

Building Michigan's Future

Michigan Futures Research Seminar

James Madison College

Michigan State University

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Michigan was the only state in 2005 not hit by a hurricane to experience a net job loss. This is only the most recent statistic in a downward trend Michigan has experienced since 2000. The good news is that although Michigan is losing its competitive edge, it is not too late to reverse this slide and reclaim our position as an economic leader. How does the state create the demand to keep smart people living and working in Michigan? The Michigan Futures Research Seminar is a specially crafted undergraduate initiative at James Madison College in Michigan State University designed to look at the problems of Michigan's economy from a unique perspective and solve the puzzle of creating high-tech, high-skilled, high-paying, and exciting jobs. After conducting extensive research, we were able to create a set of policy prescriptions that will move Michigan's economy into the twenty-first century.

Literature Review

To fully understand where Michigan has gone wrong and what Michigan needs to become economically competitive, we began our research by looking at a number of case studies. We picked cases on the basis of their successful transition from agricultural and manufacturing based economies into high technology and professional service industries. We chose international as well as domestic cases to get a sense of the scale and perspective of successful economic policies. We added domestic failures to our list of cases to highlight policies and problems that states and cities facing similar challenges to Michigan had incurred.

Our plan for analyzing this puzzle began with a selection of twelve case studies, eight of which were economic successes and four of which were economic failures. Within these twelve cases, we used four international successes. These consisted of Chile, South Korea, Ireland, and Singapore. The remaining cases were divided into four domestic failures and four domestic successes. All cases were chosen because of their commitment to economic excellence, high technology, and strong track record of economic growth and job creation. No international failures were used because of the sizeable number of failed economies across the globe would make this imprudent. The analysis of these data sources led us to isolate common traits within each case, and allowed us to draw inferences as to what policies each state had implemented were responsible for its economic growth and high-tech job creation.

International Successes

Ireland

Ireland has transformed itself from an economy struggling to compete with Europe to an economy leading the world in research and development. In 1987, the Irish economy was trapped in high spending, high taxes, high interest rates, and rising debt. Ireland lost 300 million pounds potential tax revenue in 1986 because people shopped outside of Ireland's borders to avoid paying high taxes. In response, Ireland instituted a new duty law that required all travelers to spend forty-eight hours outside of Ireland before they could qualify for duty-free allowances. In 1988, the Irish government provided amnesty for taxpayers and raised more than 500 million pounds in revenue. When the Irish government repeated the granting of amnesty again in 1993, the government raised an additional 260 million pounds of revenue. The Irish government also

waived interest and penalty charges on outstanding debts. In addition, people who start a business in Ireland do not have to pay property taxes for the next ten years.¹

Ireland's Industrial Development Agency (IDA) is a sterling example of effective government. The IDA eases the burden of starting a business by having all necessary forms and applications available online. The IDA has complete autonomy in its ability to provide companies with tax shelters, research and development grants, and answers to questions about the legal system, labor, and taxation. The IDA grants subsidies with long-run goals towards land purchases, factory construction, training, and research and development. These subsidies promote business creation among manufacturing and small-sized industries with less than 50 employees. In 2004, the IDA spent 59 Million euros on redevelopment and strategically located research parks. Enterprise Ireland, a subsidiary of the IDA, is responsible for venture capital and zero-stage funding. Enterprise Ireland doles out 200,000-1,000,000 euros every year in seed financing toward financial, pharmaceutical, and technology sectors.² Cooperative and centralized economic development policies have transformed the Irish economy.

Singapore

We examined a number of factors that contributed toward Singapore's success in the global economy. The Singapore Economic Development Board has been instrumental in attracting new business to Singapore, as well as facilitating the growth and expansion of existing firms. In fact, startups in Singapore can be successfully completed in under 8 days, and only require one phone call to obtain everything necessary.³ Streamlining the process to get a business up and running has drastically improved the business environment. In conjunction with

¹ Ray MacSharry, former Minister for Finance 1982, *The Making of the Celtic Tiger*, Dublin: Mercier (2000) pp.86-96

² Ireland's Industrial Development Agency. www.idaireland.com

³ Singapore's Economic Development Board. www.sedb.gov

specialized incentive packages, the Singapore Economic Development Board attracted Seagate, one of the largest producers of hard disk drives in the world.

Singapore's government is committed to innovation and growth. For example, Singapore has a \$1 billion fund that provides 100 firms with \$1 million in seed capital every year. Committing \$1 billion in seed capital overcomes the collective dilemma of financing new ventures in high-risk industries. The Singaporean government recognizes that although some firms will fail, the benefit from providing some deserving firms the capital they need outweighs the risk of other firms failing. Other services, such as the provision of configurable facilities, have provided the capability for firms to not only succeed in Singapore, but also flourish.⁴

Finally, a commitment to education and a high skilled workforce has provided one of the fundamental ingredients for Singapore's success in the global market. By providing a highly trained workforce capable of meeting the needs of each firm, as well as a commitment to developing labor for future demand, Singapore's development has extended beyond simple manufacturing and production. Research and development firms all over the world have moved to Singapore to take advantage of its skilled labor force, and the skilled labor force has contributed to the growth and expansion of existing firms. Whether providing subsidies to encourage higher education or training initiatives, Singapore has demonstrated a commitment to present and future worker capabilities.⁵

South Korea

South Korea's ability to overcome party affiliation and bureaucratic inefficiency is a remarkable achievement. Although South Korea has recently suffered an economic setback, it appears that recently the economy has started to achieve the levels of economic growth prior to

⁴ *Ibid.*

⁵ Kai-Sun, Kwong, Chau Leung-Chuen, Francis T Lui, and Larry D Qiu. Industrial Development in Singapore, Taiwan, and South Korea. River Edge, NJ: World Scientific, 2001.

the Asian Financial Crisis. Short of that incident, it is reasonable to expect that South Korea would have maintained its torrid growth rates throughout the 1990s.

From 1961 to 1979, South Korea had its largest period of economic growth. During this time, South Korea's GDP increased by 10% *each year*. South Korea's plan for economic development had four components. First, a comprehensive development plan was intact. The plan focused on development for the entire economy, not specific sectors. Secondly, a coordinated and centralized process implemented South Korea's development plan. An organized bureaucracy was made possible by the third component, a bureaucracy run by technocrats with greater allegiance to their jobs than their political affiliations. Finally, South Korea achieved consistent results in the development plan despite major changes in government leadership.

Chile

Chile is an economy in the midst of transition. In the past, Chile's economy has depended on agriculture to succeed. To foster economic development, the Chilean government has pursued policies and programs directed at creating a high-technology industry in the country. Santiago, Chile is comparable to other cities in Latin American as well as London, Tokyo, and Miami in terms of competitive business costs and high standard of living. Although Chile does not meet the OECD's standard of 19 days to start-up, Chile's 27 days to start-up is superior to the 63 days to start-up of other Latin American countries.⁶

⁶ "In the Eyes of the World" by Foreign Investment Committee http://www.foreigninvestment.cl/index/plantilla2.asp?id_seccion=3&id_subsecciones=80, "Chile has most effective business startup time in Latin America" by Eurochile. http://www.eurochile.cl/prontus/eurochile_i/site/edic/20050603172105/pags/20050628160615.html. "Doing Business: Explore Economies" by World Bank. <http://www.doingbusiness.org/ExploreEconomies/Default.aspx?economyid=41>

In addition to easing the burden of starting a business, the Chilean government has targeted high-tech sectors. The government's Economic Development Agency (CORFO) promotes new investment and provides support to small and medium size enterprises. The agency collaborates with the Foreign Investment Committee to target the investment of high-tech industries in Chile by providing seed capital for business ventures.⁷ Other policies to support small to medium enterprises are financing: lending programs, quasi-capital programs, subsidy programs, technical assistance, technological development, training, and export promotion and partnership. However, these programs have not successfully contributed to the development of small and medium size enterprises.⁸ The Chilean Economic Development Agency and the University of Chile established four research parks to promote technological development. The University of Chile plans to move its research facilities into the research parks.⁹ Although the parks are still in the development stage and much of the high-tech business remains government sponsored, Chile pursuing more policies that create incentives for foreign direct investment and business to flow into the research parks.

Domestic Successes

Austin

Austin's corporate environment as a cluster for high technology firms began in 1967 when IBM moved into Austin. IBM manufactured the Selectric typewriter, and soon after, Texas Instruments moved into Austin in 1969 and Motorola followed in 1974. Currently, Austin has over 400 high tech manufacturers including: Dell, Freescale Semiconductor, Apple Computer, Vignette, Advanced Micro Devices, Intel, Samsung, 3M, and Sun Microsystems.

⁷ "CORFO: Creating opportunities for small business" by International Reports.net
<http://www.internationalreports.net/theamericas/chile/2002/corfo.html>

⁸ Cecilia Alarcon, "Policies for small and medium-sized enterprises in Chile" *CEPAL REVIEW* 74 (August 2001)

⁹ "Future Poles of Technological Development" by Foreign Investment Committee
http://www.foreigninvestment.cl/index/plantilla4.asp?id_seccion=33&id_subsecciones2=7

Austin also boasts a large high skilled labor force and a traditionally lower wage rate. Austin's bureaucratic structure is easy to navigate. Without a state income tax, business tax, or property tax, local governments have the autonomy to negotiate powerful tax incentives to attract incoming firms and retain existing firms.

Boston

Boston's Route-128 is one of the U.S.'s premiere technology corridors. Route-128 is the development of electronics-related companies on the 65-mile highway surrounding Boston and Cambridge in the area's major research universities.

Digital Equipment Corporation, Lotus, and Raytheon are some of the descendents of industrial titans that located along Route-128 in Boston.¹⁰ Industry clustering contributes to Boston's success by its direct effect on new venture product innovation and growth. The prosperity generated from industry clustering unexpectedly leads to geographic diversity of alliance partners and eventual product innovation. We learned from the Route-128 case that the size of the alliance network is not as important as the network's ability to produce product innovations when measuring for economic growth.¹¹

Clustering also creates spillover effects. A portion of the spillover from research and development is captured locally as new companies. Even if spillovers are not captured locally, the benefits from research and development will be captured by firms from other states and countries.¹²

¹⁰ Mackun,

¹¹ Gilbert, Brett. The Implications of Geographic Cluster Locations for New Venture Performance. Indiana: Indiana University, 2004.

¹² Bania, Neil, Randall Eberts, and Michael Fogarty. "University and Startups of New Companies: Can We Generalize from Route 128 and Silicon Valley." *The Review of Economics and Statistics*. 75:4 (Nov. 1993), pp. 761-766.

Chicago

Chicago transformed its economy from distribution and manufacturing to a center for international finance. When a financial crisis hit New York City, the United States turned to Chicago as the model of stability. Cities around the United States envied the public-private linkages that existed in Chicago.¹³ Within ten years, this system had fallen into disrepute. Chicago is a study of transition: partnerships created, then dissolved, and in the process of rebuilding again. In the past decade, Chicago has developed partnerships again among the public and private sectors in order to increase economic development.

Many of the programs aim toward fostering innovation. Under the direction of the Mayor's Council of Technology, the Chicagoland Chamber of Commerce established the Chicagoland Entrepreneurial Center in 1999. The Chicagoland Entrepreneurial Center assists enterprises by connecting them to business accelerators and incubators. Seventy percent of the businesses helped by the Chicagoland Entrepreneurial Center are within the technology industry value-chain. The Chicago government has also enacted policies to compliment business start-up and expansion in Chicago. By combining three agencies into the Department of Business Affairs and Licensing, Chicago reduced the amount of time a business must spend complying with the tax code and regulatory structure.¹⁴

North Carolina

The North Carolina Research Triangle Park is the most prominent of a number of similar institutions scattered through the country, and arguably the most successful. From its inception in 1960, the research park in the triangle area has grown by leaps and bounds. Since the

¹³ Haidar, Donald

¹⁴ Dept. of Business Affairs and Licensing.

