

## Licensing and markets for IP

Markets for technology, or markets where knowledge and technology (intangible assets) rather than tangible products are traded, are increasingly important for the knowledge-based economy. Notably, markets for technology help support the development of technology firms specializing in the production of knowledge, which they then sell to manufacturing companies. Intellectual property rights and patents are essential in promoting markets for technology, by facilitating licensing agreements or trading of IP titles. Several factors, including better access to knowledge and finance for technology firms, the development of new actors (patent brokers) and improvements in the functioning of the IP system, impact on the development of markets for technology.

### What are licensing and markets for IP?

Markets for technology are markets where transactions are about “the use, diffusion, and creation of knowledge and technology” (Arora et al., 2001, p. 423). They are places where technology sellers (supply side) meet technology buyers (demand side). The actors in these markets can be public research centers, technology companies (start-ups), manufacturing companies, consulting firms, but also market intermediaries (technology brokers).

There are two ways in which IP can be traded: via licensing agreements over specific IP-protected titles or via sales of IP titles. Markets for IP are probably one of the most specific features of the knowledge economy. Since knowledge is becoming an increasingly key asset, it is not surprising to see firms specializing in the production of technical knowledge that they then sell to other companies. Therefore, the further development of markets for IP has a fundamental impact on the organization of production and innovation in some sectors. The development of markets for technology promotes vertical division of labour by allowing the emergence of technology firms specializing in the production of knowledge, that they can then sell to manufacturing companies located downstream on the value chain and which incorporate such knowledge into their manufactured products.

### How does the IP system affect licensing and markets for IP?

Although it may be possible to trade unprotected technologies, IP greatly facilitates the realization of market deals, especially when knowledge is codified and hence easily imitable. Indeed, patents contribute to solving what has been referred to as the “Arrow paradox” (1962). Arrow explains that it is often very difficult to buy and sell information, because in order to sell the information the seller must first reveal it to the buyer (who obviously will not agree to pay for something he knows nothing about). But once the information is revealed, the buyer does not need to purchase it since he has already obtained it for free. Putting it another way, in the absence of the patent system, the Arrow paradox reduces the possibility of the emergence of markets for codified knowledge. In theory, the patent system offers a solution to Arrow's paradox because it allows both the disclosure and protection of technology, the combination of which favours the development of technology sellers. The diffusion of knowledge allows sellers to advertise and report their technology, but the property right secures the technology and prevents “free rider” behaviour (i.e. using technology without compensating the inventor).

### How important are licensing and markets for IP in practice?

There is no statistical method that enables the development of a reliable and comprehensive measure of markets for technology. This lack of empirical data is mainly due to the private nature of technology transactions. Indeed, **most transactions are proprietary and confidential**. However, evidence exists on specific aspects of markets for technology.

Available information on **international licensing** also suggests an **upward trend in transactions** in markets for technology. Cross-country license and royalty payments, and receipts

for all types of IP, including among affiliates, increased in the OECD area by an average annual rate of 10.6% between 2000 and 2010 (Figure 1), well above the growth of OECD gross domestic product (GDP) over the same period. However, these figures do not capture payments internal to countries and include intra-company international payments. The latter represent more than 80% of receipts in the United States, France and Germany (OECD, 2010).

**Figure 1. International IP flows through royalties and licence fees, 2000-10**

Average annual growth rate in USD, percentage

Source: OECD, Technology Balance of Payments Database, March 2012; OECD, Trade in Services Database, March 2012; World Bank, World Development Indicators, March 2012; OECD, Annual National Accounts Database, March 2012. <http://dx.doi.org/10.1787/888932690092> [1]

### What challenges affect the development of markets for IP?

**Transaction costs in markets for technology still remain high and often prohibitive.** These transaction costs are often related to the imperfect nature of information. Challenges include the following:

- **It is difficult to identify the players on markets for technology** . For example, Guellec and Pluvia-Zuniga (2008) show that a large number of European and Japanese companies wishing to sell technology cannot find a buyer and, conversely, a large number of firms that want to buy technology cannot find a seller. It is thus likely that lack of information impedes the development of technology markets.
- **It is extremely difficult to assess the price of a technology transaction** since the value of a technology is usually largely unknown. Practitioners use a number of practical methods to assess the value of a technology (i.e. methods based on costs, the net present value, or comparisons), but all of them are subject to major limitations.
- **Contracts for the transfer of technology are often largely incomplete** . In most markets, the goods that are transferred are fully specified. But this is hardly possible in the case of a commercial exchange of knowledge. The inability to write complete contracts opens the door to a host of opportunistic behaviours, thus increasing the risks of the transaction.
- **It is difficult to protect a technology** . Even when patents protect technology, it can be difficult for a seller to prevent imitation, mostly due to the costs of identifying counterfeits and enforcing the patent (litigation costs).

