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Controversy over the economic justifications for patent protection

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Abstract

The objective of this paper is to show the necessity of reviving the debate on the economic justifications for patent protection. On the one hand, we see the need for the assessment of the overall welfare consequences of the existing systems of patent protection, and on the other hand, we believe that major changes to the patent law should be considered. Critical review of the discussion on patents shows that the weaknesses of many arguments for patent protection, as well as the resulting adverse effects of the patent laws have been known for a long time. The analysis of the strategic behavior of firms shows that patent protection has often been misused and may negatively affect the total welfare.

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1. Introduction

In the discussions on externalities associated with the economic activity, it has been pointed out at the necessity to reduce the negative consequences and the need to strengthen the welfare improving effects. Unfortunately, any regulatory intervention aimed at eliminating one type of market inefficiency are usually not neutral and create side effects that cause disturbances in the other parts of the economic system. In the case of patent protection, many phenomena arise that are negative from the overall welfare viewpoint. Currently, more and more often the question is being asked, whether the existing legal protection of the inventions is not too costly in comparison to the benefits it was supposed to generate for the economy. This

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fundamental question has been the focus of the long, historical discussion which turns out not to be concluded, yet.

The main objective of this paper is to show the necessity of reviving the debate on the economic justifications for patent protection of inventions. Especially, at the time of strong tendencies towards liberalisation of markets, such discussion should, on the one hand, contribute to the assessment of the overall welfare consequences (benefits and costs) of the existing systems of patent protection, and on the other hand, lead to welfare improving changes in this area.

In the next section, a critical retrospective analysis of economic arguments for patent protection of inventors has been made. The analysis shows that the essential weaknesses of the key arguments, as well as the resulting adverse effects of the patent laws have been known for a long time. In section 3, we analyse how firms use patent protection laws in their business strategies. It can be argued that patent rights have often been misused and become a source of numerous negative economic phenomena. Summary and conclusions are given in the last section.

2. An overview of the discussion on patent protection

A broad-ranging discussion on the subject of patent rights has now been underway since at least the mid-eighteenth century, but it intensified in the mid-nineteenth century. The arguments ‘for’ and ‘against’ that were advanced during that time remain valid today.

It has been noted that the inventor has a right to patent for moral reasons based on natural law, or for pragmatic reasons in the name of benefits to society. There are four main positions in the debate supporting the right of the inventor to patent protection that can be distinguished (Machlup, 1958, p. 21):

- natural law,
- reward in the form of a monopoly,
- incentives created by the monopoly profits,
- compensation for revealing the secret.

We will review more closely each of these approaches to patent protection.

2.1. *Natural law*

On the foundation of natural law it is assumed that each person is the natural owner of his or her ideas. Seizing the ideas of others without authorisation should be regarded as theft, for which reason the law should protect inventors against such an occurrence. In accordance with this viewpoint, exclusivity of use of patented inventions should be guaranteed by law.

An approach based upon natural law was adopted by the National Constitutional Assembly of France in 1791, claiming that each new idea, the implementation of which can be useful from a societal point of view, is the property of its inventor. It was acknowledged that the property rights to intangible objects such as ideas can be applied in the same way as the right to material property.

The viewpoint described above has been widely criticised or even ridiculed.[†] The contradiction has been cited that if ideas as property are a function of natural law, then why is their ownership limited to a given number of years (Coquelin, 1873, p. 213) instead of being permanent?[‡] It has also been underlined that no

[†] In English, see Rogers, 1863, in French, see Beaulieu, 1862, and in German, see Schäffle, 1867, or Grothe, 1877.

[‡] Radical opinions have also been presented that intellectual property rights should be permanent, e.g. Jobard, 1844, who was a consistent proponent of protectionism and a fierce opponent of free-market competition.

person can have exclusive right to the possession of an idea after revealing it to others (Krauss, 1838). The notion of property as understood in the context of material things typically cannot be applied to ideas, which are not embodied in material objects. Unlike in the case of material things, the use of someone's idea (a non-material item) does not deprive its owner of the possibility to make use of his or her own invention.

