Are the U.S. Patent Priority Rules Really Necessary?

by
MARK A. LEMLEY* & COLLEEN V. CHIEN**

Introduction

The United States is the only country in the world that awards patents to the first person to invent something, rather than the first to file a patent application. In order to determine who is first to invent, the United States has created an elaborate set of "interference" proceedings and legal standards to define invention and decide how it may be proven. Supporters of this system claim that it is necessary to protect small inventors, who may not have the resources to file patent applications quickly, and may therefore lose a patent race to large companies who invented after they did.[1] Advocates of global

* Professor of Law, Boalt Hall, University of California at Berkeley; of counsel, Keker & Van Nest LLP.

** Associate, Fenwick & West.

We would like to thank Jim Hirabayashi at the U.S. Patent and Trademark Office (PTO) for his significant assistance in collecting small entity data, Dale Shaw at the Board of Patent Appeals and Interferences for his helpful explanations of the BPAI's processes and procedures, and Bob Cooter, Rose Hagan, Jay Kesan, Arti Rai, and Jay Thomas as well as participants at the University of Washington High Technology Protection Summit, the Intellectual Property Scholars' Conference, and a workshop at the Haas School of Business, University of California at Berkeley for helpful discussions and comments on an earlier draft.

[1] *See, e.g.*, Dana Rohrabacher & Paul Crilly, *The Case for a Strong Patent System*, 8 HARV. J. L. & TECH. 263 (1995); 140 CONG. REC. H11,450, 11,456 (daily ed. Nov. 29, 1994) (statements of Reps. Bentley & Rohrabacher opposing harmonization as demanded by Japan and permitting big Japanese and multinational corporations to steal the patent rights of American inventors); John Paul Baremore, *Don't Shoot the Messenger: Congress and the Prospect of Patent Harmonization*, 44 LOYOLA L. REV. 761, 781 n.101 (1999) (reprinting a letter from many Nobel laureates arguing that patent harmonization will hurt small inventors); Jeffrey E. Robertson, *If it Ain't Broke, Don't Fix It: The Unnecessary Scope of Patent Reform as Embodied in the "21st Century Patent System Improvement Act" and "The Omnibus Patent Act of 1997,"* 5 J. INTELL. PROP. L. 573 (1998). For

patent harmonization have suggested, however, that the first inventor is usually also the first to file,[2] and that the first-to-invent standard is unnecessary and wasteful.[3]

In this Article, we study U.S. Patent and Trademark Office ("PTO") interference proceedings and court cases in which the parties dispute who is first to invent. We find that the first person to file is usually, but by no means always, also the first to invent. In over 40% of the cases, the first to invent is last to file. We also find that the long-standing rule that discriminated against foreign inventors by requiring proof of inventive activity in the U.S. had surprisingly little effect on outcomes; that a large number of priority disputes involve near-simultaneous invention; and that the vast majority of such disputes could be resolved without reliance on much of the evidence the law permits. Finally, we study the role of small inventors to see whether they are disproportionately the beneficiaries of the first to invent system. While the evidence is mixed, it does not appear that small inventors particularly benefit from the first to invent system.

Part I describes the legal background for the international debate over how to determine patent priority. Part II describes our studies and discusses our results in detail. Finally, Part III draws conclusions for policy-makers from the data. There is some truth to the arguments of both sides in this debate. The first to invent system

other arguments in favor of the first to invent system, see Kevin Cuenot, *Perilous Potholes in the Path Towards Patent Law Harmonization*, 11 U. FLA. J. L. & PUB. POL'Y 101, 114 (1999).

On the other hand, a recent study by the General Accounting Office found that more than 70% of small businesses supported patent harmonization as a way to reduce the aggregate costs of worldwide intellectual property protection. United States General Accounting Office, *Federal Action Needed to Help Small Businesses Address Foreign Patent Challenges* 1 (July 2002).

[2] *See, e.g., The Patent Harmonization Act of 1992: Hearings on H.R. 4978-S.2605*, Joint Hearings Before the Senate Judiciary Subcommittee on Patents, Copyrights and Trademarks and the House Judiciary Subcommittee on Courts, Intellectual Property and Administration of Justice, 102d Cong., 2d Sess. 83 (1992) (statement of Robert P. Merges).

[3] *See, e.g.*, Toshiko Takenaka, *Rethinking the United States First-to-Invent Principle From a Comparative Law Perspective: A Proposal to Restructure §102 Novelty and Priority Provisions*, 39 HOUS. L. REV. 621 (2002) (arguing that the differences between the systems are smaller than generally perceived, and that a first to file system would not substantially change U.S. law); Peter A. Jackman, *Adoption of a First to File Patent System: A Proposal*, 26 U. BALT. L. REV. 67 (1997). *But cf.* John F. Duffy, *Harmony and Diversity in Global Patent Law*, 17 BERKELEY TECH. L.J. 685 (2002) (questioning the value of patent harmonization, though not specifically the efficiency of first to file).

does produce significantly different results in individual cases than a first to file system would. But it is not clear that those different results are particularly fairer, or that they are worth the cost. We suggest some possible ways to modify the U.S. system to take account of these facts without changing entirely to a first-to-file system.

I. The Politics of Patent Harmonization

The United States has long been a maverick in the intellectual property world. We spent most of our history as a pirate nation,[4] with rules that intentionally discriminated against foreign intellectual property in order to benefit domestic industries.[5] Besides intentional discrimination, U.S. intellectual property rules are frequently at odds with those in the rest of the world. The U.S. failed to adhere to the Berne Convention for almost 100 years because we did not want to relinquish our insistence on the formalities of notice, registration, publication and deposit in copyright.[6] Even after U.S. adherence to Berne in 1989, the United States failed to adopt effective protection for moral rights, as the rest of the world does and as Berne requires.[7] In trademark, the United States is one of the only nations to require proof of use in commerce rather than trademark registration for proof of priority.[8] There are other, more subtle differences, such as the

1. *See, e.g.*, ROBERT A. GORMAN & JANE C. GINSBURG, COPYRIGHT: CASES AND MATERIALS 9, 10 (1999) (describing the U.S. as a "pirate nation" for the first century of its existence); JAMES J. BARNES, AUTHORS, PUBLISHERS AND POLITICIANS: THE QUEST FOR AN ANGLO-AMERICAN COPYRIGHT AGREEMENT, 1815-1854 (Ohio State University Press, 1974) (describing this history in detail); Peter Yu, *The Copyright Divide: A Comparative Inquiry into the Causes of Massive Copyright Piracy* (working paper 2002).

5. For discriminatory provisions in U.S. IP law, see domestic production requirements in copyright, *see* 17 U.S.C. § 601 (2002). *See also*, onerous rules for notice and local registration that forced many foreign copyright owners to forego protection in the U.S. 17 U.S.C. §§ 401, 405, 407, 408 (2000); *see also*, rules that gave priority to inventions made in the U.S. rather than abroad. 35 U.S.C. § 102(g) (2000). To some extent those rules are still in force. *See, e.g.*, 35 U.S.C. § 102(a), (b) (2000) (favoring prior use within the U.S.); §102(g) (2000) (focusing on use within the U.S. for some kinds of priority contests).

6. The Berne Convention was promulgated in 1891, but the U.S. did not adhere to it until 1989. Berne Convention Implementation Act of 1988, Pub. L. No. 100-568, 102 Stat. 2853, 2853-2861 (1988).

7. *E.g.*, Graeme B. Dinwoodie, *The Development and Incorporation of International Norms in the Formation of Copyright Law*, 62 OHIO ST. L.J. 733, 740-41 (2001).

8. *See, e.g.*, Kenneth L. Port, *The Congressional Expansion of American*

rather more expansive nature of the U.S. fair use doctrine in copyright than its European "fair dealing" counterpart.[9] These differences have made international harmonization of intellectual property laws more difficult, though a number of strides have recently been made in that regard.[10]

Similar disparities have impeded even first steps towards harmonization in patent law. U.S. law has long differed in fundamental ways from the rules in the rest of the world. The U.S. traditionally awarded patents for 17 years from the date of the patent grant, while the rest of the world protected patents from the date of grant until 20 years after the application was initially filed.[11] The U.S. until recently kept all patent applications secret, while the rest of the world publishes them 18 months after filing.[12] The U.S. gives a one-year grace period to inventors who publish or put their invention on sale, while Europe requires that a patent application be filed before any such activity.[13] Europe has a system of prior user rights to protect those who independently develop an invention and begin using it before a patent issues; the U.S. has no analogous

Trademark Law: A Civil Law System in the Making, 35 WAKE FOREST L. REV. 827, 859-62 & n.121 (2000). In 1988, the U.S. changed its law to permit the filing of a trademark application based on an *intent* to use a mark in commerce. However, the PTO will not register a trademark until actual use has commenced. 15 U.S.C. § 1051(b)-(c) (2000).

9. *See, e.g.*, Neil Weinstock Netanel, *Asserting Copyright's Democratic Principles in the Global Arena*, 51 VAND. L. REV. 217, 233-34 & n.49 (1998) (noting the narrower nature of fair dealing and other foreign fair use counterparts).

10. U.S. adherence to the Berne Convention in 1989 enabled copyright owners in most countries of the world to obtain "national treatment" in all other member countries. Substantive minimum protection was further solidified by the 1994 GATT TRIPs agreement. On the trademark front, the slow but steady progress of the Madrid Protocol, an adjunct to the Madrid Agreement that is designed to include the U.S., has brought harmonization tantalizingly close.

11. *See, e.g.*, 35 U.S.C. § 154(a)(2), 154 (c)(1) (2000).

12. *See* 35 U.S.C. § 122(b) (2000). The provision for publication of applications after 18 months was added by the American Inventors Protection Act in 1999. It does not apply to patentees who chooses only to file an application in the U.S. *Id.*

13. *Compare* 35 U.S.C. § 102(b) *with* the "absolute novelty" rule in Europe. John R. Allison & Lianlian Lin, *The Evolution of Chinese Attitudes Toward Property Rights in Invention and Discovery*, 20 U. PA. J. INT'L ECON. L. 735, 760-61 (1999); Michael N. Meller, *Commentary on the Future Including the Need and Possibility of a Global Patent*, 9 FED. CIR. B.J. 605, 611 (2000) (describing and criticizing the absolute novelty rule). Japan, by contrast, has a six-month grace period.

system.[14] The U.S. law generally does not provide a way for competitors to oppose a patent in an administrative setting; most other countries have well-established opposition procedures.[15]

A few of these differences have disappeared – or at least lessened – in recent years.[16] But by far the most significant difference remains: the U.S. grants patents to the first person to invent, while the rest of the world gives a patent to the first person to file a patent application on a particular invention.[17] The difference

14. While Congress in 1999 adopted a "prior inventor" defense, it is extremely limited. 35 U.S.C. § 273(b)(3) (2000). It applies only to business method patents, and protects only those parties who were using the invention before the patentee invented it. By contrast, European prior user rights apply to all sorts of inventions, and cover uses that began after the patentee's invention but before the patent was published.

