State Policies, Academic Research, and Economic Development

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A salient theme of public policy at the start of the 21st century has been the encouragement of technology-based economic development. From member countries of the Organization for Economic Cooperation and Development to developing countries, policymakers have sought schemes that would create enduring links between industry and science to stimulate innovation and growth. The vital contribution expected from science makes these policies important for universities. This has been especially true in the United States. There, individual state governments have implemented policies that should be of interest to any polity concerned with fostering technology-based economic development.

State governments have long invested in research at local universities in the expectation of producing economic benefits, beginning with agriculture. Since 1980, state policies have sought to encourage interactions between industry and universities, with the specific aim of stimulating the development and transfer of technology. Since 2000, state policies have enlarged this previous pattern with new policies aimed at technology creation rather than technology development. Such policies are predicated on a more sophisticated model of factors inducing economic growth, and strengthening the research infrastructure of universities is a key strategy.

The States' Problem

States perceived that the greatest potential for economic payoffs would come from additional investments in science-based research technologies. However, investing in basic research in such fields presented the same kind of pitfalls for states as it did for private firms; particularly, uncertainty whether investors could capture any value created or if it would escape as "economic spillover."

Policy considerations on this last point were shaped by the dazzling exemplar of Silicon Valley. As reflected in the policy literature, Silicon Valley possessed the advantages of agglomeration: the clustering of research universities, high-tech corporations, and smaller start-up firms not only produced a resource-rich environment in which innovation flourished, but it also retained spillovers within the region. Such clusters generated a greater collective intelligence on which participants came to depend, igniting economic growth and concentrating it as well.

Creating another Silicon Valley might be chimerical, but the rationale and policy design nevertheless followed from this analysis and have now become widely accepted. The starting point is some source of comparative advantage. Most major research universities not only possess expertise in several research technologies, but also have to some extent spawned clusters of related firms and other institutions. In order to build on these strengths, state policies aimed to augment and upgrade the research infrastructure in strategic fields. Special funding has been directed to the hiring of star-quality professors and the erection of state-of-the-art infrastructure. Expectations are that economic payoffs will occur through the creation of human capital for industry, but especially through the creation of intellectual property (IP), licensed to major corporations or more likely developed through spin-off firms. The policy thus needs to make provisions to nurture this latter process with IP offices, business incubators, management assistance for start-ups, and venture capital.

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Technology Development vs. Technology Creation

Although technology creation and technology development would seem to overlap, they represent fundamentally different pathways to technology transfer. Since the 1980s, technology development policies in the United States have been generally successful. They were based on a traditional model of university-industry interaction in which basic or university research served primarily to enhance the effectiveness of industrial research. The policies of the 1980s furthered such interaction by creating arrangements for collaborative research, such as engineering research centers. Such units brought university expertise to bear on problems relevant to industry; and state subsidies lowered the price enough to make it cost-effective for industry. Thus, the initiative in choosing topics for research lay primarily with industry, technology transfer took the form of expertise shared with industry, and IP was ultimately developed in industrial laboratories. Policies for technology creation differ in three important ways.

First, the role of technology creation depends heavily on universities and academic science. Basic research is the preferred task of universities, and the favored research technologies present enormous scientific as well as technological challenges. The state-sponsored institutes at the University of California are focused on biotechnology, nanotechnology, and information sciences. New York's initiatives support these same general areas but in a more dispersed fashion; for example, the state assists nanotechnology units on six campuses, public and private. Georgia created a program for broadband technology and related chip design. The appearance that these and other states are crowding into the same areas may be misleading. Rubrics like biotechnology and nanotechnology conceal myriad specialized fields, each with unique research challenges and commercial possibilities.

Second, technology creation by its nature must aim for the highest possible quality. These intensely competitive fields resemble "winner take all" situations where the best knowledge is far more valuable than the second best. Not accidentally, state initiatives in New York, Florida, and South Carolina are called "centers of excellence." More important, states have emphasized investments in top-flight scientists by creating special chairs to accompany these research units.

Third, states have taken the theory of agglomerations to heart. Georgia's intention was to make Atlanta a hub for broadband R&D and manufacture. Michigan dubbed its initiative the "Life Sciences Corridor." New York consciously intended to nurture a biotechnology corridor on Long Island and a nanotechnology cluster around Albany. The extent to which these aspirations are fulfilled may never be precisely determined, but the policy thrust is notable. Universities are no longer seen as discrete organizations, but rather as parts of larger innovation systems. Greater cooperation across institutions may be a permanent legacy of these policies.

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Implications

These policies have brought a huge investment in the research capacity of American universities that would not otherwise have been made. All state strategies sought to employ leverage—the use of state resources to mobilize additional resources from industry, philanthropy, the federal government, and universities themselves. New York expected a 3-to-1 ratio of matching funds for its Centers of Excellence program; The California institutes were matched more than 2-to-1; and South Carolina asked its Centers of Excellence merely to match the state appropriation. Whether or not these policies prove effective in promoting economic development, they have contributed materially to the nation's capacity for fundamental research in economically strategic subjects.

On the other hand, the role of technology creation, through its dependence on IP, draws universities ever more deeply into the commercial realm. Without endorsing recent strictures against commercialization, the university's predicament should still be recognized. Universities stimulate economic activity in a variety of ways. The current emphasis by states on technology creation aims above all at generating knowledge of commercial value, in the form of IP. Creating a valuable product inevitably involves universities in the marketplace. Although their foremost and ultimately most valued function is to create intellectual capital, they can hardly avoid selling IP to parties who can realize its monetary value. State policies to promote economic development through university research have thus tilted the balance further toward the commodification of academic knowledge. ■

Corruption in China's Higher Education System: A Malignant Tumor

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Broadly defined by Transparency International, a nongovernmental monitoring group, as "the abuse of public office for private gain," corruption also constitutes an element of higher education in many parts of the world. The term academic corruption in mainland China usually refers to such violations as misrepresenting one's educational background or work experience, plagiarism, distortion of research data, affixing one's name to someone else's publications, and making false commercial advertisements, as well as other acts. Yet, the scope of infractions is much broader than imagined and includes corrupt behavior on the part of individuals and groups that is actually endemic to the entire system.

Since the 1990s, corruption has seriously threatened mainland China's universities in their teaching, research, service to society, and international links and exchanges. Yet, discussions of corruption have been largely confined to exchanges on the Internet. The Chinese masses know little of these discussions. Media coverage within China remains fragmentary and superficial. The government has just begun to address this issue by instituting countermeasures. The Ministry of Education promulgated Academic Norms Regarding Philosophy and Social Science Research in Higher Learning Institutions in early September 2004.

In China, the scale of corruption pertains to almost all aspects of higher education. This article focuses on three aspects that are indicative of academic corruption in other parts of the system.

Research Administration

The current quality of research conducted in China often suffers due to rampant plagiarism. A professor from the Southwest University for Nationalities even refers to China's academe as a "plagiarist's paradise." In early 2002, Wang Mingming from the Department of Sociology of Peking University became notorious because 100,000 words in his