

Book Review

Can the Courts Rescue Us from the Patent Crisis?

THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT. By Dan L. Burk and Mark A. Lemley. Chicago, Illinois, and London, United Kingdom: University of Chicago Press, 2009. 220 pages. \$45.00.

Reviewed by Scott Baker*

In *The Patent Crisis and How the Courts Can Solve It*,¹ Dan Burk and Mark Lemley have produced a significant and good book that tackles the most pressing needs in the patent system.

The book contains a description and a proposal for reform. Burk and Lemley start by describing how the world actually works. They show that the development of technology differs by industry; that is, what it takes to get invention and innovation is industry specific.² Some industries, say pharmaceuticals, face high fixed costs and relatively low imitation costs.³ Other industries have low fixed costs and low imitation costs.⁴ Some industries are characterized by lots of patents per commercial product; others have few patents per product.⁵ These technological differences translate into how industries view and use the patent system.

Not only does the production of new technology vary by industry, the courts also treat industries asymmetrically. The Federal Circuit, for example, applies the written-description requirement differently to a patent from a biotechnology firm than a patent from a computer-software firm.⁶ Further, experiences at the Patent and Trademark Office (PTO) are industry specific. It matters for the length of time of prosecution whether a chemical firm or

* Professor of Law, Professor of Economics (courtesy), Washington University in St. Louis School of Law. I thank Adrienne Davis, Rebecca Hollander-Blumoff, Kim Krawiec, Doug Lichtman, and Adam Rosenzweig for helpful discussions about this Review.

1. DAN L. BURK & MARK A. LEMLEY, *THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT* (2009).

2. *Id.* at 4–5. Invention is typically discussed as coming up with a new technology. Innovation, by contrast, refers to acts of transforming that technology into a commercial product. See RICHARD R. NELSON & SYDNEY G. WINTER, *AN EVOLUTIONARY THEORY OF ECONOMIC CHANGE* 263 (1982) (noting the invention–innovation distinction).

3. *Id.* at 143–44.

4. *Id.* at 84.

5. *Id.* at 53–54.

6. *Compare* Regents of the Univ. of Cal. v. Eli Lilly & Co., 119 F.3d 1559, 1568 (Fed. Cir. 1997) (requiring a description of the biotechnology invention in addition to an indication of a result), *with* Fonar v. Gen. Elec. Co., 107 F.3d 1543, 1549 (Fed. Cir. 1997) (requiring only a disclosure of the software’s functions). The book contains a detailed discussion of the differences between these cases. BURK & LEMLEY, *supra* note 1, at 60.

software firm filed the patent application.⁷ In short, although the patent statute makes no distinctions between industries, in practice those distinctions are being made in the courts and the PTO.

Burk and Lemley next move to their proposal for reform. They suggest that the courts are best suited to solve the patent crisis.⁸ To do so, they advocate that the courts tweak the doctrinal rules, using what they term “policy levers” to ensure a more sensible approach to innovation policy.⁹ To them, the courts, not Congress or the PTO, are the place to look for solutions to the problems that plague the system: patent holdups,¹⁰ the flood of bad patents,¹¹ patent thickets,¹² and anticommons concerns.¹³

At the outset, I should note that readers hoping for a scathing methodological critique or devastating arguments will be disappointed in this Review.¹⁴ The book is careful, well organized, insightful, and well written. My short Review considers what would happen if the courts do what Burk and Lemley say they should do: attempt to solve the patent crisis through case-by-case adjudication.

To start, I ask why the courts, specifically the Federal Circuit, have applied the facially neutral patent statute differently based on industry. Do judges have a hunch that innovation and invention vary by industry and, as such, actively transform patent doctrine to respond and recognize this fact? Or, in the alternative, have judges unconsciously achieved the doctrinal results that Burk and Lemley identify? If it is the former, Burk and Lemley are encouraging judges to go further, to be more explicit in considering differences in the mechanics of innovation and invention across industries. If it is the latter, Burk and Lemley want the courts to deliberately consider industry-specific facts and problems for the first time. Either way, whether this encouragement yields better outcomes turns on the interaction between *stare decisis* and more aggressive judicial policy making.

To accomplish the assignment set out by Burk and Lemley, the courts must do two things. First, they must identify the characteristics of the industry and, in light of those characteristics, the likely problems the industry

7. See John R. Allison & Mark A. Lemley, *Who's Patenting What? An Empirical Exploration of Patent Prosecution*, 53 VAND. L. REV. 2155 tbl.9 (2000) (presenting the results of a survey of U.S. patents broken down by type and time in prosecution); see also *id.* at 2124–32 (describing the methodology and other findings of this survey).

8. BURK & LEMLEY, *supra* note 1, at 5.

9. *Id.* at 6.

10. *Id.* at 28–30.

11. *Id.* at 22.

12. *Id.* at 89–92.

13. *Id.* at 86–89.

14. For a recent example of a scathing critique of a book on gene patents, see Chris Holman, *David Koepsell, Who Owns You? The Corporate Gold Rush to Patent Your Gene*, NOTRE DAME PHIL. REVIEWS (2009) (book review), <http://ndpr.nd.edu/review.cfm?id=17005>. For an example of a strong methodological critique of legal empirical research in general, see Lee Epstein & Gary King, *The Rules of Inference*, 69 U. CHI. L. REV. 1 (2002).

faces. Second, the courts must come up with a doctrine or combination of doctrines to solve the identified problems. Both the identification step and the solution step present potential pitfalls. Start with identification. Suppose that a panel of the Federal Circuit decides that, in the computer-software industry, the obviousness standard should be lower and the scope of claims narrower. The panel believes Burk and Lemley's intuition that this industry is characterized by cumulative innovation and relatively low development costs.¹⁵ As such, narrowing the scope and power of each patent facilitates the cumulative innovation process while still maintaining a carrot sufficient to get initial invention. The panel could be wrong in its identification assumption. The software industry might not, in fact, display these characteristics. In addition, as Burk and Lemley acknowledge, the software industry is dynamic—the characteristics it displays today might be gone tomorrow.¹⁶

If a panel wrongly assesses the characteristics of an industry, it will declare a mistaken policy that applies either explicitly or by implication to a whole industry. Because of *stare decisis*, another panel will be reluctant to overturn that policy. The mistake will be felt industry-wide and could have far-reaching consequences. Sure, judges might be more humble here, understanding that they are trying to match patent policy to the needs of an industry rather than simply deciding the case before them. And judicial humility might reduce the chance of mistake, but it is hard to know how likely this is. In addition, the panel will be making assessments about the needs of an industry primarily based on facts presented, the information before them, and what can be plumbed from prior case law. That information will be taken from a skewed sample of appealed cases.

