

“Economic Engagement and the Research Enterprise:  
The Role of American Higher Education”

University Economic Development Association Summit

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1. THE VALUE OF PUBLIC HIGHER EDUCATION

One of the fundamental strengths of the United States is our longstanding commitment to higher education. From the earliest days of the republic, this country’s founders demanded that higher education should be available to everyone, not just those who could afford a private education. In fact, the Northwest Ordinance of 1787, which led to the creation of the state of Indiana, declared that “Religion, morality, and knowledge, being necessary to good government and the happiness of mankind, schools and the means of education shall forever be encouraged.”<sup>1</sup>

Since those early days, the general belief in the transformative power of higher education has not waned. In numbers too large to count, the graduates of public higher education have found personal success and have created a society that has been and remains the beacon, and sometimes the envy, of the world. As journalist Fareed Zakaria

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<sup>1</sup> “Primary Documents in American History: Northwest Ordinance.” Library of Congress Website. Virtual Services Digital Reference Section. <<http://www.loc.gov/rr/program/bib/ourdocs/northwest.html>>

explained, “[H]igher education is the United States’ best industry. In no other field is the United States’ advantage so overwhelming.”<sup>2</sup>

Among the most compelling evidence of the quality of our system is the fact that countries around the world are now vigorously seeking to emulate it. China, Russia, Germany, Korea, France, and many other countries are pouring billions of dollars into their systems of higher education precisely to replicate, and then compete with, the American system.

## 2. A NEW ERA IN HIGHER EDUCATION

### 2.1 THE KNOWLEDGE SECTOR

According to recent figures from the Department of Education, nearly 70% or nearly 15 million students attending college are enrolled in public universities in the United States. These students are part of a new era in higher education. In years past, manufacturing made up the lion’s share of the U.S. economy. People could make a good living with a high school education, and they could expect to secure jobs that would last a lifetime.

This is no longer the case as our economy has shifted to one that is knowledge and information based, and people—and companies—have become more mobile in response to changing economic factors. Some people mistakenly equate the knowledge sector with a shift away from all forms of manufacturing, but in reality, this knowledge and information-based economy makes possible more complicated manufacturing with fewer people. A good example of this is the car parts industry so prevalent in Indiana, including in the Kokomo area. I am pleased that Chancellor Harris from IU Kokomo will be speaking to this group later in the conference about his campus’ economic engagement efforts.

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<sup>2</sup>Zakaria, Fareed. “The Future of American Power.” The New York Times Website. 19 May 2008. <<http://travel.nytimes.com>>.

## 2.2 TRANSFORMATION IN HIGHER EDUCATION FINANCE

This era is also characterized by a transformation in the finances of higher education that directly affects students and their families.

The factors that exist in higher education today are creating what could be described as a perfect storm. Economic downturns such as the one we are facing are often associated with increased interest in higher education as people prepare themselves for the changing economy. The economy itself has shifted towards the knowledge-sector, which depends, in significant measure, upon the education provided by our public state universities. The need for higher education, then, is greater than ever, but the resources to support higher education are being stretched thin.

Part of our goal as administrators with a special interest in economic development and engagement is to help our institutions weather or adapt to such situations, and, if possible, come out of them better than we went in.

At IU, we have made short and long-term changes to address our current situation, instituting many measures to increase efficiency, to help students complete their degrees on time and sometimes ahead of time, and to use the resources entrusted to us as productively as possible.

## 3. AN OVERVIEW OF ECONOMIC ENGAGEMENT

At the same time that state funding for public universities is declining across the nation, expectations that public universities should contribute to the lives of their states are increasing.

Those expectations fall into a number of different categories, but the two fundamental areas are related to our education and research missions. Educating students and

preparing them for their future has always been one of our fundamental missions, and this cuts across all of our institutions. We are all educating and graduating more students faster and cheaper, supplying a steady stream of educated graduates who help companies across the nation prosper and grow. And university graduates are also leaders in their communities, contributing their skills and expertise outside of the workplace in an effort to improve those communities.

In fact, in Indiana, at our regional campuses in communities as diverse as Gary along Lake Michigan in the north and New Albany along the Ohio River in the south, the overwhelming majority of those students—often working full- or part-time jobs while in school—typically remain in their local communities after graduation to further contribute to the economic well-being of their respective communities.

