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Future U.S. Technology Leadership?

Philip H. Abelson

At the moment, the United States is the world leader in many aspects of technology and innovation. Its research universities enjoy global eminence, and admission to its graduate schools is sought by students from many lands. One remarkable U.S. innovation is the Internet, which is changing the way in which businesspeople, scientists, and others in many countries function; and the United States has also made many important advances in biomedical research and practice. The United States has enjoyed a high standard of living in part because of its long-term leadership in innovation.

A common assumption is that such favorable circumstances will continue indefinitely, but future U.S. preeminence is not guaranteed. During the past decade, changes have occurred that may have serious consequences. Insufficient innovation in some sectors of the U.S. economy has been a factor in a large and increasing international trade deficit. One effect has been that the United States has become the world's largest debtor. The February 1999 federal *Economic Report of the President* stated that at the end of 1997, the net international investment position of the United States at market value was a deficit of $1322 trillion. In addition, the rate of increase of the U.S. international debt is accelerating. In 1998, the debt expanded by more than $230 billion. Extrapolation of data for the first 6 months of 1999 indicates a further increase of more than $300 billion this year.

"[F]uture U.S. preeminence is not guaranteed."

One corrective step might be to speed the pace of innovation to improve U.S. productivity and global competitiveness in the trade of goods. If this strategy is to succeed, federal policies must be improved. This need is discussed in a March 1999 publication of the Council on Competitiveness titled *The New Challenge to America's Prosperity: Findings from the Innovation Index*.* The principal authors are Michael E. Porter of the Harvard Business School and Scott Stern of the MIT Sloan School. They point out that innovations are fundamental to the prosperity of advanced economies. They assert that no advanced economy can maintain high wages and living standards and hold its own in global markets by producing standard products with standard methods.

The authors have devised and tested an Innovation Index, which measures the effectiveness of the components of national policies and the circumstances that foster innovation. Some of the components of the index are the amount of investment directed at R&D, the resources devoted to higher education, and the size of the labor force dedicated to R&D and other technically related work. The last of these components is particularly problematic. Prospects for a future adequate U.S. R&D labor force seem poor. Graduate school populations in engineering and the physical sciences are static or declining. A large number of graduate students are foreign nationals, and an increasing proportion of them are returning to their home countries after completing their studies. Meanwhile, less than half of the U.S. alumni are employed in technological fields. The Innovation Index provides evidence that the United States may be living off of assets that have not been adequately renewed (indeed, U.S. investment in the fundamentals of innovative capacity reached a peak in 1985).

Other nations are determined to compete in global trade. Most members of the 17 countries in the Organization for Economic Cooperation and Development have increased their commitment to education and to R&D. Their capabilities for innovation have improved relative to those of the United States. South Korea, Taiwan, Singapore, and Israel have also fostered their competitive skills. At a time when other countries were taking effective steps to improve their capabilities, the United States was curtailing support for some of the activities that made it great. A future crisis can be avoided, but action must be taken years before the event. The Council on Competitiveness report provides useful analysis and guidance and should be thoughtfully considered by policymakers.

*Information about the report is available at www.compete.org.