



*The Research University and Economic
Development: A National Perspective*

by:

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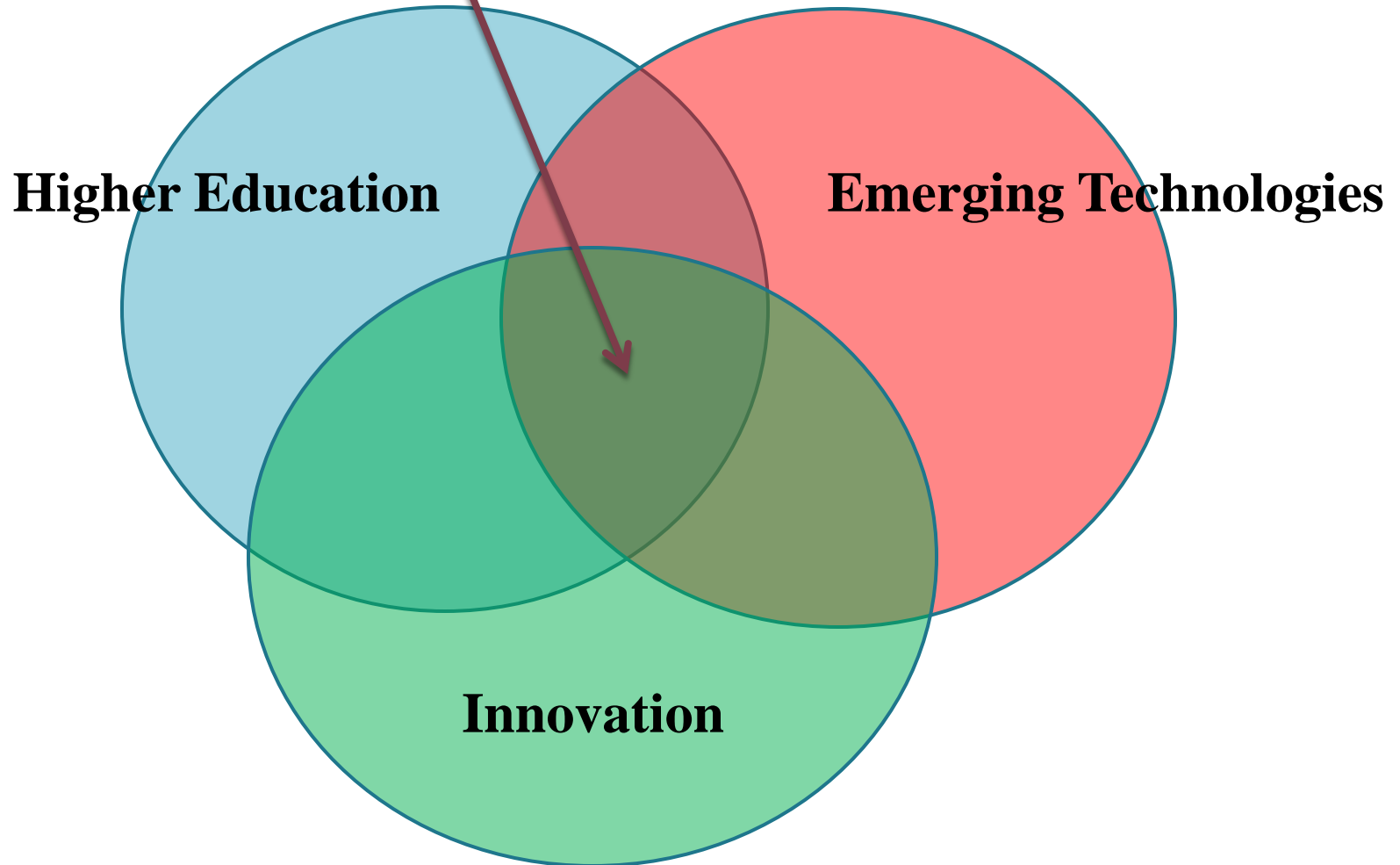
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February 2012

I Live My Life Here



Way Points in That Intersection

- Professor of Physics, Chair, Dean, etc
- Research Center Director
- Physics Society Executive
- J. Erik Jonsson '22 Distinguished Professor of Physics Engineering Science, Information Technology, and Management, RPI
- Founder, President, and Chairman, ILINC Corporation
 - \$500 million software company when I left it in 2000.
- University President
- Co-Founder Mass Green High Performance Computing Center
- Member of too many boards –most non-profit

