Turning Science Into Business: Patenting and Licensing at Public Research Organisations

OECD Breakfast Series
in partnership with NABE

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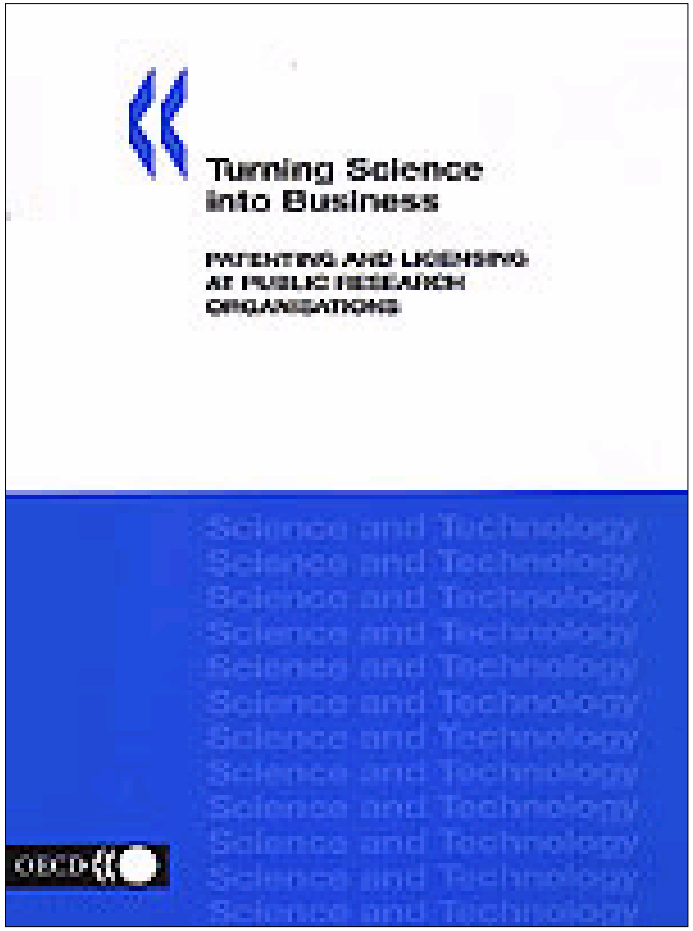


Today's Themes

(1) Policy Background

(2) Methodology

(3) Legal & Regulatory Frameworks

(4) Survey Scope and Findings

(5) Lessons learned

(1) Policy Background

- As funders of public research, govts are held accountable for "results"
  - local economic impacts? costs and benefits?
- PROs aim for "mission balance"
  - commercial activity v research, teaching
- Effects on access to, efficiency and orientation of research

Project Objectives

- To document the **laws** and **regulations** that affect the protection and licensing of innovations by PROs
- To **measure** actual **PRO IP activity**
- To **assess impact** of changing practices on OECD scientific, industrial and economic performance
- To identify **best practices** for framework conditions and IP management, in an effort to balance PRO commercial objectives with research missions

A Focus on Licensing

- No int'l comparisons of licensing income
- Better commercial proxy than patents
- Captures broader range of IP activity
- License clauses reveal information about PRO public mission
- License info helps create new indicators: efficiency, income skew

(2) Methodology

- 2 surveys administered by participating countries
  - 1st to national governments on legal framework
  - 2nd (**modelled on AUTM and national surveys**) to PROs on patents and licenses
- 13 countries administered questionnaire ('00 or '01)

  Belgium, Canada, Denmark, Germany, Italy, Japan, Korea, Netherlands, Norway, Spain, Switzerland, Russia, USA
- Questionnaire responses not directly comparable
  - Mix of univs and PROs dependent on country
  - Response rates & % of valid responses variable
  - Normalisation by PRO size or research intensity not possible
  - 2 countries used existing survey

(3) Legal Frameworks for IP at PROs are Complex

Legal Frameworks

- Intellectual Property Legislation
- Employment Laws
- Law/rules on government research funding
- Contract Law

Diversity of rules within and between countries resulting from research funding structures and historical tradition

- Some countries inventors/researchers retain right to academic patents; in others the institution or the government!
- In a few countries, more than 50% of public R&D carried out by **public labs and applied research institutes** as opposed to higher education institutions
- Central versus regional governance of **higher education institutions** - e.g. national rules in France but different rules on IP ownership at universities across provinces in Canada or Cantons in Switzerland

Do countries need a Bayh-Dole Act?

