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Reexamining the Patent System

Is the patent system working? It depends on whom you ask. Which industry, upstream or downstream firms, public companies or small inventors? Opinions are plentiful, but answers supported by data are few. The patent system is at the heart of the knowledge economy, but there is surprisingly little knowledge about its costs and benefits. If the system is to promote innovation as effectively as possible, we need to know much more about how patents are used and licensed and what effects they have on innovators and business practice. Since innovation is one of the key engines of economic growth, the cost of a dysfunctional, or merely suboptimal, patent system could be substantial.

Signs of dysfunction are spreading, stimulating interest in legislation to reform our patent system. But to date, progress toward enacting any reforms has been stymied by inter-industry disputes over key provisions. Although patent reform is often contentious because of the divergent economic interests at stake, the current political struggle between the pharmaceutical and biotech industries on one end and information technology and financial services on the other is unprecedented.

In a recent acclaimed book, *Patent Failure*, economists James Bessen and Michael Meurer review the literature on the private value of patents and costs of patent litigation. They conclude that the system now functions effectively only for the pharmaceutical and chemical industries. Whereas 20 years earlier the system provided a net benefit across the board, in effect it now imposes a tax on other industrial sectors.

The conflict raises a fundamental question: Is a one-size-fits-all system viable in an age when technologies and the processes of innovation are so diverse? Given the high stakes, we need to know the answer to this question. If the end result of a uniform system is to favor innovation in one field at the expense of others, then the patent system will effectively influence the allocation of capital to different economic activities, resulting in an unintentional form of industrial policy.

At least one of the underlying problems is easy to recog-

nize. In pharmaceuticals, there is a close relationship between patents and products: Blockbuster drugs are characteristically very dependent on a single primary patent. Conversely, in information technology, there is a great distance between a patent and a product.

Computers and computer programs may contain thousands of patentable functions. Each may represent only a tiny fraction of the market value of the product, which may in fact derive primarily from product design and the integration of components. But a patent dispute over a single component function may result in an injunction against the entire product line. This creates an incentive for opportunistic patent owners to “hold up” companies who have made a very large investment in a product. In other words, a patent owner who obtains an injunction can potentially extract settlements that approach the financial and opportunity cost of withdrawing the product from the market and redesigning, remanufacturing, and remarketing it.

Although there are numerous press reports describing the tactics of such “patent trolls,” we actually know relatively little about how common or successful holdups are. What we do know is limited to just a few industries, such as semiconductors and cellular telephony, and even those examples are disputed.

Why the mystery?

The reasons why our knowledge about patents is so limited and why we have not even begun to collect sufficient data are numerous. Many stem from overly simplified, idealized understanding of how patents work. Patents are commonly understood to be protections against theft by unscrupulous imitators. And although they are often seen as an affirmative right to exploit technology, in fact a patent is a right to prevent the use of the patented invention. Thus, a patent holder can be blocked from using his or her own patented invention because of patents owned by others.

The patent system is a form of government regulation, but it regulates indirectly, and mostly out of public view. The U.S. Patent and Trademark Office (PTO) grants patents as

a private right, and it is up to the patent owner whether and how to assert the right. Thus, patent issues are framed narrowly within disputes arising between two parties under particular circumstances. And the overwhelming number of these conflicts go undocumented because they stop well short of being litigated in court.

Economic considerations play no explicit role in the patent system unless and until the ultimate train wreck occurs—that is, when litigation results in a finding of infringement and damages need to be calculated. In a rights-based legal system managed by specialized lawyers, patents tend to be seen as absolute entitlements: as ends in themselves rather than as tools for promoting innovation. The PTO focuses all its attention on the original decision to deny or grant a patent. Once patents go out the door, the PTO does not attempt to monitor their value, to document how they are used, or to uncover how they are abused.

A dearth of information on assertions, licensing contracts, settlements, and other business aspects of patents means that there is little empirical foundation on which to develop sound policy. Practically all we know about these business activities is anecdotal. This is of little help when each patent is, by definition, unique, and when the business context varies so greatly.

For all the talk of “patent quality,” there is no consensus on what that term means or how it can be measured consistently, let alone how problems with quality should be fixed. Deep confusion exists over the obligation of technology creators and users to read, assimilate, and evaluate the massive database of current patents in order to avoid infringement.

Even at the level of individual patents, there is often considerable uncertainty about where the boundaries lie, whether the patent is valid and enforceable, and whether a particular product actually infringes. Patents are intended to disclose new knowledge to the public, but they are written by lawyers for lawyers. If you want to know what the patent means and whether it is valid, you need legal assistance. If you want to know whether your product infringes, you are advised to get a legal opinion. In 2007, the average cost of a legal opinion on validity cost \$13,000. A legal opinion on whether a product infringes costs another \$13,000.