Much is Expected of Research Universities

- At the same time that governments and corporations expect us to educate the workforce and create new products and industries from our research,
- Universities have to cope with reduced funding and increased reliance on entrepreneurial activity.
- While everyone “knows” that local (and global) economic development seems to nucleate around great research universities.
- Few seem to have a deep understanding of the mechanisms

Historical Moments

- 1636 Harvard's Founding
- 1824 S. van Rensselaer: *“for the purpose of instructing persons ... in the application of science to the common purposes of life.”*
- 1862 Justin Morrill in Morrill Act: *“in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life.”*
- 1980 Bayh-Dole Act: *“to encourage maximum participation of small business firms in federally supported research and development efforts; to promote collaboration between commercial concerns and nonprofit organizations, including universities.”*

So What's a University to Do?

- If we are expected to create
 - ▣ new ideas,
 - ▣ new processes,
 - ▣ new products, and
 - ▣ new industries
 - ▣ (not to mention futures for our students)
- then what leads to success?
- Why are some good at it and others “not so much?”

Context

- This talk would draw on my work as
- Chairman of the Commission on Innovation Competitiveness, and Economic Prosperity (CICEP) for the Presidents of the American Public and Land Grant Colleges.
- In that work we conducted two major projects:
 - ▣ The first was on creating better **metrics** for economic development and
 - ▣ the second was on developing tools to **allow assessment of a university's internal and external activities** in support of economic development.
- [[Metrics](#)]
- [[Assessment Tools](#)]
- Required surveys of leaders of major public research universities

APLU -> NACIE -> Commitment

- In these, we worked closely with the Commerce Department, Bureau of Economic Analysis (BEA), NSF, and other federal agencies to help them create better policies in support of research universities.
- We also banded together with other organizations, (Association of American Universities (AAU) and American Council on Education (ACE) in particular) that represent the major research universities in Washington, to address some very contentious national policy issues on research commercialization.
- With that group, we worked with the President's [National Advisory Council on Innovative and Entrepreneurship](#) (NACIE) which was chaired by the APLU member Presidents: Mary Sue Coleman, Michigan, Michael Crow, Arizona State, Bud Peterson, Georgia Tech, and Holden Thorpe, North Carolina. This report to the President was signed by over 100 University Presidents.
- I signed from UMass and on behalf of CICEP.
 - It was easy since UMass and the Commonwealth had made this commitment together years before!

President's-Investors Summit

- on Wednesday January 18, we convened the “Presidents-Investors Summit on University Research Commercialization” in Washington, DC.

Report Recommendations



1. Promoting student innovation and entrepreneurship
2. Encouraging faculty innovation and entrepreneurship
3. Actively supporting the university technology transfer function
4. Facilitating university-industry collaboration
5. Engaging with regional and local economic development efforts
6. Recognizing exemplary economic engagement.

Promoting Student Innovation and Entrepreneurship

- Many campuses already offer courses aimed at teaching entrepreneurship, provide new opportunities for experiential learning, run student business plan competitions, support student clubs, and sponsor programs that put multidisciplinary student teams to work solving real world challenges. To promote student innovation and entrepreneurship further, we will:
 - Build upon and expand these activities.
 - Create new programs and grow existing activities on our campuses to encourage undergraduates, graduate students, and post-doctoral students to pursue careers as innovators and entrepreneurs.
 - Develop new cross-college, cross-disciplinary programs that connect business with science, math, technology and engineering fields.
 - Extend these programs to reach young people in underserved and low-income areas by involving community colleges in consortia for training and mentoring in innovation and entrepreneurial activities.

Encouraging faculty innovation and entrepreneurship

- Financial incentives, faculty industry sabbatical leaves, campus prizes and other forms of recognition encourage faculty innovation and entrepreneurship. To promote these ideals further, we will:
 - ▣ Expand efforts to encourage, recognize and reward faculty interest in research commercialization by providing incentives and encouraging engagements with industry, entrepreneurs and venture partners.
 - ▣ Create or expand programs that connect faculty and students to the resources they need: industry partners, entrepreneurial mentors, translational research and “proof-of-concept” funds, accelerator facilities and venture creation services.
 - ▣ Encourage streamlining and reduction in reporting and compliance requirements, which would allow faculty to increase time spent on proposal writing and research.
 - ▣ We also call upon the federal government to refrain from enacting policies, such as overly stringent regulations on conflict of interest, that discourage our faculty from working with industry or developing innovative technologies.