15. The U.S. law has long permitted any party to submit a patent for reexamination, but a third party who does so has no opportunity to participate in the subsequent administrative process. 35 U.S.C. §§304-305 (2000). Congress recently enacted an *inter partes* opposition statute, but it has such shortcomings that virtually no one seems willing to use it. 35 U.S.C. §§ 311-18 (2000). For a description of those shortcomings, see 35 U.S.C. § 315(c) (2000); Mark D. Janis, *Inter Partes Patent Reexamination*, 10 FORDHAM INTELL. PROP., MEDIA & ENT. L.J. 481 (2000). For a suggestion that the entire idea of post-grant oppositions is inferior to pre-grant oppositions, see Jay A. Kesan, *Carrot and Sticks to Create a Better Patent System*, 17 BERKELEY TECH. L.J. 763, 776-83 (2002).

One feature of U.S. law does create a limited sort of opposition system. Because the PTO can declare an interference with an issued patent for up to a year after issue, 35 U.S.C. §135 (2000), it is possible for a junior party who learns of a newly issued patent to file a patent application with claims identical to the newly issued patent, thus "provoking" an interference. This is not a classic opposition system, because it allows a challenge only on the basis that the junior party itself invented first, not the ground that the senior party's patent is invalid for some other reason. But it does permit administrative challenges to issued patents in some circumstances.

16. For example, the U.S. patent law now includes a 20-year term, 18-month publication, a limited prior user right, and an inter partes opposition procedure. 35 U.S.C. §§ 154(a)(2), 122(b), 271, 311-18 (2000). In each case, however, Congress so watered down the new provisions that they bear little resemblance to their foreign counterparts. Thus, the 20-year term is riddled with extensions, 35 U.S.C. § 154(b) (2000); 18-month publication is required only for inventors who also file abroad, 35 U.S.C. § 122(b)(1)(B) (2000); the prior user right applies only to business method patents, and even then only in extreme cases, 35 U.S.C. § 273(b)(3); and the opposition procedure is anemic, *see supra* note 15.

17. *Compare* 35 U.S.C. §§ 102(g), 104 (2000) *with* the European system, under which the first applicant to file is entitled to the patent. *See, e.g.*, Andrew Beckerman-Rodau, *The Choice Between Patent Protection and Trade Secret*

between the "first to invent" and "first to file" systems not only means that in some cases different people will own patents on the same invention in different countries, but also leads to radical differences in procedure. The U.S. has an elaborate legal mechanism, both in the PTO and in the courts, for determining who was first to invent.[18] The rest of the world has no analogous process. Unless the U.S. is willing to abandon the first to invent system – or unless it can persuade the rest of the world to abandon first to file[19] – we will never have a truly international patent system.[20]

Debates over international patent harmonization may seem abstract and technical. In fact, however, they have proven extraordinarily divisive and politically charged. Beginning with the shift to the 20-year patent term[21], a loose coalition of political conservatives and small inventors have challenged the process of patent reform, arguing that harmonization is a tool of large corporations and foreigners that unfairly disadvantages individual inventors.[22] This small inventor coalition has had substantial success

Protection: A Legal and Business Decision, 84 J. PAT. & TRADEMARK OFF. SOC'Y 371, 387 n.142 (2002); Rochelle Cooper Dreyfuss, *An Alert to the Intellectual Property Bar: The Hague Judgments Convention*, 2001 U. ILL. L. REV. 421, 444 n.110; Donald S. Chisum, *Intoduction*, 26 J. MARSHALL L. REV. 437 (1993). Noted patent historian Ed Walterscheid argues that the U.S. first to invent system was a historical accident that arose from competing claims to a patent on the steamboat in different states during the founding of the Republic. Edward C. Walterscheid, *Priority of Invention: How the United States Came to Have a "First-to-Invent" Patent System*, 23 AM. INTELL. PROP. L. ASS'N Q.J. 263, 291-92 (1995).

18. The PTO administers "interference" proceedings between two or more applicants who claim to be the first to invent. 35 U.S.C. § 135 (2000). In addition, a patent may be challenged in court on the grounds that the patentee was not the first to invent. 35 U.S.C. § 102(g) (2000).

19. The momentum is in the other direction. Even those few countries who once had a first to invent system, such as the Philippines, have abandoned it. *See* Gerald J. Mossinghoff, *The U.S. First-to-Invent System has Provided No Advantage to Small Entities*, 88 J. PAT. & TRADEMARK OFC. SOC'Y 425, 425 n.1 (2002).

20 *See, e.g.*, Anneliese M. Siefert, *Will the United States Take the Plunge into Global Patent Law Harmonization? A Discussion of the United States' Past, Present, and Future Harmonization Efforts*, 6 MARQUETTE INTELL. PROP. REV. 173, 184 (2002) (calling agreement on first to file the "cornerstone" of patent harmonization).

21 35 U.S.C. §§ 154(a)(2).

22. *E.g.*, Dana Rohrabacher & Paul Crilly, *The Case for a Strong Patent System*, 8 HARV. J. L. & TECH. 263 (1995); 140 CONG. REC. H11,450, 11,456 (daily ed. Nov. 29, 1994) (statements of Reps. Bentley & Rohrabacher opposing harmonization as demanded by Japan and permitting big Japanese and

in blunting initiatives for harmonization.[23] Their arguments delayed adoption of the American Inventors Protection Act for several years, and watered down a number of its provisions.[24]

The central battle between small and large inventors has been over first to file.[25] To simplify, those who advocate a first to file system point to the savings that would result from avoiding the cost and delay of interference and priority proceedings. By contrast, first to invent advocates claim that a first to file system unfairly disadvantages individuals and small companies, who may not be able to get a patent application on file as easily their larger counterparts. This policy debate centers on disputed questions of fact. Do first inventors in fact file second? If not, there is not much point to the first to invent system. Are small entities likely to be the ones who take advantage of the process? If not, the fairness arguments raised by small inventors are less persuasive.

Our objective in this paper is to shed some evidentiary light on this debate. We study both the outcomes of interference and priority proceedings and the entity status of participants in those proceedings. We discuss our findings in detail in the following section.

---

multinational corporations to steal the patent rights of American inventors); James J. Barta Jr., *Death of a Superior Intellectual Property Law System*, 17 ST. L. U. PUB. L. REV. 383 (1998). For a discussion of the political debate, see John F. Duffy et al., *Early Patent Publication: A Boon or Bane? A Discussion on the Legal and Economic Effects of Purchasing Patent Applications After Eighteen Months of Filing*, 16 CARDOZO ARTS & ENT. L.J. 601, 604 (1998); Stephanie Gore, *"Eureka! But I Filed Too Late . . .": The Harm-Benefit Dichotomy of a First-to-File Patent System*, 1993 U. CHI. L. SCH. ROUNDTABLE 293; Mark A. Lemley, *An Empirical Study of the Twenty-Year Patent Term*, 22 AIPLA Q.J. 369 (1994). It is one of the curious facts of patent politics that conservative politicians are arguing that big companies are conspiring to hijack the political process, while liberals are defending the interests of those corporations.

23. On the power of the small inventor as an icon, see Mark D. Janis, *Patent Abolitionism*, 17 BERKELEY TECH. L.J. 899, 910 (2002).

24. *Id.* at 918-19 (changes in the AIPA "bear the unmistakable influence of lobbying on behalf of independent inventors."). For a discussion of the watered-down provisions, see *supra* notes 14-16 and accompanying text.

25 *See, e.g.*, Donald S. Chisum, *The Harmonization of International Patent Law*, 26 J. MARSHALL L. REV. 437, 440 (1993); Robert W. Pritchard, *The Future is Now – The Case for Patent Harmonization*, 20 N.C. J. INT'L L. & COM. REG. 291, 300 (1995) (attributing the Clinton Administration's refusal to push first to file to its fear of upsetting small inventors).

II. Who Files – and Who Wins – Priority Contests?

A. Our Data

We collected two different datasets for purposes of this study. First, we collected reported decisions involving priority disputes for the period of 1990 through 2001. Specifically, we included final adjudications on priority reported on either Lexis or Westlaw and made by the PTO's Board of Patent Appeals and Interferences (BPAI) or by a federal court.[26] We identified cases with keyword searching, using the terms, "102(g)" and "priority," and found 118 such reported opinions.[27] Eighteen of those decisions were not pure decisions on the merits, but procedural or intermediate rulings (such as a denial of a preliminary injunction) that did not ultimately resolve the priority issue. This left 100 "clean" cases to consider. Of these cases, 76 were actually decided by determining who the first inventor was. The remaining 24 cases were decided on grounds that did not require resolution of the priority dispute. In all but one case, this was because the adjudicator determined that the two inventions were not identical.[28]

For each of these cases, we determined who adjudicated the case, whether the junior or senior party won,[29] the grounds on which they won,[30] when (in the period) the decision was rendered, the

26. Specifically, we included in the "court" category decisions by the Federal Circuit, the federal district courts, the International Trade Commission (ITC) or the Court of Claims.

27. 26 of the 118 total cases were from the BPAI, 52 were from a federal district court, 35 were from the Federal Circuit, and the remaining 5 were from the ITC or the Court of Claims. Where a case was litigated at multiple levels, we report the appellate rather than the board or district court result.

28. In the one other case, no clear basis was provided by the court.

29. Throughout, we refer to the senior party as the first to file an application and the junior party as the second to file.

30. The possible grounds we identified were: (1) a non-priority basis, e.g. that the two inventions were not identical (2) that the winner was first to reduce to practice, (3) the winner was first to conceive but last to reduce to practice, (4) the losing party lacked diligence, (5) the losing party abandoned, suppressed or concealed the invention, and (6) another basis or no listed basis. In a number of cases, the finder of fact ruled on two or more of these grounds. In such a circumstance, we classified the case in the category which most clearly represented the grounds for victory.

In addition, we also categorized these bases into circumstances in which a party won by its own efforts (proof of earlier reduction to practice or proof of conception plus diligence) and those in which a party won due to the other's negligence (lack of diligence or abandonment, suppression or concealment).

evidence each party relied upon,[31] relevant dates of senior and junior invention where available, and whether there was a foreign inventor. For appellate decisions, we also noted the source of the decision below and whether it was affirmed or reversed.

This first data set is a population study, rather than a sample. That is, we did not select a few cases at random from a larger group. Rather, our data include *all* the cases that meet our criteria – a written decision available online that produced a clear winner. As a result, there is no need to predict the characteristics of a larger population; we have determined its characteristics.[32]

Our second dataset involved only interference proceedings available on the BPAI website. The BPAI website[33] provides some but not all board decisions, both published and unpublished, from approximately 1997 until the present. There are approximately 7,000 decisions indexed on the BPAI web page, but only several hundred were interference decisions.[34] We randomly selected 190 interference decisions from this group, and attempted to determine the nature of the entities involved in the interference. We used two different methodologies to identify entity status. First, in the subset of cases in which the PTO could provide us with small entity data,[35] we classified the applicants into the statutory categories of individual, small business, non-profit group, and large business. In an independent analysis we also attempted to determine small entity status by observation, assuming that unassigned patents belonged to individual inventors and that non-public companies should be

31. The categories here were (1) a senior party won by relying on its filing date, (2) a senior party won by relying on earlier proof of reduction to practice, (3) the senior party relied on conception date, (4) the senior party relied on both conception date and reduction to practice, (5) the junior party relied on reduction to practice, and (6) the junior party relied on both conception and reduction to practice.