Assuming the court has correctly identified the industry-specific problems, consider next the solution step. Can we be confident that case-by-case adjudication will yield the right doctrinal reforms? To answer that question, we need to understand judge-made law, when it works, when it does not, and why.

One critical issue for evaluating the likely effectiveness of judge-made law is what information can be gleaned from prior precedent. Unpacking this idea, Part III contrasts tort law and patent law. The contrast generates insights about the effectiveness of judge-made law in patent. Unlike torts, much of the information needed for tweaking the patent doctrines of, say, obviousness and novelty will be hidden from judges' view.

For case-by-case adjudication to lead to judicial learning and good judicial policy making, a judge in a case at time t_j must (a) learn something that is relevant for determining the proper scope of the legal rule and (b) convey that information through his opinion to future judges. Most patent litigation does not teach the judge much about the proper scope of the legal

15. BURK & LEMLEY, *supra* note 1, at 157.

16. *Id.* at 165.

rule. As a result, canvassing prior precedent at time t_2 to uncover the factual conditions under which a certain doctrine fails and when it is successful might not be a worthwhile exercise.

For example, it could be difficult, if not impossible, for a judge to determine the socially optimal amount of innovation and invention would occur with less (or more) patent protection, the number of overlapping patents and holdups, or the pace of technological change in an industry precisely because these issues are rarely teed up in patent litigation. The case law will be uninformative for future judges. In other words, judges in patent cases might have trouble extracting information from prior cases about whether the doctrine, as applied in those cases, advances the policy goals of patent law. It follows that judges will have difficulty refining the doctrine to make it better. If that is true, it is not obvious that the best recipe for reform is to place the burden of solving the patent crisis on the judges.

In deciding which institution is best suited to mitigate the patent crisis, Burk and Lemley compare the courts to Congress and the PTO, and conclude that the courts should take the lead.¹⁷ Yet that is not the only possibility. We could do nothing. We might suggest that the courts continue doing what they have been doing, recognizing that neither Congress nor the courts nor the PTO will effectively address the problems identified in the book.

It is not clear that calling for the courts to “play big” will lead to better outcomes than telling them to follow the same familiar judicial path—a strategy that, Burk and Lemley demonstrate, has led to a number of prudent doctrinal moves.¹⁸ One must consider the chance of judicial error and whether those errors will be magnified by attempts to solve the patent crisis. The error risk and resulting consequences are hard to quantify. In reading Burk and Lemley, I was left wondering under what conditions they thought a judiciary committed to industry-specific patent reform would achieve better results than one that was not. In particular, what happens when the committed judiciary misfires identifying the problems in an industry or in coming up with doctrinal reforms?

This Review unfolds in four parts. Part I discusses the positive claim advanced in the book. Part II identifies potential strengths and weaknesses of the proposal. Part III asks whether judges, as a theoretical matter, will be able to learn the information necessary to tailor patent law to industry-specific problems through case-by-case adjudication. Part IV concludes.

17. BURK & LEMLEY, *supra* note 1, at 3.

18. *Id.* at 131–41.

I. Positive Theory in *The Patent Crisis*

A. *The Patent Crisis*

The book's title declares a crisis in the patent system. It is unsurprising, then, that Burk and Lemley begin by defining the crisis.¹⁹ Scholars, lawmakers, and industry participants have all asserted failures in the patent system. The third chapter of the book is devoted to explicating these failures.²⁰ The problem starts with the flood of patent applications and the overburdened PTO.²¹ Limited PTO resources and numerous applications mean that each application receives little scrutiny.²² On top of that, Burk and Lemley point out that it is quite hard to finally reject a patent application.²³ By filing continuation applications, each applicant can get an unlimited number of "do-overs."²⁴ The end result is predictable: a stream of bad patents, i.e., patents that do not meet the statutory requirements. And each of these patents earns a presumption of validity in court.²⁵

If bad patents were simply ignored, their existence would not cause a stir, much less a crisis. But this is not the case. In many industries a single product can implicate and infringe many patents.²⁶ In other words, there is not a one-to-one correspondence between patent and product. More troubling, the scope of claims in each patent is hard to discern until the Federal Circuit renders a decision on the matter.²⁷ Imperfect screening by the PTO, uncertain claim language, and many patents per product combine to produce expensive and time-consuming patent litigation.²⁸

Besides cumbersome litigation, the multiplicity of patents can create "patent thickets." In a patent thicket, each firm holds a portfolio of patents for defensive purposes only.²⁹ If Company A's product infringes

19. BURK & LEMLEY, *supra* note 1, at 95–108.

20. *Id.* at 21–33.

21. *Id.* at 22–24.

22. See John R. Thomas, *Collusion and Collective Action in the Patent System: A Proposal for Patent Bounties*, 2001 U. ILL. L. REV. 305, 318 ("In combination with the declining significance of the utility and statutory subject matter requirements, meager Patent Office funding has had a felt impact upon patent quality.").

23. BURK & LEMLEY, *supra* note 1, at 24–25.

24. On continuation applications, see 35 U.S.C. § 120 (2006). The mechanics of continuation applications are filled in by regulations from the PTO, described in 37 C.F.R. § 1.53(b) (2005).

25. 35 U.S.C. § 282.

26. See BURK & LEMLEY, *supra* note 1, at 26–27 (explaining how IT industries usually have multiple patents for each product).

