## WORKSHOP: NEW STRATEGIES FOR THE COMMERCIALISATION OF PUBLIC RESEARCH

13-14 November 2013, OECD Headquarters, Paris

## HIGHLIGHTS

**Speaker:**

**Daniel Kupka**, Economist for Science, Technology and Industry in the Directorate for Innovation, OECD

The introductory presentation, Daniel Kupka presented findings from the OECD book *Commercialising Public Research: New Trends and Strategies*. Some of the pertinent key findings were:

- There was a slight drop in invention disclosures after the financial crisis.
- Israel leads the world in patents filed under the patent cooperation treaty per billion GDP, followed by Estonia and Korea.
- Overall revenue from licensing is low in Europe compared to the USA and does not show signs of increasing.
- Business-funded research and development in the university sector is declining.
- Many firms are not willing or able to deal with the high transaction costs and other barriers to collaborating with universities for research purposes.
- Mobility of people is important for knowledge diffusion.

The book also outlines initiatives that aim to improve the situation:

- Legislative initiatives:
  - Easy access innovation partnership in Glasgow.
  - A grace period extended for patent filing (seems to be a global trend).
  - The European Commission code of practice for management of intellectual property.
- Technology Transfer Offices (TTOs) to bridge institutions:
  - There seems to be some convergence towards a common set of organisational and financial models of TTOs.
  - There is also a tendency toward TTOs being replaced or improved as “hub and spoke” structures.
- Collaborative intellectual property tools and funds:
  - Easing access to patent portfolios for start-ups and Small and Medium Enterprises.
  - Intellectual property sharing agreements, e.g. Lambert Toolkit, Denmark’s Schluter model.
- Open access:
  - More requirements to publish in digital format, e.g. Spain’s Science, Technology and Innovation Law in 2011.
  - Examples of shared repositories of knowledge within and between countries.

- Supporting the emergence of entrepreneurial ideas from public research:
  - Development of different tools for different stages of development and research.
  - National financial support is shifting from seed funding to funding proof of concept and prototype development.
  - Higher education institutions are also setting up seed funding and proof of concept funds, although there are many different business and governance models for these practices.
- Implications and challenges:
  - Policy goals differ according to public research environments, e.g. academic excellence and commercial success are seen to mutually reinforce each other.
  - Students are a major source of knowledge transfer: incentive strategies for academics and students need to be aligned to encourage technology transfer.
  - Government should take oversight of the above.
  - Teaching, research and commercialisation should be linked without placing undue burdens on the research apparatus.
  - Potential for commercialisation needs to be balanced with retaining the fundamental integrity of research.
  - There should be more experimentation with how relationships with industry are organised.
  - Patents and commercialisation could be included in the criteria for promotions for some research staff.
  - Intellectual property remains the basic grammar of technology transfer, but it may be too narrow for modern practices, e.g. student start-ups could be protected by copyright rather than a patent.

In a context where a higher education institution does not have a certain scale of research office, the institution may not need a technology transfer office (TTO), yet many have such offices as a matter of institutional pride. The existence or model of a TTO should align to the local research environment.

Students should be encouraged to be entrepreneurial – they may be better entrepreneurs than their professors. To encourage an entrepreneurial spirit in students, the higher education institution should create an "eco-system" for entrepreneurship, e.g. clubs and funding centres of excellence to attract industry funding. Care must be taken that universities do not become too aggressive; troll-like behaviour may lead to companies cancelling student placements.

**Speaker:**

**Giovanna Oddo**, Unit Manager, European Patent Office

Over the past five years, the context of limited financing has required universities to focus their activities even more than before. In reaction to the demand for focus, the following issues have been highlighted with regard to intellectual property and commercialisation:

- Intellectual property (IP) should support commercialisation, as well as the traditional missions of teaching and research.
- Only a few universities are performing well in IP: universities lack a professional structure for IP management, collaboration with academics is necessary, but challenging (researchers may fear publication of results cannot be done without violating IP.

- IP can help promote innovation and exploitation of research with the right incentives in addition to supportive structures and processes.
- It is a challenge to harmonise IP across the European Union; it must be adapted to specific institutional contexts.
- Making revenues from IP should not be a priority.
- It is a challenge to use metrics to measure IP performance.
- Only a few technology transfer offices have shown good results.
- It may be more attractive for industry if offerings from higher education are bundled for reduced transaction costs; however, there is are limits to consolidating technology transfer offices (proximity to researchers is important).
- Training of technology transfer officers is necessary, but challenging: there is need for support, guidelines, model contracts, etc.
- There is a need for transparent rules about technology transfer, e.g. regarding conflicts of interest.
- Clear boundaries should be drawn between proprietary IP and open access (the European Union's charter on IP and the UK guidelines have not been very successful).

