



Commercialising Public Research

Mario Cervantes

*Country Studies and Outlook
Division, DSTI*

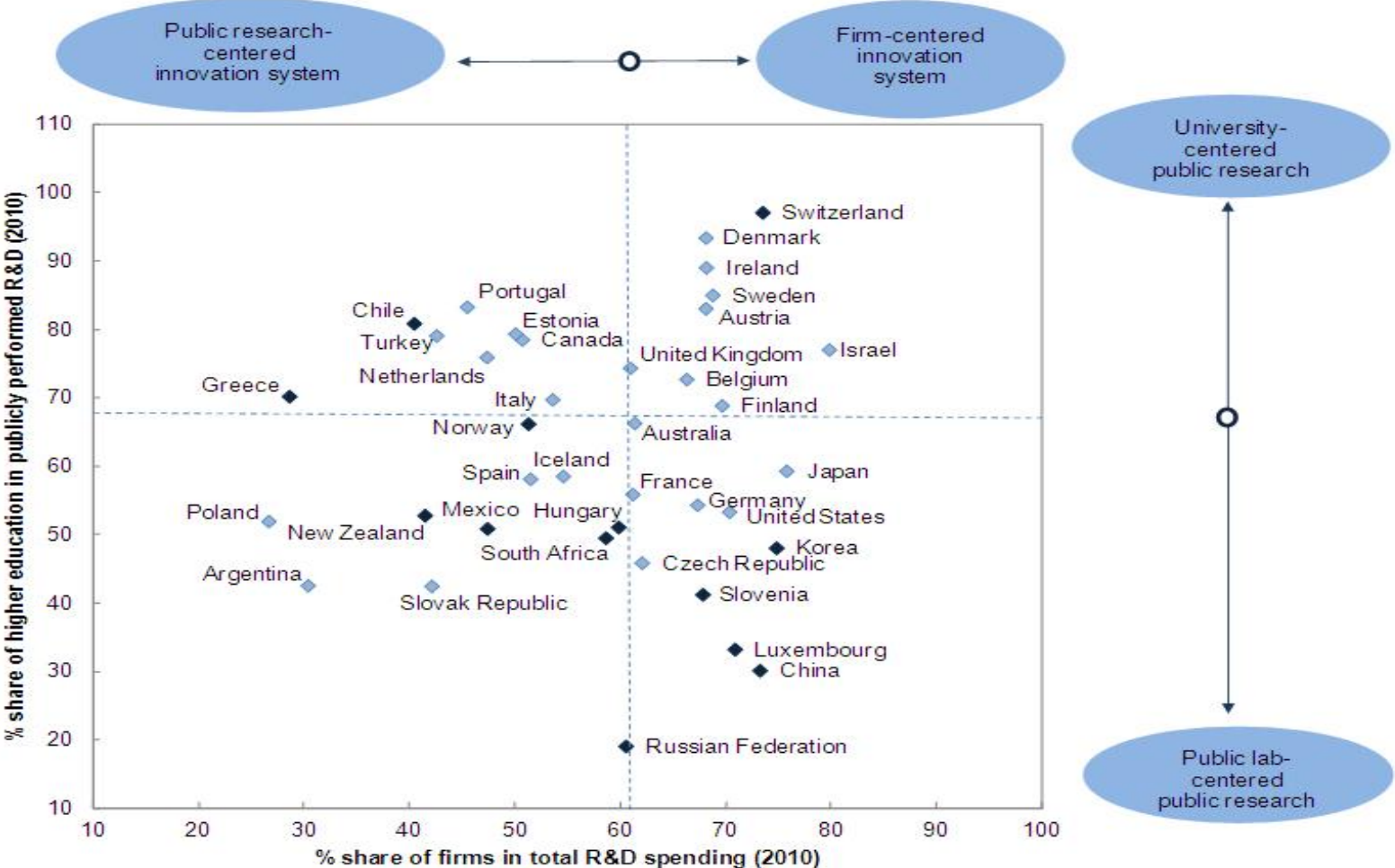
OECD

**Lecture at the Higher
School of Economics
Moscow 19 June 2012**

Outline

- Types of Innovation Systems
- Commercialisation process
- Public Policies for Commercialisation
- TTOs
- Implications for Policy

