



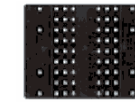
**TESSERA®**



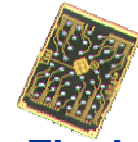
## **University Licensing Strategy to Industry: Difference between universities & private sector**

Sandeep Agarwal  
January 10, 2008

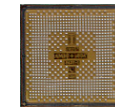
- Total IP portfolio = 1067 patents
  - USA: 736 (500 granted and 236 pending)
  - Foreign: 331 (140 granted and 191 pending)
- Licensing revenues (royalties):
  - 2007 = \$150 million (approx)
  - 2006 = \$99.6 million
  - 2005 = \$56.9 million
  - 2004 = \$39.6 million
- Two major technology groups:
  - Semiconductor packaging
  - Micro-optics (wafer-level camera)
- Sales & Licensing team of ~20 people
- Actively defends its IP – *much appreciated by our current licensees*



DRAM



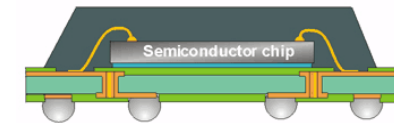
Flash



ASIC



DSP

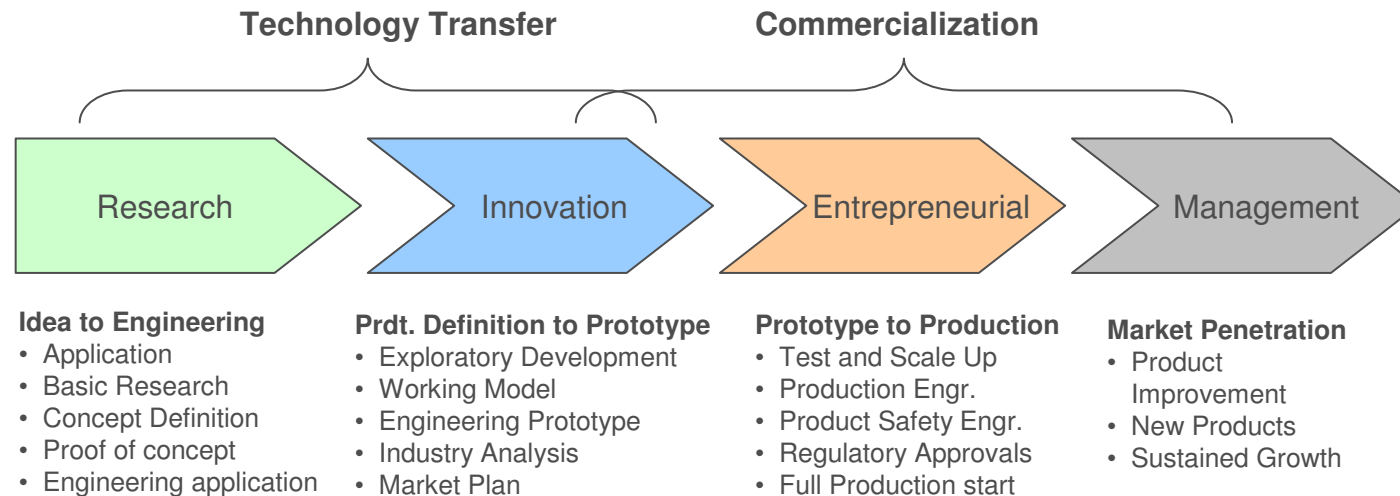


- Technology Transfer & Commercialization
  - Definitions & Options
  - Factors influencing TT
- Differences in University and Industry
- Strategy Development
- Comparing the 4Ps of marketing
  - Product
  - Price
  - Promotion
  - Place
- The 5<sup>th</sup> “P” - Peripherals
- Conclusions
- Personal Recommendations



*Technology Transfer* is a process of moving research from one place to other (lab to lab, lab to market)

*Commercialization* is a process of introducing a new product in the market



Source: Making a Licensing Decision, US DOE

# Technology Transfer Options

- Licensing the invention
  - Exclusive, non-exclusive, partially exclusive, single use, cross license, etc.
- Joint research and development
  - Two party or multi-party (e.g. government funded)
- Sponsored research
- Starting a new company
  - Voting or non-voting shares
- Out-right sale of IP
  - Auctions, direct contact
- Merger & Acquisition