27. See Kimberly A. Moore, *Markman Eight Years Later: Is Claim Construction More Predictable?*, 9 LEWIS & CLARK L. REV. 231, 231 (2005) ("There is concern among the bench and bar that the Federal Circuit's de novo review of district court claim construction decisions and lack of guidance have caused considerable unpredictability.").

28. See BURK & LEMLEY, *supra* note 1, at 28–30 (listing the overburdened PTO and its associated problems, along with lengthy and expensive trials, as impetuses for patent reform).

29. See Gideon Parchomovsky & R. Polk Wagner, *Patent Portfolios*, 154 U. PA. L. REV. 1, 26–29 (2005) (explaining the defensive value of patent portfolios); see also, e.g., Bronwyn H. Hall &

Company B's patent, there is a good chance that one of Company B's products infringes a patent held by Company A. The companies play a game of mutually assured destruction from litigation; as a result, the two firms cross license the portfolios. Notice, however, how having to file patent applications and hold defensive patent portfolios wastes resources. Both companies would be better off if neither had any patents whatsoever.

The proliferation of patent rights can also lead to what Michael Heller dubbed the "anticommons problem."³⁰ Like the commons problem, the anticommons problem involves a failure of coordination. If property rights are disaggregated and held by many different players, it becomes harder and harder to get the parties to come together, agree on terms of trade, and build the product. Each right holder has a blocking position: without their consent the product cannot be made. With many different right holders in a blocking position, each one will have an incentive to hold out for more than their fair share of the product's revenue, slowing and perhaps even halting production.

The anticommons problem stems from a failure of coordination of patent-right holders before production. The "patent holdup" is a related problem that occurs after firms have invested in a technology. In essence, a patent holdup does not play well with others.³¹ The patent holdup waits until a firm or group of firms has sunk resources into developing a product that arguably infringes its patent.³² It then sues and uses the threat of a punitive remedy, either injunctive relief or treble damages for willful infringement, to extract a settlement that exceeds what it would have gotten if it licensed its patent *ex ante*.³³ The settlement exceeds the value of the *ex ante* license because it includes the cost of having to design around the patent *ex post*. Knowing the holdup threat is out there, firms will be wary of making technology-specific investments.³⁴

To put matters succinctly, the patent crisis stems from the PTO issuing more and more patents each year, many of them bad. This leads to increased

Rosemarie Ham Ziedonis, *The Patent Paradox Revisited: An Empirical Study of Patenting in the U.S. Semiconductor Industry, 1979–1995*, 32 RAND J. ECON. 101, 105–08 (2001) (detailing the defensive use of patent portfolios in the semiconductor industry).

30. Michael A. Heller, *The Tragedy of the Anticommons: Property in Transition from Marx to Markets*, 111 HARV. L. REV. 621, 656 n.168 (1998); see also Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Medical Research*, 280 SCI. 698, 698 (1998) (advocating the need to privatize biomedical research to "sustain both upstream research and downstream product development").

31. Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEXAS L. REV. 1991, 1992–93 (2007).

32. *Id.* at 2008–10.

33. In *eBay v. MercExchange*, 547 U.S. 388 (2006), the Supreme Court set new rules governing injunctive relief in patent cases. *Id.* at 391–94. For a discussion of the rules governing willful infringement, see Mark A. Lemley & Ragesh K. Tangri, *Ending Patent Law's Willfulness Game*, 18 BERKELEY TECH. L.J. 1085, 1089–94 (2003).

34. For a model of the holdup problem and its effect on bargaining power, see Lemley & Shapiro, *supra* note 31, at 1995–2008.

patent litigation, wasteful patent thickets, thorny anticommons problems, and troubling patent holdups.

B. Industries Innovate Differently

The patent crisis is felt more severely in some industries than others. Anticommons might be a bigger concern in biotechnology than in pharmaceuticals, for example.³⁵ To understand why, Burk and Lemley identify heterogeneity in innovation and invention practices across industries.³⁶ The basic story of the patent system is familiar. The creation of new inventions requires expending resources—i.e., there is a fixed cost of invention. New inventions can be cheaply copied. And so, without some intellectual property protection, few firms will invest in new technology. Each firm will want to be an imitator, not an inventor.

This story, as Burk and Lemley make plain, is too simple.³⁷ In some industries, like pharmaceuticals, there are high fixed costs to invention and low costs to imitation.³⁸ Perhaps in those industries the basic patent story makes sense.³⁹ In other industries it is difficult or impossible to imitate, but the fixed cost of invention is small—Burk and Lemley give computer software as an example.⁴⁰ Still other times, both innovation and invention are driven by factors outside the patent system—a desire for government funding, a longing for academic praise, or the anticipated returns from being a first mover.⁴¹ How much these factors play a role in fostering technological development depends on the industry.

Burk and Lemley argue that, if innovation and invention practices differ, the notion that a unitary patent system could provide the right

35. See BURK & LEMLEY, *supra* note 1, at 144 (arguing that “generic manufacturers that wish to imitate an innovator’s biotechnology-generated drugs face substantially lower costs and uncertainty than do innovators in the pharmaceutical industry,” and therefore the ease of imitation encourages freeloaders in biotechnology and furthers anticommons concerns).

36. *Id.* at 66–78.

37. See *id.* at 5–8 (explaining that even though the basic idea behind the patent system is to encourage invention by rewarding inventors, “a purely unitary patent system no longer fits the extraordinarily diverse needs of innovators in today’s technology industries”).

38. See *id.* at 80–81 (observing that because pharmaceutical innovation is highly expensive for original manufacturers and the costs of imitation are low for generic manufacturers, the absence of effective patent protection in the pharmaceutical industry would create a large ratio of inventor cost to imitator cost).

39. *But see* MICHELE BOLDRIN & DAVID K. LEVINE, AGAINST INTELLECTUAL MONOPOLY 214 (2008) (opining that the case for patents in the pharmaceutical industry is weaker than many commentators assert); Michele Boldrin & David K. Levine, *The Case Against Intellectual Property*, 92 AM. ECON. REV. 209, 209 (2002) (arguing that the assertion that inventors “deserve the fruits of their efforts” does not necessarily lead to the conclusion that the current patent system is the best way to achieve this result and asserting that the current patent system creates a “socially inefficient monopoly”).