Many graduates have been deeply involved in the research enterprise, as they progress towards their degrees. I have heard the figure that one third of all research conducted in university laboratories is conducted by graduate students. The movement of graduate students and post-docs between and among university and industry labs facilitates innovation on many levels, in a way “cross-pollinating” the labs in which they are working.

The research enterprise offers other avenues for measurable economic engagement in the life of the state including the direct effect of the grants and awards that support university research. Those funds translate into both jobs and money. Longstanding analyses of a university's economic impact on its region estimate that each dollar spent by a university on research generates \$2.30 in impact. This means that Indiana University's record \$509 million in research expenditures in the last fiscal year represents about a \$1.17 billion economic impact on the state of Indiana.<sup>3</sup> Expand this calculation to universities across the country, and the results are impressive indeed.

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<sup>3</sup> “IU Research Expenditures Surpass \$500 Million Mark in FY 2011.” IU News Room. Indiana University Website. <<http://newsinfo.iu.edu/news/page/normal/19360.html>>

Those measurable contributions also include the transfer of technology from university laboratories into products. Increasingly, legislators and senior administrators look to commercializing technology and licensing revenue as a means to supplant revenue lost from declining state support. While these proceeds can help, very few schools in the country generate sums to offset that deficit, and many tech transfer offices actually do well just to cover their costs of operation. At Indiana University, we have been fortunate to realize significant gains arising from several of our innovations and technologies, which we have reinvested into the research enterprise and strategically deployed to augment our technology commercialization ecosystem.

Ultimately, the real purpose of technology commercialization is to work in a systematic and institutionally-supported way to transfer the great research work being conducted by faculty members into products that can help people here in the United States and around the world lead better, healthier lives and experience a higher standard of living.

In addition to technology commercialization, universities can also play an important role as a safe harbor where different, and sometimes competing, businesses can partner with one another under the auspices of a university research center that focuses on an area of shared interest. As competitors, these companies would not normally collaborate to solve common problems, but the university research center can harness the expertise from multiple parties, synthesize and share it in a generic way—in the form of a report, an academic paper, or a white paper, for instance— so that the broader group of stakeholders reaches a solution to the problem from which all realize a benefit.

Inherent in these engagement efforts is service to the broader community. We also see such service in the increasing number of students holding internships and taking advantage of opportunities for community service. According to recent census figures, over four million college-age students volunteer their time in their communities, and that

translates into over \$6 billion worth of volunteer service across the nation.<sup>4</sup> For public universities with medical schools, that “service” also may extend to an academic health system where university scientists and physicians conduct cutting-edge research and provide top-quality clinical care.

Beyond these more traditional approaches to economic engagement, we could also include cultural elements such as music, art, and theatre, among others. These not only add to the cultural richness of a region, but they also contribute directly to the area economy. In fact, according to a national report, the nonprofit arts and culture industry generates over \$166 billion in economic activity every year—\$63.1 billion in spending by organizations and an additional \$103.1 billion in event-related spending by their audiences.<sup>5</sup> In Indianapolis alone, a recent study indicates that the non-profit art community generates nearly half a billion dollars in economic activity (\$468 million), supports over 15,000 full-time jobs, and generates nearly \$52 million in local and state government revenue.<sup>6</sup>

Another somewhat less traditional area of economic engagement is athletics. Even with modest attendance at IU football games, we have 30,000 people in the stands, many of whom will be dining at area restaurants, staying at area hotels, and shopping in area stores. Our sports programs also generate television revenue, which we reinvest in our facilities. Though not always included in the traditional economic development portfolio, athletics programs such as ours keep alumni connected to university communities and through those connections, alumni continue contributing to the regional economy.

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<sup>4</sup> Information for this calculation was taken from the following Websites: Independent Sector at <<http://www.independentsector.org>>, the National Center for Education Statistics <<http://nces.ed.gov/>>, and Volunteering in America <<http://www.volunteeringinamerica.gov/export.cfm>>.

