MEETING THE CHALLENGE:

Economic Development & the University of Missouri

University of Missouri Economic Development Milestones

Vice President for Research & Economic Development position established

ABC Labs announces plans to build at MU Discovery Ridge research park

RADIL to move to MU Discovery Ridge

MU **Discovery Ridge** research park formed

MU incubator construction start announced

Declaration of **UMR research park**

investing more than $300 million in research annually

2004 2005 2006 2007

educating more than 63,000 students annually

Economic development added as the University's fourth mission

Express Scripts, Inc., announces plans to build at new UMSL research park

Decentralization of **technology transfer** offices

UM Venture **Foundation** established

UMSL information technology incubator planned

Cover photos: Construction underway at Discovery Ridge research park; a research lab at MU combines life sciences and engineering; and an aerial view of Missouri Research Park.

how missouri ranks in the new economy

Missouri was once a frontier state and later emerged as an industrial, manufacturing and agricultural leader. Today, with rapidly changing technologies and culture across the country and spanning the globe, Missouri faces a new challenge and a new economy.

The emerging economy is decidedly different. As identified by the Information Technology and Innovation Foundation in partnership with Kansas City's own Kauffman Foundation, the new economy is knowledge-based, global and entrepreneurial. It is driven by innovation and change. Our ability to cope with, and master, such change will largely determine the quality of our communities, our environment, our state and our lives.

Long-term studies that began in 1999 resulted in the first-ever rankings among states in how they are coping with the new economy. Repeated and improved every five years, the most recent *2007 State of the New Economy*[1] was released using a composite of 26 individual indicators.

The findings do not bode well for Missouri. Missouri tied with Arizona and Oklahoma as states whose rankings slipped the most – seven places. Ranked 28th in 2002, Missouri has now slipped to 35th among the 50 states.

In collaboration with other educational, government and private sector partners, the University of Missouri plays a pivotal role in the future of the state and how it negotiates the future.

2007 State of the New Economy Indicator Rankings for Missouri

Indicator	*Rank*
IT Professionals	13
Managerial, pro, tech jobs	33
Workforce Education	38
Immigration of Knowledge Workers	25
Manufacturing Value-Added	34
High-Wage Traded Services	11
Export Focus of Mfg and Services	39
Foreign Direct Investment	31
Package Exports	29

Indicator	*Rank*
'Gazelle' Jobs	31
Job Churning	17
Fastest Growing Firms	27
IPOs	27
Entrepreneurial Activity	45
Inventor Patents	37
Online Population	24
Internet Domain Names	34
Technology in Schools	11

Indicator	*Rank*
E-Government	29
Online Agriculture	44
Broadband	37
High-Tech Jobs	31
Scientists and Engineers	32
Patents	33
Industry R&D	30
Venture Capital	26
Overall among 50 states	**35**

[1] See the full report at http://www.kauffman.org/pdf/2007_State_Index.pdf

facing the challenge: the economic development mission

Furthering economic development as the University's fourth mission will require bold and deliberate action.

The University of Missouri established its fourth mission of economic development to signify the sense of responsibility for the state's economy. Never before has the public asked for so much from its public higher education research institutions. But never before have these institutions, as well as their faculty, staff and students, been so vitally involved in the creation, research, development and furthering of new ideas that feed the new economy. Teaching, research, service and economic development all flow from the needs of the times and the needs of the people from their leading public higher education institutions.

Economic development is achieved and measured in several ways, including the success of graduates and professionals, the majority of which stay in the state; the operation of the University itself, a $2.3 billion dollar business, among the state's largest public corporations; the value added through Extension and continuing education, available in every Missouri county and accessed by more than one million Missourians each year; and the health care provided across the state, resulting in $47 million in uncompensated care in the last year alone. These are but a few ways of fulfilling our obligation of economic development for Missouri.

Now being more deliberate about the economic development mission, the University of Missouri is facing the challenges that lie ahead. The University intends to focus on four key aspects that directly relate to the transformation required of the new economy:

I. Raising awareness and a greater understanding of the pivotal role of the University in the state's future economy

II. Recognizing the need to keep University research globally competitive

III. Committing research to results through technology transfer

IV. Deliberate development of new economy clusters and partnerships

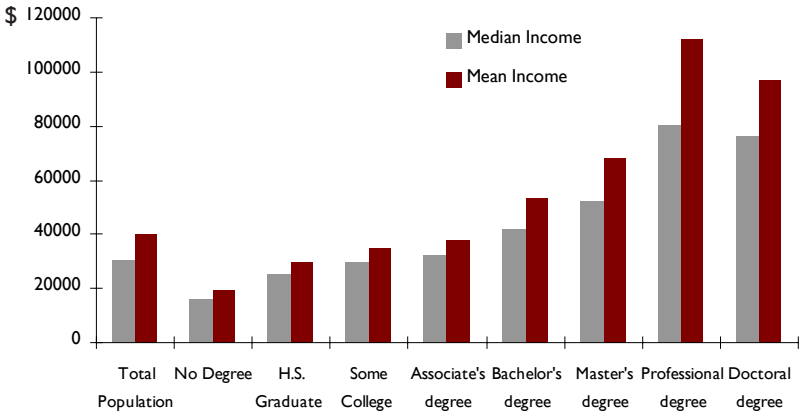
I. Raising awareness & understanding

• *Students*

The relationship between education and earning potential has never been stronger. The most recent fall class of 63,783 University of Missouri students was the largest ever, with 84 percent from Missouri. History has shown that more than 50 percent of the graduates will be retained in the state. The University of Mis-

souri is the only public university in the state to educate doctors, dentists, veterinarians, lawyers, optometrists, engineers and other professionals – all highly related to career-earning potential.

Income in 2004 by educational attainment for individuals with income between 25–64



Source: U.S. Census Bureau, Current Population Survey, 2005 Annual Social and Economic Supplement.

• *The public*

Part of the new economy transformation has been a reorganization of the nation's research and development players. Now more than two-thirds of all basic research is conducted in American research universities like the University of Missouri. This basic discovery is funded mostly through federal competitive grants among agencies like the National Institutes of Health, the National Science Foundation and the United States Department of Agriculture. University research is then licensed to the private sector for further development, commercialization and often the creation of new business start-ups. As revealed in the most recent data[1], the nation's research universities licensed more than 4,900 new technologies and spun off 628 new businesses based on university research.

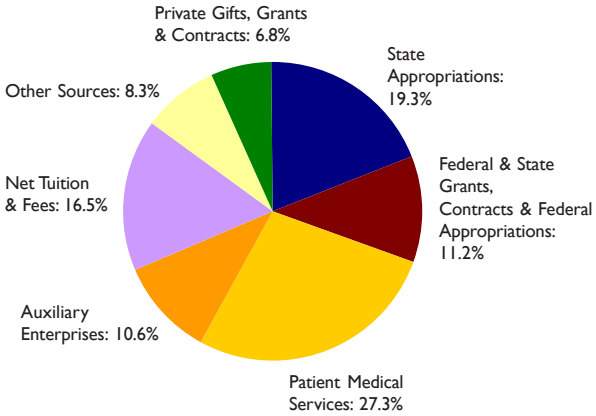
• *The General Assembly*

The University of Missouri has proven a good investment for the state, generating a 5 to 1 return in annual operating revenues for every dollar appropriated. In turn, University employees are among the largest and highest value workforce in the state. With nearly 26,000 total in-state employees, the payroll alone accounts for $940 million annually with a direct return of $126 million in taxes. That's not accounting for the value University faculty and staff add each day teaching students, responding to Extension clientele, providing health care throughout the state, or the creativity in new works – be it literature, music, business or science.

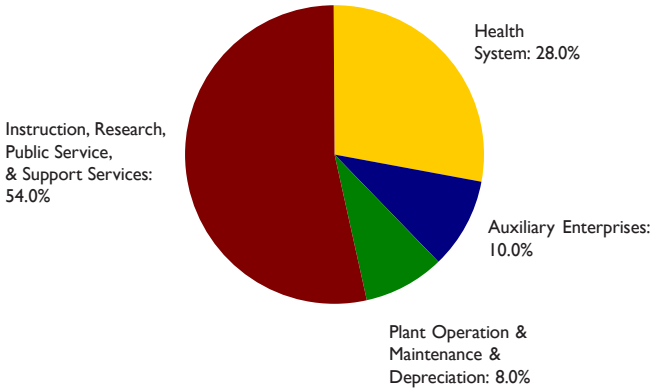
[1] FY05 data available from AUTM, see http://www.autm.net/pdfs/AUTM_LS_05_US.pdf