<http://egov.cityofchicago.org/city/webportal/portalEntityHomeAction.do?entityName=Business+Affairs+and+Licensing&entityNameEnumValue=147>

attraction of an anchor firm, IBM, in 1965, the park has experienced rapid growth. In just under 40 years, employment at the park has grown from 500 to nearly 40,000. Moreover, the vast majority of these jobs are high skill, high tech, and the salaries of these employees totaled over \$2.7 billion annually.¹⁵

However, this was not accomplished merely by creating a research park and forcing firms to actively seek it out. Instead, the state government made a commitment to fill the research park, and actively campaigned on its behalf to attract anchor firms in order to encourage other firms to follow them into the park. This effort was instrumental in encouraging both IBM and the National Health Institute to open offices in the park in 1965, setting off a period of rapid growth for the RTP. Without this strong leadership and persistent vision, the Research Triangle Park would not have been the success that it is today.¹⁶

Domestic Failures

Cleveland, Ohio

The plight of Cleveland symbolizes of the rest of the rust belt's dependence on industries that have fallen prey to the encroachment of foreign firms that can do the same work for less pay. Still, one characteristic separated Cleveland and Ohio from the rest of our case studies. Unlike many of the other success cases we reviewed, Ohio does not have a well-managed and coordinated economic development agency. In fact, registering a business in Ohio requires 37 phone calls connecting the business owner to various agencies, only to end up at the public library.

¹⁵Statistics obtained from the North Carolina Research Triangle Park website. <http://www.rtp.org>

¹⁶ *Ibid.*

Mississippi

Mississippi's poor economic performance is a systemic failure. The failure of traditional industries in Mississippi has led to a low quality of life and an undesirable place for businesses to relocate. Local governments are notoriously corrupt and public goods are provided inefficiently. Mississippi lacks the infrastructure to attract businesses and capitalize on Mississippi's few valuable natural resources. The labor force is largely unskilled and unprepared for high technology jobs. Similar to Michigan, the Mississippi economy is dependant on the manufacturing industries of the old economy and unable to attract high paying, high technology jobs.

Mississippi's efforts to rebuild have been hampered by the lack of innovative thinking on the part of its bureaucrats and economic development agents. One possible explanation is the lack of political competition. For over a century, the governor's office was held by one party, which resulted in a lackluster set of incentives to develop the state's economy. This, in turn, was partially responsible for old economy thinking that concentrated the state's efforts on complex bureaucracy, status quo-based thinking, and an inordinate focus on tax incentives and old industries. Now, in the dawn of the new century, much of Mississippi's economy still looks like the beginning of the last century.

Camden, New Jersey

The City of Camden, New Jersey went through the same out migration patterns many other cities experienced during the 1950s and 60s. The suburban flow attracted middle class white families and later wealthy immigrant and ethnic populations to the areas surrounding the city. By the 1970s, racial tension consumed Camden and deterred wealth and jobs from entering the city. Disappointingly, Camden has not been able to reverse its economic downslide.

Camden's location near Philadelphia, access to a port, and major university connection through Rutgers give Camden great potential. Still, Camden lacks strong leadership, municipal stability, an educated workforce, and economic incentives to attract businesses into the city. Public officials often have two opposing groups—private business and community groups—that bottleneck potential helpful policies from being approved.

Currently, a third of the population is below the poverty line; 51% have a high school diploma and only 5.4% hold a degree of high education. While the city has stated its mission is to empower its citizens to become educated and find jobs, the city's policies do not focus on retraining and improving education, but take the form of enterprise zones and tax and wage credits for hiring Camden residents.¹⁷ These policies are grossly inefficient; costing on average over \$260,000 per job retained.¹⁸

Other problems in Camden include weakness of the municipal government to monitor the programs and remain credible to their commitments. The city officials fail to curb violent crime. In 2004, Camden ranked first in the country for most violent crime occurrences.¹⁹ The city officials also lack the ability to monitor the success of their programs, making change and progress unlikely.

Pittsburgh, Pennsylvania

Pittsburgh is another city not able to transition its economy from manufacturing to service and high-technology industries. The main issues facing Pittsburgh are high cost to business start-up, lack of public-private linkages and student retention. Similar to Michigan's dependence on the auto industry, Pittsburgh's economy depends on a single industry: steel. The presence of labor unions also adds to Pittsburgh's difficulty in transitioning out of steel

¹⁷ http://www.ci.camden.nj.us/economic/masterplan/SummaryReport_1.pdf

¹⁸ <http://www.ci.camden.nj.us/economic/urban.html>

¹⁹ <http://www.msnbc.msn.com/id/6555449/>

manufacturing. The lack of demand for high-skilled jobs furthered Pittsburgh's economic problems by causing college graduates to leave the city.²⁰ Although Pittsburgh has worked over the past quarter-century to develop a system of public-private linkages to stimulate economic growth with some degree of success, significant obstacles block Pittsburgh's path to economic success. Specifically, attempts to balance corporate interests and working class institutions, such as labor unions and neighborhood activist groups, have been unsuccessful. Any concession made to one party generally incurs the wrath of the other.²¹

Expert Opinions

The roles of taxes, research parks, government capacity, student retention, labor, and investment among others as indicators surface when studying these case studies. Each of these presents complex issues in and of themselves.

We invited guest lecturers from a wide range of fields to help guide our research and enhance our understanding of what drives economic growth.²² These lecturers included business owners, government leaders, heads of chambers of commerce, chemical engineers, researchers at independent think tanks, and economic experts like Charles Ballard, Joan Crary, and George Benson. We learned what they thought mattered for economic development, and we used their expert opinions to narrow our scope.

David Hollister

David Hollister was a state legislator for 19 years and mayor of Lansing for 10 years. Hollister is now the head of the Michigan Department of Labor and Economic Growth.²³

²⁰ Hansen, Susan B., Carolyn Ban, and Leonard Huggins. "Explaining the "Brain Drain" From Older Industrial Cities: the Pittsburgh Region." Economic Development Quarterly 17 (2003): 132-147.

²¹ Jezierski, Louise. "Neighborhoods and Public-Private Partnerships in Pittsburgh." Urban Affairs Quarterly 26 (1990): 217-249.

²² See Appendix A

²³ www.michigan.gov/cis/

Hollister has a three-part strategy for economic growth in Michigan: retention, diversification, and workforce development.

The retention strategy focuses on keeping manufacturing firms like GM, Ford, and Delphi from leaving Michigan. Restructuring the state business tax and implementing workforce training are Hollister's strategies for keeping the automotive manufacturers' consolidations in Michigan.

Creating "jobs for the 21st century" is the focus of the diversification strategy. By using future income from the tobacco settlements, Governor Granholm agreed to earmark programs that focus on life science, advanced manufacturing, alternative energy, and homeland security. Entrepreneurs interested in starting a business in one of the for aforementioned fields can submit a business proposal for final approval in late April, and \$100 million in grants and loans to start-up companies in the four areas will be granted in June.

The workforce development strategy anticipates the shortage in the supply of skilled workers when the baby boomer generation retires. In response, Hollister proposes adding additional high school graduation requirements such as two years of foreign language study. Hollister said his goal is to double the number of people with college degrees in Michigan. To accomplish this goal, Hollister recommended extending the length of public school education from kindergarten through 12th grade by providing an additional two years of community college in the hope of making lifelong learning a part of the Michigan culture.

Hollister also addressed labor issues and taxation. Hollister argued that Michigan has positive labor relations. Remarkably, Michigan has never had a labor strike. When Hollister and Governor Granholm met with executives at Toyota, Hollister said that there was a 70 percent chance Toyota might build a manufacturing plant in Michigan. Hollister also noted that

Michigan is the epicenter of research and development in auto manufacturing. Eighty percent of all automotive manufacturing research and development in the world takes place in southeast Michigan. Hollister asserted that the automotive manufacturing industry is thriving, but not in Michigan. He also stated that Michigan's largest competitors are Alabama and Mississippi.

Restructuring Michigan's Single Business Tax is another of Hollister's priorities. The Single Business Tax is based on a firm's capital, number of workers, healthcare costs, and research and development. In times of prosperity the Single Business Tax raises a lot of revenue for the state, but in bad times the tax makes Michigan's economic situation worse.

Charles Ballard

Charles Ballard is a professor of economics at Michigan State University. Ballard is currently writing a condensed version of Michigan at the Millennium, a 700-page compilation of essays written by economists that looks at Michigan's economy and tax system.²⁴ Ballard gave us statistical information on Michigan's economy and then he shared his views on the direction policymakers should move.

In the 1950s and 1960s, Michigan was an economic powerhouse. The average worker did not need a college education to make a living, only a strong back. Although the productivity of manufacturing has increased over the past fifty years, the demand for manufacturing has also decreased. While real incomes continue to rise, most of the growth is disequalizing. Inequality continues to grow, because most of the growth is in the top quarter of income distribution.

Michigan is above the national average in high school attainment; 87.9% of the population has a high school degree or higher. Michigan is also substantially below the national average in percent of population with a bachelor's degree or higher. Over the past 50 years,

²⁴ Ballard, Charles L, ed. Michigan at the Millennium: A Benchmark and Analysis of its Fiscal and Economic Structure. East Lansing, Michigan: Michigan State University Press, 2003.

Michigan lagged about 3% on average below the national level for college attainment. Only 24.4% of the population has a bachelor's degree or higher. Ballard estimates that a 1% increase in the population with a college degree will lead to an \$800 increase in per capita personal income. Michigan taxpayers spend \$800,000 per student on K-12 education, and Michigan ranks fourth in the nation for highest teacher salaries. Allocating more money toward teachers' salaries is not the most efficient way to improve education.

Michigan also faces a budget problem. In 1972, the state budget had 10 billion more real dollars than it has today. Ballard views the sales tax and remote sales as two problems that lead to less revenue for the state of Michigan holding all else equal. The sales tax contributes to the erosion of the tax base, because the sales tax does not apply to most services, even though services are the fastest growing sector of Michigan's economy over recent decades. Secondly, Michigan residents are supposed to pay a Michigan use tax on remotes sales (internet or mail order sales) but the tax is difficult to enforce.

Ballard recommended a statewide mandate of full-day kindergarten, higher age of mandatory schooling, longer school year, fewer half days, a later start of the school day, stricter the graduation requirements, less rigid pay scales, and a restructuring of the tax base for school funding. Clearly, Michigan residents need to improve educational attainment, and Michigan needs to be a place where educated people want to stay.

Joan Crary

Joan Crary is a researcher for the Research Seminar in Quantitative Economics at the University of Michigan. Crary said that the economy operates in cycles. Michigan closely follows the cycles of expansion and recession in the rest of the country. However, the deepening recent recession in Michigan is contrary to other states. In 2005, Michigan was the only state not

hit by a hurricane to have a net job loss—15.4% loss in manufacturing jobs versus a 10.7% loss in the national average.

In the short-run, Crary indicated that Michigan is still poised to lose more jobs. Michigan's economy depends on automotive exports. Ford and GM are producing older models, playing catch-up with new fuel technologies and are running at 20% excess capacity in terms of employment. The projected 33,000 job cuts Ford and GM are planning on making accounts for the continued deepening of the recession in the short-run.

Crary outlined the challenges to improving the business climate in Michigan for the future turnaround. The first problem she indicated was Michigan's Single Business Tax (SBT). Currently, the SBT accounts for 23% of the General Purpose Fund of the State Budget. However, the budget has seen significant losses (8% since 1996), and getting rid of the SBT could be worse than keeping it. On the other hand, the SBT has led to inefficiency. The largest 1% of businesses paying the tax contributes to 50% of the revenue; the largest 11% to 90% of revenue. The tax also has perverse incentives to expand businesses as it has a gross receipts threshold of \$350,000.

The second challenge facing Michigan is diversification. The financial services industry, venture capital availability, and entrepreneurship are weak in Michigan. In terms of venture capital, Michigan has only three venture capital networks. Most of these private firms are funding projects outside the state. Tied directly to entrepreneurship, Michigan ranks 25th in seed capital investment.²⁵ Crary suggested that Michigan needs long-term as well as short-term diversification strategies. She believed Michigan has comparative advantages in automotive research and tourism. For diversification to be productive, it should be directed at the supply-chain or value-chain of these select sectors and geographic areas, such as Detroit or Flint.

²⁵ Statistics from Price CooperWaterhouse www.pcw.org

Jack McHugh

Jack McHugh is a researcher at the Mackinaw Center, a public-private think tank located in Midland, MI. McHugh's suggestions to the class were very interesting, given his ardent belief that the most important tool in properly addressing Michigan's flagging economy was the reassessment of incentives. McHugh suggested that instead of examining what kind of policies should be enacted, and what proactive measures could be taken to encourage growth, the class should instead promote a withdrawal of government from the private sphere. He argued that excessive interference and regulation in the business sector is one of the primary inhibitors to economic success in Michigan. If the incentives were correct, he suggested, businesses would move in regardless of whether we addressed some of the other factors. He was particularly passionate about reforming the Small Business Tax, and indicated that he felt very negatively about any sort of taxation on business.