Royalty Income from University licenses has grown 17%/year since 1992 and it crossed \$1 billion in 2002

# Factors Influencing Technology Transfer



**Getting to the deal**

**Negotiating a deal**

**Closing the deal**

**Living with the deal**

Institutional	Individual	Systemic
Preset Policies	Knowledge & Experience	Cultural
Technology status & scope	Responsibility & Authority	Drivers for Technology Transfer (e.g. federal requirement)
Vehicles for Technology Transfer	Responsiveness	Money vs. public good
IP Ownership	Valuation	IP rights (e.g. joint inventions)
IP Protection	Negotiating skills	Regulatory (e.g. domestic manufacturing requirement)
Contractual requirements (e.g. license grants, IP costs, indemnification, etc.)	Relationship management	UBIT (Un-related Business Income Tax)
Expectations (including valuation)		TEBA (Tax Exempt Bond Act)
Tools (e.g. market research, deal database, IP docketing, etc.)		
Audit management		

## *Fundamental Differences*

### University

- Mission is education & research
- Goal is publication
- Result is *Invention*
- Focus on science & learning
- Driven by professors & funding
- Technology Transfer is a secondary consideration
- Commercialization is not well understood
- Externally funded

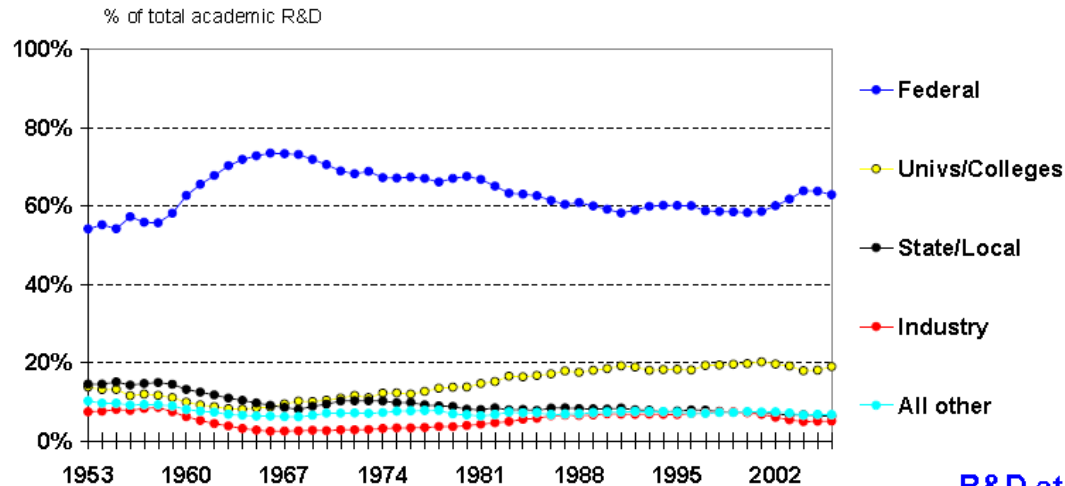
### Industry

- Mission is share holder value
- Goal is product
- Result is *Innovation*
- Focus on markets & selling
- Driven by sales & marketing
- Technology Transfer is the primary consideration
- Commercialization aspects are key considerations
- Internally funded

