Knowledge for Growth

Policy Debate n° 1
October 2007

The "Knowledge for Growth" Expert Group advises the European Science and Research Commissioner on the economic implications of research and innovation. In addition to providing Policy Briefs, the Group also puts forward issues for a more wide-ranging debate. The report on which the paper is based can be downloaded at: **http://ec.europa.eu/invest-in-research/monitoring/knowledge_en.htm**

What policies are needed to overcome the EU's R&D deficit?

The issue:

There has been a lot of focus on the concept of a deficit in research and development expenditures (R&D) in recent discussion on research and innovation policy in the European Union. The existence of a deficit is often used to suggest that there is a general problem with innovative activity in the EU, and concerted efforts are being made to induce European enterprises to spend more on R&D with a view to boosting economic performance through enhanced innovation. However, a close consideration of the R&D deficit challenges such a straightforward analysis of its implications for innovation policy. Instead, what we know about the nature of the R&D deficit, its causes and its implications need to be better appreciated if it is to serve as a useful guide in contemporary policy discussions in the EU.

What is meant by an R&D deficit?

Business R&D expenditure in the EU is 30% below the US, and the €60 billion gap has not narrowed in the last five years. But at individual company and sector levels, there are numbers of EU companies that are investing as much in research as their US counterparts. For understanding the R&D deficit, industrial structure is a crucial consideration. The EU's deficit in R&D expenditures vis-à-vis the United States is one that primarily reflects a shortfall in EU R&D spending in the production of IT goods and services. This shortfall, in turn, seems to reflect characteristics of enterprise structure and dynamics, specifically the constraints on the rapid growth of new, technology-based entrants in the EU as compared with the US. There are reasonable grounds for concern that this pattern may be repeated in emerging areas of innovation, such as biotechnology. In short, the R&D deficit appears to be a symptom, rather than the cause, of weakness in the EU's capacity to innovate. The cause is rather the structure and dynamics of the region's enterprises and industries.

> Question:
> Are policies to raise R&D expenditures across all types of enterprises and industries in the EU appropriate to redressing the situation?

Given the role played by enterprise and industrial structure and dynamics in the R&D deficit, it becomes likely that policies that focus on overcoming barriers to innovation in specific industries and certain types of firms will be more effective than more generalised encouragement to increase R&D spending.

What causes the deficit?

If policies are to be adjusted to redress the particular innovative problems of high technology sectors in the EU, then the reasons for these problems must be clearly identified.

> Questions:
> Why are EU firms weaker in technology-based sectors than US firms? And why are new EU firms less able to expand?

Perhaps the most common explanation for these differences is a greater willingness on the part of the US financial markets to fund new sectors and new firms. There is also greater flexibility of the US labour market, often identified as an important factor in spurring the emergence of new industries and new firms.

On the EU side, barriers such as the fragmentation of product markets and the attitudes of EU consumers to new products have also been cited as potential barriers to innovation.

This is a market-based view of the innovation system. It is also important to focus on the innovation system itself, and particularly how its various players, public and private, interact with each other. From this perspective, the relationship between the public sector, such as the defence and health systems, and industry is a crucial element. The long-standing and continued importance of the role of the US federal government in the defence and health systems, through procurement, R&D subsidies and other mechanisms, must be a major factor in the success of the IT, biotechnology and other dynamic, high-technology sectors.

Although these and other ideas abound about the causes of the deficit, most of them have not been tied in a rigorous way to the outcomes that they seek to explain. Moreover, many of the explanations seem more consistent with general shortcomings in R&D in Europe rather than the very specific problems highlighted for particular industries and types of firms. There seems little question that more work needs to be done to identify the general causal interactions and dynamics involved in the emergence of new industries if policy making in this area is to be systematic. This is particularly important since whichever causes are found to be the most salient, they will force research and innovation policy out of its normal realm if it seeks to redress them.

Why does the deficit matter?

Questions:
What has been the cost to Europe of falling behind in IT? Can it catch up? Are there lessons to be learnt for other emerging sectors?

Of course, the IT sector is long past its emergent phase and there may well have been important costs of the EU's falling behind that are hard to see now. Moreoever, it may well be that a window of reasonable opportunity for catching up in IT has now passed. Nevertheless, a better understanding of what has been lost in IT would provide the context for understanding what might be lost again from falling behind in sectors that are only now emerging.

In examining how to address the R&D deficit and its structure, policy-makers need to be clear about the economic and social benefits that they hope to achieve by overcoming the EU's lag in new emerging industries. It ought not to be assumed that building a strong capability in the *production* of advanced technologies is necessary to exploit the gains from these sectors' technologies. Based on the example of IT, at least, much has been gained through the *use* of IT. Understanding how these gains might be exploited is, therefore, crucial to designing policies to overcome the EU's lag in this sector. Only if it can be shown that there is an important link between producers and users would efforts to further develop production capabilities in this sector be justified.

There should be a focus not only on economic outcomes but also on the social implications of the EU's lag in emerging technologies. Certainly, in cases such as biotechnology, nanotechnology and new materials as well as environmental technologies, the social implications of leads and lags seem just as important. However, there is a danger in overstating the role of advanced technology, in and of itself, as a salve for social problems. For example, existing research shows that advances in biotechnology do not translate automatically into improvements in healthcare. Therefore, further serious effort is required to evaluate the social costs and benefits of being leaders or laggards in fields such as biotechnology.