

OUVERTURE

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**Le rôle de la Propriété Intellectuelle
dans les interactions entre Science et Industrie**
Quelle perspective européenne ?

La propriété intellectuelle dans les relations science-industrie

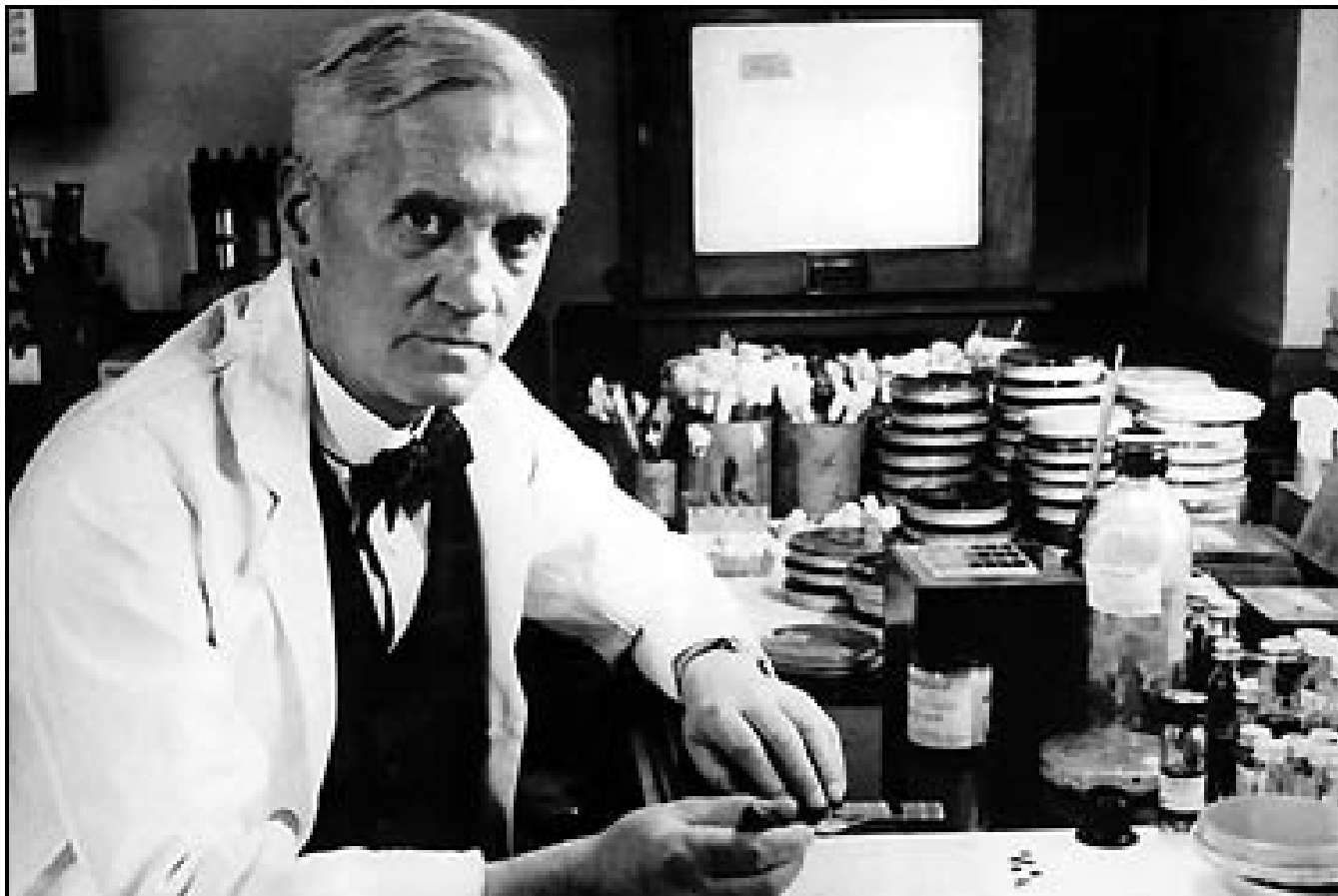
Strasbourg, IEEPI, 7 April 2022

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Chairman, Knowledge Transfer Committee, ULB

Historical Perspective

A knowledge transfer success ?



