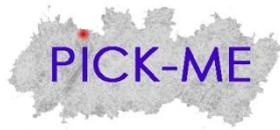




EUROPEAN POLICY BRIEF



Policy Incentives for the Creation of Knowledge: Methods and Evidence (PICK-ME)

Policy Incentives for the Creation of Knowledge, an EU-funded research project exploring the key role of public demand in innovation policies aimed at fostering the multifaceted dynamics of technological knowledge

June 2012

INTRODUCTION

Valorise latent innovative potential by promoting the systematic integration of otherwise dispersed local competences

The mutual relationships across demand, sectoral development and the organization of innovation are central to the current policy discourse, especially in relation to the evolving governance of innovative activities. A key question concerns the sources and the effects of emergent phenomena such as technological cooperation across small and large companies driving sectoral development in a given regional context. Pursuing this objective implies a two-fold strategy: first, appreciate the local characteristics of a regional innovation system, and, second, analyze the impact of public procurement on the development of competitive technology-based industries.

As a long-standing tradition in innovation studies suggests, the development of new technologies impinge upon locally established sectors, even where these turn out to be mature. This process is at root of phenomena such as rejuvenation of areas that are mostly specialized in low-tech sectors. Demand-driven innovation policies in these socio-economic contexts are expected to valorize latent innovative potential by promoting the systematic integration of otherwise dispersed local competences. On a practical level such policies should identify and support the most effective pathways of governance for innovation activities by engaging and redirecting sectoral and geographical specificities.

To pursue this task we propose a portfolio of sector-specific studies with the objective of articulating the complementarities between demand-pull forces - at the public, private, final, intermediary and derived levels - and changing patterns of sectoral specialization in local contexts. This framework will elucidate the evolving organization of knowledge generation and exploitation mechanisms as well as its effects on the introduction of innovations.

METHODOLOGY

The structure of knowledge interactions: a multilayered approach

The portfolio comprises of the following studies by sector and region:

- 1 – Biofuels across OECD countries;
- 2 – Automotive in the North-West of Italy;
- 3 – Wind Energy in Spain;
- 4 – Choice of multinational corporation in the UK;
- 5 – Knowledge intensive sectors across OECD countries;

The common thread across the case studies is the interplay between “top-down” (i.e. policy or newly available technological opportunities) and “bottom-up” (i.e. the business structure, the micro learning processes) processes, which is a key issue in the conceptual foundations of the PICK-ME project.

We appreciate that the diversity of areas and geographical regions is an asset of this part of the project in that it allows coverage of a broader terrain. In particular, case studies on currently-emerging “environmental” sectors (Wind Energy, Electric Car, Biofuels) stand in contrast to “non-green sectors” (such as Biotechnology and Nanotech) to obtain a balanced menu of empirical experiences (e.g. green vs non-green). On the other hand all of the above have been (or are) influenced by dedicated (national and international) demand-driven policies.

The three “green” case studies offer a comprehensive overview of technologies and sectors that share a common functional objective (e.g. reducing the impact on the environment) but that are at different points in their life cycle.

All sectoral case studies are built on data drawing on a variety sources including face-to-face interviews, bibliometric data, patent data and official policy documents.

KEY ISSUES AT STAKE

The need for harmonizing the EU regulatory framework by taking into account local innovation drivers

The inherent heterogeneity of assets and competences in areas as diverse as environment, agriculture, fiscal and industrial strategy across EU countries requires an effort in harmonizing the regulatory framework by taking into account local innovation drivers, and by enabling the interaction across mixed market and non-market mechanisms.

The limitation of traditional R&D investment programs is mostly associated to the growing role of external sources of innovation and new knowledge. The main challenge in this area consists in facilitating the establishment of flexible collaboration networks between firms, and between firms and universities, R&D labs and technology transfer centres.

Dedicated efforts in the form of mixed public and private interventions

Emerging sectors led by knowledge-intensive networks require dedicated efforts in the form of mixed public and private interventions. A key concern here is the durability of channels for developmental feedback to reap the latent innovation potential. Sector-specific networks should be supported to the effect of providing stable mechanisms tailored around the complex governance issues that are observed in emergent systems such as environmental related industries.

The fast obsolescence of technology life-cycles combined with delays in the profitability of knowledge intensive sectors entails the swift depreciation of high-end competences in regions that invested considerably at the beginning of the life-cycle. Technological and organizational proximity across pools of intensive specialized knowledge is desirable to avoid the dissipation of competitive potential.

Public-private interactions should be monitored closely at all stages

Public-private interactions should be monitored closely at all stages, from design to implementation and then reformulation, in order to correct mismatches and failures that likely emerge with regards to idiosyncratic sectoral and regional demands. Analytical tools aimed at assessing the emergent discourse across actors is a worthy source of information for policy makers concerned with those issues. Awareness of the changing modes and logic of interaction is crucial to appreciate how policy instruments evolve in the long-run to adapt to changing perspectives and objectives.

