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Should Patent Infringement Require Proof of Copying?

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SHOULD PATENT INFRINGEMENT REQUIRE PROOF OF COPYING?†

Mark A. Lemley*

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Patent infringement is a strict liability offense. Patent law gives patent owners not just the right to prevent others from copying their ideas, but the power to control the use of their idea—even by those who independently develop a technology with no knowledge of the patent or the patentee. This is a power that exists nowhere else in intellectual property (IP) or real property law,¹ but it is a one that patentees have had, with rare exceptions, since the inception of the Republic. In an important paper in the *Michigan Law Review*, Samson Vermont seeks to change this, arguing that independent invention should be a defense to patent infringement, just as it would be in copyright or trade secret cases.² In an era in which both the Supreme Court and Congress are showing a nearly unprecedented interest in patent law and in which there is a general sense that the patent system is out of whack, Vermont's idea may be one whose time has come.

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1. The closest that other IP doctrines come to precluding independent development is in trademark law, which precludes uses likely to confuse consumers even if the use was developed independently. Whether the defendant adopted its mark intending to trade on the goodwill of the plaintiff's mark is, however, the most important factor in determining confusion, so trademark law certainly takes copying into account. See Barton Beebe, *An Empirical Study of the Multifactor Tests for Trademark Infringement*, 94 CAL. L. REV. 1581, 1628 (2006) (finding that the intent factor is the most significant one in predicting the outcome of cases, creating "a nearly un-rebuttable presumption of a likelihood of confusion").

2. Samson Vermont, *Independent Invention as a Defense to Patent Infringement*, 105 MICH. L. REV. 475 (2006). Carl Shapiro has recently made a similar argument in the economic literature. Carl Shapiro, *Prior User Rights*, AM. ECON. REV., May 2006, at 92, 95.

I. THE BENEFITS OF AN INDEPENDENT INVENTION DEFENSE

An independent invention defense has much to recommend it. The most significant problem facing the patent system today is the rise of so-called “patent trolls”—entities that do not manufacture products or transfer technology, but instead assert patents against successful companies that independently develop and manufacture technology without knowledge of those patents. Patent trolls have a number of tools at their disposal. They can file continuation applications and modify their invention to track changes in the defendant’s product.³ They can threaten injunctive relief and seek damages out of proportion to the importance of the invention, allowing them to capture significantly more than just the value of their technical contribution.⁴ In the information technology industries, it sometimes seems as though the overwhelming majority of patent suits are not brought against people who copied a technology, but against those who developed it independently.⁵

An independent invention defense would eliminate the troll problem.⁶ It also comports with our sense of equity. Those not schooled in patent law would likely find it odd that a patent not only prevents the imitation of the patentee’s technology but also limits the ability of inventors to develop and market their own technologies. And while an independent invention defense would be new to U.S. patent law, it is hardly unprecedented. Not only do other U.S. IP laws have such a defense, many other countries provide a “prior user right defense,” which, as we will see, is akin to independent invention.⁷

3. For a discussion of this practice, see Mark A. Lemley & Kimberly A. Moore, *Ending Abuse of Patent Continuations*, 84 B.U. L. REV. 63, 76 (2004).

4. Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. (forthcoming May 2007).

5. Empirical evidence I am currently collecting suggests that in the computer and electronics industries between 25% and 40% of all suits are filed by patent trolls, depending on how one defines the term. There is no empirical evidence to quantify the number of cases that challenge independent invention rather than copying, in significant part because under current law nothing turns on the distinction. Judge Kimberly Moore’s work has shown that 92% of patent suits allege willfulness. Kimberly A. Moore, *Empirical Statistics on Willful Patent Infringement*, 14 FED. CIR. B.J. 227, 232 (2004). But under current law, patentees can claim willful infringement even by an independent inventor; all the patentees must do is send the defendant a letter identifying the patent. Mark A. Lemley & Ragesh K. Tangri, *Ending Patent Law’s Willfulness Game*, 18 BERKELEY TECH. L.J. 1085, 1090 (2003) (discussing this willfulness standard). So a willfulness claim, even if proven, is no indication that the defendant copied from the patentee.

