

Patents and Appropriation: Concerns and Evidence¹

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ABSTRACT. For over the past twenty years, the United States has witnessed a pro-patent movement. In response, numerous concerns have been raised, including possible impediments to innovation in cumulative technologies, emergence of anti-commons, barriers to entry and an elevation of costs of innovation associated with defensive patenting, growth in patent litigation and poor quality patents. Although there is little systematic evidence that these concerns have materialized in any substantial way, vigilance is nonetheless warranted.

Key words: patents, R&D, innovation

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1. Introduction

For over 20 years, the United States has witnessed a pro-patent movement, manifest in both public policy and managerial practice. In 1982, the Court of Appeals for the Federal Circuit (CAFC) was established to make patent protection more uniform, and indirectly strengthened it. Since the early 1980's, there has been an expansion of what can be patented, with the courts affirming that life forms, software and even business methods were patentable. The 1980 Bayh-Dole Amendment and related legislation has extended the eligibility of who can patent, permitting universities and other institutions receiving federal R&D support to obtain patents on the work supported by those funds. Partly stimulated by these policy changes, firms have become more aggressive in both applying for and asserting patents. Similarly, universities and other

publicly supported research institutions have increased their patenting and their pursuit of licensing revenues.

This pro-patent movement has raised concerns among scholars as well as public and quasi-public agencies and authorities, including the National Research Council (2004) and the Federal Trade Commission (2003). Nelson (2004), among others, argues that now that universities and other public research institutions are patenting more aggressively, access to new scientific and technological discoveries is becoming more restricted, threatening the research enterprise itself. Heller and Eisenberg (1998) suggest that the patent landscape is becoming too fractionated in biomedicine, with too many patents associated with any one therapeutic, undermining development and commercialization of innovation. Hall and Ziedonis (2001) and Shapiro (2000) have argued that the semiconductor industry has witnessed an acceleration of patent portfolio races that stimulate both defensive patenting and the patenting of marginal innovations that may be both raising the cost of innovation and acting as a barrier to entry. Finally, Barton (2000) and others have argued that the bar for receiving a patent has fallen, potentially conferring monopoly power with little compensating innovation in exchange. Collectively, these concerns have raised the question whether, from a social welfare perspective, the pendulum has swung too far in the direction of privatization of intellectual property (IP).

In this paper, we will briefly review the broad outlines of the pro-patent movement, and the reaction against it. We will also try to assess what scholars of technological change understand empirically about these various critiques. In this context, we will review recent research that I

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have conducted with colleagues on the impact of patenting and appropriability on R&D.

2. Pro-patent movement in the U.S.²

It is widely understood that since about 1980, likely stimulated by the competitiveness crisis of the 1980's, U.S. policy and courts have moved in a pro-patent direction. The major change in the policy environment was the 1982 creation of the CAFC, a court designed to consolidate all appeals in patent cases emerging from the Federal District Court level in the U.S. The chief purpose of the court was to make judicial decisions in patent cases more uniform, and thus diminish the incentives to "forum shop" in the U.S. In contrast to many of the Federal District Courts, the CAFC also offered the advantage of providing judges who are expert in patent law and often in the technologies that came before them. Finally, the CAFC has also been generally recognized as broadly sympathetic with the overall intent of patent law, which has not always been the case in selected courts, and certainly not the case previously in the U.S. Thus, while the major intent of the CAFC's creation was to make patent law more uniform, its creation also indirectly strengthened it.

Indeed, the creation of the CAFC is widely thought to have signaled a shift in U.S. courts' consideration of patent cases. For example, citing the work of Allison and Lemley (1998) and Koenig (1980), Jaffe (2000) notes that before 1980, "a district court finding that a patent was valid and infringed was upheld on appeal 62% of the time; between 1982 and 1990 this percentage rose to 90%. Lanjouw and Lerner (1998) note that plaintiff success rates have increased from an average of 61% in the years before the establishment of the CAFC in 1982 to 75% by 1987.

In addition to an increase in plaintiff success rates, it appears that the values of the settlements have also increased. While I have found no systematic data on trends in settlement values, it is widely acknowledged (e.g., Hall and Ziedonis (2001)) that the nearly 900 million dollar payment to Polaroid in its suit against Kodak, resolved in 1985, was a watershed event in demonstrating just how much could be won (and lost) in patent infringement cases.³ Subsequent

settlements, also in the hundreds of millions of dollars, notably in the cases brought by Texas Instruments, had a similar demonstration effect. While such settlements are unusual, it is not uncommon for substantial values to be at risk in patent suits. For example, the 1997 "Report of Economic Survey" of the American Intellectual Property Law Association reported that the "estimated average value at risk" for 42% of the patent infringement suits were in the one to ten million dollar range, 38% in the ten to 100 million dollar range, and eight percent were over 100 million dollars.

Also marking the "pro-patent" movement in the U.S. was the expansion in patentable subject matter. Patentability was extended to life forms with the landmark *Diamond v. Chakrabarty* Supreme Court case in 1980. After previously striking down patents on mathematical algorithms, the Supreme Court allowed a patent on a computer program as an adjunct to a physical process in its 1981 decision, *Diamond v. Diehr*, thus endorsing the patentability of software. The courts, however, struggled over interpretation and implementation of their decisions regarding software for many years, gradually expanding the scope of patentable subject matter. The 1998 decision in *State Street Bank and Trust v. Signature Financial Group* rejected the doctrine against patents on "methods of doing business", thus affirming the patentability of software, and dispensing with virtually all limitations on software-related subject matter.

Another of the major reforms of the pro-patent era in the U.S. was the extension of eligibility regarding who can patent. The Bayh-Dole and the Stevenson-Wydler Acts of 1980 permit universities, government research labs, and other institutions receiving federal R&D support, to obtain patent rights over the inventions developed with federal support. The impetus behind Bayh-Dole and related legislation was the assumption that there is a stock of underexploited, valuable knowledge residing in universities and other research institutions receiving federal funding, and that patents would incent the private sector to undertake the downstream R&D and related investment necessary for commercialization (Mazzoleni and Nelson, 1998). Going beyond the intent of the original legislation, by