

Industry-Science Relations: Reflections from the OECD Strategy

OECD Innovation Strategy Roundtable – Prague , 30-31 March 2010

Outline

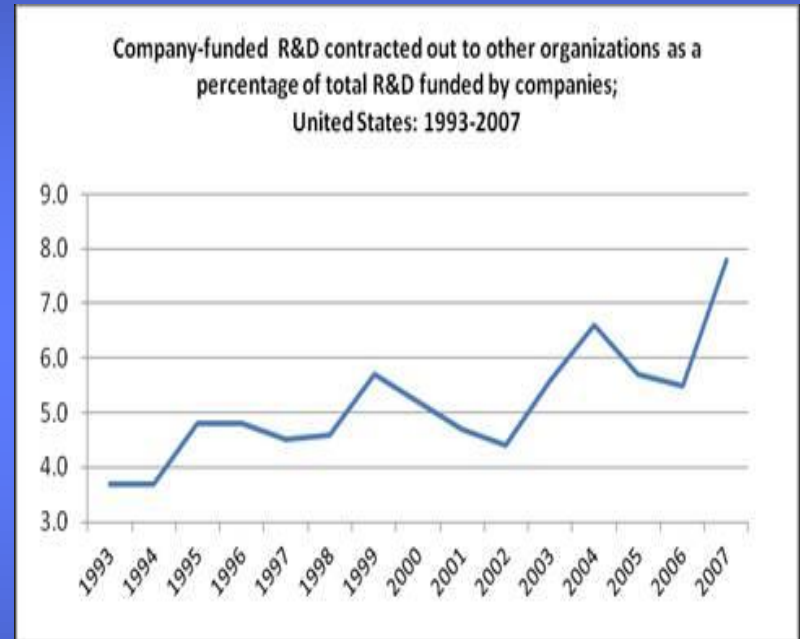
- r New Rationales for Industry-Science Relationships (ISR)
- r Recent Trends
- r Barriers and Challenges
- r Focus on Public Private Partnerships
- r Open questions/Issues for future research

Traditional and New Rationales for ISR

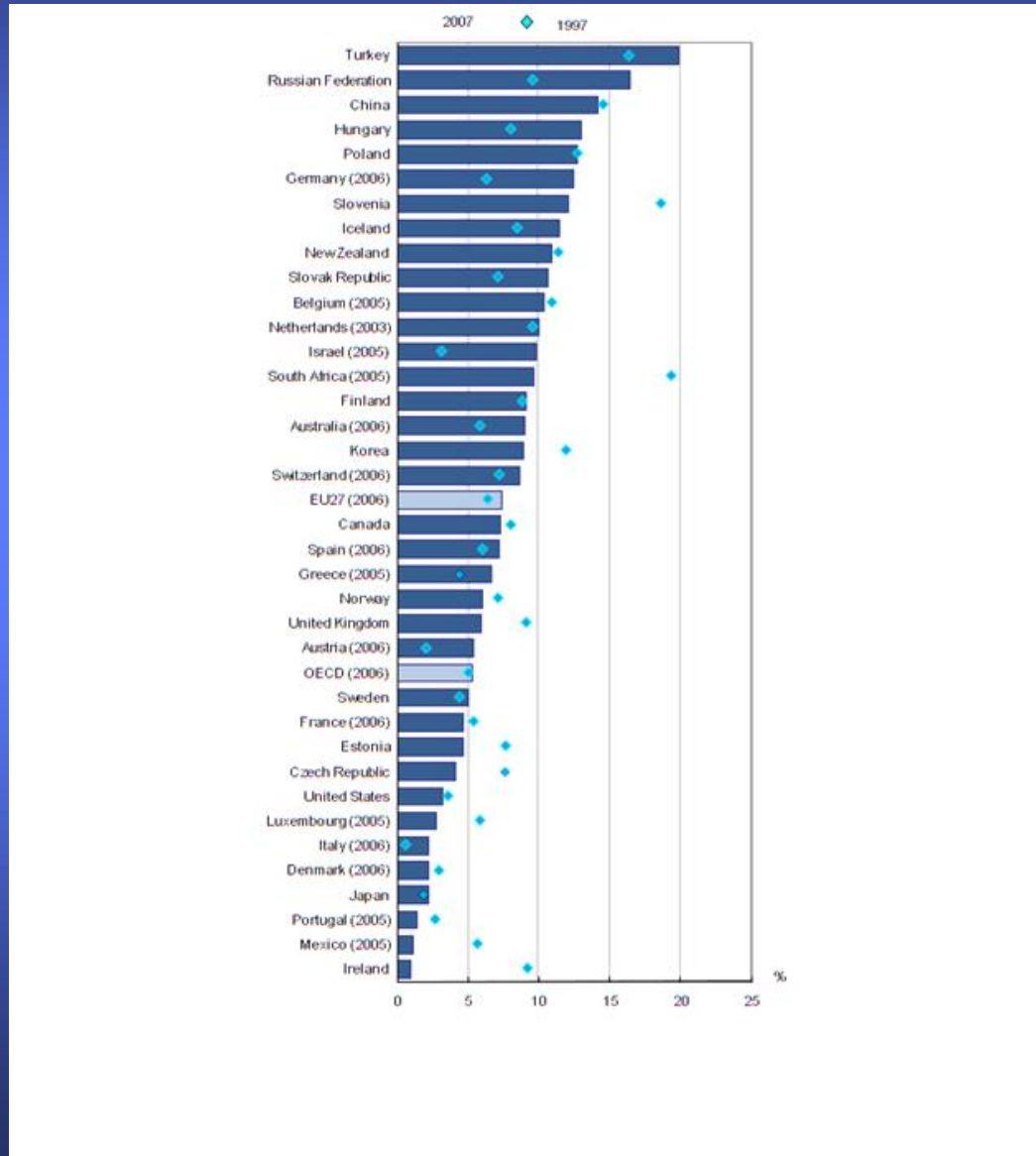
- r Improve connectivity within NIS
- r Develop new capabilities
- r Budget pressures and rising costs and complexity of R&D at the frontier
- r Achieving critical mass and excellence through public-private collaboration
- r Collaboration as a means of linking supply and demand
- r Collaboration is enabled by ICTs and the rise of Open Science/Open Innovation Models/Cloud computing
- r Global challenges increase demands for collaboration

