

1995

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Recommended Citation

Kidd, Robert M. , Richard C. Hill, and James S. Ward IV. "Technology Policy: A Fixture on the National Agenda." *Maine Policy Review* 4.2 (1995) : 13 -15, <https://digitalcommons.library.umaine.edu/mpr/vol4/iss2/3>.

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Commentary

Technology Policy: A Fixture on the National Agenda

Maine Policy Review (1995) Volume 4, Number 2

Two commentaries follow. Robert Kidd, president of the Maine Science and Technology Foundation, echoes the authors' call for a new technology policy focused on industrial competitiveness and defines a partnership role for states in the design and implementation of national technology priorities. James Ward, IV and Richard Hill, director and director emeritus of the Department of Industrial Cooperation at the University of Maine, raise several questions. Can we rely on the federal government to successfully direct this policy area? How would a new technology policy impact the roles and responsibilities of the private and public sectors? What can we learn from partnerships between universities and industry that have led to innovation and enhanced competitiveness and did they result from good policy or practical incentives at the local level?

Robert M. Kidd

“Technology policy: A fixture on the national agenda,” by Rycroft, Kash, and Adams, asserts that “there is consensus that technological innovation is the greatest source of economic well being in the world,” and that “the Japanese are threatening to take the lead in technological innovation away from the United States,” perhaps by the year 2000. Given the significance of such a sweeping economic scenario, the authors argue, technological innovation deserves a prominent place in the national policy debate.

I agree with the authors’ assertions regarding the importance of technological innovation. Clearly, we now live in a technology-dominated society where economic security is directly linked to industrial competitiveness and productivity. I wish I could be as optimistic about the degree of national consensus that exists, however. Recent U.S. trends are alarming. Many federal programs designed to foster technological innovation in important economic areas are caught up in budget debates and likely to be eliminated. While investments in technology should consistently appear at the top of the national agenda, they do not.

The article addresses the policy debate that is currently occurring in Washington D.C. In short, this debate is focused around “whether the federal government should overtly promote the innovation of commercial technologies,” or “pick winners.” I am disturbed when I hear that important U.S. Department of Commerce trade and technology programs are referred to as “corporate welfare” programs. It is these programs that are helping to create organizational networks and consortia that foster the creation and rapid movement of knowledge and technology. These types of programs enable the U.S. to continuously improve the organization of human and financial resources around technology-driven opportunities in economic areas that are relevant to future global competitiveness. The Department of Commerce, National Institute of Standards and Technology, and Maine Science and Technology Foundation, through the Manufacturing Extension Partnership, are fostering the development of these networks in Maine. This type of “infrastructure” is critical to Maine’s future as well as the nation’s.

The authors envision sweeping change in our national technology policy. They argue that, "...now technology policy has to be integrative, synthetic, and dynamic across the national landscape, particularly for complex technologies." What are the authors really saying? One perspective can be derived from a Carnegie Commission Report entitled "Science, Technology and the States in America's Third Century, 1992." During the Cold War there was an obvious rationale for technological innovation to be managed centrally and focused in the areas of defense and government agency missions. However, as the Carnegie Commission has suggested, it is time for a shift in priorities. The Cold War has ended.

The Carnegie Commission report identified a need for changes in how the nation's technology programs are managed. In particular, states and the federal government should become partners in the design, funding, and administration of both national and state-level programs to stimulate technological innovation. This recommendation departs from previous practice. Historically, federal programs have been designed and administered inside the "beltway," and have focused on federal priorities. Meanwhile, state technology programs have focused on working with industry and enhancing economic competitiveness. It follows then, that new federal priorities should also lead to partnerships between federal agencies and state technology programs. The states have valuable expertise to contribute to the national effort of enhancing industrial competitiveness through technological innovation. The Carnegie Commission report strongly supports this idea, one that has been called a revitalization of federalism in the area of technology policy.

In conclusion, I believe:

1. Technological innovation belongs at the top of the U.S. agenda. (I wish I could agree with the authors that this priority is a consensus. If it was, technology programs would be less threatened in the national budget debate.)
2. States must strengthen their voice in the debate to place technological innovation on the top of federal priorities; and
3. It is imperative of a new national technology policy that states become partners in the design and implementation of programs that support the nation's technology effort.