<sup>5</sup> “Arts & Economic Prosperity III: The Economic Impact of Nonprofit Arts and Culture Organizations and Their Audiences.” National Report of Americans for the Arts. <[http://www.artsusa.org/pdf/information\\_services/research/services/economic\\_impact/aepiii/national\\_report.pdf](http://www.artsusa.org/pdf/information_services/research/services/economic_impact/aepiii/national_report.pdf)>

<sup>6</sup> Arts Council of Indianapolis 2009 Annual Report <<http://www.artscouncilofindianapolis.org/content/blogcategory/68/195/>>

#### 4. INDIANA UNIVERSITY'S RESPONSE TO ENGAGEMENT NEEDS

In light of the many and varied expectations and demands placed upon universities, including my own institution, it is incumbent upon all of us to ask, “How do we respond to those seeking to do business with our university—among both internal and external stakeholders?”

At Indiana University, we have undertaken significant steps and a major reorganization to more effectively and efficiently answer that question and engage the university in the life and economic wellbeing of the state and all her citizens.

Based upon the findings and recommendations of a university-wide strategic plan focusing on economic development, one of my first acts even before I was officially installed as president was to begin preparations for establishing a vice presidential level office of engagement. It was abundantly clear to me that for an institution as large and complex as Indiana University, we needed to establish a primary point of contact for all matters relating to how the university could effectively respond to need and opportunity throughout the state. For external stakeholders, in particular, it was critical that they understood how they could navigate an institution such as ours with relative ease, through a single front door, if you will.

The Office of the Vice President for Engagement is charged with channeling and leveraging the university's extensive intellectual resources and related assets to further advance the state's economic vitality and the wellbeing of Hoosiers throughout the state. This office, while not at all large or heavily staffed, works in a networked fashion by enlisting willing colleagues from throughout the institution on a project or needs basis.

A significant development along these lines was the creation of our Council on Regional Engagement and Economic Development, through which the chancellors of all eight IU campuses have appointed representatives to support our engagement efforts

throughout the state. The Council provides a forum that connects all of our campuses, helps ensure continuity relative to engagement, and serves as an important information relay system or clearinghouse so that broader university initiatives can be communicated and best practices adopted statewide.

Given the heightened emphasis placed on our statewide engagement efforts and, frankly, recognition for our efforts, it was important for us to appropriately denominate or “brand” this new work in progress. “*Innovate Indiana*” is our nameplate for the broad range of engagement activity we undertake throughout the state. It is really intended to underscore IU in action—that is, the many ways by which we are contributing to Indiana’s economic vitality and wellbeing of the citizens of our state. It’s our Indiana Business Research Center undertaking an economic impact analysis for a proposed new hospital in Northwest Indiana. It’s a faculty member in the College of Arts and Sciences providing subject matter expertise in the area of materials science to a plastics manufacturer in Evansville. It’s IU’s world-renowned Jacobs School of Music taking the show on the road to small, rural Indiana communities that have never enjoyed the pleasures of a grand symphonic orchestra. All of which reflect IU in action—*Innovate Indiana*.

In addition to establishing the Office of the Vice President for Engagement, we also brought the IU Research and Technology Corporation under the auspices of the Office of the Vice President for Engagement to more fully integrate the staff and operations of our technology commercialization operation with our broader engagement portfolio, thereby more effectively aligning all economic development efforts and further extending our reach statewide. Established in 1996, the IURTC is a not-for-profit supporting organization with a governance structure separate from Indiana University and focused on commercializing the innovations and intellectual property developed by IU faculty and researchers.

The board of the IURTC was reconstituted to include representation from the deans of those schools integral to our economic development efforts—Informatics and

Computing, Business, and Medicine; key faculty members, including a number who have had significant entrepreneurial experience; and, of course, leaders from business, industry, and government. Together, with a fully professionalized staff operation, the IURTC has made significant strides in terms of productivity and in garnering the trust and confidence of our faculty and those external partners who help support and fund our work.

In 2010, we witnessed a new high-water mark at IU in terms of a commercial transaction linked to the sale of a university start-up company. Angel Learning, the Indianapolis-based coursework management company founded by IUPUI professor Ali Jafari and his graduate student David Mills, and in which IU through the IURTC invested, was sold for \$100 million to their primary competitor, Blackboard, Inc. of Washington, D.C.