Types of innovation systems

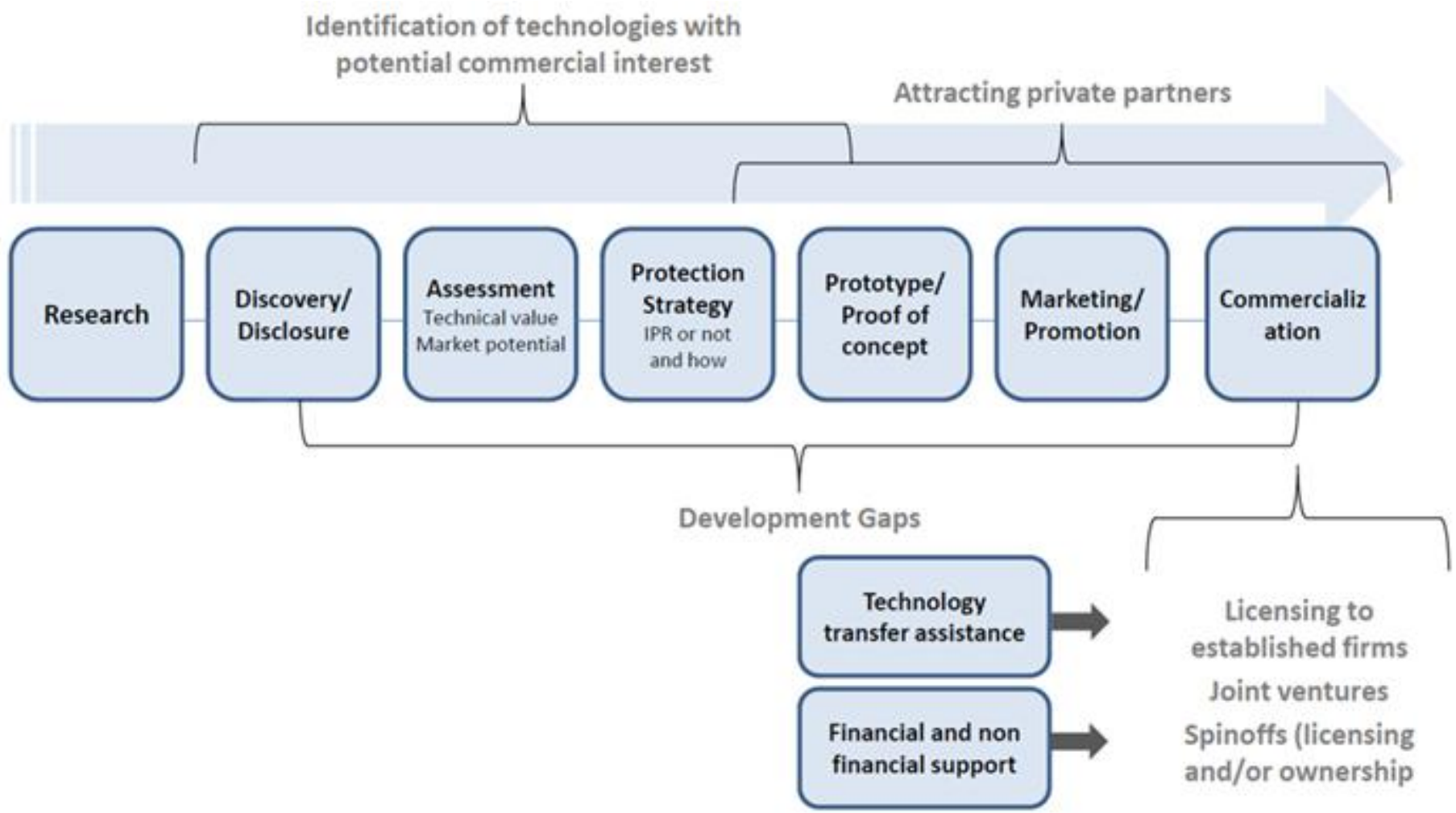


◆ In bold are countries that have been already subject of an OECD Review of Innovation Policy