Actively supporting the university technology transfer function

- Moving an idea effectively across the “valley of death” requires critical programs that include funding for proof of concept research and new mechanisms within the existing grant process that help defray the costs and risks. To actively support the university technology transfer function we will:
 - Work to further reduce barriers to technology transfer to accelerate the rate at which ideas move from the lab to the marketplace. Central to this effort will be to ensure that our technology transfer offices are adequately staffed with skilled professionals who are provided with the resources to effectively and efficiently perform their jobs.
 - Publicly promote the importance of technology transfer, to encourage participation by our researchers and encourage engagements with potential partners.
 - Establish policies to encourage technology transfer offices to strive to maximize the societal and economic development benefits of discoveries, rather than maximizing revenues.

We also encourage government and state governments, and business collaborators to

- Expand networking conferences and events to exchange best practices and attract talent and resources for commercialization activities.
- Assist in these efforts by subsidizing the costs of research commercialization.
- Create a new SBIR program that could focus on commercialization with Phase 0 awards to be used by universities to engage in prototyping, funding mentoring talent and supporting market-readiness initiatives.
- Establish federal tax credits that could be provided to industry to encourage businesses and venture partners to leverage university technologies and start-up venture opportunities.

Facilitating University-Industry Collaboration

- To increase the presence of industries on campus, many of our institutions have established a "front door" or portals to enhance access to research expertise, intellectual property, and commercial opportunities. To facilitate university-industry collaboration, we will:
 - Further support programs that facilitate sharing of labs, facilities, student-faculty teams, and other resources.
 - Strengthen strategic investments in university-industry collaborations aimed at advancing technologies of mutual interest and renowned research programs, designed to enhance market-pull of research.
 - Develop ways to incentivize and support industry R&D professionals to collaborate with universities.
 - Encourage the development of accelerators and public-private partnerships on or within close proximity to campuses; and find ways to provide innovation services to new enterprises external to the university.

We also call on federal agencies to assist by:

- Building entrepreneurship and innovation components into agency grants;
- Creating opportunities within federal agencies for high-risk innovative research;
- Allowing, as appropriate, commercial potential to be a part of grant proposals through the development of commercialization plans;
- Including the evaluation of market potential of new technologies as a milestone component in research;
- Facilitating the presence of industry on campus by creating an IRS exemption for university-industry collaborations built around university-owned intellectual property and conducted in university buildings;
- Promoting a DARPA-hybrid model of collaboration between small firms and universities; and Funding talent collaborations, especially for universities with less-developed innovation ecosystems.

Engaging with regional and local economic development efforts

Our universities will promote efforts to link regional and national stakeholders together in support of research and education critical to local businesses and industry by:

- Striving to expand existing university participation in national, regional and local economic development efforts.
- Fostering consortia of research universities and industries across regions.
- Working with the federal government and other stakeholders and professional associations to improve the coordination of the nation's venture accelerators, including development of a searchable database of all federally funded intellectual property.
- Working with local, regional, state and business leaders to promote access to assets such as research parks, accelerators, and laboratories to support regional industries, especially existing and small, young companies.
- Participating in developing and implementing economic strategies
- Partnering in community development and revitalization efforts.

Recognizing exemplary economic engagement

To accelerate achievement of the goals outlined in this letter, we call on the National Advisory Council on Innovation and Entrepreneurship and the Obama Administration to work with the higher education community to develop a national program to identify, recognize and celebrate exemplars of “economically engaged” universities. This program would:

- Raise awareness about the importance of higher education and economic engagement in driving regional and national economic growth
- Assist with the creation of organizational assessment tools and measurement criteria that capture the full range of our impact
- Educate higher education leaders about the practices of best-in-class institutions
- Recognize national role models and honor them with a Presidential Award for economic engagement.

Our Commitment

- Our universities, and the national associations that represent us, are committed to sharing best practices, and to identifying additional federal policies that will help to leverage investments made by government, and industry, in the research conducted at our institutions.
- Further, we will continue to use national forums, such the Association of University Technology Managers (AUTM), the University Industry Demonstration Partnership (UIDP) and the Commerce Department's National Advisory Council on Innovation and Entrepreneurship, to engage in an ongoing dialogue with industry, non-profit foundations and the government on how we can advance our shared objectives.

