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Do Patent Challenges Increase Competition?

Stephen Yelderman†

As a general rule, judges and scholars believe settlement is a good thing. But for nearly a century, the Supreme Court has said that patent litigation is categorically different, since it offers the chance to increase competition by freeing the public from the burdens of a monopoly. Based on this theory, and in the hopes of seeing more patent litigation fought to completion, the Court has overturned long-standing common-law doctrines, declined to enforce otherwise-valid contracts, and—in the recent case of Federal Trade Commission v Actavis, Inc—subjected patent settlements to scrutiny under the antitrust laws. Similar reasoning has resulted in legislative initiatives to encourage patent challenges, including the regulatory bounty for challenging pharmaceutical patents included in the 1984 Hatch-Waxman Act and the administrative review procedures created by the 2011 America Invents Act. Moreover, scholars continue to call for reforms to provoke additional patent challenges, again asserting their supposed procompetitive benefits.

This Article is the first to seriously scrutinize the claim that patent challenges lead to increased competition. It identifies a number of conditions that must hold for a patent challenge to provide this particular benefit, and evaluates the reasonableness of assuming that the procompetitive benefits of patent challenges are generally available. As it turns out, there are a number of ways these conditions can and regularly do fail. This Article synthesizes legal doctrine, recent empirical scholarship, and several novel case studies to identify categories of challenges in which the potential benefits for competition are smaller than previously thought or, in some cases, completely unavailable.

This analysis has a number of implications for patent law and policy. First, it provides guidance for how the Patent Office should administer its new review authority under the America Invents Act. Second, it exposes weaknesses in judicially created policies intended to encourage more patent challenges. Third, it vindicates the present scope of the regulatory bounties provided under the Hatch-Waxman Act and cautions against recently proposed expansions of these incentives to other technology areas. Fourth, it sheds new light on the competitive consequences of patent settlements, and thus informs how the Court's recent Actavis decision should be applied in future cases.

† Associate Professor of Law, Notre Dame Law School. For very helpful comments on prior drafts, I thank Michael Abramowicz, Joe Bauer, Dan Burk, Tun-Jen Chiang, Colleen Chien, Christopher Cotropia, Tom Cotter, Daniel Crane, Greg Dolin, Jeanne Fromer, Yaniv Heled, Timothy Holbrook, Dmitry Karshtedt, Ariel Katz, Bruce Kobayashi, Brian Love, Jonathan Masur, Mark McKenna, Lisa Larrimore Ouellette, Michael Risch, Saurabh Vishnubhakat, and Melissa Wasserman. I also thank Joseph Nugent for his excellent research assistance.

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If there be an issue more troublesome, or more apt for litigation than this, we are not aware of it.

Judge Learned Hand¹

INTRODUCTION

As a general rule, courts and commentators agree that settlement is a good thing. As the Advisory Committee on Rules of Civil Procedure has observed, settlement “eases crowded court dockets and results in savings to the litigants and the judicial system,” and so “should be facilitated at as early a stage of the litigation as

¹ *Harries v Air King Products Co*, 183 F2d 158, 162 (2d Cir 1950).

possible.”² While some have argued otherwise,³ the prevailing view today is that the costs of litigation typically outweigh its advantages, and that litigants should be allowed—encouraged, even—to resolve their differences as swiftly as possible.⁴

But patent litigation is different. Alone among the many civil causes one might think produce public benefits—such as environmental litigation, First Amendment challenges, RICO suits, and so on—patent disputes are *the* class of civil litigation singled out by courts as requiring a departure from the ordinary principle of encouraging settlement.⁵ Why? Because, as the Supreme Court explained in 1945, “a patent is an exception to the general rule against monopolies and to the right to access to a free and open market.”⁶ As such, patent litigation implicates the public’s “paramount interest” in ensuring that patents are “free from fraud or

² FRCP 16(c), Advisory Committee Note to the 1983 Amendments.

³ See, for example, Owen M. Fiss, *Against Settlement*, 93 Yale L J 1073, 1075 (1984); Leandra Lederman, *Precedent Lost: Why Encourage Settlement, and Why Permit Non-party Involvement in Settlements?*, 75 Notre Dame L Rev 221, 222–23 (1999).

⁴ See *Wygant v Jackson Board of Education*, 476 US 267, 305 (1986) (Marshall dissenting) (“[C]ivil rights litigation is no exception to the general policy in favor of settlements.”); *United States v Davis*, 261 F3d 1, 27 (1st Cir 2001), quoting *United States v Comunidades Unidas contra la Contaminacion*, 204 F3d 275, 280 (1st Cir 2000) (observing a “strong public policy in favor of settlements, particularly in very complex and technical regulatory contexts”); *Doe v Delie*, 257 F3d 309, 322 (3d Cir 2001) (“The law favors settlement, particularly in class actions and other complex cases, to conserve judicial resources and reduce parties’ costs.”); *Flex-Foot, Inc v CRP, Inc*, 238 F3d 1362, 1369 (Fed Cir 2001), quoting *Hemstreet v Spiegel, Inc*, 851 F2d 348, 350 (Fed Cir 1988) (“[T]here is a compelling public interest and policy in upholding and enforcing settlement agreements voluntarily entered into because enforcement of settlement agreements encourages parties to enter into them—thus fostering judicial economy.”) (quotation marks omitted); Lederman, 75 Notre Dame L Rev at 222 (cited in note 3) (summarizing reasons for preferring settlement).

⁵ See *Federal Trade Commission v Actavis, Inc*, 133 S Ct 2223, 2239 (2013) (Roberts dissenting) (“[The parties’ patent settlement] put an end to litigation that had been dragging on for three years. Ordinarily, we would think this a good thing.”). For discussion of the public interest in patent litigation, see *Pope Manufacturing Co v Gormully*, 144 US 224, 233–36 (1892); *Standard Water Systems Co v Griscom–Russell Co*, 278 F 703, 705 (3d Cir 1922); *Kellogg Co v National Biscuit Co*, 305 US 111, 122 (1938); *Aero Spark Plug Co v B.G. Corp.*, 130 F2d 290, 293 (2d Cir 1942) (Frank concurring); *Mercoid Corp v Mid-continent Investment Co*, 320 US 661, 666 (1944); *United States v United States Gypsum Co*, 333 US 364, 387–88 (1948); *Hieger v Ford Motor Co*, 516 F2d 1324, 1327 (6th Cir 1975); *Schlegel Manufacturing Co v USM Corp*, 525 F2d 775, 781 (6th Cir 1975); *Cardinal Chemical Co v Morton International, Inc*, 508 US 83, 100 (1993); *Benitec Australia, Ltd v Nucleonics, Inc*, 495 F3d 1340, 1350 (Fed Cir 2007) (Dyk dissenting); *Medtronic, Inc v Mirowski Family Ventures, LLC*, 134 S Ct 843, 851–52 (2014).