- **Emulation of Bayh-Dole**

- *Japan; Germany; Korea*

- **Reform of Employment Laws – abolishment of "Professor's Privilege" at Universities**

- *Austria, Denmark, Germany, Norway*

- **- Issuance of National "Codes of Practice or "IP policy guidelines"**

- *Canada, Ireland*

Trends in regulations

- IP policies are not well disseminated, including among faculty and students
- Administrative or legal requirements to disclose inventions, protect and work inventions are lacking
- Royalty sharing rules sometimes set nationally, but move to greater autonomy at institutions
- Non-IP barriers remain:
  - Government limits to keeping royalty revenue
  - Public pay-scales that limit hiring of tech-transfer professionals

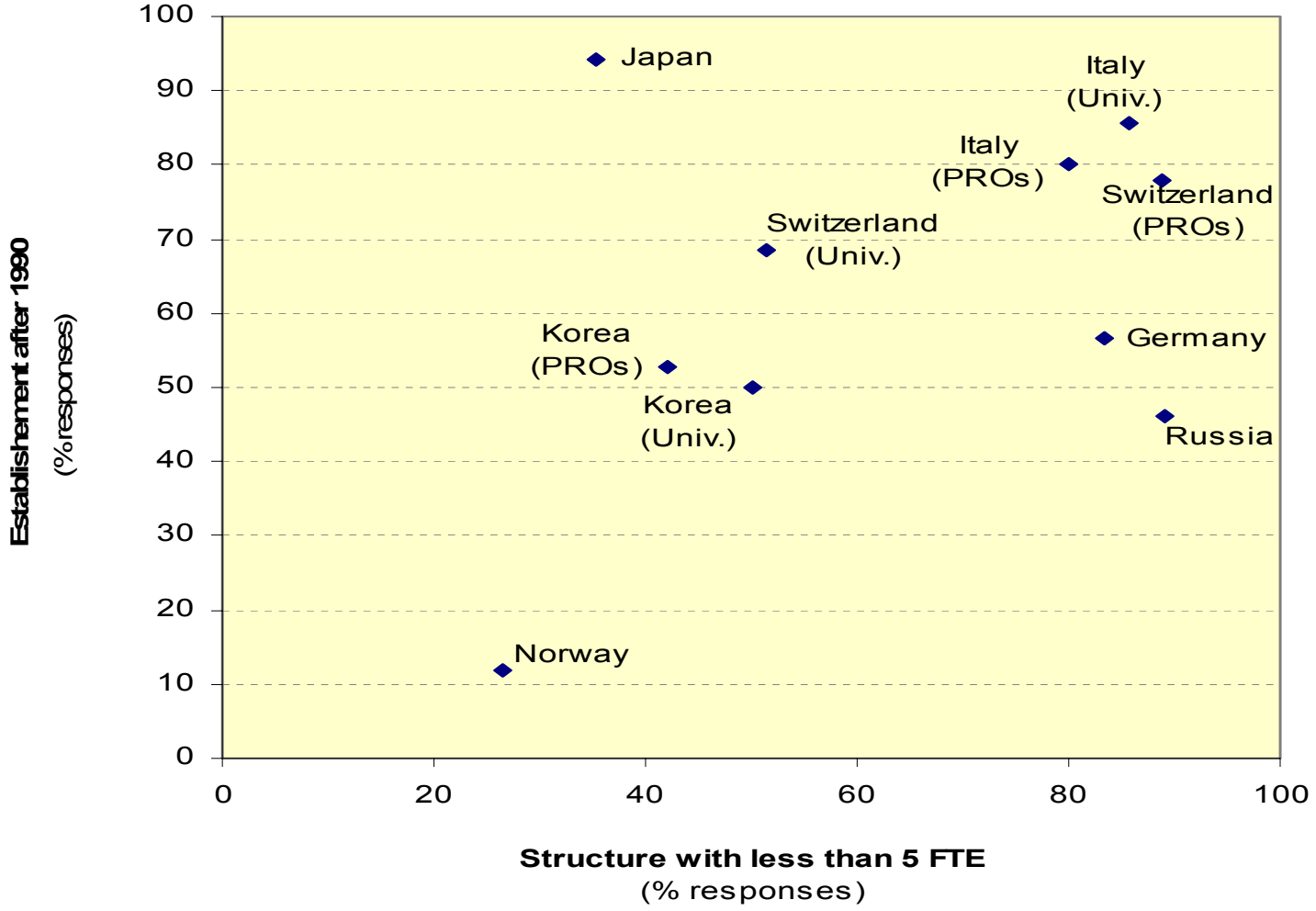
(4) TTO Survey Scope

- Technology Transfer Office organisation
- Nature of IP portfolio
  - Stock & flow of patent applications, grants, non patent IP, licenses
- Licensing Practices
  - Types of licenses and clauses negotiated, technology sectors, exploitation requirements and other safeguards for public missions
- Licensing income & expenses
  - Income, litigation, skew of income earners

