

Technology transfer

Overview

The relevance of innovation for economic growth and competitiveness has resulted in the increasing attention to the process through which ideas and knowledge are transferred from public research organizations (PROs) to the marketplace. The pace and effectiveness of such a process has a substantial impact on the contribution of the respective public investments to economic development and calls for awareness regarding (i) its processes and the key actors involved, (ii) the conditions that enable such processes, (iii) the factors that affect the demand for it and (iv) the rationales and means of policy intervention. Before turning to discuss each one of these aspects short definitions of the two terms will be useful:

Technology transfer refers to the movement of know-how, skills, technical knowledge, procedures, methods, expertise or technology from one organizational setting to another (Roessner, 2000). Most commonly, the term refers to the transfer of such assets from research institutions and universities to firms or governmental institutions, generating economic value and industry development.

Technology commercialization -also known as research commercialization- refers to the valorization of research and intellectual assets by industry, or the process of taking an idea to market and creating financial value. It implies the selling, licensing of, or contracting of technology services, intellectual assets, and related-knowledge into spinoff creation and R&D collaboration (Zuniga and Correa 2013).

Technology transfer and commercialization (TTC) can generate important benefits for economic development. These benefits are embodied in knowledge spillovers and are realized through industry-science collaboration and technology transactions that can range from simple technical consultancy all the way to licensing of intellectual property. In general, by improving the process of knowledge transfer countries can foster innovation and thereby raise productivity, create better job opportunities, and address societal challenges.

Processes and Actors

Technology transfer and commercialization (TTC) occur via, both, formal and informal channels. Formal channels include training and education, hiring students and researchers from universities and PROs, sharing of equipment and instruments, technology services and consultancy, sponsored research and R&D collaboration, and other mechanisms. Informal channels include the transfer of knowledge through publications, conferences, and informal exchanges between scientists. Technology transfer and commercialization do not evolve naturally and linearly from research and the discovery of scientific solutions. Often, unfavorable economic conditions and inadequate supply of complementary services form obstacles for their completion, while their execution is a multi-actor and multi-stage process in which chance may also play a role.

Technology transfer and commercialization are executed through the active participation and support of various individuals and organizations. Involved actors undertake activities that evolve around the production of knowledge, the provision of essential supporting services, training, market research and intermediation. Such actions are driven by different objectives but are joined towards adding value to the process and supporting the technology transfer and commercialization process.

Enabling Conditions for Universities and PRIs to engage in TTC

The nature of technology transfer and the type of channels used are strongly determined by the characteristics and the level of economic development of the country/region. Contextual factors may refer to the skills, capabilities and infrastructure of the country/region, its entrepreneurial

environments and institutional setup and so forth. In practice, contextual variations result in different technology transfer needs and solutions. For instance, in less-developed economies, where the needs for diffusion and adaptation are core, technology transfer will be more oriented to the provision of basic technical services and the supporting incremental innovation.

Factors affecting the demand for TTC

Technology transfer forms a path of using and exploiting existing and new knowledge for product development and commercial purposes. As such stock is distributed between different loci, the demand for its use and commercialization rests upon the existence and quality of access channels and transfer mechanisms. Technology transfer channels and mechanisms vary across economic and institutional contexts as these determine the availability of knowledge stock, facilitate (or inhibit) the organization, capabilities and interactions of key actors and influence technological choices. These factors impinge upon the demand for commercially exploitable knowledge and are critical points of consideration for policy makers.

Policy Intervention in TTC

The potential benefits stemming from the transfer of technology to different users and its commercialization justify the policy makers' interest in planning supporting instruments aimed at alleviating institutional gaps, mismatches and barriers. Public intervention on this area has followed different yet complementary rationales summarized in tackling misalignments in agents' objectives, dealing with incomplete markets for technology and IP transfer and addressing system failures.

Considering these challenges and the ensuing benefits that their resolution can bring along, governments have been actively searching for ways to widen and improve the use of public research output and plan instruments to:

- ensure a sound policy-making context
- alleviate funding barriers
- strengthen the links between science and industry
- provide knowledge services
- establish a clear regulatory framework and
- foster education

In various combinations and degrees of intervention these instruments aim to cover policy needs that correspond to both the supply and demand side of technology transfer and commercialization and that can be sustained throughout time. Policy sustainability is critical in this process and the need for a long-term political horizon is essential.

Related Link: Technology Transfer and Commercialisation

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