Bruce Dale

In many of our cases, research parks or business clustering played a critical role in the success of an area. Professor Bruce Dale, Chairman of the Chemical Engineering Department at Michigan State University, spoke to the class about the possibilities regarding biofuels and alternative energy research. One of his most important points was the need for anchor firms situated in the value chain, and he suggested ADM and Cargill as possibilities. Through the attraction of one of these larger firms, he argued that other firms involved in the various aspects of alternative energies research and production would be encouraged to move into the park, establishing the critical mass necessary to spark the kind of growth that other research parks have experienced.

George Bensen

As George Bensen, Director of the University Foundation at Michigan State University, described, a research park is “just a plot of land.” There are reasons beyond mere market incentives to why only a select few of the 200 research parks throughout the United States and Canada have succeeded. Bensen’s theory does not contradict Dale’s importance of an anchor firm. Bensen though, recognized that the chance of getting a major firm to relocate into a research park is slim. On average, only 6-10 such firms relocate a year, making the market to attract an anchor firm into a research park *very* competitive. Although Bensen would agree that once an anchor firm was firmly established, clustering becomes easier, but not automatic. One would expect that given various tax incentives to make the real estate cheaper, research parks would be filling up, but this is not always the case. Michigan has 11 “SmartZones” scattered throughout the state that attach such incentives to the real estate. Clearly, the administration and social capital networks associated with a research park or a high-tech cluster are just as important to its success.

The administrator of a research park must encourage a critical mass of native businesses to locate into the park. In most cases, these are enterprises that come out of University spin-offs. Administrators must be an interface between research at the university and businesses to help the marketability of the technologies. In many cases, as Bensen explained, the agency that currently helps get research to the marketplace does not have the business skills necessary and the products do not get off the ground, because they are not valued correctly or fail to take into account the needs of the consumer.

Additionally, Dale suggested that one of the important challenges that universities need to address is the treatment of intellectual property. One of the problems we discussed was the

inability of universities to commercialize research. Dale discussed his experience with the Intellectual Property Office at Michigan State, remarking that they often overvalued the creations, and impeded the successful deployment of university research in the private sector.

Mike Balow

The second aspect of a successful research park is taking advantage of existing social capital networks. This is another reason the park needs to promote native businesses. The existence of the University Corporate Research Park at Michigan State University is one such example. The core firm located in the park is Basell USA, Inc., an affiliate of Shell BASF. Mike Balow, the site manager for Basell, indicated that the main reason Basell was still in Michigan is not because of the taxes or incentives offered by the park, but because of the established networks Basell possessed before being bought out by Shell BASF. As in Dell's decision to stay in Austin, the incentives could be in place to relocate, but a company's current placement within networks and the value-chain is more important than taxes and incentives when choosing a location.

Methodology

Our dependant variable for this experimental design is the number of high tech jobs in Michigan. Through assessment of the case studies, we were led to potential independent variables which positively affected high tech job growth in each country or state. One independent variable was business climate; the measure for this independent variable was ease of access to services needed for business start-up. We also researched days to business start-up within each country as a measure of the accessibility and friendly nature of the business climate.

Another independent variable we considered in our case studies was business financing. We measured business financing by the amount of venture capital, seed financing, and government funds available to technologically focused companies. When measuring business financing, we considered the conditionality of the financing made available to companies, such as financing being all at-risk, and the frequency with which funds were available.

We also found a positive linkage between geographic clustering of businesses and the number of high-tech jobs. To start, we measured geographic clustering by the number of research parks located in a country, state, or metropolitan area and whether the parks contained high-technology firms. Then we assessed the scale of firms in the research parks, noting if a research park had one firm in particular which drew the most related businesses into the park.

The final independent variable with a correlation to high technology job creation was the presence of an educated population. An educated population can be defined as the number of high school graduates, scientists, or PhD students. We chose to measure an educated population in terms of the number of 22-29 year olds with a bachelor's degree or higher. We also measured the existence of incentives for higher education, such as scholarships and loan forgiveness for students.

Quantitative Research

Regression

Using technology employment as the dependent variable, we ran a multivariate regression to test for correlation with independent variables that we thought might affect the outcome. The independent variables regressed were college attainment, industrial diversity, business climate, and union representation. All of the following statistics were taken from the Corporation for Enterprise Development (CFED) 2004 Development Report Card, unless otherwise noted.²⁶

Dependent Variable

Technology employment is defined as the total wage and salary jobs in high technology industries in 2003. Since our goal is to increase high technology jobs in Michigan, we are concerned with determining the factors that impact the ability to attract high technology employment.

Independent Variables

College attainment is defined as the percent of heads of households with at least four years of college from 2001-2003. This variable was included to determine how the supply of educated workforce affects the capacity of the state's economy to compete in high-tech jobs.

Industrial diversity is based on the Herfindahl Index. The Herfindahl Index measures the level of diversity in a specific industry. The scores are based on a 0-1 scale, 0 representing perfect diversification, and 1 representing a monopolized industry. Including industrial diversity in the regression allows for the analysis of whether states without diversified economies are able to attract high-tech jobs.

²⁶ <http://www.cfed.org/>

Business climate is indexed according to wage cost, tax burden, electricity cost, industrial rent cost, and office rent cost. We used the statistics for business climate compiled by the Milken Institute.²⁷ An index score of 100 indicates that the cost of doing business is equal to the U.S. average. States with scores above 100 have a higher than average cost of doing business, while scores below 100 indicate a lower than average cost of doing business. If business climate is statistically significant with a negative coefficient, then Michigan needs to improve its business climate in order to gain high technology jobs.

Union representation is measured by the percent of the workforce with union membership. Since 20.8 percent of the workforce in Michigan is represented by unions, we wanted to know if it is statistically significant in deterring high-technology jobs.²⁸

Primary Research

Telephone Survey

During our assessment of successful domestic cases, the ease of starting a business and navigating the bureaucracy emerged as a significant independent variable. In order to measure the ease of starting a business, we identified an organization that can streamline a businesses entry into a state, and referred to this as a one-stop-shop. We created a set of requirements for the ideal one-stop-shop, using Singapore's Economic Development Board as a model and then analyzed all 50 states to see how they compared.

Our requirements for a one-stop-shop is the ability to help start a business in as short a time possible, the consolidation of all relevant processes and departments into one location, the ability of the one-stop-shop to make deals for potential business prospects, and the ability to operate autonomously. We measured the capacity of each state's one-stop-shop by telephoning

²⁷ www.milkeninstitute.org

²⁸ *Union Membership and Earnings Data Book*, The Bureau of National Affairs.

each economic development agency in all 50 states and assessing their ability to satisfy our requirements. We used a structured survey by asking a series of open-ended questions one would ask when starting a business. This type of survey allowed us to judge the scope and capacity of each state's one-stop shop in comparison to Singapore, as opposed to just the existence of a one-stop shop as would have been the case with a structured and closed question survey. Based on our findings from the telephone surveys, we then ranked the effectiveness of each state's one-stop shop on a 0 to 4 scale.

- 0: no capacity existed whatsoever.
- 1: an isolated organization where you have to go to each individual department to get necessary information for doing business in the state.
- 2: an organization which has the ability to connect you to tools needed to start a business and other relevant departments, but nothing is done for you.
- 3: existence of a one-stop shop which does some legwork for you in starting a business, and may have the ability to cut some deals with a business.
- 4: a true one-stop shop modeled after Singapore's Economic Development Board which delivers business start-up in "one phone call, eight days."

Findings

To create a business climate for sustainable economic development in Michigan, we have to solve the problems of reducing barriers to entry for new businesses, overcoming seed capital dilemma, retaining an educated workforce, facilitating linkages between universities and businesses, and creating and maintaining an entrepreneurial environment. In the old economy, people chose to focus on labor, taxes, and regulations as the means to alleviate economic problems. However, after studying international and domestic success stories such as Singapore, Ireland, Massachusetts and Austin, we found that old economy methods do not play an integral role in determining success in the new economy.

Research on successful and unsuccessful international and domestic cases shows that there are three variables (what we call factors of the “new economy”) that critically affect a region’s economic success. These are a one-stop shop for business development, research parks, and venture capital financing. Furthermore, these three factors of the new economy work most effectively when they link together, and the major facilitator of the linkages is the retention of highly skilled graduates.

One-Stop Shop Development Agency

A one-stop shop is a centralized agency that assists businesses in finding a location; matching businesses with skilled workers, cutting tax deals, and offering other business incentives. By streamlining and coordinating the regulatory process, a one-stop-shop can ease the burden of starting or expanding a business by helping a company to navigate through the vast regulatory structures of state and city bureaucracies as well as connect them with potential investors or skilled workers. A one-stop-shop encourages business start-ups, since entrepreneurs have enough challenges to face without dealing with additional bureaucratic red tape.

Through our analysis of all fifty states, we found great variation in the existence and effectiveness of a one-stop shop. One of the most effective one-stop shops is the Massachusetts Agency for Economic Development. This agency boasts powerful public-private linkages that have made it possible for an entrepreneur to contact one agency and have it set up everything from tax incentives, workforce training, financing and the site best fitted for the company. And this can be done in one phone call. At the weak end of the spectrum are states like Ohio. One of our colleagues made 37 phone calls and ended up being referred to the Public Library with no information gained. Table 1 suggests that the presence of a well functioning one-stop shop is highly correlated with technology industry employment.

Table 1.

| Existence and Effectiveness of U.S. One-Stop Shops | | |
|---|-------------------------------|-------------------|
| | <i>Technology employment*</i> | <i>Rank (0-4)</i> |
| Massachusetts | 9.7 | 4 |
| Texas | 6.7 | 4 |
| Michigan | 5.6 | 2 |
| Ohio | 4.1 | 0 |

*% of total state employment 2003

Since an economic one-stop shop is the first contact a state or city gives out to potential investors, the more they are able to accomplish, the better a state or city is portrayed. To be effective, one-stop shops must be able to cut all deals, shorten the time to start-up, and aggressively attract start up entrepreneurs or promote business expansion. Singapore's Economic Development Board represents the ideal of what a one-stop shop should be.

²⁹ "Development Report Card for the States 2003." <http://drc2003.cfed.org/download.html>. Corporation for Enterprise Development. 2003.

The Model One-Stop Shop: Singapore's Economic Development Board

Singapore's most powerful catalyst to economic development since gaining independence in 1965 has been the Economic Development Board (EDB). "The EDB is a statutory board of the Government of Singapore that plans and executes strategies to sustain Singapore as a leading global hub for business and investment."³⁰ Since the 1960's, the EDB has essentially paved the way for investment and entrepreneurship within the Singaporean economy. The EDB is responsible for promoting all aspects of economic activity. With its goal of promoting Singapore as a Total Business Center during the 1980's and 1990's, the EDB successfully attracted international service corporations in the financial, medical, education, lifestyle, software and IT sectors. In the 21st century, the EDB has shaped Singapore's economy in the following ways: promoting manufacturing and services as the pillars of growth, strengthening and identifying industrial clusters, nurturing innovation driven enterprises, developing new geographies, and making Singapore's economy competitive and conducive for global business.³¹

With seven offices in the North America, five in Europe, eight in Asia, and its global headquarters in the financial district of Singapore, the EDB has made itself readily accessible in many of the world centers of economic development. Widespread accessibility has made the EDB a one-stop shop for investors, entrepreneurs, inventors, and corporations throughout the world.

When a firm is planning to start a business in Singapore, the EDB will help the firm do its groundwork. This includes allowing foreigners to fast track through immigration with the EntrePass system that allows them to explore business opportunities or investment ventures.

³⁰ Wikipedia. http://en.wikipedia.org/wiki/Economic_Development_Board. 12/14/05.

³¹ EDB. http://www.edb.gov.sg/edb/sg/en_uk/index/about_us/our_history/the_way_ahead.html. Retrieved: 4/24/2006.

