Specialisation and Markets for IP

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The Current Paradigm:
A Closed Innovation System

Science & Technology Base

The Market

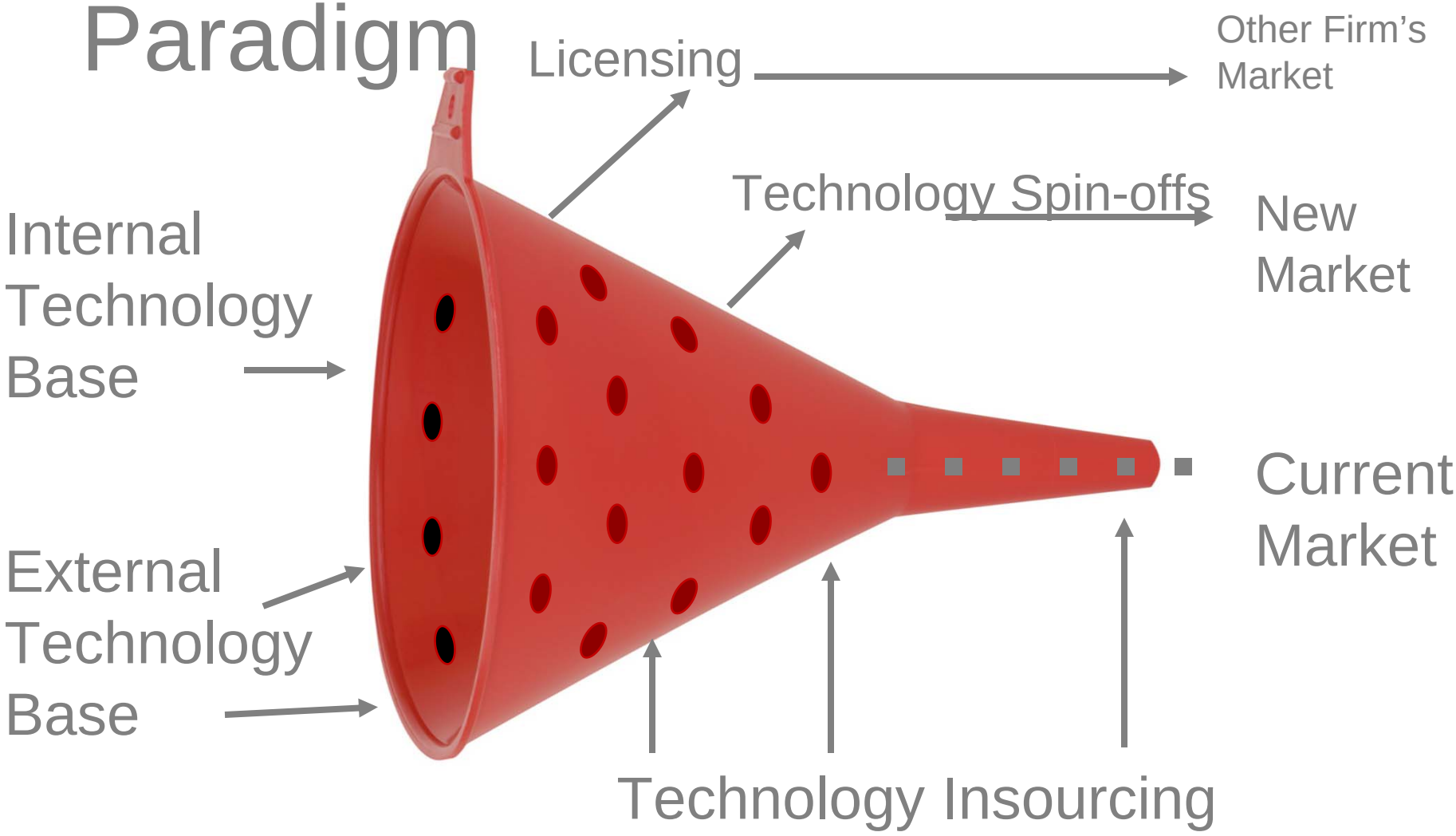
Research Investigations

Development

New Products /Services

R → ← D

The Open Innovation Paradigm



R D

US Industrial R&D by Size of Enterprise

Company Size	1981	1989	1999	2005
< 1000 employees	4.4 %	9.2%	22.5%	24.1%
1,000 – 4,999	6.1 %	7.6 %	13.6%	15.5%
5,000 – 9,999	5.8 %	5.5%	9.0%	8.0%
10,000 – 24,999	13.1%	10.0%	13.6%	14.8%
25,000 +	**70.7%**	**67.7%**	**41.3%**	**37.6%**

Sources: National Science Foundation, Science Resource Studies, Survey of Industrial Research Development, 1991, 1999, 2001, 2006.

