Innovation and Entrepreneurship

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"The companies that will provide most of the jobs we will need twenty years from now probably don't exist today" -- David Birch

INNOVATION AND ENTREPRENEURSHIP
EXECUTIVE SUMMARY

Summary of Issue

A healthy state and national economy depends on a vital, growing number of innovators and entrepreneurs. Statistics reveal that 66% of all new U.S. jobs in a given year are created by firms with twenty or fewer employees. Small business, especially those in the earliest stages of development are critical future generators of new jobs. These fledgling enterprises with the greatest potential for growth also suffer the greatest losses. Entrepreneurs often fail within the formative stages of growth. 80% of all new businesses do not survive the first five years of operation.

Given the first uncertain years of a small business, how can the state assist in the promotion of new enterprises in Minnesota? Perhaps the most helpful avenue is to create and maintain an environment helpful to small business growth. A clearly defined "infrastructure" is needed to support the flow of new ideas and the successful commercialization of technologies. An environment that will nurture the development of start-up enterprises may be the most effective and useful role for state government. The intent of such a policy would not be to regulate small business start-ups or failures. Indeed, many businesses should be allowed to fail. The purpose of creating an "entrepreneurial environment" is to give innovators the tools that will help them to succeed. Several areas require attention at the initial start-up level. They include financing, support services, research and development, transfer of technology and education.

Major Findings/Conclusions

1. Research and development plays a key role in the creation of new products, processes and services. Educational resources, particularly within major universities, attract entrepreneurs and small businesses to the university community by providing ready access to research and development information and highly trained personnel.

2. There are several obstacles to research and development growth in Minnesota:

    a. Outside the University of Minnesota, there are few state-sponsored research and development resources to serve outstate Minnesota.

    b. Little incentive is given within the University to encourage the transfer of technology from the lab into the marketplace and provide faculty members the means to initiate more independent research activity.

3. Minnesota ranked only 18th among the states on a per capita basis and 17th in a simple ranking of state funds allocated for research in 1981.

4. "Seed capital" financing for early stage research and development efforts is difficult to obtain in Minnesota.

5. There is little cooperation or coordination among the wide variety of small business support services in the state.

6. State funded economic development programs are rarely required to measure the number of jobs created, or the success or failure of the initiative.

7. There is no formal planning and review mechanism within state government to identify state research and development needs.

8. Few young people are encouraged or guided into entrepreneurial opportunities. Although this pattern is slowly changing, the prevailing attitudes dismiss small enterprises in favor of larger companies.

Recommendations

1. Create a State University System Applied Research Fund (1985). Funding: $900,000 plus private sector match.

2. Create a Minnesota Innovation Fund. Funding: $1.5 million (1985), $4.0 million, 1986 (depending on the success of the 1985 program).

3. Initiate a program within the Small Business Assistance office of the Dept. of Energy and Economic Development to coordinate more closely the variety of small business assistance and support services in the state. The Center should work with the Lt. Governor's Office and the Governor's Council on Innovation and Entrepreneurship to increase visibility and coordination (1985; $100,000).

4. Measure more closely the present and proposed state funded economic development programs, especially those related to small business development.

5. Continue to promote and expand the efforts within the elementary, secondary and post-secondary schools to encourage greater awareness of the opportunities provided by entrepreneurship and small business.

6. Develop a capacity within state government to plan for the research and development needs and capabilities of the state agencies and review requests for research and development funding from the University and state universities.

7. Increase the portion of overhead funds received under federal research grants to the University: Funding: $2 million for 1985; $4 million for 1986.

Background

Previous efforts to assist entrepreneurs have been hindered by a lack of knowledge of the importance of small business and the ingredients necessary to innovation success. Just recently, the job creation potential of small business was documented. More importantly, a distinction has been drawn between the needs of start-up, high growth operations and older, more established small business enterprises. The two categories clearly have different needs as they move from the "idea stage" through to third or fourth round financing for expansion. Different obstacles and opportunities are found at each stage in the growth of small enterprises.