⁶ *Precision Instrument Manufacturing Co v Automotive Maintenance Machinery Co*, 324 US 806, 816 (1945). For an earlier statement to similar effect, see *Pope Manufacturing*, 144 US at 234 (“It is as important to the public that competition should not be repressed by worthless patents, as that the patentee of a really valuable invention should be protected in his monopoly.”).

other inequitable conduct and that such monopolies are kept within their legitimate scope.”⁷

In other words, patent litigation is special because it has the potential to scuttle monopolies and open markets, benefitting not just the prevailing party in a given suit, but consumers and competitors throughout the economy. This view is deeply intuitive and has been the basis for a number of judicial and legislative enactments to increase the number of patent challenges brought to fruition. By 1971, the Court had consciously recognized a line of decisions aimed at “encourag[ing] authoritative testing of patent validity,”⁸ and, in more recent years, has continued to root decisions in the “strong public interest” found in the adjudication of patent rights.⁹ Following this doctrine, a number of courts have refused to enforce—and declared federally preempted—otherwise-valid contracts that might impair a party’s incentives or ability to bring a patent challenge.¹⁰ And, in the 2013 case *Federal Trade Commission v Actavis, Inc.*,¹¹ the Supreme Court declared that settlement *itself* can sometimes run afoul of the antitrust laws, again citing the potential for patent litigation to benefit the public through increased competition.¹²

Congress, too, has taken steps to encourage parties to contest the validity and scope of patent rights. For example, a central feature of the Drug Price Competition and Patent Term Restoration

⁷ *Precision Instrument Manufacturing*, 324 US at 816.

⁸ *Blonder-Tongue Laboratories, Inc v University of Illinois Foundation*, 402 US 313, 344 (1971).

⁹ See, for example, *Cardinal Chemical*, 508 US at 100; *Medtronic*, 134 S Ct at 851–52.

¹⁰ See, for example, *Lear, Inc v Adkins*, 395 US 653, 674–75 (1969); *Warner-Jenkinson Co v Allied Chemical Corp*, 567 F2d 184, 188 (2d Cir 1977); *Atlas Chemical Industries, Inc v Moraine Products*, 509 F2d 1, 6 (6th Cir 1974); *Panther Pumps & Equipment Co v Hydrocraft, Inc*, 468 F2d 225, 230–32 (7th Cir 1972); *Massillon-Cleveland-Akron Sign Co v Golden State Advertising Co*, 444 F2d 425, 427 (9th Cir 1971). See also *Edward Katzinger Co v Chicago Metallic Manufacturing Co*, 329 US 394, 401–02 (1947) (holding that a party is not estopped from challenging a patent’s validity despite a contractual covenant to refrain from doing so); *Beckman Instruments, Inc v Technical Development Corp*, 433 F2d 55, 62 (7th Cir 1970), abrogated by Act of Aug 27, 1982 § 17, Pub L No 97-247, 96 Stat 317, 322 (refusing to enforce an arbitration provision for a patent validity claim).

¹¹ 133 S Ct 2223 (2013).

¹² *Id* at 2234–36. Similar judicial reasoning has shaped the law in other ways as well. See, for example, *Cardinal Chemical*, 508 US at 99–101 (requiring the Federal Circuit to reach questions of validity even when a case could be disposed of on other grounds); *Sinclair & Carroll Co v Interchemical Corp*, 325 US 327, 330 (1945) (giving similar guidance to district courts); *Bulldog Electric Products Co v Westinghouse Electric Corp*, 162 F2d 994, 997 (2d Cir 1947) (reaching the validity question despite the plaintiff’s unclean hands); *Crane Co v Aeroquip Corp*, 356 F Supp 733, 739 (ND Ill 1973); *Business Forms Finishing Service, Inc v Carson*, 452 F2d 70, 74 (7th Cir 1971); *Broadview Chemical Corp v Loctite Corp*, 474 F2d 1391, 1395 (2d Cir 1973).

Act of 1984¹³ (the Hatch-Waxman Act) was a regulatory bounty system designed to incentivize generics to challenge more pharmaceutical patents.¹⁴ More recently, the 2011 Leahy-Smith America Invents Act¹⁵ (AIA) created new administrative procedures designed to encourage the testing of patent validity by enabling earlier, faster, and cheaper patent challenges.¹⁶ And Congress continues to consider other substantive and procedural mechanisms designed with the specific goal of stimulating more patent litigation.¹⁷

Prior scholarly work in the area has largely taken these benefits as given, and has instead focused on the question whether private actors will have the incentives to bring patent challenges in sufficient numbers.¹⁸ Overwhelmingly, commentators have

¹³ Pub L No 98-417, 98 Stat 1585.

¹⁴ See Joseph Scott Miller, *Building a Better Bounty: Litigation-Stage Rewards for Defeating Patents*, 19 Berkeley Tech L J 667, 724–25 (2004) (explaining the operation of this provision); *Generic Drug Entry prior to Patent Expiration: An FTC Study* *4–5 (FTC, July 2002), archived at <http://perma.cc/RBP7-RZD4> (“FTC Generic Drug Study”).

¹⁵ Pub L No 112-29, 125 Stat 284 (2011), codified at 35 USC § 100 et seq.

¹⁶ See Gregory Dolin, *Dubious Patent Reform*, 56 BC L Rev 881, 909–20 (2015) (describing these new procedures); HR Rep No 112-98, 112th Cong, 1st Sess 78 (2011) (“America Invents Act Report”); Joe Matal, *A Guide to the Legislative History of the America Invents Act: Part II of II*, 21 Fed Cir Bar J 539, 599–604 (2012) (summarizing the legislative history); *Cuozzo Speed Technologies, LLC v Lee*, No 15-446, slip op at 16–17 (US June 20, 2016) (discussing the purposes of the AIA amendments).