This was one of our greatest successes to date in terms of a university start-up company, and it was made possible in part by the strategic investments IU has made in information technology over the past decade or more. I might add that Dr. Jafari is currently working on a new project, in which IURTC is, again, investing, that draws on popular social networks like Facebook and Twitter and provides a free, online platform connecting teachers and students around the world based on their shared interests and class subjects.

The university's equity share from the sale of Angel Learning approximated \$24 million and is being used to leverage the creation of new research infrastructure and further augment our technology commercialization capabilities.

More specifically, those funds are being used in part for the construction of the new Science Lab Building on the IUPUI campus.

Some of the proceeds, along with private philanthropic investments, have been dedicated to the establishment of a \$10 million seed capital fund—the Innovate Indiana

Fund—to help nurture and support fledgling but promising IU affiliated business start-ups. By establishing this evergreen fund, we now have critical early and late stage seed capital—funding that is so difficult to obtain, especially in challenging economic times that not only enables young start-ups to get on their feet but also better positions them for capital investments from other sources as they mature.

For example, Courseload, an exciting new a digital platform that delivers course material through any web-enabled device, was funded by the Innovate Indiana Fund. This product delivers the same course material as traditional textbooks at about one third of the cost, thus reducing the costs for students at all levels. Courseload was designed and piloted at IU, and IU has signed a deal with Courseload to make this option available to all IU students, and many other educational institutions, at all levels, are implementing Courseload as well.

Another example of such success is the sale of Marcadia Biotech to Roche earlier this year. The pioneering research behind Marcadia occurred in the Chemistry Building on our Bloomington campus and has created significant new wealth in the state—ultimately over \$500M—all of which was imported from Switzerland and has generated substantial new tax revenue for the state of Indiana.

With help from the Innovate Indiana Fund, over the course of the last three years, seventeen start-up companies have been established based on Indiana University faculty research, with seven in the last year alone. Of those seven, one is a healthcare IT company, two are green energy—wind and solar—and four are life sciences, one of which provides help for children born with a congenital heart disease that is the leading cause of death from birth defects in the first year of a child's life.

Let me also mention our incubator facilities. In Indianapolis, we have the IU Emerging Technologies Corporation. We are also developing a series of Technology Parks along the Bypass in Bloomington. The northern anchor is IU Tech Park North, which features the IU Integrated Science and Accelerator Technology Hall as well as the Center for

Exploration of Energy and Matter and the IU Health Proton Therapy Center. And the eastern anchor is IU Tech Park East, the keystone of which is the Cyberinfrastructure Building being dedicated later this week. Also located there are the IU Innovation Center and the IU Data Center. Both of these tech parks are connected by the IU Technology Corridor that runs along the Bypass.<sup>7</sup>

#### 4.2.1 SUCCESS ON MULTIPLE LEVELS: IU HEALTH

One of the most dramatic but underappreciated ways in which IU has an impact on the state of Indiana is through the IU Health hospital system.

One of our strongest collaborative efforts on a statewide level is the IU Health hospital system, which was formed in 1997 as a not-for-profit joint venture between IU and the Methodist Church through a merger of our hospitals and other services with theirs. It is also a partnership with the IU School of Medicine and the other IU clinical schools. It was originally called Clarian Health Partners but earlier this year changed its name to Indiana University Health. This change is having an immense impact by making much clearer the extraordinary scope and scale of the impact that Indiana University has on the state of Indiana.

IU Health has grown to be the largest hospital system in Indiana with hospitals or other medical facilities in nearly every part of the state, as well as being one of the largest hospital systems in the country. It is ranked in the top 50 programs by *U.S. News and World Report*. Its impact on the well being of the citizens of this state is, in short, colossal. In the last year it treated over 100,000 Hoosiers and nearly 2 million people made outpatient visits. It has gross patient revenues of over \$7 billion and employs

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<sup>7</sup> President McRobbie extemporized this paragraph, which was drafted based on his notes and may not exactly match what he actually said.

around 22,000 people. In fact IU, which employs around 18,000 people, and IU Health are collectively the largest employer in the state of Indiana.<sup>8</sup>

As an employer as well as provider of among the best clinical care in the nation, IU Health is touching millions lives throughout the year, and in this, it is strengthening both Indiana University and the IU School of Medicine.