40. See BURK & LEMLEY, *supra* note 1, at 43 (naming computer software as an industry with relatively low research-and-development costs where head-start advantages are more effective than patents at enabling corporations to reap returns from innovation).

41. *Id.* at 44–45.

incentive across industries is far-fetched.⁴² Industries face different hurdles and constraints in the innovation process. It takes tons of resources, for example, to get a drug approved by the FDA; it takes fewer resources to develop a new computer-software program.⁴³ The first-mover advantage is important in software, less so in chemical or electrical products.⁴⁴ If the patent system ignored such differences, sometimes it would provide too much protection, and other times too little. Why, for example, provide computer-software firms an extensive set of twenty-year patent rights if the first-mover advantage is sufficient to induce innovation in that industry? To avoid such results, Burk and Lemley argue that a sensible patent policy would take account of industry-specific differences.⁴⁵ Fortunately, for them and for the rest of us, there is already some industry tailoring going on.

C. Institutional Responses

1. *The PTO Treats Industries Differently.*—The empirical evidence gathered by Burk and Lemley shows that experiences with patent prosecution differ by industry. John Allison and Mark Lemley, for example, find that “chemical, pharmaceutical, and biotechnological patents spend much longer in prosecution than other types of patents.”⁴⁶ Studying prosecution practice, Douglas Lichtman finds that, in certain industries, examiners are more prone to ask for amendments to an application.⁴⁷ Mark Lemley and Bhaven Sampat find that young examiners are more likely to reject applications.⁴⁸ This age distortion has industry-specific effects because young examiners are more likely to be assigned to patents in information technology.⁴⁹

The reasons for industry-specific experiences at the PTO are unclear. It may be that the PTO is treating industries differently. It could be that firms in certain industries spend more resources in prosecution than firms in other industries (by citing more extensive prior art, for example). The resources spent on the initial application, then, trickle down into how the PTO handles the patent. Burk and Lemley do not speculate on the cause of the asymmetric prosecution experience. They discuss the empirical data of prosecution to

42. *Id.* at 95.

43. *Id.* at 39–40.

44. *Id.* at 44.

45. *See id.* at 95 (“[T]he unitary patent statute already gives substantial discretion to courts to build industry-sensitive policy analysis into their decisions, and . . . courts have latitude to create other such opportunities.”).

46. Allison & Lemley, *supra* note 7, at 2146.

47. Douglas Lichtman, *Rethinking Prosecution History Estoppel*, 71 U. CHI. L. REV. 151, 155 (2004).

48. Mark A. Lemley & Bhaven N. Sampat, *Examiner Characteristics and the Patent Grant Rate* 18 (Stanford Law Sch. Program in Law and Econ., Working Paper No. 369, 2009), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1329091&rec=1&srcabs=1121224.

49. *Id.* at 22.

bolster the main descriptive point: We do not have a single patent system; instead, we have several different industry-specific patent systems.⁵⁰

2. *Patent Law Is Already Industry-Specific.*—Turning now to the judges, Burk and Lemley divide the doctrinal developments in the courts into macro and micro policy levers.⁵¹ The court employs a macro lever when it explicitly applies a different legal standard by industry.⁵² The court uses a micro lever when it considers certain factors important for application of the doctrine and those factors are more likely to be present in some industries than others.⁵³

Burk and Lemley give a litany of both kinds of levers.⁵⁴ To get a flavor, a partial summary follows. Consider some macro levers first.

1. The utility requirement, namely the statutory requirement that the invention be “new and useful,” has bite for chemical, biological, and pharmaceutical firms, but not elsewhere.⁵⁵
2. The person having ordinary skill in the art is an important benchmark for many patent doctrines.⁵⁶ To apply the

50. BURK & LEMLEY, *supra* note 1, at 50–53.

51. *Id.* at 109–10.

52. *Id.* at 109.

53. *Id.* at 110.

54. *Id.* at 110–30.

55. See 35 U.S.C. § 101 (2006) (describing the usefulness requirement). The doctrine is usually framed as a minimal requirement that the invention be capable of achieving a pragmatic result. See *Mitchell v. Tillghman*, 86 U.S. 287, 396 (1873) (holding that whoever discovers that a useful result will be produced by using a certain means or invention is entitled to a patent). The classic statement of utility was given by Justice Story in *Lowell v. Lewis*. See 15 F. Cas. 1018, 1019 (Story, Circuit Justice, C.C.D. Mass. 1817) (“All that the law requires is, that the invention should not be frivolous or injurious to the well-being, good policy, or sound morals of society. The word ‘useful,’ therefore, is incorporated into the act in contradistinction to mischievous or immoral.”).

56. The concept of the person having ordinary skill in the art comes up in tests for obviousness, novelty, the enablement requirement, the written-description requirement, and charges of indefinite claims. On obviousness, see 35 U.S.C. § 103(a), requiring that the invention be nonobvious to a person having ordinary skill in the art as a precondition for patentability, and *Bayer Schering Pharma AG v. Barr Labs., Inc.*, 575 F.3d 1341, 1347 (Fed. Cir. 2009), holding that an obviousness analysis must examine “the scope and content of the prior art, the differences between the prior art and the claims at issue, and the level of ordinary skill in the pertinent art.” On novelty, see 35 U.S.C. § 102, requiring novelty to a person having ordinary skill in the art as a precondition for patentability, and *PPG Indus., Inc. v. Guardian Indus. Corp.*, 75 F.3d 1558, 1566 (Fed. Cir. 1996), holding that “[t]o anticipate a claim, a reference must disclose every element of the challenged claim and enable one skilled in the art to make the anticipating subject matter.” On the enablement requirement, see 35 U.S.C. § 112, requiring that the specification contain a written description of the invention in such clear terms as to enable any person skilled in the art to which it pertains to make and use the invention, and *Spectra-Physics, Inc. v. Coherent, Inc.*, 827 F.2d 1524, 1532 (Fed. Cir. 1987), stating that “[t]he essence of [the enablement requirement] is that a specification shall disclose an invention in such a manner as will enable one skilled in the art to make and utilize it,” quoting *In re Gay*, 309 F.2d 769, 772 (C.C.P.A. 1962). On the written-description requirement, see 35 U.S.C. § 112, requiring that the specification contain a written description of the invention such that a person skilled in the art could make and use the invention, and *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563–64 (Fed. Cir. 1991), holding that adequate written description requires that the

benchmark, the court has to make an assessment of the relative skill of the ordinary scientist in that community. This assessment is, by its nature, industry specific and often further refined to scientists concerned with a particular set of technology within an industry.