But \$26,000 does not buy certainty. Because the interpretation of claims at trial is reversed on appeal one-third to one-half of the time, it is difficult to see how our patent system provides adequate notice of existing or pending property rights to other inventors and the public in general. With this uncertainty and the sheer volume of patenting in some fields, inadvertent infringement inevitably becomes a nearly unavoidable hazard for innovators seeking to bring

complex products and services to the marketplace.

The lack of information on the cost-effectiveness of the patent system is inexcusable for a government function that has come to play such a pervasive role in today’s knowledge-driven economy. Although patent policy is inevitably determined via the adjudication of lawsuits, judges lack an adequate framework for evaluating the efficacy of the system as a whole. Judges correctly point to Congress as the proper arbiter of policy, but Congress also is bedeviled by a lack of adequate data. Besides, Congress is burdened with more politically salient issues.

Thus, individual patent cases are decided because they must be, while meaningful policy decisions are deferred for lack of data. No institution has the responsibility to collect data on patents and how they are used, and no organized constituency demands it. There is constant pressure to keep patent application fees low to encourage more patenting, but the much higher legal and business costs of patent practice and litigation are not officially monitored or measured.

Data needs

We need a patent database that, like a land title registry, shows a chain of title and tells us who has what interests in the patent. We need unique identifiers for assignees and a database that tells us whether an assignee is independent or owned by another firm.

It would be useful to have estimates of the number of innovations firms make, what proportion they choose to patent, and with how many patents. We need an understanding of how innovators cope with the problem of inadvertent infringement, especially in areas such as software, where low barriers and/or intense competition result in prolific, widespread innovation at many levels of granularity and abstraction.

We need to know about the life of patents after they are issued and before they become a matter of public record in litigation, because many are asserted or licensed in some form but never fully litigated. It would help to know the frequency and cost of searching patents and other prior art to avoid infringement, the frequency of letters putting innovators on notice of patent claims, and the outcomes of those letters. We need information on the number and terms of settlements, patent-licensing agreements, and transfers of patents. We need to know whether these agreements are really manifestations of technology transfer or capitulation to legal bullying. Although gathering such information must respect the need for confidentiality in some aspects of business practice, acquiring and analyzing as much data as possible is essential to understanding and promoting the efficiency

of our nascent markets for technology.

R&D and patent information is generally available for larger publicly held firms, but newer and smaller firms are underrepresented in the available databases. And although the Census Bureau collects data on R&D for smaller firms, accessing these data can be difficult. This is unfortunate, because our understanding of the implications of intellectual property on decisions to form and invest in new companies is essential to understanding the growth of the economy.

Most of the existing databases focus on manufacturing firms, which are traditionally the predominant users of the patent system and where there is a consensus about the definition of R&D. But with more permissive standards for patentable subject matter, service firms have increasingly turned to patents for business models and practices. The service sector, which accounts for the majority of economic output, can no longer be ignored simply because it is difficult to determine what should be considered R&D in a service firm. If our definitions of R&D require refinement, we should begin that process today.

Where should economic insight be built into the system? At one level, investors need meaningful reporting about patents as sources of value as well as potential liability. But we also need statistical reporting that helps us understand how well patents work to promote innovation in different fields. Indeed, the Department of Commerce has already launched an effort to develop metrics for innovation, and better patent data could be a key component.

Perhaps the most obvious solution is to ask the PTO to assume greater responsibility and accountability for the performance of the system. To its credit, the PTO has just announced that it is hiring a chief economist—a step that is long overdue. But will it be possible for the insights of the chief economist to counterbalance the demands of hundreds of thousands of patent applicants and their attorneys for making patents easy to get? The PTO's commendable efforts at reforming the application process have already met a

tidal wave of opposition.”

To insulate economic analysis from political influence or capture by particular patent interests, an autonomous institute could be established, perhaps housed in the PTO but independent of PTO administrators. This institute could be a critical resource not only for the PTO in its advisory functions but also for Congress, the courts, and other agencies.

To ensure independence, the institute could be overseen by a council of agencies with an interest in innovation, along with an advisory board that represents the best disinterested experts as well as the “users” that make up the PTO's present public advisory committee. This institute would craft and support a research agenda to advance our understanding of the crucial tradeoffs involved in our efforts to improve the functioning of the patent system. The institute might be funded by a very small share of patent maintenance fees, which presently bring in over \$500 million a year, and most of the research would be performed through grants or contracts.

This modest step would advance knowledge about patents and their effects on knowledge, technology, and innovation—the very heart of today's economy. It would help give credence to the rhetoric we often repeat as a matter of faith: that patents are tools for innovation and economic growth. Tools need at times to be calibrated, sharpened, and augmented. Sometimes, they may need to be traded for other tools better suited to the problem at hand and with fewer unintended side effects.

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