¹⁷ See, for example, Innovation Act, HR 3309, 113th Cong, 1st Sess 6 (Dec 9, 2013) (including an attorney’s fee–shifting provision); HR Rep No 113-279, 113th Cong, 1st Sess 21 (2013) (“Innovation Act Report”) (explaining that attorney’s fee–shifting would encourage patent challenges). See also generally *Demand Letters and Consumer Protection: Examining Deceptive Practices by Patent Assertion Entities*, Hearing before the Subcommittee on Consumer Protection, Product Safety, and Insurance of the Committee on Commerce, Science, and Transportation, United States Senate, 113th Cong, 1st Sess (2013) (evaluating mechanisms to encourage more patent challenges).

¹⁸ See, for example, John R. Thomas, *Collusion and Collective Action in the Patent System: A Proposal for Patent Bounties*, 2001 U Ill L Rev 305, 333; Roger D. Blair and Thomas F. Cotter, *Are Settlements of Patent Disputes Illegal Per Se?*, 47 Antitrust Bull 491, 526 (2002); Maureen A. O’Rourke and Joseph F. Brodley, *An Incentives Approach to Patent Settlements: A Commentary on Hovenkamp, Janis & Lemley*, 87 Minn L Rev 1767, 1777–78 (2003); Miller, 19 Berkeley Tech L J at 674 & n 24 (cited in note 14); Joseph Farrell and Robert P. Merges, *Incentives to Challenge and Defend Patents: Why Litigation Won’t Reliably Fix Patent Office Errors and Why Administrative Patent Review Might Help*, 19 Berkeley Tech L J 943, 946 (2004); Mark A. Lemley and Carl Shapiro, *Probabilistic Patents*, 19 J Econ Persp 75, 88–89 (Spring 2005); Brian J. Love, *The Misuse of Reasonable Royalty Damages as a Patent Infringement Deterrent*, 74 Mo L Rev 909, 941–43 (2009); Michael Risch, *Patent Challenges and Royalty Inflation*, 85 Ind L J 1003, 1022 (2010); Megan M. La Belle, *Patent Law as Public Law*, 20 Geo Mason L Rev 41, 65–66 (2012); Gideon Parchomovsky and Alex Stein, *Intellectual Property Defenses*, 113 Colum L Rev 1483, 1518 (2013); Anup Malani and Jonathan S. Masur, *Raising the Stakes in Patent Cases*, 101 Georgetown L J 637, 656–57 (2013); Roger Allan Ford, *Patent Invalidity versus Noninfringement*, 99 Cornell L Rev 71, 113 (2013); Michael J. Burstein, *Rethinking Standing in Patent Challenges*, 83 Geo Wash L Rev 498, 500, 543 (2015); Alan D. Miller and

concluded that the answer is “no,” and have in turn proposed a variety of interventions to encourage additional patent challenges—such as bounties,¹⁹ expanded standing rules,²⁰ fee-shifting,²¹ and other reforms.²² Like Congress and the courts, scholars have focused almost exclusively on the question of how to incentivize more patent challenges, without exploring the conditions necessary for these challenges to bestow their supposed benefits on the public.

This Article tests the long-held premise that patent challenges lead to increased competition. A careful examination of the theory reveals multiple unstated assumptions that have not been previously identified or scrutinized. To increase competition, a challenge must be directed at a patent that is a but-for cause of market power. The challenge must be timely. And it must be successful. When any of these conditions fails, the commonly presumed conclusion that challenges increase competition no longer holds. And, problematically, there are a number of ways these conditions can and regularly do fail. This Article draws on a combination of legal doctrine, recent empirical work, and several case studies to illustrate the difficulties with assuming that the possibility of increasing competition is consistently available in every patent challenge. As it turns out, there are entire categories of cases in which the possibility of increasing competition is small, and even some cases in which it cannot happen at all.

At the same time, this analysis also reveals categories of cases in which the conditions necessary for a challenge to increase competition *are* usually present. The most conspicuous example is challenges to pharmaceutical patents under the Hatch-Waxman Act.²³ Various features of prescription drug markets and the attendant regulatory regime ensure that the conditions necessary for a challenge to increase competition will often be present in

Michal S. Gal, *Licensee Patent Challenges*, 32 *Yale J Reg* 121, 135–37, 143–45 (2015); Timothy R. Holbrook, *The Supreme Court’s Quiet Revolution in Induced Patent Infringement*, 91 *Notre Dame L Rev* 1007, 1033–39 (2016) (suggesting that recent developments in the law of indirect liability do not adequately encourage patent challenges).

¹⁹ See Miller, 19 *Berkeley Tech L J* at 705 (cited in note 14); Malani and Masur, 101 *Georgetown L J* at 672 (cited in note 18).

²⁰ Burstein, 83 *Geo Wash L Rev* at 544–46 (cited in note 18); Robert C. Dorr, Note, *Patent Law—Patent Validity: The Public Is the Third Party*, 51 *Denver L J* 95, 98 (1974).

²¹ Jay P. Kesan, *Carrots and Sticks to Create a Better Patent System*, 17 *Berkeley Tech L J* 763, 795–97 (2002).

²² Ford, 99 *Cornell L Rev* at 118–26 (cited in note 18); Farrell and Merges, 19 *Berkeley Tech L J* at 967 (cited in note 18).

²³ Several other examples are discussed throughout this Article.

these cases. This may partially explain why these conditions have been so frequently assumed: much of the recent case law and scholarship addressing the competitive effects of patent challenges was crafted with Hatch-Waxman litigation squarely in the foreground.²⁴ But, in a number of ways that matter for competition, these cases are not typical of patent litigation in general. Many assumptions that are reasonable in the Hatch-Waxman context are doubtful in other contexts, though courts and commentators are not always mindful of this distinction.²⁵

To be clear, this Article does *not* conclude that Hatch-Waxman challenges always increase competition or that other challenges never do. Determining whether a challenge is likely to increase competition requires a detailed, case-specific inquiry, and there is no simple, bright-line rule that can substitute for this analysis. This Article also does not develop a position as to whether there is too much or too little patent litigation in general—there are, after all, other benefits that could potentially come from patent litigation.²⁶ But it does argue that the existence of identifiable circumstances in which patent challenges are unlikely to have a significant effect on competition presents both complication and opportunity. If increasing competition by scrutinizing patent rights is indeed a desirable goal—and there is no reason to think it isn't—that goal may be better served by focusing resources on those challenges in which the conditions necessary to increase competition are in fact present.

