

SPECIAL REPORT -- UNIVERSITIES EMERGE AS AN IMPORTANT CATALYST IN THE NEW BUSINESS DEVELOPMENT PROCESS

Venture capital, once thought of only as a high stakes, high rollers game, is being perceived more and more as a panacea to the nation's economic problems. In many areas without local venture capital, a key concern has become how to attract venture capitalists to actively invest in the area or, better, to locate there in order to spur new company formations.

Although many in the public sector concerned with economic development believe that local venture capital sources must be developed, analyses by Venture Economics show that there is no necessary correlation between the amount of venture capital being managed in a region and the share of nationally available venture capital that entrepreneurs in that region attract. For example, entrepreneurs in Illinois received only 1.2% of the venture capital disbursed in 1982 despite the fact that, at mid-1982, 12% of the nation's venture capital was being managed in that state. Nor have significant increases over the past few years in the amount of venture capital being managed in Connecticut led to proportionate increases in venture investment activity there.

Others, mainly in the private sector, citing states such as Colorado and Washington, argue that venture capital is drawn into new areas as entrepreneurs emerge. While this is to a varying extent true, the Northern California experience does suggest that more entrepreneurs "come out of the woodwork" when they perceive numerous sources of seed and startup capital.

While the absence of local venture capital can mean opportunities to develop new companies are lost, its presence is not of itself enough. Other ingredients for a fertile new business development climate include: a fiscal, regulatory and political environment supportive of new enterprise development; a business community familiar with the problems of rapidly growing young companies; major corporate and government R&D centers; a skilled labor force; technical and professional services; and commercial banks experienced in lending to non-traditional firms.

The relative significance of each of the above-listed ingredients may be debated but it is increasingly hard to escape the conclusion that universities are playing a key role as catalyst in bringing all these factors together to enhance the new business development process.

Analysis of the Route 128 and Silicon Valley phenomena have led many, and rightly so, to the conclusion that MIT and Stanford made a significant contribution to the development of these two regions. That these technically oriented universities had the benefit of large federally funded R&D programs should not mask the fact that it was a few entrepreneurially oriented faculty (like Terman of Stanford who lured Packard back to work with Hewlett) that made it happen.

As awareness of the MIT and Stanford contributions heightens, numerous universities across the country are becoming increasingly involved in a wide range of activities to stimulate the new business development process and entrepreneurial activity in their region. VENTURE CAPITAL has observed five different ways in which universities are making an impact:

1. Education and Training
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3. Incubator Units/Science Parks
4. Technical and Management Assistance to Entrepreneurs and Investors
5. Indirect and Direct Investing

Education and Training

Universities are increasingly providing education and training for entrepreneurs through entrepreneurship programs. "The professor's role is to ignite the entrepreneurial spirit," says Albert Shapero, professor of private enterprise at Ohio State. Karl Vesper at the University of Washington has been active for many years in promoting entrepreneurship studies. Surveys he conducted indicated that in 1969 fewer than 10 colleges and universities offered entrepreneurship courses. That number grew to over 200 by 1980 and has more than doubled since. Each year a conference is held at Babson College which brings together leading educators in the field in an attempt to further improve entrepreneurship education.

Last year two leading venture capitalists, Arthur Rock and Fayez Sarofim, recognizing the importance of the universities' role in entrepreneurship education as well as technological innovation, endowed a chair at the Harvard Business School devoted to the creation and management of new business ventures.

In addition to their programs for full-time students, many universities offer courses and seminars on various aspects of business development including how to raise venture capital. *VENTURE CAPITAL* is co-sponsoring two dozen seminars this year on raising venture capital about half of which are co-sponsored with universities and institutes of technology. These include Carnegie Mellon, Case Western Reserve, Duke, George Mason, Georgia Tech, Northeastern, Ohio State, Rensselaer Polytechnic Institute (RPI), University of North Carolina System, the University of Tennessee-Knoxville, and the University of Texas at Austin. Interest in sponsoring these seminars has been expressed by a number of other universities as well. What is intriguing is that, within these universities, the co-sponsoring entity varies. In some cases, it is the business school or engineering department but also included are a patent office, the treasurer's office, the continuing education department, and an advanced technology development center.

University-sponsored courses and seminars are helping create the understanding and support required to foster new business development, particularly where universities are making the effort to involve professionals within their communities -- lawyers, accountants, commercial bankers, consultants, economic development officers -- in these activities as well as entrepreneurs and inventors.

For example, The University of Texas at Austin's Chair of Free Enterprise was established in 1976 to encourage the development of relationships between the academic programs of the University of Texas and government, industry, and other educational centers in the United States.

R&D Providing the Technology Base for New Ventures

Universities, through the research and development undertaken by their faculties, provide the technological base for many new ventures founded by entrepreneurs and backed by venture capitalists.

Stronger linkages between R&D centers in the academic world and those in government and industry, active patent licensing programs and more industry-sponsored research at major universities throughout the country are all contributing to the commercialization of innovative technologies. Industry is continually looking to universities and colleges for new ideas and is, in turn, offering much needed financial assistance to universities which are then able to improve research facilities and develop new research centers.