Some famous university inventions

- Recombinant DNA technology
- Google search engine
- Metal alkoxide process for the production of the cancer drug Taxol
- Avian Flu Vaccine
- Hepatitis B Vaccine.... Etc.

Commercialisation process



Traditional mechanisms for commercialisation of public research:

- Investor/ a company signs a legal contract with academic institution (Tech Transfer Office/TTO).
- The university is a subcontractor of the industrial company.
- Academic researchers are hired as a professional advisors to a company.
- **Initiators – Start-up company / Incubator company**

**At the core: There is a legal contract regarding the
intellectual property managed by TTOs**

Commercialisation Policies: Institutional-based

- **Instituting specific laws and institutions to regulate technology transfer and to encourage PROs and universities to file for and commercialize their IP;**
- **Building openness in science**
 - Disclosure of inventions, publications
- **The establishment of intermediaries that facilitate technology transfer**

Commercialisation Policies: Institutional-based

- **Institutional based support for universities & PROs via TTO/TLOs**
 - Legal reforms – Bayh-Dole type of legislation
 - Support to IP management and training
 - Creation of limited liability companies to manage tech transfer
 - Special IP support from patent offices, including reduced fees

Technology transfer/licensing offices

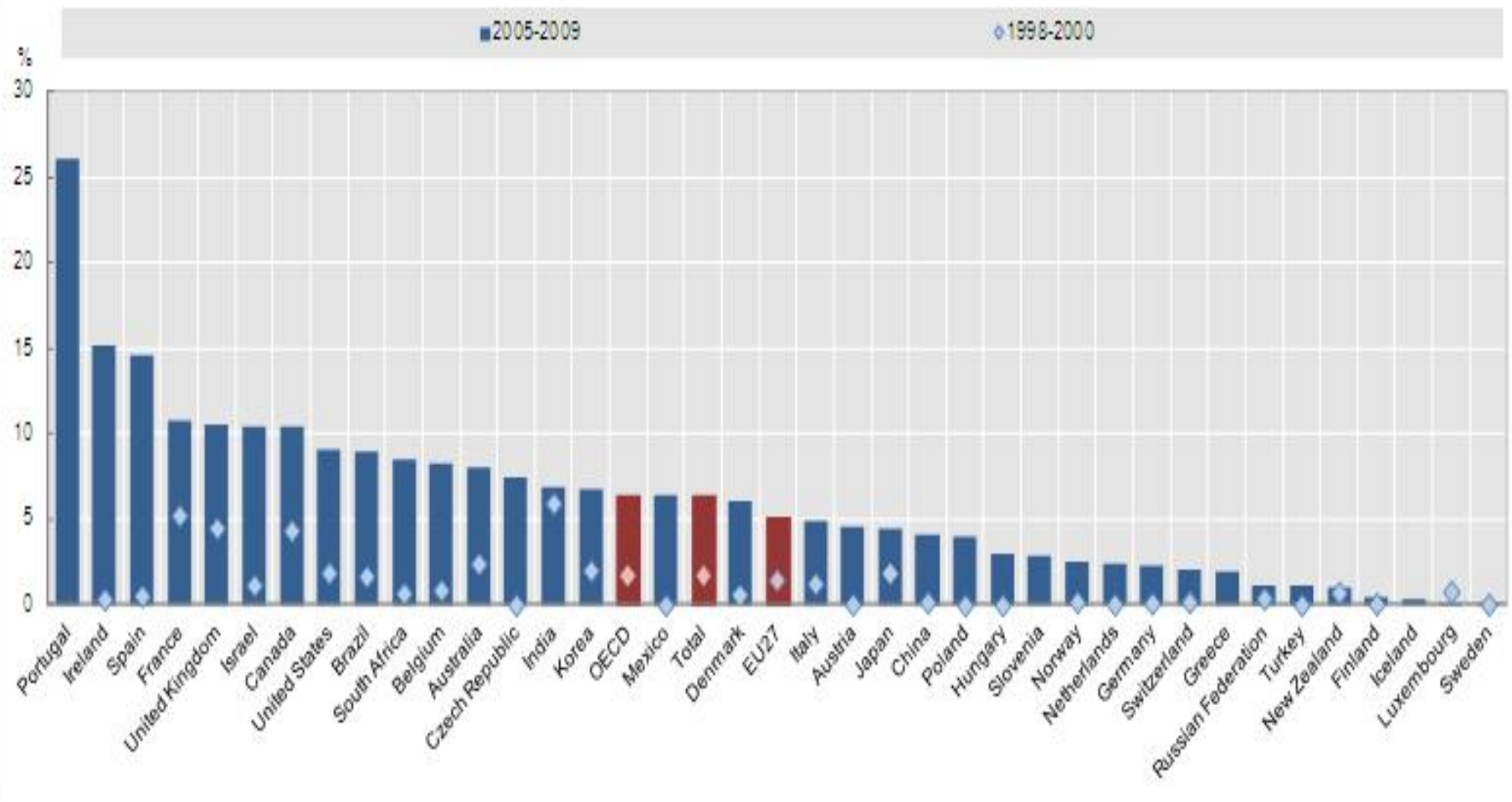
- Bayh – Dole type of legislation
- Linear process
- Transactions centrally
- IP very centrally managed
- New hub-and-spoke models (UK, France)
- The “free agency” model: return to professor privilege?