Jim Bessen and Mike Meurer have demonstrated that the more research and development a company does, the more likely it is to get sued for patent infringement. JAMES BESSEN & MICHAEL MEURER, *DO PATENTS WORK?* (forthcoming 2007). The most likely reason that this would be true is if inadvertent infringement is a common occurrence. That infringement is inadvertent doesn’t prove independent invention—the infringer may have copied the invention from a non-patent disclosure without realizing it was patented – but it makes independent invention more likely.

6. See Scott Baker & Doug Lichtman, *Discouraging Patent Holdouts through Reciprocal Commitment*, 5–6 (2006), http://www.law.northwestern.edu/colloquium/law_economics/lichtman.pdf.

7. See, e.g., John Neukom, *A Prior Use Right for the Community Patent Convention*, 12 EUR. INTELL. PROP. REV. 165, 165–66 (1990).

Vermont analyzes and dissects a number of common objections to an independent invention scheme for patent law. He responds persuasively, for example, to the concern that people would exploit an independent invention defense by falsifying evidence of independent invention. As he notes, outright fraud and perjury are rare in the patent system, even when more is at stake than proving an independent invention defense.⁸ If people won't lie about when they invented to get patent rights, it seems unlikely they will lie to get the lesser benefit of a defense to infringement.

The heart of Vermont's article is a response to the concern that an independent invention defense will weaken patent rights and therefore undermine incentives to invent.⁹ Vermont uses Bayesian analysis to argue that while an independent invention defense will weaken patent rights, it will not significantly affect invention incentives. He points out that independent invention will succeed as a defense only when an invention is made by multiple people in near simultaneous fashion. Vermont's core insight is that the fact that many people succeed in making an invention provides persuasive evidence that a monopoly right is an excessive reward because the invention would have been made even without granting exclusive rights to one of those inventors.¹⁰ Since the point of patent law is to encourage invention, not to satisfy some moral entitlement,¹¹ we should limit a patent owner's rights—and therefore facilitate competition—in any case where a stronger right isn't necessary to induce invention.

II. RISKS OF AN INDEPENDENT INVENTION DEFENSE

In short, Vermont offers persuasive justifications for an independent invention defense. There are good reasons to think that the defense would solve the problem of excessive litigation by patent trolls, and do so without significant cost to innovation incentives. Nonetheless, I have concerns. These concerns do not completely undermine the defense, but they are

8. Vermont, *supra* note 2, at 502.

9. This concern stems from the assumption that prices will be lower under duopoly than under monopoly and that the incentives provided by duopoly competition will be less than they would be under a truly exclusive right. Vermont and I both share this assumption, though it is worth noting that economic theory is all over the map in predicting price under duopoly, with estimates ranging from close to monopoly pricing to pure competitive pricing.

10. Vermont, *supra* note 2, at 497–500. Others have pointed out the social value of an independent invention defense in increasing competition, a value that should be weighed against the risk of reducing new inventions. *E.g.*, Emeric Henry, *Runner-up Patents: Is monopoly inevitable?* (June 2006), http://www.ssrn.com/sol3/papers.cfm?abstract_id=922316. But Vermont is the first to note that independent invention can itself provide valuable information about the likelihood of losing the invention.

11. For a concise discussion of why moral entitlement claims are “hard to take seriously” in patent law, see Dan L. Burk & Mark A. Lemley, *Policy Levers in Patent Law*, 89 VA. L. REV. 1575, 1597–99 (2003). For a few efforts to take these claims seriously, see, for example, A. Samuel Oddi, *Un-Unified Economic Theories of Patents—The Not-Quite-Holy Grail*, 71 NOTRE DAME L. REV. 267, 275–77 (1996). Cf. Lawrence C. Becker, *Deserving to Own Intellectual Property*, 68 CHI.-KENT L. REV. 609, 620–29 (1993) (arguing that desert-based arguments for patent law are intuitively appealing, but do not necessarily justify the scope of current patent doctrine).

significant enough that we should think carefully before making as significant a change as Vermont recommends.