3. The written-description requirement is applied vigorously in biotechnology, but not elsewhere.⁵⁷
4. In determining reasonable royalties, courts look at industry-wide profit margins and licensing rates.⁵⁸

Some micro levers include the following:

1. The experimental-use doctrines are more likely to be applied in industries where “testing” in the market is a key component of getting a product from development to market.⁵⁹
2. The articulation of the patentability requirement in *In re Bilski*⁶⁰ suggests that the hurdle of patentable subject matter will be harder to clear for financial-services firms and software companies.⁶¹
3. One nugget of evidence in defining the doctrine of equivalents—the idea of reasonable interchangeability—works

specification “convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention.” Finally, on the charges of indefiniteness, see 35 U.S.C. § 112, requiring that the written description of the invention contain such definite terms that a person skilled in the art could make and use the invention, and *Young v. Lumenis, Inc.*, 492 F.3d 1336, 1346 (Fed. Cir. 2007), holding that “[i]ndefiniteness requires a determination whether those skilled in the art would understand what is claimed.”

57. BURK & LEMLEY, *supra* note 1, at 118–19.

58. *See, e.g., Minco, Inc. v. Combustion Eng’g, Inc.*, 95 F.3d 1109, 1120 (Fed. Cir. 1996) (noting, in the context of computing reasonable royalties, that “the industry enjoyed high profitability”). For an extensive discussion on the determination of damages in patent cases, see ROGER E. SCHECHTER & JOHN R. THOMAS, *INTELLECTUAL PROPERTY: THE LAW OF COPYRIGHTS, PATENTS, AND TRADEMARKS* 510–16 (2003).

59. Experimental use comes up in two places in patent law. Experimental use can be used to toll the one-year grace period under Section 102(b). *See Elizabeth v. Pavement Co.*, 97 U.S. 126, 133–37 (1877) (stating that an inventor did not abandon his patent to public use when exhibiting it in public in order to test it, even if such testing created public knowledge of the invention). In addition, experimental use can serve as a limited defense in an infringement action. The classic articulation of this defense comes from Justice Story. *See Whittemore v. Cutter*, 29 F. Cas. 1120, 1121 (Story, Circuit Justice, C.C.D. Mass. 1813) (“[I]t could never have been the intention of the legislature to punish a man, who constructed such a machine merely for philosophical experiments, or for the purpose of ascertaining the sufficiency of the machine to produce its described effects.”).

60. 545 F.3d 943 (Fed. Cir. 2008), *cert. granted sub. nom. Bilski v. Doll*, 129 S. Ct. 275 (2009).

61. *See id.* at 974 n.18 (stating that, with regard to financial-services firms, “while [evidence presented by amici curiae] shows that inventions in the business realm of finance and management historically enjoyed patent protection, it does little to establish that business methods directed to the organization of human activity not involving manufactures, machines or the creation of compositions of matter were similarly patentable”); *id.* at 978 (Newman, J., dissenting) (noting that, with regard to software companies, “this court now adopts a redefinition of ‘process’ in Section 101 that excludes forms of information-based and software-implemented inventions arising from new technological capabilities”).

better in industries where an invention can be broken down into component parts.⁶²

This list is incomplete but sufficient for my purpose. The point is that patent law already is industry specific in the courts, either explicitly (a macro lever) or implicitly (a micro lever). Burk and Lemley do not take a position whether the described doctrines reflect self-conscious industry tailoring by judges or happenstance. Nonetheless, the fact remains that the unitary patent statute is not unitary in judicial application. This, in my view, is a key and significant contribution of the book.

II. Solving the Patent Crisis

A. *The Proposal*

So far so good. Burk and Lemley have established that when it comes to the macro levers, the court does not feel a need to harmonize, for instance, the utility doctrine as applied to chemical patents with the utility doctrine as applied to software patents. With respect to micro levers, the court in applying doctrine takes account of factors more likely to be present in some industries than others.

As noted in the introduction, Burk and Lemley propose that the court use policy levers more aggressively to address particular problems in the patent system.⁶³ As I see it, the use of such levers implicitly breaks down into a two-step process. First, looking for guidance from theories of patent law, the court should identify the characteristics of an industry and the types of problems firms in that industry are likely to face.⁶⁴ Second, the court should choose, from the many different doctrinal levers, the lever or combination of levers that mitigates the problem while generating the fewest costly side effects.⁶⁵

For concreteness, let me tie my discussion of this proposal to Burk and Lemley's case study involving biotechnology. Following Burk and Lemley's description of the biotechnology industry, say a Federal Circuit panel decides that (1) anticommons is a concern in that industry and (2) the industry needs a bigger reward to stimulate postinvention innovation. Based on these assumptions, the panel adopts the Burk and Lemley proposal. They couple a

62. See *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 733–34 (2002); *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 40–41 (1997) (both defining the doctrine of equivalents); see also R. Polk Wagner, *Reconsidering Estoppel: Patent Administration and the Failure of Festo*, 151 U. PA. L. REV. 159, 163–66 (2002) (providing a discussion of the relationship between prosecution-history estoppel and the doctrine of equivalents).

63. BURK & LEMLEY, *supra* note 1, at 95.

64. *Id.* at 109–10.

65. *Id.* at 164–65. In deciding on levers, Burk and Lemley prefer micro levers for two reasons. First, they want courts to avoid making coarse judgments about which firms are in which industry. Second, they think courts will be more comfortable with standards rather than industry-specific rules. *Id.* at 141.