# R&D Funding – Academia

## Sources of Academic R&D Funding, by Sector

Fiscal Years 1953-2006



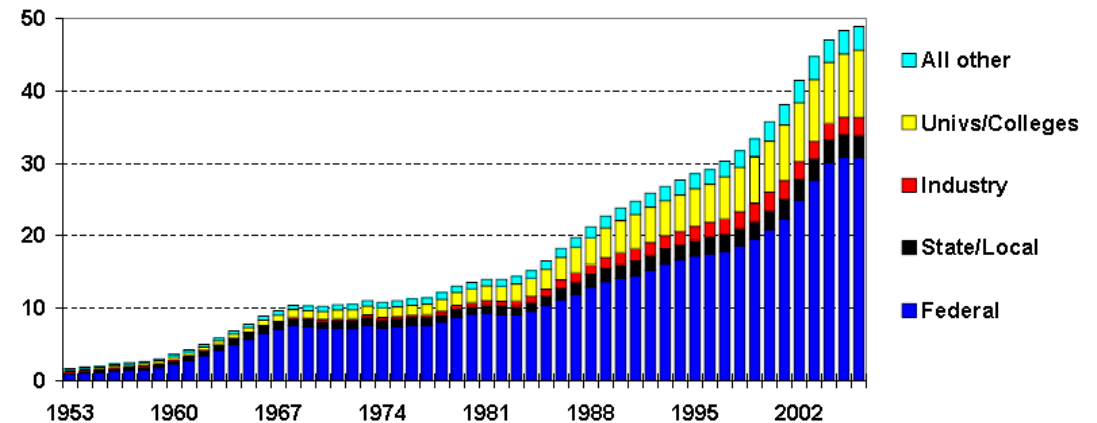
**Total Academic R&D ~ \$48 Billion**

### Sources:

- **Federal Gov. ~ \$30 Billion 63%**
- **Internal ~ \$9 billion 19%**
- **State/local, other ~ \$6 bn 13%**
- **Industry ~ \$3 billion 5%**

## R&D at Colleges and Universities by Source of Funds

in billions of constant FY 2007 dollars, FY 1953-2006



- Marketing strategy\*: A process that can allow an organization to concentrate its **limited resources** on the greatest opportunities to **increase sales** and achieve a **sustainable competitive advantage**
- Industry has been using the Marketing Mix and its 4 parameters – 4Ps (Product, Price, Promotion, Place) to position products in the market since 1960s!
- Universities have an opportunity to learn from and/or adopt the same concepts from the industry



<http://www.netmba.com/marketing/mix/>

\* Source Wikipedia

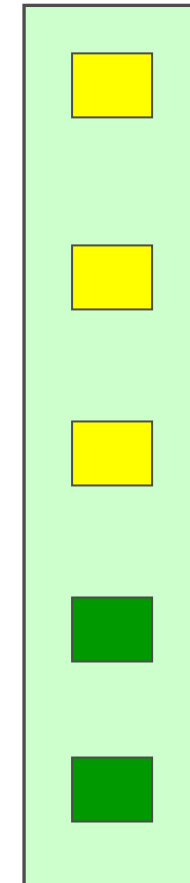
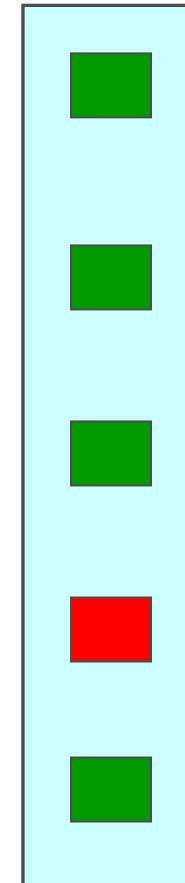
# 4Ps – Product (Technology)



- Technology specifications
  - Supporting literature, description of benefits & features, technical details
- Quality of Technology
  - Originality, newness, underlying research
- Breadth/Complementary technology
  - Supporting technical disciplines, single trick pony?
- Technology readiness
  - Early stage, market readiness
- IP Protection
  - Domestic, international, IP ownership

University

Industry

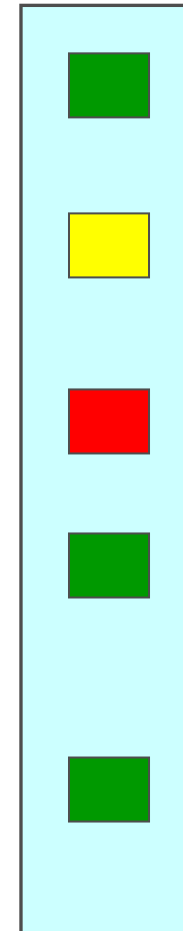


■ Good  
■ Medium  
■ Poor

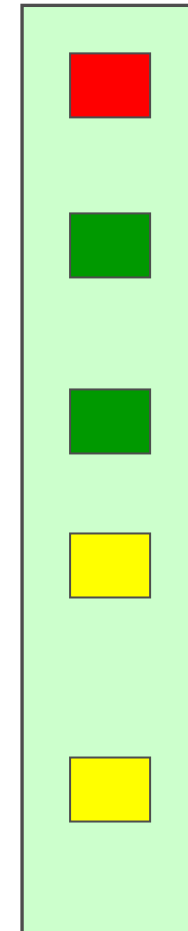
- Technology pricing
  - Upfront fees, running royalties
- Pricing Strategy
  - Cost plus, skimming, undercutting
- Cost of development (risk?)
  - From prototype to production
- Value of technical support
  - Willingness and ability to provide continued technical support?
- Payment terms
  - Flexibility, interest for late payments