To begin, the stakes are quite high. While we tend to glorify the individual inventor who makes a significant leap forward, most of the important inventions in U.S. history were made independently by multiple inventors, or at least were built on a solid base of prior work by others. Vermont identifies a number of such simultaneous inventions, including the light bulb, the telephone, the telegraph, the telescope, and the integrated circuit.¹² We might reasonably add to his list the steamboat, which was patented by different inventors in different states;¹³ the airplane, which was first patented by the Wrights but independently developed and significantly improved upon by Glenn Curtis and others;¹⁴ the laser, which was the subject of patent applications by two different groups;¹⁵ and polypropylene, which was the subject of a 30-year interference between competing inventors.¹⁶ The fact that so many important advances in technology involved independent invention by multiple parties underscores the significance of Vermont's argument. But it also means that if Vermont is wrong, and an independent invention defense would significantly reduce the incentives to innovate, the potential losses for society are substantial.

Vermont counters that simultaneous invention is evidence that a right to control not just copiers but independent inventors is excessive. Underlying Vermont's reasoning is the idea that if the prospect of a huge reward tempts many people to invest in research and they all succeed, the prospect of a more modest reward will likely motivate at least one person to make the same investment. And because the fact of independent invention demonstrates that those remaining inventors are still likely to succeed, society will still obtain the invention.

This reasoning makes considerable sense if the barrier to invention is the uncertainty of research outcomes. Researchers will either think an outcome is certain or that it isn't. If they expect an outcome is certain, they will anticipate independent invention by others, but they will also believe that they

12. Vermont, *supra* note 2, at 478–79.

13. *E.g.*, *Gibbons v. Ogden*, 22 U.S. (9 Wheat.) 1 (1824); BRUCE W. BUGBEE, *GENESIS OF AMERICAN PATENT AND COPYRIGHT LAW* 90–91 (1967); Frank D. Prager, *The Steamboat Interference: 1787–1803*, 40 J. PAT. OFF. SOC'Y 611, 640–41 (1958).

14. *E.g.*, George Bittlingmayer, *Property Rights, Progress, and the Aircraft Patent Agreement*, 31 J.L. & ECON. 227, 230–31 (1988); Herbert A. Johnson, *The Wright Patent Wars and Early American Aviation*, 69 J. AIR L. & COM. 21 (2004).

15. *E.g.*, *Gould v. Schawlow*, 363 F.3d 908 (C.C.P.A. 1966). For a detailed discussion, see NICK TAYLOR, *LASER: THE INVENTOR, THE NOBEL LAUREATE, AND THE THIRTY-YEAR PATENT WAR* (2000).

16. The multi-party interference was declared by the Board of Patent Appeals and Interferences ("BPAI") on September 9, 1958. *Standard Oil Co. (Ind.) v. Montedison, S.p.A.*, 494 F. Supp. 370, 374 (D. Del. 1980). The BPAI issued its final opinion on priority on November 29, 1971. *Id.* at 375. The patent was filed on June 8, 1955, and issued on February 6, 1973. *Id.* at 374 n.5; U.S. Patent No. 3,715,344 (filed June 8, 1955). The BPAI decision was appealed to the United States District Court for the District of Delaware, *id.*, and then to the Third Circuit, *Standard Oil Co. (Ind.) v. Montedison, S.p.A.*, 664 F.2d 356 (3d Cir. 1981), *cert. denied*, 456 U.S. 915 (1982).

can reach the outcome and therefore that engaging in research will be relatively cheap.¹⁷ If, on the other hand, a researcher thinks a particular line of inquiry is a long shot, she will not expect others to independently develop the invention, and so won't worry as much about competition.