“fairly high obviousness threshold” with a “fairly low disclosure requirement.”⁶⁶ The panel does so to “solve the anticommons problem often identified with DNA while at the same time boosting incentives to innovate by giving stronger protection to significant inventions.”⁶⁷

The first concern is whether the assumption is correct. How does the court know that the anticommons is a major problem in biotechnology? Does the court take a survey? Do the litigants brief how many products failed to come to market because of failed licensing negotiations? Is such information even available? Does the panel ask for amicus briefs on the topic?

Information about the scope of the industry-wide anticommons problem is not going to be readily apparent from the case at hand. Indeed, that case could be misleading. If licensing worked smoothly, the case is unlikely to arise. That is to say, the court sees many cases where licensing failed—where parties were not able to come to terms for whatever reason.⁶⁸ The court does not see the situations where biotechnology firms successfully solved the anticommons problem themselves.⁶⁹ Those situations remain hidden. The same is true with the prior case law involving the biotechnology industry, where the court usually looks for clues about the scope of the doctrine.⁷⁰ Simply put, to justify the anticommons assumption the court needs information about the global problems facing biotechnology—information that might be difficult to come by.

Suppose now that the panel is mistaken in its initial assumptions about biotechnology. Stability of the law remains a value. No matter the industry, patent lawyers and companies want to know what the rules of the patent game are. Recognizing this fact, the next panel will be reluctant to overturn, even if the initial panel decision is misguided. Judicial errors resonate through the case law because of stare decisis. This concern is especially troubling if the court is making doctrinal shifts based on hunches and incomplete information about the problems facing an industry.

66. *Id.* at 151.

67. *Id.*

68. *See, e.g., Intel Corp. v. Commonwealth Scientific and Indus. Research Org.*, 455 F.3d 1364, 1366–67 (Fed. Cir. 2006) (noting the Research Organization’s intention to procure licenses from Intel and Dell but pursue litigation if license agreements could not be reached); *see also BURK & LEMLEY, supra* note 1, at 56 (discussing patent litigation as an alternative to patent licensing).

69. *See BURK & LEMLEY, supra* note 1, at 16 (explaining that a patent holder can either enforce his right to exclude through litigation or attempt to collect royalties through negotiation and licensing).

70. *See, e.g., KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (stating that, depending on the subject matter of the claim, it will sometimes be necessary for courts to look to other factors, such as market demands, to determine the scope of the obviousness doctrine); *In re Fisher*, 421 F.3d 1365, 1373–77 (Fed. Cir. 2005) (relying largely on statutory language and analogies to non-biotechnology cases in rejecting a patent claim for certain gene sequences).

On the other hand, suppose that panel is right in its assumptions. Yet, as Burk and Lemley recognize, no industry remains static.⁷¹ Ten years from now, the hurdles to innovation in biotech will have shifted. As such, policy levers designed to match patent policy to today's biotech problems might well misfire tomorrow. The court will have to update its view and replace the doctrine with something else, altering the obviousness standard and the disclosure obligations. To do that the court needs to know when to make the change. Timing becomes crucial. The court needs information about the global conditions in the constantly evolving industry to decide whether the doctrinal tweaks imposed in the past continue to make sense. Like before, litigated and appealed cases are a poor repository of that information.

Burk and Lemley suggest that the dynamic and changing circumstances of invention and innovation are a reason to allow the court to take the lead in solving the patent crisis.⁷² Proceeding in a common law fashion, courts are more nimble than legislatures. That point is right and should not be overlooked. My point is an informational one involving timing. The court needs to know when to make a change, when to be nimble.

Burk and Lemley go on to note that on the rules-versus-standards spectrum, the patent statute is closer to the antitrust statute (a standard) than to the tax code (a set of rules).⁷³ The patent statute provides general, rather than specific, statutory directions from Congress. The analogy between the patent statute and antitrust statute is illuminating for the point I am making here. In antitrust, a court can rely on teams of economists at the Federal Trade Commission to tell it about the global conditions in the industry and the likely economic impact of different antitrust rules.⁷⁴ The court has a funnel of information upon which to make good policy. As currently

71. BURK & LEMLEY, *supra* note 1, at 142.

72. *See id.* at 95 (arguing there is no need to “legislate different patent standards for different industries” because the unitary patent statute “already gives substantial discretion to courts to build industry-sensitive policy analysis into their decisions”).

73. *See* Neil W. Averitt & Robert H. Lande, *Using the “Consumer Choice” Approach to Antitrust Law*, 74 ANTITRUST L.J. 175, 240–41 (2007) (listing the FTC Bureau of Consumer Protection’s antitrust expertise among the means available to the antitrust agencies’ efforts to gather and organize data); JOSEPH FARREL, FTC BUREAU OF ECON., ABOUT THE BUREAU OF ECONOMICS (2009), <http://www.ftc.gov/be/about.shtm> (explaining that the Bureau of Economics serves to provide the FTC and other governmental bodies economic analysis of market processes); *see also* Richard J. Gilbert, Professor of Econ., Univ. of Cal. at Berkeley, and Principal, Law & Econ. Consulting Group, Responding to Structural Change: A Call for a Review of the Competitive Consequences of Hospital Mergers, Comments Before the FTC Hearings on Global and Innovation-Driven Competition (Nov. 14, 1995), (transcript available at <http://www.ftc.gov/opp/global/gilbert.shtm>) (claiming that the FTC should “use its investigatory powers to learn more about the competitive effects of hospital mergers . . . [because t]he Commission could do a great service by undertaking a critical review of the effects of antitrust enforcement in this industry”).

74. *See* Hosp. Corp. of Am. v. Fed. Trade Comm’n, 807 F.2d 1381, 1386 (7th Cir. 1986) (Posner, J.) (“One of the main reasons for creating the Federal Trade Commission and giving it concurrent jurisdiction to enforce the Clayton Act was that Congress distrusted judicial determination of antitrust questions.”).

structured, the PTO does not offer the same set of expertise, making the risk of judicial error higher.⁷⁵

Finally, the fact that the Federal Circuit alone hears patent appeals can exacerbate the problems identified above. We do not have twelve circuit courts experimenting with patent doctrine. Instead, we have one centralized decision-making body. Craig Allen and John Duffy have drawn attention to the problems of the centralized jurisprudence in the Federal Circuit, noting that the “very structure not only discourages parties from challenging the settled precedents of the court with different perspectives, but also limits the set of available authorities and experience from which the court might seek guidance.”⁷⁶ They further argue that “attorneys are usually hesitant to urge courts to overturn their own precedents, and courts are not usually disposed to entertaining such arguments even when they are made.”⁷⁷ In other words, the precedent in the Federal Circuit might be stickier than precedent in courts with decentralized lawmaking. Such stickiness can heighten the impact of judicial error.

