

Economics of knowledge

IP plays an important role in fostering the creation of new knowledge. IP deals with the challenges posed by the specificities of knowledge as opposed to tangible assets such as capital and labour. Knowledge stands apart from other factors of production in that it is non-rival and non-excludable as well as cumulative over time. IP titles introduce excludability so as to enhance investments in the creation of knowledge. For optimal social returns, however, the wider dissemination is important. The fact that the value of knowledge is difficult to assess also explains why such difficulties arise for IP titles and, in consequence, for trading IP titles on markets.

What characterizes the creation of knowledge and what is the role of IP in this context?

Along with capital and labour, knowledge is an essential factor of economic growth. Knowledge stands apart from other factors of production in the following ways:

- **Non-rivalry.** Knowledge is characterized as a non-rival factor of production because the use of one piece of knowledge does not prevent the simultaneous use of the same piece by another party. Unlike physical goods, explicit knowledge can circulate and be kept in the same place simultaneously. Of course, this applies to disembodied knowledge because of its intangible nature. Furthermore, the marginal cost of implementing a piece of knowledge is close to zero because once an invention exists there is no need to reinvent it, although there may be a need to adapt it to circumstances. This applies, for instance, to information circulating on the Internet. Non-rivalry is an important reason why knowledge can generate spillovers: once a piece of knowledge satisfies the standard economic return requested by investors, it can go on to produce additional value that accrues to competitors or customers who can derive further benefit from it. In terms of the socially optimum, existing knowledge should be used by as many agents as possible. By contrast, with respect to tangible property, the goal is to find the single best place for its use and to identify which type of market or administrative mechanism will lead to its most efficient allocation. Given that knowledge can be used in several places at the same time, the goal is not to determine the best place for a given unit of knowledge, but to determine all the places in which this unit of knowledge can be used efficiently, having taken into account the types of direct or indirect costs. In view of this essential difference, the mechanisms allocating explicit knowledge across the economy will differ deeply from those allocating tangible goods and factors.
- **Excludability and non-excludability.** When explicit knowledge is being produced by private parties, resources, even if scarce, need to be invested in its production. Earning a return on the investment will often depend on the ability of the private parties to exclude those end users who would not pay some price for the knowledge. Excludability is thus a key condition for explicit knowledge in order to earn private monetary value, and this is where IP can play a substantial role. Means used to assure excludability can be technical, such as the protection of access by passwords; legal in the form of copyright protection, patents and other types of IP; and/or organizational, including keeping the knowledge secret. The non-excludable characteristics of pieces of knowledge, in the sense that it is not possible to exclude others from using the pieces, is the challenge facing inventors, as spillovers do not allow recouping costs of producing knowledge.
- **Enhancement over time.** Unlike physical property, knowledge grows over time. New knowledge expands on the back of old stock, new discoveries rely on current level of science and new ideas originate from yesterday's experiences. Knowledge is non-rival and virtually impossible to destroy. Because knowledge can be accumulated over time, it gives sense to the notion of "knowledge capital". Unlike physical capital, knowledge capital is not depleted

when it is used, even though its monetary value may change depending on use.

- Difficulties of measurement. The real value of explicit knowledge is generally difficult to assess, until it is actually placed on the market in the form of a good or service incorporating it. Even in this case, the particular contribution of one unit of knowledge may be difficult to disaggregate from the total value of the product, making valuation of the knowledge difficult. This uncertainty in value is a source of risk that may limit the willingness of risk-avoiding actors to engage in transactions based on forms of knowledge. While various methods are available to place a value on forms of knowledge—particularly those subject to intellectual property rights—none of these is currently seen as highly reliable.

References

- OECD 2010), Knowledge Networks and Markets: A Typology of Markets in Explicit Knowledge, Document DSTI/IND/STP/ICCP(2010)3, OECD, Paris.

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