Recent trends in ISR

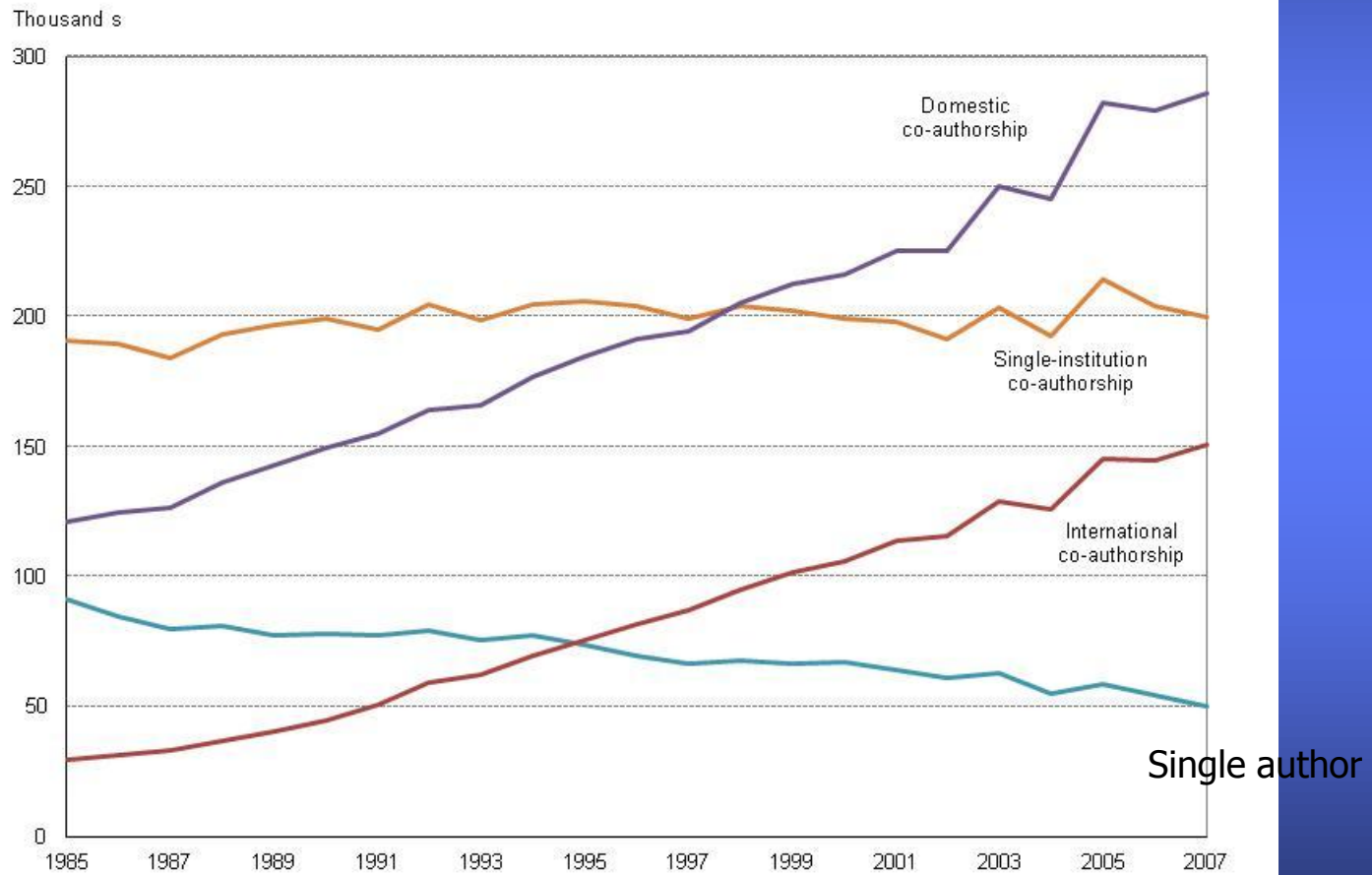
- Institutionalisation of industry-science links in nearly all OECD countries
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- Direct industry funding of university R&D has risen but is stable
- But other forms of funding, such as contract R&D and public-private partnerships rising
- Tax incentives being used to promote industry-university collaboration



