

Chicago Fed Letter

Can higher education foster economic growth?—A conference summary

by Richard H. Mattoon, senior economist and economic advisor

While higher education is being asked to perform more roles in the local economy, specific pathways for influencing local and regional economic transformation are still being identified. On October 30, 2006, the Federal Reserve Bank of Chicago and the Midwest Higher Education Compact held a conference on higher education and economic growth.

Materials presented at the conference are available at www.chicagofed.org/news_and_conferences/conferences_and_events/2006_higher_education.cfm.

To begin the conference, Michael Moskow, Federal Reserve Bank of Chicago, noted that the Midwest's higher education institutions represent a primary asset to the region's economy, providing highly skilled human capital and research and development potential for new businesses and technology transfers. While other economic actors have an increasingly global perspective and less direct interest in the local economy, higher education is being asked to fill new roles regionally.

Would a direct economic development mission compromise traditional roles of higher education in teaching and research? Moskow noted that interaction between business and higher education has been uneven and that many of the roles higher education is being asked to fill (such as providing business strategy and consulting services) are already offered by private consulting firms. Moskow asked the following three questions. Are there barriers here that limit business-university engagement? For instance, intellectual property rights are often seen as a contentious issue between private firms and universities. Is there an inherent tension between higher education, whose mission is to disseminate knowledge broadly, and industry, with its goal of capturing proprietary knowledge to gain competitive advantage? Finally, will

the needs of business firms be better served by consultants than by universities trying to provide consultant-like services?

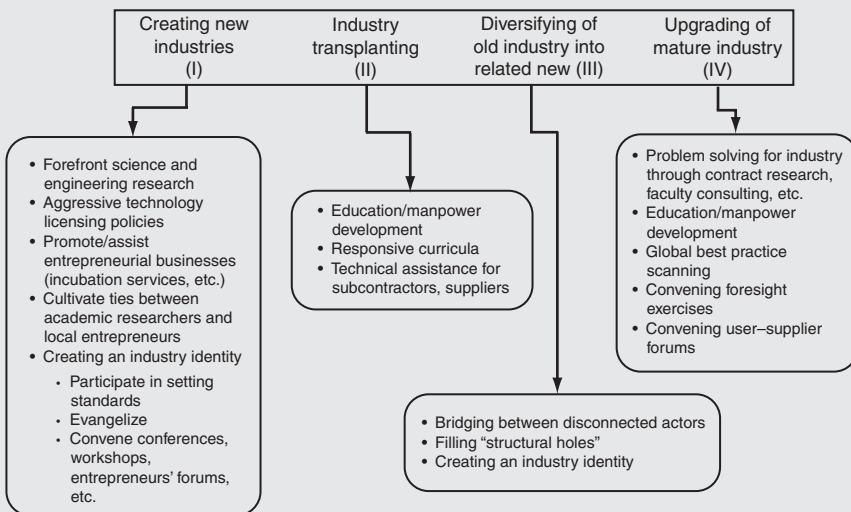
A framework for higher education's role in economic growth

Richard Lester, Massachusetts Institute of Technology, presented his work on a multi-year study conducted by an international consortium of universities that addressed university involvement in local economic change. Lester found that the "one-size-fits-all" approach to economic development does not always work well in real-world scenarios. The common approach that focuses largely on patenting, licensing, and forming new businesses needs to be replaced with a more comprehensive and differentiated view of higher education engagement. This specifically means aligning the universities' contributions with what is happening in their respective local economies.

Lester's model suggests four dimensions of economic transformation, ranging from creating new industries to retooling existing firms. Each type of economic transformation has a specific strategy for university involvement (see figure 1).

In Lester's view, this strategic approach to local economic development is fully compatible with the university's primary missions of education and research.

1. University roles in alternative regional innovation-led growth pathways



SOURCE: Richard K. Lester, 2005, "Universities, innovation, and the competitiveness of local economies: A summary report from the Local Innovation Systems Project—Phase 1," Massachusetts Institute of Technology, Industrial Performance Center, Local Innovation Systems Project, working paper, No. 05-010, December 13, available at <http://web.mit.edu/lis/papers/LIS05-010.pdf>.

Case studies

Michael Luger, University of North Carolina–Chapel Hill, described the university's Center for Competitive Economies, which aims to apply its resources to problems of economic development, mostly within North Carolina; to use the university outputs to improve business decision-making and government policy related to economic development; and to coordinate and publicize ongoing economic development activities on campus and with other campuses, state agencies, and economic development organizations.

The center developed a series of metrics for success that include the abilities to attract external funds, to produce publications and conference speeches, and to demonstrate an effect on policy and visibility leading to respect at the state capital and beyond. The center has taken on several projects, ranging from strategic economic development plans to analysis of specific legislation.