32. Of course, the relevant population is priority disputes decided between 1990 and 2001. It is not necessarily predictive of the outcome of future cases.

33. http://www.uspto.gov/web/offices/dcom/bpai/bpai.htm (last visited Mar. 25, 2003).

34 There are more decisions here than in our population study because many BPAI decisions are not published and because the BPAI database includes resolution of cases short of actual determination of the priority question, for example by procedural default.

35. For privacy reasons, the PTO only releases small entity data for applications that mature into patents. However to avoid biasing our database by only including the status of "winners," we gathered status data where the particular application matured into a patent *and* where an application was associated with a parent patent for which data was available.

considered small businesses.[36] We also attempted to determine which party initiated the interference, whether parties of like size were matched against each other, whether the interference went to litigation, and the outcome when it did go to litigation.[37] We present the results of both studies in the next section.

B. Results

(1) Junior vs. Senior Winners

(a) First Inventors in Litigated Cases are Often Last to File

Who wins interferences has been a matter of significant debate. The central justification for the first to invent system is a judgment that the first inventor may not be the first to file a patent application. If there were no variance between the results of the two systems, there would be no reason to undertake the cost and delay of a priority inquiry. Advocates of a first to file system occasionally suggest that there is essentially no benefit to the first to invent system because few first inventors are in fact second to file.[38] Some of these statements are based on statistical assumptions that are dubious at best.[39] The data suggests that interferences are litigated to judgment

36. This methodology is imperfect for several reasons. Some patent applications that are not assigned at the time of filing are later assigned before issuance. Some patent applications may have been assigned but their assignment was not reported by the BPAI in its opinion. And some large companies are not publicly traded, and so will improperly be listed as small companies.

37. Because this is a sample study, we are necessarily trying to predict the characteristics of the larger population of all interference proceedings. Unfortunately, because the cases on which we have entity status data may not be random, we cannot predict with statistical confidence that the results of our sample are representative of the population of overall interference proceedings.

38. *See, e.g.*, Peter A. Jackman, *Adoption of a First to File Patent System: A Proposal*, 26 U. BALT. L. REV. Summer 1997, at 67, 84 (arguing that 99.9% of cases don't involve priority disputes, and in most cases the outcome is the same anyway); Interview with TECH TRIB: Todd Dickinson, at http://www.ct.org/News/TechTribune.asp?Path=3 (same). *Cf.* Charles L. Gholz, *First-to-File or First-to-Invent?*, 82 J. PAT. & TRADEMARK OFF. SOC'Y 891 (2000) (supporting first to file system for other reasons).

39. For example, Dickinson argues that 99% of all priority disputes are resolved on the basis of who is first to file. cite. But he assumes that any case in which there is no priority challenge was in fact a victory for the first filer. This is wrong. In the vast majority of patents there is no priority contest at all, and so no one to lose. Only in the subset of cases in which priority is actually disputed can we judge the relationship between filing and invention.

in about the same percentage of applications as infringement suits are litigated to judgment once a patent issues.[40] So the fact that there are relatively few interference decisions does not prove that there are no priority contests any more than the fact that there are even fewer patent infringement decisions proves that there is no infringement occurring in the world. Rather, it demonstrates only that in administrative as well as judicial settings, relatively few parties take their disputes all the way to court.

In fact, notwithstanding these extravagant claims that the system doesn't matter, our data show that junior parties won a surprisingly large percentage of the cases litigated to judgment in the last ten years. The data are presented in Table 1.

TABLE 1

OUTCOME OF PRIORITY CONTESTS BY SENIOR STATUS

JR. V. SR. STATS	Total Clean Cases	Jr.	Sr.
All Cases	100	33	67
Apellate Cases	30	16	14
Dist Ct Cases	44	10	34
BPAI Cases	26	7	19
^True Priority Contests	76	33	43
^True Priority Contests = Clean cases excluding cases decided on the basis that the 2 inventions are not identical or where no basis for decision is provided			
JR. V. SR. %	Total Cases	Jr.	Sr.
All Cases	100%	33%	67%
Apellate Cases	30%	53%	47%
Dist Ct Cases	44%	23%	77%
BPAI Cases	26%	27%	73%
^True Priority Contests	76%	43%	57%

40. Only about 2% of all patents are ever litigated, and only 0.2% of all patents actually go to trial. *E.g.*, Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1501 (2001). Similarly, Gerald Mossinghofff reports that 2,858 interference cases [representing at least 5,700 applications, since each interference includes two or more patent applications] went to decision between 1983 and 2000. Mossinghoff, *supra* note 19, at 427. This represents about 0.25% of all the applications filed during that period. [Mossinghoff's lower statistic reported in text—0.1%—is incorrect because he does not account for the multiple applications that are necessarily at issue in any interference.]

Of the 100 cases in our population that have final outcomes, junior parties won 33, or 33%. More significantly, in the 76 cases that are actually resolved on priority grounds, junior parties won 33, or 43%.[41] Thus, it seems that when priority is actually adjudicated, the first to invent is quite frequently not the first to file.[42]

Table 1 also breaks the cases down by the type of adjudicator. Interestingly, junior parties are more likely to prevail the higher the tribunal they encounter. Of the 26 BPAI decisions in our dataset, only 7 (or 27%) were decided in favor of the junior party. Of the 41 district court decisions, only 10 (or 24%) were decided in favor of the junior party. Of the 30 Federal Circuit decisions, fully 16 (or 53%) were decided in favor of the junior party. These results are particularly striking given that the burden of proof is heavier on the junior inventor in court cases that challenge the validity of a patent than in Board cases that adjudicate rights between two applicants.[43] The absence of a difference between BPAI and district court decisions may also provide some weak evidence against the use of specialized trial courts in patent cases:[44] the specialized judges of

41. Most of the remaining 24 nonpriority cases are ones in which the adjudicator ultimately determined that the two inventions were not identical, and so there was no interference. It also includes a few cases in which the junior party's invention was unpatentable for reasons unrelated to priority. In these cases, the senior party is the winner, but the cases shed no light on who was the first to invent.

42. These results are almost identical to the only other study on the issue, published 15 years ago, which found that junior filers won priority disputes 42.7% of the time. *See* Mark T. Banner & John J. McDonnell, *First-to-File, Mandatory Reexamination, and Mandatory "Exceptional Circumstances": Ideas for Better? Or Worse?*, 69 J. PAT. & TRADEMARK OFF. SOC'Y 595, 602 (1987).

43. This is a function of the statutory presumption of validity, which can only be overcome by clear and convincing evidence. 35 U.S.C. § 282 (2000); Apple Computer v. Articulate Systems, 234 F.3d 14, 26 (Fed. Cir. 2000). By contrast, interference proceedings between applicants place a lower burden of proof on the junior party. *See* Brown v. Barbacid, 276 F.3d 1327, 1322 (Fed. Cir. 2002).

Not all Board cases involve two applicants, however; junior parties can challenge issued patents at the Board for one year after publication or issue. 35 U.S.C. § 135(b). Further, some of the appellate cases involve appeals from Board decisions rather than district court cases, and so involve the lower burden of proof. Of the 30 clean, priority-based Federal Circuit decisions in our study, 10 were appeals from interference proceedings and 20 were appeals from district court 102(g) decisions.

44. For a suggestion that specialized trial courts should be used in patent cases, see Arti K. Rai, *Specialized Trial Courts: Concentrating Expertise on Fact*, 17 BERKELEY TECH. L.J. 877 (2002).

the BPAI don't appear to reach different outcomes than judges and juries in the court system at large.

(b) Litigation Selection Effects Cannot Explain Our Findings

Before concluding that first inventors are often last to file, however, we should consider another possible explanation: that the outcomes are an artifact of litigation selection effects. In an influential article, Priest and Klein suggested that cases should be litigated to judgment only where they are close enough or the law uncertain enough that the parties vary in their assessment of the chance of winning.[45] In the absence of asymmetric information or asymmetric stakes, they predict that plaintiffs will win litigated cases about 50% of the time.[46] There is significant evidence suggesting that the Priest/Klein hypothesis does not effectively predict outcomes in many sorts of cases,[47] including substantial variance from the 50% norm in both patent validity and infringement decisions[48] as well as

45. George L. Priest & Benjamin Klein, *The Selection of Disputes for Litigation*, 13 J. LEGAL STUD. 1 (1984). Interferences should have roughly symmetric stakes, since both parties are competing to be awarded a patent of identical scope and no damage awards are possible. Validity litigation may have different characteristics. Other classic literature on selection for trial includes I.P.L. P'ng, *Strategic Behavior in Suit, Settlement and Trial*, 14 BELL J. ECON. 539 (1983); Lucian Arye Bebchuk, *Litigation and Settlement Under Imperfect Information*, 15 RAND J. ECON. 404 (1984); Kathryn Spier, *The Dynamics of Pretrial Negotiation*, 59 REV. ECON. STUD. 93 (1992).

46. Priest & Klein, *supra* note 45, at 5, 17.

47. For a review of the economic literature offering limitations and qualifications to the Priest-Klein hypothesis, see, e.g., Robert B. Cooter & Daniel L. Rubinfeld, *Economic Analysis of Legal Disputes and Their Resolution*, 27 J. ECON. LIT. 1067, 1074-75 (1989). *See also* Steven Shavell, *The Appeals Process As a Means of Error Correction*, 24 J. LEGAL STUD. 379 (1995); Samuel Issacharoff, *The Content of Our Casebooks: Why Do Cases Get Litigated?*, 29 FLA. ST. U. L. REV. 1265, 1273-74 (2002). *But see* Joel Waldfogel, *Reconciling Asymmetric Information and Divergent Expectations Theories of Litigation*, 41 J. L. & ECON. 451, 452 (1998) ("Considerable evidence supports the main prediction of the" Priest-Klein model).

48. *See* John R. Allison & Mark A. Lemley, *Empirical Evidence on the Validity of Litigated Patents*, 26 AIPLA Q.J. 185, 251-2 (1998) (patentees win validity 54% of the time, but decisions vary greatly by factfinder and procedural posture); Kimberly A. Moore, *Judges, Juries, and Patent Cases – An Empirical Peek Inside the Black Box*, 99 MICH. L. REV. 365, 385, 407 (2000) (patentees win at trial in 58% of all cases; also noting that declaratory judgment plaintiffs win substantially more than similarly situated parties who do not file suit first). The Priest/Klein hypothesis also has difficulty explaining the substantial change in patent validity litigation outcomes over time. *See* Allison & Lemley, *supra*, at 205-6 n.53

in other sorts of cases.[49] Further, Priest & Klein have difficulty explaining why decisions on appeal are systematically more likely to affirm than to reverse.[50]

Our data seem difficult to square with the Priest/Klein hypothesis. BPAI and district court decisions show a substantial bias in favor of the senior party, while appellate outcomes are roughly evenly divided.[51] One possible explanation is the presence of private

(validity rate increased from 35% to 54% after the creation of the Federal Circuit).