Alexander Fleming

- 1928, discovery but not enough funding in St Mary's Hospital
 - Transfer research to Oxford University : Chain and Florey
 - Funded by the government & Rockefeller Foundation (US)
- 1939: first successful therapeutical experiments
- 1945: Nobel Prize for Fleming, Chain and Florey
- Florey and Chain decided not to apply for a patent! ...
 - Regulation: not allowed
 - Cultural context
 - Disagreement between them

The Penicillin business...



THE CHALLENGE OF ACADEMIC PATENTING

- Historical perspectives

Learning from the case

LEARNING FROM THE CASE

- Public funding matters, for scientific AND social progress
- The socio-economic return can be ... “anywhere in the world”
- Technology transfer can generate resources, securing local ‘impact’
- Academic patenting generates debates
 - Within academic community: “Intellectual weakness”?
 - Within academic and policy makers: “does it block innovation?”
 - Within university administrations: is it break-even?
 - Within government bodies: when subsidized, is it “worth it”?

THE CHALLENGE OF ACADEMIC PATENTING

- Historical perspectives
- Learning from the case

Policy making

1980 USA: The **Bayh–Dole Act**

Change in ownership of inventions made with federal funding. Before 1980 inventors assigned inventions to the federal government.

Bayh–Dole permits a university to elect to ***pursue ownership*** of an invention

2010: Betsy de Parry. “I am alive today because of you!”



Birch Bayh

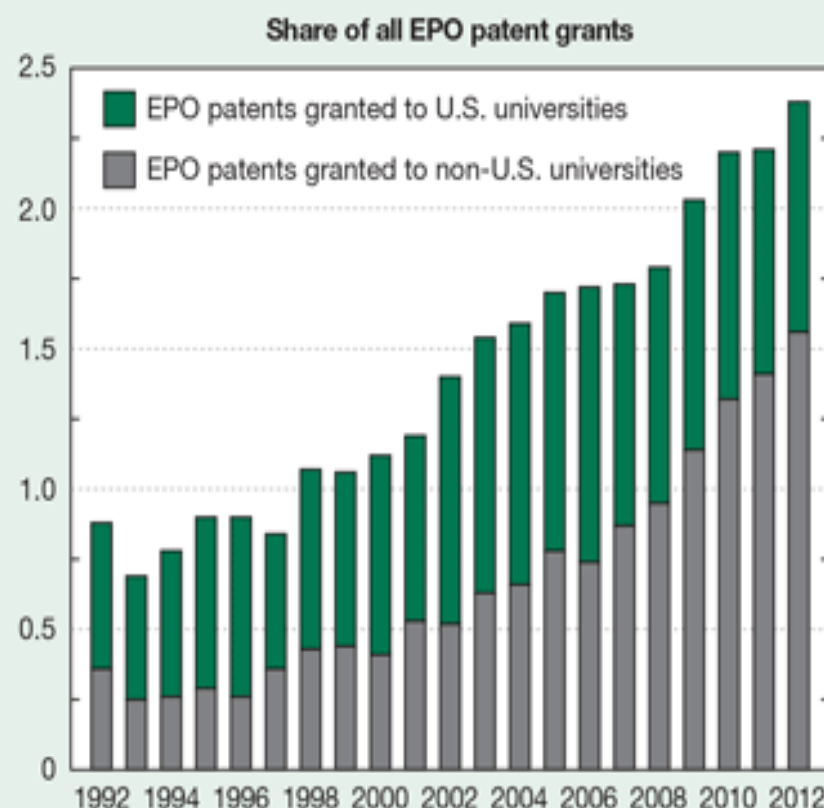
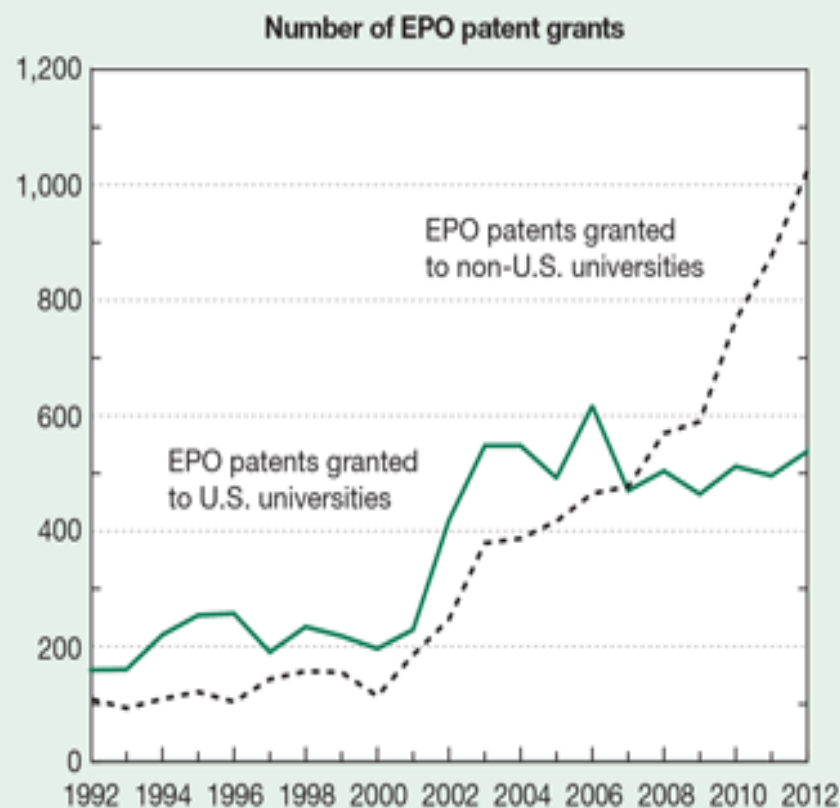