**Speaker:**

**Peter Plenge**, University Director, Aalborg University, Denmark

A Danish law enforced since 2000 clarified the ownership and rights of intellectual property. There have been highly charged discussions between industry and the higher education sector around the best way to transmit research benefits to industry and society. Different universities take different approaches. Some have tried to profit from the law, which industry did not like. The University of Aalborg interpreted the law with linkages to regional growth and developed a "triple helix" model: investment in basic research, applied research and commercialisation of research; sales and licensing are all under one framework. These are used to secure research results and product that are beneficial to society and become the foundation of new companies, which create new jobs and financial development.

With the University of Aalborg approach, technology transfer is integrated in the core business of the university with linkages to the education of students, industry relations, and the strategic use of intellectual property rights in long-term research co-operation with industry and society. With time, they learned that the most productive collaboration came with companies that have experience in taking a commercial view on risk and potential success. Without such experience, a lot of money may be put toward protecting a patent that has no real chance of success.

Overall, they have learned that a differentiated approach works best, depending on the industrial partner (e.g. a big American company or a local trade). Evaluation must be based on qualitative parameters and intellectual property rights should be transferred through flexible agreements. The people in the region are also stakeholders and are considered part of what might be called a "quadruple helix".

The University of Aalborg has set up "IPR North", a network to exchange experience on intellectual property rights. Small institutions that could not go through the same learning process can begin working with IPR through this network that includes members from industry, government and research.

**Speaker:**

**Frederic Caillaud**, Head of Product Development, L'Oreal

L'Oreal has a long and growing history of collaborating with research universities and other institutions that hold patents. Originally, the company would visit possible partners to discuss collaboration; however, this was risky and ideas were too often given away. Now L'Oreal uses an advanced IP database to map patents worldwide. Partners are identified based on clusters of patents in specific areas of interest to the company and it does not matter if the partners are universities or any other type of institution. Global transparency of patent-holders is a great boon to the company and works much faster to link them with the right partners.

Thomson Reuters databases are used to create a topographical "map of innovation" along particular sets of criteria. In such a map, "seas" are emerging technologies while "mountains" are clusters with a high density of innovation in a particular field.

L'Oreal manages 250 collaborations per year on average. They need to lower the transaction costs and have no time for extended dialogues around negotiation. They look for a fair offer and move on if negotiations are too slow.

The company identifies several barriers to collaborating with universities:

- Higher education institutions are not interested in applied research.
- Technology transfer offices are dogmatic.
- Lack of training of TTO staff.
- Cultural gap between higher education and business.
- Intellectual property splitting.

To address the problem of TTO staff training, L'Oreal is establishing a certification for TTO staff across Europe.

The company remains concerned about the cultural gap between business and higher education. The gap is large because there is not enough mobility across cultures, geographically and organisationally. Sometimes cultural gaps are too large for an agreement to be reached.

In general, the company would like to see technology transfer happen within three months, not a year, as it too often does now. L'Oreal sees a need for more syndication across and between universities to get IP ready for sale to the company. National TTOs, fusion of TTOs, competition among TTOs and new business models are all seen as positive trends.

Sovereign and private investment funds are cherry-picking patents by using the mapping tools. It is strongly recommended that policy makers and universities start using the tools as well.

**Speaker:**

**Paul Wang**, Vice President for Research and Development, National Cheng Kung University, Taiwan

The National Cheng Kung University is among the top ten in the world for industry-funded research. Their strategy was set around 15 years ago with a strong emphasis on industry funding. They have 72 research centres and emphasise disruptive research. There are incentives in place for staff in terms of salary and job security.

The university has invested in advanced analytical equipment to the extent that they are better outfitted than industry. This advantage attracts industry to the university. The university is able to evaluate things quickly and move on to design and production.

**Speaker:**

**Vincent Lamande**, CEO, *Ouest valorisation*, France

Technology transfer offices are a very young phenomenon, on average about 13 years old. Most have been established in the UK and Spain. TTO have an average staff size of seven full-time employees.

On average, across TTOs in 2010:

- 5 230 invention disclosures (25% of all TTOs had no disclosures)
- 2 571 patent applications (31% of all TTOs had no patent applications)
- 19 596 active patents (30% of all TTOs had no active patents)
- 4 300 licenses (42% of all TTOs had no licenses)
- EUR 66 million in licensing revenues (39% of all TTOs had no revenues from licensing)
- 579 spin offs (across 70 TTOs)

In France, a new legal framework instigated a paradigm shift for research and innovation. EUR 3 billion have been allocated for ten years. So far, changes have consisted of the following:

- Start-ups are fostered by public incubators with public researchers as shareholders.
- In 2005, there was a shift to project-based funding mechanisms for public research.
- Research and development tax incentives were revamped.
- Competitiveness clusters were created to build competitiveness in public research.

A ten-year funding programme is also being set up, called “investing in the future”. This aims to accelerate technology transfer and create value through proof-of-concept funding. The challenges are to preserve intellectual property and protect assets while creating value through proof-of-concept.

Ouest valorisation - Société d’Accélération du Transfert de Technologies (SATT) - works at the regional level as a technology transfer hub, managing links for seven universities, hospitals, engineering schools and laboratories. They aim to:

- reduce fragmentation
- organise regionally
- fund projects
- take the risks of technology transfer away from the university
- provide a single entry point for researchers and for industry.