Once an investor decides to conduct business in Singapore, the EDB will walk them through the process. The EDB will help the firm develop a business plan as well as obtain the correct licenses and permits in order to register a business. In addition, the EDB will walk businesses through the tax structure and suggest various incentives that may apply to a particular company. Business incentives are often one of the top reasons investors choose to do business in Singapore. Singapore offers dozens of tax incentives, grants, and loans to attract established business and promote entrepreneurship.³²

In addition to offering incentives for both attracting and expanding businesses, the EDB also offers expansive assistance in helping find premises for business to locate. The country itself has over fifty business incubators, including research parks and hot zones which provide “plug and play” facilities, technology collaboration (via universities and technology experts), business development and expansion, networking, mentorship, and fund raising. Moreover, in terms of technological assistance, the EDB will facilitate communication with the Agency for Science, Technology, and Research, which fosters scientific and technological research and nurtures scientific talent to enhance Singapore’s knowledge based economy. In addition, partnerships with the National University of Singapore and the Nanyang Technological University will assist enterprises in developing and commercializing technologies. In fact, A*STAR will pay up to 70% of researchers salaries for up to two years for businesses looking to develop commercial technologies and services. In conjunction with the Intellectual Property Office of Singapore (IPOS), the EDB protects the intellectual property and patents of companies that develop proprietary technology. A slew of initiatives promote the creation and exploitation of intellectual property. Singapore’s Patent Application Fund is designed to encourage

³² For examples of Singapore’s business incentives, see Appendix B

innovation and the commercialization of IP's. The Patent Application Fund will help defray the cost of patenting with up to S\$30,000 in assistance.³³

For businesses looking to expand and accelerate their operations, the EDB offers a menu of services depending on business type and sector. There are a number of organizations sponsored by the EDB such as the Locally-based Enterprise Advancement Programme (LEAP) and the Singapore Business Corporation that offer counseling, seminars, courses, trade partnerships, and business matching efforts to help business develop within the Singapore marketplace. For companies looking to gain access to public sources of funding, the EDB will facilitate communication with the Singapore Exchange (SGX) which operates the SGX SESDAQ and SGX Mainboard to help encourage capital investment growth. In addition, the EDB will help both domestic and international companies expand throughout Southeast Asia. With a market of over 2.8 billion within a seven hour flight from Singapore, the EDB offers many resources to help businesses expand overseas. Singapore's extensive list of free trade agreements and partnerships with ASEAN allows Singaporean enterprises to receive preferential treatment and access to many of the world's key markets including the US, Japan, New Zealand and Australia, Switzerland, Norway, Iceland and Lichtenstein. Additionally, the EDB's global headquarters offers a concessionary tax rate of 15% for 3 years on incremental qualifying income for companies with headquarters in Singapore that choose to expand into global markets.³⁴

The EDB has made it easy to start-up in Singapore; a business can generally start up in as little as 8 day and seven steps. According to Pearl Yu of the Economic Development Board, the Singapore incubator spaces make it possible for a business to start operations the day after all official documents are signed. In addition to the EDB's convenient customer service operations

³³ EDB. "Our Services: Startup Guide."

http://www.edb.gov.sg/edb/sg/en_uk/index/our_services/startups/startup_guide.html. Retrieved: 4/24/06.

³⁴ "Regional Headquarters Award (RHQ)." <http://www.business.gov.sg/incentives/rhq.htm#cri>. Retrieved: 4/24/06.

and dozens of offices worldwide, the EDB is well positioned to tackle any problem, query, or initiative an investor, start-up or established business may have. Such services and accessibility has allowed the EDB to fulfill its goals of creating “sustainable GDP growth for Singapore with good jobs and business opportunities for its people, and promoting the country as a compelling global hub for business and investment.”³⁵

Michigan One-Stop Shops

The one-stop shops in Michigan are isolated and competing. State sponsored economic development agencies such as the Department of Labor and Economic Growth (DLEG) and the Michigan Economic Development Corporation (MEDC) are two agencies that encroach on each other’s territory. DLEG facilitates training for companies and matches employees to businesses while the MEDC takes care of the economic development needs for the state. Although DLEG has the capacity to cut business deals, and MEDC has the autonomy, neither agency can provide everything a business needs. Regional organizations such as the Right Place in Grand Rapids and Spark in Ann Arbor can only do so much to attract a company and cater to its needs. Table 2 compares the capacities of these agencies to the model agency of the Singapore EDB.

³⁵ EDB. “Vision and Mission.” http://www.edb.gov.sg/edb/sg/en_uk/index/about_us/vision_mission.html. Retrieved: 4/24/06.

Table 2.

| Does the OSS have the capacity and autonomy to: | Singapore EDB | Grand Rapids “Right Place” | Ann Arbor “Spark” |
|---|--|--|---|
| 1. find a location | Yes. Usually within value chain/supply chain | Yes. Only for established firms | Yes. Find office infrastructure; locate firm within value chain; partner firms with other businesses that might help with distribution/ manufacturing |
| 2. find skilled workers | Yes. | Yes. | Yes. Will try to, but no funding after may. MichBio BioConnections/Jobs Fund runs out end of may... they have no person coordinating talent pool, but looking for someone to be in charge |
| 3. train skilled workers | Yes. Will subsidize employee training | Yes. Will help with training development programs | Not Yet. Their goals are to encourage entrepreneurs but no programs unique to SPARK in place... partner with other organizations to provide entrepreneurial education; connect with training program opportunities in community |
| 4. find capital investment | Yes. Sponsors programs and venture capital funds to companies in all stages of business. | Yes. Only later stage financing for expansion | Yes. Contributes up to \$50,000 per company toward services they need in early stages of development... provides financial support to 25-30 companies a year... support ends once company actually receives private equity to take them to the next step or has enough revenue to go out on their own |
| 5. navigate regulatory environment | Yes. 1 phone call 8 days | Yes. Will help you fill out forms if needed | Yes. Will help you fill out forms if needed |
| 6. cut tax deals and other business incentives | Yes. | No. Does not have capacity, but will work with company to apply for incentives | No. Cannot “cut deal,” but will find tax incentives |

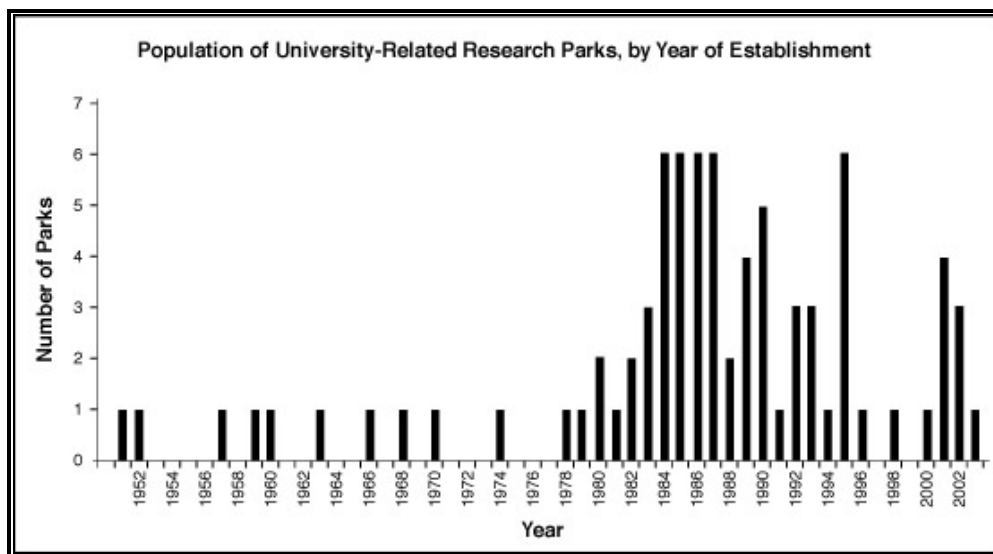
As noted in above, Right Place and Spark have the capacity to accomplish some of the things needed for business start up and expansion. However, these agencies lack the overarching capacity to cut deals, which greatly reduces the agencies’ ability to attract and retain businesses.

University Research Parks

A university research park is a property-based venture which has buildings designed for research and development facilities; a contractual, formal, or operational relationship with one of more science/research institutions of higher education; a role in promoting university research and transferring business and technology skills between university and industry teams throughout the regional economy and local community.³⁶

While the idea of research parks is nothing novel, the concept of university related parks is fairly young. Most university research parks were not introduced until the advent of computer related technologies. In fact, the early 1980's persistently remained strong years for university research parks.

Graph 1.



Issues In Science and Technology, 23 Apr 2006, <http://www.issues.org/20.1/realnumbers.html>

Research parks have two primary functions. The first function is to incubate local business innovation and help business development in research grow. The second function is to

³⁶ Association for University Research Parks, 23 Apr 2006, <http://www.aurp.net/about/whatis.cfm>

accelerate business development. Thus two primary models exist: the incubator model and the accelerator model. The incubator model is seen as a venture in which the firm can establish a product over a long period of time. In contrast, the accelerator model is described as a product you can “take in a bag” and run with in the short run; it is new and has a first-mover advantage in the market.³⁷ Therefore, the most cost-effective model for research parks is the accelerator model.

Accelerator Model and Cost Effectiveness

The Association of University Research Parks (AURP) collects statistical data on research parks in the United States. Most universities have a budget of under \$1 million dollars, making the accelerator model lucrative:

Overall, 36.1% of parks have an annual operating budget of less than \$1 million. Another 29.2% have an operating budget of \$1 million to \$3 million and 15.3% between \$3 million and \$6 million. This means that about eight out of every ten parks have an annual operating budget of \$6 million or less. While only four parks have budgets of \$6 million to \$15 million, ten parks (13.9%) have an annual operating budget of \$15 million or more.

On average, 59.4% of current operating revenues for parks are from park operations. Another 20.4% are from universities, 12.1% from government, and 8.1% from corporate foundations.³⁸

In addition, AURP claims that biotechnology and pharmaceutical firms comprise a majority of 23.8% of current tenants in research parks nationwide, the second is IT and software companies.

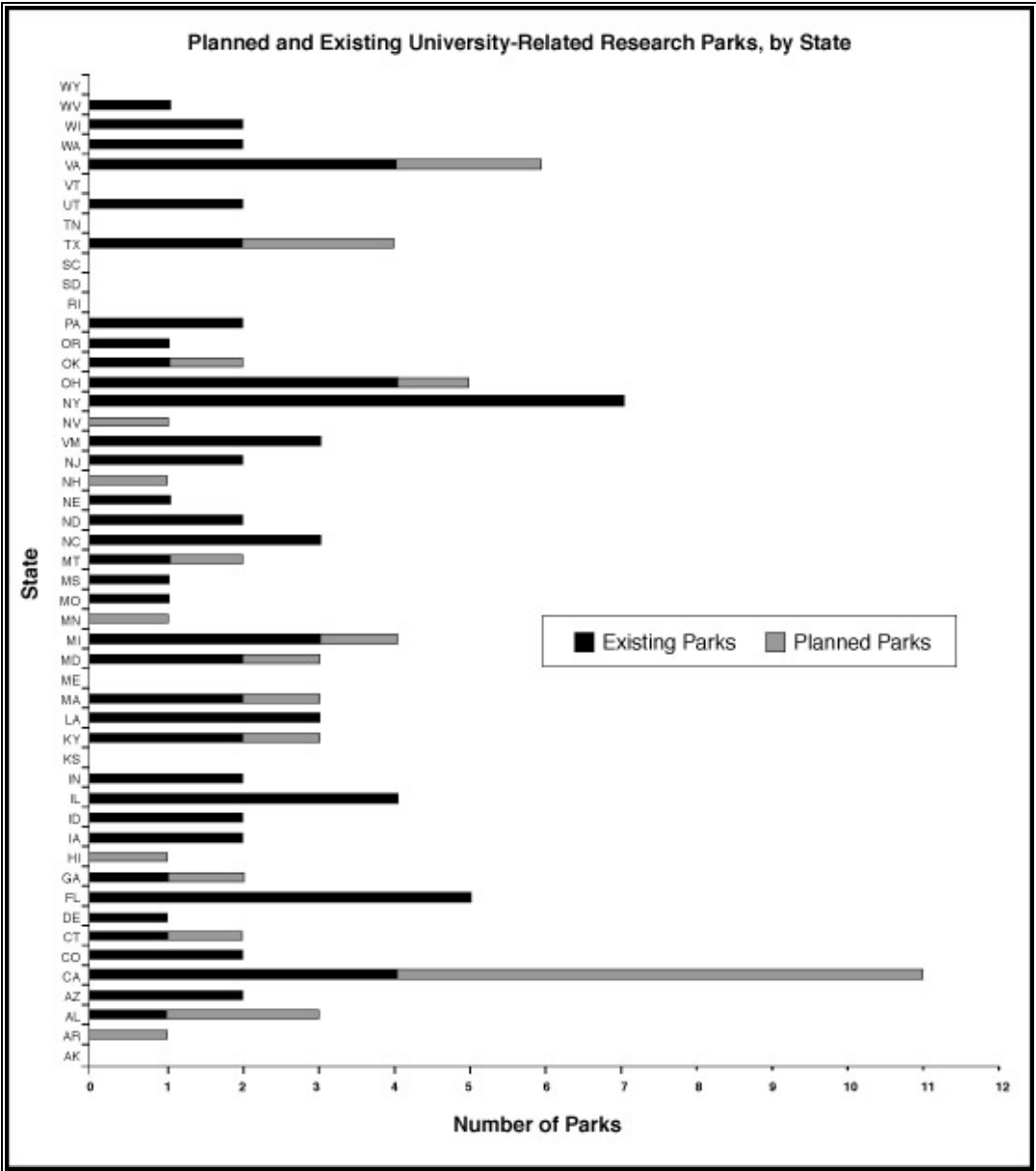
Most universities have a short time window to fill parks with tenants. The most successful parks are noted as having strong state and university leadership.³⁹

Graph 2.

