Assessing the impact of mechanisms to promote university-industry research cooperation and knowledge transfer

Wolfgang Polt

POLICIES – Institute for Economic and Innovation Research / JOANNEUM RESEARCH

CSTP Workshop on Assessing the Impact of STI Policy Instruments

Paris, 20.10.2014

Introduction

- **Where do we stand in understanding ISR and related policies?**
  - What do science studies tell us about the impacts of science – industry interactions?
  - What do evaluation studies tell us about the impacts of programmes?
  - Where does this take us?
- **Sources of evidence**
  - Science and Innovation studies (see e.g. Perkman et al 2013 for a synthesis)
  - Evaluations (see Cunnningham/Gök 2012 and European Knowledge Transfer Study 2012 for summaries)
  - ..plus some of our own work (SHOK, K-plus, …)

What do we know about the characteristics of university-industry collaboration from science and innovation studies (1)?

Comparison between academic engagement and commercialisation.

Variable	Engagement	Commercialisation
Impact		
Scientific productivity	o	+
Commercial productivity	o	n/a
Shift towards applied research	o	o
Increased secrecy	o	+
Collaborative behaviour	+	+
Teaching	o	o

Notes: The table reports the effects of independent variables (vertical) on outcome variables (individual-level academic engagement and commercialisation). Commercialisation includes academic entrepreneurship and IP-based technology transfer. Key: (+) Positive effect in at least some studies. (–) Negative effect in at least some studies. (o) ambiguous effect/not enough empirical evidence. (n/a) not applicable.

From: Perkman et al. (2013), 426

What do we know about the characteristics of university-industry collaboration (2)?

- ***Cooperation activities*** (‚academic engagement') ***are a multiple of commercialisation activities*** (both in frequency and relevance in terms of income)
- They ***differ in motivation***: academic engangement is (from the side of university researcher) driven by research considerations (i.e. learning and access to additional resources) while commercialisation is predominantly driven by monetary incentives
- There is (by and large) a ***positive correlation between (individual) researchers scientific productivity and academic engagement and commercialisation***

What do we know about the characteristics of university-industry collaboration (3)?

- Researchers that are ***successful in raising government grants*** are ***also*** the ones ***successful in raising funds from industry***.
- While this is true on the level of individual researcher, the ***overall effect of organisation*** level academic quality seems to be negative for cooperation activities, but positive for commercialisation activities !
- ***Impact on research agendas***: apparently little effect except for industry funded research being somewhat more applied and more collaborative, both with public and private partners. Overall impression: must not be to the detriment of basic research

What do we know about the characteristics of university-industry collaboration (4)?

- ***Impact on teaching*** is not clear and has not been subject of the academic literature
- ***Impact on openess***: some evidence for increased secrecy for those more engaged in commercialisation activites, not so for collaboration in the wider sense
- While scientific collaboration is increasingly international on a wide scale, ***collaboration with industry tends to be more loca***l

What do we know from Evaluations? – Programmes for collaborative research (1)

Input Additionality	Output Additionality	Behavioural Additionality
Generally positive, with some caveats: • not everywhere, • not always for all firms, • to establish causality is often a problem	Generally: **evidence of increased collaboration** • Positive correlation between collaboration with industry (esp. international collaboration), sometimes inverted U-shape is found • Mixed evidence on direct economic benefits (LINK <-> FPs): some find substantial effects, others don't	In general, not only number of collaborations is increased, but also • Number and types of partners • Duration of Project • Interdisciplinarity But: • quite often not taking more risk, • Not being more 'strategic' to the firm' and hence • Not resulting in 'technological breakthroughs'
•		

What do we know from Evaluations? – Effects of Programme Design and Governance (2)

- ***Clear intervention logic*** (leading to clear programme goals) is likely to increase the effects of a programme
- ***Characteristics of partners*** was crucial for success
  - Prior experience of collaboration (+)
  - Number of partners (inverted-U for most of the effects)
  - Geographical proximity (+)
  - Vertical (+) instead of horizontal (-/~) collaboration
  - Trust among partners
  - Stability in personell
- ***‚Good' Programme management*** (Application procedures, ex-ante/monitoring, …not too much bureaucracy !) (+)

What do we know from Evaluations? – the example of the Austrian competence center programme (3)