To these ends, this Article presents a number of policy implications spanning the judicial, administrative, and legislative domains. For example, this analysis yields important guidance for how the Patent Office should implement its new authority to review issued patents under the AIA.²⁷ It also exposes flaws in judicially created policies intended to encourage more patent challenges.²⁸ It sheds new light on the competitive consequences of patent settlements and thus informs how the 2013 Supreme

²⁴ Within the last decade, the antitrust treatment of reverse-payment settlements in Hatch-Waxman litigation generated a circuit split, *hundreds* of law review articles (easily found through a search for “reverse /s settlement /s payment & Hatch-Waxman” in Westlaw’s JLR database), and, ultimately, a Supreme Court opinion. See Parts III.C–D. Still, this is at best a partial explanation, since the presumption that patent challenges increase competition predates the 1984 Hatch-Waxman Act by decades. See notes 5–6 and accompanying text.

²⁵ See Part III.D (discussing *Actavis* and commentary).

²⁶ See Part I.C.

²⁷ See Part III.A.

²⁸ See Part III.B.

Court decision *Actavis* should be applied in future cases.²⁹ And it provides a framework for evaluating the various reforms scholars have proposed to incentivize patent litigation.³⁰

This Article proceeds in four parts. Part I introduces several plausible reasons why patent litigation might be more valuable than other forms of litigation and contextualizes the particular theory that is the focus of this Article—that patent challenges increase competition. Part II explores this theory in more detail, identifying and evaluating several previously unstated assumptions implicit in that theory. Part III presents a number of implications of the prior analysis. The final Part concludes.

I. BACKGROUND: WHAT MAKES PATENT LITIGATION SPECIAL?

As the Introduction described, there is a long-standing and widespread consensus among courts and commentators that patent litigation is somehow different from other forms of civil disputes. This Part more closely examines the question *why*. In so doing, it introduces several theories of how patent litigation might benefit the public, focusing on explanations that are specific to patent litigation among all other forms of litigation. It then defines a few terms and concepts that will be used throughout the balance of the Article.

A. Patent Litigation Clarifies the Law and Yields Other Valuable Information

One potential benefit of patent challenges is the production of information that is relevant to others beyond any given dispute. As Professor Owen Fiss famously argued in his 1984 article *Against Settlement*, settlement deprives courts of the opportunity to do justice and interpret the law, mooting an otherwise valuable “interpretive occasion[.]”³¹ One could expand this argument slightly to include other kinds of information as well—pleadings and trials might bring important facts into the public eye, and final judgments might send powerful messages about the primacy of the rule of law. Litigation can also lead to jury trials, which, as

²⁹ See Part III.D.

³⁰ See Part III.C.

³¹ FISS, 93 *Yale L J* at 1085 (cited in note 3). See also LEDERMAN, 75 *Notre Dame L Rev* at 228 (cited in note 3).

the Supreme Court has noted, afford the public an important opportunity for direct participation in the adjudicatory process.³²

These arguments are not necessarily wrong, but they prove too much. The problem is that the same benefits could be claimed for civil litigation generally—*any* case might yield legal rules, valuable information, or the opportunity for jury service—and yet judicial policy in this country is explicitly oriented in favor of settlement. If the question is why patent litigation is special, why the presence of a patent claim causes a case to take on particular importance, Fiss-style assertions about the benefits of litigation generally cannot be the answer. Instead, what is needed is a public benefit that is specific to patent cases, one that is not found in run-of-the-mill contract or property disputes. This requirement excludes many benefits that might flow from patent litigation just as well as from any other form of litigation.

B. Individual Patent Challenges Increase Competition

One theory that *is* specific to patent disputes is that they present an opportunity to mitigate the harms to competition imposed by individual patents. On most accounts, the purpose of having a patent system is to reward invention through time-limited bequests of market power.³³ According to this theory of the benefits of patent challenges, such cases can reduce or eliminate the patent holder's market power, stemming the harms to competition that might otherwise flow from an overbroad or invalid grant.

When explaining why patent challenges are specially vested with a public interest, courts and commentators have repeatedly invoked exactly this theory. In this view, all patents—valid or not—impose the static and dynamic costs attendant to other monopolies, such as reduced output, higher prices, and inhibited innovation.³⁴

³² See *Powers v Ohio*, 499 US 400, 406–08 (1991).

³³ See Ariel Katz, *Making Sense of Nonsense: Intellectual Property, Antitrust, and Market Power*, 49 Ariz L Rev 837, 855–56 (2007). There are other theories of how the patent system might benefit the public, some of which are less dependent on a regulatory bequest of market power for their success than the prevailing rewards theory. See Stephen Yelderman, *Coordination-Focused Patent Policy*, 96 BU L Rev 1565, 1577–81 (2016). The following discussion is framed in terms of the traditional rewards account because the theory of how patent challenges can benefit competition is typically set against that backdrop. In any event, the ex post costs of patents can be significant regardless of the theory invoked to justify them. See *id.* at 1594 (noting that significant market power is possible even with a coordination-focused patent system).

³⁴ See *Blonder-Tongue Laboratories, Inc v University of Illinois Foundation*, 402 US 313, 343 (1971) (asserting that a patent “has the economic consequences attending other monopolies”).

These are the ex post costs incurred to create the ex ante incentives offered by the patent system. Whether these costs are justified depends on whether the underlying patent was properly granted. When a patent is valid, the ex post costs it imposes are simply the price of rewarding invention through a system of exclusive rights.³⁵ But when the patent is actually invalid, these same costs are no longer justified.³⁶ Although patent litigation is expensive in its own right,³⁷ the upsides of eliminating unjustified market power can more than justify the process costs of doing so.³⁸ In short, patent challenges are a golden opportunity to mitigate the costs of having a patent system.

Increased competition is a clear public benefit, and one that can make patent litigation different from run-of-the-mill contracts or torts cases, the outcomes of which do not typically affect the competitiveness of markets.³⁹ As the Supreme Court has explained, “a patent is an exception to the general rule against monopolies and to the right to access to a free and open market.”⁴⁰ Because patent grants are a departure from normal promarket principles, “[i]t is as important to the public that competition should not be repressed by worthless patents, as that the patentee of a really valuable invention should be protected in his monopoly.”⁴¹ Patent challenges thus advance the “public interest in free competition” by offering a chance of terminating a “patent monopoly.”⁴² As a result, there is an inherent public interest in patent

³⁵ The theory, at least, is that these costs will be justified by increased innovation in the long term. See *Graham v John Deere Co of Kansas City*, 383 US 1, 9 (1966).