2.2. Reward in the form of a monopoly

Compensation in the form of a monopoly assumes that each person should receive payment for his or her services in proportion to the benefits that they create for society. Therefore, to the extent possible, society should ensure such compensation. It has been argued that the best way to repay such debt is to grant the inventor a temporary monopoly in the form of exclusive patent rights to his or her invention.

Compensation of the inventor in the form of a monopoly position was widely endorsed by English economists. Interestingly, great economic minds such as Smith, 1776, Bentham, 1843, or Mill, 1848, who invented the principles of the free market in all kinds of activities, at the same time acknowledged that the awarding of a temporary monopoly is a just reward for the efforts of the inventor. More cautious in this area, however, were German cameralists such as Justi, 1758, Jakob, 1837, or Lotz, 1822, who agreed that innovations should be supported, but not in the form of a monopoly. Among French economists, Simonde de Sismondi, 1827 adopted a critical position toward patent monopolies.

Opponents of the awarding of a monopoly in the form of a patent claimed that almost all inventions are much more the product of progress taking place in the society as a whole than the result of individual genius. The creation of an invention by a particular person is, as a result, mainly a matter of luck, and thus, there is no need to reward someone for being the first to come up with a given idea.[§]

2.3. Incentives created by the monopoly profits

The next position is based on the assumption that sufficient amount of inventions cannot be achieved without inventors and investors looking forward to the prospect of obtaining extraordinary profits. It was argued that the most efficient method for creating appropriate stimulus is the awarding of a temporary monopoly in the form of exclusive patent rights to the invention.

Many economists, including Lyon et al., 1939, Ravenshear, 1908, and Wieser, 1927, adopted the perspective that only an anticipated profit along with the possibility of possessing a monopoly resulting from the patenting of an invention can drive inventors and investors to take on pioneering research and experiments. In accepting that risk, entrepreneurs must have the opportunity to achieve benefits that substantially exceed their inputs in order for their behaviour to be rational.

In the light of this understanding, it can be stated that patent protection guaranteeing monopoly profits is a key factor in determining the human motivation to undertake research works, as a result of which inventions and innovations may arise.

In opposition to the thesis described above, many counterarguments have been formulated. In particular, attention has been accorded to the fact that no monetary reward or stimulus is necessary for many people, who naturally love to create and implement innovative technologies. This standpoint was presented by Taussig, 1915, among others. If some encouragement is required, then it should be rather in the form of recognition or

[§] See e.g. the speech of the Prime Minister (Ricardo, 1851) in the House of Lords. This type of argumentation was presented by later authors such as: the economist and chemistry professor Polanyi, 1944, or Kahn, 1940, or Mises, 1949. The justifiability of compensation in the form of monopoly position was also questioned by Penrose, 1951.

awards. Stimulus in the form of profits received due to implementation of the innovation before competitors would be an adequate material reward.

The use of the stimulus argument probably results from several causes. When it was advanced in the mid-nineteenth century, during the European patent debate, experimental psychology had not been introduced, yet, which meant that knowledge of sources of human motivation was limited and remained mainly intuitive. Along with development of neoclassical economics and the inception of mathematical modelling, the stimulus argument was strengthened further. It served with extraordinary efficiency to create microeconomic optimisation models, as it offered a simple objective function as the aim of the inventor – maximising the total of monopoly profits after the introduction of the invention into the marketplace. The aforementioned internal motivations, matters of prestige or recognition on the part of others are, however, “invisible” to the model and difficult to express in the language of calculus. Therefore, undoubtedly due to methodological advantages, the stimulus argument has enjoyed uninterrupted popularity among many economists, particularly those who work in industrial organisation. It would appear, therefore, that here we come to a point at which the applicability of models as a criterion is rejected in favour of their “elegance” (Gowdy, 2004).