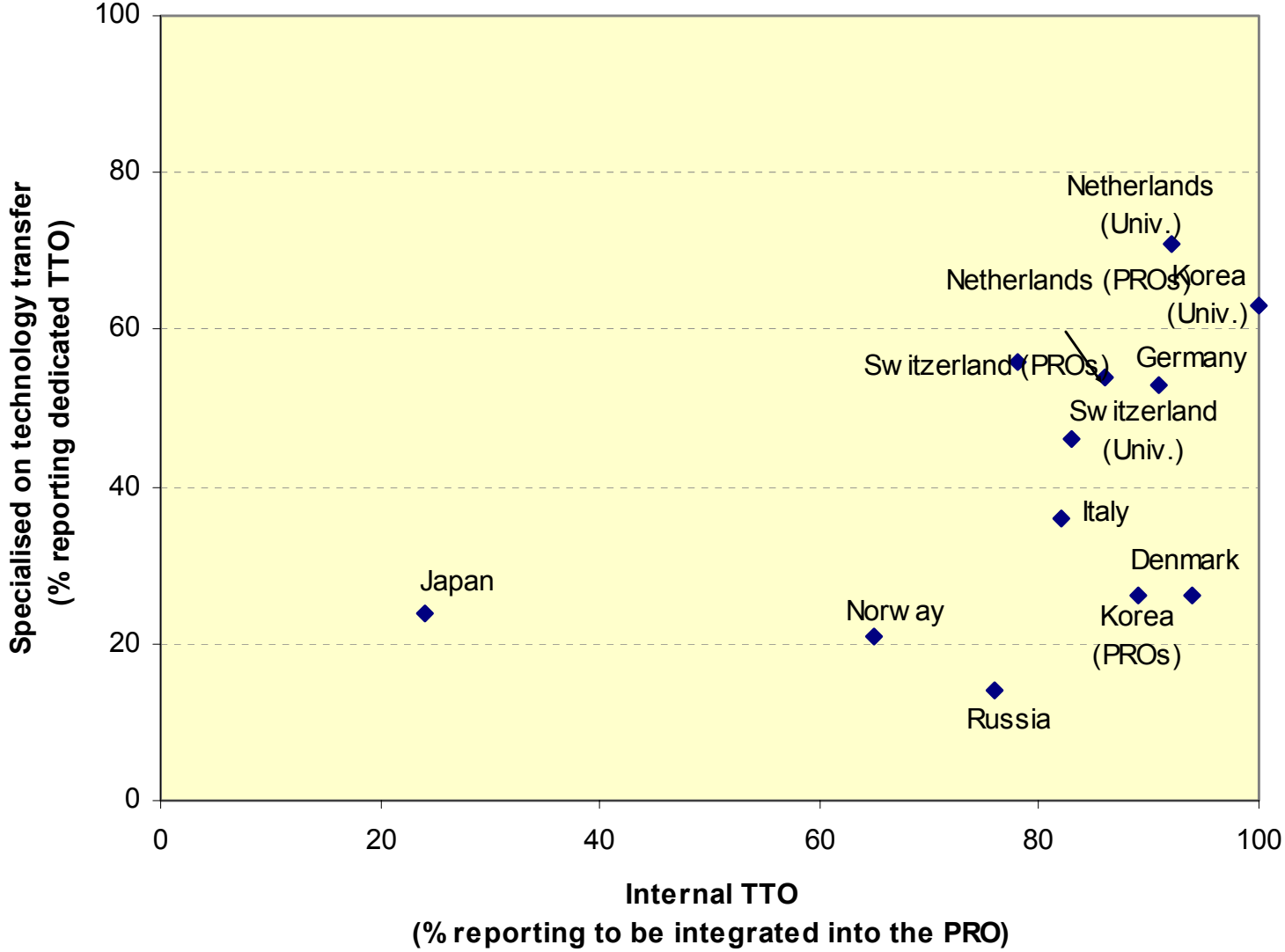
TTO Organisation & Managment

- Most TTOs are less than 10 years old
- Most have less than 5 FTE staff
- Most univ TTOs are integrated into the university but not dedicated to tech transfer
- Informal relations are main channel of tech transfer (own or researcher contacts)
- Licensing-in technology is less frequent than licensing-out