This reasoning breaks down if the barrier to research is not uncertainty but cost. Suppose that potential researchers know that they can develop a new drug for \$500 million and that a full right to exclude will offer potential rewards well in excess of the cost. If the researchers face competition from one or more independent inventors, the researchers may not be able to recoup their investment. In that case, an independent invention defense may undermine incentives to develop the invention at all. In theory, this case shouldn't differ from the uncertainty case. If a researcher knows that lots of others will race to a particular outcome, she should discount for her reduced odds of being first. But in practice that is not how invention works. Researchers may not know or suspect they are in a race. Even if they do, people—even nominally rational corporations—systematically overinvest in high-risk, high-reward activities.¹⁸ This bias towards investment in winner-take-all systems may be irrational, but it is an irrationality that arguably benefits society by generating inventions with significant spillover benefits.¹⁹ In other words, one advantage of the current system is that inventors invest more than they should rationally expect to recoup. Their investment produces social benefits that significantly outweigh the actual expected benefits to the patentee. Society benefits from the difference.

17. Indeed, one can strengthen Vermont's point here. The possibility of an independent invention defense may actually *increase* research incentives among those who want to enter an invention race but fear that they will not be the first to invent. Under current law, such research is wasted. With an independent invention defense, the second to invent at least gets some reward for their research—the ability to compete in marketing the invention.

18. F.M. Scherer, *The Innovation Lottery*, in EXPANDING THE BOUNDARIES OF INTELLECTUAL PROPERTY: INNOVATION POLICY FOR THE KNOWLEDGE SOCIETY 3 (Rochelle Cooper Dreyfuss et al. eds., 2001).

19. Economic evidence suggests that the social benefits of invention far outweigh the private benefits appropriated from that invention. See, e.g., NESTER E. TERLECKYJ, EFFECTS OF R&D ON THE PRODUCTIVITY GROWTH OF INDUSTRIES: AN EXPLORATORY STUDY (Nat'l Planning Ass'n, Report No. 140, 1974); M. Ishaq Nadiri, *Innovations and Technological Spillovers*, (Nat'l Bureau of Econ. Research, Working Paper No. 4423, 1993); Edwin Mansfield et al., *Social and Private Rates of Return from Industrial Innovations*, 91 Q.J. ECON. 221 (1977); Leo Sveikauskas, *Technology Inputs and Multifactor Productivity Growth*, 63 REV. ECON. & STAT. 275 (1981); Akira Goto & Kazuyuki Suzuki, *R & D Capital, Rate of Return on R&D Investment and Spillover of R&D in Japanese Manufacturing Industries*, 71 REV. ECON. & STAT. 555 (1989); Jeffrey I. Bernstein & M. Ishaq Nadiri, *Interindustry R & D Spillovers, Rates of Return, and Production in High-Tech Industries*, 78 AM. ECON. REV. PAPERS & PROC. 429 (1988); Frederick Scherer, *Using Linked Patent and R&D Data to Measure Interindustry Technology Flows, in R & D, PATENTS, AND PRODUCTIVITY* 417 (Z. Griliches ed., 1984); Jeffrey Bernstein & M. Ishaq Nadiri, *Product Demand, Cost of Production, Spillovers, and the Social Rate of Return to R&D* (Nat'l Bureau of Econ. Research, Working Paper No. 3625, 1991); see also Zvi Griliches, *The Search for R&D Spillovers*, 94 SCANDINAVIAN J. ECON. 29, 43 (Supp. 1992) ("In spite of [many] difficulties, there has been a significant number of reasonably well done studies all pointing in the same direction: R&D spillovers are present, their magnitude may be quite large, and social rates of return remain significantly above private rates."). For a discussion of the implications of this issue for IP, see Brett M. Frischmann & Mark A. Lemley, *Spillovers*, 107 COLUM. L. REV. 257 (2007).

While I agree with Vermont that we can learn a great deal from the fact of independent invention, I am not yet confident that an independent invention defense will have no undue effect on incentives. Eliminating the significant holdup costs associated with patent trolls may be worth the risk, but that will depend on how much invention we think an independent invention defense will in fact put at risk.

Complicating this difficult empirical question is the likelihood that the effects of an independent invention defense would be different in different industries.²⁰ Vermont's approach depends on the traditional economic justification for patent rights—what I have called the “ex ante” incentive story.²¹ In this story, IP is a necessary evil. If we don't need a particular reward in order to encourage invention, we shouldn't distort the market by imposing that reward. There are other “ex post” theories of invention, however. In those theories, patent exclusivity is valuable not because of the incentives to invent, but because control over the invention after it is made will permit coordination of the development and use of the invention.²² For these “prospect” theorists, central coordination is better than competition in determining how an invention should be used. A prospect theorist would likely oppose an independent invention right because the ability of a third party to make use of the invention would interfere with that coordination effort.