For economic analysis of decisions to litigate in the patent context, see, e.g., Jean O. Lanjouw & Mark Schankerman, *An Empirical Analysis of the Enforcement of Patent Rights in the United States*, working paper 2002; Deepak Somaya, *My Strategy Says "See You in Court!" Determinants of Decisions not to Settle Patent Litigation in Computers and Research Medicines*, working paper 2001.

49. *E.g.*, Peter J. Hammer & William M. Sage, *Antitrust, Health Care Quality, and the Courts*, 102 COLUM. L. REV. 545, 576 (2002) (plaintiffs win only 16% of medical antitrust cases, and only 9% of staff privilege cases); Andrew T. Guzman, *Litigation and Settlement at the WTO* (working paper 2002) (finding that complainants win 90% of all WTO panel disputes, and offering a model to explain this asymmetry).

50. In general, trial decisions are affirmed about 70-75% of the time on mandatory review. *See, e.g.*, J. WOODFORD HOWARD JR., COURTS OF APPEALS IN THE FEDERAL JUDICIAL SYSTEM: A STUDY OF THE SECOND, FIFTH AND DISTRICT OF COLUMBIA CIRCUITS (1981); Donald R. Songer et al., *Do the "Haves" Come Out Ahead Over Time? Applying Galanter's Framework to Decisions of the U.S. Courts of Appeals, 1925-1988*, 33 LAW & SOC'Y REV. 811, 819 tbl.2 (1999). Indeed, the affirmance bias is so strong that evidence that the Federal Circuit reverses about 1/3 of all claim constructions, *see* Christian A. Chu, *Empirical Analysis of the Federal Circuit's Claim Construction Trends*, 16 BERKELEY TECH. L.J. 1075, 1104 (2001), Kimberly A. Moore, *Are District Court Judges Equipped to Resolve Patent Cases*, 15 HARV. J. L. & TECH. 1, 14 (2001), created a firestorm of complaints that the reversal rate was too high. Under a Priest/Klein model, it is difficult to explain why parties likely to lose on appeal haven't settled. There may be other explanations, of course: appeals are not nearly as costly as trials, and the appellant may see the delay associated with the appeal as a benefit.

The numbers are different where review is discretionary, of course, as in many Supreme Courts. Courts that can choose which cases to take are more likely to review opinions that are controversial or with which they disagree. *See, e.g.*, James E. Bond & Kelly Kunsch, *A State Supreme Court in Transition*, 25 SEATTLE U. L. REV. 545, 549 (2002).

51. One conclusion from our data that *is* consistent with Priest/Klein, *supra* note 45, is the fact that burden of proof seems to make little difference to the outcome of cases actually litigated. Even though 102(g) challenges in court must be proven by clear and convincing evidence, while interference claims made against patent applications need only be proven by a preponderance of the evidence, the junior user win rate is similar in both sets of cases. This suggests

information about valuation. While parties to an interference proceeding must disclose the information they possess about inventorship during discovery, they do not have to disclose how much they value the possibility of obtaining a patent.[52] The lack of such information may impede settlement. But if so, it is an effect we would expect to see only in interference cases, not in 102(g) disputes. In the latter set of cases the patent has already issued and infringement is being litigated, so its value should be clearer. Further, in litigation the parties must disclose information related to damages, making it easier for each side to assess the other's expected outcome value. Since both the BPAI and the district courts have about the same junior party win rates, this explanation is unsatisfying.

If there is some information failure that systematically leads parties not to settle interferences, it is reasonable to expect that senior parties should prevail in the majority of the resulting trials, since they have an obvious evidentiary advantage. As Table 1 demonstrates, that is in fact what occurs. But it is harder to explain why appellate decisions are divided evenly between senior and junior parties, and why there is no difference between BPAI and district court outcomes despite the rather different legal standards and procedural postures. We don't have a good explanation for this discrepancy. It seems as though standard economic theories of litigation are inconsistent in predicting the results in our dataset. This should raise a cautionary flag for those who place much reliance on such theories.

(c) Will a First to File System Change This Result?

One argument made by advocates of a first to file system is that first inventors who are last to file under the U.S. system would have an incentive to file more quickly under a first to file system. Thus, the argument goes, those first inventors would not necessarily be disadvantaged by the switch to a first to file system, because they would file more quickly and therefore might end up being the first to file.

We are not persuaded. It is certainly true that a first to file system gives inventors an incentive to get a patent application on file early. But it gives such an incentive to all inventors. Inventors file

that some sort of selection effect may be occurring. Alternatively, factfinders may simply disregard burdens of proof.

52. As Cooter and Ulen point out, however, parties have an incentive to disclose self-serving information, so incomplete disclosure of information is likely to make both sides unduly *pessimistic*, not optimistic, and therefore encourage settlement. *See* ROBERT C. COOTER & THOMAS ULEN, LAW AND ECONOMICS 390-92 (3d ed. 2000).

their applications under a "veil of ignorance." They don't know whether they are first or second to invent, nor when their opponent might be expected to file. Thus, under a first to file system every inventor will be encouraged to file her patent application as early as possible. There is no reason to believe that those who are first to invent but last to file under the current system would be more affected by this incentive.[53] Further, inventors already have significant incentives to file patent applications early. The rest of the world uses a first to file system, so any inventor who wants protection outside the U.S. already has an incentive to file early.[54] And section 102(b) punishes inventors who delay filing by expanding the categories of prior art that may invalidate the patent to include sale or publication by the inventor herself.[55] While it is fair to say that a first to file system will give everyone some additional incentive to file early, there is no reason to believe it will affect first inventors more than second inventors.

(2) Grounds for Victory

Priority disputes are complex creatures, with a morass of legal rules that are grist for the mill of patent law classes.[56] We reviewed each case to determine whether the decisive factor was that the victorious party was first to reduce to practice, that the victorious party was first to conceive but last to reduce to practice,[57] that the

53. As noted *infra* Table 2, junior and senior filers wait roughly the same amount of time after reducing an invention to practice before filing a patent application. So there is no systematic difference between junior and senior filers in how long they delay filing and therefore no reason to believe it will be easier for junior than senior filers to shorten the period of delay.

54. It may be reasonable to suppose that small inventors are less likely to file abroad than large inventors and therefore that they have less incentive to file early currently. Under a first-to-file system, small inventors may accelerate their filing more than large inventors. This theory seems plausible, but it has trouble explaining Mossinghofff's finding that small inventors are no more likely than large inventors to be first to invent but last to file. *See infra* note 16 and accompanying text.

55. 35 U.S.C. § 102(b) (1996).

56. For example, one leading patent law casebook devotes seventy-eight pages to priority disputes, compared with twenty-three pages for claim construction and six pages for literal infringement. ROBERT P. MERGES & JOHN F. DUFFY, PATENT LAW AND POLICY: CASES AND MATERIALS 439-515, 533-535 (priority), 878-84 (literal infringement), 884-907 (claim construction) (3d ed. 2002).

57. In such a case the victorious party must also prove its diligence from a time immediately prior to the other party's reduction to practice. 35 U.S.C. § 102(g)(2) (1996).

losing party was not diligent,[58] that the losing party abandoned its work,[59] or a reason unrelated to priority. The results are presented in Table 2.

TABLE 2

GROUNDS FOR WINNING PRIORITY CONTEST

BASIS OF WIN STATS	Total Cases	Non-priority Basis	First to RTP	First to Conceive, Last to RTP	Other Party's Lack of diligence	Other Party Abandon, Suppress Conceal	Inventorship Mistake/ Other	No Basis
All Cases	118	26	60	9	12	7	2	2
Clean Winner	100	23	54	5	11	6	0	1
Jr. Winner	33	0	25	2	3	3	0	0
Sr. Winner	67	23	29	3	8	3	0	1
Sr. Winner excluding nonpriority	44	-	29	3	8	3	0	1
All Cases	100 %	22%	52 %	8%	10%	6%	2%	
Clean Winner	85 %	23%	55 %	5%	11%	6%	0%	

58. Section 102(g)(2) provides that a party who is first to conceive, but last to reduce to practice, will be deemed the first inventor only if it was diligent in reducing the invention to practice from a time prior to the other party's conception. *Id.*

59. Actually, the test is whether the party "abandoned, suppressed or concealed" its invention. 35 U.S.C. § 102(g). *Id.*

Jr. Winner	33 %	0%	76 %	6%	9%	9%	0%	
Sr. Winner	67 %	35%	44 %	5%	12%	5%	0%	
Sr. Winner excluding nonpriority	44 %	-	67 %	7%	19%	7%	0%	

There is virtually no difference in why junior and senior parties win priority disputes. The only exception is diligence. Senior parties are significantly more likely to win by proving their opponent dilatory than the reverse. In theory this outcome should not be surprising, given that junior parties generally have a longer period of delay to explain in circumstances where diligence is relevant. But the data in Table 3 show that the difference is minor: on average, senior parties spent 14 months between conception and reduction to practice, while junior parties spent 15 months.

Table 3

TIME DIFFERENCES IN PRIORITY CONTESTS (IN MONTHS)

AVERAGE TIME DIFFERENCES IN PRIORITY CONTESTS	# of Cases	Avg. Sr. Filedate v. Sr. RTP	Avg. Sr. Conception v. RTP	Avg. Jr. Conception v. RTP	Difference in RTP Dates	Difference in Conception Dates
Cases where Sr. Party Prove Alt RTP and filedate	22	23[60]	-	-	-	-

60. While it seems curious that senior parties wait an average of almost two years after reducing to practice before filing their patent application, in fact this is a statistical anomaly caused by one case in which the senior party waited more than ten years to file its application. If we exclude that case from the dataset, the average drops to a more reasonable fifteen months.

Cases where Sr. Party Prove Conception and RTP available	27	-	14	-	-	-
Cases where Jr. Party Prove Conception and RTP date available	21	-	-	15	-	-
All nonforeign not nonpriority cases where both RTP dates available	52	-	-	-	13	-
All nonpriority cases where both RTP dates available	64	-	-	-	12	-
All cases where 2 conception dates available	12	-	-	-	-	8

At least part of the explanation may be attributable to the "one-way" nature of diligence: only the diligence of the first to conceive but last to reduce to practice matters under the statute.[61] While both

61. 35 U.S.C. § 102(g); *See, e.g.*, Steinberg v. Seitz, 517 F.2d 1359, 1364 (C.C.P.A. 1975); 3 DONALD S. CHISUM, PATENTS: A TREATISE ON THE LAW OF PATENTABILITY, VALIDITY, AND INFRINGEMENT §10.03[1][a] (2002).

junior and senior parties may be in this position, junior parties are more likely to be last to reduce to practice, since they were last to file. Thus, there may simply be more cases in which the junior party's diligence is at issue than cases that consider the senior party's diligence.

A more important finding is that the overwhelming majority of priority disputes are won or lost merely by relying on proof of reduction to practice. 29 out of 44 (or 67%) of senior parties prevailed by showing nothing more than reduction to practice, and many of these prevailed on the basis of their filing date.[62] Even more striking, 25 of 33 (or 76%) of *junior* applicants who won did not

62. Indeed, as Table 6 demonstrates, in many cases prevailing parties did not even *present* evidence of conception or reduction to practice other than the filing date.