Most TTOs less than 10 years old, less than 5 FTE staff



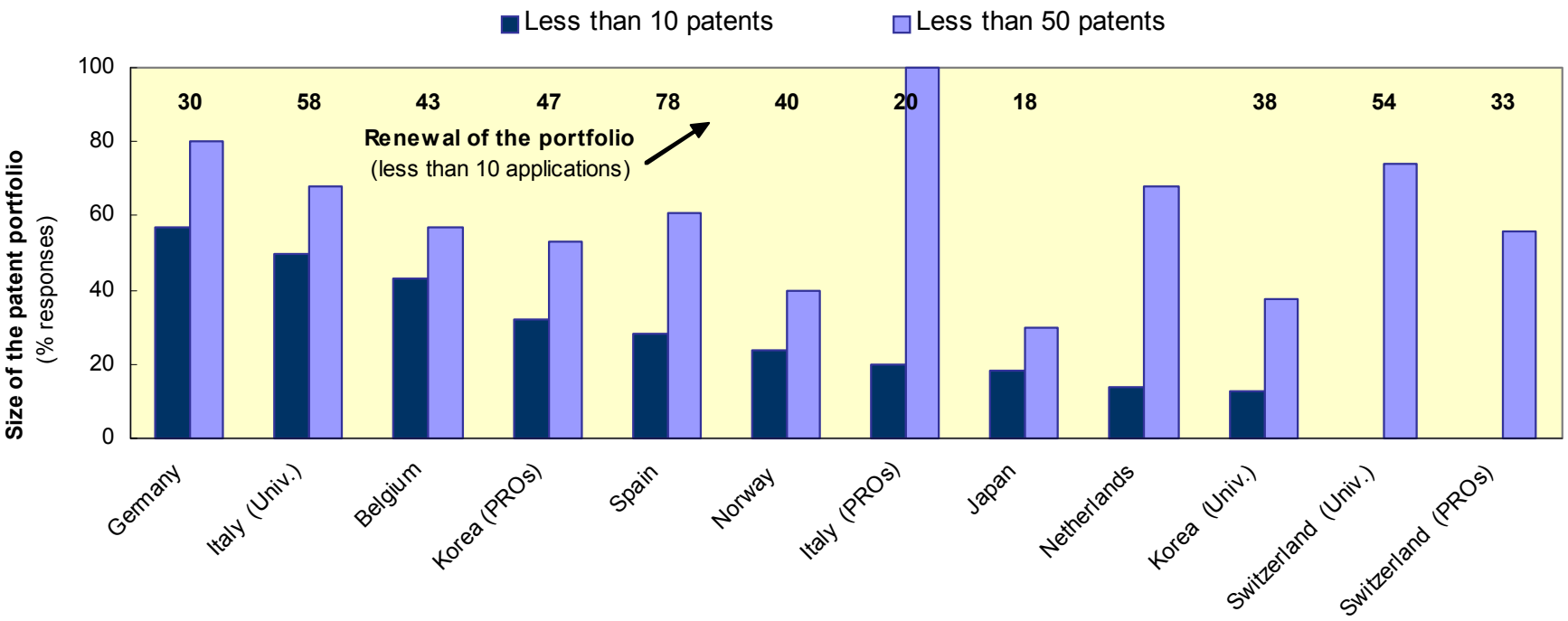
Most TTOs are internal to the univ but not dedicated to tech transfer



Patent Data

- Data refers to patents assigned to institutions
- Stock of technically unique patents smaller at univs than at other PROs (<20)
- Number of patents granted per year per PRO is <10
- Most patent applications are in health

