

# Competitiveness and the University

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*February 23, 2012*

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# My Argument in Brief

- Increasingly, society expects universities and their faculties to make substantial and identifiable contributions to the competitiveness of industry and to the development of the economy at all levels.
- Universities and faculty members are rewarded largely for fulfilling their roles in education and research and not for their roles in competitiveness and economic development
- Society has not come to grips with the growing gap between expectations and rewards
- This gap is a significant contributor to the stresses, financial and otherwise, under which modern American universities operate
- It is important to work toward filling this gap with new forms of reward for both institutions and faculty

# Overview

- The Competitiveness Problem(s)
- The Roles of the University Yesterday and Today
- Rewards to the University and the Faculty
- Rewarding University Contributions to Competitiveness – the Example of Technology Transfer
- From the Periphery to the Core – Reforms in Supporting Universities

# The Competitiveness Problem(s)

- Slow growth
- Stagnant or declining real family incomes
- Loss of many leading industries
- Adverse balance of trade, even in high-tech
- Declining shares of patents, papers, citations
- Little or no net job creation
- Declines in new firm formation and V.C.

# Why the Competitiveness Problem?

- Macroeconomic and financial weaknesses in the near term
  - Too much/not enough public spending
  - Too much debt/not enough investment
  - Not enough consumer demand
- Declining long-run competitiveness owing to
  - Weakness in Federal support of basic research
  - Weak educational system
  - Insufficient infrastructural investment
- Government's role in the economy
  - Too weak
  - Too strong
- "China cheats"

# Why no Consensus on Causes?

- Liberals and conservatives look at the problem differently for ideological and political reasons
- Weak theories of competitiveness undermine measurement and policy analysis
- Many key participants in policy debates have limited understanding of the topics of discussion
- Experts play necessary roles but democratic values and real-world experience limits their influence

# Ideas Contribute to the Confusion

- Old Ideas
- New Ideas



# Old Ideas Limit Thought and Action

- The linear model of innovation is useful
- Basic research is the proper federal domain
- Big companies innovate on their own
- Innovations are always based on technology
- Universities produce only talent and research
- Competitive strength abroad hurts the U.S.
- Public policy should treat all sectors the same

# Some New Ideas Aren't Much Help

- The important innovations are radical or transformative
- Small entrepreneurial firms produce most innovations
- Regional clusters are key to innovation
- Innovation prizes can substitute for R&D funding
- Universities should have to show how the results of each Federal grant will help the economy
- If we work at it, we'll be able to predict the outcomes of R&D investments
- Dropping out of university is a good strategy for getting rich

# Federal R&D Policies and Funding Don't Help Competitiveness Much

- Federal R&D programs and funding are
  - Disproportionately focused on defense and health
  - Non-defense R&D is low relative to GDP
  - Extraordinarily weak in applied research
- Planned DOD cuts may hit RDT&E hard
- Manufacturing R&D support is small and ill-focused
  - No R&D agency focuses on manufacturing
  - Overly focused on glamour areas
  - Systems perspectives are missing
  - Linkages to human resources preparation are weak
  - “Extension” activity is quite limited

# Society's Turn to the Universities

- Universities are being viewed as essential to company, regional, and national performance
- They are seen as playing vital roles in competitiveness
- They are also seen as major contributors to economic development
- The "Open Innovation" strategy used by industry puts high demands on universities
- (Of course, improving the economy is not the only new expectation of universities!)

# University Engagement in Helping Competitiveness is Challenging

- Pits new roles against old
- Upsets traditional systems of reward
- Requires more and different administrators and non-faculty staff
- Adds complexity to already complex institutions
- Costs money
- Alters the political environment

# The University in Society: Old Roles

- A place for teaching and learning
- A codifier of, and repository for, old knowledge and understanding
- A generator of new knowledge and understanding
- A community for personal growth
- A transmitter of values and builder of citizens
- A neutral space for debate
- A home for criticism of society
- An organizer of entertainments

# The University in Society: New Roles

- A generator of new technologies
- A prime source of new ideas
- A founder of new companies
- A solver of problems
- A partner in economic development
- A bridge to the world
- A venue for political presentation
- A critical contributor to economic growth
- A source of specialist leadership

# Rewards for the Faculty

- The faculty are the principal actors in fulfilling the many roles of the university, old and new
- But the faculty are rewarded almost exclusively for two
  - Teaching
  - Generating new knowledge (research)
- And often only for research
- Rewards take the form of:
  - Compensation
  - Appointment, promotion and tenure
  - Recognition and opportunity



# A Paradox

*Rewards to faculty are based on their performance of, and on, a remarkably small proportion of the activities and contributions that society expects from the university*

# Rewards for the University

- Rewards for the university include:
  - State appropriated funds
  - Freedom of action/autonomy
  - Contributions from alumni and friends
  - Recognition and accolades
  - Political support
- The basis for rewards to the university is nearly as narrow as that for faculty:
  - Student enrollment, graduation rates, and job success
  - High profile research accomplishments
  - Athletic victories

## Another Paradox

*Rewards to universities are based on their performance of, and on, a remarkably small proportion of the activities and contributions that society expects from them*

# The Core and the Periphery

- The CORE is understood to be teaching and research\*
- The PERIPHERY is everything else
- For want of another conceptualization, we call everything else “service,” and we applaud but don’t reward it
- It’s time to move some of the periphery into the core

\*Some would argue that athletics are in the core

# The Bases for Rewards to Both Faculty and Universities are in Need of Reform

- Rewarding faculty and institutions for activities and accomplishments in teaching and research is radically out of step with what society expects them to do
- Society's expectations have grown dramatically, especially on the periphery
- Society's willingness to reward even the core has declined sharply
  - The financial crisis in higher education is recognized,
  - But, the mismatch of rewards and expectations is not
- The relationship between higher education and society is in need of serious reexamination