Evidence largely supportive, based on US/OECD experience

- **Patent grants to universities and colleges increased sharply from 1988 to about 1999, when they peaked at just under 3,700 patents, and then fell to about 3,000 in 2008 (USPTO).**
- **Data from AUTM show that invention disclosures filed with university technology management offices grew from 13,700 in 2003 to 17,700 in 2007**
- **Patent applications filed by reporting universities and colleges increased from 7,200 in 2003 to almost 11,000 in 2007.**
- **US universities income from licensing increased from \$200 million in 1991 to 1.6 billion US\$ in 2005**

- **In Singapore, 24% of all PCT filings were owned either by the government or the higher education sector (OECD, based on PCT data)**
- **In Europe OECD, Ireland had the highest proportion of patenting by universities (9.5% in 2003-05), a notable increase over the mid-1990s when universities owned less than 3%.**
- **In Belgium, Israel, Spain, the United Kingdom and the United States, the higher education sector accounts for 6 to 9% of all PCT filings.**

Patents filed by public research organisations, 1998-2000 and 2005-09



Commercialisation Policies: Entrepreneurial-based

- Financial Support to creation of tech/innovative start-ups/SMEs
 - R&D grants for SMEs
 - Tax Credits for SMEs
 - VC and angel support
 - Commercialisation /Deployment Grants
 - Infrastructure support to incubation/spin-off
 - Intermediation

What changed?

- ❑ Integration of demand-pull and supply-push mechanisms for knowledge transfer
- ❑ Challenge driven research and shift towards specific technologies
- ❑ Technology convergence also affects commercialisation pathways

Commercialisation through open innovation

- ❑ Open Innovation creates division of labour in the exploitation and commercialisation process
- ❑ Importance of new IP mechanisms and market places for exchanging, trading IP, etc.
- ❑ Open Innovation is more than “transactions”, it requires relationship building between universities and firms.
But larger firms are better equipped.
- ❑ Open innovation requires absorptive capacity in firms but also in universities
- ❑ Increasing role of intermediaries to broker commercialisation activities

Evolving role of TTOs

- ❑ From administrating patents to providing IP management and technology services
- ❑ High IP costs means the financial viability of TTOs limited
- ❑ Open science and open innovation place premium on sharing and networking
- ❑ Collaborative IP arrangements increases the channels of formal tech transfer
- ❑ Hence, need for TTOs to network building inside and outside the university
- ❑ Focus on increasing disclosures !!