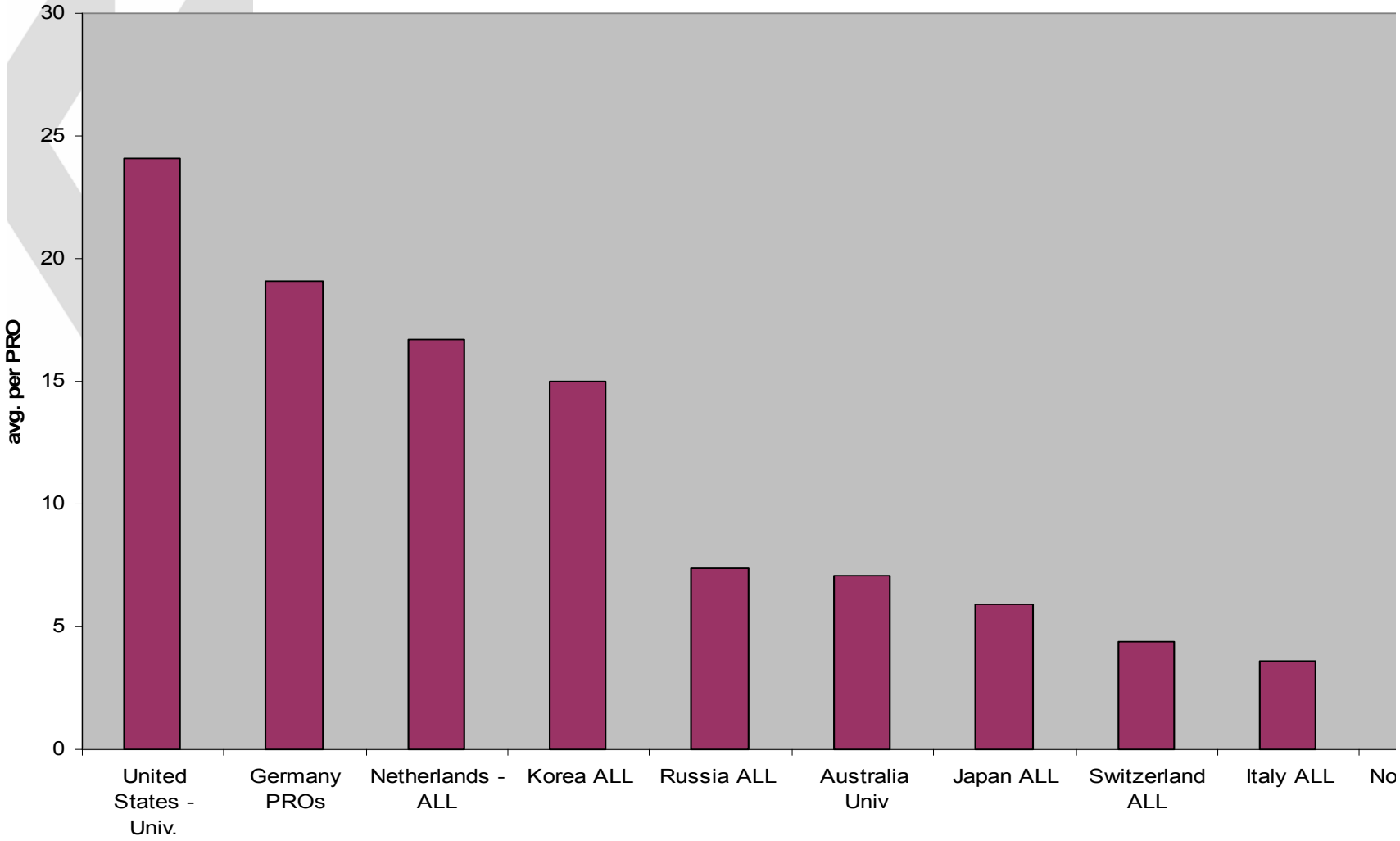
Stock of patents and renewal of portfolio



Licensing Practices

- Great variability in number of licenses negotiated, IP type and technology sector
- Licensees more often small than large firms, more often domestic than foreign
- PROs uneven in their use of safeguards in licensing agreements
- No consensus yet on what are good licensing practices