The development of these issues, especially the importance of specific areas critical to start-up growth will be addressed in greater detail by the Governor's Council on Innovation and Entrepreneurship. Chaired by Carol Pine, Pine and Mundale, and assisted by the Lt. Governor's Office and Minnesota Wellspring, Commission members will present recommendations in the areas of financing, support services and education and training by November, 1984.

The Issue Team on Innovation and Entrepreneurship was created in January of 1984 and charged with: "identification of programs through which government can assist in the promotion of new ideas, research and development, innovation and entrepreneurship and improved access to the small business innovation research grants (SBIR) of various federal agencies." Team members concentrated on the initial "start-up" phase of small business, including the research and development sector that is responsible for the creation of new ideas.

The team's approach centered on a comprehensive review of existing and proposed programs and identification of weaknesses in the state's "entrepreneurship" policy that require attention. During this process, several key elements were identified as important to a future policy agenda. They include financing, research and development, transfer of technology and educational opportunities.

Teams members include:

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Findings and Conclusions

1. Research and Development

The most critical investment in both the eduational and economic development infrastructure are funds dedicated to research and development. Basic discoveries in all educational fields widen our knowledge, bringing new dimensions to the learning environnment. Research and development breakthroughs also give us the opportunity to use the results to develop new products, proceeses or services. Entire industries have formed around such basic discoveries as the design and construction of the point-contact transistor, the correct description of the DNA molecule and the ability to induce genetic mutations.

Colleges and universities with significant research and development resources have become centers of innovation. Small businesses and entrepreneurs have based their operations near these research generators to receive not only vital information, but to draw upon the highly skilled labor force educated by the universities. Examples such as Silicon Valley and Route 128 in Boston illustrate the economic development activity fostered by superior educational research institutions. A study by the Joint Economic Committee revealed that a primary locational factor for many fast growing companies was a major research university in close proximity to the proposed work site.

Several obstacles to greater research and development opportunities are evident in the state of Minnesota. Outside the University of Minnesota, few state-sponsored research and development programs exist to serve outstate communities. A number of applied research programs with significant regional potential have been identified in the state universities. They include programs in peat development, sugar beet processing and film processing. However, because of a limited applied research priority in the SUS, faculty are not encouraged to adequately pursue these projects. Likewise, the resources and incentives within the University of Minnesota for technology transfer and basic research are few. There is little encouragement either in faculty time or salary adjustment to pursue research projects.

According to a 1981 survey of state funds allocated for research, Minnesota ranked 18th on a per capita basis and 17th on a simple ranking of the 50 states. While the rankings are not below average, it does indicate that sixteen other states allocate significantly higher amounts to research and development efforts than Minnesota. They include Texas, North Carolina, Alabama, Wisconsin, California and Lousiana.

An additional difficulty encountered in Minnesota as well as many other states is the lack of coordinated information on state funded research programs. An integrated process of planning and budgeting for research within state government is a rare occurence. Given the amount of money spent on research and development (states range from $1.0 to $43.0 million) little is done to account for specific expenditures, trends or future needs.

Financing

Several gaps in financial support were found in the course of our evaluation. According to the Minnesota Commission on Small Business Innovation Research Grants, "start up capital has traditionally been very difficult for small businesses to obtain." The difficulty in acquiring seed capital was recently addressed in an article in Venture Capital Journal, which stated: "with few exceptions, the emphasis of professional venture capitalists remains on the application of technology developments into productivity improvements in commercially viable markets, not the support of new scientific and technological breakthroughs." Plenty of funds are available for the attractive, established small companies, but not for the more risky, start-up ventures.

A program at the federal level encourages small business development through greater access to start-up financing. The Small Business Innovation Research Grant Program (SBIR) authorizes federal agencies to set aside a portion of their research and development contract budgets for small businesses. The funds allocated for this purpose were recently boosted to $450 million annually. Grants are available to qualified small businesses through a three stage financing arrangement.