#### 4.2.2 SUCCESS ON MULTIPLE LEVELS: HIGHER EDUCATION COLLABORATIONS

Our engagement efforts also include higher education partnerships across the state. Just last spring, we dedicated the Harper Cancer Research Institute in South Bend, which will enable University of Notre Dame and IU researchers to continue their search for treatments and cures for cancer, which has touched so many lives.

We have also partnered with the University of Notre Dame, Purdue University, and the state of Indiana on the Clinical and Translational Sciences Institute, or CTSI, which was established in 2008 with a \$25 million grant from the National Institutes of Health. Like Harper Hall itself, CTSI offers another example of the great possibilities of public/private partnerships.

I should also mention the recently dedicated Advanced Manufacturing Center for Excellence, located in Columbus. This center represents the strong partnership between Indiana University and the city of Columbus and also includes Ivy Tech Community College and Purdue University.

In addition, just two years ago, we partnered with Purdue University on a major legislative initiative designed to enhance several of our respective research cores, including nano-engineering at Purdue and medical imaging at IU among others. While

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<sup>8</sup> Information in this section comes from <http://iuhealth.org/about-iu-health/facts-figures/>.

we were successful in obtaining a \$20 million authorization, the funds were not all appropriated given the state's fiscal situation.

There are also the campuses we share with Purdue University across the state, our partnership with Ivy Tech Community College that helps us align our curricular requirements and encourages Ivy Tech graduates to continue their education towards a 4-year degree. All of these are ways that we work with other universities throughout the state to maximize our resources, align our services to specific communities, encourage collaboration, and serve the people of Indiana.

## 5. A BROADER PERSPECTIVE: AMERICAN RESEARCH CLUSTERS

I offer these examples, not as a form of triumphalism but as a case study in how Indiana University has made strategic institutional changes in order to encourage new forms of engagement at multiple levels. We can see this kind of engagement at universities across the country, particularly with the radical transformation that has taken place in the world of research over the past fifty years or so.

Basic research that once took place almost exclusively in American industry and government laboratories has increasingly shifted to the laboratories of this country's top research universities. In the United States at least, the research university is now **the** principal place where basic scientific research is carried out, fueled by intellectual collaboration and academic freedom. The problem with which most great research universities struggled was how to best establish partnerships with industry that enabled this research to be translated into new products and services.

There is ample evidence that universities and communities across the country are solving that problem, to the great advantage of regional economies. Witness MIT and Route 128 in Boston, the Research Triangle in North Carolina, Scripps Research Institute and UC San Diego and the life sciences in the San Diego area, and—perhaps

the quintessential example—Stanford and Silicon Valley, which is the kind of partnership to which all research institutions aspire. In fact, this partnership may be said to have created Silicon Valley.

If we look across the country, the economic regions making the progress—even in times of challenge such as those we face today—are those regions that include a major research university or a cluster of universities. The relationship between universities and regional growth is no coincidence in a knowledge-based economy.

## 6. CONCLUSION: ADAPTING TO DRAMATIC AND PERVASIVE CHANGE

Earlier I mentioned the perfect storm that public universities, in particular, are facing. Some may consider this an apt metaphor, building on the idea that we can, to borrow from the National Academies report, rise above that gathering storm.

A more realistic view is that what we are facing now is not a storm at all but a permanent climactic change. In the face of such dramatic and pervasive change, there is no safety except in adaptation that allows us to use our resources more efficiently, partner more effectively, and transform our organizations in a way that makes the most of the challenges we all are facing.

As those most closely connected to the economic development efforts of your respective universities, you are charged with a responsibility that has grown in proportion to those challenges. You must somehow build a bridge between the academic and entrepreneurial worlds to help your institutions find new models of academic/industry partnership that will further increase efficiency, generate revenue, and control costs for students.

You must find ways to help your institutions continue to respond flexibly to the changing needs of your communities even as you are facing increasing government and other oversight.

And most important, you must help your institutions maintain the quality of their academic and research programs so that they may continue to educate global citizens and conduct research that changes our worlds.

Over the years, these responsibilities have become increasingly important, and the role of economic engagement in American higher education will not diminish in the future. Higher education as a whole is coming to depend more and more on that engagement, as are the communities that we serve.