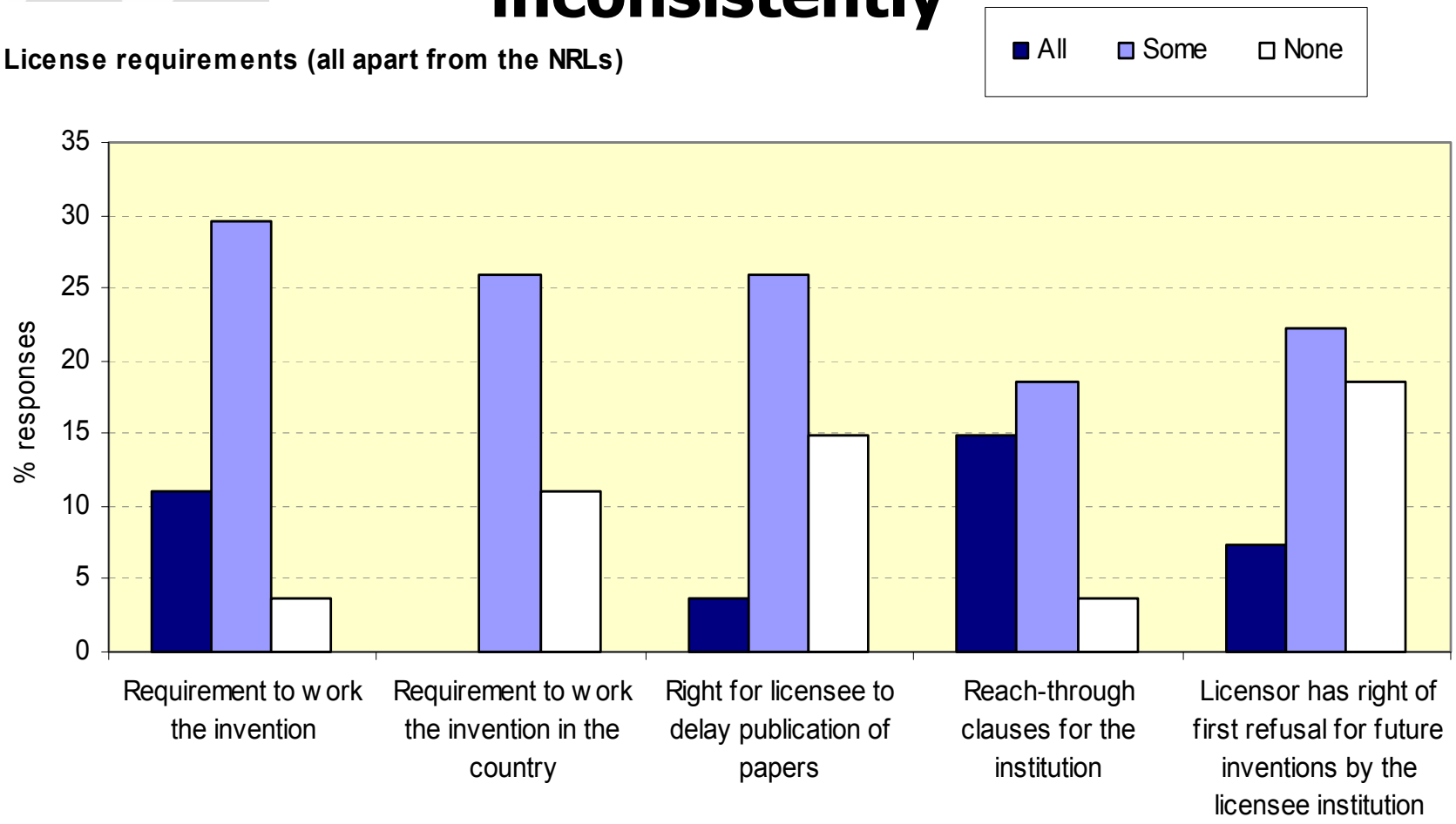
Average # of licenses negotiated per PRO: 1-24 per year



% of licenses negotiated by IP type

	Netherlands		Norway All		Switzerland	
	Univ%	PRO%	No.	%	Univ%	PRO%
Patented inventions	8%	8%	9	6%	11%	26%
Patent pending	12%	9%	16	11%	17%	23%
Non-patented	52%	41%	12	8%	14%	29%
Copyrighted material	24%	42%	106	73%	42%	23%
Industrial designs	0%	0%	3	2%	5%	–
Plant breeder's rights	1%	0%	0	0%	1%	–
Other	2%	0%	0	0%	12%	–
Total	100%	100%	146	100%	100%	100%

