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Patents versus ex post rewards: A new look

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Abstract

Economic studies that aim at comparing the patent system social efficiency versus an ex post reward system rest on an outdated view of patents. They assume that firms use the patent system only in order to be granted a short-term commercial monopoly rent. This assumption is convenient because it allows straightforward comparisons between patents and rewards but it is not confirmed by empirical studies, which stress that in many industries most firms use patents as strategic devices to trade technologies and to ease R&D collaborations. This change leads to rethinking the framework of the patent–reward debate.

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1. Introduction

"The reward mechanism raises considerable questions and received only little attention from economists and scholars in other disciplines. Given the (justified) renewal of interest for this mechanism, it would be desirable to develop new studies on this topic" (Tirole, 2003, p. 41)

Patents are often regarded as a reasonable consensus providing increased incentives to invest in knowledge production and at the same time, ensuring a wide diffusion of the knowledge underlying the patented innovation. But, problems inherent to this system, mainly the deadweight monopoly loss it generates, has led researchers to explore alternative solutions to patents.[1]

Among these alternative solutions, the present paper focuses on ex post rewards and public patents buy-out[2] (Polanyi, 1944; Wright, 1983; Kremer, 1998; Llobet

[1] Quotation originally in French. The translation is mine.

[2] Systems of patents buy-out and ex post rewards are not exactly similar, as we will see in Section 3. Nevertheless, in this work we use these two expressions alternatively without making any difference between them because the point we want to make (that the patent system cannot be reduced to a simple amount of money and, as such, that it cannot be properly replaced by a system that gives only money to innovators) applies similarly to both of them.

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et al., 2001; Shavell and van Ypersele, 2001). Under a system of ex post reward, innovators are paid directly by governments for their contributions to social welfare and their innovations pass immediately into the public domain. Similarly, under a patent buy-out system governments buy patents from the innovators and put them into the public domain in order to ensure free access of the patented innovation to everybody. Such systems are appealing since, under certain conditions, they have: "The potential to eliminate monopoly price distortions and incentives for wasteful reverse engineering, while encouraging for original research" (Kremer, 1998, p. 1138). In other words, they could preserve the benefits of the patent system while mitigating its main disadvantages.

However, studies that attempted so far to appraise the social efficiency of a system of ex post reward and to compare it with patents are somehow all based on a similar approach. They rest on a classical perspective of patents in the sense that they make the central assumption that firms apply for patents for the sole purpose to exploit a commercial monopoly position, the other benefits provided by patents entering only marginally into the decision to patent or not. This hypothesis reduces, by far, the role of patents but is convenient because within such a framework it is straightforward to compare patent and reward systems.

Indeed, if firms use patents only in order to secure short-term monopoly rents, governments can compute the expected monopoly profit of each innovation and pay this amount to innovators. Instead of granting a patent, the government can thus directly reward innovators, so that incentives to invest in R&D are held constant but the deadweight monopoly loss provoked by the patent is removed. Following this traditional approach of the patent system, the social desirability of patents versus ex post rewards rests mainly on the quantity and quality of information available to policy makers. If a central planner can gather enough information to appraise, even approximately, the expected monopoly profit of each innovation then it is worth replacing patents by ex post rewards.

This paper aims at widening this discussion about the social desirability of patents or rewards. With the exception of a few industries (mainly chemicals, pharmaceuticals, petroleum), firms are far from considering patents as efficient devices to appropriate their innovations and, therefore, to secure monopoly rents (Mansfield et al., 1981; Mansfield, 1986; Levin et al., 1987; Goto and Nagata, 1996; Arundel and van de Paal, 1995; Cohen et al., 2000; Arundel, 2001; Hall and Ziedonis, 2001; Reitzig, 2003). Nowadays, the consensus that emerges from empirical studies is that in a knowledge-based economy patents assist the collective process of innovation by easing technology trading and inter-firm collaborations. In other words, the patent system may be a central element of the knowledge production process not because it provides incentives to invest in knowledge production, but because it facilitates coordination among actors of innovation (Pénin, 2003b).

It follows that in most industries, the central hypothesis that allows a straightforward comparison between patent and reward systems collapses. Usually, a patent cannot be reduced merely to a single amount of money. This new vision of the patent system leads to re-thinking the debate between patents and ex post rewards and to orienting it towards a ground that would take into account the coordination properties of patents. The central issue when comparing patents and ex post rewards may not be whether or not policy makers have enough information to compute the optimal reward but may rather rest on the effect of ex post reward on the collective process of innovation. Before deciding to replace patents by ex post rewards, we must assess how this replacement affects technology trading and inter-firm collaborations.

The paper is structured as follows: we start by recalling the classical foundations of patent policy. Then we introduce the ex post reward system and we analyse the traditional line of comparison between this system and the patent one. In Section 3, we review the empirical criticisms that have affected the classical view of patents and we discuss the role of patents as devices to ensure coordination. We conclude by an investigation of how this new vision of patents affects the patent–reward debate and by focusing on the special case of the pharmaceutical industry.

2. The theoretical background of patent policy

Current innovation policies, including patents, are based on a vision of knowledge that goes back to the pioneer work of Nelson (1959) and Arrow (1962). Knowledge is considered as a non-rival and non-appropriable good and as such, its production