

# *The evaluation of third missions of universities*

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# The scene

- Governments are seeking ways to strengthen the role of universities as agents of innovation based growth
- Entrepreneurial objectives as a third component to the mission of the university: introducing the concept of “entrepreneurial” universities.

Are European universities, through their third stream of activities, able to match society's expectations as engines of innovative growth and achieve their full potential, without jeopardizing their main mission of educating and basic research?

- Success stories, mostly from the US, have helped to promote what has now become a standard view of the entrepreneurial university and its economic role, centering on technology transfer, more particularly (licensing) patents and faculty spin-offs.

# Evidence on the classic technology transfer model for universities

- Only few university patents are licensed, even fewer generate substantial licensing income;
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- Return on spin-offs and licensing income is extremely skewed, with a few successes accounting for the majority of income;
- Although few in numbers, academic spin-offs are more successful than other spin-offs
- Student spin-offs are less frequently looked at, but are in terms of numbers, order of magnitude larger than faculty spin-offs
  - Cf Astebro and Colombo
- Licensing income and income from spin-offs is of minor importance as source of income for universities
- Largest component of income for universities is contract research

# Evidence on conditions@science for better performance on tech transfer

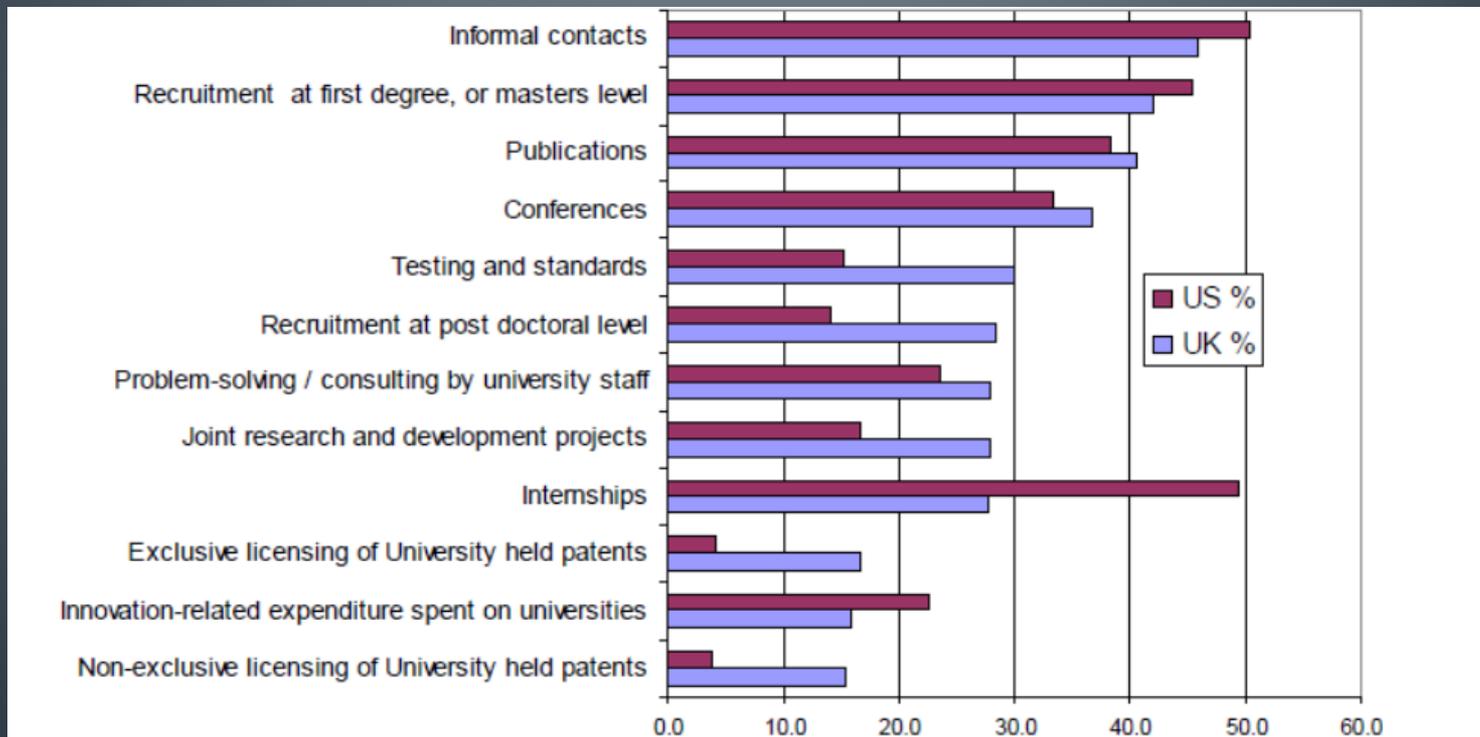
- The research quality of the faculty
  - Complementarity between second and third mission of universities !
- Proper incentive schemes in place for tech transfer
- Well defined strategies and structures for tech transfer
  - Expertise and experience at tech transfer office
- Critical scale of tech transfer activities

# Beyond the tech transfer model

- Patenting and licensing is only one of a number of pathways for the transfer of knowledge from universities to industry
- The best form of technology transfer, at least the most often used, may not be patenting, licensing and spin-offs
- The best form of technology transfer may be the moving van that transports the graduate or PhD from his or her university to a new job in industry.
- This implies that the university's most important contribution would run through its first and second mission of research based education and training.
- Unfortunately this pathway remains relatively unexplored in academic work, often hampered by data availability.