The organisation’s model is based on medium-term results with an evaluation every three years, they have ten years to break even.

**Speaker:**

**Christine Tausig Ford**, Association of Universities and Colleges, Canada

Forty percent of research and development in Canada is carried out in the higher education sector. The private sector is quite weak in this respect, compared with other nations. A number of policy schemes have transformed the R&D landscape:

- Canada Foundation for Innovation
- Compute Canada
- Open Access Week (open access policy across the three Federal Research Granting agencies)
- Mandate that publications are made publicly available within one year of publication

Open data is a clear and acknowledged national goal. Until recently, efforts have been decentralised and discipline based. Now Canada is aiming to develop a national framework for digital scholarship with world-class data management centres, graduate training in data management, etc. The costs are an ongoing concern.

**Speaker:**

**Giulia Ajmone Marsan**, Economist for Science, Technology and Industry in the Directorate for Innovation, OECD

The OECD's definition of open science is broad and encompasses inputs and outputs of research, social networking and engagement with civil society. Open science is largely made possible by the Internet and further benefits can be predicted, such as: faster knowledge transfer, reduce duplication and costs, more research gained from the same datasets, multiplying effects and increased collaboration, new services, and start-ups by innovators who use public research.

There are tensions between open access and quality. Incentives for academics to co-operate and share openly may encourage open access (e.g. CERN).

There are also tensions between data confidentiality or privacy and data sharing, as well as intellectual property issues.

Other issues that have not been resolved include:

- sustainability: infrastructure for large database management
- lack of people with the skills to manage such a large database.

**Speaker:**

**Seppo Laukkanen**, Vice President for Knowledge Networks, Aalto University, Finland

Aalto University was created from the merger of three universities of science, art, technology and business; the interplay between the formerly distinct institutions is a distinctive part of Aalto's mission.

Entrepreneurship is broadly defined at the University and is based around the individual and his/her motivation to behave entrepreneurially. Emphasis is given to the community orientation of entrepreneurs, the mission of finding the value proposition and the conviction that success does not always begin with thinking of profits.

Disciplines taught at the University are fused together in thematic platforms such as:

- digital society
- human centred living environments
- energy and sustainable use of natural resources

Entrepreneurial behaviours include:

- lateral thinking
- observing and questioning
- experimenting
- networking
- working with a bias against the status quo
- recognising opportunities
- associational thinking
- demonstrating commitment and persistence

Personal characteristics of entrepreneurs, who are not always easy characters, include:

- resilience to failure
- commitment to outcomes, not means
- networking at multiple levels
- not selfish, aware of dependency on others
- persistent, pragmatic and never satisfied
- ambitious and humble
- creative and intuitive

Examples of the innovation "ecosystem" the University cultivates include:

- Appcampus
- Startup sauna
- AaltoES – community focus
- Aalto ventures programme

**Speaker:**

**Paul Ryan**, National University of Ireland, Galway

NUI Galway is 150 years old with local and institutional priorities resistant to the term "entrepreneur". Regional universities such as NUI have a remit to assist in regional development and there is an ecosystem external to the university that is strongly linked to creative industries wherein people show many of the characteristics of entrepreneurs; however, they would not like to be labelled thus.

New technologies rely on multiple innovations and a single company cannot supply all aspects. Basic research is also important and part of the entrepreneurial ecosystem.

Tensions surrounding entrepreneurship education at traditional universities include:

- Language: the term "start your own job" may be more attractive and manageable than "create your own business".
- Identifying projects and what research or personnel needs they require.
- The types of knowledge academics are best at are not always those most needed by entrepreneurs.

## Related Reading

OECD (2013), *Commercialising Public Research: New Trends and Strategies*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264193321-en.

OECD (2013), *OECD Science, Technology and Industry Scoreboard 2013: Innovation for Growth*, OECD Publishing, Paris, http://dx.doi.org/10.1787/sti_scoreboard-2013-en.

OECD (2012), "Commercialisation of public research", in OECD, *OECD Science, Technology and Industry Outlook 2012*, OECD Publishing, Paris http://dx.doi.org/10.1787/sti_outlook-2012-en, pp.192-194.

OECD (2012), *Transferable Skills Training for Researchers: Supporting Career Development and Research*, OECD Publishing, Paris http://dx.doi.org/10.1787/9789264179721-en.

Ponomariov, B. and C. Boardman (2012), "Organizational Behavior and Human Resources Management for Public to Private Knowledge Transfer: An Analytic Review of the Literature", *OECD Science, Technology and Industry Working Papers*, No. 2012/01, OECD Publishing, Paris, http://dx.doi.org/10.1787/5k9d4gt7mdbp-en

## Find out more

OECD Reviews of Innovation Policy: www.oecd.org/innovation/reviews

Key science and technology (S&T) statistics and publications: www.oecd.org/sti/keyscienceandtechnologyststatisticsandpublications.htm

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