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Two points of view: Holding the lead in high tech

Dean Morton

Max Donner

William K. Krist

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Holding the Lead in High Tech

A Private View

by DEAN MORTON / *Treasurer,*
and MAX DONNER / *Research Associate,*
American Electronics Association

The importance of technology-intensive industries to America's economic vitality is increasing as foreign competitors mount a serious challenge and as many basic industries undergo a painful restructuring. Against that backdrop, high technology has been catapulted to the forefront of efforts to revise our national economic strategy. Well-founded, long-term strategies will require a much deeper understanding of the challenges facing us. We also will need to identify and enhance the elements of our national strategy which have contributed to the enormous success of America's high-technology industries.

High-technology industries—principally electronics, biotechnology, and aerospace—grew more than twice as fast as the national economy in the 1970s. They are projected to grow at least 70 percent in the next ten years. Yet, America's market share in world exports of high-technology goods—a key barometer of international competitiveness—is declining. That measure dropped from 38 percent in 1970 to 33 percent in 1980.

Part of the problem—and solution—lies with American business itself. Historically, many large firms have been slow to introduce new technologies or improve their ability to compete in cost or in quality; small entrepreneurial firms have led the way in innovation. But only 11 high-tech start-ups have penetrated the *Fortune* 1,000. The others often have lacked the scale and resources to compete globally. Selling out to large centralized firms has not improved their ability to manage these weaknesses. Firms and the government must recognize such potential weaknesses and consider appropriate remedies.

To be globally competitive, American firms must start with innovation. America's entrepreneurial environment has demonstrated unparalleled success in producing technological innovations. America's universities and research institutions have pioneered hundreds of scientific breakthroughs, which complement the technological development of entrepreneurial firms. Market-oriented incentives, such as employee stock options, tax credits for research and development, and generous support for autonomous university research, can strengthen America's lead in innovation.

One approach to spurring innovation is the research and development cooperative. Starting with the new Microelectronics and Computer Technology Corporation, these are being formed to allow small- and medium-sized firms to share technical talent and research budgets.

There are major bottlenecks constraining the global competitiveness of high-technology firms—technical education, quality, and capital. While the United States graduates about 13,000 with bachelor's in electrical engineering and computer science annually, a 1981 study by the American Electronics Association shows that the industry needs at least 33,000. The problem is expected to become more severe as the industry's need for engineers accelerates and our capacity to train new engineers stagnates. America's Ph.D. engineering programs are graduating about 450 new faculty each year, while our universities need 1,000 just to maintain quality and capacity in existing programs. Moreover, much of the equipment used in university engineering programs is 20 to 30 years old. Forward-looking public policies, such as tax credits for industry donations, can help solve these shortages.

Quality is another important consideration. Innovation has allowed American firms to develop new foreign markets with their pioneering technologies. Quality control can preserve those foreign markets and allow American firms to set the international standard for quality.

Improving access to capital and lowering its cost can assist the efforts of high-tech firms to help themselves. A firm backed by venture capital, or listed over the counter with strong quarter-to-quarter earnings pressures, often must compete against multi-

billion-dollar firms from Europe and Japan. Many of the huge competitors in France, for example, take advantage of government ownership or low-cost loans. Correspondingly, we can attack our vulnerability in capital costs by improving investment incentives and removing barriers, such as the limitation on pension fund investments in new high-technology companies.

America's leadership in innovation makes it imperative for our high-technology products to enjoy unrestricted access to foreign markets. Likewise, open competition by foreign firms in the U.S. market can motivate American firms to seek the highest goals in productivity and innovation.

The innovative, open environment we seek from public policy needs to be followed by American firms themselves. American private enterprise must continue to be primarily responsible for its own success or failure. Private firms must better their foreign competition's technology, cost, quality, and service, and be ambitious in America and in the home markets of their competitors. Thoughtful government leadership supporting the advances of private firms in innovation, manufacturing, and exporting will enhance America's global preeminence in high-technology industries.

Dean Morton also is executive vice-president of Hewlett-Packard.

A Public View

by WILLIAM K. KRIST/
Assistant U.S. Trade Representative

Discovery, invention, and entrepreneurship have contributed greatly to the economic well-being of the United States. Our nation's capacity for technological innovation became especially noticeable in the 20 years following World War II, when we were acknowledged worldwide as having across-the-board technological superiority. In the last 10 years, however, there has been a progressive narrowing of this leadership margin, as both developed and developing countries have begun to conquer the technological frontier.

The continued worldwide economic leadership by the U.S. is tied to its ability to use high technology to stimulate growth in both the U.S. and world economies. Some argue that the United States should concentrate on the high-tech industries and accept the demise of our smokestack industries. This concept fails to take into consideration that fostering high-technology applications in our smokestack industries can help them to become more competitive. A strong industrial base provides a stronger market for the rapidly developing array of products and processes being invented. Our traditional industries and our high-technology industries are, in fact, inextricably linked; the performance of one will seriously affect the strength of the other.

There are countries that intervene in their economies to give support to their advanced-technology sectors. Composite metals, semiconductors, aircraft, machine tools, and specialty chemicals all are being labeled from abroad as targeted industries. To assure success for these industries at home, many argue that we must replace the free and open marketplace with explicit guidance by government officials.

Traditional U.S. policy has been that millions of individual decision makers, continually producing better goods at lower prices, provide a more efficient means for allocating resources than would the dictates of a nationally administered industrial policy; that the marketing of new technologies is the task of the industrial and commercial sector; and that a competitive atmosphere in the private sector forces technological progress and long-term growth. Instead of imposing its own will, the government should devise policies that enable U.S. producers to compete in the world.

These policies can be looked at as a triangle, which can provide a solid base on which U.S. businesses can build. The first side would be an analysis of the practices of foreign governments that target specific U.S. industries and an effort to seek international consensus for new rules in this area. Other targeting practices also exist, but they are not as easily identified.

Offset requirements are not covered by international agreement, and national R&D programs that are geared to developing commercial products are not inconsistent with the rules of the General Agreement on Tariffs and Trade. Nonetheless, such practices may give competitive advantages to firms in countries that have these programs. For practices in these areas, we must build an international consensus leading to the development of improved international discipline.

The second side of the triangle would be the development of domestic policies that encourage competition. Positive steps in this direction have been the Export Trading Company Act and the removal of burdensome regulations by the president's task force on regulatory reform. Other policies, such as the Foreign Corrupt Practices Act, also must be reviewed to ensure that we are not overregulating our companies into secondary positions in the world marketplace. Moreover, we must encourage our country to save in order to provide an adequate capital base for our industries; programs such as the Individual Retirement Account will provide both a larger capital base and increased job flexibility for our workers.

The final side of the triangle would be a resurgence in quality education. While we Americans historically have believed that the virtue of education is paramount, the trend in American education over the last two decades has been one of decline. We have no program of lifetime education to reduce structural unemployment—that mismatch between current labor skills and new employment requirements. The United States must recognize the need for a competitive educational system.

Measures to bolster U.S. competitiveness must focus on enhancing our native strength and maximizing our economic flexibility to respond quickly to technological change. The United States has the potential for a new economic surge fueled by advanced technology.