Business-funds around 5.3 per cent of R&D in the higher education and government sectors *(as a percentage of R&D performed in these sectors in 2007)*



Scientific collaboration is rising within and across organisations



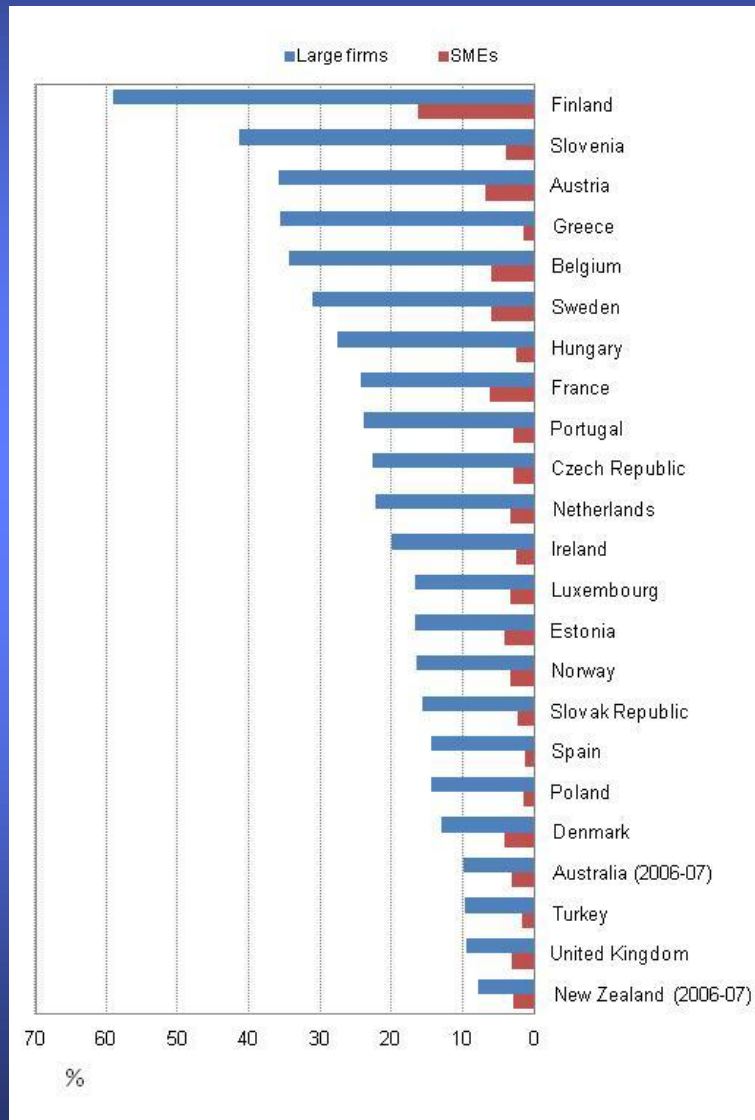
Collaboration is a major source of innovation in firms