Evolution of Business Models in Semiconductors

- Systems (1950s, AT&T, IBM)
- IDMs (1970s, Intel, TI)
- Fabless/Foundry (1980s, TSMC)
- Today, further specialization
  - Design services
  - Foundry services
  - Packaging services
  - All entrants to the industry have been specialists
- Also more value added in specialties
  - Applied Materials selling recipes with its equipment
  - TSMC's Open Innovation Platform
  - Design services selling cores, reference designs

Evolution of Pharmaceutical Models

- In the beginning….
  - Completely integrated, from lab to patient
- Then…. Specialisation develops
  - Biotechs partner with pharmas
  - CROs partner with both
  - Tool companies supply new capabilities
  - Universities play an increasing role early stage
- IP now often contracted by field of use
  - Amyris example

Patent Renewal Fees: A Policy Success

- Substantial evidence exists that most patents are neither used nor licensed
- Renewal fees encourage companies to either use their patents or abandon them
- This also stimulates a secondary market for patents
- More could be done by USPTO to publish information when patents are transferred

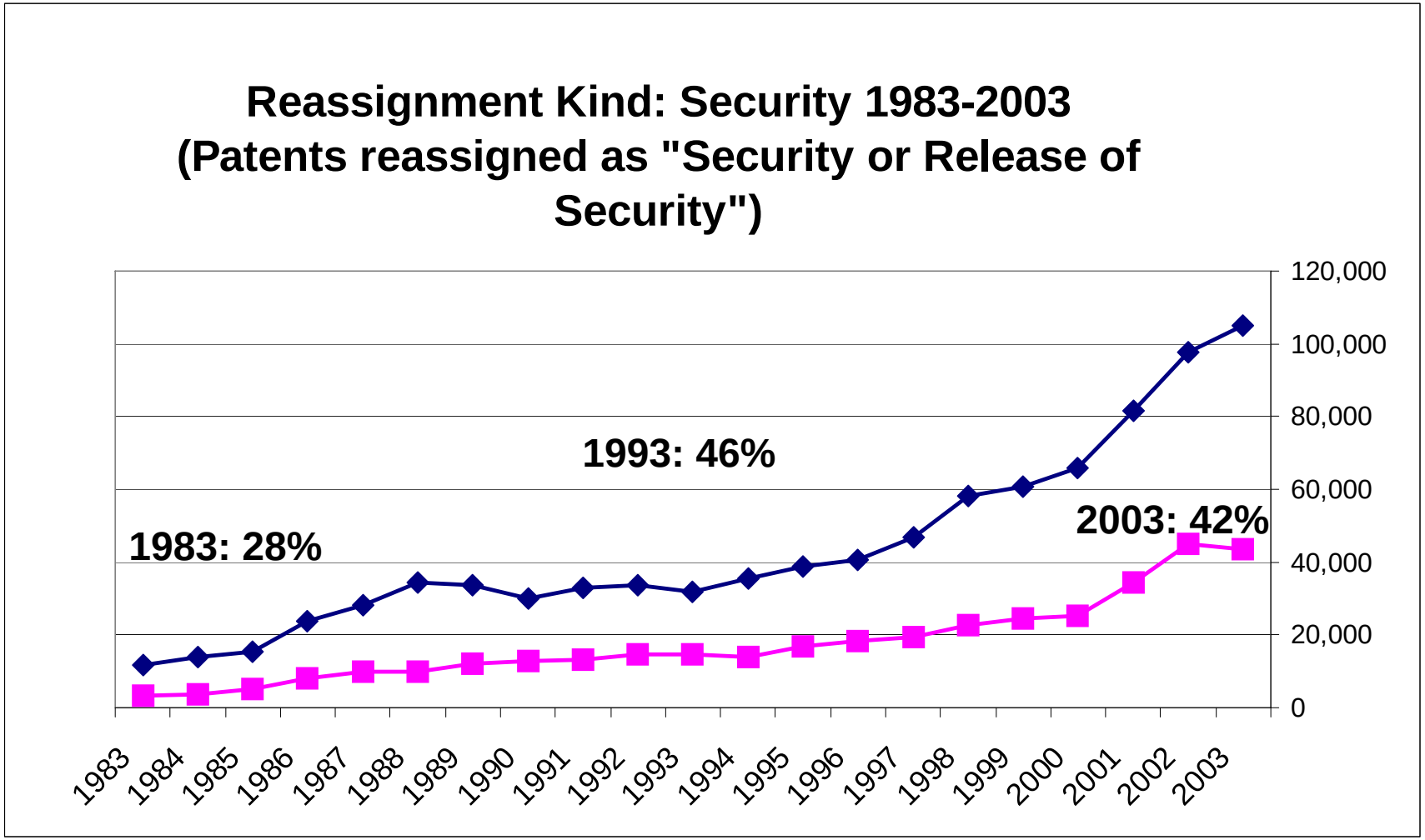
Emerging IP Business model experiments

- Intellectual Ventures: 20,000+ patents, $5 billion under management, major licensing deals
  - Also per patent licensing fees
- RPX: defensive patent pool, revenues from membership fees from $35K to $5 million
  - No per patent licensing fees
- Ocean Tomo: patent auctions
- IBM, HP exploring patent insurance models
- Halliburton patent application for patent trolling
  - To be used defensively if granted
- Merck Gene Index
  - Pre-emptive publishing

Implications

- More open innovation processes require markets for IP
- IP Markets are highly inefficient
  - Insiders, and the rest of us
  - Unlikely to be socially optimal, or even allocatively efficient
- Opportunities exist to enhance availability of information on secondary markets
  - Reduce price dispersion, information asymmetries
- Pre-emptive strategies may become more common

Backup slides


Reassignment Kind: Security 1983-2003
(Patents reassigned as "Security or Release of Security")
1983: 28%
1993: 46%
2003: 42%
120,000
100,000
80,000
60,000
40,000
20,000
0
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003

What does a Reassignment Title grant?

- The certificate of such acknowledgment constitutes prima facie evidence of the execution of the assignment, grant, or conveyance.
- This is both the official language of the USPTO and it has been confirmed by IP lawyer.
  - However it is not clear whether patent reassignments have ever been used in court during patent litigations.

Are Reassignments part of a more complex deal?

- A follow up to John King's interview: "usually companies reassign patent when they are selling/acquiring other assets, or in situations of merging/spinoffs, when the structure of corporate control changes."
- What is the percentage of transactions that happen between:
