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# Establishing a new intellectual property rights regime in the United States Origins, content and problems

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## Abstract

Major changes have been made over the past 20 years in the US intellectual property rights regime. These include the fact that the regime has been opened up to software patents and to business models, on one hand, and to living entities on the other—all within a general environment marked by the relaxation of patentability criteria. They have resulted in major changes in the US system of innovation—more specifically in the increasing privatisation of knowledge domains and activities that were previously public. The changes result from the combined effects of a response to US perceptions of increased foreign competition, of the emergence of major new technological opportunities in biotechnology and ICT, and of a series of regulatory changes that have paved the way for the financial sector's increased involvement, via direct investments in firms whose main activity is comprised of R&D. Contemporary doubts about the viability of these changes reflect, the harmful long-term economic effect of the privatisation of basic knowledge (especially in the biopharmaceutical sector) and the difficulties that the financial sector has faced in ensuring the sustainability of the necessary pre-conditions that allow for the development of innovation.

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## 1. Introduction

In order to highlight the significance of the changes that have taken place in the area of intellectual property (as well as its effects on the conditions for producing and diffusing innovation), the present paper has been articulated and organised as follows.

**Section 2** recaps some of the main findings from the field of economics of patent and innovation, in an

attempt to clarify how, and to what extent, the new regime deviates from traditional analysis and practices in this area. Some of the legislative changes (initiated by Congress to reinforce the PR regime) are presented and analysed; they have been re-situated in the specific environment of the time, characterised by a sharp drop in American firms' competitiveness (**Section 3**). The analysis then focuses on two specific domains: the continued extension of the area of patentability to computer programs, mathematical algorithms and "business models" (**Section 4**); and to living entities (**Section 5**). These two fields were chosen because they have experienced the most dramatic changes. In **Section 6**, the paper presents the concomitance of

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change in the IPR systems and financial sphere and the related changes it has generated as regards the financing of innovation. The conclusion (Section 7) raises questions about the long-term sustainability of this type of regime in the light of recent developments.

## 2. Basic principles of the economics of patents, IPR and innovation

To highlight the nature and meaning of the changes that have affected the field of innovation, we think it useful to recall some of the basic principles that have been put forward to explain why certain “institutional arrangements” (Arrow, 1962)—in actual fact differing types of IPR and public incentives—have been deemed necessary so that R&D activities can maintain a “socially sufficient level” of dynamism (Nelson, 1959).

Two series of contributions should be recalled at this juncture, inasmuch as they were once considered to be the theoretical foundations of any type of IPR system.

### 2.1. *Information, knowledge and the trade-off between “private” and “social” costs*

Building on propositions that were first formulated by Nelson (1959), Arrow introduced in a seminal paper he published in 1962 the idea that knowledge—whenever it can be assimilated to information—is a good that will present a number of specific characteristics. In particular, the “indivisible” nature of knowledge means that whatever its production costs, subsequent reproductions cost nothing or next to nothing. This attribute is at the origin of market failure as well as “free rider” problems. Insofar, as market mechanisms are unable to offer those solutions that will induce firms to make a “socially optimal” level of investment in the production of knowledge, society as a whole runs the risk of always under-investing in knowledge production. To overcome this type of market failure, non-market mechanisms are needed to create the right types of incentives.

Two types of fundamental incentives can be designed:

- (1) *Patents*: These are partial and temporary monopolies that are awarded to inventors under a given set of conditions. They are the first institutional

arrangements helping to overcome the free rider problem.

- (2) The allocation of public funds to research (and especially to basic research) is the other direction in which these non-market mechanisms can go. Here, the information and knowledge that has been produced as a result of public subsidies is made available to everyone for zero cost and it is the taxpayer who covers the cost of delivering the “public good” needed to maintain the type of knowledge flow that makes it possible to ensure societal progress.

It is noteworthy that in both cases (patents and/or public subsidies), the main issue is how to limit the innovation’s social cost—regardless of whether this cost is to be covered by the consumer or by the taxpayer.

### 2.2. *“Open science” versus “private science”*

Our understanding of the world of basic and/or publicly funded research was enhanced by Dasgupta and David’s (1994) seminal paper, devoted to an analysis of the world of “open science”.<sup>1</sup>

In essence, analysis of the world of open science highlights those specific co-ordination mechanisms that are at work in this area of R&D activities. It offers cogent arguments relating to the relative efficiency of the whole range of formal and informal rules that govern this world (open publication and communication, “priority rules” for inventors/discoverers, etc.) and contrasts them with the rules governing the world of private innovation activities, also called the “kingdom of technology” (based on secrets, patents and rent-seeking).

In actual fact, these two worlds are interconnected by many subtle relations, both formal and informal. However, from a theoretical point of view, we should remember that the key principle underlying the rationale for the various types of non-market mechanisms that have been designed and implemented in the world’s different national innovation systems (NISs) is the distinction between the granting of “patents” to reward “private” innovators, on one hand, and the

<sup>1</sup> On the economics of science and the importance of basic research for innovation see also Pavitt (1991).

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