TABLE 6
EVIDENCE PRESENTED BY WINNERS IN PRIORITY CONTESTS

Analysis F: How much evidence did parties need to win? (Stats)	Total Cases	Filedate Only	More than just Filedate	Filedate + Alt RTP Only	Filedate + Conception Only	Filedate + Conception + RTP
Sr. True Priority NonForeign Winners	34	18	16	6	6	4
	Total Cases	RTP Only	More than RTP	RTP + Conception		
Jr. True Priority NonForeign Winners	29	21	8	8		
(Percentages)		Filedate Only	More than just Filedate	Filedate + Alt RTP Only	Filedate + Conception Only	Filedate + Conception + RTP
Sr. True Priority NonForeign Winners		53%	47%	18%	18%	12%
		RTP Only	More than RTP	RTP + Conception		
Jr. True Priority NonForeign Winners		72%	28%	28%		

need to prove anything more than their date of reduction to practice. All the other grounds for resolving priority contests were minor by comparison. Junior applicants won 2 cases (6%) on the basis of their own diligence, 3 cases (9%) on the basis of the senior party's lack of diligence, and 3 cases (9%) on the basis of the senior party's abandonment, suppression or concealment of the invention. Similarly, senior applicants won 3 cases (7%) on the basis of their own diligence, 8 cases (19%) on the basis of the senior party's lack of diligence, and 3 cases (7%) on the basis of the senior party's abandonment, suppression, or concealment of the invention. Given the small number of cases in which proof of conception, diligence, abandonment, suppression, and concealment actually matters to the outcome, and given the detailed factual nature of those inquiries, the net benefit of the detailed U.S. priority rules is open to question. Many of the priority disputes are resolved on the basis of the filing dates themselves. Indeed, our analysis suggests that in more than half of the cases in which the senior party won a priority contest, and more than a third of total cases, the senior party needed to do no more than prove its filing date, suggesting that the entire proceeding was a waste of time.[63] Many more can be resolved by proof of

63. Our data for this finding are taken from the subset of cases in which neither party was a foreign inventor. We imposed this limitation because for cases with invention dates before 1996 – virtually all of the cases in our study – foreign patentees were barred from proving conception and reduction to practice outside the U.S. Inclusion of foreign cases would have artificially skewed the number of parties who relied solely on their filing date. There were sixty-three such cases. The senior party won thirty-four and the junior party twenty-nine. Of those thirty-four, eighteen were won by relying on no more than the filing date and another six by the senior party proving their date of reduction to practice. The complete data for this subset are included here as Table 5.

TABLE 5

RELIANCE ON EVIDENCE IN DOMESTIC PRIORITY DISPUTES

Evidence Stats	Total Cases	Jr. Winner	Sr. Winner
Non-foreign Not nonpriority Clear ("Good") Cases	63	29	34
Sr. Party rely on Filedate only (1)	29	11	18
Sr. Party Prove Alt RTP only (2)	9	3	6

reduction to practice, without inquiring further. So even if the United States were to retain a first to invent system, the data suggest it could get most of the benefit of that system by looking only at evidence of reduction to practice.[64] Further, eliminating proof of

Sr. Party Prove Conception but not Alt RTP (3)	15	9	6
Sr. Party Prove Conception and Alt RTP (4)	11	7	4
Jr. Party Rely on RTP Only (5)	46	21	25
Jr. Party Prove Conception and RTP (6)	17	8	9
Evidence %	Total Cases	Jr. Winner	Sr. Winner
Non-foreign Not nonpriority Clean Cases	63%	46%	54%
Sr. Party rely on Filedate only	46%	38%	62%
Sr. Party Prove Alt RTP only	14%	33%	67%
Sr. Party Prove Conception but not Alt RTP	24%	60%	40%
Sr. Party Prove Conception and Alt RTP	17%	64%	36%
Jr. Party Rely on RTP	73%	46%	54%
Jr. Party Prove Conception and RTP	27%	47%	53%

64. Indeed, one commentator has proposed just such a system. Sean T. Carnathan, *Patent Priority Disputes – A Proposed Redefinition of "First-to-Invent"*, 49 Ala. L. Rev. 755 (1998).

One argument against relying solely on the reduction to practice standard is the problem of "spurring." It may be that inventors who fail to patent or commercialize their invention for a number of years will be spurred to file a patent application when they see others who have developed independently the idea to obtain their own patent. Under existing law, the work of a first inventor will not bar a subsequent inventor from getting a patent if the first inventor has "abandoned" or "suppressed" the invention. 35 U.S.C. § 102(g). If the law

conception, diligence, abandonment, suppression and concealment would not disadvantage junior applicants, since they are no more likely – indeed, somewhat less likely – than senior applicants to benefit from such evidence. But it would reduce much of the cost of interferences, particularly 102(g) judicial proceedings, since parties to a court case will investigate and prepare their proof for all these issues even in cases in which the court does not need to rely on that evidence.[65]

Eliminating use of such evidence will also relieve courts of the burden of evaluating particularly difficult concepts such as state of mind (which is relevant to both diligence and abandonment) and acceptable periods of delay.[66] Filing dates and reductions to practice tend to be objective facts that can be determined by documentary or physical evidence. By contrast, proof of conception and diligence requires some inquiry into what an inventor thought and when they thought it. It therefore tends to rely at least in part on the memories of the inventors and their compatriots, and those memories can be

---

excluded evidence of abandonment or suppression from 102(g), it is possible that these first inventors could defeat the subsequent inventor in a priority dispute by proving they were first to reduce the invention to practice.

We are not persuaded that spurring will occur in a significant number of cases or that it should necessarily be viewed as a problem when it does occur. Section 102(c) already provides that the first inventor in such a situation could not obtain its own patent. So, the only circumstance in which spurring would arise is when an infringement defendant – perhaps the first inventor itself – tries to defeat the patent granted to a second inventor. In such a case, it is not clear that a second inventor should be entitled to patent something in fact invented by another who has kept that invention secret. For a detailed discussion of one case where the problem has arisen with regard to computer software, see MARK A. LEMLEY ET AL., SOFTWARE AND INTERNET LAW 334-40 (1st ed. 2000).

65. Priority disputes occur only between two bona fide inventors. In some circumstances a putative inventor will claim that his idea has been stolen by another who patented it. For an egregious case of such theft, see Univ. of Colo. Found. Inc. v. Am. Cyanamid Co., 196 F.3d 1366 (Fed. Cir. 1999). Such cases will of course require inquiry into the details of inventorship. But, they will be resolved under 35 U.S.C. section 102(f), which covers derivation, or by correction of inventorship under 35 U.S.C. section 256. They do not justify collecting subjective evidence in true priority disputes.

66. *See* Paul M. Janicke, *Do We Really Need So Many Mental and Emotional States in United States Patent Law?*, 8 TEX. INTELL. PROP. L.J. 279, 290 (2000) (challenging the idea that invention should depend on subjective mental state); *cf.* Roger D. Blair & Thomas F. Cotter, *Strict Liability and its Alternatives in Patent Law*, 17 BERKELEY TECH. L.J. 799 (2002) (questioning the wisdom of requiring proof of mental state in patent infringement cases).

biased or simply lost years later.[67]

The one significant use of such evidence in the existing cases is actually a benefit to senior applicants. Junior applicants who win are more likely than senior applicants to win through proof of their own efforts, rather than the other party's lapse.[68] These results are illustrated in Table 4.

TABLE 4

NATURE OF VICTORY: BY AFFIRMATIVE EFFORTS OR THE FAILURE OF OPPONENTS

DEFAULT WINNER STATS	Total Cases	Win by own efforts	Win by other's lapse
True Priority Contests	76	59	17
Jr. Winner	33	27	6
Sr. Winner	43	32	11
DEFAULT WINNER %	Total Cases	Win by own efforts	Win by other's lapse
True Priority Contests	100%	78%	22%
Jr. Winner	43%	82%	18%
Sr. Winner	57%	74%	26%

Junior winners prevail 82% of the time on the basis of their own

67. Indeed, the problem with relying on inventor testimony is so great that the Federal Circuit has created an evidentiary rule requiring claims of inventorship by non-patentees to be corroborated. Cooper v. Goldfarb, 154 F.3d 1321, 1330 (Fed. Cir. 1998). The normal sort of corroborating evidence is a contemporaneous laboratory notebook, but the corroboration requirement can be satisfied by the testimony of other witnesses, as well as by circumstantial evidence. *Id.* So, the evidentiary rule does not do away with the problem of evaluating inventor and witness credibility. On the rather intricate rules for corroborating claims of inventorship in interference proceedings, see Michael F. Ciraolo, *Application of the Corroboration Requirement to Interference Proceedings and Other Sections of 102*, __ J. PAT. & TRADEMARK OFC. SOC'Y 531 (2002).

68. We define victory by proof of one's own efforts as victory based on evidence that an applicant was first to reduce to practice or was first to conceive but last to reduce to practice and was diligent in reducing to practice. We define victory by the lapse of the other party as victory based on an opponent's lack of diligence or their abandonment, suppression or concealment.

affirmative proof and 18% of the time because of the senior party's lapse. Senior winners prevail 74% of the time on the basis of their own affirmative proof and 26% of the time because of the junior party's lapse. While the differences are not striking – both parties clearly tend to prevail on the basis of their own efforts – they are intuitive. Because senior applicants by definition filed first, juniors will on average have a longer delay to explain, making it somewhat less likely that they can prove diligence or continued working for that longer period. This fact may justify retaining a diligence or non-abandonment standard. But it is worth noting that if the U.S. does retain the current approach, the effect will be to protect senior rather than junior applicants.

(3) Small Inventors

Since small inventors – and particularly individual inventors – have led the fight against patent harmonization, it seems particularly important to determine whether small inventors in fact benefit from the first to invent system. An important recent study by Gerald Mossinghoff addresses this issue in detail. Mossinghoff studied all 2,858 interference decisions between 1983 and 2000 in order to determine whether small inventors were really more likely to prevail in priority disputes.[69] He found that the first to invent system did not benefit small inventors on average. Of the 2,858 interferences, 203 were decided in favor of a small junior party; Mossinghoff defined these 203 as small inventors benefiting from the system.[70] But 201 more interferences were decided adverse to a small senior party,[71] suggesting that small entities neither gain nor lose on average from using the system. Indeed, Mossinghoff found that individual inventors, who have most strongly advocated the interference

69. Mossinghofff, *supra* note 19. The PTO began charging reduced fees to small inventors in 1983. This creates a means of tracking the size of inventors. An entity is defined by the PTO as "small" if it meets the requirements of 35 U.S.C. § 41(h)(1), which incorporates by reference section three of the Small Business Act. Small inventors as defined by the PTO fall into three categories: individuals, small businesses, and non-profit organizations. 35 U.S.C. § 41. While many of the non-profits are in fact quite large, non-profits as a whole represent only about one percent of all patents issued. Most small inventors are either individuals (17.5% of all patents) or small businesses (10.7% of all patents). John R. Allison & Mark A. Lemley, *Who's Patenting What? An Empirical Exploration of Patent Prosecution*, 53 VAND. L. REV. 2099, 2117 (2000).