■ Good  
■ Medium  
■ Poor

## University



## Industry



## ■ Active

- Industry Trade shows
- Commercial media (news paper, TV)
- Internet Blogs
- Email campaigns
- Targeted calling (citation analysis, US/IPC classifications, industry codes)
- Industry/Alumni contacts
- Word of mouth

## ■ Passive:

- Industry Publications
- Internet (own website, 3<sup>rd</sup> party portals)
- Award submission

- Good
- Medium
- Poor

## University



## Industry



# Promotion – Industry



The screenshot shows the TESSERA website homepage. At the top right, there is a language selection menu with icons for the United States, Japan, South Korea, France, and China, all circled in red. Below this is a search bar. The main header features the TESSERA logo on the left and a large banner with the text: "TESSERA TECHNOLOGIES FOUND IN ALMOST ALL ELECTRONICS" - INVESTOR'S BUSINESS DAILY. Below the banner is a navigation menu with links for COMPANY, TECHNOLOGIES, SYSTEMS ENG, INVESTORS, NEWS, and CAREERS. The main content area is divided into three columns: LATEST RELEASES, WHAT'S NEW, and NEWS. The LATEST RELEASES column features an article titled "TESSERA'S μPILR™ Package-on-Package Technology" with a "MEDIA KIT" button circled in red. The WHAT'S NEW column features an article titled "TESSERA INTRODUCES REVOLUTIONARY OPTIML™ WLC TECHNOLOGY" with a "MEDIA KIT" button circled in red. The NEWS column features several articles, including "TESSERA TECHNOLOGIES TO ANNOUNCE FOURTH QUARTER 2007 RESULTS" and "TESSERA SHELLCASE RT TECHNOLOGY AVAILABLE FOR 300MM WAFERS", with the latter having a "LEARN MORE" button circled in red. At the bottom, there is a "FEATURED VIDEO" section with a "FEATURED VIDEO" button circled in red. A "MEDIA KIT" button is also circled in red in the bottom left area.

Multiple languages

Front Page Introduction

Immediate Availability

Media kit and videos

# Promotion – University 1



## STANFORD UNIVERSITY

SEARCH  More options

INDEX OF STANFORD SITES  
A B C D E F G H I J K L M N  
O P Q R S T U V W X Y Z

Academic Programs  
**Research**  
Admission  
About Stanford  
Medical Center  
Administration  
Arts & Events  
Athletics

Students  
Faculty  
Staff & Employment  
Alumni  
Prospective Students  
Visitors & Neighbors

**NEWS »**

**Study links CO2 emissions to increased mortality:**  
Mark Jacobson, professor of civil and environmental engineering, has released a study showing for the first time the direct links between increased levels of carbon dioxide in the atmosphere and increases in human mortality.

**Stanford Press revives interest in Kabbalah masterpiece:** *The Zohar*—a compendium of enigmas that forms the basis of the Kabbalah—is getting a long-awaited renewal thanks to Stanford University Press's new translation.

**New employee wellness program:** As part of the university's campaign to promote wellness among staff and faculty, Stanford has launched a new three-step program that offers incentives to stay on the path to fitness the entire way.

**EVENTS »**

**Woods Energy Seminar:** Professor Kenneth Caldeira of the Carnegie Institution discusses ocean acidification and geoeengineering. Wednesday, January 9 at 4:15 p.m. in Bldg 420.

**ON THE STANFORD WEB »**

Stanford on iTunes U  
University Slideshow  
Undergraduate Academic Life  
One-stop information for Stanford undergrads.  
Bing Overseas Studies  
Stanford centers around the globe.

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Even searching for “technology transfer” does not take you to the website

## Research

*“The creation and communication of knowledge is at the heart of every research university, and a great research university, like Stanford, aspires to create knowledge that will benefit our society.” -- President John Hennessy*

12.05.07  
Wind power, long considered to be as fickle as wind itself, can be groomed to become a steady, dependable source of electricity and delivered at a lower cost than at present, according to scientists at Stanford University. [more»](#)

Academic Programs  
**Research**  
Admission  
About Stanford  
Medical Center  
Administration  
Arts & Events  
Athletics

Students  
Faculty  
Staff & Employment  
Alumni  
Prospective Students  
Visitors & Neighbors

**Schools, Departments and Interdisciplinary Programs**  
The synthesis of teaching and research is fundamental to Stanford University. All faculty engage in scholarly research, most often in association with graduate students or advanced undergraduates. Much of this research takes place in Stanford's [schools](#), [departments](#) and [interdisciplinary programs](#).