Although it has been the policy of many universities to conduct only basic research, the increasing collaboration of university researchers and business is encouraging more applied research leading to more technology being developed and successfully commercialized. The willingness of MIT and Stanford to allow their faculty members to exploit the business potential of R&D conducted within their walls and work with the business community was a critical factor in making Route 128 and Silicon Valley the meccas for new technology which they have now become.

Cooperative R&D centers are springing up across the country at many major universities: e.g. Carnegie Mellon (robotics), Case Western Reserve (applied polymer), MIT (manufacturing and productivity), North Carolina State (communications and signal processing), Ohio State (welding research), Research Triangle universities (microelectronics), RPI (interactive computer graphics), Rutgers (ceramics research), Stanford (integrated systems), University of Massachusetts (polymer research) and University of Rhode Island (robotics). This research is often geared toward problem solving, may include collaboration with industry researchers and gives industry timely access to research results.

The Washington Research Foundation in Seattle was set up in 1981 to assist in the patenting, licensing and transferring of technology from Washington state's universities. Similar programs are in existence at a number of other universities.

Case Western Reserve also has a new program called "Quest for Technology" operated jointly with Control Data. Faculty members are given the opportunity to present any patents they hold for potential commercialization. Control Data is currently analyzing the first 40 nominations and is expected to work with those they believe commercially viable.

Incubator Units/Science Parks

Startup companies in some areas are also discovering a haven in university "incubator" facilities. Although the incubators vary in terms of the services they provide, generally, in addition to low cost space, the startup company is offered access to a ready work force from the student population, faculty skilled in advising on technical and managerial problems, and laboratory, library, computing and office service facilities.

Such facilities are located, for example, at Georgia Tech and RPI. RPI describes its incubator program as "the creation of an interactive environment between industry and education . . . where technological companies of tomorrow can develop and grow, honing their technical and entrepreneurial skills in an environment rich in the knowledge necessary to bring innovative ideas to the marketplace."

The University City Science Center in Philadelphia, a joint venture with 23 colleges and universities founded 16 years ago, has one of the oldest incubator facilities. Pennsylvania's recently created Ben Franklin Challenge Grant Program will help fund four additional incubator centers: one is being developed near Carnegie Mellon and the University of Pittsburgh and another at Lehigh University.

In 1978, the National Science Foundation awarded a grant to the University of Utah to set up the Utah Innovation Center as a facility to house fledgling companies. When NSF funding was terminated in 1981, the program was continued as a private enterprise which maintains close university ties.

Science parks or research parks, as they are sometimes called, are generally located near universities and offer another link between universities and industry. The objective of these parks is to attract both R&D and/or manufacturing operations of established technology-based companies, and new businesses from inside and outside of the state. The parks facilitate collaboration between the university and industry which can result in increased technological innovation.

Probably the most well-known such area is Research Triangle Park (RTP) in North Carolina located near North Carolina State University, Duke University and the University of North Carolina. RTP was established in 1956. Although its companies and research facilities employ close to 20,000 people, it has generated very few spinoffs. Local communication networks between entrepreneurs and support people are undeveloped and there has to date been no locally based venture capital. Recently the three universities and the local chambers of commerce, (particularly the Durham Chamber) have set out to address the issues of entrepreneurial education, support and the provision of venture capital. Support from the venture capital industry could have a significant impact on how rapidly this area develops.

More than 18 states have or are in the process of setting up similar though smaller science parks with local university support.

Technical and Management Assistance to Entrepreneurs and Inventors

Although there are only a few universities with formal incubator space, many universities are actively involved directly, or through their alumni associations, in programs designed to provide assistance to new and growing businesses. The MIT Enterprise Forum, sponsored by MIT's alumni association, meets regularly to review and comment on the business plans of entrepreneurs. A special "Incubator forum" focuses on very early stage companies which make presentations to a panel consisting of entrepreneurs, attorneys, CPAs, venture capitalists and members of the financial community. The entrepreneur poses a problem which the panel and audience can comment on. The Forum also conducts seminars on various topics related to business development; its Chicago branch is co-sponsoring a "How to Raise Venture Capital" seminar with VENTURE CAPITAL this fall.

Baylor University's Hankamer School of Business, among its other activities aimed at preserving free enterprise and the entrepreneurial spirit, has an Innovation Evaluation Program. The program is designed to satisfy the need of the inventor for an objective evaluation of the commercial feasibility of an idea or invention and to provide guidance in its commercialization.

Case Western Reserve's Business School operates an innovation center which, in addition to conducting numerous seminars designed to educate and assist entrepreneurs and the community, will soon have three graduate students available to help new businesses with such things as strategy development and business plan preparation. The Center also provides advice and guidance in selecting professionals such as attorneys and CPAs and will introduce entrepreneurs to venture capitalists.