³⁶ *Actavis*, 133 S Ct at 2232.

³⁷ See *2015 Report of the Economic Survey* I-110 to -112 (American Intellectual Property Law Association 2015) (“AIPLA 2015 Report”) (reporting that each side’s attorney’s fees for a patent trial often run into the millions of dollars).

³⁸ Malani and Masur, 101 *Georgetown L J* at 639, 657 (cited in note 18); Farrell and Merges, 19 *Berkeley Tech L J* at 946 (cited in note 18); Burstein, 83 *Geo Wash L Rev* at 538–39 (cited in note 18); Dorr, Note, 51 *Denver L J* at 113 (cited in note 20); *To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy* ch 1, *11 (FTC, Oct 2003), archived at <http://perma.cc/D4DC-WGC7> (“FTC Innovation Report”) (“If an unwarranted patent confers market power on a patentholder, it can deprive consumers of the benefits of competition without compensating value.”).

³⁹ See Miller, 19 *Berkeley Tech L J* at 679 (cited in note 14) (claiming that patents, unlike contracts or torts, affect public—and not just private—interests).

⁴⁰ *Precision Instrument Manufacturing Co v Automotive Maintenance Machinery Co*, 324 US 806, 816 (1945).

⁴¹ *Pope Manufacturing Co v Gormully*, 144 US 224, 234 (1892).

⁴² *United States v Glaxo Group Ltd*, 410 US 52, 57–59, 69 (1973) (restating and summarizing the history of this argument). See also *Cuozzo Speed Technologies, LLC v Lee*, No 15-446, slip op at 16–17 (US June 20, 2016); *Medtronic, Inc v Mirowski Family Ventures, LLC*, 134 S Ct 843, 851–52 (2014); *Actavis*, 133 S Ct at 2234; *Cardinal Chemical Co*

challenges, and that interest is not necessarily represented by any of the parties to a particular patent dispute.⁴³

A notable feature of this theory is that it predicts measurable benefits in a well-defined sphere. Previously, a patent right was reducing competition in some product market, resulting in reduced output, higher prices for consumers, and impaired incentives to innovate in the future. Then a challenge changes things. Competition in the relevant markets increases. Output expands. Prices fall. Innovation occurs. In short, this theory implies that a successful patent challenge will be a discrete, dramatic event that opens a definable product market to competition. The promised benefits include immediate, observable price effects as well as more subtle, longer-term benefits for future innovation.⁴⁴

This is the theory that is the primary focus of this Article. As a justification, it is a fruitful topic for inquiry—it is patent-specific, is testable in individual cases, and has been widely invoked by courts and commentators alike. Moreover, the specificity of this theory makes it possible to assess the public desirability of patent challenges at an individual level. Consider, for example, a patent challenge that costs \$5 million to litigate to judgment, but results in a multiyear 10 percent price reduction and a 5 percent increase in quantity in a \$10 billion annual market. With these numbers, the deadweight losses avoided by removing patent market power are many times the process costs of the litigation, so a challenge like that one is plainly worthwhile.⁴⁵ Conversely, when it does not

v Morton International, Inc, 508 US 83, 100–01 (1993); *Blonder-Tongue*, 402 US at 342–48; *Lear, Inc v Adkins*, 395 US 653, 663–64 (1969); *In re Cipro Cases I & II*, 348 P3d 845, 850 (Cal 2015); *FTC Innovation Report* at ch 1, *11 (cited in note 38). A number of commentators have similarly suggested that patent challenges benefit the public by increasing competition. See, for example, Dorr, Note, 51 Denver L J at 97, 113 (cited in note 20); Miller, 19 Berkeley Tech L J at 689–90 (cited in note 14); Malani and Masur, 101 Georgetown L J at 657 (cited in note 18); Farrell and Merges, 19 Berkeley Tech L J at 946 (cited in note 18); Burstein, 83 Geo Wash L Rev at 538–39 (cited in note 18).

⁴³ Miller, 19 Berkeley Tech L J at 679–80, 738 (cited in note 14); Malani and Masur, 101 Georgetown L J at 668–69 (cited in note 18); Lemley and Shapiro, 19 J Econ Persp at 75, 91 (cited in note 18); Dorr, Note, 51 Denver L J at 103, 113 (cited in note 20).

⁴⁴ In addition to static costs saved, a successful challenge can avoid certain dynamic harms—such as reduced future investment in the area covered by the patent and overinvestment in alternate technologies. These dynamic benefits will often be more difficult to measure, but the theory that patent challenges increase competition nonetheless predicts that such benefits will occur at a specific time and place—in the wake of the challenge itself and in the field in which the successful challenge occurred.

⁴⁵ In the simplest model (with a linear demand curve, constant marginal costs, and a resulting competitive equilibrium), deadweight loss is given by one-half of the product of the change in quantity and the change in output. See Walter Nicholson and Christopher Snyder, *Microeconomic Theory: Basic Principles and Extensions* 425–26 (Thomson 10th ed

work out that way—when a challenge does not result in an improvement in price, quantity, innovation,⁴⁶ or some other metric of competition—this theory does not justify the cost of litigation incurred. That does not mean the disputants should be prohibited from going to trial, but, unless some other benefit is shown, the litigation may have been a waste of resources. On this theory's own terms, if a case does not appear likely to have an effect on competition, settlement may be preferable to adjudication for all the reasons that apply to civil litigation in general.

This Article carefully scrutinizes the conditions necessary for patent challenges to increase competition and the factors that determine the magnitude of any benefit that is obtained. However, it should be noted that increased competition is not the only public benefit that plausibly might come from patent litigation. The next Section introduces other potential benefits and explains how they relate to the theory that is the focus of this Article.