Attention should nevertheless be given to another crucial outcome of the use of patent protection. Patents create improper incentives, which cause the transfer of companies’ activities from the field of production into the field of research and development, as well as from other areas in which there is no possibility of receiving patent protection into areas that allow the attainment of a monopoly position through patents. Plant, 1934 and other economists have drawn attention to this fact. In addition, negative effects for free-market companies due to patent protection create major social costs that fundamentally outweigh the advantages resulting from the implementation of a patent system.

2.4. Compensation for revealing the secret

An approach based on payment for the revelation of secrets assumes that a business transaction is conducted between the inventor and the society. In the transaction, the inventor reveals his secret knowledge in exchange for temporary protection in the form of exclusivity in its use. It was noted that if such a transaction did not occur, then economic development would be slower, as it would be necessary to wait longer for the spread of new technologies. Therefore, it is in the interest of the society to close a mutually beneficial deal with the inventor to reveal his or her secret. The best method for achieving that aim would be to offer him or her exclusive patent rights in exchange for publication of the invention.

The most frequent direction of the criticism to this approach is the claim that society loses nothing or little, if some inventors seek to conceal their achievements. On the one hand, few manufacturers have succeeded in maintaining secrecy in the long term, and on the other hand, similar discoveries are made by several people at the same time. The inventor that assumes that no one else comes upon a similar idea would not have a reason to patent his or her invention. Only the information that cannot be kept secret would be revealed against compensation.

2.5. Further standpoints in the debate

The nineteenth-century discussion on patents was very lively until 1873, when proponents of the elimination of patents (a decided majority of economists) were finally overcome by government officials, lawyers and so-called “protectionists”. As a result of this, economists lost interest in this problem, and ceased producing publications on the subject, moving on to other issues. The only remaining writers on the subject were lawyers, engineers and historians. They completely ignored the earlier literature on the topic, and drew only upon the most widely distributed economics textbook of the period by Mill, 1848, who, like the other

classical English economists, despite supporting the free market in every other area, was supporting temporary monopolies for inventors.

It should be noted that before 1873 economists stopped short of the word “monopoly” and referred only to the concept of ownership of the invention (innovation). It was, however, only later that the right to ownership of a patent and the limited monopoly became a broadly accepted legal concept. At the same time it was emphasised that this did not refer to the “odious” monopoly, but rather to a “social monopoly”, also called “general welfare monopoly” (Ely, 1914) or a “socially earned” monopoly (Fetter, 1922). In order to soften the tone of the word “monopoly”, attention was drawn to its temporary nature and conditionality.

Nevertheless, a whole host of well-known economists disputed the views described above. Among them, Robbins, 1939, Chapman, 1911 and Fisher, 1912 claimed that a monopoly that came into being as a result of the receipt of a patent is no different from any other type of monopoly. They described patent protection as being equivalent to tariff protection or political protection of selected branches of industry.

Clark, 1927 indicated that a temporary monopoly due to a patent could help create a powerful company that would be in a position to continue to block potential competitors from entry into a given market, and in that manner to sustain the monopoly. Marshall, 1919 pointed out that many influential firms achieved their initial success thanks to the obtaining of important patents. In his opinion, the system of patent protection gives privilege to large companies at the expense of small ones, whose financial resources are significantly limited. Similarly, Robbins, 1939 stressed that a patent allows its possessor to develop an entire business network that enables to strengthen the monopolistic position in the market. He openly claimed that rather than improve their inventions, inventors concentrate on patenting variants of the given production process in order to ensure a longer period of monopoly.

A long list of adverse effects of the monopolies resulting from patent protection was presented by Vaughan, 1925, Burns, 1936 and Hayek, 1944. All of them pointed out that the existence of the patent law destroys the system of free competition.