**Research Centers and Institutes**  
Several national research centers are located on the campus, including the [Center for Advanced Study in the Behavioral Sciences](#) and the [Stanford Linear Accelerator Center \(SLAC\)](#). Numerous other research centers and institutes are listed here by subject: [engineering](#), [humanities](#), [medicine](#), [sciences](#) and [social sciences](#). [Complete listing](#)

**Multidisciplinary Research**  
Several new multidisciplinary initiatives expand a long tradition of cross-disciplinary research and collaboration. The [Initiative on Human Health](#) brings biology, engineering, and medicine to bear on some of the most daunting health problems of our time. The [Initiative on the Environment and Sustainability](#) mobilizes faculty from across campus to address critical environmental issues. The [International Initiative](#) promotes collaboration throughout the university on international issues. The [Arts Initiative](#) seeks to foster a culture of creativity on campus by integrating the arts more fully into the curriculum. You can read more about these and other interdisciplinary activities in the [Multidisciplinary Teaching and Research at Stanford](#) website.

**Libraries**  
[Stanford University Libraries](#) contain more than 8 million volumes and maintain an online catalog called [Socrates](#).

**Offices & Resources**  
Faculty and student research is supported by numerous offices, including the [Office of Research Administration](#) and the [Dean of Research](#) office, which maintains the [Research Policy Handbook](#). The [Undergraduate Research Programs](#) office links students with research opportunities across campus and offers grants to defray the cost of research. [Complete listing](#)

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Correct URL (through Google)

<http://otl.stanford.edu/inventors/resources.html>

# Promotion – University 2



wednesday, january 9, 2008

MIT massachusetts institute of technology

**about mit**  
facts, visit, map, energy, global MIT

**news**  
research news, by topic, for media

**education**  
schools+departments, OpenCourseWare

**admissions+financial aid**  
undergrad, grad, professional

**research**  
labs+centers, libraries

**offices**  
services, jobs, giving, Commencement


**community**  
students, faculty, parents, alumni

**calendars**  
events, academic, arts, athletics, IAP

**video**  
courses, lectures, videos by+about MIT

**search**  
MIT Google People Offices

spotlight **video contest: show your stuff on techtv and on YourMIT**



today's image: Joshua Velasquez, '06

**headlines from MIT**  
MIT students blog during MIT's January IAP:

- Global warming?
- Greetings from Honduras
- A sadly beautiful sight
- Working in a rice field
- The Space Between
- Back in Dhaka
- Where is the shower curtain?
- Bangkok at last
- A truly independent activities period

**events**

- Holography: the light fantastic at the MIT Museum - ongoing  
[more events...](#)

massachusetts institute of technology 77 massachusetts avenue cambridge, ma 02139-4307 tel 617.253.1000 ty 617.258.9344 about this site contact

Correct URL (after few tries on Google)

<http://web.mit.edu/tlo/www/>



MIT TLO

HOME | CONTACT US | DOWNLOAD FORMS

About MIT TLO | MIT Community | For Industry | Resources

### MIT Technology Licensing Office

Our mission is to foster commercial investment in the development of inventions and discoveries flowing from the research at the Massachusetts Institute of Technology, Lincoln Laboratory, the Broad Institute and the Whitehead Institute. We do this through licensing of the intellectual property resulting from our research.