# Recruiting of students as most important science link for industry

% of firms reporting pathway as important for innovation



Source: Cosh et al (2006)

# Student and Researcher mobility

- Student & Researchers' mobility is a critical mechanism to transfer knowledge from the university to industry, particularly when the knowledge to be transferred is hard to codify, which is typically the case for science-based knowledge.
- Although this is an area of great importance to the study of the innovation process, only recently research has started to attempt to trace labour mobility. These first studies find:
  - Mobility is associated with knowledge transfers
  - University-trained researchers will not only be important to contribute to the firms' own R&D activities, they are also important pathways for firms to better absorb external R&D.
  - (Inter-firm) mobility works positively on both old and new employees
- Large scale studies on the mobility of researchers between universities and firms as conduits of knowledge transfer are very rare. The problem is lack of good large databases on labour mobility of university trained scientists.
  - Survey of Earned Doctorates (US, OECD)
  - Mobility of authors and inventors, using bibliometrics & technometrics
  - Linked employer-employee data

# Contribution of universities to local development

- The major focus in most studies on the contribution of universities to regional development is on technology transfer, more particularly patenting, licensing and faculty and graduate spin-offs,
- These studies show a strong Alma-Mater home bias.
- Case studies on university based regional centers (like Silicon Valley...) show that their development require a long term perspective. They also show a multitude of pathways for local impact.
  - Beyond tech transfer from university research, also the first teaching mission of universities may lead to strong regional effects, as in-moving students have a higher probability to stay in the area after graduation.
- Beyond the creation of new industries, there are other modes for universities to contribute to regional development: enabling industrial change, upgrading mature sectors, diversification of old industries in new activities. In these modes, other pathways besides spin-offs and licensing of university patents need to be looked at.

The one-size-fits-all approach to local economic development through spin-offs and licensing, needs to be opened for multiple pathways.

It calls for a broader view of the university's role in local economies – as creators, receptors, and interpreters of innovation and ideas; as sources of human capital; and as key components of social infrastructure and social capital.

# Policies for university tech transfer

- The most frequently used policy instruments for improving universities' third stream activities are
  - Regulation of intellectual property rights (cf Bayh-Dole)
  - Supporting Technology Transfer Offices
  - Supporting “science parks”
  - Funding industry science collaboration
  - Stimulation of the formation of technology clusters
- The current stage of economic research evaluating these policy instruments is still far from being able to assess whether such policy interventions are indeed effective
- Most studies grapple with establishing a causal link, identifying proper counterfactuals for the policy intervention.
- The policy initiatives all suffer from a lack of a proper evaluation strategy prohibiting systematic evidence collection on the causal effects of the policies.

# Some policy suggestions

- The need for a proper evaluation strategy,
- Policy should take a long-term perspective for developing a triple helix eco-system, avoiding the temptation of quick “success stories”.
- To be avoided is a focus on few targeted interventions, ignoring the need for a systemic approach, supportive of all three missions of universities and their interactions.
- A particular dangerous policy practice is a target focusing on the commercialization of university technologies, through licensing and spin-offs, ignoring the broader contribution to economic development with other pathways, most notably the training and mobility of human capital

- Veugelers, R. and E. Del Rey “Contribution of Universities to innovation, (regional) growth and employment”  
EENEE Analytical Report Nr 18, Jan 2014  
Downloadable from [www.eenee.de](http://www.eenee.de)
- Cassiman, B., R. Veugelers and S. Arts, 2010, Tracing the effect of links between science and industry: the role of researcher interaction and mobility between firms and research organisations, KUL-MSI Working Paper
- Siegel, D., M. Wright and R. Veugelers, 2007, University Commercialization of Intellectual Property: Policy Implications, Oxford Review of Economic Policy, 23, 4, 640-660.
- Veugelers, R., Callaert, X. Song, B. Van Looy, 2012, The participation of universities in technology development: do creation and use coincide? An empirical investigation on the level of national innovation systems, Economics of Innovation and New Technologies, 21, 5-6, 445-472.
- Debackere, K. and R. Veugelers, 2005, Improving Industry Science Links through University Technology Transfer Units: an analysis and a case, Research Policy, 34,3, 321-342.