C. The Distributional Effects of Patent Challenges in the Aggregate

As the prior Section described, the dominant theory of how patent challenges benefit the public is that they avoid the costs of patent-based market power in individual cases. But there are other potential effects as well. Given that patent litigation often has significant distributional consequences, it seems likely that

2008). In this example, the prechallenge price (P) times the prechallenge quantity (Q) is \$10 billion. The difference between the old price and the new price is $(0.1)*P$, and the difference between the new quantity and the old quantity is $(0.05)*Q$. With a linear demand curve and constant costs, the deadweight loss avoided is therefore $(0.5)*(0.1)*P*(0.05)*Q$, which simplifies to $(0.0025)*P*Q$. Since $P*Q$ is \$10 billion, the deadweight loss avoided is therefore \$25 million annually. As a result, the deadweight losses avoided in the first year alone would exceed the cost of even an unusually expensive patent litigation. See *AIPLA 2015 Report* at I-112 (cited in note 37) (reporting that, in 90 percent of patent cases with more than \$25 million at stake, the cost of litigating through trial was less than or equal to \$12 million). The precise calculations here are beside the point, which is only that in some cases the public benefits of increased competition can trounce the process costs necessary to obtain them. See C. Scott Hemphill, *An Aggregate Approach to Antitrust: Using New Data and Rulemaking to Preserve Drug Competition*, 109 Colum L Rev 629, 648–50 (2009) (describing settlements involving pharmaceuticals with billions of dollars of annual sales).

⁴⁶ It is important to note that the postulated benefit for innovation here is the avoidance of dynamic harms that might otherwise be caused by the challenged patent. This is in contrast to the theory (described in the next Section) that improved accuracy may increase the ex ante incentives created by the patent system itself. One is a claim about the benefits of mitigating the ex post costs of a specific patent, while the other is rooted in the ex ante effects of improving the patent system as a whole. See note 48 and accompanying text.

challenges have aggregate effects that go beyond the cost savings that can be tabulated on a case-by-case basis. In other words, there may be a public interest at a systemic level that is not fully captured by the sum of the static and dynamic costs avoided through individual challenges.

This theory is right as far as it goes, but it is not easily brought down to specifics. First, it depends on the claim that the public has a greater interest in the distributional consequences of patent cases than those of any other category of civil litigation. Otherwise, this theory suffers from the same overbreadth problem as the Fiss-style benefits discussed above, and cannot explain why patent challenges *in particular* should be encouraged within a judicial landscape that typically favors settlement. Surely the public has some interest in the distributional consequences of contract or property cases, and yet the prevailing view is that the public comes out ahead when those kinds of cases are resolved without a trial.

One possible answer is that the public has a special interest in the distributional outcomes of patent cases because they determine the effectiveness of the patent system itself.⁴⁷ The patent system is, after all, premised on a theory of *ex ante* incentives; the idea is that people will invest more in innovation if they anticipate a greater reward for doing so. The system's success in creating these incentives therefore depends on its ability to accurately

⁴⁷ The public interest in the distributional outcomes of patent cases is explored in a subsequent paper. See generally Stephen Yelderman, *The Value of Accuracy in the Patent System* (working paper, 2016) (on file with author). For prior discussion of the public's interest in the outcomes of patent cases, see R. Polk Wagner, *Understanding Patent-Quality Mechanisms*, 157 U Pa L Rev 2135, 2140–45 (2009); Robert P. Merges, *As Many as Six Impossible Patents before Breakfast: Property Rights for Business Concepts and Patent System Reform*, 14 Berkeley Tech L J 577, 592 (1999); Christopher R. Leslie, *The Anticompetitive Effects of Unenforced Invalid Patents*, 91 Minn L Rev 101, 127, 179 (2006); Jay P. Kesan and Andres A. Gallo, *Why "Bad" Patents Survive in the Market and How Should We Change?—The Private and Social Costs of Patents*, 55 Emory L J 61, 76–77, 90–92 (2006); Matthew Sag and Kurt Rohde, *Patent Reform and Differential Impact*, 8 Minn J L Sci & Tech 1, 9–11 (2007); Malani and Masur, 101 Georgetown L J at 650–52, 657 (cited in note 18); *FTC Innovation Report* at ch 5, *2 (cited in note 38) (“Payment of royalties on an invalid patent distorts the incentive system that the patent system was designed to provide.”); Einer Elhauge and Alex Krueger, *Solving the Patent Settlement Puzzle*, 91 Tex L Rev 283, 293–95 (2012); Kesan, 17 Berkeley Tech L J at 767 (cited in note 21) (describing rent-seekers who choose to invest based on bad patents); Thomas, 2001 U Ill L Rev at 319–20 (cited in note 18) (describing how rent-seeking patent filers may divert resources from productive activities); Ford, 99 Cornell L Rev at 113 (cited in note 18); Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 Nw U L Rev 1495, 1515 (2001); Joseph Farrell and Carl Shapiro, *How Strong Are Weak Patents?*, 98 Am Econ Rev 1347, 1349, 1362 (2008) (concluding that weak patents distort innovation incentives); *In re Cipro*, 348 P3d at 868.

award benefits to those who invest in innovation. Persistent mistakes weaken the correlation between awards and deserts, thereby undermining the incentives to innovate that the patent system is supposed to provide. As a form of intensive post-grant scrutiny, patent challenges correct mistakes in individual cases and, ideally, improve the incentives created by the patent system for future prospective inventors as a whole.

In contrast to the theory that individual challenges increase competition, this theory is concerned with the effects of patent challenges in the aggregate. The public might not care how individual cases are resolved, but nonetheless have an interest in the allocation of the costs and benefits of patents at a systemic level. As a result, the theory's predicted benefits cannot be cabined to any particular sphere.⁴⁸ A series of challenges in one field can stimulate innovation in another. The benefits of improved accuracy may accrue gradually over time. There may be little to no relationship between individual litigation events and observable public gains. The prediction here is straightforward but broad: improved expectations of accuracy will lead to greater innovation in the long run.

While this is a plausible explanation for why patent cases are special, stating it proves frustratingly little. The problem is that the relationship between patent grants and innovation *in general* remains a mystery.⁴⁹ For the same reasons, it is quite difficult to measure (or even estimate) the public benefit of improving the accuracy of patent grants. Consider, for example, a hypothetical policy proposal that will cause an extra \$1 billion to be spent litigating patents annually—roughly the direct cost of having 300 patent trials each year instead of the typical 150.⁵⁰ It seems reasonable to assume that this additional investment in litigation

⁴⁸ This is in contrast with the possibility that a successful patent challenge can reduce dynamic harms in the field of the formerly patented invention. See note 46.