Furthermore, in the discussion of the permanent period of patent protection, questions arose concerning the justifiability of the identical treatment of all types of inventions. Interestingly, in that period the question of the optimal time period for patent protection was not taken under consideration.

Another attempted economic argument for the use of patent protection appeared along with the expansion of the scale of research and the implementation of innovations. Opinions of this type were presented by Hadley, 1903 and even Clark, 1927, who at the same time have also stressed the negative aspects of patents.

Among the strong opponents of the patent system as a stimulus for invention activities and their implementation in production we could name Plant, 1934 and Edwards, 1949. Also joining the ranks of the opponents of patent protection was Robinson, 1956. She noted the impossibility of constructing socially advantageous law in this area by formulating “the paradox of patents”.

3. Strategic behaviour in the field of patent law

It should be noted that patent law serves less and less to stimulate productive entrepreneurship** in the economy (Baumol, 1990), and it is increasingly used by companies and inventors to limit competition in the

** Baumol, 1990 distinguished between three types of entrepreneurship – productive, non-productive and destructive. If companies satisfy the needs of consumers through their activities, then this is known as productive entrepreneurship. By this they cause economic growth. If, on the other hand, companies focus on seeking out subsidies, then their activities constitute non-productive entrepreneurship. Furthermore, people can exercise their talents by engaging them in activities that are directly destructive such as theft, vandalism or violence. These behaviours are defined as destructive entrepreneurship.

marketplace and to create “artificial” monopolies, maintained solely on the basis of the law. Among these types of strategic behaviour by companies and inventors, we can point to:

- “shelving” or “parking” of patents,
- use of patents as “bluffs” or “decoys”,
- the declaration of patent “battles” or “wars”,
- application for patents that are too broad in scope,
- application for invalid patents.

These activities can sometimes lead to inhibition of spontaneous and productive entrepreneurship in the economy and to losses in the total welfare.

3.1. “Shelving” of patents

Cohen et al., 2000 state that companies surprisingly rarely treat patents directly as a source of profits that help recover the costs of research and development. Rather, companies patent inventions for other, strategic reasons, including the desire to prevent rivals from making use of similar technologies^{††} in the marketplace. Companies sometimes apply for the awarding of patents on technologies that they have no intention to implement in production. Managers prefer to “shelve” a patent (Tirole, 1988, p. 394) than to allow a given technology to be used by a rival.

“Shelving” of patents may be a way for the incumbent firm to keep out potential entrants. Let us examine the following example. Assume that a certain number of companies operate in a given monopoly or oligopoly market and they achieve extraordinary long-term profits. Those companies may be interested in maintaining the *status quo*, while the introduction of innovations (such as those lowering the costs of production) could mean the need to incur significant costs in adapting their present production lines to a new processing technology. Let us also assume that another company is interested in entering that market. If it were to implement the new, more efficient production method, it could take over a significant portion of the market. The incumbents are therefore motivated to protect their position in the marketplace and to frighten away any potential rival, while at the same time they do not wish to create fierce cost competition in the market. The solution to this conflict between these motives may just be the “shelving” of a patent by the companies that are currently operating on the market. In this way they can prevent the use of a new technology by the company that is interested in entering the market. After successfully driving away a potential rival, the incumbent companies have no economic motivation to implement new technologies (e.g. due to the high costs of adapting the existing production lines to the new methods of processing).

In some countries attempts have been made to limit the practice of “shelving” patents (Shavell, 2004). In that case legal regulations are enacted that force companies to make use of the subject of a patent (Rüster, 1991). It is difficult, however, to assess the effectiveness of such regulations.

