Firms' demand for new technology

The need, degree and intensity of technology transfer and commercialization can be affected by the nature and orientation of firms' technology needs. Firms shape, express and fuel their technological needs by engaging in the innovative process via various channels and business models, while their technological choices are to a degree determined by the existing dynamics of technological and economic development.

Technology transfer forms a path of using and exploiting existing and new knowledge for product development and commercial purposes. As such stock is distributed in different loci, the demand for its use and commercialization rests upon the existence of access channels and transfer mechanisms, barriers and transaction costs. Then the interactions between key technology transfer actors rests at the core of unlocking the potential of such stock and determines the nature and intensity of its transfer.

How do Innovation networks and clusters relate to technology transfer and commercialization?

Innovation networks and clusters strengthen existing research patterns or (re)-orient research activities, education and training programs towards the needs of the participating organizations or individuals. Their existence enhances the mutual understanding between the actors and thus, facilitates the development of common development strategies relevant to technology transfer. On the contrary, their absence is a signal of weak links between publicly produced research and private firms, a fact that may hinder and/or delay technology transfer and commercialization.

How do private R&D expenditure and other investments in innovation relate to technology transfer and commercialization?

Private R&D expenditure and other innovation relevant investments imply a guarantee and provide a signal that private firms are capable, interested and willing to participate in technology transfer activities. R&D intensive firms are likely to seek complementary sources outside their premises and are the ones who may lead collaborative research projects with other private and public entities. Such ability and strategic orientation increases the likelihood of interaction with universities and PRIs, thus fuels technology transfer and commercialization. The absence of private interest and R&D investment translates into the lack of a sound base of innovative firms and consequently limited demand for the outputs of scientific demand. Such condition would compromise the technology transfer process as it renders some of its attributes (e.g. R&D collaboration licensing) less relevant.

How does Industrial specialization affect technology transfer and commercialization?

Industrial specialization defines the relative importance and dominance of industries within a given economy or geographical location. The type and patterns of specialization in an economy influence the results of research and consequently determine the structure and scope of the scientific base available for further use and commercialization. In addition it affects the role and relative power of the key players in the process, such as universities and PRIs, so that it carries implications for the interactions among actors and the relevance of technology transfer activity. For instance, strengthening high-tech industries would intensify R&D collaboration, while an emphasis on more

low-tech industries may increase the relevance of extension and consulting services.

How do technological trajectories relate to technology transfer and commercialization?

Considering the importance of the existing and newly produced knowledge base for technology transfer, the temporal dynamics and trajectories of technological development become determining factors for the direction of demand for technology transfer. Whether technological paths evolve smoothly or with discontinuities is a factor that affects technological choices and consequently the demand for existing of new scientific results. In this vein, technological discontinuities can render some existing knowledge obsolete, while technological discoveries along a more tranquil trajectory may spur new clusters of innovations and increase the volume of business opportunities. In both cases, firms have an incentive or “obligation” to explore new alternatives and make use of the technology transfer mechanism. The path dependent nature of knowledge accumulation and technological evolution, can also affect negatively technology transfer and commercialization by locking agents in existing paths, where incrementalism prevails and actors are discouraged to seek / exploit alternatives, hence reducing their interest in technology transfer.

How do markets for technology relate to technology transfer and commercialization?

Technology transfer, particularly technology commercialization, does not flow naturally from the research base to industries and markets. In principle, well-functioning “markets for ideas and technologies” constitute an appealing mechanism in which inventors, researchers and scientists supply their inventions, and firms, entrepreneurs, and investors demand them, with a price that clears the market. While recognizing that such markets remain incomplete due to the inherent characteristics of knowledge and its applications, their complete absence would limit the opportunities for technology transfer and commercialization. In such setting, uncertainty on the commercial value of scientific discovery would prevail, incentives to launch new ventures would be hampered and processes such as licensing and sales would become hard to execute and control.

How does open innovation relate to technology transfer and commercialization?

Open innovation assumes that companies should use external ideas as well as internal ideas to advance their technologies and products. In a world of widely distributed knowledge, companies cannot afford to rely entirely on their own research, but should also buy or license processes or intellectual property from external sources. Open innovation strategies demand that firms combine internal and external knowledge to create new products and follow internal and external paths to commercialize them. Thus, the adoption of such strategies, clearly points to the use and commercialization of knowledge produced and located outside the firm, including publicly produced knowledge. The implementation of open innovation strategies by firms widens the scope for technology transfer and commercialization and improves the communication and objective sharing between private firms and public research organizations.

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Innovation networks and clusters
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