NACIE

- We are also seeking ways to collectively implement recommendations made by the National Research Council in its October 2010 report, *Managing University Intellectual Property in the Public Interest*.
- Although the specifics of our strategies will vary, reflecting the diverse missions and resources of our institutions, we pledge our universities to greater efforts to advance regional and national economic growth. We are dedicated to ensuring that the knowledge and technological breakthroughs developed at our institutions are rapidly and broadly disseminated to advance the nation's social and economic interests.

Kauffman Foundation

- Some think that Universities are the problem and not the solution.

Kauffman Press Release:

Current restrictions imposed by U.S. research universities on the ways their faculty can commercialize federally funded discoveries are slowing the diffusion of new technologies, according to the article by Robert E. Litan and Lesa Mitchell published this week in the January-February 2010 issue of HBR. These limitations are detrimental to the U.S. economy and universities themselves.

"We know that there are many vital innovations and discoveries languishing in university labs because of a suboptimal licensing system at many universities," said Litan, vice president for research and policy at the Kauffman Foundation. "One simple amendment to the Bayh-Dole Act would allow faculty members to choose their own licensing agents/experts and bring these discoveries to market quickly. Unleashing this kind of innovation will lead to the creation of new companies and new jobs. "

Universities are suspicious

- Commercialization of Intellectual Property includes three major stakeholders;
 - ▣ Universities: Bayh-Dole gives them control
 - ▣ Industries: They resent having to negotiate with Universities and think they are too tough.
 - ▣ Faculty: Although they share in any patents and licensing, their primary interest is in furthering their research.
 - In return for research funding, they are often willing to sign away rights.
 - ▣ In public universities there is a fourth: Government. Giving away government property without adequate compensation is illegal.

Largest Research Universities (R\$ in M)

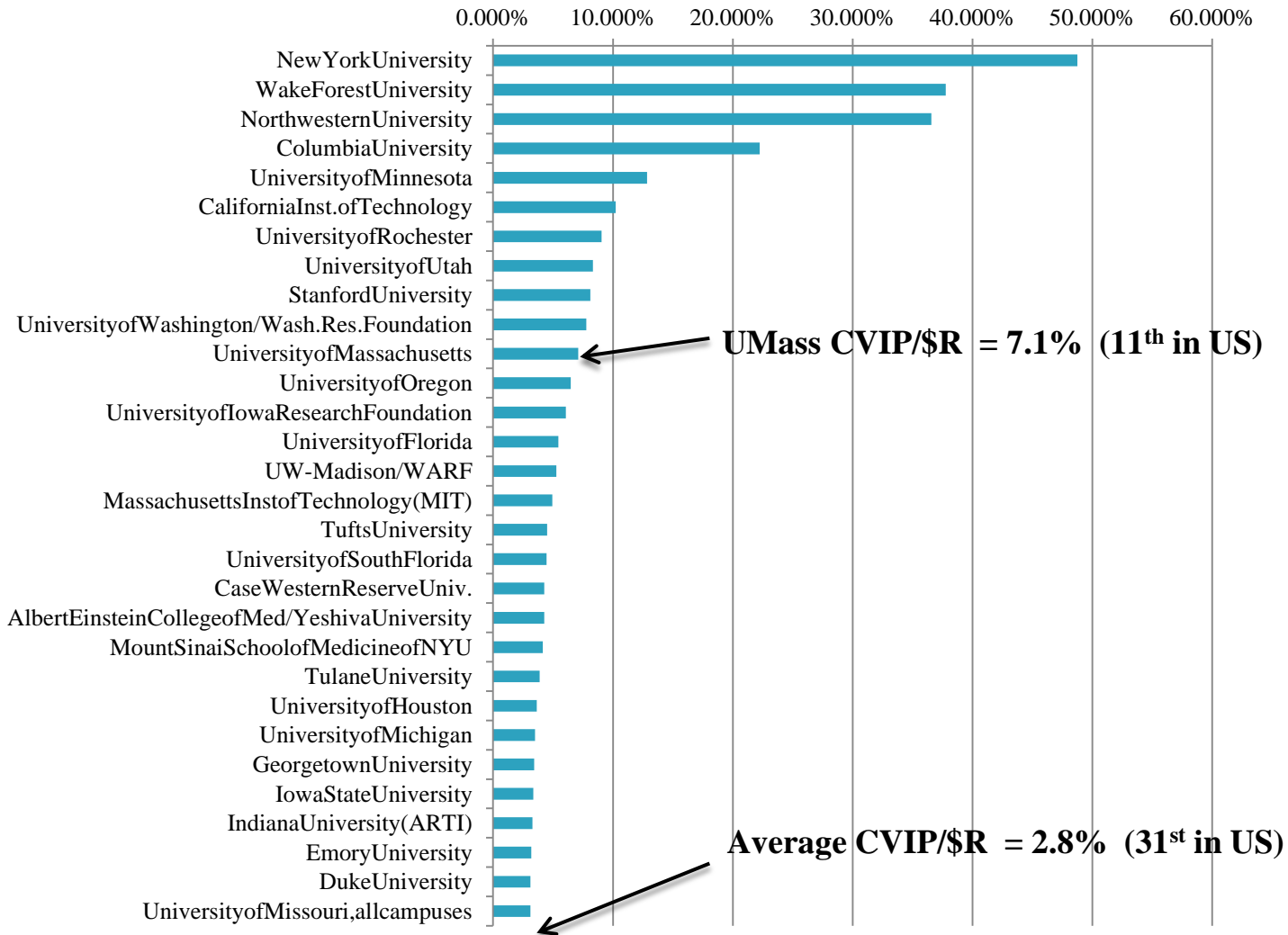
1	University of California System	5,172	26	Georgia Inst. of Technology	644
2	University of Texas System	2,346	27	University of Southern California	593
3	Johns Hopkins University	1,463	28	University of Arizona	587
4	Massachusetts Inst of Technology (MIT)	1,401	29	Purdue Research Foundation	573
5	University of Michigan	1,139	30	University of Massachusetts	564
6	Johns Hopkins University Applied Physics Lab	1,071	31	University of Florida	536
7	UW-Madison/WARF	1,029	32	California Inst. of Technology	504
8	Research Foundation of SUNY	891	33	Vanderbilt University	492
9	University System of Maryland	888	34	Northwestern University	492
10	University of Washington/Wash. Res. Foundation	887	35	The UAB Research Foundation	490
11	University of Illinois, Chicago, Urbana	878	36	University of Rochester	461
12	University of Colorado	847	37	University of Utah	450
13	Duke University	827	38	Emory University	450
14	Stanford University	806	39	University of Iowa Research Foundation	444
15	University of Pennsylvania	785	40	Indiana University (ARTI)	432
16	Penn State University	780	41	Michigan State University	431
17	Harvard University	770	42	Louisiana State University System	417
18	Cornell University	764	43	Baylor College of Medicine	403
19	Ohio State University	756	44	Boston University/Boston Medical Center.	403
20	University of North Carolina, Chapel Hill	738	45	Oregon Health & Science University	392
21	University of Pittsburgh	737	46	University of South Florida	391
22	Washington University of St. Louis	706	47	University of Chicago/UC Tech	379
23	Texas A&M University System	690	48	Mount Sinai School of Medicine of NYU	371
24	Columbia University	662	49	Rutgers The State University of NJ	368
25	University of Minnesota	654	50	New York University	366