3.2. The use of patents as “decoys”

It is important to observe that the strategic decisions of companies to patent inventions should be analysed in the context of the asymmetry of information in a competitive market. The inventor who developed a given technology is better informed about own invention than his competitors. The inventor may also be better able to estimate the commercial potential of a given invention, and the prospects for this type of research. The rivals (the less informed party) attempt to fill in the missing information from the behaviour of the leader in

^{††} This refers to technologies that can fulfill similar functions as technologies developed by a given company.

the “patent race” (Tirole, 1988). Therefore the leader may use the natural asymmetry of information to mislead the rivals by patenting “bad” inventions, and in this way to encourage them to focus on unpromising types of R&D activities. The strategy of patenting low-potential inventions in order to mislead the rivals is known as using the patent as a “decoy” (Langinier, 2005). It can be said metaphorically that such patents are reminiscent of the release of a “decoy” from a submarine that draws the path of an enemy torpedo (here: the competition’s research efforts) in a direction that is safe for the submarine (here: a commercially unpromising area). In microeconomic literature several works can be found that are dedicated to the use of patents to mislead the rival firms (Horstmann et al., 1985; Crampes and Langinier, 1998; Langinier, 2005).

Using game theory, Langinier, 2005 demonstrated the use of a patent as a “decoy” in the “patent race” model. In a Bayesian subgame perfect equilibrium he found two equilibria. In the first of them, the winner always patents the invention at time t_1 , and the “laggard”, or company that is not the leader in the patent race, withdraws from the race. In the second equilibrium, at time t_1 the winner either decides to patent the invention while the discovery can still be improved with some probability, or always patents when the discovery can no longer be improved. Then the “laggard” remains in the race as long as the leader has not made an application for a patent. However, when the technology is patented by the leader, the “laggard”, with a certain probability, takes the decision to cease competing. This equilibrium point corresponds to the strategic behaviour of the leader in the patent race, which is intended to mislead the rival.

3.3. Declaration of a patent war

Legal patent wars have become an indispensable tool for competition in high-technology industries. For example, in the global computer technology industry, the waging of patent wars in order to weaken or block a rival has become almost a standard practice of strategic management. Examples of patent wars being waged at present include the following disputes (dailytech.com, 22 November 2011):

- Microsoft vs. the Salesforce.com company,
- Apple vs. the HTC company,
- Xerox vs. Google and Yahoo,
- Apple vs. Samsung.

These wars are not beneficial from the consumer point of view, they slow down the development of the industries, and increase the business risk.

Firstly, legal patent wars are extremely expensive and lead to the increased costs of doing business for every company in the industry. In a competitive environment, in which any pretext can be used by a rival to begin a patent war, or the filing of a suit against a given company by so-called “patent trolls” or “patent sharks”^{‡‡}, market players are forced to spend considerable amounts of money on legal services in order to protect themselves from negative consequences of accusations of intellectual property rights violations. At the end, these costs are passed on from companies to their customers.

Secondly, legal patent wars can limit companies' investment in research and development. The process of creating an innovation is in itself associated with uncertainty (Karbowski, 2010) and there is no guarantee that the money spent on research and development will be recovered. A new factor is now reducing the probability of the recovery of money spent on R&D – the patent war. Even if a company is able to create an innovation, it

^{‡‡} A “patent troll” is a physical or legal person that abuses imperfections in intellectual property law in the aim of receiving specific financial benefit. The “troll” buys patents and then, typically through the use of the courts, demands financial compensation for violation of his intellectual rights by various entities. Observers see the behaviour of “trolls” as opportunistic or aggressive. The “troll’s” goal is not production, sales or development of the subject of the patent purchased.

can be accused of violating intellectual property rights. Therefore, in making the decision to begin research on a technology, an R&D manager in any company must also take into consideration that possibility.

Thirdly, legal battles are accompanied by uncertainty. Legal processes in cases of intellectual property rights violations are lengthy, and judges frequently decide on cases concerning specialised technical matter that they do not understand (and expert witnesses, too, are often not knowledgeable enough). As a consequence court decisions in matters of intellectual rights violations can be haphazard.

Legal patent wars in their current form and scale can only be seen as a twisted version of the patent protection system. They sometimes serve only to limit competition in the marketplace, waste precious resources, and slow down the development in high-tech industries.