Companies collaborating on innovation activities, by partner, 2004-06

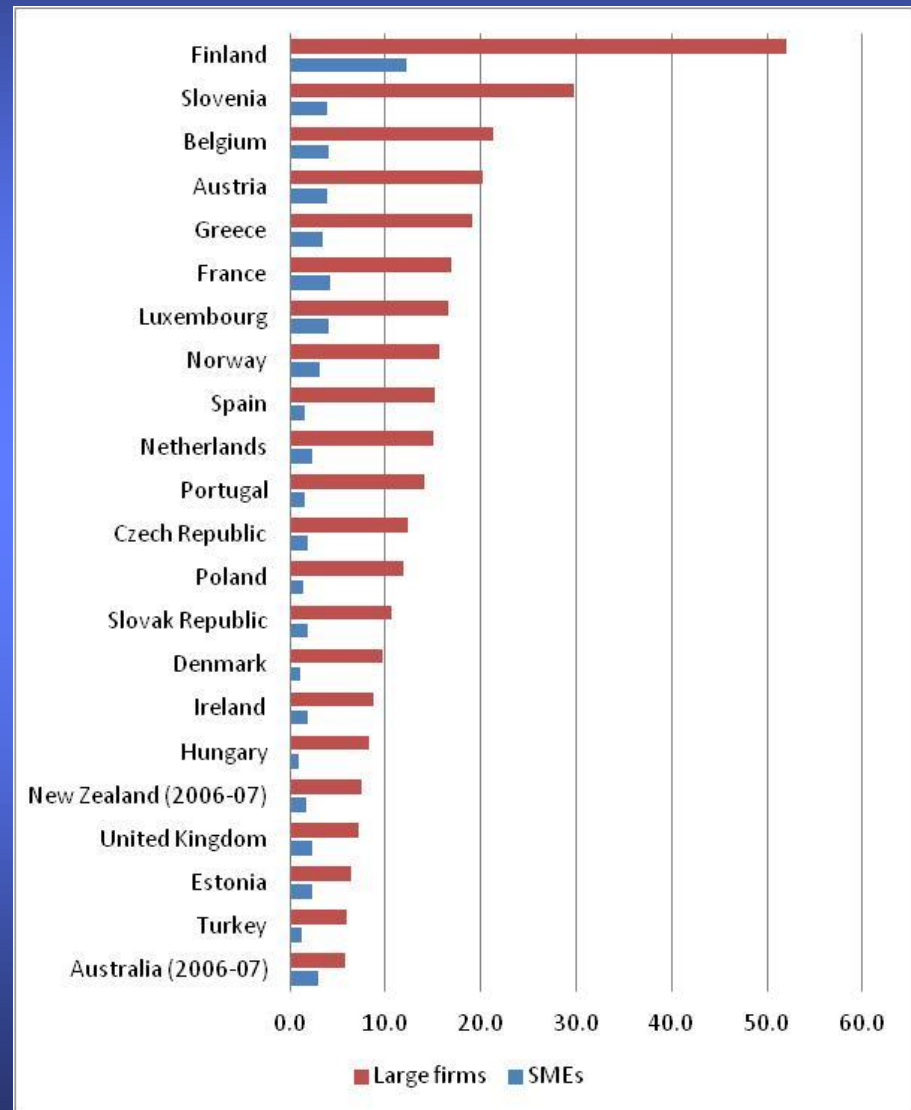
	<i>Suppliers</i>	<i>Customers</i>	<i>Competitors</i>	<i>Consultants and private R&D institutes</i>	<i>Universities and other higher education</i>	<i>Government and public research</i>
Austria	43%	45%	22%	42%	58%	30%
Czech Republic	80%	68%	40%	39%	34%	19%
Belgium	73%	59%	27%	42%	37%	26%
Denmark	66%	65%	35%	44%	32%	16%
Germany	44%	51%	27%	18%	53%	26%
Ireland	72%	78%	19%	31%	31%	18%
Spain	52%	23%	17%	23%	26%	28%
France	65%	50%	36%	32%	26%	18%
Italy	56%	39%	37%	50%	36%	11%
Hungary	71%	53%	37%	34%	37%	14%
Netherlands	75%	55%	31%	38%	31%	24%
Slovenia	79%	70%	43%	42%	41%	28%
Slovakia	84%	80%	56%	49%	39%	30%
Finland	92%	93%	77%	74%	75%	59%
Sweden	75%	65%	25%	46%	41%	15%
United Kingdom	74%	73%	36%	41%	33%	25%
Norway	70%	67%	36%	61%	45%	49%