Support Services

An additional difficulty encountered by many small businesses is the myriad number and scope of small business assistance programs and services. Unfortunately, there is little evidence of cooperation or coordination among these organizations that enables a smooth flow of information to the people who could use their services. The Small Business Assistance Office in the Department of Energy and Economic Development does a fine job of publishing a small business assistance journal. However, no one is responsible in state government for actively matching needs to available resources or generating an ongoing statewide information network.

Education

The educational infrastructure is important to the future health of the "entrepreneurial economy". Few young people are encouraged or guided into entrepreneurial opportunities. Although this pattern is slowly changing, the prevailing attitudes dismiss small business in favor of larger companies. Students in both elementary and secondary schools are gradually learning of options that encourage risk taking and individualistic expression. School-business partnerships are helping to foster greater knowledge of small business as well as the larger corporate world.

Several programs are in place in post-secondary institutions that have recently opened the door to "entrepreneurial" ventures. The University of Minnesota's Strategic Management Institute, the Community Colleges and AVTI's have started and maintained programs in small business development, management and innovation. A special entrepreneurial program for students at Macalester College was started in 1983. The programs in both secondary and post-secondary institutions focus on specific entrepreneurial skills, higher order thinking and problem solving skills, as well as "attitude teaching", which encourages leadership and individual creativity.

Recommendations

1. Create a State University System Applied Research Fund.

Minnesota has only one major research university. An untapped, economic resource that could benefit other parts of the state is the State University System. Expanding applied research activity to include Bemidji, Moorhead, Mankato and other regions could serve as a much needed local catalyst for small business development and job creation.

The intent of the proposal is to:

1) Match specific business research needs with the strengths and resources available at a particular state university. This "partnership" approach will link specific economic needs to research resources.

2) Focus on applied research efforts, leaving basic research opportunities to the University of Minnesota.

There are a number of applied research efforts underway at the state universities that have commercial value to local entrepreneurs or businesses. Examples of partnerships that could be implemented soon include a cooperative program of chemical research between the American Crystal Sugar Company and Moorhead State University, and a peat evaulation laboratory to conduct research in extraction production processes and chemical physical analysis of Minnesota peats by Bemidji State University and three companies in Baudette, Alexandria and Gilbert.

An Applied Research Fund of $1,200,000 would be required for F.Y. 1985. $900,000 of this fund would be appropriated by the state legislature while the remaining $300,000 would be raised by private sources. Funds for specific research proposals will range from $25,000 to $175,000, depending on the type and scope of research activity required.

2. Create a Minnesota Innovation Fund.

A Minnesota Innovation Fund can enhance the federal set-aside of research and development funds for small business (SBIR program) and finance research in areas where the state has a particular interest. Funds would be made available for:

a. Early stage research and development efforts that require seed capital financing. These funds would be targeted to non-SBIR recipients. Initial funding up to $50,000 should be provided.

b. "Bridge" financing for Minnesota businesses receiving SBIR monies. Up to $150,000 should be made available for Phase II participants provided there is a commitment for private sector financing and based on successful performance of Phase II.

Preference should be given to projects that meet several criteria. First, proposals must demonstrate the ability to create a viable business resulting in a reasonable number of jobs. Second, proficiency in idea development and innovation must be demonstrated. The "Innovation Fund" is designed to encourage the creation of entirely new products or processes. Third, proposals must recognize the needs and opportunities of their surrounding communities.

$1,000,000 should be appropriated to the Innovation Fund for 1985, with $4,000,000 appropriated in 1986 based on the success of the 1985 program. Project funding should be viewed as a grant and not obligate the grantee to repay the amount in the event of innovation failure. However, successful projects should repay the monies through a royalty that would cease once payments have been made equaling three times the amount of the initial investment. Consequently, if one third of the projects are successful, the fund will replenish itself over time and not require additional appropriations. Funding decisions would be assisted by the Minnesota Cooperation Offices functioning throughout the state. Administration of the program should be provided through the Minnesota Energy and Economic Development Authority.