Bob Dole



Figure 5-35

EPO patents granted to U.S. and non-U.S. academic institutions: 1992–2012



EPO = European Patent Office.

SOURCE: The Patent Board,TM special tabulations (2013) of Proprietary Patent database.

THE CHALLENGE OF ACADEMIC PATENTING

- Historical perspectives
- Learning from the case
- Policy making

Issue 1: Substitute to basic research?



"I'm an idea man."

Expansion of IPR is privatizing the scientific commons and limiting scientific progress

- Heller and Eisenberg (1998); Argyres and Liebskind (1998); David (2000); Lessig (2002); Etzkowitz (1998); Krinsky (2003)

Murray and Stern (2007): “Do formal intellectual property rights hinder the free flow of scientific knowledge? An empirical test of the anti-commons hypothesis”

- Citation patterns of publications in pre-grant period and after grant
- 169 patent-paper pairs (Nature Biotechnology)
- Modest anti-commons effect: decline in citation rate by 10 to 20% (at grant)

Does involvement in patenting jeopardize one's academic footprint? An analysis of patent-paper pairs in biotechnology

Magerman, Van Looy, Debackere (2015, Research Policy)

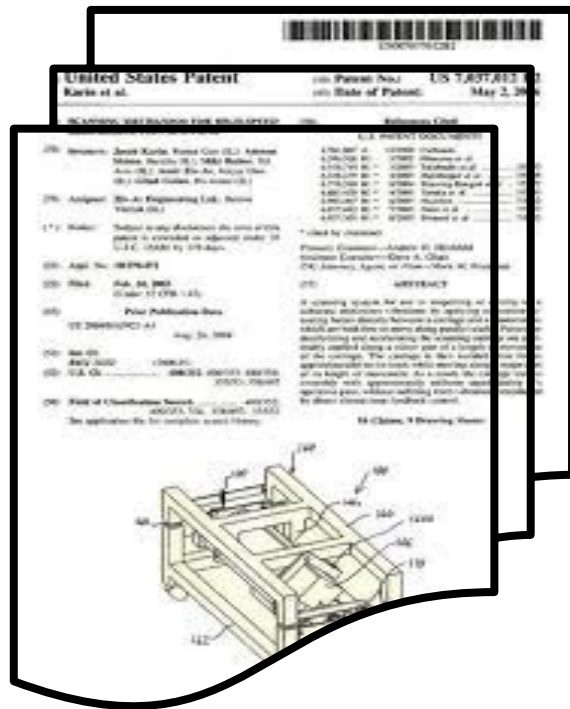
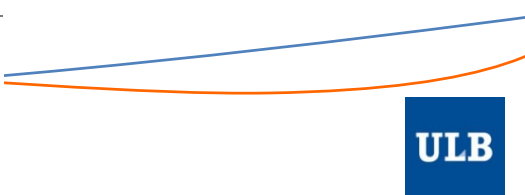