³⁷ Quoting George Benson, MBI International, East Lansing, MI

³⁸ Association of University Research Parks, 23 Apr 2006, <http://www.aurp.net/about/statistics.cfm>

³⁹ *Issues in Science and Technology*, 23 April 2006, <http://www.issues.org/20.1/realnumbers.html>



Issues in Science and Technology, 23 Apr 2006, http://www.issues.org/20.1/images/realnumbers_f2.jpg

Table 3. Selected Characteristics of University-Related Research Parks

| | |
|--|--|
| Percentage of parks formally affiliated with multiple universities | 6% |
| Percentage of parks owned and operated by a university | 35.4% |
| Percentage of parks on or adjacent to a university campus | 24.6% |
| Distances (miles) from a park to a university campus | Mean: 5.7 Range: 0—26 |
| Percentage of parks located in distressed urban areas or abandoned public-sector areas | 11% |
| Percentage of parks initially funded with public money | 50.4% |
| Percentage of parks with a single dominant technology | 37.7% |
| Distribution of dominant technologies among parks with a dominant technology | NA |
| Bioscience | 48.5% |
| Information technology | 42.4% |
| All other technologies | 9.1% |
| Percentage of parks with an incubator facility | 62.3% |
| Park size | Mean employees: 2,740 Range: 30—37,000 Mean acres: 552 Range: 6—6,800 |

Issues in Science and Technology, 23 Apr 2006, <http://www.issues.org/20.1/realnumbers.html>

Strategies to Attract Tenants

Successful research parks that attract tenants have the following characteristics:

- (1) Proximity to supply chain
- (2) Tax incentives
- (3) Business Clusters

- (4) Public/Private Collaboration
- (5) Acceleration Model Strategies
- (6) Manipulating personal relationships
- (7) Student internship strategies
- (8) Anchor a strong firm (North Carolina Research Triangle did this with IBM)

The acceleration model has the additional benefit of growing park capacity. The study conducted by Issues in Science and Technology revealed the following findings:

Park directors associate park employment growth with park success, and Table 4 compares the growth rates of parks having certain characteristics with the average rate for all parks. Parks with a single dominant technology, located close to universities and managed by private-sector organizations, are the faster-growing parks. The fastest-growing park is the University of Arizona Science and Technology Park (1995), which has been adding an average of more than 1,100 employees per year. Previously, the fastest-growing park was the North Carolina Research Triangle Park, which has been adding an average of almost 950 employees per year since its founding in 1959.

Table 4.

| | |
|---|---|
| Annual rate of park growth, averaged over the population of university-related research parks | 13.0% per year |
| Parks with a single dominant technology grow | 3.2% faster than the average, per year |
| Off-campus parks (evaluated at the mean distance from the university) | Grow 3.7% slower than the average, per year |
| Parks that are university-owned and -operated | Grow 6.7% slower than the average, per year |
| An incubator facility | Has no effect on park growth |

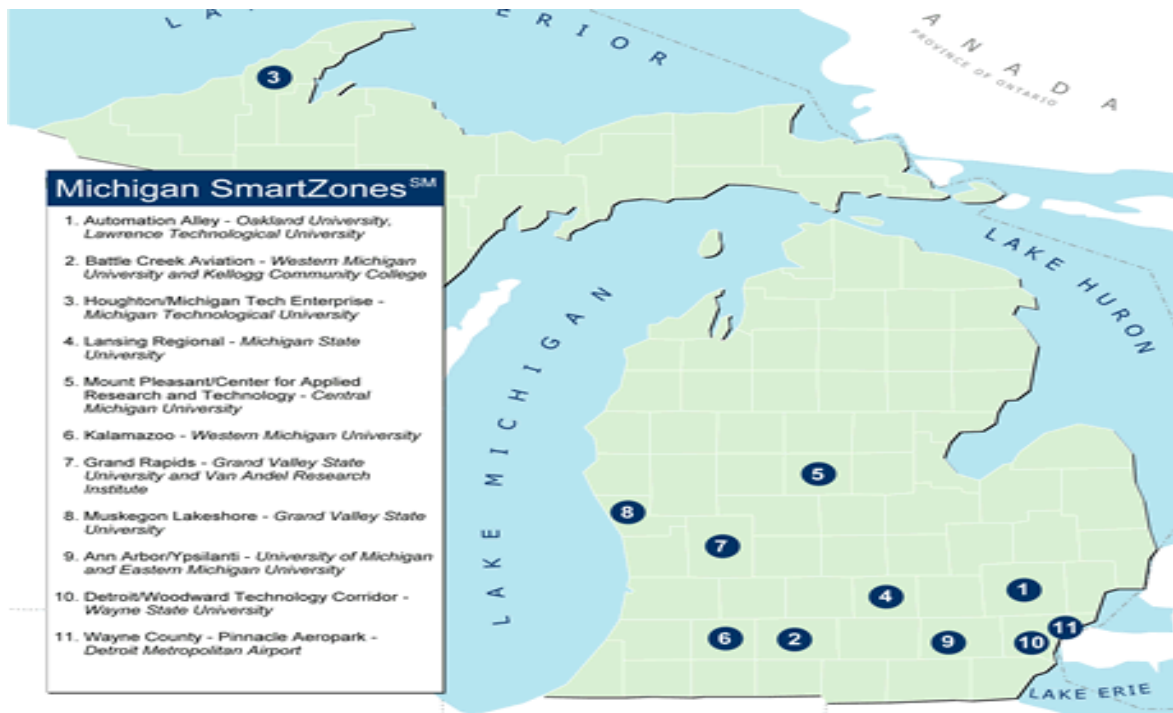
University Research Parks in Michigan

University research parks in Michigan are organized under Michigan SmartZones. SmartZones are defined in the following three ways: collaborations between universities, industry, research organizations, government, and other community institutions; stimulators of technology-based businesses and jobs by aiding in the creation of recognized clusters of new and emerging businesses; and collaborators of ideas, patents, and other opportunities surrounding corporate, university or private research institute R&D efforts.⁴⁰

Michigan SmartZones are designated in 11 principle Michigan Universities. Typical services of Michigan SmartZones include: provisions of telephones, office equipment, conference centers, and in major research parks, wet labs. Map 1 shows the 11 SmartZones.

⁴⁰ Michigan Economic Development Corporation, "Program Description: SmartZones," <http://www.michigan.org/medc/smartzones/>

Map 1.



Michigan Economic Development Corporation, "Program Description: SmartZones,"
www.michigan.org/medc/smartzones/

Major University Research Parks in Michigan are found at the following institutions:

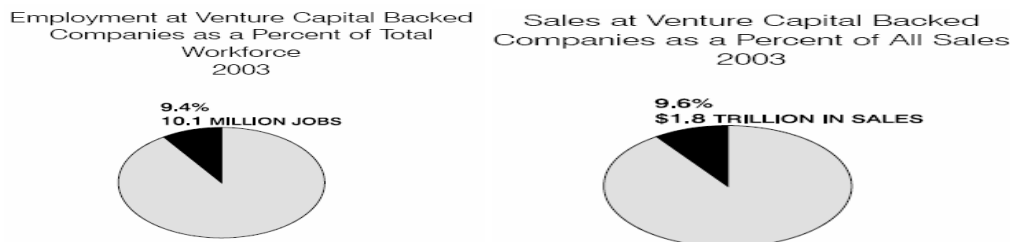
- (1) Michigan Technological University (Houghton)
- (2) Oakland University (Detroit)
- (3) Western University (Kalamazoo)
- (4) Michigan State University (East Lansing)
- (5) Central Michigan University (Mt. Pleasant)
- (6) Grand Valley State University (Allendale)
- (7) Wayne State University (Detroit)
- (8) University of Michigan (Ann Arbor/Ypsilanti)

Findings in our research also revealed that research parks are successful when matched with an anchor firm that initiates the clustering factor and encourages businesses to move into university research parks. Such a strategy motivated the IBM clustering effect in the North Carolina research park and spurred successful clustering. The four strongest centers include: The Grand Valley State University/Van Andel Research Institute, Wayne State University, University of Michigan, and Michigan State University. Therefore, Michigan would better combine its research facilities by concentrating on these four primary centers as a target for new clusters and new businesses.

Venture Capital

One of the biggest dilemmas for new start-ups or expanding businesses is the collective dilemma of seed capital financing. Starting a company is risky business and people are risk adverse, but readily available seed-capital lowers the risk of investment, so people can be more entrepreneurial. Venture capital networks act as mechanisms for providing investors with access to local entrepreneurs, and also let local entrepreneurs find which investors are looking for which type of project.

The accessibility of seed capital is one of the most important aspects of economic success for starting and expanding businesses. Indeed, it is often times that these venture capital backed businesses create the substantial jobs and revenue for a city or state. According to Global Insight Inc., “venture capital backed companies employed more than 10 million American workers and generated \$1.8 trillion in sales in 2003.”

Figure 1.

Global Insight. "Venture Impact 2004: Venture Capital Benefits to the U.S economy." *National Venture Capital Association*. 2004.

Moreover, during the economic downturn between 2000 and 2003, companies backed with venture capital registered 6.5% and 11.6% gains in jobs and revenues respectively, while national employment fell 2.3%, and U.S. companies' revenues rose only 6.5%. These statistics show that venture capital backed companies are more resilient than average companies. Indeed, venture capital backed companies may start off very small, but those that go on to succeed, define new industry sectors and every so often change the way we live and work. Examples of successful venture backed companies include: Microsoft, Federal Express, Apple, Cisco, Compaq, Genentech, Office Depot, Intel, Home Depot, AOL, Amgen, and Starbucks. More recent beneficiaries of venture funding include: eBay, JetBlue, Seagate, and Google.

Table 5 shows that states with some of the highest job growth have also experienced some of the strongest levels of venture capital investment. California, Texas, and Massachusetts have produced the most jobs and revenue for the country, as they have been significantly propelled by venture capital investment.

Table 5.

| Rank | State | Jobs 2003 | Cumulative VC Investment* (billions) |
|------|---------------|--------------|---|
| 1 | California | 2,470,942 | \$ 140.1 |
| 2 | Texas | 899,173 | 20.5 |
| 3 | Massachusetts | 712,329 | 35.5 |
| 4 | Pennsylvania | 604,045 | 9.5 |
| 5 | Georgia | 551,439 | 7.2 |
| 6 | Tennessee | 543,018 | 2.3 |
| 7 | New York | 470,527 | 18.4 |
| 8 | Washington | 399,863 | 9.6 |
| 9 | Virginia | 333,199 | 8.6 |
| 10 | New Jersey | 310,925 | 10.1 |

Global Insight. "Venture Impact 2004: Venture Capital Benefits to the U.S economy." *National Venture Capital Association*. 2004.