Vermont's analysis implicitly rejects prospect theory. As a general matter, I don't think that's a problem because I think the economic evidence is quite strong that it *should* be rejected—that the market is better than central planning by the inventor at determining how to make use of inventions once they are made.²³ But there may be some circumstances—and some industries—in which that is not true. In the pharmaceutical industry, for example, it is reasonable to conclude that the most significant expense and uncertainty associated with innovation is not the act of inventing a drug, but the efforts to develop and test that drug to prove to the FDA that it is safe and effective. Some argue that the same is true of many university inventions—that they are at such an early stage that they will languish unless the university can transfer patent rights to private companies who will undertake develop-

20. See generally Burk & Lemley, *supra* note 11, at 1580–95 (demonstrating the ways in which different industries experience the patent system differently).

21. Mark A. Lemley, *Ex Ante versus Ex Post Justifications for Intellectual Property*, 71 U. CHI. L. REV. 129, 130 (2004).

22. See, e.g., Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & ECON. 265, 275–80 (1977); F. Scott Kieff, *Property Rights and Property Rules for Commercializing Inventions*, 85 MINN. L. REV. 697, 707–12 (2001). For more critical but not entirely negative assessments, see, for example, Michael Abramowicz, *The Problem of Patent Underdevelopment* 3–8 (The George Washington Univ. Law Sch., Pub. Law & Legal Theory Working Paper No. 179, 2005) available at <http://papers.ssrn.com/abstract=873473>; John F. Duffy, *Rethinking the Prospect Theory of Patents*, 71 U. CHI. L. REV. 439, 443–47 (2004).

23. For my detailed defense of that argument, see, for example, Lemley, *supra* note 21, at 135–41 and Mark A. Lemley, *Property, Intellectual Property, and Free Riding*, 83 TEX. L. REV. 1031, 1060–62 (2005).

ment.²⁴ In these industries, patent owners may need the power associated with a right of complete exclusion not just to encourage invention but to ensure that the inventor invests the resources to take the idea from invention through development to marketability. If generic pharmaceutical companies could compete with patent owners from day one by independently developing the drug,²⁵ the incentives to engage in pioneering pharmaceutical innovation would change significantly, and not for the better.²⁶ An independent invention defense is almost certainly a good idea in the information technology industries, but if it is a bad idea in other industries, we need to think carefully about whether and how the defense should be implemented.

Related to the potential effects on post-invention investment are the effects that an independent invention defense will have on markets for patents. An independent invention defense will significantly change any possible market for patent rights. It is much easier to sell a right of absolute exclusion than a right of control that is potentially defeasible based on information—the fact of independent invention—that the patentee is unlikely to have at the time of the sale. If an inventor obtains a patent under current law, he can sell his patent to others who are better able to commercialize it because he can guarantee them exclusivity—at least if the patent is valid.²⁷ In comparison, it is harder (though admittedly not impossible) to sell trade secrets, in part because there is no guarantee that the buyer will have any exclusivity.²⁸ For patents with an independent invention

24. This is the view that underlies the Bayh-Dole Act encouraging university patenting. See 35 U.S.C. §§ 200–212; see also Chester G. Moore, *Killing the Bayh-Dole Act's Golden Goose*, 8 TUL. J. TECH. & INTEL. PROP. 151, 155–57 (2006). For a more negative view of the value of patents in commercializing university inventions, see DAVID C. MOWERY ET AL., *IVORY TOWER AND INDUSTRIAL INNOVATION: UNIVERSITY-INDUSTRY TECHNOLOGY TRANSFER BEFORE AND AFTER THE BAYH-DOLE ACT IN THE UNITED STATES* 4 (2004).

25. Currently these companies do not independently develop their drugs, but rather deliberately set out to make drugs bioequivalent to the ones the patent owner sells. But one can imagine the development of an industry of generic drug design, producing a wide range of chemical compounds and waiting to see which compounds happen to match drugs that a patentee has found a medical use for.