70. Mossinghofff, *supra* note 19 at 427-28. 738 large junior entities also prevailed in an interference.

71. *Id.* 740 large senior entities also lost interference proceedings.

system, actually lost more from the system than they gained.[72]

We have not sought to replicate the results of Mossinghoff's comprehensive study. We did study one other aspect of the dispute that has relevance, however: on whose behalf the interference proceeding was initiated.[73] Initiation matters because it is the party on whose behalf the interference is being initiated (whether by the party itself provoking an interference or by the patent examiner declaring the interference) who might be thought to be the one who stands to benefit from the interference system. Ordinarily that would be the junior party. But in more than half of the cases, the interference appears to have been initiated on behalf of the *senior* party – the one with the earlier filing date. This can occur where the junior party's patent has already issued, and the senior party provokes an interference, or where the party on whose behalf the interference is initiated in fact can claim priority to an earlier-filed application, making them the senior party. Our results are reported in Table 5.

TABLE 5

WHO INITIATES INTERFERENCES BY ENTITY SIZE

INITIATOR AND STATUS STATS	Total Cases	Entities w/Status Data[74]	Small/ Independent	Nonprofit	Other/Large
All Cases	190	-	-	-	-
Cases Initiated for Jr. Party	92	86	42	4	40
Status of Jr. Party	-	36	9	2	25

72. *Id.* (98 individual junior inventors won their interferences, while 115 individual senior inventors lost their interferences). For a non-statistical argument along the same lines, see Jackman, *supra* note 38, at 83-84 arguing that interferences disadvantage small inventors because of their cost and delay.

73. We applied the following rules to determine on whose behalf the interference was being initiated: 1) in contests pitting one application against another application, the interference was initiated on behalf of the applicant with the later priority date (the junior applicant), and 2) in contests pitting an application against a patent, the interference was initiated on behalf of the applicant (junior or senior applicant). How could the applicant be a senior party in the latter scenario? As described above, the applicant could conceivably have a priority date senior to the challenged patent where it is a continuation of an earlier patent application or issued patent, or simply took longer in prosecution than the challenged patent.

74. There are at least two parties to each interference; so the number of parties with status data will sometimes exceed the number of interferences.

Initiator					
Status of Sr. Challenged Party	-	50	33	2	15
Cases Initiated for Sr. Party	98	153	38	7	109
Status of Sr. Party Initiator	-	58	8	3	47
Status of Jr. Challenged Party	-	95	30	4	62
Status of All Initiators	-	94	[redacted]		
Status of All Challenged Parties	-	145			

INITIATOR AND STATUS %	Total Cases	Cases w/Status Data*	Small	Nonprofit	Other/Large
All Cases	100 %	-	-	-	-
CASES INITIATED FOR JR. PARTY	[redacted]	-	-	-	-
Status of Jr. Party Initiator	-	39%	25%	6%	69%
Status of Sr. Challenged Party	-	54%	66%	4%	30%
CASES INITIATED FOR SR. PARTY	[redacted]	-	-	-	-
Status of Sr. Party Initiator	-	59%	14%	5%	81%
Status of Jr. Challenged Party	-	97%	32%	4%	65%
Status of All Initiators	-	-	[redacted]		
Status of All Challenged Parties	-	-			

The results are striking. Of the 94 initiating parties for which status data were available,[75] only 17 (or 18%) were individuals or small businesses, while 72 (77%) were large entities.[76] By contrast, of the 145 respondents in an interference for which data was available, 63 (or 43%) were individuals or small businesses, while 77 (53%) were large entities.[77] These findings are significant because they suggest that interference proceedings are more often used by large entities to challenge the priority of small entities, not the reverse. This evidence further supports Mossinghoff's conclusion that the first to invent system is not working to the benefit of small entities. If anything, small entities are getting bogged down in interference proceedings initiated by larger companies. This makes some intuitive sense. Large, sophisticated entities are more likely to understand the patent system, including the rather arcane interference process, and use it to their advantage. Small entities tend to be less sophisticated about patents, and may not take full advantage of interferences.[78]

(4) Simultaneous Invention

By definition, priority disputes arise when two or more parties claim to have invented the same thing. One of the striking factors in our dataset, though, is just how close the invention dates appear to be. We compared the dates of reduction to practice for the senior and junior inventors in cases in which both parties proved reduction to practice and in which we had dates reported by the court.[79] There

75. As noted above, only some of the small entity status data was available to us. In most cases, the entity size data was available only for winners, because only winners had patents issued.

76. The remaining five (5%) were non-profits. While non-profits are classed as small entities for purposes of PTO fees, all the non-profits in our sample were in fact large universities. Thus, we have chosen to include them neither in the small nor the large categories.

77. Six (4%) were non-profits.

78. *See* Charles R.B. Macedo, *First-to-File: Is American Adoption of the International Standard in Patent Law Worth the Price?*, 18 AIPLA Q.J. 193, 227-28 (1990). *Cf.* Richard A. Epstein, *Intellectual Property: Old Boundaries and New Frontiers* Addison C. Harris Lecture (Nov. 9, 2000) *in* 76 IND. L.J. 803, 815 (2001) (noting that the first-to-invent rule is an odd way to favor small inventors, since any inventor can benefit from it and "the sheer war of attrition that this rule invites should dissuade all but the hardiest to favor it.").

79. In some cases, the adjudicator's opinion was not specific as to the date of reduction to practice. Where the adjudicator specified a month but no day, we have arbitrarily assumed that that invention occurred on the mid-point of the

were 58 such cases when we included foreign applicants, and 47 when we excluded foreign applicants.

The dates of reduction to practice are quite close. In fully 45% of the cases in both datasets, the senior and junior applicants first reduced to practice within 6 months of each other. In 70% of the cases they reduced to practice within a year of each other. Similarly, a chart showing the difference in conception dates in the 11 cases where both parties proved conception shows that in more than 45% of the cases, the parties conceived within 6 months of each other, and that 70% conceived within a year of each other. These results are presented in Table 7 and depicted in Figures 1 and 2.

TABLE 7

DIFFERENCES IN PRIORITY DATES (IN MONTHS)

PRIORITY CONTEST STATS IN BUCKETS (SHARE OF CASES RESOLVED IN. . .)	N	1 month or less	6 months or less	1 year or less	18 months or less	24 months or less	24 months or more
RTP v. RTP excluding nonpriority and foreign	47	4%	45%	70%	83%	87%	13%
RTP v. RTP excluding nonpriority only	58	3%	47%	74%	84%	90%	10%
Difference in Conception Dates	11	18%	45%	73%	91%	91%	9%

Figure 1

month. In a few cases, the adjudicator said nothing more specific than "party x proved reduction to practice on or before date y." We have excluded those cases from the analysis in this section.

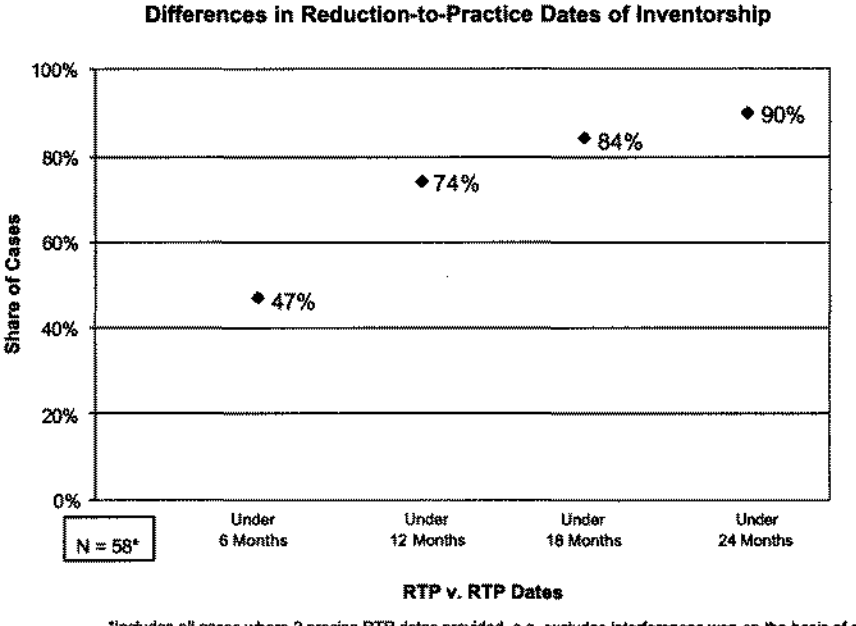
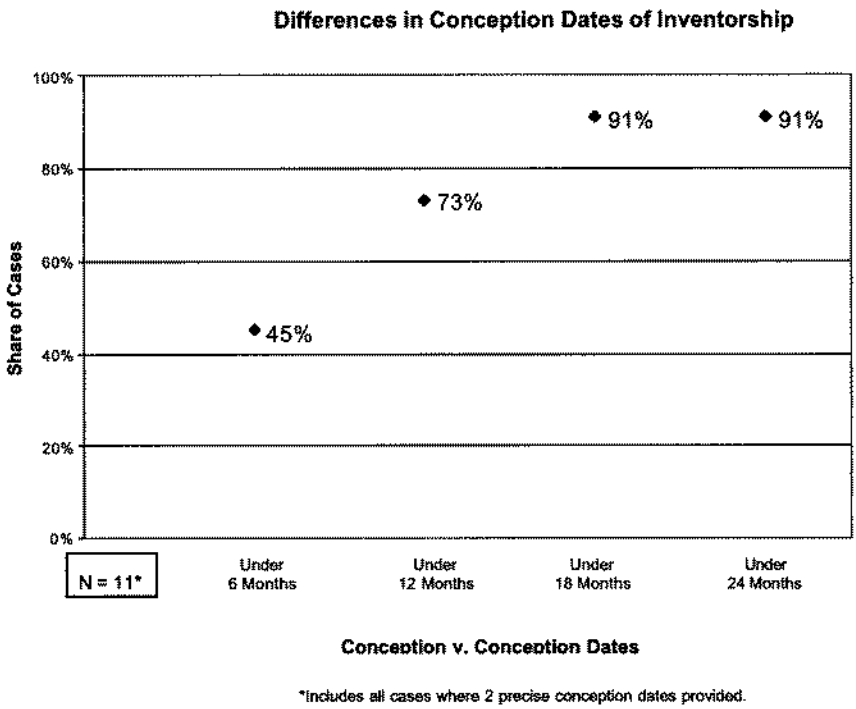

Differences in Reduction-to-Practice Dates of Inventorship
100%
80%
60%
40%
20%
0%
Share of Cases
47%
74%
84%
90%
N = 58*
Under 6 Months
Under 12 Months
Under 18 Months
Under 24 Months
RTP v. RTP Dates
*Includes all cases where 2 precise RTP dates provided, e.g. excludes interferences won on the basis of a lack of identical inventorship and interferenes where only imprecise dates (i.e. "before 3/4/82) were provided.

FIGURE 2



These results provide some support for the idea that simultaneous or near-simultaneous invention is a regular feature of innovation.[80] But we caution against reading too much into the data.