Table 6 : Differences in lifespan H-index between patenting authors and authors refraining from patenting activity (data sourced from Thomson Reuters Web of Science Core Collection)

Matching	H-Index measured for the overall period under observation				
	Treatment group	Control group	Difference	N	Significance level
Identical lifespan; identical initial H-index	15.45	12.01	3.44	48,791	0.000
Identical lifespan; identical initial H-index; comparable highly cited paper during lifespan (+/- 10%)	15.86	8.6	7.26	6,603	0.000
Identical lifespan; identical initial H-index; comparable highly cited paper in 1997 (+/- 10%)	15.57	9.58	5.984	5,828	0,000
Identical lifespan; identical initial H-index; comparable highly cited paper 1997 (+/- 10%); comparable portfolio composition (normalized distance < 0,4)	17.20	10.59	6.61	834	0,000
Identical lifespan; identical initial H-index; comparable highly cited paper 1997 (+/- 10%); comparable portfolio composition (normalized distance < 0,3)	18.07	10.93	7.14	376	0,000
Identical lifespan; identical initial H-index; comparable highly cited paper 1997 (+/- 10%); comparable total number of publications (+/- 10%)	14.05	9.93	4.11	636	0,000
Identical lifespan; identical initial H-index; comparable highly cited paper 1997 (+/- 10%); comparable portfolio composition (normalized distance < 0,4); comparable total number of publications (+/- 10%)	14.6	10.27	4.329	85	0,000
Identical lifespan; identical initial H-index; comparable highly cited paper 1997 (+/- 10%); comparable portfolio composition (normalized distance < 0,3); comparable total number of publications (+/- 10%)	15.85	10.67	5.18	33	0,000

**Authors' H
vs
Patenting Authors' H**

Magerman et al., 2015



THE CHALLENGE OF ACADEMIC PATENTING

- Historical perspectives
- Learning from the two cases
- Policy making
- Issue 1: Substitute to basic research?

Issue 2: blocking innovation?

Would patents block further research?

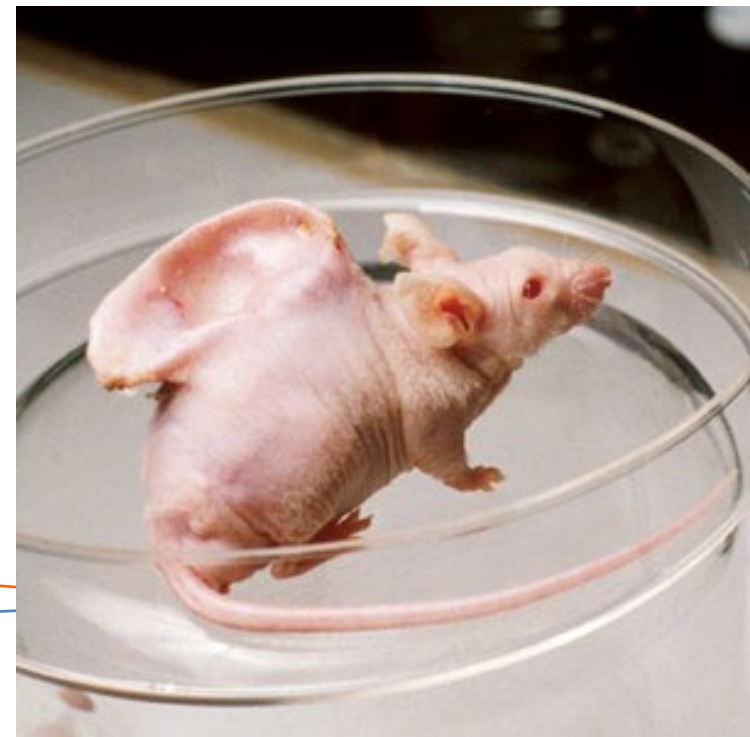
As patents are rights to exclude, there are growing fears that they could impede basic research:

- US Court decision “Madey vs Duke”
- A few isolated cases, especially in the USA

Special case: the Onco Mouse in the USA

Murray, Aghion, Dewatripont, Kolev, and Stern (2009)

Dropping patents on Mice: increase in the level of follow-on research and more diverse research paths...



