Summary

Low-Quality Patents in the Eye of the Beholder: Evidence from Multiple Examiners

A comparative study of quality across the five largest patent offices

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Prof. Gaétan de Rassenfosse

École polytechnique fédérale de Lausanne (EPFL), Chair of Innovation and IP Policy,
College of Management of Technology, Lausanne, Switzerland.
Website: http://www.gder.info
Twitter: @gderasse

Prof. Adam B. Jaffe

Director and Senior Fellow, Motu Economic and Public Policy Research; Adjunct Professor, Queensland
University of Technology; Economic and Social Systems Research Theme Leader,
Te Punaha Matatini Centre of Research Excellence.

Prof. Elizabeth Webster

Centre for Transformative Innovation, Swinburne University of Technology, Victoria, Australia.

Abstract

A low-quality patent system threatens to slow the pace of technological progress. Concerns about low patent quality are supported by estimates from litigation studies suggesting that the majority of patents granted by the U.S. patent office should not have been issued. In a recent paper, we propose a new way of measuring patent quality, based on twin patent applications granted at one office but refused at another office, applied to the five largest patent offices. Our method allows us to distinguish low-quality patents issued because an office has a low standard from patents issued in violation of an office's own standard, however high or low (so-called 'weak patents' in the scholarly literature). The results suggest that quality in patent systems is higher than previously thought; in particular the percentage of 'weak' patents is in single digits for all offices, although the U.S. patent office's performance is poorer than those of Europe and Japan.

Introduction

Concern that the patent system inhibits rather than encourages innovation has become a staple of the business and technology press. A major source of concern is that patent offices may grant too many low-quality patents, whose existence can chill the R&D investment and commercialization processes, either because of background uncertainty about freedom to operate or because of implicit or explicit threats of litigation.

Concern about patent quality is by no means new. But in the last few decades, significant increases in the number of patent applications granted and the frequency of patent litigations, as well as media attention such cases have received, have given these concerns new force. Major patent offices are well aware of the problem and several of them have initiatives underway aimed at improving the quality of patent review. For example, the U.S. Patent and Trademark Office (USPTO) now has an Office of Patent Quality Assurance and has recently initiated an ongoing online 'patent quality chat.'

We interpret concern about low-quality patents as corresponding to concern that patents are being granted whose inventive step is too small to deserve patent protection. Conceptually, there are two pathways by which this may be occurring. A first source of low quality in a patent system relates to the fact that patent offices might *systematically apply a standard that is too lenient*, relative to some conception of optimal stringency. Some of the discussion of the patent quality problem, particularly in the United States, has this flavor. In their book, Jaffe and Lerner, for example, argue that changes in the incentives of the USPTO, the U.S. courts, and U.S. patentees over the 1980s and 1990s led to a systematic lowering of the standard for a U.S. patent grant.[1]

A conceptually distinct source of low quality in patent system is mistakes—*granting patents that in actuality do not meet the office's own implicit standard*, however high or low that standard may be. Observers of the patent system also discuss this issue. For example, Lemley and Shapiro write: "There is widespread and growing concern that the Patent and Trademark Office issues far too many 'questionable' patents that are unlikely to be found valid based on a thorough review."[2] Although there are clear patentability requirements and patentable subject matters, flaws in the examination process and in the governance of patent offices affect the quality of the examination process. More generally, the grant decision rests ultimately on a subjective comparison of the application's inventive merit and the office's standard for novelty. Perfect consistency of decision-making seems unlikely to be the outcome of such a process.

The practical and normative consequences of these different sources of low quality are different. Systematically low standards create monopoly power and transfer rents in

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[1] Jaffe, Adam B. and Josh Lerner (2004). *Innovation and Its Discontents: How Our Broken Patent System is Endangering Innovation and Progress, and What to Do About It*. Princeton: Princeton University Press.

[2] Lemley, M. A., & Shapiro, C. (2005). Probabilistic Patents. *Journal of Economic Perspectives*, 19(2), 75–98.

situations where the triviality of the invention arguably does not justify the reward. But low standards consistently applied are not, logically, a source of uncertainty about which patents are truly valid—so long as the patent office and the courts are applying exactly the same standard. Such uncertainty only comes about if standards are not applied consistently. Scholarly literature refers to patents that were granted because standards were not applied consistently as 'weak' patents. It argues that the litigation threat that they pose reduces welfare by leading consumers to pay supra-competitive prices due to the public good nature of challenging a patent.

