S. chip was used, the entire product had to receive a U.S. re-export license. They also conversed with U.S. customs officers stationed abroad. One officer complained that on instructions from Washington, he spent most of his time "chasing" personal computers.

The United States is trying to control items produced by the millions in many countries. In 1979, legislation was enacted that called for elimination of controls on items that the Soviet Union either can make for itself or freely buy from uncontrolled sources. However, the will of Congress has been thwarted. Substantial progress has not been made in eliminating outdated controls.—PHILIP H. ABELSON

Balancing the National Interest* (National Academy Press, Washington, DC, 1987). See also, C. Norman, *Science* **235, 424 (1987).