26. To be sure, pharmaceutical companies receive rights to exclude others from the FDA, not just from the patent laws. E.g., Rebecca S. Eisenberg, *Patents, Product Exclusivity, and Information Dissemination: How Law Directs Biopharmaceutical Research and Development*, 72 FORDHAM L. REV. 477, 481–84 (2003). The FDA approval process can itself impose costs on generic developers, just as it does on first movers. Those costs can effectively substitute for patent protection. William E. Ridgway, Note, *Realizing Two-Tiered Innovation Policy Through Drug Regulation*, 58 STAN. L. REV. 1221, 1236–39 (2006). It is when the regulatory cost structure is asymmetric, as it is under current law, that some form of exclusivity becomes important. If patent law did not provide that exclusivity to pharmaceutical developers, FDA market exclusivity would have to pick up the slack.

27. This is a significant limitation. Patents are probabilistic rights to begin with, so patent owners can't really "guarantee" anything.

28. People do regularly transfer copyrights despite the existence of an independent invention defense in copyright law. But I think patents are much more like trade secrets than copyrights in this respect. The value of a copyright resides in the expression and not in the idea expressed. In contrast, it is the idea behind a patent or a trade secret that is valuable, and in many cases it is unlikely to matter how that idea is implemented. In copyright, anyone who buys an idea buys it subject to the risk that one or more competitors will have rights to use all the value of that idea. Indeed, in circumstances where it is only the idea of a copyrighted work that owners want to transfer, as is the case with movie scripts, the fact that others can implement the idea in their own way without fear of

defense, the problem may be greater still because the patentee will have publicly disclosed the invention. Commercializers will be less likely to purchase rights to patents under an independent invention system because they won't know if they are buying exclusivity or just the right to participate in a duopoly or a triopoly. At the least they may delay any such purchase—and therefore slow commercialization—to see if independent developers surface.

Whether this is a problem depends on whether the development of a market for patent rights divorced from products or know-how is in fact a good thing. Selling or exclusively licensing patents can improve economic efficiency by allowing an inventor to transfer her rights to someone who is in a better position to commercialize the invention.²⁹ But selling patents can also put them in the hands of patent trolls who use those patents to hold up independent inventors that have actually commercialized the technology. The underlying question is an empirical one: do patent licenses in fact involve socially beneficial technology transfer, or do they primarily involve the sales of a right to litigate? If the former, we should be worried that a change in the law that will stunt the marketability of patents will also interfere with the valuable dissemination of information. If the latter, then the obstruction of such sales may be a feature of Vermont's proposal, not a bug. Here too the answer may differ by industry, though we simply don't know enough about markets for technology to begin to answer the question.³⁰

III. ALTERNATIVES TO INDEPENDENT INVENTION

In short, an independent invention defense could eliminate a great deal of inefficient behavior by those who abuse the patent litigation system. As Vermont's analysis shows, the defense offers the prospect of doing so at little or no cost to innovation incentives. At the same time, an independent invention defense might interfere with incentives to develop, transfer, or commercialize the invention after it was made, and in rare circumstances it might also interfere with incentives to invest in research. We must be careful in balancing these effects, recognizing both how little we know about the economics of patents and how the ultimate economic calculus may vary for

liability—unless they see the script—makes the development of a market for movie scripts virtually impossible. For a discussion of this problem, see, for example, ROBERT P. MERGES ET AL., *INTELLECTUAL PROPERTY IN THE NEW TECHNOLOGICAL AGE* 880–83 (4th ed. 2006).

29. See, e.g., DEP'T OF JUSTICE & FED. TRADE COMMISSION, *ANTITRUST GUIDELINES FOR THE LICENSING OF INTELLECTUAL PROPERTY* § 2.3 (1995) (Licensing . . . can facilitate integration of the licensed property with complementary factors of production. This integration can lead to more efficient exploitation of the intellectual property, benefiting consumers . . . [L]icensing also can increase the incentive for [IP] creation and thus promote greater investment in research and development.”).