The Pittsburgh Enterprise Corporation, a joint effort between Carnegie Mellon and the University of Pittsburgh, operates as a conduit between university, industry and government to foster new business development. The Center has been instrumental in supporting and securing funding for a number of successful startup companies, one of which was Tartan Laboratories which received several rounds of venture capital financing.

Bringing these new ideas to the marketplace is the ultimate goal of the university incubator programs and university outreach programs. These universities have strong ties with the business and financial communities and work hard to help launch these companies nurtured within their walls or developed with their advice and counsel.

Strong ties with the venture capital community is an objective of many universities. Where there are local venture capitalists, the universities develop relationships with them. Where there are no local venture capitalists, universities have made efforts to attract the interest of venture capitalists outside the area to make investments there or to start new local funds or branch offices.

The American Electronics Association (AEA) seminar format, which brings venture capitalists and other investors together to listen to presentations by entrepreneurs, has been adopted by some universities. Georgia Tech has concentrated the efforts of its Advanced Technology Development Center on bringing together promising new local companies with venture capital investors across the country. Its Continuing Education Department has been operating such a conference for the past four years and will conduct its fifth annual seminar in October. RPI conducted a similar conference in May and Southern Methodist University will sponsor one in the fall. In June, Georgia Tech sponsored its first seed capital conference which will also become an annual university program.

Indirect and Direct Investing

Universities also participate more directly in the venture capital process through investments in venture capital partnerships. To date, universities have invested approximately \$350 million in partnerships, of which about \$290 million was invested since 1980. Some of the more active investors include Boston University, Carnegie Mellon, Harvard, MIT, Stanford and Yale, although there are a number of other universities such as Dartmouth, Duke and Notre Dame which have made commitments to venture firms.

Some universities will make direct investments in companies, usually either along side their venture capital partners or occasionally in companies which have spun out from the university's laboratory or research center. These universities include Boston University, University of Chicago, Grinnell College in Iowa, Harvard, Lawrence University in Appleton, Wisconsin, The University of Notre Dame, University of Rochester, RPI, and Stanford. Michigan Tech recently formed the first university-funded SBIC, Michigan Tech Capital Corporation. Another mode of involvement is illustrated by Brown University which has recently acquired a minority interest in a spinoff in return for its contribution of technology.

These types of investments are usually made from the university's endowment fund with the capital gain as the objective rather than new business development.

Because the companies spinning out from the universities are often in need of seed capital financing, much discussion is going on among universities anxious to establish seed capital funds, or support the formation of a seed capital fund outside the university with which it can maintain strong ties. Georgia Tech is supporting the formation of a seed capital fund in Atlanta. Carnegie Mellon and Case Western, among others, are contemplating how they might establish one.

The University of Pennsylvania's Wharton Innovation Center recently entered into an agreement with The Seed Company, under which Wharton will assist in the formation and capitalization of a venture capital partnership, provide analysis of

proposed investments and assist in the management of these investments. Since 1980, the Innovation Center has been working with entrepreneurs and technology oriented firms in developing business and operating plans, market strategies and helping to secure financing.

Conclusion

As the universities garner more government and local industry financial support, it is probable that they will expand their efforts toward supporting and funding seed stage companies. They have the resources to nurture fledgling enterprises and, by maintaining close ties to industry and the financial community, they can become more and more skilled in identifying and pursuing the seedlings with the most potential for commercial success.

Much of this activity is relatively new. Until recently, universities had spurned the commercial exploitation of their research, but changes in federal funding policy and the increased costs for research, are forcing them to become more pragmatic. Profits accumulated through these new efforts can then be channeled back to the basic research centers of the universities.

The success of the university research and cooperative commercial development conducted across the country will impact significantly on the U.S.'s response to competition from Japan and Europe. Support from industry and strong ties to the private sector are therefore imperative to focus university research on critical areas. Even more important is the need for collaboration among the universities as well and not let them be too regionally oriented. Competition between areas of strength can stimulate the development of expertise, but, like the venture capital business, niches must be found and exploited to avoid needless competition between states. If regions can concentrate on developing unique resources and expertise and cooperate with others that have a different focus, the end results can be considerably enhanced.

The successes of the Route 128 and Silicon Valley developments were not unrelated. There was cooperation and coordination, even if it was not always recognized as such. Venture capital capabilities developed within these two regional economic infrastructures and often served as a connecting link between the two areas when the resources and expertise of one could help developments in the other. Mayfield, a leading West Coast venture capital firm with close ties to Stanford, was involved with the formation of The Charles River Partnership in Boston, which had a relationship with MIT. Numerous other venture capital firms in both areas were instrumental in establishing working relationships between portfolio companies on both coasts.

University/industry cooperation will continue to foster the development of new technologies and innovative new businesses. The venture capital industry should be one of the beneficiaries of the universities' efforts, so it is incumbent upon more venture capitalists to become involved in helping focus the universities' efforts towards realizing commercial success.

Footnote: There are numerous other universities actively involved in programs such as these and similar programs. It was impossible to mention them all. Our objective was to highlight the emergence and diversity of the initiatives and the caliber of the universities involved.