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Patent systems for encouraging innovation: Lessons from economic analysis☆

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Abstract

Economic theory views patents as policy instruments aimed at fostering innovation and diffusion. Three major implications are drawn regarding current policy debates. First, patents may not be the most effective means of protection for inventors to recover R&D investments when imitation is costly and first mover advantages are important. Second, patentability requirements, such as novelty or non-obviousness, should be sufficiently stringent to avoid the grant of patents for inventions with low social value that increase the social cost of the patent system. Third, the trade-off between the patent policy instruments of length and breadth could be used to provide sufficient incentives to develop inventions with high social value. Beyond these three implications, economic theory also pleads for a mechanism design approach: an optimal patent system could be based on a menu of different degrees of patent protection where stronger protection would involve higher fees, allowing self-selection by inventors.

JEL classification: 031; 034

Keywords: Patent subject matter; Patentability requirements; Sequential innovations; Incentive mechanism; License fee

1. Introduction

There have been tremendous changes in the patent system over the past two decades, most of them going in the same direction: expanding and strengthening the protection of inventions.[1] The patent community, including attorneys, judges, patent officials and members of intellectual property business associations, has been a major driving force behind this evolution. Are these

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[1] See e.g. Kortum and Lerner (1999), Jaffe (2000), Coriat and Orsi (2002), Gallini (2002), Martinez and Guellec (2004) and Menell and Scotchmer (2006).

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changes justified from an economic perspective based on what we have learned so far from research on the economics of patents? The answer is complex and depends on an assessment of whether the economic literature provides useful conclusions for what could be considered an optimal patent regime. Economists have only recently started to participate in policy discussions surrounding patents and to exchange views with the patent community in open fora; however, there is still a long way to go and this paper aims at contributing to improving such communication.[2]

Economic research in the area of patents is not new, but it has expanded and progressed considerably in recent years. The major justification given by practitioners for the existence and the working of the patent system refers to its effects on innovation and economic growth. However, economic analysis has not until very recently informed decisions taken by courts, patent offices and legislators. The traditional gap between economic research and patent policy might have been partially due to lack of communication between economic researchers and the patent community, whose members are mainly engineers and legal scholars, but it has also been due to the inability of economists to make operational their messages. Economic arguments are often cast in terms that are not especially helpful for policy makers, based on variables that do not constitute real policy levers. The purpose of this paper is to draw lessons from recent economic research on how the design of real policy levers in the field of patents may affect the innovation process.

We do not aim to present an exhaustive survey of recent research in the economics of patents and its relevance to all policy questions. We will instead focus on a limited number of key policy questions, leaving aside other important issues, such as what is the appropriate choice of patent regimes according to the state of development of a country, or the political economy of patent regimes.

Patent subject matter has expanded over the past decades to include biotechnology, software and, in some countries, methods of doing business. The extent to which patents are effective as an incentive mechanism in all fields of knowledge, that is, whether the incentives provided by competitive market mechanisms need to be supplemented or not by legal monopolies granted by governments to compensate inventors for their investment, is examined in the next section of the paper. As documented by empirical and theoretical studies, patents are necessary in certain, but not all cases. A note of caution should then be attached to the expansion of the domain covered by patents.

Some countries have arguably experienced a weakening of the standard criteria for granting patents (justified by the belief that "more patents is better"), and a tendency to grant patents with broader scope in certain technology fields (according to the principle that "broader patents are more valuable, then better") in the past few years. However, as reported in Section 3, these trends might have detrimental effects on competition and follow-on invention and should be carefully monitored.

More fundamental reforms of the patent system as suggested by recent research are addressed in Section 4 of this paper, such as the design of efficient patent protection mechanisms that provide strong incentives to invent while minimising the social costs associated with a monopoly position. This analysis is still highly theoretical and based on the idea that an efficient patent regime should encourage the self-selection of patentees for obtaining different degrees of patent protection, making the extension of their rights commensurable with the value of their invention to society.

Changes to patent regimes should be implemented carefully based on an analysis of their economic impacts on prices, on innovation and on diffusion. Emphasizing the use of patents as a policy instrument would reinforce their status by highlighting the benefits they bring to society and help prescribe a careful design and implementation of the rights they confer to inventors. However, the implementation of economic insights in the field of patent policy can be quite difficult in practice: it would require more empirical testing of the theoretical lessons reviewed here, together with improved communication and strong collaboration between economists and the patent community.

2. In what economic contexts are patents needed?

The cornerstone of the traditional economic argument in favour of patent protection is the non-rival character of knowledge, which means that once an invention is known, everyone can use it with no additional R&D cost.

[2] Recent illustrations can be found in the 2002 FTC-DOJ Hearings on Competition and Intellectual Property Law and policy in the knowledge-based economy (http://www.ftc.gov/opp/intellect/index.htm) that led to the publication of a report by the FTC (2003), as well as in the reports produced by the Committee on IPRs in the knowledge-based economy of the US National Research Council of the National Academies (NAS, 2003, 2004), the OECD conference on patents, innovation and economic performance held in Paris in August 2003 (OECD, 2004) and Guellec and van Pottelsberghe (2006) for an overview of the European scene.