Would patents block further research?

Surveys by Cohen et al. (2002 and 2005)

- 1% of US biomedical academic researchers: delay of more than a month, or project modified
- 8% reported modifying a project due to difficulties for accessing TANGIBLE inputs (data, tests, etc)

=> more problems are induced by scientific ***competition between researchers and promotion schemes*** than by patents (race for publications, proprietary databases)

THE CHALLENGE OF ACADEMIC PATENTING

- Historical perspectives
- Learning from the case
- Policy making
- Issue 1: Substitute to basic research?
- Issue 2: Blocking innovation?

Issue 3: Private or social value?

Government-funded research increasingly fuels innovation

Lee Fleming, UC Berkeley
Hillary Greene, University of Connecticut
Guan Cheng Li, UC Berkeley
Matt Marx, Boston University
Dennis Yao, Harvard

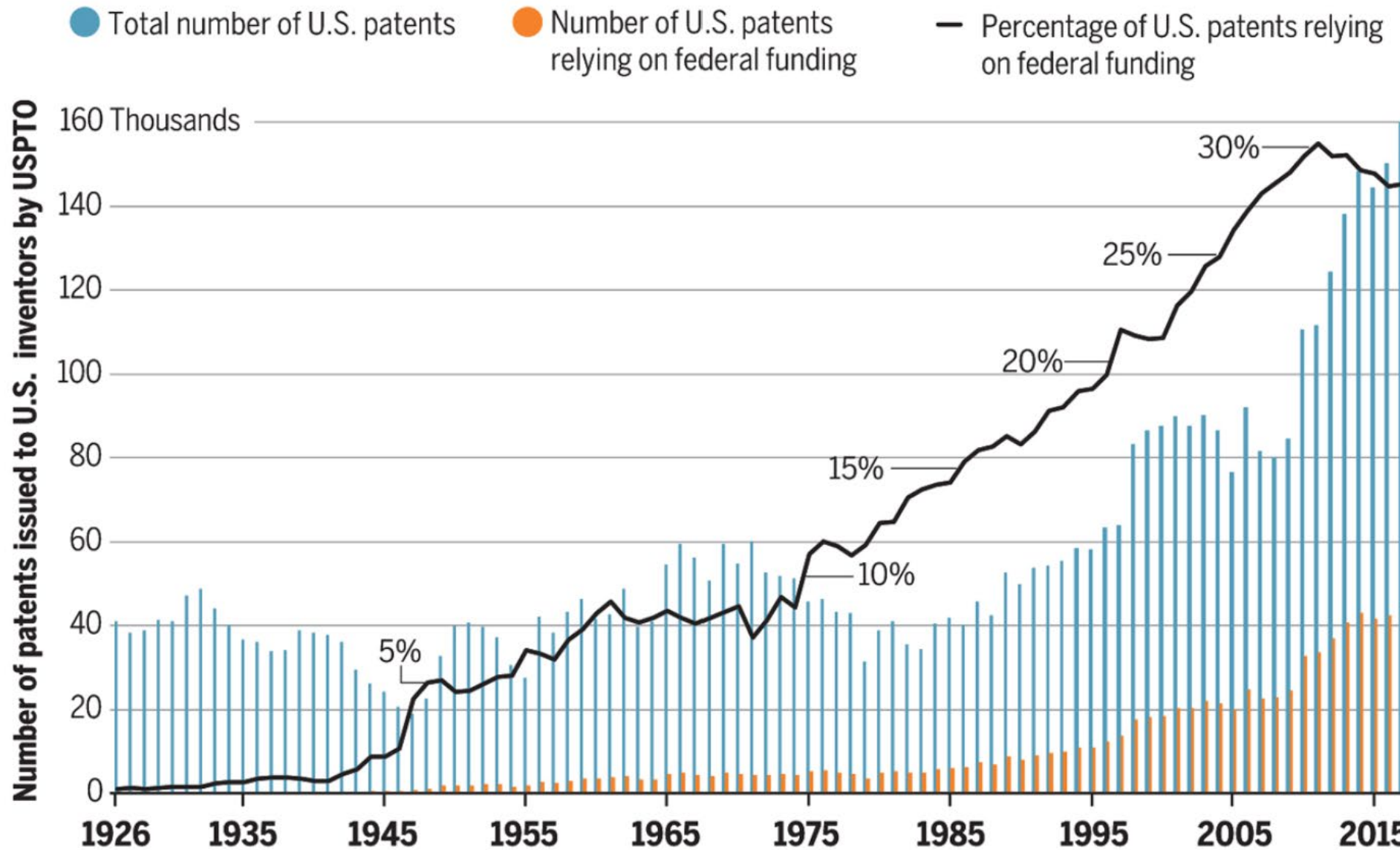
2019

This research funded by SciSIP Award #1536022.

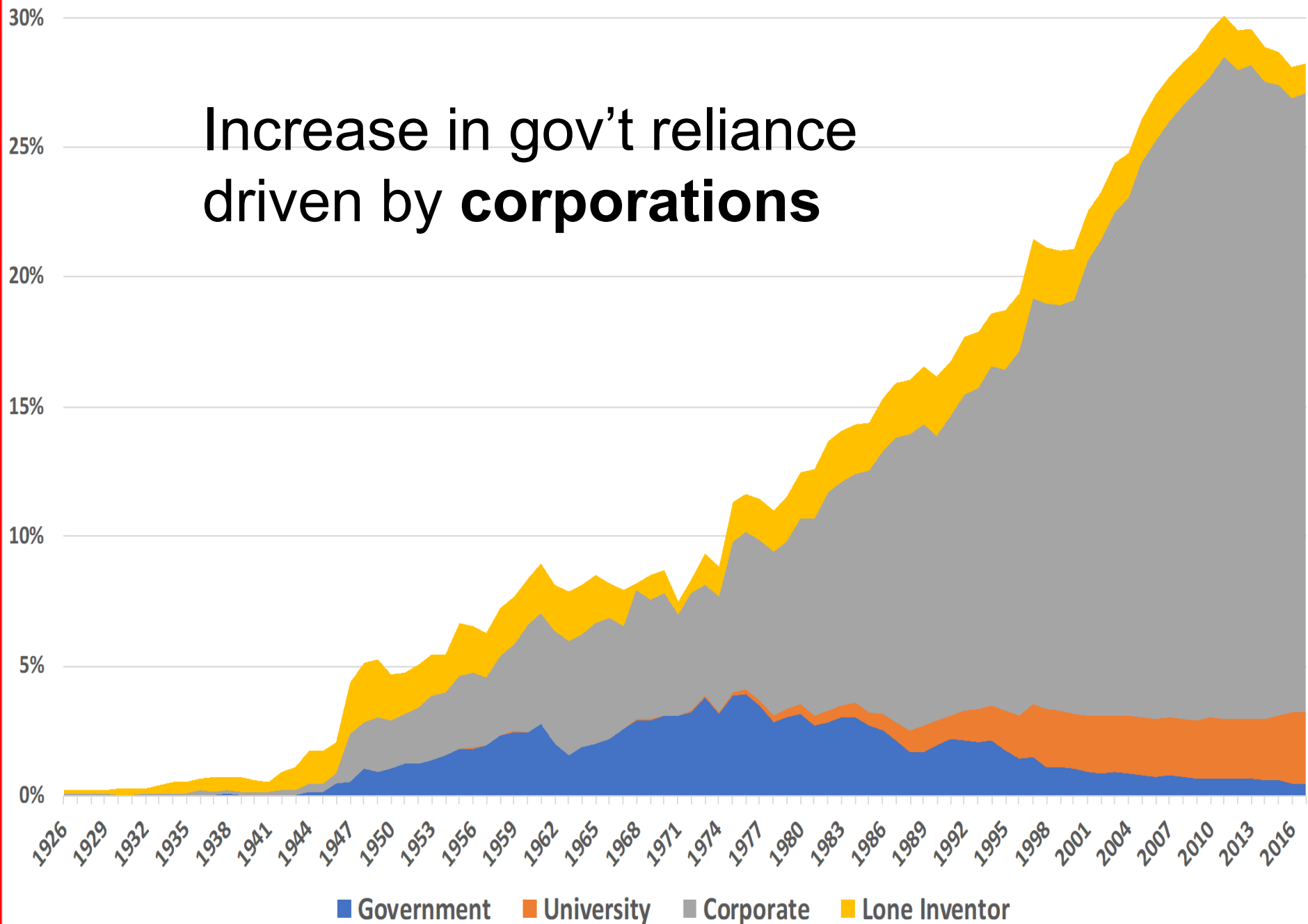
Also thank you to Coleman Fung Institute for Engineering Leadership, University of Connecticut Law School, Questrom School of Business, and Harvard Business School.