- ***Input additionality:***
  - Competence Centres ***did not substitute other channels of industry-science collaborations*** ! (direct contracts, establishment of bilateral labs [CDG] …)
  - But didn‘t raise the R&D expenditures of participants…
- ***Output additionality:***
  - Comparatively lower scientific output (not comprehensively documented?)
  - Low number of patents and direct commerzialisation by the centres (lack of interest from both sides)

What do we know from Evaluations? (4)

- ***Behavioural additionality:***
  - Number of cooperationen increased significantly
  - Partners mainly from large enterprises (already experienced in collaboration), relatively small number of ‚new entrants'
  - More long-term research, but not much ‚behavioural additionality' with respect to other warranted project characteristics (e.g. more risky research aimed at creating breakthrough technologies)
  - Discernable effects on research agendas at the technologically oriented Universities, but not for the rest
  - Increased internal collaboration between faculties and disciplines

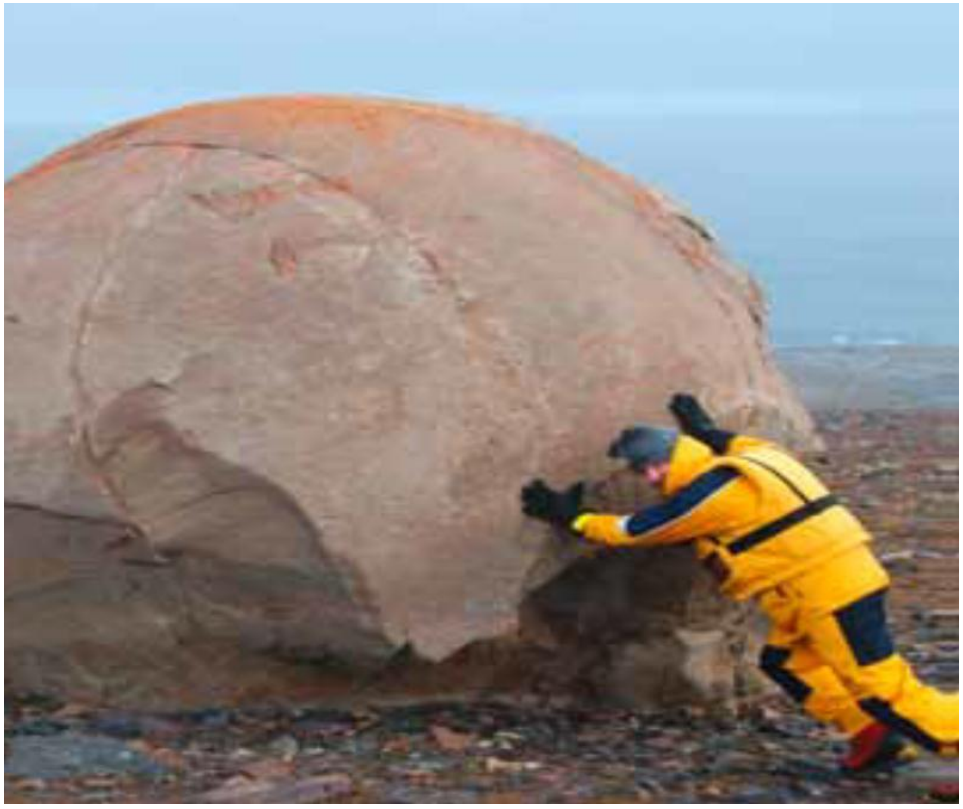
What do we know from Evaluations? – Knowledge and Technology Transfer Activities (5)

- Universities / PROs that have an explicit policy are more successful in various dimensions of KTT
- Monetary incentives are (much) more effective than non-monetary ones (e.g. inventors share in revenues or salary increase)
- Drafting your patents youself is good for you – TTOs doing this internally have higher rates to patent and higher incomes from licenses

Some implications for Policy and IA

- We are far from a comprehensive (let alone ‚systemic') IA – and maybe we'll never get there ..yet we have a body of findings on which policy makers must act
- Policies and Programme design have to face potential trade-offs between instruments, which should be part of ex-ante deliberations and establishment of sound internvention logic
- …and have to be experimental and flexible enough to learn, change and adapt (…and not wait till ex-post IA)
- Ceterum censeo: we need a much better data basis!

Thank you for your attention… and of course all caveats you heard of apply !



Wolfgang POLT
JOANNEUM RESEARCH
Institute for Economic
and Innovation Research
Leonhardstraße 59, 8010 Graz
Sensengasse 1, 1090 Wien

wolfgang.polt@joanneum.at
www.joanneum.at/policies