Luger cautioned that the center's clients are often more interested in having the university's name on the report than in the actual content of the report. Clients are often reluctant to pay for academically rigorous work. Similarly, business clients often want the work to be proprietary, which is at odds with the center's mission

of disseminating findings. Public sector leaders are unlikely to be enthusiastic about work that is critical of current policies, and this can erode support for the center. Finally, applied centers tend to have an uneasy relationship with the rest of the university. Luger felt that this could be improved if the center employed full-time tenured faculty rather than adjunct faculty.

Sean Safford, University of Chicago, focused on the role of higher education in transforming mature and declining industrial economies in Akron, Ohio, and Rochester, New York. In Akron, the tire industry was in rapid decline. In Rochester, traditional chemical-based photography was being challenged by digital imaging. In both cases, the local universities were looking to diversify an existing industry into a related new industry.

In Akron, the university invested heavily in the study of advanced polymers, the building blocks of the synthetic rubber used in tire production. In Rochester, the emphasis was on photo-optics. Safford concluded that the latter effort was more successful because it had focused more on deepening the social capital of the region. Indeed, Safford demonstrated that a dense communication node had developed in Rochester, suggesting that

university–business–community interaction was richer there than in Akron. He argued that universities are best able to expand their roles when they serve as "forums" for social connection rather than as "fountains" of specialized knowledge.

Larry Isaak, Midwest Higher Education Compact, discussed an effort to transform North Dakota's higher education system that began in 1998, when the state faced a struggling economy and out-migration of population. The higher education system was not considered a player in the state's economic future. To reverse this, the state commissioned a legislative study, centered on a broad-based higher education roundtable. The roundtable was to develop expectations for the North Dakota University System (NDUS), an accountability system aligned to these expectations, and a funding methodology.

The message of the roundtable's private sector participants was that the NDUS needed to be more progressive and entrepreneurial. Universities need to lead, but they also need to be held accountable. Isaak explained that as a result of this effort, the state's university system is now seen as a critical component to achieving a stronger economy. The NDUS's enrollment and assets have grown significantly: Enrollment grew more than 24% from 1999 to 2005, and assets rose from \$60 million to over \$100 million.

Stefanie Lenway and Rod Shrader, both of the University of Illinois at Chicago (UIC), described using entrepreneurship as an economic development tool. A program at UIC allows students to develop business plans to raise funds for new products. This exposes students to all aspects of business planning, including marketing, financing, and analyzing market potential. Lenway stressed that producing skilled entrepreneurs for the local economy can generate a significant local advantage.

Brian Fabes, Civic Consulting Alliance, spoke about the potential of community colleges to contribute to economic development. Community colleges educate nearly half of all undergraduate students, and their student populations tend to stay in the local community. In addition, community colleges have clear missions in work force development and adult

education that are less likely to be filled by other educational institutions.

Fabes suggested that community colleges need to better align their entrance and exit requirements. Too often, incoming students require extensive remediation to prepare them for college-level work. High school coursework needs to certify that the student is ready for a college curriculum. Similarly, community college courses should be as rigorous as courses at four-year colleges so that credits can be transferable to a four-year college. Furthermore, Fabes argued that community colleges should focus on measured outcomes. These colleges often lack financial resources. To attract more revenue, they need to demonstrate that their coursework and programs make a difference and represent a wise use of public dollars. Fabes noted that a Chicago community college had recently won a National Science Foundation grant. While this is impressive, Fabes said that if community colleges try and move “upstream” (e.g., by taking on a research mission) they may lose focus on the missions that differentiate them from other higher education institutions.

What does business want from higher education?

Arthur Rothkopf, U.S. Chamber of Commerce, stated that business wants graduates who can read, write, and speak intelligently; solve problems; work collaboratively; understand math and science; and possess a good work ethic and professional attitude. The problem is a failure of the education community at all levels to produce these kinds of future employees.

Rothkopf suggested that dealing with this requires some urgency. Seventy-seven million baby boomers (the most educated population segment) are poised to retire. American competitiveness and productivity require that students be able to master key skills, and yet studies by the ACT (American College Testing Program) have found that roughly half of students applying to college have substandard reading, writing, and math skills. Rothkopf suggested that the cost of this failure to society and business is high. Over 40% of all college students end up

taking at least one remedial course at an estimated additional cost to taxpayers of \$1 billion. According to the National Assessment of Adult Literacy, 69% of college graduates are not proficient in prose literacy, and a Conference Board study found that 40% of high school graduates hired by firms were not ready for work because of inadequate reading, writing, and math skills. This forces businesses to spend billions of dollars on remedial education for employees beyond the normal expense of training employees for their jobs.