Patentees increasingly depend upon federally supported research

Total granted U.S. patents by U.S. inventors (blue bars), and subtotal that rely on federal research (orange bars), and proportion of patents (black line = orange bars/blue bars) that rely on federally supported research.



Increase in gov't reliance driven by **corporations**



Reliant patents also have a higher 'value'

- More likely to be (highly) cited
- More likely to be renewed
- Contain more words new to the patent corpus

THE CHALLENGE OF ACADEMIC PATENTING

- Historical perspectives
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- Policy making
- Issue 1: Substitute to basic research?
- Issue 2: Blocking innovation?
- Issue 3: private or social value?

Issue 4: People “management”?
Governance, emotions & skills

TTO typology

- **We theoretically identify four major TTO types**

(a) Degree of discipline spec.	Discipline-integrated										Discipline-specialized	
(c) Level of autonomy granted	Dependent			Independent								
(d) Degree of exclusivity	Exclusive						Non-exclusive					
(b) Degree of task spec.	Fully integ.	Backw. integ.	Forw. integrated	Fully integ.	Backw. integ.	Forw. integ.	Fully integ.	Forw. integ.	IP spec.	Fully integr.	Forw. integr.	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
TTO Type	I. Classical TTO			II. Autonomous TTO			III. Discipline-integrated TTA			IV. Discipline-specialized TTA		

- **Each TTO type has strengths and weaknesses (depends on university and environment)**
- **Performance measurement should take into account the typology**

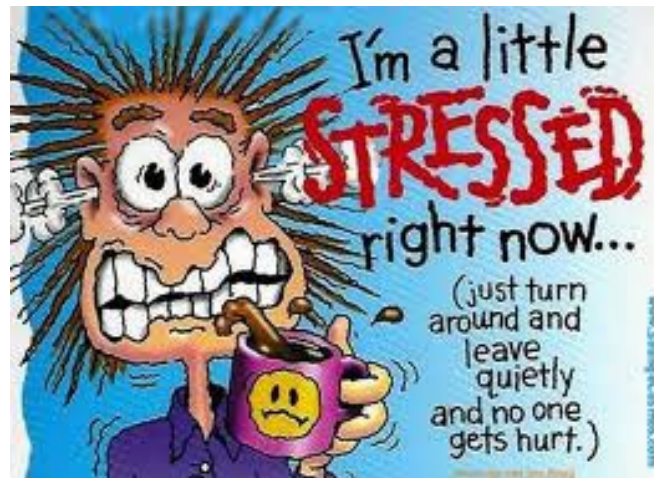
Schoen, van Pottelsberghe, Henkel, JoTT, 2014, Governance typology of universities' technology transfer processes

Creative tensions over TTO Officers?

Professor/Pr. Inv.:
\$ Return? No time!
Star... influence

University
Reduce costs!
Research matters first!
Right of 1st refusal
Scyzophrenic deals

Researcher
No experience,
But Boss/Her baby
Anxiety for career



VCs/BAs
Urgent !!!
Licencing to expensive
Un. Innefficient
Right of 1st refusal

Incubators
Priority
Always TTO's fault

- **Challenging managerial decisions:**

- Patent filing a poor indicator, research funding is a priority
- Governance of the POC (third parties involved?)
- Governance of the spin-off (researcher to manager? Who decides?)
- **Separate IP** (invention) issues from **entrepreneurial** issues (stock options)
- Right of first refusal (for venture funding)?
- Link promotion to patent filings... (correlates +) ?
- willingness to search/check novelty/F20 before research starts ?
- + TTO, but organizational design matters (vision/**integrated (R2B?)**/specialized/skills/resources/shared...)
- **Trust matters** (scientific expertise, localized, transparency, fair practice,...)

references

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