3. Expand the Small Business Assistance Center within the Department of Energy and Economic Development.

A comprehensive clearinghouse for information on all programs of small business assistance is required at a central location. The Center should be responsible for marketing these programs and coordinating a vigorous public awareness campaign. The Governor's Council on Innovation and Entrepreneurship, chaired by Carol Pine and the Lieutenant Governor's Office could provide the necessary statewide network to lend visibility and a higher profile to the small business programs. A resource that would further communication and coordination would be the creation of a "small business information" network available through computer and similar to other data banks. This recommendation could be accomplished by Executive Order, directing the Small Business Assistance Center to re-allocate existing resources to this activity, or by legislative appropriation ($100,000).

4. Measure the results of state funded economic development programs.

All present and future programs receiving state funds pertaining to small business or economic development must include provisions to measure the success or failure of the program. State government should be willing to experiment with new directions, while at the same time, recognize failures that should be eliminated. Our resources must be focused on programs that provide the greatest return on our economic development investment.

5. Allow the University of Minnesota to retain a greater portion of funds received under federal research grants for indirect costs.

In 1983 the Legislature acknowledged the importance of research to the state's economy by allowing the University of Minnesota to retain all funds received under federal research grants for indirect costs in excess of $11.9 million. In 1983-84, the funding retained by the University amounted to $1.1 million. We support the Minnesota High Technology Council recommendation to increase the portion of federal overhead funds returned to the University.

25% of any additional overhead funds should be set aside for the purposes of encouraging the transfer of technology that has already been developed into the marketplace and increasing the research efforts within the University to expand innovation. The amount recommended for this purpose is $1,000,000 for 1985 and $4,000,000 for 1986. The funds should be allocated as follows:

Technology Transfer

a. Proposal assistance for research grants, to enhance the likelihood of winning more grants. Includes up to $100,000 per proposal for the acquisition of equipment (25%).

b. Technology transfer support, including any additional development to prepare existing technologies for transfer (35%).

c. Staff support to facilitate transfers, including outreach (15%).

Research

a. Research pertaining to new ideas identified by Minnesota Project Innovation or other sources relating to the state's economic development (25%).

6. Promote and expand the efforts within Minnesota's elementary, secondary and post-secondary educational institutions to encourage greater awareness of small business and entrepreneurial opportunities.

A number of fledgling programs in small business development and entrepreneurship are gaining currency in Minnesota schools. Efforts must be made wherever possible to support and expand these programs. Especially at the elementary and secondary level we must instill an awareness of entrepreneurial opportunities and advantages.

7. Develop a capacity within state governmnent to review and plan for research and development needs.

The Office of Science and Technology recently issued a report summarizing the need for a central research and development planning and review function within state government. The state's economic development program would be strengthened by this procedure through a long range planning perspective. In addition, an accurate account could be kept of research and development programs receiving state funds.

Sources

1. David Birch, The Job Generation Process, M.I.T. Program on Neighborhood and Regional Change, Cambridge, MA. 1979.

2. Federal Funds for Research and Development; National Science Foundation, Government Studies Group. 1983.

3. Location of High Technology Firms and Regional Economic Development. A Staff Study for the Joint Economic Committee, Congress of the United States. June 1, 1982.

4. Role of the Venture Capital Industry in the American Economy; Hearing before the Subcommmittee on International Trade, Finance and Security Economics of the Joint Economic Committee. September, 30, 1982.

5. Opportunity for Innovation, A Report to Governor Perpich by the Commission on Small Business Innovation Research Grants.

6. Academic Science/Engineering Research and Development Funds; Fiscal Year 1982. Surveys of Science Resources Series, National Science Foundation.