

Patent races

In a patent race, two or more inventors compete (usually by increasing their research expenditures) to discover an invention for the prize of obtaining the patent. This can lead to patents that are neither used nor licensed to others, and also to wasteful investments and duplication of research efforts. However, the competitive element of patent races can be positive in speeding up innovation processes. Moreover, parallel research efforts may ultimately lead to different results or to the quicker identification of solutions than in the absence of competition. Furthermore, firms engaged in a patent race increasingly disclose research information to the patent office or through other means for various purposes. Therefore, it is important that the patent system be designed to encourage innovation while limiting the potential negative effects generated by races (e.g. by promoting research alliances among competitors).

What are patent races?

A patent race is a competition between two or more inventors (usually firms) to discover an invention first in order to obtain patent protection for the invention and exclude competitors.

In a typical patent race, each inventor or company makes an irrecoverable bid – notably, inventors make substantial research and development (R&D) investments – for the prize of obtaining the patent. In a race, the player that is prepared to pay the most to develop the invention first wins the prize (patent). One of the players in the race is usually an incumbent monopolist, currently supplying products with which the future invention would compete. If the incumbent's rivals do not obtain the patent first, then the monopoly persists, but if the challenger (new firm) wins the patent, the latter will enter the market and compete with the incumbent (Harris and Vickers, 1985).

In research-intensive industries, such as pharmaceuticals and high-technology electronics, the constant introduction of new products and R&D investment to achieve product innovation are critical for the survival of a firm. Within this context, innovators can either begin research on a new innovation, which is more costly, or join the patent race for an already targeted invention, which many of them do (Zeira, 2003).

What is the relationship between patent races and innovation?

With regard to innovation, it is important to distinguish between two kinds of patent races: 1) standard races, in which the winning firm obtains the patent and the other firm loses its R&D expenditures, and 2) asymmetrical races, where an incumbent firm tries to prevent a rival from filing a patent first and thereby avoid competition (Harris and Vickers, 1985). In an asymmetrical race, the incumbent firm is only concerned with maintaining its monopoly rather than improving its innovative performance.

The competitive element in standard patent races can be positive in speeding up invention processes. However, such races may not always be effective in promoting innovation, as they come with costs that can be damaging from a social perspective. Such costs, however, do not necessarily arise, as duplication in research efforts will not necessarily occur even if competitors invest with a similar research objective. Results may ultimately lead to different products or to the quicker identification of solutions than in the absence of competition in research efforts. Moreover, firms engaged in a patent race increasingly disclose research information to the patent office or through other means for different purposes (e.g. to make the patent office aware of potentially patentable information, extend the patent race, or raise the patentability standard for the targeted invention, etc.) (Baker and Mezzetti, 2005). By publishing details of their research findings, firms establish new prior art and thus strategically raise the bar for patentability of related innovations (Bar, 2006), and disclose existing knowledge to the public, which helps to promote further research.

In addition, patent races may not always end with the introduction of a new invention into the market. Sometimes in an asymmetrical patent race, the incumbent firm aims to prevent its rivals

from winning the patent, but it may not necessarily want to win the patent and exploit the invention itself (Harris and Vickers, 1985). Asymmetrical races can lead to patents that are neither used nor licensed to others (sometimes called “sleeping patents”) (Gilbert and Newbery, 1982).

What are the policy implications of patent races?

Since patent races lead to increased investment, they can also lead to quicker innovation. Therefore, it is important that the patent system be designed to encourage innovation, while carefully weighing the benefits of quick innovation against possible harmful costs generated by races (Judd et al., 2011).

Where this is the case, governments can promote research alliances in order to avoid over-investment and duplication of research efforts. For example, in a joint venture, firms can jointly earn more profit by concentrating research efforts in the least-cost firm (Gandal and Scotchmer, 1993). In order to coordinate their research efforts efficiently, firms in a joint venture must be willing to share information about their research abilities, since the optimal rate of investment for each firm will depend on the abilities of all participating firms. Obviously, the benefits of concentrating research efforts in various ways needs to be looked at carefully, since such activities can lead to collusive market behaviour by leading innovative businesses.

Wasteful patent races could also be eliminated by the early grant of the patent. Nonetheless, this approach has to be carefully designed in order to maintain the incentives that the patent system provides for innovators.

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