30. For a useful summary of what we do know, see ASHISH ARORA ET AL., *MARKETS FOR TECHNOLOGY: THE ECONOMICS OF INNOVATION AND CORPORATE STRATEGY* (2001). Judge Kimberly Moore's work has found that patents that are litigated are much more likely to be transferred before litigation. See Kimberly A. Moore, *Populism and Patents*, 82 N.Y.U. L. REV. (forthcoming 2007). This may be evidence of the troll hypothesis, but it might also simply be consistent with the idea that valuable patents are more likely to be litigated. See John R. Allison et al., *Valuable Patents*, 92 GEO. L.J. 435, 437–38 (2004).

different industries. This isn't a reason to reject Vermont's proposal, much less his analysis. But it is a reason to proceed with care.

In light of this, let me suggest four ways that we could take advantage of Vermont's insights without moving all the way to an independent invention system.

A. Willfulness

First, we could reform our standard for willful infringement to incorporate an independent development defense. Even if there turn out to be good reasons to find independent developers to be patent infringers, it makes little sense to describe someone who independently invents as a "willful infringer."³¹ As I have suggested elsewhere, willfulness should be defined instead as copying the technology from the patent owner, whether or not the copier was aware that the technology was patented.³² Doing so will distinguish independent inventors from copiers, making treble damages available only against the latter.

Vermont worries that this will encourage too much patent racing.³³ I am less concerned. First, as Vermont notes elsewhere, changes in willfulness are unlikely to move incentives to invent much in any direction, except at the margins. Second, I am less persuaded than he that patent races are bad. While reinvention does involve some duplication of research, research is not always or even usually a fungible commodity. Multiple lines of research attacking the same problem may lead to different inventions, each of which is valuable to society. It may also cause the racers to reach the finish line faster, with significant social benefits.³⁴ Finally, as I have explained elsewhere, the willfulness change would encourage scientists to read patents, which would eliminate a significant inefficiency in the nascent market for patents.³⁵

B. Prior User Rights

Second, we could adopt a limited form of independent invention defense in the form of a prior user right.³⁶ Under this approach, which has been

31. On willful infringement, see *Knorr-Bremse Systeme v. Dana Corp.*, 383 F.3d 1337 (Fed. Cir. 2004) (en banc).

32. See Lemley & Tangri, *supra* note 5, at 1116–21.

33. Samson Vermont, *The Angel is in the Big Picture: A Response to Lemley*, 105 MICH. L. REV. 1537 (2007).

34. See John F. Duffy, *Rethinking the Prospect Theory of Patents*, 71 U. CHI. L. REV. 439 (2004).

35. See Lemley & Tangri, *supra* note 5, at 1121.

36. For suggestions that the U.S. should adopt a prior user rights system, see, for example, *Oversight Hearings on Prior User Rights Before the Subcomm. On Intellectual Property and Judicial Administration of the H. Comm. On the Judiciary*, 103d Cong. 32–45 (1995) (statement of Robert P. Merges, Professor of Law, Boston University School of Law); Kyla L. Harriel, *Prior User Rights in a First-to-Invent Patent System: Why Not?*, 36 IDEA 543 (1996).

adopted in Europe and has been proposed in recent U.S. patent reform legislation,³⁷ independent invention becomes a defense, but only if the independent invention is made and commercialized sufficiently early in the process, such as before the patentee files its application. Indeed, Vermont himself endorses an independent invention defense that is similarly limited, one that applies only if the independent inventor invents before the invention is published.³⁸ Doing so avoids some of the problems that might plague a broader independent invention right. Specifically, this limited approach makes it very difficult to game the system by falsifying independent invention. It also makes it easier to sell at least some patents because everyone involved will know fairly early on if an independent inventor will claim intervening rights. That may be enough to tip the scales in favor of an independent invention defense. But a prior user right would be more limited still, since it would protect not those who engage in the mere act of independent invention but only those who take steps to commercialize the invention before the critical date. That limitation should eliminate any worry in the pharmaceutical industry, where generic companies will not be able to commercialize an invention before the patentee without seeking FDA approval for a new drug. Alternatively, if even a prior user right would be too threatening to the pharmaceutical or biotechnology industries, the right—which already exists in U.S. law for business method patents³⁹—could be expanded to other information technology industries, where we can be more confident that the benefits outweigh the costs.