Largest CVIP Universities

1	New York University	26	Iowa State University
2	Wake Forest University	27	Indiana University(ARTI)
3	Northwestern University	28	Emory University
4	Columbia University	29	Duke University
5	University of Minnesota	30	University of Missouri, all campuses
6	California Inst. Of Technology	31	University of Georgia
7	University of Rochester	32	Carnegie Mellon University
8	University of Utah	33	University of Chicago/UCTech
9	Stanford University	34	Rutgers TheStateUniversity of NJ
10	University of Washington/Wash.Res.Foundation	35	Louisiana State University System
11	University of Massachusetts	36	Baylor College of Medicine
12	University of Oregon	37	University of Southern California
13	University of Iowa Research Foundation	38	University of California System
14	University of Florida	39	University of Virginia PatentFoundation
15	UW-Madison/WARF	40	University of New Mexico/Sci.&Tech.Corp.
16	Massachusetts Inst of Technology(MIT)	41	University of Texas System
17	Tufts University	42	Dartmouth College
18	University of South Florida	43	University of Illinois ,Chicago,Urbana
19	Case Western Reserve Univ.	44	Cornell University
20	Albert Einstein College of Med/YeshivaUniversity	45	North Dakota State University
21	Mount Sinai School of Medicine of NYU	46	Virginia Tech Intellectual Properties, Inc.
22	Tulane University	47	Research Foundation of SUNY
23	University of Houston	48	University of Pennsylvania
24	University of Michigan	49	North Carolina State University
25	Georgetown University	50	Harvard University

Wide Variation in Results.