The design of this long term portfolio of supporting instruments should be guided by signals, values and such discourses that can clearly clarify about the creation of future competitive conditions under which emerging industries have to operate as a permanent basis. These signals and values have the role of distinguish between different political economy objectives such the creation of new sectors, local development, employment, internationalization of industries and increase cross sectoral and regional cooperation.

Last but not least, the balance between public and private support instruments should be dynamically balanced along the implementation process in order to reinforce competitive conditions.

Mechanisms related to risk management and facilitating privately funded experiments (i.e. venture capitals and other risk-innovation instruments) should be developed in parallel to traditional public policy tools and, thereby, become progressively integrated in the criteria for supporting new emerging sectors.

CONCLUSIONS

Importance of the microeconomic foundations of the demand-pull hypothesis

The intuition of Nicholas Kaldor that public intervention can become a structural component of economic policy when and if it consists of a support of aggregate demand, able to pull technological change, is worth further efforts to better articulate the understanding of the underlying dynamics. The contribution of Jacob Schmookler helped refining the Kaldorian hypothesis, focusing attention of the role of selected investments. The further implementation of the demand pull hypothesis, building upon the Kaldor-Schmookler line of analysis, requires better understanding of its microeconomic foundations. The new literature on the economics of knowledge provides useful guidance in these attempts and to better grasp the conditions that make it possible the very generation of technological knowledge and the eventual introduction of technological innovations. This implies the scrutiny of the introduction of technological and organizational innovations as systemic processes, based on the active participation of individual agents to the knowledge commons embedded in the structure of economic systems and implemented by knowledge interactions. A crucial feature of those interactions is their being channeled by user-producer transactions, pushing further the appreciation of the endogenous character of technological change.

The microeconomic foundations of the demand pull hypothesis are crucial in this respect, in that they build upon the Schumpeterian approach to innovation as a form of reaction to unexpected changes in the conditions of factor and product markets, including the levels of the demand, that becomes actually creative when and where firms can rely upon the access to external sources of technological knowledge. The Schumpeterian microeconomics of the demand pull hypothesis stresses the complementarity between demand pull and knowledge externalities.

Call for a targeted demand-driven support

In this direction, generic increases of the aggregate demand are not sufficient to pull the rate of introduction of innovations. Only when the increase of demand is qualified as it is associated to the actual increase of the rates of innovation introduction of the user sectors, the demand pull mechanism becomes effective. Consequently, the evidence of an important role played by innovative user in their interactions with innovative producers, combined with the quasi-public good characteristics of knowledge, implies that externalities may be crucial in shaping industrial development in Europe. Additionally, however, those externalities require a market context and its effective transactions to operate.

The implications of the microeconomic foundations of the demand pull hypothesis are important both from the viewpoint of economics and for economic policy. From the viewpoint of economic analysis the qualification that demand matters in pulling innovation when it is associated with stronger user-producer transactions that channel knowledge interactions amount to suggesting a way to reconcile the Keynesian and the Schumpeterian traditions. Demand matters as in the Keynesian tradition, articulated by Nicholas Kaldor, only when it is derived demand of competent users that have innovated and are able to support the innovative efforts of their suppliers. The new emphasis of knowledge externalities clearly impinges upon the Schumpeterian tradition. From the economic policy viewpoint, the

results of our research have important implications for public support of innovative initiatives, as they credit the need to identify sophisticated public interventions able to combine the support to the demand with the exploitation of technological opportunities. In this sense, public support to sustain demand should assume a follow-up perspective to take into account and sustain possible positive repercussions on the supply-side.

Failure of generic support to aggregate demand

The generic support of aggregate demand may speed the diffusion of innovations, as suggested by Kaldor, but is not likely to pull effectively the generation of new technological knowledge and the introduction of innovations. The identification of user-producer transactions-cum-knowledge interactions as the systemic mechanisms, by means of which the participation of each agent to knowledge commons is effectively enhanced, stresses the need to proceed to the selection of the filieres along which competent and innovative users can support the increase of the derived demand, including both the demand for capital goods and for intermediary inputs. This would have the chance to pull the overall increase in the rate of generation of technological knowledge and the introduction of technological and organizational innovations.

A competent public demand, as opposed to a generic one, based upon both public procurement and private demand stirred by dedicated regulations can pull effectively the generation of new technological knowledge and the introduction of new technologies, provided it is able to identify the relevant technological opportunities available at each point in time and the structures of vertical transactions that are actually associated to active knowledge interactions.

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Funding Scheme	EU 7th Framework Programme THEME [SSH-2010-1.1-1] [Demand-driven research and innovation policies for growth, welfare and wellbeing]
Duration	January 2011 – December 2014
Budget	EU Contribution: EUR 1.838.817
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