UNIVERSITY OF MISSOURI

Total Revenues, FY 2006: $2.3 Billion



Total Operating Expenses, FY 2006: $2.0 Billion



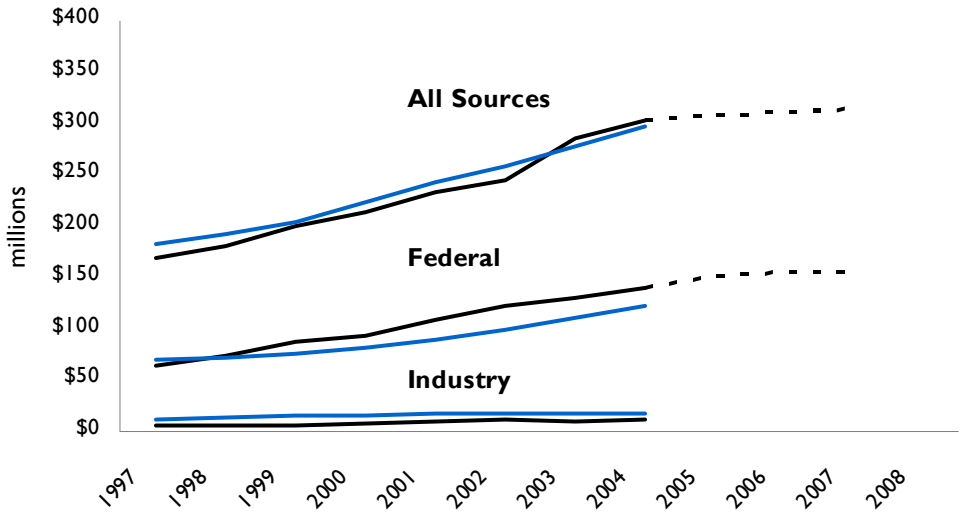
II. Recognizing the need to keep University research globally competitive

The University's research goal must be to maintain its market share of research funding and to continue the ability to improve it during periods of rapid funding growth.

Missouri's ability to earn competitive grants and contracts is directly related to the quality of the University's faculty, staff, facilities and equipment available to conduct research. The University's ability to compete is dependant upon achieving excellence, which requires a long-term focus.

Excellence takes years, sometimes decades, to achieve. But it can quickly dissolve. Creative and productive faculty are attracted by colleagues and a supportive environment. Salaries, benefits, endowments and other forms of compensation are rewards used to recruit and retain the highest quality of faculty possible. Up-to-date and capable facilities and equipment also play a large role in maintaining a research program of high productivity and quality.

University of Missouri Research Expenditures



NSF Actual and Projected

Benchmark: Peer Group Mean

Given the competitive nature of U.S. research funding, the University of Missouri has done remarkably well in the past decade and particularly in the last five years. Benchmarked against its peers[2], UM has been able to gain ground based on its ability to compete for federal funds. Only funding from industry (private sector grants and contracts) has been less than the peer group benchmark.

The most recent trends in federal funding, however, forecast much slower growth. Annual increases have been minimal for federal funding, particularly in the areas of the University's expertise. In addition to the funding outlook, there is an increasing number of competing applicants. Missouri's ability to be an innovator is reliant on its ability to maintain and, when funds are available, continue to grow the market share of available research funding. Further, a special emphasis on increasing funding from industry could improve the ability to stimulate Missouri-based entrepreneurial activity.

[2] The peer group used includes other major public research universities that approximate the scale and scope of the University of Missouri. These include Louisiana State University, North Carolina State University, University of Georgia, Virginia Polytechnic State University, Iowa State University, University of Tennessee, University of Kentucky, University of California-Davis, Colorado State University, and the University of Nebraska.

III. Committing research to results through technology transfer

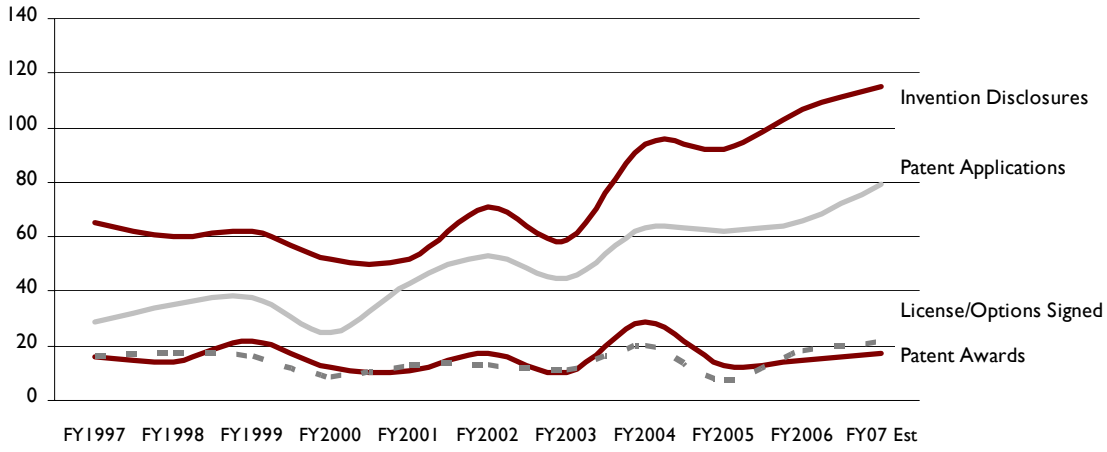
The University of Missouri's administration of patents, licensing and other aspects of technology transfer has continued to evolve over the past 20 years. Most recently, in mid-2006 the office was decentralized, with each campus establishing its own office and authority customized for the needs of the faculty and their research. Like most other major research universities across the country, technology transfer is taking on a more important role in response to the new economy.