Research objective and findings

We propose a formal model that attributes inconsistent patent examination decisions across offices to systematic differences in offices' propensity to grant applications (capturing *de facto* policies and practices) or mistakes by one or another office. We then use novel data on multiple examination outcomes for the same invention in different patent offices to estimate the magnitude of these sources of inconsistency. Our data are derived from a population of about 400,000 inventions with linked patent applications that have been examined in at least two of the five major patent offices, covering in total more than a million applications. The premise of our model is that a refusal by an examiner in one jurisdiction raises doubts with regard to the legitimacy of the patent grant secured elsewhere (of course, the model allows for other "legitimate" factors to affect differences in the grant decision across offices). In particular, we estimate a statistical model of the grant process that captures parametrically the effect of observable application attributes on the grant probability, the effect of systematic differences in propensity to grant applications across offices, and the possibility of personal (*i.e.*, examiner) discretion in every decision.

We find that systematic differences across offices appear to be larger than within-country inconsistency of decisions, but such inconsistency is present to varying degrees across countries. The model estimates imply that only 2–6 percent of granted patents have dubious validity in the specific sense that they appear to be inconsistent with the country's own standard for patent grant (what we call a weak patent). The model allows us to interpret how accurate the screening at the office is according to its own *de facto* standard. Should the EPO take random grant decisions, we estimate that it would grant 5.8 times as many weak patents as it currently does. The relative accuracy rates at the other offices are 2.15 (USPTO), 3.25 (KIPO), 4.8 (JPO) and 2.3 (SIPO), which implies that the EPO and JPO are the most accurate offices and the USPTO and SIPO the least accurate.

An additional 2-15 percent can be thought of as low-quality in the sense that they would not have been granted by the strictest office. Patent offices in China and the United States appear to be the most lenient offices, and the Japan patent office the strictest, closely followed by the EPO. While these estimates are of interest in their own rights, given the difficulty in measuring patent quality, they also inform policy discussion. In particular, our results have important implications for current international agreements between patent offices and for discussions about how to fix the patent system.

Implications

The (much) lower rates of weak patents obtained with our method compared to litigation studies can be explained by four factors. First, litigated patents are highly selected towards those most likely to be found invalid. Second, litigation studies implicitly assume that courts apply the same standard as that of the office whose grant is being reviewed, and do not make mistakes themselves. In practice, it is possible that courts systematically apply a stricter standard for validity than the patent office—and make mistakes themselves. Third, although patent applications in our sample are examined by up to five examiners from very different cultures and language groups, every examiner spends considerably less time than if the patent were re-examined in litigation. Finally, review by a court is fundamentally different from review by another examiner because the court review is an adversarial proceeding. It is possible that there is prior art that no patent examiner will ever find, but which the adverse party is able to bring to the court's attention. Thus overall our results provide a different perspective on patent quality and should be viewed as complementary to those of litigation studies rather than directly comparable.

The magnitude of the difference between the figures presented in this paper and the figures obtained using patent litigation data bear important implications for discussions about patent quality. One difficulty in interpreting the difference is that we do not know how much of it might be due to selection bias in the litigation studies. But if we assume for the sake of argument that invalidity in the view of the courts is truly significantly higher than invalidity in the view of the offices, we can make four general points. First, much of the debate around quality focuses on improving examination. Our results suggest that this effort is somewhere between misguided and only marginally useful. Second, some of the debate has a flavor of the United States, in particular, having a low standard. Our results suggest that while it is true that the U.S. standard is somewhat low, raising it to the level of the highest country would have only a modest impact. Third, more generally, the tone of the debate is frequently that the uncertainty around validity is the patent offices' fault. Our results suggest rather that it is inherent in the examination process that a non-trivial number of invalid patents will be approved. Finally, we bring into sharp focus the question of *why* courts are more likely to invalidate than examiners. To the extent that it is because of the adversarial nature of litigation, the finding brings the question of how to best to organize re-examination processes that are undertaken within offices. But if it is because judges are fundamentally tougher than examiners, the finding raises deeper questions about administrative law, since judges are not supposed to apply different standards.