Some recent trends (1)

- TTO/TLOs expanding role to contract research, accessing R&D funds
 - But TTOs still benchmarked by a narrow range of metrics – disclosures, inventions, patents, licenses
- Entrepreneurial programmes not always linked with institutional support schemes
 - Decentralisation but scope for “one-stop” windows (e.g. France)
- Most government programmes focused on “commercialisation” within national space/national benefits
 - But science and R&D are increasingly global , open
 - **Challenges of cross-border commercialisation!!**

Some recent trends (2)

Use of collaborative IP mechanisms such as Patent Pools, IP clearing houses, IP Sharing agreements risen and driven by:

- Create efficiencies in the exchange/trading of IP
- Facilitate research & development of technologies & products
- Create new commercial opportunities by pooling implementation technologies
- Clearing IP blocking positions
- Stimulate access to technology, research tools, etc.
- Reduce transaction costs and burden
- Can help address equity/development /global challenges
- Removing infringement uncertainty

Case Study: The University of North Carolina Express Licensing Agreement

- A single license that can be used for widely divergent various deals with minimal negotiation.
- In addition, the leadership of the University Committee established a set of guiding principles as follows:
 - Foster a collaborative spirit between the Office of Technology Development and the faculty involved in the process;
 - Be a resource to help faculty license or transfer their technology to the outside world;
 - Encourage entrepreneurial efforts by the faculty which will result in serial entrepreneurs and many newcomers;
 - Encourage deal flow;
 - Establish a fair deal for all parties involved;
 - Be a tool to recruit faculty to UNC who are interested in entrepreneurial activities

Some recent trends (3)

- **Patent Banks –Aggregators**
 - Korea - Intellectual Discovery (tech transfer)
 - Chinese Taipei - ITRI Patent Bank
 - France – France Brevet
 - Japan – Intellectual Property Network

Case study: France Brevet

- A co-investment company fund created in March 2011 by the French government and the *Caisse des Depots* (a public trust) with each party investing EUR 50 million.
- Focused on patent monetisation and matching SMEs and PROs that hold patents with potential licencees.
- Seeks to transfer research from SMEs and research institutes to industry.
- Works with universities, PROs, research institutions and private companies and seeks to establish long term relationship with researchers. In some cases it also funds patent generation and provides industry insights.

Summary

Bayh-Dole enacted at a time of crises, when Japan was the main competitor to the US. Today it's a bigger game.

Bayh-Dole enacted when a supply-push tech-transfer model predominate; when a single or few patents on inventions could launch entire industries

Today, turning science into business is much more complex: a focus on challenge driven research, joint development

Need for speed, cost-sharing, and access to best talent and knowledge anywhere in the world = more openness!

Implications for policy makers

- Bayh-Dole type legislation - a building block in a larger framework for commercialisation of public R&D
- Patents need not be the default option, esp. in life sciences
- Role of collaborative IP mechanisms to foster networks/markets
- Universities and public research are “nodes” in broader networks of innovation
- Ensure incentives and practices compatible with a more open, networked model of innovation
- Funding agencies play a critical role
- Learn from others (experimentation in firms and non-profits foundations)
- Monitor and evaluate!

Policy considerations for further research

- **How to reconcile shift towards IP in universities with open science, open innovation approaches?**
- **Adaptability of TTOs**
- **Measuring commercialisation when most important knowledge flows may be under-counted**

Thank you!

**Contacts: www.oecd.org/sti/innovation
Mario.cervantes@oecd.org**