  - previously independent corporations
  - Internal transactions between subsidiaries
  - merging corporations
  - spin-off operations
  - results from bankruptcies
  - security agreements
  - alliances/joint ventures and the likes
  - pure technology transfers

Definitions

Throughout this paper we will use the following definitions:

- **Reassignment event**. It happens when a patents gets reassigned once.
- **Reassigned Patents**. A patent is reassigned when a reassignment occurs. For the way the IFI database is designed, when counting reassignment of patents, and aggregating these reassignment by years, we are counting only one reassignment per patent even if this patent has been reassigned more than once each year. i.e. reassignment events >= reassigned patents
- **Vintage**. Is the registration year of a reassigned patent
- **Maturation**. Difference (in years) between the date of the reassignment and the date of the patent's registration
- **Assignee (of reassignment)**: is the company/individual that becomes the assignee of the patent after the reassignment
- **Assignor (of reassignment)**: is the company/individual that was the assignee of the patent prior of patent's reassignment
- **Hitting Rate**: number of reassignments (events or patents) over number of patents
- **IPC**: International Patent Class (see appendix for the description of the classes codes that have been here referred to).

“Restless…”

Patent class	Total Patents	Pat_abs_ ranking	Total Reassignments	Reass_abs _ranking	%Rea/Pat	%_>500 _rank	%_>1000 _rank	%_>2000 _rank
B61D??	2128	318	629	233	30%	4	3	1
A22C??	3096	257	849	186	27%	7	4	2
C06B??	2111	319	575	247	27%	8	5	3
A21D??	2226	307	606	240	27%	9	6	4
E02F??	3684	235	988	167	27%	11	8	5
D06P??	3422	245	916	177	27%	12	9	6
C03B??	7486	142	1952	93	26%	14	11	7
A01D??	7150	148	1804	99	25%	19	12	8
C09B??	5293	188	1333	133	25%	20	13	9
F22B??	2398	295	603	241	25%	22	14	10

Let’s do the numbers

- Overall, from 1979 to October 2004
  - 623,583 patents have been reassigned at least once.
  - 969,168 times a patent has been reassigned at least once a year.
  - On average, for the entire period, excluding the patents that have not been reassigned, a patent is reassigned 1.6 times.
  - Average reassignment/patent ratio is 0.17 (sd 0.55)

- Most of the patent reassignments recorded in the IFI Claims database (approximately 90-95%) happen between corporations.
  - These numbers do not take into account the first reassignment between inventor and employer, which the Dialog database “incorporates” in the patent information by recognizing the company where the inventor is working as the “original assignee” of the patent.
  - Reassignments between individuals are however present. Looking at a large sample of patents (semiconductors International Patent Class H01L), where we see recorded patent transactions between an individual inventor and a corporation
    - More rarely, we see a corporation assign a patent to an individual