# We Need an “Academic New Deal”

- The Academic New Deal would be a new implicit understanding among the universities, their faculties, and society about what is expected and about how meeting those expectations will be rewarded
- The Academic New Deal would recognize as core some activities what are now seen as being on the periphery
- The Academic New Deal would reverse the current perverse situation in which resources for academia are being cut even as expectations are expanding
- The Academic New Deal would require substantial changes in how the professoriate manages its responsibilities for controlling admission to its guilds

# Example: Moving Technology Transfer from Periphery to Core

- While some universities had long sought opportunities to put new technologies from research into practical use, until the passage of the Bayh-Dole Act in 1980 this kind of activity was very much on the periphery of the university (except in agriculture)
- Bayh-Dole both enhanced the authority of universities to transfer their technologies to practical applications AND strengthened society's expectation that they would do so

# “Policy and Objective” of the BD Act

*It is the policy and objective of the Congress to use the patent system to promote the utilization of inventions arising from federally supported research or development; 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; to ensure that inventions made by nonprofit organizations and small business firms are used in a manner to promote free competition and enterprise without unduly encumbering future research and discovery; to promote the commercialization and public availability of inventions made in the United States by United States industry and labor; to ensure that the Government obtains sufficient rights in federally supported inventions to meet the needs of the Government and protect the public against nonuse or unreasonable use of inventions; and to minimize the costs of administering policies in this area.*

35 USC 200



# Bayh-Dole Was Not Intended to Help Universities Make Money

- Under BD, universities are permitted to earn royalties and fees from licensing federally-funded inventions
- They must share such income with the inventors
- They may use the income to pay “expenses incidental to the administration of such inventions”
- The remaining income must be used in support of scientific research or education

# Bayh-Dole Contains No Provision to Help Universities Not Lose Money

- Bayh-Dole set new expectations for university engagement in technology transfer
  - Legal expectations
  - Political expectations
  - Industry expectations
  - Faculty expectations
- Bayh-Dole only recognizes that technology transfer requires resources when it allows IP income to be used to cover “incidental expenses”
- Bayh-Dole has no mechanism for covering universities’ costs of technology transfer if licensing income and fees fail to cover “incidental expenses”

# Financial Realities of Tech Transfer

- For most universities, technology transfer is a cost center, not a source of net income
- Only a few institutions “make money” on technology transfer, and this is usually the result of a single “home run” or a small cluster of related home runs
- This is in unfortunate contrast to the expectations of many policymakers and academic administrators
- It is, however, completely consistent with the core—neither teaching nor research “make money” and, for most places, they are cost centers

# How Society Pays for the Core

- Public appropriations for institutions
- Private gifts
- Student tuitions
- Concessional loans to students
- Sponsored research grants and contracts
- Income from “auxiliary enterprises”

# How Society Pays for the Periphery

- By diverting resources intended for the core
- Through infrequent gifts and grants to support activities on the periphery
- Occasional industrial contracts
- Evidence for the growth of the periphery and its costs
  - Growth of non-faculty staff
  - Declining share of base budget spent on instruction
- This is, of course, not satisfactory
  - It's a drag on the core
  - It undervalues the periphery
  - It fails to recognize that some activities once on the periphery have moved to the core

# Moving technology Transfer to the Core

- As a key element of the Academic New Deal, it's time to move technology transfer to the core
- This would recognize and validate that technology transfer is no longer a marginal activity that is "nice to do," but has become a core function of the university
- It would mean:
  - Paying for technology transfer from the base budget
  - New state and Federal programs to support innovation in technology transfer
  - Incorporating accomplishment in invention and technology transfer, along with other modes of creativity and development, into the pantheon of faculty evaluation criteria
  - Rewarding administrators , in part, on their support for technology transfer

# Some Implications

- Public institutions need to tell their legislators that, if they want technology transfer and economic development, they have to help pay for it
- Private institutions need to raise private funds to support technology transfer and economic development
- Deans and promotion and tenure committees need to give full recognition to technology transfer in faculty actions
- The Federal government, which started the whole thing, needs to support technology transfer and economic development as it does research

# The System is Moving This Way

- The Carnegie Foundation for the Advancement of teaching recognizes the “Scholarship of Service” as one of the forms of modern scholarship
- Some institutions have incorporated technology transfer and economic development contributions into P&T criteria
- A few high profile private and corporate gifts have been made to support technology transfer and/or commercialization
- The U.S. Department of Commerce is focused on reforming the technology transfer system to enhance its performance and value
- A few states are providing universities with competitive grant funds to commercialize inventions and/or support technology transfer



# What Remains to be Done

- Full recognition by leading institutions that technology transfer and economic development are core functions of the university
  - Top-ranked universities
  - University associations
  - Faculty associations
  - Associations of university academic and financial officials
  - Academic societies
  - Opinion leaders
- Formalization of the place of technology transfer and economic development in university budgets and plans
- A significant new Federal investment in university-based technology transfer and economic development

# The Politics will be Tough

- There will be opposition to an Academic New Deal
  - those who view adding new activities to the core as a threat to the integrity of the old core
  - Those who worry about the university “selling out” to business
  - Fiscal conservatives
- Meeting this opposition responsibly is an important role for professionals engaged in technology transfer and economic development at universities
- Forming coalitions with others on the periphery may be useful in achieving an “Academic New Deal”

Change Will Come Slowly, but it  
Will Come

Thank you!

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