The en banc procedure provides one error-correction mechanism to deal with panel miscues. And, in fact, the Federal Circuit has taken a number of inconsistent panel opinions en banc in recent years.⁷⁸ The en banc mechanism mitigates, but does not eliminate, the concern voiced above. The en banc court needs the same information as any panel. It needs to know (1) the nature of the problems the industry faces and (2) when, if ever, those problems have changed and, as such, the old doctrine no longer serves its function.

If the court lacks information about industry-wide problems, the task assigned by Burk and Lemley becomes difficult. That said, even if the court is confident in its assessment of industry-wide problems, much is left to be done. The court needs to articulate and develop a doctrine or set of doctrines

75. If the problem with the Burke and Lemley proposal is the lack of information for the courts, the natural rejoinder is to provide that information. We should have the PTO take a more prominent role in providing the courts information. But providing information is not free. The question is whether the economic benefits of better, more informed patent doctrine outweigh the cost of providing this additional information.

76. Craig Allen Nard & John F. Duffy, *Rethinking Patent Law's Uniformity Principle*, 101 NW. U. L. REV. 1619, 1623 (2007).

77. *Id.* at 1644. For an empirical test of Nard and Duffy's theory, see Lee Petherbridge, *Patent Law Uniformity?*, 22 HARV. J.L. & TECH. 421, 427–28 (2009), producing evidence that “the Federal Circuit does not lack for jurisprudential diversity.”

78. *See, e.g., In re Bilski*, 545 F.3d 943, 949 (Fed. Cir. 2008) (ordering sua sponte en banc review as to whether claims were directed to patent-eligible subject matter), *cert. granted sub. nom. Bilski v. Doll*, 129 S. Ct. 275 (2009); *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 234 F.3d 558, 563 (Fed. Cir. 2000) (hearing a patent-infringement suit en banc “to resolve certain issues relating to the doctrine of equivalents that remained in the wake of” a recent Supreme Court decision), *vacated*, 535 U.S. 722 (2002). Another recent case involves the written-description requirement and is yet undecided. *See Ariad Pharm. v. Eli Lilly & Co.*, No. 08-1248, 2009 WL 2573004, at *1 (Fed. Cir. Aug. 21, 2009) (per curiam) (granting Ariad Pharmaceuticals' petition for rehearing en banc).

to mitigate the problem—the second step in the two-step analysis. The court has to match the doctrine to the problem, when it is unclear, at least at first, which doctrine will do the job most effectively. In other words, there is uncertainty as to the proper judicial policy, even if the court is correct in its assessment of the industry-specific concerns. To understand and evaluate step two in the Burk and Lemley framework requires a theory of judge-made law and judicial learning. I take up this issue in the next Part of this Review.

III. The Effectiveness of Judge-Made Law: Tort Law Versus Patent Law

Will judicial learning take place in patent law and, if so, will the aggressive use of judicial policy levers make the law better? These questions are the heart of step two of the Burk and Lemley proposal. In other words, do the assumptions needed for judicial learning hold true in the world of patent jurisprudence? If so, then, we might be confident that the court will be able to tweak the micro and macro policy levers appropriately. If not, Burk and Lemley's court-centered solution becomes problematic.

In addressing these issues, it is useful to consider Judge Richard Posner's views on *stare decisis*:

A system of decision according to precedent . . . reduces the costs of litigation by enabling the parties to a case, and the tribunal also, to use information that has been generated (often at considerable expense) in previous cases. If it has been held in 20 cases that an electric crossing signal is a required (cost-justified) precaution at busy railroad crossings, the marginal gain in knowledge of the relevant costs and values from incurring the expense of a trial in the twenty-first case may be smaller than that expense. A rule of the common law emerges when its factual premises have been so validated by repeated testing in litigation that additional expenditures on proof and argument would exceed the value of the additional knowledge produced.⁷⁹

The idea here is that the court can use litigation on railroad-crossing accidents to uncover the proper rule to decide future cases: electric crossing signals are required at busy railroad intersections. In addition, the court might comfortably reason from busy railroad crossings to busy highway crossings, using the costs and benefits learned in one fact situation, railroad crossings, as a useful indicator of the cost and benefits from having a similar precaution at a highway crossing. Furthermore, scholars have shown that the process of distinguishing the two cases can provide information about what factors are important for applying the legal rule.⁸⁰ For example, highway crossings are different and hence have less of a need for gates because cars

79. RICHARD A. POSNER, *ECONOMIC ANALYSIS OF LAW* 560 (6th ed. 2003).

80. See Nicola Gennaioli & Andrei Shleifer, *The Evolution of the Common Law*, 115 J. POL. ECON. 43, 45–46 (2007) (providing a model where distinguishing cases embeds new information in the law).

can stop more quickly than trains. One view of torts says that it develops by repeatedly testing the reasonableness standard against new fact patterns. Oliver Holmes held this view.⁸¹ In a variety of formal models about the evolution of legal rules, torts is often the example used.

Consider, by way of contrast, patent law. As noted above, in biotechnology Burk and Lemley think the most appropriate policy combines a “fairly high obviousness threshold” with a “fairly low disclosure requirement.”⁸² Over time, the court will fill in the phrases “fairly high” and “fairly low” by examining patents challenged in court.

For industry-specific judicial policy making to improve over time, we need to assume that litigation about one patent provides some guidance as to the proper scope of the judge-made rule in future cases. In torts, it seems sensible to reason from railroad crossings to highway crossings in understanding the costs and benefits of precautions. In many areas of patent law, on the other hand, specific cases do not impound much relevant and useful information for promulgating future rules.