The University is focusing on deal flow between the institution and the private sector to maximize impact on the entrepreneurial activity necessary for success in the new economy.

The University's technology transfer goals from 1987-1999 were to minimize administrative costs and reduce risk to the University. From 1999-2006 the University sought blockbuster technologies, and did so with Zegerid™, a heartburn drug invented by Dr. Jeff Phillips of the MU School of Medicine that has already returned more than $10 million to the University.

Today the University continues to focus on cost-effective administration, risk management and blockbuster technologies, while at the same time emphasizing a commitment to move as many technologies to market as possible. The University is focusing on deal flow between the institution and the private sector to maximize impact on the entrepreneurial activity necessary for success in the new economy. UM also is attempting to double the number of licenses/options signed annually. In an important change, the University also intends to foster start-up companies, which bring knowledge-based workers, accelerate the dynamics of the economy and attract venture capital to Missouri.

University of Missouri Technology Transfer



Conceptual drawings of Discovery Ridge research park at MU, where ABC Labs is under construction (top left), and Express Scripts, Inc., at UMSL. (bottom).

IV. Deliberate development of new economy clusters and partnerships

Just as teaching and research require dedicated and unique facilities, so too does successful economic development. In addition to classrooms that maximize learning, and laboratories that stimulate discovery, many universities have found the addition of business incubators and research parks as welcome tools to help establish more entrepreneurial activity surrounding their campuses, their faculty and their students.

The concept of a dedicated business incubator, a special facility dedicated to proof-of-concept testing for new ideas and businesses — a relative newcomer to Missouri — has already proven its potential impact. The University's oldest such facility is the Center for Emerging Technologies in St. Louis. In operation since 1998, its nine-year track record is evidence of what a dedicated facility and program can do for economic development. With a direct investment of $27.1 million, this incubator has attracted $719 million in outside investment capital for the creation of 26 companies and 300 new knowledge-based jobs.

The University's oldest research park in St. Charles County is the Missouri Research Park, first developed 20 years ago. Although not adjacent to any of the University's campuses, it helped spawn what is now the I-40 corridor of technology-based businesses and jobs. Using this experience, the University has now established other parks adjacent to UMSL in St. Louis, which hosts the world headquarters of Express Scripts, Inc. In Columbia, construction is already underway on ABC Laboratories' expansion in pharmaceutical testing at Discovery Ridge.

Facilities like incubators and research parks also deepen the partnerships between the University and the private sector. Earning the trust to attract angel investors, venture capital and business investments in the University are necessary, even to the extent of establishing a special external company with the sole purpose to create start-ups.

With the creation and expansion of similar facilities adjacent to all of the University campuses, the University intends to develop the kind of clusters that encourage new economy growth and economic development. Research shows that 84 percent of companies that graduate from incubators into viable businesses remain in the region where they first began.

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Dear Readers,

Carl Schramm, president and CEO of the Kauffman Foundation, writes about *The Entrepreneurial Imperative* — the challenge before us all to keep the American economy a global leader through our own unique brand of innovation and entrepreneurship. If this is the imperative, then an essential ingredient is a vibrant university.

The educational mission of the University of Missouri traces back to 1839 when the first public university west of the Mississippi began. As time went on, research, service, and a special brand of outreach called "Extension" were added as University missions. Given the expectations of the state and nation, the University of Missouri has now formalized the mission of economic development.

There is a whole new role and expectation of the public research university in today's economy. Missouri needs the University's leadership. Furthering the University's ability to contribute will require not only funding, but an ongoing enthusiasm for:

- Funding technology transfer through the establishment of a $1 million fund for patents and other intellectual property protections;
- Exploring new ways to deal with and manage risk as an inevitable consequence of economic development;
- Enhancing our ability to manage, not avoid, conflicts of interest;
- Assisting start-up companies internally through the UM Venture Foundation and externally through establishment of a development company and partnerships with other angel/venture capital providers;
- Establishing incubators and research parks at all UM campuses and across the state as opportunities arise.

It's my hope that we can face the challenges of the new economy together. It will take bold leadership in government and business, as well as among our universities, to be successful in the years ahead. Our imperative is to see that our students and state succeed in the coming era of entrepreneurship.

Regards,

John C. Gardner, Ph.D.

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