80. For a discussion of "patent races" resulting from near-simultaneous invention, see, e.g., Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 884 (1990). For an example of simultaneous invention, see e.g., *Spitting Image*, ECONOMIST, Sept. 21, 2002, at 21:

The thermal inkjet printer was invented not once, but twice. The idea was conceived simultaneously, and unbeknown to one another, by two competing teams on either side of the Pacific. In Japan, Ichiro Endo, an engineer at Canon, noticed ink squirting from the neck of a syringe when a hot soldering iron touched it. Thousands of miles away at Hewlett-Packard's laboratories in Silicon Valley, a researcher called John Vaught dreamed up his version of the thermal inkjet by borrowing from the mechanism of the coffee percolator.... Two years later, Hewlett-Packard found out about Canon's work. The patents for many of the key inventions in both research efforts had been filed within months of one another.

Id.

One problem is that priority disputes are self-selecting. Since priority disputes tend to arise when two or more parties file patent applications at close to the same point in time, perhaps it should not be surprising that those cases show remarkably similar dates of invention. Further, if the Priest/Klein hypothesis[81] has any validity, a litigation selection effect may be at work: the cases that actually make it to court may be those in which the dates are close enough that the outcome is unclear.[82]

Even taking such selection biases into account, the closeness of invention dates is striking. It may suggest that the U.S. first to invent system is not particularly "fairer" than a first to file alternative, since regardless of who wins, the loser is an independent inventor who will likely have made substantial investment in developing its invention before learning of another party's priority.[83] A fairer system might seek to allocate some rights to both parties in a case of roughly simultaneous invention. One such approach is the European system of prior user rights, under which those who independently develop an invention get a limited right to continue using it even after another party's patent issues.[84] Another alternative would be to create a

81. *See supra*, notes 45-51 and accompanying text.

82. By contrast, we reject another suggestion – that litigants don't go to great effort to prove dates of conception or reduction to practice earlier than they need to win -- since the cost of proving the earliest date of reduction to practice is unlikely to be much greater than the cost of proving an intermediate date.

83. Epstein, *supra* note 78, at 815 (suggesting that the cost of an interference system is not justified given the simultaneity of many inventions).

Cases in which one party takes the idea from another present a different issue, of course. But 35 U.S.C. section 102(f) prevents such derivation without the need for a priority dispute. In addition, patent law rules against inequitable conduct, see generally J.P. Stevens & Co., Inc. v. Lex Tex Ltd., Inc. 747 F.2d 1553 (Fed. Cir. 1984), and other laws such as fraud and even antitrust may come into play in such a case. *Cf.* Walker Process Equip., Inc. v. Food Mach. & Chem. Corp., 382 U.S. 172 (1965) (antitrust cause of action for fraudulent procurement of a patent); *but see* Brunswick Corp. v. Riegel Textile Corp., 752 F.2d 261 (7th Cir. 1984) (*Walker Process* fraud does not apply to disputes over who owns an invention). For a full discussion of such claims, see HERBERT HOVENKAMP ET AL., IP AND ANTITRUST: AN ANALYSIS OF ANTITRUST PRINCIPLES APPLIED TO INTELLECTUAL PROPERTY LAW § 11.2 (2003).

84. For a discussion of prior user rights, see, e.g., Prior Use Rights: Hearing Before the Subcomm. on Intell. Prop. and the Admin. of Justice, H.R., 102d Cong., 127 (1994) (statement of Robert Merges); John Neukom, *A Prior Use Right for the Community Patent Convention*, 5 EUR. INTELL. PROP. REV. 165 (1990); Lisa M. Brownlee, *Trade Secret Use of Patentable Inventions, Prior User Rights and Patent Law Harmonization: An Analysis and Proposal*, 72 J. PAT. & TRADEMARK OFFICE. SOC'Y 523 (1990).

defense to patent infringement for independent invention, so that patent law tracked copyright and trade secret law.[85] This would be a somewhat more radical departure from the existing patent rules, though it has been proposed by a number of commentators.[86] But under current law, a priority contest remains a winner-take-all game, no matter how close the score.

(5) Discrimination

The U.S. patent priority rules have long discriminated against foreign inventors.[87] Until 1994 only inventive activity in the U.S. counted for priority;[88] foreigners who could not show they invented in the U.S. – or at least that they had brought their invention into the country[89]—had to rely on their filing date for priority.[90] As a result,

85. Copyright and trade secret both punish only those who acquire the work from another – "copying" or "misappropriating" it. *See, e.g.*, MERGES, *supra* note 56, at 23, 27.

86. *See, e.g.*, Stephen M. Maurer & Suzanne Scotchmer, *The Independent-Invention Defense in Intellectual Property*, __ ECONOMICA __ (forthcoming 2002); Michelle Armond, Comment, *Introducing the Defense of Independent Invention to Patent Preliminary Injunctions*, 91 CAL. L. REV. (forthcoming 2003); John S. Leibovitz, *Note:Inventing a Nonexclusive Patent System*, 111 YALE L.J. 2251 (2002); Julie S. Turner, *The Nonmanufacturing Patent Owner: Toward a Theory of Efficient Infringement*, 86 CAL. L. REV. 179 (1998). *Cf.* Roger D. Blair & Thomas F. Cotter, *Strict Liability and Its Alternatives in Patent Law*, 17 BERKELEY TECH. L.J. 799 (2002) (arguing that the rules relating to patent marking and willfulness effectively create such a system already).

87. In addition to the priority rules discussed here, see 35 U.S.C. §§ 102(a), (b) (1996) (both providing that certain types of prior art are relevant only if they exist "in this country").

Anecdotal evidence suggests another sort of anti-foreign bias: that courts are likely to favor domestic rather than foreign parties in litigation. For different efforts to evaluate the existence of this bias, compare Allison & Lemley, *Empirical Evidence, supra* note 48, at 224-27 (finding that foreign patents are actually more likely than domestic patents to be held valid in court but noting the selection bias that might occur because so few foreign patents are actually litigated) with Kimberly Pace Moore, *Xenophobia, Patents and Courts*, (working paper 2002) (arguing that the data show greater bias against foreigners than generally assumed).

88. 35 U.S.C. § 102(g) (1993).

89. In cases where an invention was made abroad but later brought into the U.S., the U.S. priority date was the date of first action in the U.S. Holmwood v. Sugavanam, 948 F.2d 1236, 1238 (Fed. Cir. 1991); Breuer v. DeMarinis, 558 F.2d 22, 28 (C.C.P.A. 1977). Even transporting the idea – coming to a conference in the U.S. while in possession of papers containing the idea, say – could count as conception in the U.S. under this rule. *See, e.g.*, In re Mulder, 716 F.2d 1542, 1543 (Fed. Cir. 1983) (receipt of written application in U.S. was date of U.S. conception,

they were at a significant disadvantage in proving priority in an interference against a domestic opponent.[91] That anti-foreign bias was reduced in 1994 and again in 1999, when U.S. law changed in compliance with TRIPs to permit a patent applicant to prove inventive activity in any WTO member country.[92] The bias was not completely eliminated, however.[93] Further, since the change in the law did not permit proof of foreign inventive activity occurring before 1996, all of the cases involving a foreign inventor in our study were decided under the old law.

Somewhat to our surprise, we found no evidence of such a disadvantage to foreigners in our data. Of the 76 "clean" cases in our sample that involved pure priority disputes, 14 involved one or more parties who invented abroad. Table 8 reports the results of those cases.

TABLE 8

even though no work on the idea was done here).

90. The Paris Convention and the Patent Cooperation Treaty permits foreign applicants to rely on a *foreign* filing date for U.S. priority so long as the application is "converted" into a U.S. patent application within a certain period of time. Paris Convention for the Protection of Industrial Property art. 4, 21 U.S.T. 1583, T.I.A.S. No. 6295, 828 U.N.T.S. 305 (1970 revision); Patent Cooperation Treaty ch. 2, 28 U.S.T. 7645, T.I.A.S. NO. 8733 (1978). *See generally*, *supra* note 56, at 454-57.

91. For example, in *Fujikawa v. Wattanasin*, 93 F.3d 1559, 1561 (Fed. Cir. 1996), the senior party was prevented from relying on proof of its first inventive activity because that activity occurred overseas. It, therefore, lost the priority dispute to the junior party, whose inventive activity occurred in the U.S. [check]

92. 35 U.S.C. § 104 (2001); Agreement on Trade-Related Aspects of Intellectual Property Rights, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, LEGAL INSTRUMENTS – RESULTS OF THE URUGUAY ROUND VOL. 31, 33 I.L.M. 81 (1994).

93. Several areas of disparate treatment remained. First, the law was effective only for proof of priority dates beginning in 1996. 35 U.S.C. § 104 (2003). Second, it did not apply to non-WTO countries. *Id.* Finally, only patent applicants could prove inventive activity abroad under the 1994 rules. Proof of foreign inventive activity could not be used defensively, to show that someone else was entitled to a patent. This resulted from the fact that Congress amended section 104 to allow proof of foreign activity in acquiring a patent, but did not amend section 102(g), which disentitled an applicant to a patent only if the identical invention was made "in this country" by another. *Id.* 35 U.S.C. § 102(g). The latter rule was changed somewhat in 1999 when Congress permitted defensive use of foreign inventive activity in PTO interference proceedings but not in judicial proceedings

INTERFERENCES INVOLVING FOREIGNERS

FOREIGN APPLICANT STATS/%	# of Cases	%	# True Priority, 1 Foreigner cases	% of True Priority, 1 Foreigner cases
Clean Nonpriority Cases involving Foreign Inventive Activity	14	-	12	-
Where the foreigner won	7	50 %	7	
Where the foreigner lost	5	36 %	5	
Other (both foreigners)	2	14 %	-	-

Of these 14, two cases involved disputes between two different foreign entities, who were presumably at a roughly equal disadvantage. Of the 12 remaining cases that pitted a foreign

challenging the validity of a patent. *Compare* 35 U.S.C. § 102(g)(1) *with* § 102(g)(2).

inventor against a domestic inventor, foreign inventors won 7 times (or 58%). This suggests that the old rules discriminating against foreign activity did not have the systematic effect of disadvantaging foreign applicants in priority disputes.

We urge substantial caution in relying on this data, however, both because of the small number of cases involved and because a selection effect may be at work here as well. Patent litigation data clearly indicates that foreign patent owners are much less likely to sue for infringement than domestic patent owners.[94] A similar reluctance may be at work in interference proceedings. One explanation for this discrepancy is that foreign patentees choose to litigate only their best cases. If so, the fact that foreign patentees win a majority of the priority contests in which they participate may mask the discriminatory effect of the old statute.

(6) Appeals

Of the 34 final Federal Circuit decisions on 102(g) issues between 1991 and 2001, 30 were "clean" cases with clear outcomes. In those cases, the Federal Circuit ruled in favor of the senior party in 14 cases (47%) and in favor of the junior party in 16 cases (53%). These results are presented in Table 1, above. One might initially suppose from this statistic that the Federal Circuit rather strongly favored junior inventors. In fact, however, we think the explanation lies in the significant deference the Federal Circuit gave to the triers of fact on priority issues. The Federal Circuit was quite likely to affirm rulings by any finder of fact; it affirmed in 25 of the 30 cases, or 83%. The Federal Circuit gave significantly more deference to district court decisions than to BPAI decisions, however, as Table 9 demonstrates.