**For MIT Community** »

We are here to assist MIT inventors in protecting their technology, and in the licensing of that technology to existing companies and startups.  
[View MIT community main page >](#)

**For Industry** »

We grant licenses for our patented and copyrighted inventions, to both existing and startup companies that demonstrate the technical and financial capabilities to develop our early-stage technology into commercially successful products.  
[View Patents Available for Licensing \(PAL\)](#)

[Selected Technologies of Particular Interest](#)

© 2006 Massachusetts Institute of Technology TLO Site Map Massachusetts Institute of Technology Site By PixelBridge

No indication of Technology Transfer on main page of MIT  
<http://web.mit.edu/>

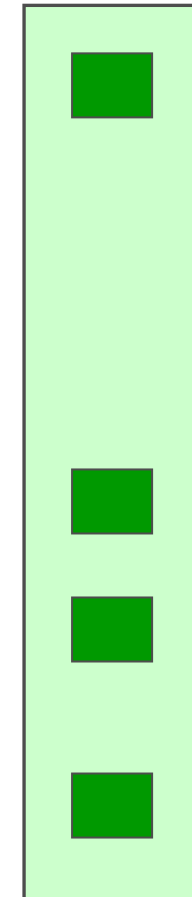
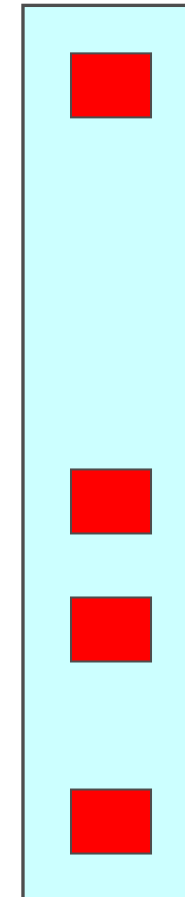
- Channel availability
  - Single distribution or multiple locations
  - 3<sup>rd</sup> party websites

## The 5<sup>th</sup> P - Peripheral

- Speed of negotiations
- Decision making
  - # of people involved
  - Ability to compromise on legal and business issues
- Ability to close the deal

University

Industry



- If understood properly, the “marketing mix” strategy can be applied for Technology Transfer
- While universities face some inherent challenges (from mission to funding) for successful Technology Transfer, they can learn from the industry in each of the 4 parameters
- Largest gains can be made in the 5<sup>th</sup> parameter i.e. “peripheral”

## Personal Recommendations

- Create excitement about the technology
- Teach inventors to show enthusiasm
- Hire trained and experienced personnel from industry
- Shorten the length of agreements
- Maximize the number of deals and (*\$\$ or ¥ will follow*)
- Weed out low quality Invention Disclosures early on
- Adopt provisional filing of patents to buy time and patent only as necessary
- Use industry tools for market research, competitive intelligence, citation analysis, landscape analysis, etc.
- *...and above all – don't aggressively wait for the phone to ring!*

# Univ. TT Results – Major BlockBusters

Product or Company	Category	University	Product/Company Launch date	Univ. ownership	Total income for Univ. from product	Comments
Lycos	Internet Search Engine	Carnegie Mellon University	1995	20%	\$ 41,000,000	In 2004 Lycos sold to Daum Comm. %95.4 million
Cisco	Network Equipment	Stanford	1984	License	\$ 200,000	Stanford did not take equity due to policy
Google	Internet Search Engine	Stanford	1998	5%	\$ 250,000,000	Approx. value of shares
Paclitaxol (Taxol)	Chemotherapy Drug	Florida State University	1990	License	\$ 67,500,000	In 2000. Licensee Bristol-Myers Squibb (BMS)
Cisplatin (Platinol)	Chemotherapy Drug	Michigan State University	1980	License	\$ 308,000,000	Originally 5 year exclusive license to BMS
Gatorade	Sports Drink	University of Florida	1973	Tradeseecret	\$ 80,000,000	

**NOTE: This is a very abridged list...**

# Thank You

Sandeep Agarwal

Director, Market Development

Tessera Inc.

(408) 383-3630

Email: [sagarwal@tessera.com](mailto:sagarwal@tessera.com)