Venture capital backed companies not only contribute to jobs and revenues, they also play a substantial role in Research and Development. According to the National Venture Capital Association:

Small companies backed by venture capital were particularly active [in R&D]. According to data from the National Science Foundation, the dollar value of small company R&D rose from \$4.4 billion in 1984 to an estimated \$40.1 billion in 2003, a nine-fold increase. The share of U.S. R&D done by companies with fewer than 500 employees rose from 5.9% in 1984 to 20.7% in 2003. Not only do these small companies fuel innovation on their own, but they also "feed" larger R&D firms with a steady stream of idea generation, according to the study. Of the top 50 firms in U.S. R&D, 41 were either originally venture-backed or were major acquirers of VC-created companies.⁴¹

The availability of venture capital networks within a state or region are a major factor that contribute towards revenues, job growth, and research and development. Venture capital should not only be limited to private investors; the government can also play a substantial role in promoting access to seed and venture capital. Singapore's venture capital networks highlight the

⁴¹ Mendell, Emily. "Venture-Backed Companies Outperformed peers in 10 industries during U.S. Economic Downturn, New Study Shows." *National Venture Capital Association*. 2004.

possibilities and successes that different programs can play in increasing the amount of available capital.

Venture Capital and Investment: Singapore's Venture Capital Possibilities

With more than 140 local and international venture capital fund management groups, amalgamating an estimated S\$16 billion worth of funds (2003), Singapore is home to a vibrant and sophisticated venture capital industry. There are a number of associations and funds that attempt to facilitate growth and development of the venture capital industry. Established in 1992 under the direction of the EDB, the Singapore Venture Capital Association is the main facilitator of venture capital and private equity interactions among professional and businesses in Singapore. It establishes links with private investors and banks that help to extend credit to startups and accelerating enterprises within the Singaporean business environment. The EDB's DEALS Portal, allows individuals and organizations to register and upload business plans to its online portal which will attempt to match and direct your plan to appropriate VCs in Singapore. In addition, SRING Singapore manages two funding schemes for start-up companies in Singapore. SPRING Singapore's, Micro Loan Program offers a fixed interest rate financing program for start up and small enterprises while the Loan Insurance Scheme offers loans that are based upon a borrowers risk profile, with an interest rate based on the startups credit assessment.⁴²

It is important to note that the capital provided by the Economic Development Board is based on decisions by a technocratic institution composed of people from labor, academia, government, and business. While many of the ventures that this institution sponsors do go on to fail, a number of them do not, and go on to create a plethora of jobs and tax revenue for the

⁴² For examples of venture capital programs sponsored by the EDB, see Appendix C.

government. What is important to consider is that the EDB does not pick “winners.” Rather, by keeping the pipeline full with sources of money, it allows “winners” to emerge from the market.

Both the investment practices of the EDB and private conglomerations have shaped the Singapore economy to what it is today. Singapore investments tend to jump on technologies and ideas that will be relevant for the future. As a result, today’s key investment areas are in data storage and disk media, advanced IC design, semiconductor packaging, multimedia, wireless communications, advanced materials, specialty chemicals, environment technologies, process controls and engineering, biomedical science, and photonics. Singapore’s EDB and investment strategies have made Singapore one of the best places in the world to start a business, created one of the best work forces in the world and a per capita GDP that rivals the most developed western nations in the world.

Michigan Venture Capital

Venture capital networks in Michigan are few and far between. The only three prominent venture capital associations in the state are the Ann Arbor “Spark,” Grand Rapids “Right Place,” and Aurora Angel Investor Associations. These associations are largely confined to their regional boundaries and are limited in their funds and capacities. Statewide venture programs are also limited in funding and scope. The Michigan Economic Development Corporation’s “21st Century Job Fund” and the “Emerging Business Fund” are two programs that attempt to attract and create business in the state. The 21st century job fund has attempted to direct Michigan’s economy into the advanced automotive, homeland security, and life sciences sectors. The fund is only in its inception period and has a goal to provide at least \$75 million of funding per year between 2008 and 2015. Awards are expected to range between \$200,000 and \$3.6

million with the average award prospected to be about \$1.3 million.⁴³ It is critical that the state maintains this project for at least 10 years and evaluates applications with a technocratic, non-politicized body composed of labor, academia, government and business. Currently though, the Emerging Business Fund is Michigan's way of promoting business start up. This fund *matches* up to \$15,000 for new business start ups that qualify within the bounds of the program.⁴⁴ However, for most new businesses, \$15,000 will only cover about a week's worth of expenses.

The top venture capital investment states are consequently those that are among the highest performing economies. Venture capital investment has indeed spurred job growth and economic development, but due to a severe shortage of networks and investors in the state, Michigan is unable to capitalize on venture based successes. Michigan ranks 26th in venture capital investment: we can't afford to be average.

Table 6.

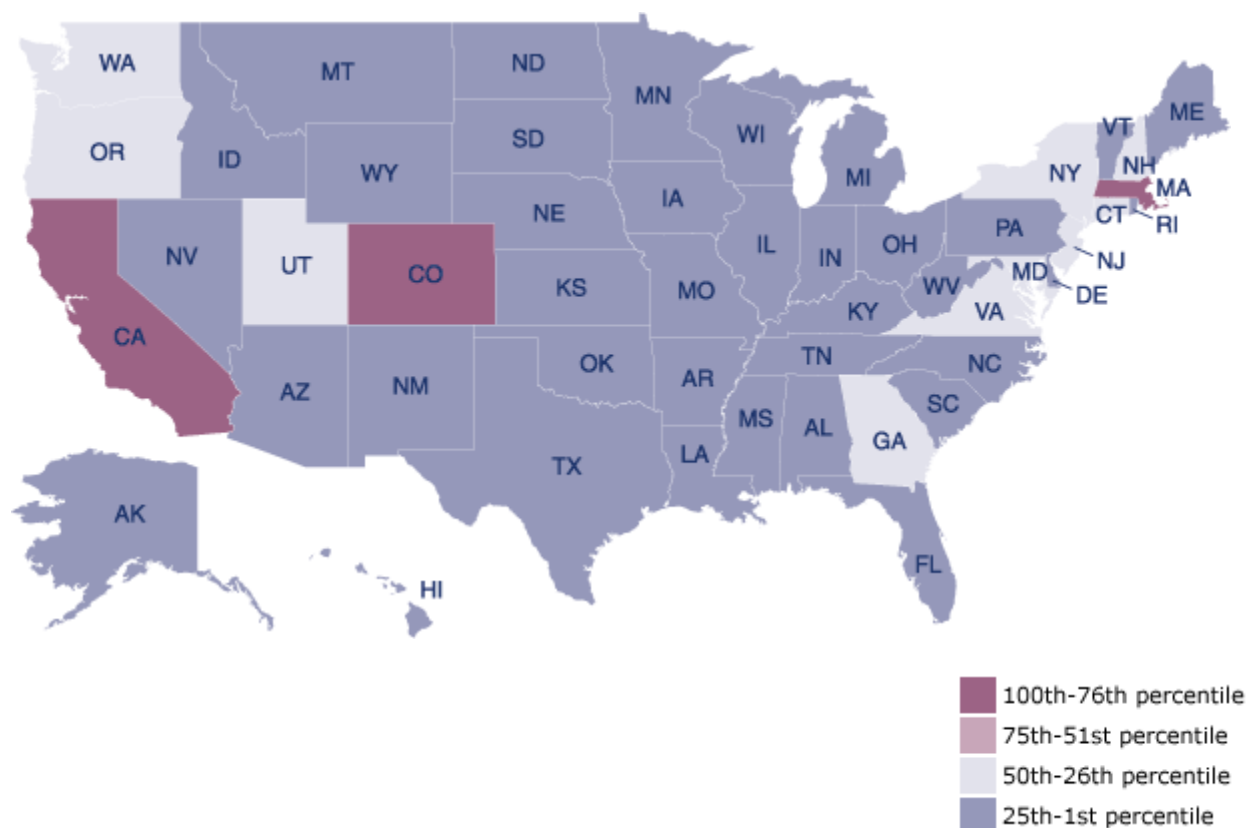
| National Rank | States | 2004 Venture Investments (\$ in millions) | % Change from 2003 | 2004 Deals | % Change from 2003 |
|---------------|---------------|---|--------------------|------------|--------------------|
| 1 | California | \$ 9,345.93 | 22.1% | 1117 | 9.9% |
| 2 | Massachusetts | \$ 2,774.90 | 11.7% | 337 | 2.7% |
| 3 | Texas | \$ 1,096.49 | -5.9% | 157 | 1.9% |
| 4 | Washington | \$ 868.28 | 125.4% | 117 | 53.9% |
| 5 | New York | \$ 721.13 | 10.7% | 142 | 18.3% |
| 6 | New Jersey | \$ 720.40 | -11.1% | 77 | -3.7% |
| 7 | Georgia | \$ 548.83 | 59.4% | 81 | 26.5% |
| 8 | Pennsylvania | \$ 526.07 | -2.2% | 91 | 9.6% |
| 9 | Maryland | \$ 512.35 | 50.5% | 87 | 7.4% |
| 10 | Colorado | \$ 443.60 | -28.5% | 70 | 0.0% |

Mansfield et al. "2004 CED North Carolina Venture Report." Council for Entrepreneurial Development. 2004.

⁴³ "The 21st Century Job Fund Overview." <http://www.michigan.org/medc/21stcenturytour/overview/index.asp>. MEDC, 2006.

⁴⁴ SBIR/STTR Emerging Business Fund. <http://www.michigan.org/medc/ttc/sbir.asp>. MEDC, 2006.

Map 2. Venture Capital Invested as a Percentage of State Gross National Product



“2002 State New Economy Index. http://www.neweconomyindex.org/states/2002/05_innovation_06.html. *National Venture Capital Association*. 2002.

Linkages

Each of the three factors of the “new economy:” research parks, venture capital financing and a one-stop shop, may only do so much when instituted alone. When linked together, their combination works in a multiplicative manner.

For example, a research park is just a plot of land if there is no venture capital available or one-stop shop to ease the process of business startup and expansion. Moreover, while many places claim to be a one-stop shop, these are of little value if they are unable to provide location

or business incentives for company. Likewise, venture capital financing is not useful if there is no attractive place for investors to put their capital. Therefore, these three factors are only able to accomplish so much when instituted alone. Once linkages between these factors are established, the three factors work together.

A research park, the foundational component of the three, cannot be utilized if a park does not link to other incentives that help to start and grow businesses. However, if the research park works effectively with other components, it can be transformed into an agglomeration of firms, which in turn transforms the value of the land, because such firms in a park increase the capacities that exist there. Specifically, venture capital financing can encourage companies to move into a research park, and a one-stop shop can greatly help the process of new businesses entering into the park.

By adding a one-stop shop, Michigan would be able to reduce the barriers and costs associated with entry of new business. A company that wants to move to Michigan starts the start-up process by going to the one-stop shop. However, the role of the one-stop shop is not only to provide the incentives to start a business, but Michigan's one-stop shop could work as an interface for marketability between research and industry by cooperating with universities, other research institutions, and private companies. The one-stop shop would then provide a link between the company and local investors and encourage both entrepreneurs and investors to start and grow businesses that could help put Michigan back on track.

Adding venture capital networks can encourage business to move into the park. The increased ease of communication between entrepreneurs and investors would then improve research facilities and knowledge sharing among firms in the research park. That is, venture

capital financing reduces the risk for investors and encourages new entrepreneurs to start and expand their businesses.

However, a missing component is needed to link the three factors together and encourage linkages. In order to make linkages among the research park, one-stop shop, and venture capital strong enough to achieve and sustain economic competitiveness in Michigan, we need people to actually work under each factor and encourage interaction among the three. Considering Michigan's need for entrepreneurs who can create high-paying, high-skilled and high-tech jobs, highly skilled and highly educated graduates should be the base or "glue" that encourages the linkages. However, the demographic leaving Michigan is 22-29 year olds with a bachelor's degree. In fact, nearly 12,000 people in this demographic leave Michigan every year.⁴⁵ This does not necessarily mean that graduates in Michigan do not have incentives to stay in Michigan. Rather, other states have created better incentive to attract and retain recent graduates. Michigan cannot settle on just providing venture capital or a location in a research park, if recent graduates are still imbued with the belief that there is no opportunity in Michigan. If we are to encourage a culture of entrepreneurship, Michigan should consider issues of student retention more seriously. No amount of seed capital, no amount of research park acreage, and no matter how effective a one-stop shop is; if recent graduates are still leaving, we will fail. If we are to build a culture of entrepreneurship, we must start at the undergraduate level before they leave our schools.

