

#### Science and Industry. Public - private partnership: a new policy

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#### Science and Industry Public - private partnership: a new policy

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#### The innovation challenge

- As for innovation and growth, Europe is falling behind the US
- Mainly because the rate of private R&D expenditure is too low
- The main challenge: which kind of policy measure is able to induce firms to spend more in R&D?

# The dissemination of technologies

- It is a matter of fact than technology dissemination is very important for the efficiency of the economy
- Technology travels from firm to firm, from country to country with an astonishing speed
- Routine innovation activity in large firms is often deliberately offered to other firms

### The sources of technology transfer

- Policy measures (or even political constraints) can explain the dissemination of technology
- But, there would not be such a technology dissemination if it was not induced by market forces.
- Thus the real source of dissemination is an appropriate mix of public intervention and market forces

#### Back to the nature of innovation

- Technology is not a precondition of innovation seen as a diffusion process
- It is the result of the innovation process, which depends on the way co-ordination issues have been dealt with.
- In this perspective, innovation is a distributed phenomenon, which involves a multitude of actors, and cannot be only determined by individual firms' incentives

### Complements and substitutes in innovation

- When innovations are substitutes, firms have a strong incentive to protect them
- But market incentives are reversed when the innovations are heterogeneous and complementary
- In the latter case, the focus is on evolving product, for which innovations are small heterogeneous improvements introduced by different manufacturers of that same product

### A technology consortium model

- An industry with n+1 firms identical in all respects except that firms 1 to n agree to share technical information, while firm n+1 keeps the results of its R&D for itself
- Inventions are supposed to be different from one another and complementary
- Innovation expenditure is devoted to cost reduction

### A technology consortium model

- Expected future costs of each consortium member are reduced by its own efforts, but also by the R&D of each of the other members
- In contrast the holdout firm will incur a total expected cost clearly greater than the consortium member's cost.
- This disadvantage increases cumulatively

# The stability of technology sharing consortia

- Despite the loss of profit resulting from exclusion of a technology consortium, incentives for not entering or quitting do exist
- Not only because firms have an incentive to cheat or to become selective in passing information about their own advances
- But because, due to co-ordination failures, the competition process does not lead to a stabilised market structure

#### Back to the competition process

- A technological change breaks both the internal consistency of the capital structure of the firms involved and the existing market structure
- Investments may become either insufficient or excessive with respect to those required to keep both the internal and the external equilibrium
- Thus, competition will be efficient if it allows competitive as well as complementary investments to be compatible, and then leads to a stabilised market structure

# Dissemination of technology and competition

- R&D agreements and technology sharing consortia, rather than to be cost reducing oriented, are oriented to market information sharing
- They help coordinating, not only R&D expenditures, but also capacity investment.
- Due to the existence of sunk cost, innovative firm can enjoy a competitive advantage in an early phase. Instead to be a barrier to entry, sunk costs maintain competition among heterogeneous firms

### From the old to the new economics of science

- The old economics of science focuses on the divergence between the private and social returns to basic research outlays
- Such a market failure, in absence of remedial actions, would result in global underinvestment in science
- Knowledge is treated as a durable public good
- Rules, norms, regulations that govern institutions are not taken into account

### From the old to the new economics of science

- The new economics of science focuses on information issues and incentives both in public and private organisation
- Then the problem to be dealt with is less characterising the properties of science, than assessing public as well as private organisations' performance

# From the old to the new science policy

- The old science policy corresponds to a top down approach, with the risk of backing wrong horses
- The new science policy corresponds to a bottom approach, which consists in trusting competitive behaviours
- Public intervention should be only devoted at elaborating and enforcing market rules
- Enhancing science and technology is obtained through competition, regulation and fiscal policies
- It is the best way to do?

# Once again on innovation and competition

- Effective competition depends on diversity in behaviour and over time
- Market knowledge is as important as technology knowledge
- Diversity of technology knowledge is the main determinant of productivity in the largest firms in the world
- Market imperfections must be view as integral and necessary aspects of the production and dissemination of knowledge

What about the objectives of science and technology policy

- Instead of only encouraging firms to exploit a given technology by means of tax allowances for R&D, specific innovation subsidies, public purchasing of innovative products
- Policy should enhance the innovation possibilities of firms by facilitating their access to knowledge and by improving their managerial capabilities

What about the objectives of science and technology policy

- Innovative firms is embedded in a wide network of knowledge generating and disseminating institutions
- This perspective is central to the idea of technology support systems
- Technology policy becomes an essential component of competition policy

What about the objectives of science and technology policy

- In this context, a programme of technology support which privileges a small number of large firms is open to question
- General support is more appropriate than specific support, focusing on the development of geographic or technological area large enough

# Why a public private partnership?

- Public private partnerships in R&D cannot be considered as an answer to public budget constraints
- They must be considered as a means for enhancing private expenditures in R&D
- How? By choosing procedures and criteria which make it viable for innovative firms to compete and cooperate

#### Which criteria?

- Subsidies and taxes reductions must be subordinated to the existence of cooperation agreements between competitive firms, between large and small firms
- Subsidies and taxes reductions must be subordinated to the reasonable belief in the stability of technology consortia

### About the stability of technology consortia

- It depends on the expected variety of new goods and processes and on the expected number of complementary innovations
- It depends on the existence of sunk costs, that is, the expenditures that cannot be recovered by a firm leaving the consortium
- One of the main aspect of governance is to call for scientific and economic expertises about these stability conditions of technology consortia

# Challenges for the European science and technology policy

- What about the European Institute of Technology and Knowledge and Innovation Communities? Must KIC be considered as technology consortia or as research and education institutes? Is it appropriate to support a thematic differentiation of KIC instead of a few number of universities?
- What about Joint Technology Initiatives? Will they be selected according criteria that privilege stability conditions of technology consortia?