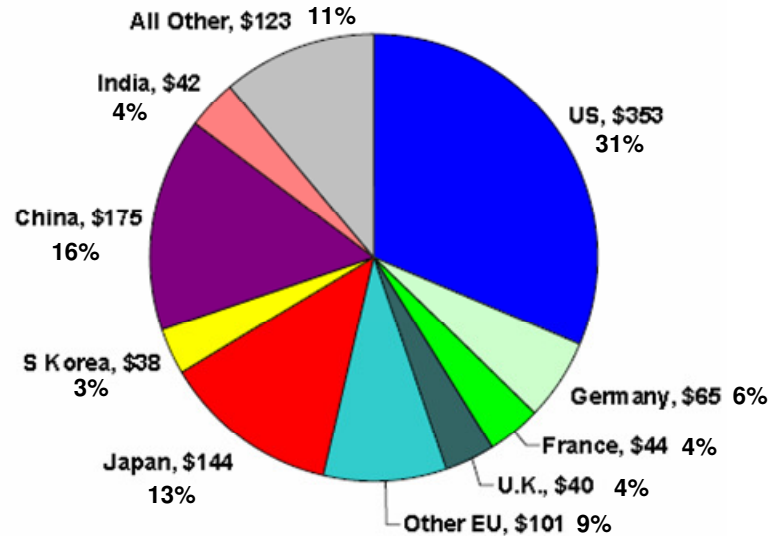
- Additional slides for information

# R&D Funding – World Perspective

## Shares of Total World R&D, 2007

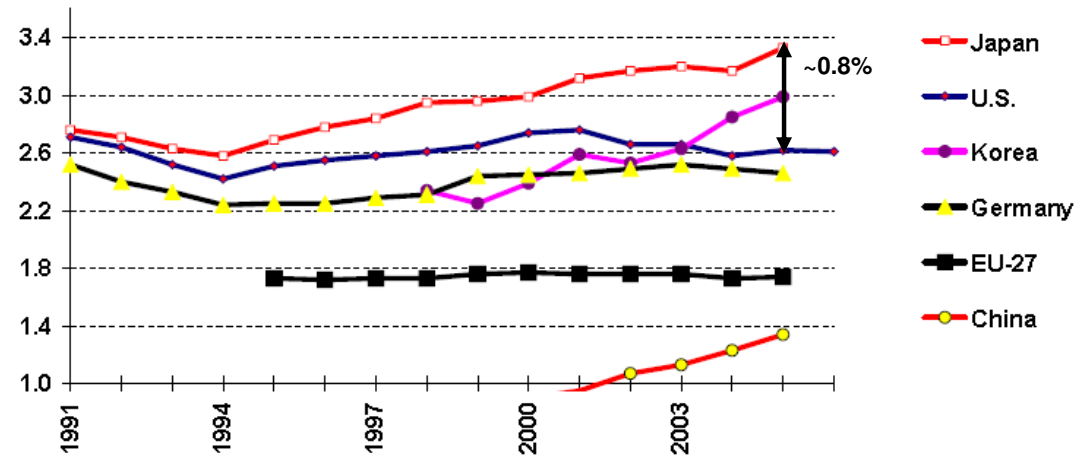
Billion \$

Total World R&D = USD 1,124 billion



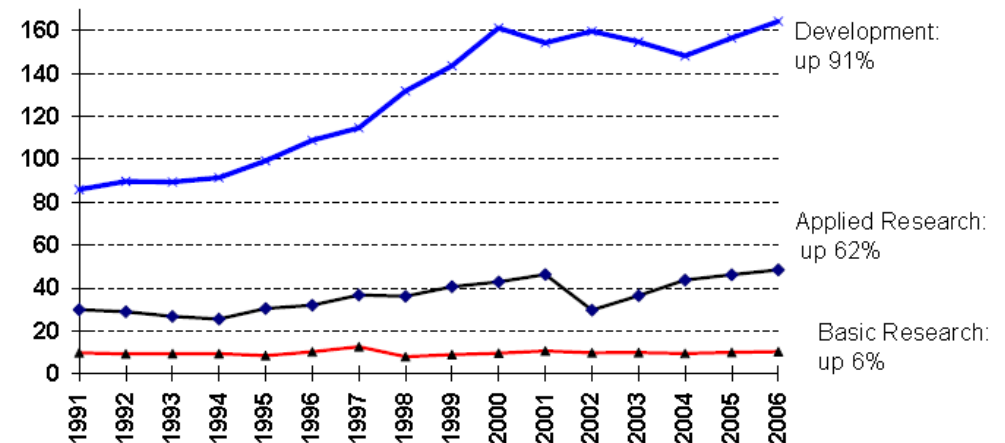
Source:  
AAAS = The American Association for Advancement of Science  
<http://www.aaas.org/spp/rd/world07.pdf>