3.4. Application for patents that are too broad in scope

Awarding the inventor too broad a scope of rights under a patent leads to economically unjustified (excessively broad) patent protection. In the opinion of Sławiński, 2005, too broad a scope of rights from patents received effectively inhibits technological progress in the industry affected. Sławiński, 2005 gives examples from the pharmaceutical and biotech industries. Imagine that some pharmaceutical company has created a new kind of erythropoietin (EPO) therapy^{§§}, say “type X”. The production of the new types of EPO hormone is possible for example by adding carbohydrate moiety. The new types can perform a similar function in the human body as those that are already available in the marketplace, but they can differ in the degree by which the body can tolerate them. If it were possible to create an EPO with a similar biological effect as the “old types” and that were at the same time more easily tolerated by the body, they would have both medical and economic value.

At present, the following types of EPO are available: alpha, beta, omega and darbepoetin alpha. The introduction into the market of a new type is not, however, possible because of the broad patent protection of those that are for sale now. This is a clear indication that a poorly formulated patent protection can not only fail to stimulate innovation, but even impede the development of some segment of the marketplace, or even the entire industry. In the opinion of Sławiński, 2005, the medical industry is particularly affected by the problem of excessively broad patent protections. This is especially significant because 50% of all patents awarded worldwide are medical in nature (Sławiński, 2005).

3.5. Application for “invalid patents”

So-called “invalid patents” contradict the nature of patent protection. The basic condition for the receipt of a patent is the revelation of a sufficient amount of information by the inventor: information that would allow another entity to produce a given invention after the term of the inventor's patent is past. At the same time many companies apply for patents without revealing enough information for the production of a given invention by other entities. Worse, the awarding of such “invalid” patents is not an exceptional situation. According to Doornbos et al., 2003, to implement a given invention, as many as 80% of companies surveyed by researchers needed more precise technical information than provided patent holders. It is especially puzzling given the fact that one of the basic stipulations of the Paris Convention for the Protection of Industrial Property, 1883 was that the key condition to obtain a patent is full revelation of information concerning production methods for the invention. As a consequence, many companies receive twenty years of

^{§§} Erythropoietin is a peptide hormone used in treatment of patients suffering from kidney failure and as a supplementary medicine in oncology and haematology.

monopoly status due to a patent without revealing key information required to produce an invention. This practice is not only unjustified from the perspective of economic prosperity, but is simply unjust and unethical. Examples of the receipt of “invalid patents” by companies and inventors are described by Splawiński, 2005.

4. Summary and conclusion

In this article a critical analysis of economic arguments for patent protection was conducted. It was shown that the essential weaknesses of the presented arguments have been known for a long time, and that business practice has shown that patent rights generate numerous negative phenomena. We drew attention to the fact that innovative initiative that was to be stimulated by patent protection is affected not only by economic but also by psychological factors. Therefore, the reference has been made not only to the works of important economists, but also to the achievements of major researchers in psychology specialising in the field of motivation. We pointed out that the typical arguments for patent protection overlook key internal personal dispositions that are crucial to innovations, and at the same time they overestimate the significance of external factors, particularly monetary ones.

The phenomena presented in this work do not by any means constitute an exhaustive list of strategic behaviours by inventors and companies in the field of patent protection. The examples cited here, however, support the theory that contemporary patent laws play a declining role in stimulating productive entrepreneurship in the economy, and are often misused by economic entities to limit competition in the marketplace, and to create “artificial” monopolies that are maintained exclusively on the basis of legal provisions.

There are numerous examples of pathologies resulting from the patent protection system. Therefore, some mechanisms must be developed to detect and eliminate the abuse of the patent law. And more generally, we see an urgent need to reopen the debate on the shape and functioning of the patent system, and to return to the fundamental discussion on the protection of intellectual property rights. This is an important direction for further research in the area of economic analysis of law.

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