Industry collaborates more with higher education than with institutes

Firms collaborating on innovation with higher education institutions , 2004-06



Firms collaborating on innovation with government institutions by size, 2004-06



Barriers and Challenges

- r Legal and Regulatory Barriers
- r IPR/commercialisation issues
 - | Technology transfer offices
- r Local/National and Global Governance Challenges
- r Aligning Incentives
 - | Financing
 - | Outcomes
 - | Evaluation

Types of industry-science collaborations

- r Dual-actor model versus multi-actor collaborative model
- r Examples:
 - r Collaborative forms of interaction, such as collaborative research, contract research and consulting
 - r Public-Private Partnerships: institutional and Programme-based models
 - r Knowledge market approaches (licensing, technology transfer, vouchers)
 - r Entrepreneurial Approaches (academic spin-offs in biotech, energy etc)
 - r Clusters based Approaches (geographic versus technology based clusters)

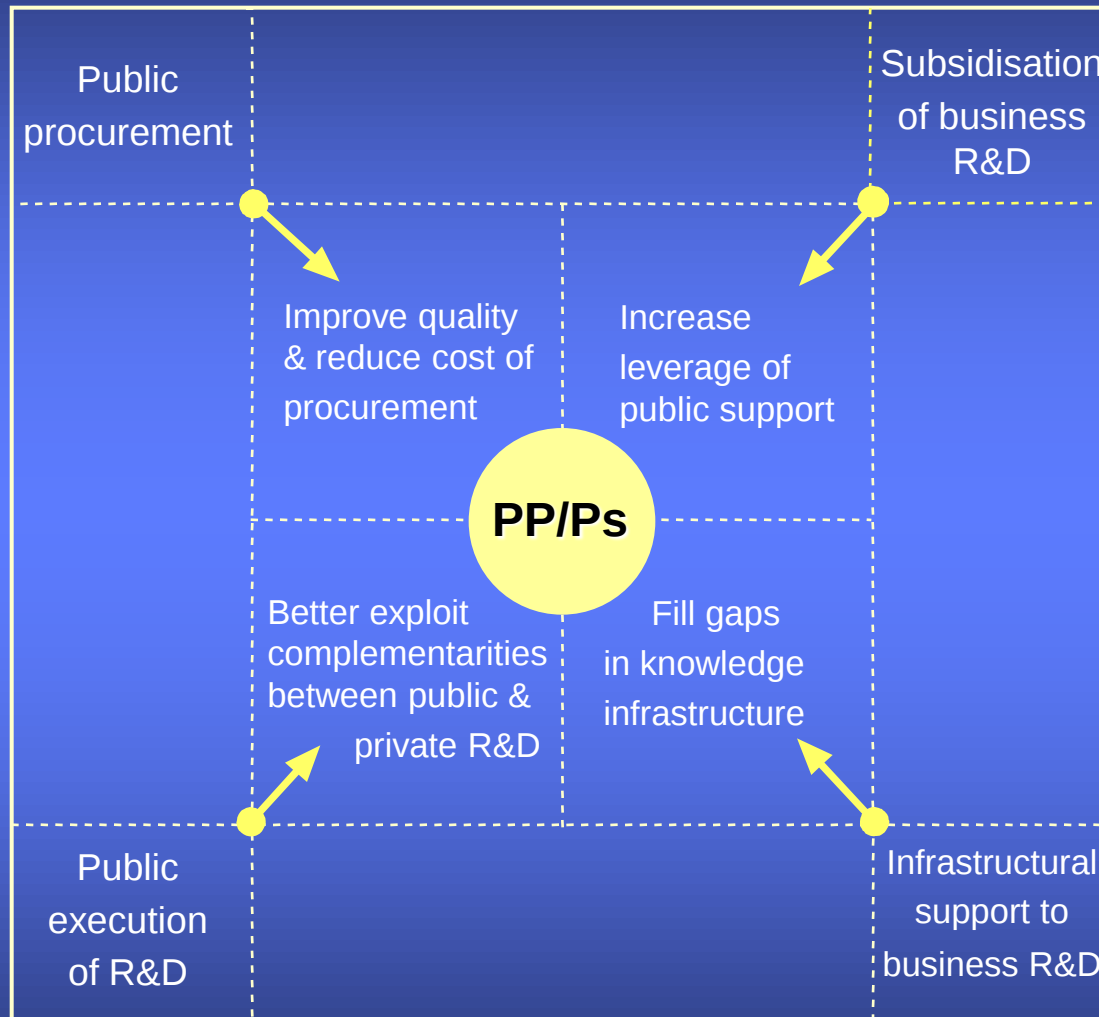
Some examples

- r UK: Energy Technologies Institute ; 50:50 public private partnership to provide funding for university, SMEs and larger firms in international collaborations
- r Italy: Joint-labs between government/university and industry in specific areas (nano, new materials, biotech)
- r Canada: 8 large scale Centres of Excellence in Commercialisation and Research involving international peer reviewed competition
- r Spain : CENIT programme links firms, public research around big projects to create critical mass
- r United States: Technology Innovation Programme funding high risk precompetitive technology. Industry input and university participation with a focus on SMEs

