

## Incentives for inventions

The standard rationales for IP are based on the incentives diffusion dilemma (Arrow, 1962). On the one hand, creating new ideas is costly, but if the ideas are not protected, they can be copied at a cost, since by raising the price it lowers access to the invention for some users, ownership comes

### What is meant by incentives for inventions?

An incentive to invent is any mechanism, monetary or non-monetary, applied to induce development of ideas, which can be used in combinations of new and existing knowledge and resources (Schumpeter, 1934). Such incentives are needed to address a number of challenges. The process of converting innovation inputs to outputs is often cumbersome and expensive. Moreover, there is high uncertainty about the outcome of innovation, as well as the time it takes for the potential revenues to start flowing from the final output.

### How does IP relate to incentives for inventions?

The process of generating newly created ideas, knowledge and inventions suffers from the following market failures:

- The production of inventions has a public good nature because of which markets may not provide the right incentives for it to be produced (see [Economics of knowledge](#) [1]).
- The creation of knowledge and eventually bringing it to the market can require substantial investment costs, both fixed and variable. For example, the large amount of R&D investment carried out by a pharmaceutical company for an anti-cancer drug or the substantial amount of intellect, time and money invested by a musician to create a new and unique composition. Covering these costs, in most cases, requires the holder of the IPR to charge higher prices simply because the marginal cost of providing an additional unit of the good (an additional drug or an additional copy of the music) is substantially lower than the average cost.
- The third market failure is due to the uncertainty underlying the newly created intellectual property embodied in the good. This is the commercial uncertainty of the consumer adopting the inventive good in the market. The inventor faces this uncertainty in addition to the ex-ante technological risk of how to make the invention work effectively.

Since markets per se generally cannot provide the right incentives to innovators, IP rights are granted by governments to inventors. These legally protective rights entitle the owner for a stipulated period of time to the right to exclude all others from commercially benefiting from the IP without prior consent of the right holder. This means that the owner can legally prohibit others from the commercial use and exploitation of the underlying IP asset. Thereby IP rights help the innovators of all kinds of intangible knowledge and assets to gain and sustain competitive advantage in the market by getting around the problem of appropriation of returns on their investments. It is worth noting, however, that they do not address the uncertainty challenge, since the payoffs for IP titles are a function of consumer uptake on markets rather than a fixed upfront return.

Such incentives are not only created by patents but also by other types of IP (such as trademarks, utility models, design rights and copyright). These other IP designations might also be particularly relevant to support incremental innovations as well as innovations outside of manufacturing. Moreover, innovative ideas often require further technical fine-tuning before they become viable

products capable of succeeding in the market. Small-scale enterprises and individual innovators may not have the required technical capabilities and marketing channels to do this. IP protection on an invention may enable the innovator to acquire R&D funds (from venture capitalists, for example), (see [IP and markets for finance](#) [2]) and to forge ties with collaborators such as other big firms, research institutions and universities. To market innovations, an owner of IP rights can enjoy a strong negotiating position in making partnerships such as joint ventures, strategic alliances, licensing agreements, merger or acquisition. These partnerships, based on royalty sharing agreements, licensing and confidentiality contracts among others, can be critical for firms to successfully commercialize their products. These aspects point to the added incentive an inventor may consider before seeking IP protection (see [Licensing and markets for IP](#) [3]).

However, for IP to generate incentives, multiple conditions have to be in place, notably including an organization of IP systems (see [Organisation of IP systems](#) [4]) that provides legal quality. Shortcomings, such as difficulties in enforcing IP rights or high costs for doing so, will effectively render the IP system less attractive for firms and thus not create incentives. Uncertainties or long delays in registration procedures can similarly discourage the use of IP systems. Moreover, certain returns, such as access to finance or the ability to trade IP, will depend on suitable market conditions (see [IP, markets and diffusion](#) [5]).

### **What evidence supports IP as incentive for inventions?**

Coupled with a strict intellectual property protection regime, inventing new ideas and patenting them is a compelling strategic direction for many firms because patent rights allow them to establish entry barriers and generate rents (Joshi and Nerkar, 2011). Using a theoretical model, Cornelli and Schankermann (1999) show that the value of an invention is endogenous to the firm's investment effort. Because the value of a patent is positively correlated with the value of the underlying invention, the patent system gives the firm an incentive to create a higher value good by spending more resources on the invention.

Moreover, implementation of the U.S. Bayh-Dole Act, or Patent and Trademark Law Amendments Act of 1980, gave American universities the right to obtain patents and permission to license discoveries emanating from federally funded academic research to private entities. Three decades later, technology licensing and transfer offices with IPR guidelines have become commonplace in several American research universities. Commercialized and licensed patents tend to reflect more valuable inventions. However, the evidence to date shows that multiple challenges have to be overcome to yield successful performance by universities and PRIs (see [Bayh-Dole and related regulation](#) [6]).

Evidence suggests that firms will not only rely on IP rights to protect their inventions, but will also take other approaches to protecting inventions such as lead time and secrecy (see [Innovation without IP](#) [7]). Sometimes such approaches are used in combination with IP (see [Combined uses of IP](#) [8]). Moreover, evidence also suggests that larger firms face more favourable conditions to benefit from IP systems due to certain sunk costs (e.g. sunk costs for managing IP titles, ensuring their enforcement) e.g. due to the advantage of having a patent portfolio). This suggests that IP systems do not provide equal incentives for all businesses (see [IP users](#) [9]).

### **References**

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