

WIPO Economic Seminar Series on “The Economics of Intellectual Property”

Special Seminar: Patents and Technology Transfer, December 5, 2011

Executive Summary

prepared by the Secretariat

At the special seminar of the WIPO Economic Seminar Series on “The Economics of Intellectual Property” on December 5, 2011, three speakers were invited to provide perspectives on the role of patents in transferring technology. The speakers, Mr. Carsten Fink (WIPO Chief Economist), Mr. Rajah Rasiah (Professor at the University of Malaya) and Mr. Gabriel Clerc (Head of the Technology Transfer Office at the École Polytechnique Fédérale de Lausanne) were asked to focus their presentations on following three points:

- What are the incentives and obstacles to technology transfer from the viewpoint of the patent system?
- What does practical experience suggest regarding the role of patents in technology transfer?
- What data are needed to evaluate the performance of the patent system in relation to technology transfer?

WIPO’s Chief Economist, Mr. Carsten Fink, introduced the subject of patents and technology transfer by highlighting how trade in technology is different compared to trade in goods and services. Firstly, successful technology transfer involves not only the transfer of the technology itself but also the know-how of reproducing such technology, which is often not codified and may thus be more difficult to transfer. Secondly, some level of learning capacity, also known as absorptive capacity, is needed to ensure fruitful technology exchange. And lastly, firms may be reluctant to share their technologies for fear of undermining their core competitive advantages.

Mr. Fink underscored that patent protection helps resolve some of the barriers toward successful technology transfer. It codifies and discloses technological information. Firms may be more willing to enter licensing negotiations if they are assured that they maintain control over their technologies. At the same time, it may or may not be in the interest of the patent owner to transfer their technologies. In that sense, exclusive rights can pose an obstacle to technology diffusion. However, much depends on business models and the availability of substitute technologies, which differ significantly across industries.

Technology transactions often do not leave a statistical trace, thus making it difficult to assess the size of market for technologies. However, Mr. Fink noted that the limited available data on international royalty and licensing transactions suggests that technology markets have grown in the last decades – both in absolute terms and relative to economic output. However most of these transactions tend to take place in high income countries, though the share of middle income countries has increased over the past decade.

Many studies analyzing how the “strength” of patent protection affects different modes of technology transfer suffer from measurement and simultaneity problems. Some studies overcome these problems by relying on firm-level data and by exploiting structural breaks in IP policies. Overall, the evidence suggests that technology flows respond positively to patent protection, though the empirical significance seems small compared to other determinates of such flows. In addition, patent protection seems to matter primarily in middle- and high-income countries, emphasizing again the role of absorptive capacity which is more limited in low-income countries.

More and better data are needed to gain a better understanding of the role of patents in technology transfer. More detailed breakdowns of balance-of-payments statistics on royalties and license fees and granting researchers access to detailed micro data would make a difference, as would additional innovation and inventor surveys, especially in low- and middle-income countries.

Mr. Rajah Rasiah, Professor at University of Malaya, questioned the importance of patent protection in promoting technology transfer for many low- and middle-income economies. Firstly, patent protection is critical for innovation in only a few industrial sectors, for example in the pharmaceutical and chemical industries. Other industries tend to rely on trade secrets more than patents to protect their technologies. Secondly, the patent system seems relevant for technology transfer for countries that innovate at the technological frontier, generating new-to-the-world type of innovation. Most less developed economies are at earlier stages of technological development and are thus less likely to be influenced by patent protection. Finally, Mr. Rasiah pointed out that technology transfer can also take place through other means, such as the movement of scientists.

Focusing his discussion on the East Asian economies’ experience in the integrated circuits (IC) industry, Mr. Rasiah argued that countries’ innovation conditions determine the extent to which technology transfer can assist in building their capacities to generate new-to-the-world technologies. He reiterated Mr. Fink’s argument on the importance of firms having sufficient levels of absorptive capacities to benefit from technology transfer, and outlined five stages of technological development. These five stages depend on four systemic pillars of innovation, namely (i) economies’ basic infrastructure, (ii) the ability of institutions to promote, conduct and develop new scientific research, (iii) network cohesions to promote knowledge exchange, and (iv) integration in regional and global markets. Economies that have had strong support from the public sector in building their innovative capacities, such as the Republic of Korea and Taiwan, Province of China, have emerged as global competitors in certain areas of the IC industry.

Lastly, Mr. Gabriel Clerc shared his experience as the head of the École Fédérale Polytechnique de Lausanne (EPFL) technology transfer office (TTO), which facilitates the transfer of university technology to industry. Describing the role of his office as providing “cradle-to-grave” support, Mr. Clerc emphasized that the role of the TTO is to “do what is best for the technology”. This includes negotiation of research and technology licensing agreements; evaluation, protection and management of intellectual property; and interaction with EPFL start-up companies. Since 1990, EPFL has disclosed 1,100 inventions and filed patents for 60 percent of them; 30 percent of all inventions have been licensed or transferred from the TTO.

Mr. Clerc underlined that patent protection is an important element of technology transfer, and noted that many venture capitalists prefer to finance start-ups that have filed for patent protection on their inventions. But he emphasized that it is not the only means of transfer, and that it is not necessarily the most important one. Other forms of technology sharing include research collaborations, frequent interactions with industry partners such as supervision of PhDs, and even some teaching activities.

During the discussion segment of the seminar, one seminar participant asked about university policies geared towards promoting technology transfer to less developed economies. Mr. Clerc indicated that the bulk of EPFL's research output requires substantial further investment to be commercially useful and may thus not be attractive for firms in low-income countries. However, Mr. Clerc emphasized that there are other ways that the university promotes technology transfer to these countries. Examples include building the skills of students from those countries, joint research work with foreign universities and inserting conditions in technology licensing contracts that require firms to make available technologies on preferential terms to less developed economies. When asked if the current structure of the EPFL TTO should be replicated in other countries, Mr. Clerc indicated that it depends on whether relevant universities have the capacities to produce new-to-the-world technologies.

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