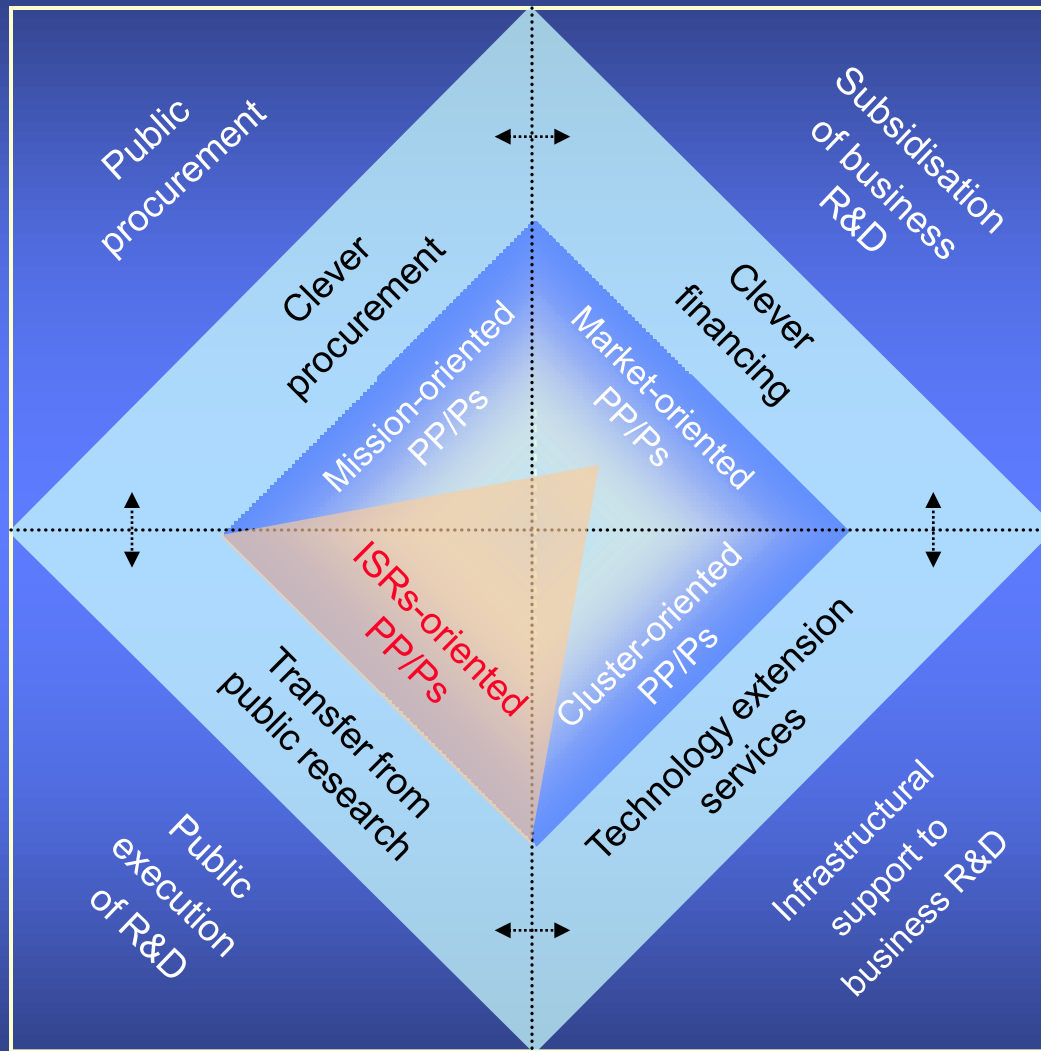
Focus on Public-Private Partnerships

- As opposed to other policy instruments, and to more casual relationships between government and industry, PP/Ps are characterised by:
 - Institutionalisation
 - Government as a partner
 - Shared objectives and a clearly defined public interest
 - Active involvement and co-investment of resources

PP/Ps for innovation – Potential benefits



PP/Ps for research and innovation – a Typology



The increased use of PP/Ps for innovation

- An expansion of PP/Ps is observed in several directions:
 - First and foremost, programmes to promote strategic R&D co-operation between universities, public research institutes and private firms are very popular since the end of the 1990s
 - PP/Ps are preferred instruments to promote research in strategic emerging research fields (e.g. genomics, nanotechnology)
 - They are also increasingly used to promote development of and access to human resources for S&T or facilitate early stage financing of technology-based firms
- Overall, they now account for a significant share of S&T budget in several countries

Ensuring industry commitment while balancing public and private objectives

- A bottom-up, competitive selection of PP/P projects is a good practice
- Clear arrangements regarding IPRs are necessary to engage private firms.
- For managing the portfolio of PP/P centres (networks) there may be a need to use some “top-down criteria” in defining research fields where proposals for PP/Ps projects should be encouraged
- To avoid a drift over time in the research agenda of established PP/Ps, strong leadership in management and rigorous evaluation are key