Contrary to Michigan, Texas has a net gain of 53,000 graduates, in part due to their programs that link students to private businesses through internships, graduate research programs, and entry-level jobs. Texas created a mechanism for students to stay in the state.⁴⁶

⁴⁵ Need the source of information

⁴⁶ Need the source of information

If Michigan can keep its graduates in the state, these highly skilled and highly educated graduates make Michigan a more attractive place to start business. In particular, if a research park is connected to a university, companies in the research park have huge advantage in employing new workers. In terms of venture capital financing, investors may be attracted by the established skill base in Michigan, thus making venture capital financing more promising.

In order to influence students to stay in Michigan, the state has to attract students with more effective retention programs. For example, internship programs seem to work effectively to retain students if they complete their internship within the state. In fact, when we spoke to Basell at the MSU research park, they said around 50% of their interns continue working with the company after graduation.⁴⁷ This shows that the social capital that students gain during undergraduate work make a much stronger set of linkages and incentives for graduates to stay.

However, internship programs in Michigan are unable to successfully convince graduates to stay in Michigan. There are two major internship databases in Michigan: MiInternship and Michigan Talent Bank. MI internships, a project proposed by the governor in March 2005 is only in its inception period. The main purpose of the program is to encourage students in Michigan to do internships by providing information on resumes, cover letters, and interviews for internships. It also provides a search system for internship in a website that is run by Michigan Talent Bank. However, the database can only be searched by a company's name and county and simply provides links to company's website.⁴⁸ Alternatively, the Michigan Talent Bank (MTB) allows people to create their individual accounts and upload their resumes. Also, MTB can search for jobs, and it has detailed job descriptions and contact information in order to

⁴⁷ Information from a conversation with Mike Balow

⁴⁸ For more information on MiInternship, visit <http://www.michigan.gov/miintern>

facilitate communication between applicants and employers.⁴⁹ On a university level, MSU has SpartanTRAK, which is a customized version of MonsterTRAK, and allows for job and internship searches both in and out of state. Students can post their cover letters and resumes on the website in order to facilitate communication between students and employers.⁵⁰

Internship and job programs on both the state and local levels have positive effects on employment in Michigan. The social capital students gain during undergraduate work combined with the possibilities of available venture capital financing, resources at a research park, and the services of a one-stop shop make a much stronger set of linkages and incentives for graduates to stay in Michigan. However, Michigan does not have an agency that actively involves students and Michigan employers. This is also true for financial and scholarship programs in Michigan.

Michigan does not have an overall financial aid and scholarship program that retains students in Michigan after they graduate although it has some programs for students of specific fields. For example, the State of Michigan has a program called Michigan Engineering Incentive (MEI).

The Michigan Engineering Incentive is a unique program designed to encourage more students to consider study and careers in the engineering and technology fields by offering a 0% interest rate and a credit equal to the Federal Loan Origination Fee.

The Michigan Engineering Incentive is for students receiving Federal Family Education Loan Program (FFELP) Federal Stafford Loans and is exclusively for students who:

- Are pursuing engineering or technology majors, and
- Intend to live and work in Michigan.⁵¹

⁴⁹ For more information on Michigan Talent Bank refer to http://www.michworks.org/mtb/user/MTB_EMPL.EntryMainPage

⁵⁰ For more information on SpartanTRAK refer to <http://www.csp.msu.edu/pages/mtrak/index.cfm>

⁵¹ For more information on Michigan Engineering Incentive refer to <http://www.michigan.gov/mistudentaid/0,1607,7-128--111860--,00.html>

Michigan also has a program called the Michigan Nursing Scholarship to retain nursing graduates. Every year, about 1,400 students receive the scholarship, and in exchange, the students promise to stay in Michigan after they graduate. More specifically,

Students receiving a full time scholarship award have to agree to work as a direct patient care nurse in eligible Michigan facility one year for each year of assistance. Failure to fulfill the work commitment will result in the scholarship becoming a loan that must be repaid.⁵²

In addition to this scholarship program, the Department of Community Health in Michigan has the Michigan Essential Health Provider program, also known as the State Loan Repayment Program. The program is federally funded, and graduates who are contracted with the program have to provide health care services in a Health Professional Shortage Area for at least two years. The State of Michigan and local agencies essentially match grants to enable healthcare professionals to pay off their debts.⁵³

Although each of these programs works toward the goal of student retention, there is no overall program focused on keeping high-skilled and educated graduates in Michigan. Why do we only focus on keeping medical graduates and engineering students in the state, when many other graduates can have a significant impact on the economy? What is important for Michigan's economy today is an economic policy that considers the long term effect on Michigan's competitiveness in the global and modern economy. Consequently, Michigan needs to focus on attracting high skilled, high paying and high tech jobs that will help to increase Michigan's competitiveness. Research parks, one-stop shops, venture capital financing, and student retention are integral in creating a competitive and successful economy.

⁵² For more information on Michigan Nursing Scholarship refer to <http://www.michigan.gov/mistudentaid/0,1607,7-128-1724-54524--,00.html>

⁵³ For more information on Michigan Essential Health Provider (MEHP) program refer to http://www.michigan.gov/mdch/0,1607,7-132-2945_40012-135399--,00.html

Policy Recommendations

It is clear that experts have recognized the four elements we talk about as important, however there is not enough being done. To help drive Michigan forward into the new global economy, we need to create initiatives at both the state and university levels. First we make recommendations on what policies the state can create to foster an environment on entrepreneurship. Secondly we propose policy changes at the university level, since universities are an important engine of job growth, through their research and education initiatives.

State Level Policy Recommendations

What should Michigan be doing at the state level to both improve upon existing programs, and to create new programs? To do this we have created four policy prescriptions at the state level. First we need to create a one-stop shop to streamline business into operation in the state. Second we need to increase the availability of seed capital, both from public and private sources, to encourage entrepreneurship. Third, the state needs to strengthen the existing SmartZone network. While the eleven SmartZones based on our universities is a good start, the current program to utilize them is far from effective. Finally, we need to improve on our effectiveness of bringing students into Michigan businesses, allowing them to build local social capital. Like the SmartZones, there are programs such as MiInternship, which try to address this, but simply are not addressing the needs of students or businesses.

Laying out the tasks is the first step, but is it plausible in the near future for Michigan to make strides towards these goals? We feel that it is, since we do not necessarily need to reinvent the wheel, we can create new policies that work within the existing infrastructure. The Michigan One-Stop Shop (MOSS) would be similar in some aspects to existing agencies, however it would require the autonomy of the MEDC and the authority of DLEG. Earlier we stated that the EBD

in Singapore is the ideal model, however currently, it is not politically feasible to have a statewide autonomous agency. Instead MOSS would work in conjunction with the local SmartZones. This would begin by the state giving the SmartZone land to the university in the area. The university would have complete autonomy over the SmartZone. It would be able to cut deals, offer tax and regulatory incentives and attract business through any way it decided. The university would put together a non-politicized, technocratic board comprised of academia and business to oversee the park. This board would act autonomously over the SmartZone, and would be able to negotiate any state, regional, or local taxes. At the state level, MOSS would oversee all of the local SmartZones. Companies would lay out their business plan and give MOSS the specifics they are looking for. MOSS would be able to go to the local SmartZones, find their offers and come back to the business with the incentives. MOSS would be the one-stop shop businesses would go to at the state level, but the local SmartZones would have the autonomy over their park. For businesses not looking to move into one of these parks, MOSS would get them through the start-up process in Michigan, by walking them through finding what tax incentives they qualify for, what regulatory steps need to be taken, and finding a location and skilled workers.

For seed capital we need to encourage increased funding at both the public and private level. For state policies we are concerned with public financing. Currently we have some programs that attempt to address this concern, such as the 21st Century Jobs initiative and the Emerging Businesses Fund. Neither are strong enough programs to actually help Michigan. The Emerging Businesses Fund matches grants up to \$15,000 for start-up companies. We spoke with an entrepreneur who recently set up a high-tech firm in Troy. His company, Great Western

Technology, Inc., has an average running cost of \$5,000 per day.⁵⁴ Under the Emerging Businesses Fund he would receive enough to run his company for three days. All of these types of high-tech firms we are trying to attract have similar costs. We need to merge all of these separate, smaller programs into one common program similar to what the EDB does in Singapore. This common fund should be given out consistently over time to businesses who are approved for it. The amount should be large enough to actually make a difference in the success of a company and the board who decides cases should be technocratic and non-politicized, unlike the current boards for both funds, which are wholly appointed by the Governor.

Finally the state needs a joint unified vision with the universities about building social capital in the state for students. Mi-intern is a decent start but it doesn't actually work as a program to move our best and brightest into local firms, it simply acts as a medium through which they find each other. Most importantly, the state needs to find a way for companies to overcome the collective dilemma of investing in training interns. An effective internship program would have students getting real-life job training, however most interns end up doing basic, grunt work of the company. Interns are temporary workers and companies do not want to invest time and training, therefore the state needs to provide incentives to companies for training interns. This could be done through tax breaks for companies with interns, or other such incentives that help make training interns economically feasible for companies. In turn, student interns would have more opportunities to get real life job experience.

University Level Policy Recommendations

What role do universities have in this vision for a 21st century economy? We will use Michigan State University as an example of how a research university can apply these policies using their existing strengths. Our vision prescribes two general tasks that a university such as

⁵⁴ Interview with Mark Ellis, CEO of Great Western Technology Inc.

MSU needs to help lead the state in economic development. First, they must develop an internal agency to control the SmartZone and research park areas granted to them by the state. This agency must be able to do two things: restructure intellectual property policies to quickly move technology research into the private sector, and develop the research park through the creation or attraction of an anchor firm. Secondly, and most importantly, the university must make the transition from university to career employment an integral component of undergraduate education. This last recommendation has several innovative components, which provide the vision that links together all of the policy recommendations into a cohesive solution.

There are two reasons for which the university would implement the aforementioned policies. The first reason is to foster economic growth in the area of the university and the state. The second reason is that traditional education methods that concentrate on classroom learning fails to adequately prepare students for success and entrepreneurship in the new economy. This old line of thinking has enshrined the value of textbook learning while ignoring that the most important ingredient to economic success is the ability to quickly adapt to new technology and opportunities.

The purpose of creating this dichotomy is to create policies for both the good of the community as well as improving undergraduate education, and highlighting the linkages between them. From the perspective of individuals and businesses, transforming the area around the university to accept cutting-edge university research and powering it with cheap, highly educated labor is impossible without the availability of quality students in the local market. This group would like to see programs whose purpose is to attract and retain the best students, so that both may benefit. Furthermore, the universities are the logical, most efficient, and easiest medium to enact these policies. In complying with the recommendations we made at the state level, the

first thing the University should do is create an agency to oversee economic development within the SmartZones and research parks granted to it by the state. For this to work, it is imperative that the university is given the complete autonomy over its perspective research park. Although the state currently has the responsibility of overseeing business development, relocation, and tax policy inside the park, the university should build upon existing structures to take over control of these tasks. At MSU, a new organization would have to be created that mirrors the MOSS in its autonomy and capacity. Michigan State actually has an organization that, if restructured, already has the readily available resources to do this: the University Foundation.⁵⁵ One of the agency's first goals would be to attract or develop an anchor firm, in the hopes of gaining the benefits of clustering. This component does not differ drastically from existing programs across the nation in its goal, but it would be leading the nation's efforts with its government-autonomous, university-led orientation.

Secondly, the university should restructure undergraduate education to help economic development by leading students directly from classroom to boardroom. Making internships an integral part of undergraduate education allows students to gain the tools and social capital necessary for increased entrepreneurship, and helps create the public-private linkages necessary for the increased flow of ideas and skills between the private sector and the university. The knowledge gained through internships would allow graduates to reach their full potential by either starting their own business or significantly contributing to an existing company. Even better, by encouraging the growth of the students' social capital networks with firms in Michigan, it concentrates the benefits more locally than the current format, which is leading to out-migration of student with a bachelor's degree.

⁵⁵ For more information on the MSU Foundation refer to <http://www.msufoundation.msu.edu/>.