C. Secondary Considerations of Nonobviousness

Third, we might internalize the lessons of Vermont's Bayesian analysis in a different way, by taking seriously the relevance of simultaneous invention as a secondary consideration in the obviousness analysis. Under current law, courts considering whether an invention is obvious are free to consider a variety of external market factors, almost all of which are found to favor patentability. Only one—simultaneous invention by others—is considered evidence that the invention shouldn't be patentable, and the Federal Circuit has minimized the significance of that factor.⁴⁰ If Vermont is right that simultaneous invention is evidence that patent protection may be unnecessary, perhaps we should give this factor more significance in the obviousness analysis. Doing so is in one sense a more radical proposal than Vermont's. It would not just create a defense to infringement for independent inventors; it would invalidate some patents altogether.⁴¹ At the same time, simultaneous

37. See, e.g., S. 3818, 109th Cong. (2006); H.R. 2795, 109th Cong. (2005).

38. See Vermont, *supra* note 2, at 484 (describing prior user rights as consistent with his "main argument").

39. 35 U.S.C. § 273(a)(3) (2000).

40. See, e.g., *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1380 n.4 (Fed. Cir. 1986).

41. See Vermont, *supra* note 33, at 1542 (worrying that this will reduce incentives too much).

invention is just one factor among many in the obviousness analysis. Courts can continue to engage in a case-specific analysis of all the factors in order to determine whether a patent is necessary given the existence of simultaneous invention. And for inventions that do seem obvious once we take Bayesian inference into account, rejecting the patent altogether might well be appropriate.

D. *Injunctive Relief*

Finally, we might take account of independent invention in setting the remedy for patent infringement. The normal remedy for patent infringement is an injunction. While *eBay, Inc. v. MercExchange, L.L.C.*⁴² made it clear that patentees are not automatically entitled to injunctions, it did not change the general status of patent law as a property rule. But while an injunction against a copier seems perfectly equitable, an injunction against an independent developer can render significant irreversible investments by the defendant worthless. One might address this situation by refusing injunctive relief (and other remedies) altogether, as Vermont suggests. An alternative would be to grant injunctive relief against both copiers and independent developers, but to condition the grant of an injunction against an independent developer on the payment of a bond designed to compensate the defendant for its now-worthless investment. Such a bond corresponds to an approach identified by Calabresi and Melamed as one possible remedy for invasion of a legal right—a property entitlement in the patent owner coupled with a liability rule right in the accused infringer.⁴³ Patentees will likely object to the idea of having to pay infringers,⁴⁴ but presumably they will object less than they would to an independent invention defense. At a minimum, courts could take independent invention into account in deciding whether to grant *preliminary* injunctions, which are subject to significantly more skepticism in the Federal Circuit than permanent injunctions traditionally have been.

IV. CONCLUSION

Vermont's analysis offers reason to believe that patent law, like other IP rights, should incorporate an independent invention defense. While he is likely correct that doing so will not significantly interfere with innovation incentives, there is a danger that such a defense will interfere with incentives to commercialize or market patent rights. In limited circumstances, this interference may be a significant problem. We should think carefully about

42. 126 S. Ct. 1837 (2006).

43. Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089, 1120 (1972).

44. In the pharmaceutical industry, patentees already pay competitors to exit the market with some frequency as part of an effort to cartelize the market through settlement. See, e.g., HERBERT HOVENKAMP ET AL., IP AND ANTITRUST § 7.4(e) (perm. ed., supp. 2007) (discussing such agreements in detail); Scott Hemphill, *Paying for Delay: Pharmaceutical Patent Settlement As a Regulatory Design Problem*, 81 N.Y.U. L. REV. 1553 (2006) (same).

whether the benefits of an independent invention defense are worth the potential costs, and about whether there are alternatives that can draw on Vermont's insights without creating risks to the incentive structure of the patent system.