Richard C. Hill
James S. Ward, IV

In “Technology policy: A fixture on the national agenda” the authors do well in describing the United States’ need for a different set of policies to reduce the trade deficit and increase international competitiveness. The authors’ argument focuses on Japan and its ability to carry out incremental innovation on complex technologies, many of which were initially invented, developed, and commercialized in the United States. The evidence reported in the article is impressive and supports change; the authors recommend that a new national technology policy would be the optimal solution to the problem.

As compelling as the evidence is, however, the elusive “technology policy” is not sufficiently described in the paper. When we read: “As technologies and organizations coevolve into ever more complex forms, the capacity to link diverse companies, university research facilities, and government laboratories has become a requisite,” we wonder about the concomitant operations. What new roles do the authors prescribe for public and private sector organizations? Should relationships between the two be mandated by federal policy?

The United States has a long history of international success, and, while manufacturing industries appear to be losing ground to foreign competitors, it is not clear that this decline is related to failure in federal policy. How, for example, did a once U.S. dominated industry like automobiles lose its lead? Were there policies that encouraged U.S. citizens to buy Japanese, or policies that kept U.S. manufacturers from improving their products at a pace that matched the competition? If national technology policy did not cause these problems, how can a new policy fix them? Oversimplified as this example is, when we investigate commercial success at the company level, it is the company’s leadership, management, and vision which more often determine success. One does not have to look much further than Microsoft to see an overwhelming example of success that has occurred in spite of national policy.

Closer to home, Maine has had a varied industrial past. Once a leader in shipbuilding, textiles, shoe making, and paper, the state’s manufacturing base has dwindled. The nature of our employment base has shifted from manufacturing to service in recent years. Yet some major employers have survived, and even thrived, despite what many would consider an inhospitable Maine business environment. Surprisingly these companies (i.e., Pratt & Whitney--aircraft engines, General Electric--power generation, IDEXX--veterinary bio-technology, Brunswick Technologies, Incorporated-- composite textiles, Dexter Shoe Company, National Semiconductor), by-and-large represent complex technologies, most of which are competitive in the global marketplace.

The authors assert that the Japanese advantage relates to their ability to conduct incremental product innovations. At face value this statement would suggest that if the U.S. is to compete at incremental innovation, then companies must take greater responsibility for manufacturing research and development, and public institutions need to be responsive to their needs. Not surprisingly, most universities and federal laboratories are credited for doing basic research, which is not easily or readily commercialized. This difference in priority raises the question of accountability. The suggested consortium of private and public efforts draws fuzzy lines between

who would be held accountable for what activities. We believe that agencies should stick to what they do best, and for that which they can be held accountable. Private companies are held accountable by their stockholders and the marketplace; public institutions are held accountable by taxpayers and voters. The accountable public role includes: national security, public safety, education, and general infrastructure (roads, orderly assignment of radio frequencies, air space, etc.). Universities in particular should be held accountable for the quality of their research, teaching, and public service.

National technology policy that supports company driven innovation from the bottom up, and places the majority of the responsibility for the investment on the company is an approach we support. Asking universities to change the proportion of their basic versus applied research is a problem requiring more of a solution than changes in national technology policy.

The few times there have been effective collaborations between the University of Maine and the private sector, that collaboration resulted from the entrepreneurial zeal of individual faculty members who chose to respond to the R&D or commercial needs of an individual or group of companies. The relationship can be traced to a particular faculty member rather than institutional policy. University files contain examples of many failed efforts to establish institutes in areas such as textile research, wood products design, and fiberglass hull construction. These efforts all looked good in the beginning, but foundered in operation.

If national technology policy is to succeed in practical terms, we must find ways to build on success. For example, the U.S. Department of Energy, Lawrence Berkeley Laboratory, and Association of Home Appliance Manufacturers put together a refrigeration energy reduction program (funded almost completely by industry) that decreased domestic refrigerator energy requirements while maintaining international dominance in the market. Specific successes such as this one provide models for how the U.S. can improve its international competitiveness, rather than mandated federal policy.

Full cite: Kidd, Robert M., Richard C. Hill, and James S. Ward. 1995. *Commentaries: Technology policy: A fixture on the national agenda*. Vol. 4(2): 13-15.