As we have seen throughout the country and the world, the most interaction between students, universities, and businesses happens when the university leads the partnership by providing the resources and framework necessary for business to participate. Although businesses already have an incentive to accept interns as a source of low-paid, highly skilled workers and potential future employees, incentives to train temporary interns is lacking in most businesses and organizations.

To help create the incentives for business to use university interns, the university-lead agency of the research park could structure the park to benefit both students and companies. The agency could locate inside the research park, and create a research center that ultimately provides space for temporary joint ventures between students, faculty, and business. This agency would also serve as a home for the University to market and export its specialties and general talents.

By providing a research center, the agency would host a huge range of businesses, and help businesses overcome the collective dilemma of sinking costs into one-time ventures and internship programs. The university must take the lead in financing this project, but would recoup these costs from business rent and profits from the marketing and licensing of the joint ventures, as well as the sheer increase in the number of marketed products. Lastly, the university's agency would have to have an easily accessible pool of knowledgeable individuals to do the primary interfacing between business and the marketing to establish first contact with potential partners. This component would also provide a further outlet for intellectual property, marketable ideas, and entrepreneurship possibilities generated by the university.

However, the research center and joint ventures resulting from this center have some complications. They highlight two problems facing any potential venture or new business: seed capital and intellectual property rights. The university, led by the efforts of the new agency,

should make entrepreneurship a central focus. This could be done by establishing a program for entrepreneurial studies and by allowing students access to the seed capital networks to get their ideas off of the ground. In 2005, Entrepreneur.com did not even include Michigan State in its top fifty national schools, and MSU was absent from a list of Michigan schools that included Eastern Michigan, Northern Michigan, and the University of Michigan with tools for entrepreneurs. Intellectual property regulations must also be restructured in such a way that reflects the new economy. Like the other recommendations, it must be technocratic and focused on the marketing of research. Unlike the rest of the university, the IP office and the new agency must be based on a profit-driven model. Thus, the agency should be less academic and more business-oriented. The goal of the reformed IP office would be to efficiently move research from the university into the research park and the private sector, which would provide all of the benefits stated above.

Conclusion

Having started with the task of determining what kind of policies Michigan can enact in order to ensure a positive future, the depth and breadth of our research has contributed greatly to our understanding of economic policy. By studying international and domestic case studies, we have adequately addressed both the macro and micro perspective regarding economic development. Moreover, examination of cases in which well-intentioned policies failed to achieve results, our research provided insight into the pitfalls to avoid when designing economic policy. Our speakers provided valuable advice with respect to Michigan current economic situation.

Based on our research, the most important contributors to economic growth are a one-stop shop for economic development, research parks, availability of seed capital, and student retention. Each of these alternatives is a critical, but not comprehensive, solution to bringing Michigan back to economic prosperity. In fact, our research shows that almost all of these components were present in each of our successful cases. The linkages between each component contribute to economic success. Businesses need venture capital, an amenable regulatory environment, easy access to an educated workforce and the materials for research, and a place to fit within the value chain of their industry to grow exponentially. Action needs to be taken on these fronts, for Michigan's economy is starting to look more like Mississippi than Massachusetts

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Appendix A

David Hollister *Prima Civitas*

Bill Seppick *Lansing Chamber of Commerce*

Tim Daman *Lansing Chamber of Commerce*

Joan Crary *Michigan Economic Outlook*

Charles Ballard *Professor of Economics, MSU*

Bruce Dale *Head of Chemical Engineering Department, MSU*

Jack McHugh *Mackinaw Center for Public Policy*

Mike Balow *Basell USA, Inc.*

George Benson *Michigan State Foundation*

Appendix B

Pioneer Status

Pioneer status is usually given to high-tech companies which introduce high-tech skills to the economy. High-tech companies include business entities engaged in computer based information services, engineering services, technical services, the development or production of industrial designs and other computer related services. A company designated pioneer status is entitled to the following fiscal benefits:

- Profits are fully exempted from corporate income tax for a period of 5-10 years.
The current rate of corporate income tax is 22% (20% from 2005).
- Dividends: In Singapore there are no withholding taxes levied on dividends. Instead dividends are taxed at 20% with a tax credit being given for any corporate tax levied on the profits out of which dividends are paid. Where there is a shortfall between the tax credit and the 20% charge levied on dividends, the shortfall must be made up by the company paying the dividend and not by the shareholder receiving it. In the case of Pioneer Status companies the shortfall is exempt from any further taxation.

In February, 2004, the government announced that the Pioneer Incentive scheme will have its maximum duration increased immediately from 10 to 15 years.

Development & Expansion Scheme Status

Development & expansion scheme status has replaced the incentive known as post-pioneer status. It is available to companies whose pioneer status has expired and which

are engaged in capital investment to upgrade or modernize production capacity. The investment must have significant economic spin offs.

A company designated development and expansion scheme status is entitled to the following fiscal benefits:

- Income relating to "qualifying activities" is subject to a corporate income tax rate of not less than 10% (usually 13%) for a period of 10 years (extendable on application for a further period of 10 years). "Non-qualifying activities" are taxed at the normal corporate income tax rate of 20%.
- Dividends: In Singapore there are no withholding taxes levied on dividends. Instead dividends are taxed at 20% with a tax credit being given for any corporate tax levied on the profits out of which dividends are paid. Where there is a shortfall between the tax credit and the 20% charge levied on dividends the shortfall must be made up by the company paying the dividend and not by the shareholder receiving it. In the case of companies which hold Development & Expansion Scheme status the shortfall is exempt from any further taxation in so far as the shortfall is caused by tax free income from "qualifying" activities.

Expansion Incentive

Expansion incentives are fiscal benefits aimed at encouraging companies to boost productivity through increased mechanization and automation. The incentive consists in exempting from taxation all income which exceeds the level of income earned prior to the expansion plan being put into operation. Expansion incentive certificates are available to

growth orientated manufacturing and service companies including entities which have pioneer status.

A company granted an expansion incentive certificate is entitled to the following fiscal benefits:

- All income which exceeds the level of income earned prior to the expansion plan being put into operation is exempt from corporate income tax. The concession is available for a period of 10 years (extendable for a further 10 years in the case of service companies). The relief is usually granted to companies incurring expenditure of at least S\$10m (US\$5.7m) on the purchase of productive equipment used for the manufacture of "approved products".
- Dividends: In Singapore there are no withholding taxes levied on dividends. Instead dividends are taxed at 20% with a tax credit being given for any corporate tax levied on the profits out of which dividends are paid. Where there is a shortfall between the tax credit and the 20% charge levied on dividends the shortfall must be made up by the company paying the dividend and not by the shareholder receiving it. Companies which hold "expansion incentive certificates" are exempt from any further taxation on the shortfall in so far as the shortfall results from the concessionary tax status granted.

Export Incentives

The purpose of this incentive is to increase the value of exports through the provision of the following fiscal incentives:

- 90% of "qualifying" export income is exempt from corporate income tax.
"Qualifying" export income refers to any annual increase in export income. The exemption period is 5-10 years in the case of companies engaged in the provision of services (with a provision for extension) and 3-15 years in the case of companies engaged in the production of manufacturing products.
- Dividends: In Singapore there are no withholding taxes levied on dividends. Instead dividends are taxed at 20% with a tax credit being given for any corporate tax levied on the profits out of which dividends are paid. Where there is a shortfall between the tax credit and the 20% charge levied on dividends the shortfall must be made up by the company paying the dividend and not by the shareholder receiving it. Companies which hold "export incentive certificates" are exempt from any further taxation on the shortfall in so far as that shortfall is a direct result of the concessionary tax status granted.

Investment Allowance Incentive

Investment allowance incentives entitle a corporation to set off against profits up to 50% of the cost of "qualifying" capital expenditure which has been incurred on the purchase of plant, machinery and factory buildings (excluding land) for the purpose of an "approved project" which involves either research & development, the provision of specialized engineering or technical services, the promotion of tourist industries (other than hotels) or the manufacture of any product. The allowance is in addition to the right of every corporation to annually depreciate the cost of a fixed asset and set off the amount of depreciation against taxable profits. In this respect investment allowances represent a

form of double deduction. The allowance is granted as an alternative and not in addition to pioneer status and export incentives.

Overseas Enterprise Incentives

Companies engaged in providing designated services to "approved" overseas projects are entitled to the following fiscal concessions:

- "Qualifying export services income" is taxed at the concessionary rate of 10% for a maximum initial period of 10 years. The recipients of the services cannot be Singaporean residents or companies with permanent establishments in Singapore. The company providing the service must at least be 50% owned by Singaporean citizens or permanent residents and must be incorporated and resident in Singapore for tax purposes.
- Dividends: In Singapore there are no withholding taxes levied on dividends. Instead dividends are taxed at 20% with a tax credit being given for any corporate tax levied on the profits out of which dividends are paid. Where there is a shortfall between the tax credit and the 20% charge levied on dividends the shortfall must be made up by the company paying the dividend and not by the shareholder receiving it. Companies which have been granted "overseas enterprise incentives" are exempt from any further taxation on the shortfall in so far as that shortfall is caused by the concessionary tax status.

Double Deduction for R & D expenses

Certain "qualifying" R & D expenses can be deducted twice from profits for corporate income tax purposes. The incentive generally covers computer software, agrotechnology, information industries and medical research and laboratory testing.⁵⁶

⁵⁶ Singapore: Fiscal Incentives (Service and Manufacturing).
<http://www.lowtax.net/lowtax/html/offon/singapore/sinsmi.html#pioneer>. Retrieved: 4/24/06.

Appendix C

Venture Capital programs sponsored solely by the EDB include the following:

EDB Investments Pte Ltd (EDBI) is the wholly-owned investment arm of the Economic Development Board (EDB). It was set up in 1991 for the purpose of equity investments. Investments made are geared towards the competitive growth of industry clusters and promotion of emergent technologies and innovations. Through the Cluster Development Fund, EDBI makes Strategic Direct Investments (SDI) into projects that expand Singapore's clusters of key industries in partnership with local companies and/or multinational companies. Such projects are typically Singapore-based projects which have a substantial impact on the development of the industries promoted by EDB.

SDI's role is catalytic and complementary, and SDI's participation is meant to spur new projects in these key industry clusters. Depending on the nature of the project, SDI's period of involvement varies; however, SDI will seek to exit an investment once it is appropriate to do so.

Beyond the SDI, there are various other investment groups within EDBI, each with their own investment focus and objectives.



Startup Enterprise Development Scheme (SEEDS) was set up to foster entrepreneurship and innovation activities in Singapore through matching financing. The scheme encourages private sector investments in innovative

seed-stage startup companies as a means to stimulate entrepreneurship in Singapore. EDB will match a dollar for every 3rd party investor's cash injection raised by the startup companies, and take an equity interest in the startup.

Under the S\$50 million Startup Enterprise Development Scheme (SEEDS), EDB takes an equity stake in a seed company and matches, up to a maximum of S\$300,000, every dollar the company raises from an independent third party investor or investors. The startup must be incorporated in Singapore, but its founders need not be Singaporean.



EDBV Management Pte Ltd (EDBVM) manages about US\$450million and about 100 projects in its portfolio. Wholly owned by EDB Investments Pte Ltd and the Economic Development Board, EDBVM's investments build successful commercial enterprises and support EDB's thrusts in developing key industry clusters, entrepreneurship, enterprise globalisation, and emerging growth opportunities under EDB's charter. The funds under management include EDB Ventures Pte Ltd, PLE Investments Pte Ltd, M-Commerce Ventures Pte Ltd, M-Commerce Ventures II Pte Ltd, Fabless Investments Pte Ltd and Pervasive Storage Investments Pte Ltd. EDBVM works extensively with domestic and international co-investors, businesses and entrepreneurs.



Bio*One Capital aims to enhance the level of biomedical industrial activities in Singapore as well as generate long-term capital gains.

Bio*One Capital manages funds in excess of US\$650 million and has strategic investments in over 80 companies worldwide.

TIF Ventures Pte Ltd is a fund-of-funds management company. At present,



TIFV manages the US\$1.3 billion Technopreneurship Investment Fund (TIF). It seeks to draw more venture capital activities and develop a thriving venture financing industry in Singapore and in that process, grow locally based companies with high growth potential. TIF Ventures has invested in more than 50 partnerships worldwide.

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⁵⁷ EDB. "EDB investments." http://www.sedb.com/edb/sg/en_uk/index/about_us/edb_investments.html. Retrieved: 4/24/06.

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