TABLE 9

FEDERAL CIRCUIT AFFIRM/OVERTURN RATES OF BPAI AND DISTRICT COURT PRIORITY DECISIONS

94. Allison & Lemley, *Empirical Evidence*, *supra* note 48, at 224-27; Moore, *Xenophobia*, *supra* note 87.

DECISIONS BELOW STATS	Total Cases	Affirm BPAI	Reverse BPAI	Affirm Dist Ct	Reverse Dist Ct	Affirm Total	Reverse Total
True Priority Clean Apellate Cases	27	6	3	16	2	22	5
Validity/Sr. Winner Below	12	3	2	6	1	9	3
Invalidity/Jr. Winner Below	15	3	1	10	1	13	2
Clean Appellate Cases (including	30	7	3	18	2	25	5

non-priority cases)

DECISIONS BELOW %	Total Cases	Affirm BPAI	Deny BPAI	Affirm Dist Ct	Deny Dist Ct	Affirm Total	Deny Total
True Priority Clean Apellate Cases	-						
Validity/Sr. Winner Below	44 %	60%	40%	86%	14%	75%	25%
Invalidity/Jr. Winner Below	56 %	75%	25%	91%	9%	87%	13%

It affirmed 7 of 10 BPAI decisions (70%), and 18 of 20 district

court decisions (90%). Interestingly, the court's greater deference to district court decisions does not appear merely to be a function of the presumption of validity. The Federal Circuit affirmed ten out of eleven district court opinions ruling for the junior applicant, and in all those cases affirmance involved holding the senior party's patent invalid. So it is deference to the district court's resolution of the complicated factual questions surrounding priority, not simply adherence to the presumption of validity, that best explains these results.

This deference is significant. The Federal Circuit has often been accused of "judicial hyperactivity," or acting as a trial court by reexamining facts at will and failing to show proper deference to the judgments of the district court.[95] But our data suggest the opposite – at least in the case of priority disputes, the Federal Circuit is showing remarkable reliance on factfinding by the district courts.

(7) PTO vs. Court Decisions

One curious fact about our litigation dataset is that a significant majority of the priority cases litigated to judgment were challenges to the validity of a patent in court, not interference proceedings in the PTO. Of the 100 "clean" cases in our study, 26 were BPAI decisions, 44 were district court or ITC decisions, and 30 were Federal Circuit decisions. Of the 30 appellate decisions, 20 were appeals from district courts, and 10 were appeals from the BPAI. Thus, only 36 out of 100 decisions resulted from interference proceedings. In almost two-thirds of the cases in which priority was at issue, it was raised for the first time in infringement litigation after the patent had already issued.

There are two possible explanations for this. First, it may be that the infringement-related 102(g) issues involve claims of priority by third parties who never filed a patent application. Infringement defendants have a substantial incentive to find prior inventors and introduce evidence of their work. That evidence would likely never be found by the PTO during the ordinary examination process. Based on our data, in about 65% of the non-BPAI cases (34 out of 52 true priority appellate and district court cases), the junior party did not rely on a patent or patent application (their own or another's) to challenge the senior party's patent.

Second, even if both inventors filed a patent application, it may be that the PTO is not doing a very good job of identifying conflicts between different inventors. In any case in which both the plaintiff

95. William C. Rooklidge & Matthew F. Weil, *Judicial Hyperactivity: The Federal Circuit's Discomfort With Its Appellate Role*, 15 BERKELEY TECH. L.J. 725 (2000).

and the defendant obtained a patent on the same invention, for example, the PTO likely erred in failing to declare an interference.[96] This would be a significant failing, since simultaneous identical inventions are ones we would expect the PTO to catch. This sort of failure did not appear to be a major source of cases, however. In our data set, around 13% of the non-BPAI cases (seven out of 52 true priority non-BPAI cases) involved two patents covering the same invention. In either case, the fact that most priority disputes arise in litigation rather than before the PTO is consistent with Lemley's earlier argument that litigation, not examination, is where the system will weed out bad patents most effectively.[97]

III. Conclusions and Policy Implications

What policy conclusions can we draw from all of this? First, the arguments most commonly made both for and against the U.S. first to invent system have little basis in fact.

Advocates of a first to file system claim that priority disputes waste significant time and money without changing outcomes. These claims are incorrect. Interference proceedings and 102(g) invalidity claims do affect the results in a significant number of cases. Further, while the percentage of patent applications that involve a priority dispute is quite small, it is no smaller – and indeed somewhat larger – than the percentage of patents that are ever enforced. One can no more say that the small number of priority disputes doesn't matter than one would argue that litigated cases of infringement don't matter to the patent system. Interferences and judicial priority disputes do play a significant role in determining who gets a patent.

Second, there is the question of cost. There can be no doubt that the U.S. system is more expensive to administer than a first to file system would be, both in money and in time[98] (though we have not

96. The only alternative explanation is that one party obtained a patent, the other party saw the patent and provoked an interference by filing its own identical application, and the provoking party later won the interference and had a patent issued in its own name.

Once patents have issued to both parties, the BPAI no longer has jurisdiction to resolve priority disputes. *See* JD v. SH, 58 U.S.P.Q.2d 1468 (Bd. Pat. App. & Int. 2001).

97. Lemley, *Rational Ignorance*, *supra* note 40.

98. Patent litigation as a whole is extremely expensive. The median case costs $1.5 million per side in legal fees to take to trial. *Id.* at 1502. Not all of this expense is attributable to priority disputes, of course, and presumably in some cases the litigation would have been just as expensive without the priority issue. Interferences are less expensive but still may cost $500,000 on average.

studied the cost issue directly). But the cost savings may be overstated. As we have seen, a significant percentage of the priority disputes actually litigated are not interferences, but challenges to the validity of an issued patent based on third party prior art. A first to file system might not eliminate this class of cases, since proof that someone else invented the patented technology first but chose not to patent it calls into doubt the grounds for issuing a patent. If 102(g) challenges based on third party art are permitted to continue, the cost savings from a first to file system would be substantially reduced.

Advocates of the first to invent system claim that the system is fairer because it identifies the true inventor and systematically benefits small inventors. However, the evidence does not support the conclusion that small inventors – the purported beneficiaries of the first to invent system – in fact get anything out of the process. If the continued refusal of the U.S. to harmonize its patent system with the rest of the world is to be justified, therefore, it must be done on a different basis than its supposed benefits for small inventors.

Advocates of the first to invent system might point to the variance in results itself as a justification for the system. After all, if a first to file system picks the "wrong" inventor in a significant number of cases, that fact may be a justification for retaining the system regardless of whether the system is biased against any particular group of inventors. This is fair enough as far as it goes. But the virtually simultaneous nature of many of the inventions at issue in priority contests suggests to us that regardless of who wins, no sort of winner-take-all system is particularly equitable in many cases. Rather, some sort of divided entitlement – or perhaps a robust prior user right – would more fairly account for the independent development of the same idea by two or more parties at about the

http://www.aipla.org/committees/reports/patrel_uspto.html (data reported by Administrative Patent Judge Torczon). For a lower estimate, see William Kingston, *Is the United States Right about 'First-to-Invent'?*, 7 EUR. INTELL. PROP. REV. 223 (1992) (citing interferences cost over $100,000); Macedo, *supra* note ___, at 193 (estimating average cost of an interference that goes to final hearing at $100,000).

Both interferences and court decisions are also time-consuming. Interferences spend an average of 30.5 months pending before the PTO, and there are certain infamous interferences that continued for decades. *http://www.aipla.org/committees/reports/patrel_uspto.html* (data reported by PTO Board of Patent Appeals and Interferences Chief Judge Stoner); Evan I. Schwartz, *Televisionary*, WIRED, Apr. 2002, 68, 73 (describing the financial and psychic costs of the interference proceedings over television). Litigation is also time-consuming, with cases taking at least two years on average to get to trial and one to two more years on appeal.

same time. That such a system can be accommodated within a first to file regime is amply demonstrated by the European experience.[99] Whether prior user rights or some form of nonexclusive entitlement is a good idea is a more complex matter, one that requires us to consider not only fairness but also the economic effects of divided entitlements to intellectual property rights. There is a robust literature on this issue,[100] and we do not intend to resolve the question here. We merely suggest that the fairness argument for the first to invent system is not particularly strong.

If there is no systematic bias in favor of one group or another in a first to file system, we might decide as a society that the cost of "getting it perfect" is simply too great. For example, our evidence suggests that the overwhelming majority of priority disputes could be resolved using only evidence of filing dates and dates of reduction to practice. One alternative short of eliminating the first to invent system altogether would be to truncate the priority proceedings, dispensing with the need for parties to prove conception, diligence, abandonment, suppression or concealment. Doing so would certainly simplify the law, and would save a significant fraction of the cost of interferences, while preserving the outcome of the first to invent system in most cases. It would also let courts avoid relying on self-serving testimony regarding conception. It would not, however, accomplish the goal of harmonizing U.S. law with the rest of the world.[101]

99. Europe has both a first to file rule and a system of prior user rights. H.R. 102d Cong. 127 (testimony of Robert P. Merges), *supra* note 84.

100. For endorsements of divided entitlements in intellectual property in some circumstances, see, e.g., Robert Merges, *Intellectual Property Rights and Bargaining Breakdown: The Case of Blocking Patents*, 62 TENN. L. REV. 75 (1994); Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839 (1990); Mark A. Lemley, *The Economics of Improvement in Intellectual Property Law*, 75 TEX. L. REV. 989 (1997); Leibovitz, *supra* note 86, at 2268-2272; *cf.* Dan L. Burk, *Muddy Rules for Cyberspace*, 21 CARDOZO L. REV. 121 (1999). For arguments against divided entitlements, albeit from radically different perspectives, see F. Scott Kieff, *Property Rights and Property Rules for Commercializing Inventions*, 85 MINN. L. REV. 697 (2001) Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J. L. ECON. 265 (1977) (both arguing for strong property rights vested in a single entity that can coordinate innovation); Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 SCI. 698 (1998) (arguing against overly divided property entitlements and in favor of free use).

101. Of course, first-to-invent versus first-to-file is not the only legal obstacle to harmonization. U.S. law also differs from foreign laws in its one-year grace

As usual, the real world is messier than advocates from either side would have us believe. Our data suggest that the U.S. first to invent system has a significant effect on outcomes, but that it is not the effect many people in the debate seem to assume. Our findings might be thought to support harmonization, or alternatively to support maintaining the U.S. system, or even to provide support for a hybrid system. Whatever conclusions one draws, though, it should at least be one based on data and not merely on speculation.

period, in the absence of prior user rights, in the rules for publication of applications, in the lack of an effective opposition procedure, and in its willingness to extend patent term, among other provisions.

More generally, some have suggested that, despite its obvious cost savings, harmonization is not necessarily a desirable goal for patent law. *See, e.g.*, Rochelle Cooper Dreyfuss & Andreas F. Lowenfeld, *Two Achievements of the Uruguay Round: Putting TRIPS and Dispute Settlement Together*, 37 VA. J. INT'L L. 275, 296 (1997) (questioning whether there is a "best" patent law rule for all countries); John F. Duffy, *Harmony and Diversity in Global Patent Law*, 17 BERKELEY TECH. L.J. 685 (2002).