The Changing Dynamics of University/Industry Relations

Robert C. Miller

June 26, 2006

1

Topics:

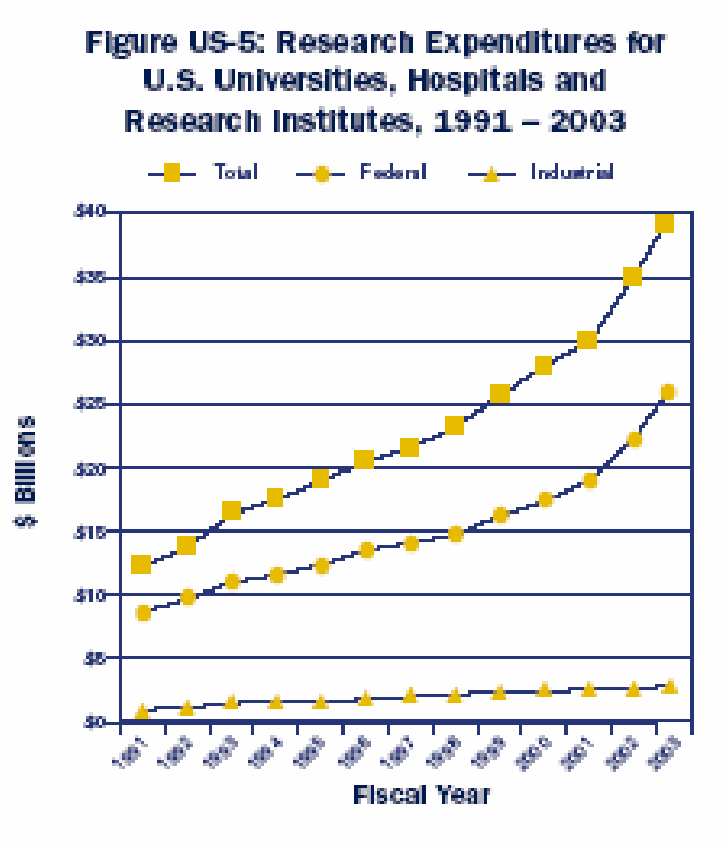
- Economic development data
- Industry sponsored research
- Issues for companies and universities
- Policy changes for universities
- Principles for good partnerships

- University/Industry relations become more important as a knowledge-based economy expands.
- U.S. venture capital investments of $273 billion created 10.1 M jobs from 1970 to 2003.
- California created 1.4 M jobs with $108 billion invested.

- Regional economies are strengthened by start-up companies which are derived from university-based discoveries.
- Since 1980 4000 technology based U.S. companies have been started directly by university license and technologies.
- 80% were formed in the state of original IP license.

- More than one half of all university derived start-ups are still viable.
- Many are acquired or merged with established firms.

- Industry sponsored research in universities continues to increase in spite of the decrease in the economy and a decrease in net research and development spending by companies.



- University Research was supported by a total of $38 billion in 2003, of which 66% came from the federal government.
- At the same time industry support was $2.9 billion, up from $2.3 billion in 2000.

- Industry now demands graduates entering the workforce who are knowledgeable about process engineering and product development.
- University/Industry co-operative agreements lead to useful results and provide graduates with useful skills.

Forms of collaboration:

- Consulting
  - State of the art assessment
  - IP developed in company
- Industry sponsored research
  - Agreed upon work plan
  - IP to the company
  - Cooperation and contribution of graduate students

Forms of collaboration (continued):

- Students in companies
  - Interns
  - Thesis (Boeing, PAPRICAN)
- Start-ups
  - Leave of absence

Forms of collaboration (continued):

- Service contracts
- Uncompensated use of facilities
  Private use of state resources

Where are we?

How did we get here?

What should we emphasize next?

In 1965 at Penn we had:

- The structure of DNA and the code
- The PDP 32 for $50,000
- Industry consulting in civil, chemical and electrical engineering

In 1975 at UBC we had:

- Synthetic genes
- Electronic memories
- Consulting and start-ups in electrical engineering

In 1985 everywhere we had:

- Genetic engineering
- Consumer computing
- Industry sponsored research
- Licenses

In 1995

- Large corporations from earlier start-ups (sizeable equity pieces) (a few)
- Large licenses (a few)
- Large industry sponsored research agreements
- The concept of clusters and the knowledge based economy
- The first Vice Provost with dedicated IP responsibilities

In 2000

- The first $100 M year in University/ Industry affairs

In 2005 – Controversy from all sides:

- The “kept university”
- The “difficult university”
- Misuse of state resources and corporate welfare
- High faculty expectations
- Government audit
- Accountability
- Regents financial problems

So what is the state of affairs?