⁴⁹ See, for example, Lisa Larrimore Ouellette, *Patent Experimentalism*, 101 Va L Rev 65, 75–84 (2015) (surveying the literature and concluding that “none of these studies resolves whether patents have a net positive effect on innovation, much less their net welfare effect, or whether alternative innovation incentives such as grants, prizes, and tax credits are inferior”); Adam B. Jaffe, *The U.S. Patent System in Transition: Policy Innovation and the Innovation Process*, 29 Rsrch Pol 531, 531 (2000) (“[R]obust conclusions regarding the empirical consequences for technological innovation of changes in patent policy are few.”).

⁵⁰ See John R. Allison, Mark A. Lemley, and David L. Schwartz, *Understanding the Realities of Modern Patent Litigation*, 92 Tex L Rev 1769, 1779 (2014) (observing 290 trials based on complaints filed during a two-year period). Depending on the amount at stake, litigating a patent dispute through trial typically costs each side somewhere between \$1 million and \$7 million. See *AIPLA 2015 Report* at I-110 to -112 (cited in note 37). Patent

will lead to a more accurate allocation of the costs and benefits of the patent system. It might also be reasonable to assume that this additional investment will lead to *some* increase in future incentives to invent. But even with these assumptions, it is quite challenging to determine whether this improvement in accuracy will justify its substantial cost—and thus whether encouraging challenges in this way is indeed good policy. If the public benefits of a more accurate patent system turn out to be, say, \$10 billion, the increased investment in litigation is easily worth its \$1 billion cost. But if the benefits of a more accurate system turn out to be more like \$10 *million*, then this increased expenditure on litigation is misguided. Either number is facially plausible, and it is unclear how one would determine whether an increased investment in accuracy is cost justified.⁵¹

There is, however, a way of avoiding this indeterminacy. If one can show that the costs of a patent challenge are already justified by the challenge's benefits for competition—that is, by the theory described in the prior Section—then the exact magnitude of any benefit from improved accuracy becomes irrelevant. If the proposed \$1 billion in additional patent litigation reliably saves \$1 billion in deadweight losses by eliminating market power, then it does not matter how much extra benefit the public gets from having a more accurate patent system. Once incremental patent challenges are justified by their benefits for competition, the advantages for innovation come as a bonus. In this way, the theory that patent challenges increase competition can be used as a kind of shield for purposes of cost-benefit analysis, providing cover for benefits of unknowable magnitude. (And indeed, most commentators seem to tack accuracy improvements onto other benefits, rather than arguing that these improvements justify policy interventions standing alone.)⁵²

Caution is in order here. The difficulty of estimating the ex ante benefits of increased accuracy does not mean those benefits do not exist. To the contrary, it would be surprising to find that a dramatic change in the rate of patent challenges had no effect on

litigation imposes costs on third parties as well. See Lemley, 95 Nw U L Rev at 1521–22 (cited in note 47).

⁵¹ Indeterminacy like this is common in patent policymaking and often pervades core, unavoidable questions at the heart of the patent system. See Oskar Liivak, *Establishing an Island of Patent Sanity*, 78 Brooklyn L Rev 1335, 1337–38 (2013).

⁵² See, for example, Miller, 19 Berkeley Tech L J at 689–90 (cited in note 14); Kesan, 17 Berkeley Tech L J at 767–68 (cited in note 21); Merges, 14 Berkeley Tech L J at 595–96 (cited in note 47).

innovation, one way or the other. However, the difficulty of quantifying the ex ante effect on innovation only heightens the need to understand when and how individual patent challenges can increase competition ex post. To the extent the accuracy of the patent system can be improved through cases that also happen to save on ex post costs, the decision is an easy one. But once those opportunities are used up, and the remaining options for improving accuracy start *increasing* ex post costs, one must confront much more difficult questions about the relationship between the patent system's errors and innovation. The practical ability of patent litigation to produce public benefits in excess of costs is thus central to larger questions about the consequences of errors and the value of accuracy in the patent system more generally.

This Article's focus on a particular theory of how patent challenges can benefit the public is not intended to imply that other theories lack merit. There may very well be other benefits that justify a general policy of encouraging challenges, or that perhaps justify more tailored policies of discouraging settlement in certain cases. Because of the possibility that patent litigation produces benefits not considered here, this Article's conclusions are limited. It does not seek to answer whether there is too much or too little patent litigation in general. Rather, it closely examines a specific, long-standing, and widely cited theory—and, indeed, one that predicts significant public benefits when certain conditions are present.

* * *

Finally, a few definitional points. As used in this Article, "patent challenge" includes both adjudications of invalidity and adjudications of noninfringement. This broad definition is not meant to suggest that both kinds of rulings always have equal value. To the contrary, and as courts and commentators have recognized, a determination of invalidity is, in general, more likely to increase competition than a determination of noninfringement. The simple reason is that an invalidity judgment removes the patent's threat completely, while a noninfringement ruling leaves open the possibility that some other product might infringe the patent.⁵³ Nonetheless, both determinations have the ability to affect competition

⁵³ See, for example, *Cover v Schwartz*, 133 F2d 541, 545 (2d Cir 1942); *Cardinal Chemical*, 508 US at 100–01; Ford, 99 Cornell L Rev at 118–26 (cited in note 18) (proposing reforms to encourage more litigation of validity defenses rather than noninfringement defenses); Stephen Yelderman, *Improving Patent Quality with Applicant Incentives*, 28 Harv

in some cases, so this Article considers both as potentially valuable forms of challenge, noting situations in which the distinction is likely to make a difference. Moreover, the term “challenge” is just shorthand for the presentation of these arguments to a court; it does not depend on who sued whom and does not imply any judgment about which party was the aggressor.⁵⁴

Traditionally, the most significant forum for patent challenges has been the federal district court, entertaining either a claim of infringement by a patent holder or a declaratory judgment action by a potential patent defendant. But in recent years, administrative agencies have played an increasingly important role, first as the International Trade Commission (ITC) became a popular forum for patent litigation in the 2000s,⁵⁵ and then as the Patent Office launched the post-grant review and inter partes review procedures created by the AIA.⁵⁶ For purposes of the following discussion, the term “patent challenges” includes both litigation in Article III courts and proceedings in the ITC, but does not include administrative review procedures in the Patent Office. Those proceedings receive their own analysis in Part III.A.