Institutional embedment within the innovation system

- Managing PP/P programmes within government
 - Inter-ministerial coordination
 - Governance structures (e.g. strategic steering *versus* operation)
- Flexible organisational models
 - Virtual or “real” centres?
 - Status of PP/Ps within public research organisations (e.g. regarding evaluation of researchers, IPRs, etc.)
- Efficient knowledge management and strong leadership in daily operation

Optimal financing

- Co-financing arrangements are central elements of the incentive structure of PP/Ps
- They vary from programme (centre/network) to programme (centre/network)
- There is room for improvement:
 - Provide different levels of government financial contribution to different types of PP/Ps?
 - Lowering budget contribution as PP/Ps mature?

SME participation

- PP/Ps are not SME policy tools
- Increased use of PP/Ps boost SME share in S&T budget
- But SME participation can be further enhanced
- Good practices can be identified:
 - Given due priority to PP/Ps in areas where SMEs are main actors
 - Creating mechanisms which allow easy and inexpensive access to PP/Ps through, for example, industry association
 - Setting transfer mechanisms aside PP/Ps

Open Issues /Questions

- New modes of Financing for ISRs
 - Rise of venture-based models in project selections
- Industry-science collaboration across borders
 - Ensuring national benefits from openness
- Research and technology convergence issues

Evaluation

- Assessing both individual schemes and a portfolio of collaboration;
- Which procedures and criteria?
- Measuring “behavioural additionality” (does collaboration change the research culture in firms and/or universities)