Transaction costs in markets for technology therefore constitute a major obstacle to their development. However, like any other market, these **transaction costs have led to the emergence of market intermediaries, whose primary role is to reduce transaction costs and facilitate the implementation transaction**. These technology brokers are composed of experts in IP law, finance and strategy. Their mission is to help disseminate information about the sellers and buyers of technology help assess the price of transactions, draft contracts as comprehensively as possible, and ensure that transactions are respected and manufacturers do not “free ride” on patents held by small start-ups. Technology brokers thus fulfill several functions and may follow different business models, but their ultimate role remains to facilitate the implementation of market technology deals by reducing transaction costs. Brokers facilitate the creation of mutually beneficial exchanges that would otherwise not be realized because of excessive transaction costs.

### How are licensing and markets for IP connected with other themes?

**Open innovation** (see [Open innovation](#) [2]). Open innovation reflects the use of both internal and external sources of knowledge to innovate, and the use of both internal and external paths to market for innovations (Chesbrough, 2003). Markets for IP are strongly linked to open innovation, with licensing-in being a direct way to achieve external knowledge and licensing-out a direct way to sell technologies developed internally.

**Interface with universities and public research institutes** (see [Interface with universities and public research institutes](#) [3]). Universities and public research centres are important technology suppliers in markets for technology (Mowery et al., 2004). In the United States, for instance, the Bayh-Dole Act (see [Bayh-Dole and related regulation](#) [4]), by incentivizing universities to patent and license the technology they invent, has strongly contributed to the development of markets for technology. In a sense, Technology Transfer Offices are IP brokers, whose role is to favour the transfer of technology from universities to industry.

**Technological co-operation between firms** (see [Technological co-operation between firms](#) [5]). Co-operation between firms can notably involve licensing agreements or the trading of IP. It might alternatively involve closer co-operation, leading to joint IP titles based on collaborative research projects.

### What policies are relevant to support the development of markets for IP?

Public policies in support of licensing and markets for IP include, aside from policies aimed at strengthening IP protection, the following:

- **Encouraging the valorization of universities' research.** As seen above, public research organisations are important actors in the supply side of markets for technology. Policies that encourage university-industry links, valorization of university research, creation of TTOS, etc., are thus important factors in ensuring the development of markets for technology
- **Raising firms' awareness about strategic opportunities offered by markets for technology** and intellectual property rights. Innovative firms often have only a partial perception of the benefits and costs implied by access to IP instruments. Information and training programmes could contribute to increased awareness about the "pro-active" use of IPR, as an asset around which innovative business strategies can be developed, as a tool for opening up new markets or segmenting existing ones and as a key to accessing technology markets, gaining revenues or combining with complementary assets to generate new value. Such use of IPR can also be a positive signal about the value of a business to competitors, customers, potential partners or investors.
- **Supporting trading mechanisms that facilitate the match between supply and demand for technologies.** Examples include: licensing markets, university technology transfer offices, clearinghouses and patent auction houses.
- **Improving information in markets for technology.** This may include making licensing deals public in order to enable the identification of patent owners, advertising IP-protected inventions available for licensing by using online databases, as well as increasing patent quality and lowering the number of patents. Indeed, the proliferation of low quality patents and the fact that patent owners may remain secret create a favourable environment for troll activity, a serious threat to markets for technology.
- **Establishing standards and transparent methods for valuing patents.** The valuation of IP is a very difficult operation, especially for small entities. The lack of references hampers the establishment of reliable prices, which in turn might deter the entry of potential participants.
- **Ensuring the existence of appropriate conditions to support competitive and well-**

**structured markets for technology.** In particular, policy makers should ensure that markets for technology allow fair and efficient access to technologies, and that the related distribution of revenues generated by the trade of technologies is fair and balanced. Several policy areas may be particularly relevant in this context, such as **IP policy** affecting the use and circulation of IP rights, **competition policy** ensuring that market mechanisms are not distorted by collusive or monopolistic behaviour, policies relating to the valuation of IP (e.g. by promoting standards), **taxation policy** affecting the flows of technologies across international boundaries, and **R&D policies** stimulating the creation and circulation of knowledge and new technologies.

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