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?