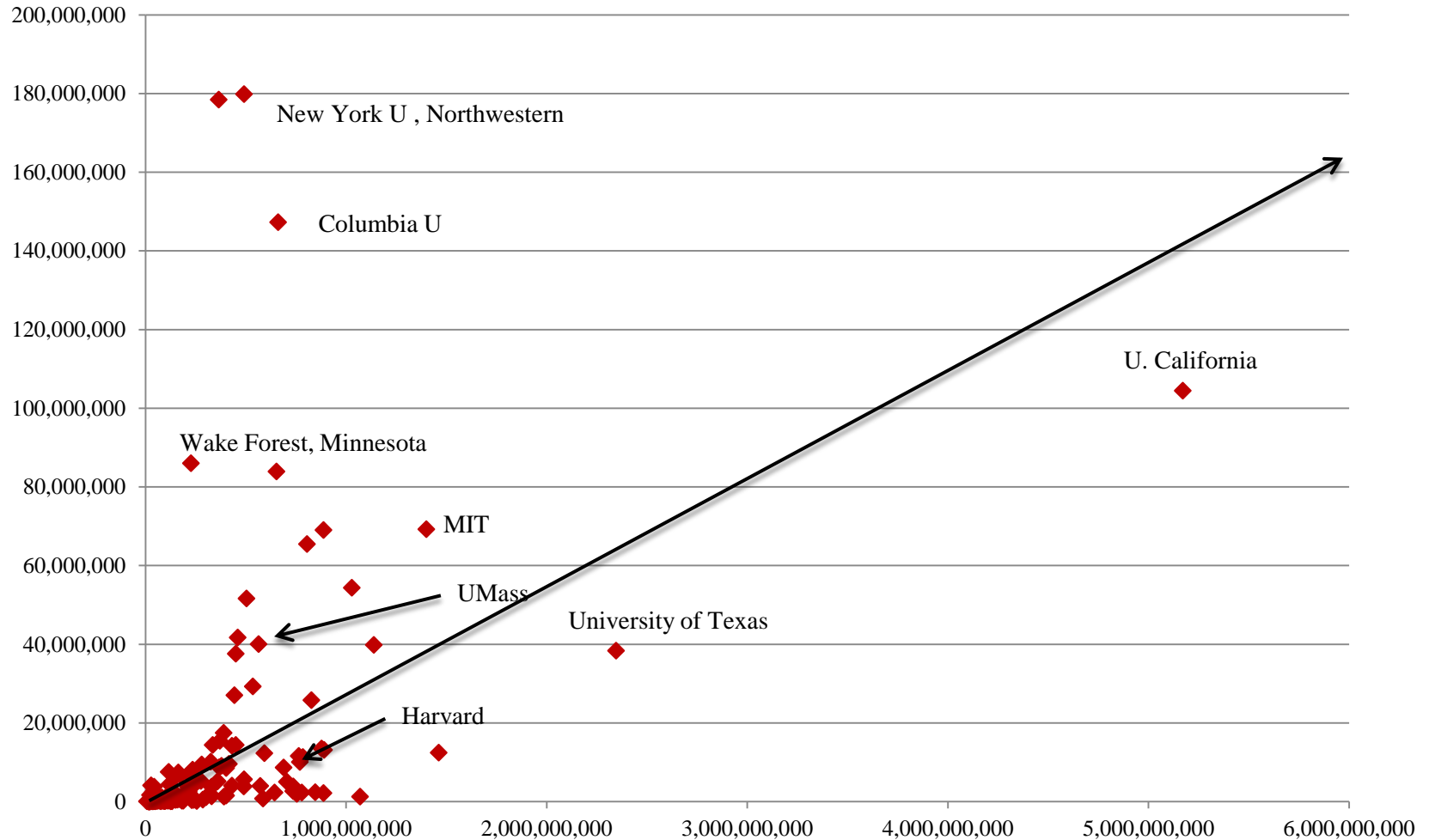
CVIP/Rsch\$



What does lead to success in CVIP?

- Should relate to research volume
- Should depend upon type of research: life science, computer science, physical science, humanities, etc.
- Should depend upon commercialization policies
 - Remember the letter from NACIE
- Should depend upon culture and history
- Should depend upon quality of commercialization support.
- Should depend upon how much entrepreneurial freedom states give public universities and their faculty.

Dependence upon research volume



There is much more to learn



- Clearly other factors are important
- We have much more to do to understand the mechanisms of technology transfer from the lab to commercial use.
- I am looking forward to working on this.



THANK YOU!