A particular gap is opening up in the fields of engineering and computer science, and highly skilled immigrants are increasingly needed to fill this gap. Rothkopf suggested two strategies to help in this area. The first is a business initiative to double the number of science, technology, engineering, and math graduates in the U.S. by 2015. The second is to increase the number of H-1B visas granted to highly skilled immigrants significantly beyond the 65,000 per year currently permitted. The industry demand for these workers is so high that applications for these visas are currently exhausted within the first two months of each year.

The role of intermediaries

Randy Eberts, W. E. Upjohn Institute for Employment Research, suggested that intermediaries might be necessary to maximize the benefits of university–business interaction. Intermediaries can play useful roles in technology transfer and education, since there are clear differences in motivation between university researchers and firms. In the university, the researcher is driven by a desire to discover new knowledge and motivated by peer recognition. For the firm, the commercialization of new technology and the financial gain through a proprietary technology matter most.

What kinds of intermediaries have been established to bridge this gap? First, government legislation established the land-grant university system (Morrill Act of 1862) and, more recently, a uniform patent policy for federally based research (Bayh–Doyle Act of 1980). Such legislation has encouraged the creation

of government intermediaries, including the National Institute of Standards and Technology, the Advanced Technology Program, and the Manufacturing Extension Program. In addition, Industry–University Cooperative Research Centers have created small academic centers dedicated to technology transfer. Other examples include Partnerships for Innovation, Independent Technology Intermediaries, and University Technology Transfer Offices, a prime example of which is the Wisconsin Alumni Research Foundation.

The other role for intermediaries is in education and work force development. Eberts noted that school–business partnerships, advisory committees, cooperative education programs, and customized training all have a role. For example, the Michigan Regional Skills Alliance has focused on work force issues facing firms operating in a specific sector in distinct geographic regions.

How do higher education leaders see their role?

Gary Fethke, University of Iowa, noted that the university only receives 15% of its budget from the state, and state money is increasingly being earmarked for particular programs, such as the life sciences. For Fethke, the key issue is

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whether the university would distribute its resources in the same way if it weren't forced to do so.

The primary relationship of any university to the economy is through the production of skilled workers. In the University of Iowa's case, 60% of its resident liberal arts and business undergraduates are employed in Iowa after graduation. Even higher percentages of resident students with other majors, such as engineering, are employed in-state after graduation. Fethke also pointed out that the university has a clear advantage in educating aspiring entrepreneurs, assisting in the commercialization of innovations, and evaluating public policies that can increase the competitiveness of the state.

Victor Lechtenberg, Purdue University, suggested that Purdue is responding to the economic development needs of Indiana by aligning itself institutionally to be more responsive in teaching, discovery, and engagement; identifying local targets of development opportunity; and emphasizing outreach. This has led to university goals in economic development, K-12 education, service learning (where Purdue students are expected to give back to the community), and continuing education and lifelong learning.

Purdue's economic development tool kit consists of the following four components: manufacturing extension, the Purdue Research Foundation, the

Discovery Park/Entrepreneurship Center/Center for Regional Development, and corporate partnerships. Lechtenberg argued that this strategy allows Purdue to align itself with the economic needs of an Indiana economy that is still struggling with a reliance on mature manufacturing firms.

Lou Anna Simon, Michigan State University, suggested that economic development is best thought of not as a separate mission but as part of a larger holistic mission of land-grant universities. Simon noted that land-grant schools are dedicated to democratizing knowledge by ensuring access for all levels of society. She suggested that the land-grant mission is different from other universities' missions because, by design, land-grant institutions are interested in the breadth of knowledge and its interdisciplinary application.

Simon noted that many higher education institutions are preoccupied with reputation and rankings. She suggested that universities can often be most effective in supporting local economies when they contribute to tools that don't show up in ranking studies. Holding conferences, serving as a public forum, and encouraging the free flow of ideas are vital to economic transformation but rarely increase the reputation of the school. According to Simon, Michigan State views itself as a "global grant" institution, which helps Michigan residents and students become successful in a global economy.

David Chicoine, University of Illinois, suggested that economic development begins with producing highly educated individuals and that the clear challenge is the need to increase the number of graduates. Access is an issue, and the university is currently starting an online "global campus" initiative to reach students who can't attend one of the system's three campuses. In addition, Chicoine suggested three other roles for the University of Illinois: facilitating knowledge creation, promoting the land-grant/public service mission, and focusing on commercialization. To accomplish these goals, the university has to create new institutions and be willing to serve as an intermediary.

Universities can also aid in economic development, Chicoine said, by taking the longer view. Much of economic development takes place over a long cycle, and universities are able to provide leadership that is not tied to an election cycle or a short-term agenda.

Conclusion

Higher education has always played a large role in the economy as a producer of human capital and as a center for research and development. Adding a third explicit expectation that higher education support regional and local economic growth has clearly had its successes, but it remains to be seen whether all higher education institutions should embrace this engagement mission.