## Trends National R&D as % of GDP 1991-2006



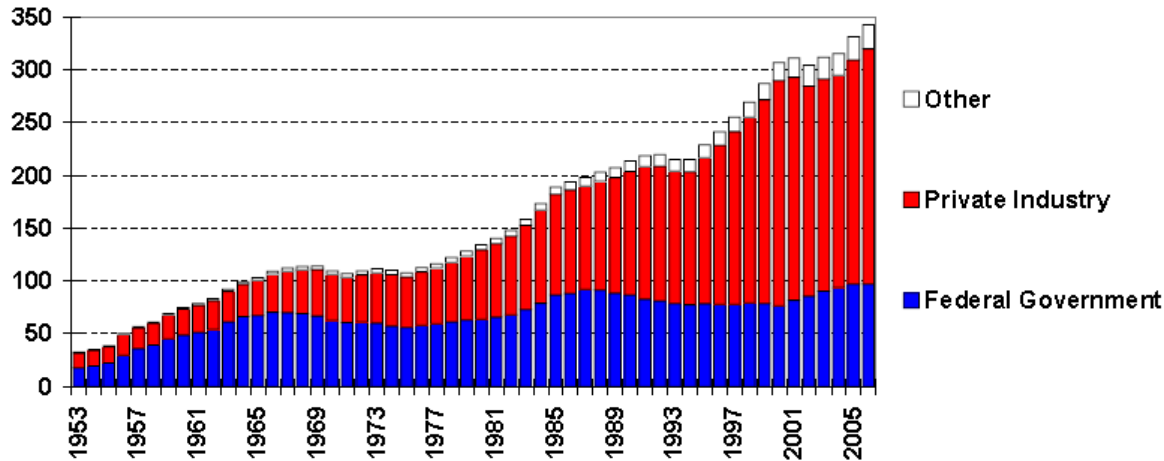
## Trends in U.S. Industry R&D, 1991-2006

Expenditures in billions of constant 2006 dollars



# R&D Funding – USA

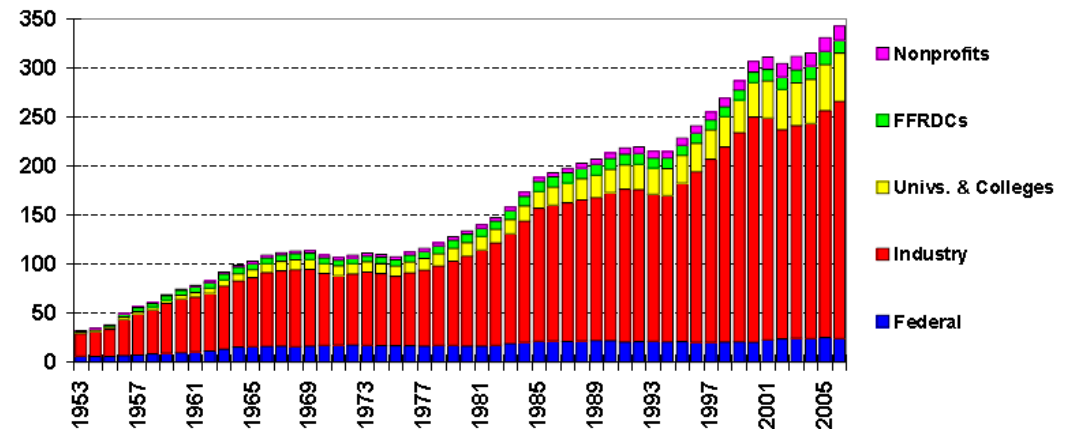
**U.S. R&D Funding by Source, 1953-2006**  
expenditures in billions of constant 2006 dollars



Most industry funds its own R&D

**Total = \$ 343 Billion**

**U.S. R&D Funding by Performer, 1953-2006**  
expenditures in billions of constant 2006 dollars



FFRDC = Federally Funded Research & Development Center

# US and Japan Univ. Environments for TT



## USA

- Historically universities have been centers of basic research with large budgets
- Bayh-Dole (1980) allowed ownership of government funded research. With some limitations universities are free to use royalty money as they please
- Well developed legal environment for IP rights (CAFC = Court of Appeals for the Federal Circuit and ITC)
- No government oversight for Technology Transfer

## Japan

- Historically universities have not been research centers and budgets are much smaller
- The Privatization Law was passed in April 2004 – univs. can own inventions and money can spent as decided by university management (i.e. not controlled by MEXT)
- Japan instituted a CAFC equivalent not until April 2005 and equivalent of ITC
- MEXT has “encouraged” all univs. to establish a IP Center (problems with TLO)