PROs do use safeguard clauses in licenses to protect mission, but do so inconsistently



Licensing Revenues

- Gross license income per PRO varies from 10k - 10m Euros per year across OECD countries
- Wide variety in the number of licenses at PROs that are earning income: 1-90 per PRO, median or 0-5 license earn income
- In most countries, only 10% active patents in a PRO portfolio are ever licensed and earn revenue in a given year
- Cost of patenting and licensing not well documented

Gross licensing revenue by type of PRO in (1 000s)

	Year	*All*	*Univ*	*PRO*	*currency*
Australia	2000	99 525	79 834	19 691	USD
Belgium	2001	240	-	-	EUR
Germany	2001	-	-	46 468	EUR
Japan	2000	1 397	-	-	EUR
Korea	2001	3 822	1 032	2 790	USD
Netherlands	2000	11 400	-	-	EUR
Norway	2001	-	2 000	7 700	EUR
Spain	2001	961	-	-	EUR
Switzerland	2001	5 650	2 800	2 850	EUR
United States	2000	-	1 297 452	69 600	USD
Russia	2001	1 375	-	-	EUR

In most countries, 10% active patents are ever licensed and earn revenue

	Italy	Japan	Netherlands		Norway	Spain	Switzerland	
	PROs	All	Univ	PROs	All	Univ	Univ	PROs
Total # of active patents	515	432	277	247	114	781	914	270
% Ever licensed	19%	21%	19%	51%	40%	8%	17%	36%
% Currently earning income	8%	n.a.	7%	13%	23%	4%	8%	9%

How many academic spin-offs/start ups in 2000/2001?

- **Academic spin-offs/start-ups activity is low yet widespread across countries**
- **Most PROs create <u>less than 1 spin-off/start-up per year</u>**
- **US exceeds with 2 per institution per year**
- **Multiple factors influence spin-off/start-up creation :**
  - **the licensing strategy (license to firm or start-up a company?)**
  - **pool of entrepreneurial researchers**
  - **access to capital**
  - **linkages to larger firms**

(5) Lessons Learned

- **Legal action can stimulate tech transfer, but national context matters**
- **A change in mindset is needed: more can be done to increase awareness of IP policies and rules at PROs**
- **Monitoring of IPR activities** at PROs is *ad hoc* and **weak**
- **Critical size of TTOs** larger than present average
- **No one-size fits all** model of TTO organisation
- **University vs. non-university PROs** in most countries have taken very different approaches to tech transfer

Lessons Learned

- **IP protection and licensing differs** by field/sector
- **Too much focus by policymakers on patents** as outcome hides large variety of IP activity at TTOs
- **PROs are experimenting with different models of TTO** (regional vs. sector)
- **Good licensing practices** need better identification and dissemination

Ultimate Goal of Tech Transfer

- **Too much focus on patenting as opposed to spin-offs or other channels of tech transfer**
- **Unpredictable nature of financial returns**
- **Tech transfer capacity takes time and skills, not just money**
- **Evaluation of short vs. long term benefits of tech transfer is necessary**

How can governments support IP management at PROs?

- Need to establish a clear and coherent IP framework for PROs
- Need to provide incentives for PRO reporting and disclosure by inventors
- Set example for conflict of interest rules – national research guidelines help
- Mobilize National Patent Offices to disseminate information to universities; training to tech transfer professionals

How can governments support IP management at PROs?

- **Subsidizing Patenting and licensing costs at PROs**
  - Denmark (8 million EUR over 2000-2003)
  - Germany (50 million EUR to develop TTOs)
  - Japan (exempt TLOs from patent fees)

BUT avoid capture and dependency culture

- **TTO Networking Initiatives**
  - UK (around hospitals)
  - Germany (regional networks)
  - Korea (sectoral)
- **Training & Awareness**
  - United Kingdom
  - Leveraging Patent Offices (US, Denmark, Japan, UK)

How can governments support IP management at PROs?

- Encourage data collection
- International co-ordination of surveys is necessary, especially OECD-wide
- Need to protect confidentiality of individual institutions

Thank you!

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