Public University goals and mandate:

- Access to education
  - Salaries (weekly)
    - 1980 – 215/348: no high school/college degree
    - 2000 – 337/821
- Publish research results
  - No secrecy
  - No confidential information
  - Access to all data
    - (environmental & clinical trials)

Public University (continued):

- Manage Budget (40,000 students)

Research from all sources	$ 800 M
Research from corporations	50 M
Medical Centers	1,500 M
Everything else	1,200 M
Academic programs	
Dorms, food, services	

- Generate support for Research

Public University (continued):

- Minimize risk
  - Collect money
  - Avoid conflict of interest
  - Pass audit
    - OMB
    - NIH
    - State
    - Regents
  - Avoid liability

Public University (continued):

- Enhance good will
  - Public
  - Government
  - Private donations
  - Corporate relations

Governance system which establishes policy and control:

- Faculty Senate
- Campus administration
- UC Office of the President
- Board of Regents
- Legislature

Governed, not managed.

A wide range of possible University/Industry arrangements exist:

- Standard industry sponsored research agreement
- Exclusive license agreement
- Non-exclusive licensing program
- Consortia based affiliates program
- Start-up company process with equity interest
- Gifts

A complex set of issues arises in each mode.

ISRA considerations must recognize other possible pre-existing agreements that cover fields of use which have generated background IP and which represent significant prior investments.

The perception of public interest must be protected.

Therefore, the University/Industry collaboration must be careful of uncompensated use of public resources (space, equipment, staff).

Compensation for faculty may include equity positions. These lead to conflict of interest considerations.

Graduate students must be protected from perceptions/realities of exploitation.

Clinical trials and major safety research cannot be conducted in context of financial interest.

In order for the relationships to develop, companies and universities must modify expectations, policies and practice.

Universities must not expect to gain large revenues from license royalties.

Large fractions of royalty revenues come from a few inventions.

Most universities have none, or only 1-2 “big hits” in their history.

“Big hits” arrive at 1/2500 disclosures.

Unrealistic negotiations over ISRA decrease collaboration, opportunity and revenue.

Large university systems must stimulate local campus control and expertise.

Metrics of success must reflect:

- Throughput
- The sum of:
  - IDC $$ from ISRA
  - Exclusive license royalties
  - Non-exclusive license fees
  - Affiliates fees
  - Equity
  - Gifts

Universities must develop an integrated administrative approach to maximizing results which reflect the metrics.

Universities must be flexible.

Different industries have different requirements.

Companies must not undercut faculty/university relations.

Companies must respect public ownership and management of Intellectual Property.

Each of the three principals (Company, Inventors, University) must be comfortable in any of the three chairs after reaching agreement.

The agreement must lead to successful partnership, not a one-sided “win”.

Overall, we need to work toward:

- Non-exclusive licensing to consortia who support fundamental research.
- Exclusive licensing for product oriented technology to start-ups.

Center for Process/Analytical Chemistry

- Agilent Technologies
- Amgen, Inc.
- The Boeing Co.
- Bristol-Myers Squibb
- Chevron Texaco
- Dow Chemical
- E.I. duPont deNemours & Co., Inc.
- Exxon Mobil Chemical
- Honeywell International, Inc.
- ICI Inc.
- Kraft Foods
- Eli Lilly and Company
- Miller Brewing Co.
- 3M

Successful relationships can lead to continuing partnership with enhanced benefits:

- Transparent window on field
- Improved graduate training for future workforce
- Tailored training for company personnel
- 2nd and 3rd generation improvements
- Networking and consortia

Successful University/Industry relations lead to support for public university budgets.

Summary

- Opportunities for beneficial partnerships have increased.
- Universities and companies must adjust expectations.
- We've done a good job – we can do better!

Acknowledgements

- Gerald Barnett, UC Santa Cruz
- Nancy Bingham, NASA Ames
- Pat Jones, University of Arizona
- Kathy Ku, Stanford University
- Ed Lazowska, University of Washington
- Burney Le Boeuf, UC Santa Cruz