Take standard litigation about obviousness. According to the patent statute, an invention is obvious if “the subject matter [of the invention] as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art.”⁸³ After the Supreme Court’s decision in *KSR International Co. v. Teleflex Inc.*,⁸⁴ the court will ask questions like whether “a person of ordinary skill can implement a predictable variation”⁸⁵ or whether “a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way.”⁸⁶

In conducting its analysis, the court will not engage in a far-ranging public-policy exercise about the optimal degree of patent protection. The court will not ask whether broad or narrow patent rights make sense. It will not take evidence on the amount spent on innovation by a typical firm and

81. OLIVER WENDELL HOLMES, JR., *THE COMMON LAW* 89 (Little, Brown & Co. reprint) (Mark D. Howe ed., Harv. Univ. Press 1963) (1st ed. 1881) (“It is equally clear that the featureless generality, that the defendant was bound to use such care as a prudent man would do under the circumstances, ought to be continually giving place to the specific one, that he was bound to use this or that precaution under these or those circumstances.”). *But see* *Mars Steel Corp. v. Continental Bank N.A.*, 880 F.2d 928, 936 (7th Cir. 1989) (Easterbrook, J.) (“Justice Holmes believed that courts would (at least, should) slowly reduce all of tort law to objective, readily applied rules. This is not viewed today as one of his more astute predictions.” (citation omitted)). In a variety of formal models about the evolution of legal rules, torts is often the example used. *See, e.g.*, Robert Cooter et al., *Liability Rules, Limited Information, and the Role of Precedent*, 10 *BELL J. ECON.* 366, 367 (1977) (modeling the process of adjusting court standards in the context of accidents and accident avoidance); Gennaioli & Shleifer, *supra* note 80, at 46 (using the simple tort of a dog biting a man to examine the evolution of legal rules).

82. *See supra* note 66 and accompanying text.

83. 35 U.S.C. § 103(a) (2006).

84. 550 U.S. 398 (2007).

85. *Id.* at 417.

86. *Id.*

the responsiveness of investment to legal rules. It will not hear evidence on the need for investment incentives or ask whether other mechanisms for generating innovation (first mover, academic success and accolades, etc.) are sufficient for the average inventor or average firm. Even the so-called secondary considerations—the commercial success of the invention, the failure of others to make the invention, the long-felt need for the product⁸⁷—are applied in reference to a specific patent in a specific case.

Interestingly, what Burk and Lemley seem to have in mind is that these policy questions will be answered during the identification stage of the process.⁸⁸ By picking out industries for specific treatment, the court will be making a rough or coarse judgment about these broader issues. Assuming the court can do that, it will still find it difficult to learn whether the doctrinal lever or combination of levers it advances are actually working.

In specific cases the court will not see whether the higher standard for obviousness is, in practice, inducing more investment in invention throughout the entire industry. The court will not observe whether the broader patent right in this industry makes licensing practices easy or difficult. The court will not hear evidence about the transaction costs of contracting around judicial missteps (if any) in the construction of a legal rule or the application of a standard. In patent litigation, these issues will not be litigated because they are irrelevant to the application of the obviousness standard to a specific patent.

This is more than a rehash of the old debate about standards versus rules.⁸⁹ Obviousness is a standard. At the beginning of this Part, the quote from Judge Posner referred to fleshing out a standard—reasonableness—with a specific rule: one must have electric gates at railroad crossings. The underlying issue for the development of judge-made law, whether a standard or rule based, is the value of the information contained in the prior cases. If precedents provide information that is mostly irrelevant to charting the proper course of future rules or the future application of a standard, we cannot be confident that judicial tweaks to doctrine based on that precedent will be beneficial or that, by looking at precedent and comparing it to the case at hand, judicial miscues will be discovered and fixed.

Effective judicial policy making depends on judicial learning. And judicial learning depends, in large part, on judges being able to extract policy-relevant information out of prior cases (to make inferences about the contours of the optimal rule from the set of cases). In evaluating whether

87. See BURK & LEMLEY, *supra* note 1, at 117 (listing the secondary considerations that the Federal Circuit has endorsed for the obviousness analysis).

88. See *supra* notes 63–65 and accompanying text; see also *supra* text accompanying notes 15–16 (discussing the potential pitfalls the court may encounter at the identification phase—the first implied step in the use of policy levers).

89. See Louis Kaplow, *Rules Versus Standards: An Economic Analysis*, 42 DUKE L.J. 557, 559 (1992) (describing the trade-offs between promulgating legal commands as rules or standards and noting the substantial volume of legal commentary on the debate).

Burk and Lemley's court-centered proposal is good or bad, one critical question is how much policy-relevant information is contained in patent cases. That is an empirical question without a clear answer.

IV. Conclusion

In *The Patent Crisis and How the Courts Can Solve It*, Burk and Lemley have accomplished what they set out to do. They show that the mechanics of inventions and innovation vary by industry. They show that the courts apply patent doctrine, despite a unitary statutory framework, in an industry-specific manner. The book's call for more aggressive doctrinal tailoring to match industry-specific needs is provocative. To my mind, the call raises two questions for further study.

The first question is whether the court can accurately assess and diagnose the global problems facing an industry. For this to work, the Federal Circuit will need to look beyond the litigated cases, listening to industry leaders, the academic community, and perhaps even charging the PTO with a more substantive policy role.

Assuming the court is correct in its identification of problems, the second question is whether the court can match and construct doctrinal solutions to solve those problems through case-by-case analysis. On this I am uncertain. To do that, the court would need to learn. It is unclear whether the court can, through the proper structuring of its opinions, actually unmask the information needed to pick the right combination of doctrinal levers for an industry. If the court fails in its industry-specific doctrinal tailoring, the issue becomes whether the mere attempt will make matters worse, and by how much. This depends on the probability of error and the loss associated with that error. If these are low, then, I am on board with their project. If these are high, I am more inclined to advocate that no institution—not the courts, not the Congress, not the PTO—should try to solve the patent crisis. No matter how one eventually comes down on this question, the book provides an important step forward in this debate.