II. THE CONDITIONS NECESSARY FOR A PATENT CHALLENGE TO INCREASE COMPETITION

As discussed in the prior Part, courts and commentators have routinely asserted that patent challenges benefit the public by increasing competition through the elimination of unjustified patent monopolies. The basic story of how patent challenges provide this benefit goes something like this: A firm with a patent sells a product into what would otherwise be a competitive market. The patent enables the firm to exclude would-be competitors from a relevant product market and therefore charge a monopoly price for its product. One of these would-be competitors challenges the patent and obtains a judgment that allows it and others to enter the market and sell their products. In the face of such competition, the

J L & Tech 77, 108–11, 121–24 (2014) (evaluating these differences and proposing reforms to encourage applicants to file claims with greater uncertainty as to infringement than as to validity).

⁵⁴ See Malani and Masur, 101 Georgetown L J at 648 & n 46 (cited in note 18).

⁵⁵ Colleen V. Chien and Mark A. Lemley, *Patent Holdup, the ITC, and the Public Interest*, 98 Cornell L Rev 1, 14–17 (2012).

⁵⁶ See Part III.A.

monopoly price falls to a competitive price, benefitting consumers, upstream suppliers, and the economy as a whole.⁵⁷

When things turn out as just described, the public benefits can be substantial. For example, one recent study estimated that, between 1997 and 2008, patent challenges resulted in \$92 billion of additional consumer surplus in the market for hypertension treatments alone.⁵⁸ A number of empirical studies (all examining markets for pharmaceuticals) have found consistent results: patent challenges lead to more entry, increased competition, and lower prices for consumers.⁵⁹ These benefits are measured in terms of hundreds of millions or billions of dollars—easily dominating the cost of the patent litigations that made them possible. And even in markets that have not been as amenable to empirical study, it seems reasonable to expect that the elimination of patent-based market power should lead to the same kinds of public benefits—lower prices, increased innovation, expanded consumer choice, and so on—that the elimination of unjustified power has generally.⁶⁰

The difficulty is that the path from a given patent challenge to a meaningful effect on competition is not always so direct. Upon examination, the theory for how this is supposed to happen depends on four specific conditions that have not previously been given much attention. First, the patent subject to the challenge gives its owner a monopoly (or at least market power) in a relevant market. Second, the challenged patent is a but-for cause of the firm's market power; the firm does not possess other intellectual property or advantages that redundantly preserve its competitive position. Third, all of this happens prospectively: the patented technology and the patent itself remain relevant for some

⁵⁷ As noted above, this outcome may yield long-term benefits for innovation in the previously monopolized product market as well. See notes 44–46 and accompanying text.

⁵⁸ See Lee G. Branstetter, Chirantan Chatterjee, and Matthew Higgins, *Regulation and Welfare: Evidence from Paragraph IV Generic Entry in the Pharmaceutical Industry* *1 (NBER Working Paper No 17188, June 2011), archived at <http://perma.cc/5BZ6-GJ2L>.

⁵⁹ See, for example, *FTC Generic Drug Study* at *22–23 (cited in note 14); Henry Grabowski and John Vernon, *Longer Patents for Increased Generic Competition in the US: The Waxman-Hatch Act after One Decade*, 10 *PharmacoEconomics* Supp 2 110, 121 (1996); Laura E. Panattoni, *The Effect of Paragraph IV Decisions and Generic Entry before Patent Expiration on Brand Pharmaceutical Firms*, 30 *J Health Econ* 126, 132–33, 136 (2011). A recent study *not* limited to the pharmaceutical context found evidence of increased innovation in the wake of successful challenges, but did not examine price effects. See Alberto Galasso and Mark Schankerman, *Patents and Cumulative Innovation: Causal Evidence from the Courts*, 130 *Q J Econ* 317, 339–41 (2015).

⁶⁰ See *Blonder-Tongue Laboratories, Inc v University of Illinois Foundation*, 402 US 313, 342–43 (1971) (asserting that a patent can create all the costs of a typical monopoly, and that the monopoly should be carefully limited); *Actavis*, 133 S Ct at 2234.

meaningful period of time after the legal rulings have taken effect. In other words, the patent challenge does not merely allocate past value, but affects competition going forward. Fourth, the patent challenge turns out to be successful, such that this potential prospective removal of a but-for cause of market power is actually realized.

Court opinions and prior scholarship have assumed (often implicitly) that all of these conditions hold and have not explored the consequences when they do not.⁶¹ Each of the following sections considers one of these conditions in more detail and evaluates the reasonability of assuming that it holds for patent challenges generally.

A. The Challenged Patent Confers Market Power

For a patent challenge to be capable of increasing competition, the disputed patent must be a cause of diminished competition in the first place. This is simple enough to state, but it is a point that has been overlooked with surprising frequency. In fact, courts and commentators often begin their analysis of patent challenges with the proposition that the patent at issue confers a monopoly, or at least market power.⁶²

⁶¹ For discussion of the effects of patent challenges on competition, see *Cardinal Chemical Co v Morton International, Inc*, 508 US 83, 100–01 (1993); *Blonder-Tongue*, 402 US at 342–43; *Actavis*, 133 S Ct at 2234; *Lear, Inc v Adkins*, 395 US 653, 663–64 (1969); *In re Cipro Cases I & II*, 348 P3d 845, 850 (Cal 2015); Malani and Masur, 101 Georgetown L J at 652, 657, 671 (cited in note 18); Dorr, Note, 51 Denver L J at 113 (cited in note 20); Burstein, 83 Geo Wash L Rev at 538–39 (cited in note 18); Ford, 99 Cornell L Rev at 78–80 (cited in note 18); Blair and Cotter, 47 Antitrust Bull at 526 (cited in note 18); O'Rourke and Brodley, 87 Minn L Rev at 1777–78 (cited in note 18); Miller, 19 Berkeley Tech L J at 686–87 (cited in note 14); Farrell and Merges, 19 Berkeley Tech L J at 946 (cited in note 18); Lemley and Shapiro, 19 J Econ Persp at 88–89 (cited in note 18); Miller and Gal, 32 Yale J Reg at 135–37, 143–45 (cited in note 18); Shubha Ghosh and Jay Kesan, *What Do Patents Purchase? In Search of Optimal Ignorance in the Patent Office*, 40 Houston L Rev 1219, 1229–31 (2004); Elhauge and Krueger, 91 Tex L Rev at 290–91 (cited in note 47) (considering the effect of litigation delays on the remaining patent term).

⁶² See, for example, *Actavis*, 133 S Ct at 2236; *Cardinal Chemical*, 508 US at 100–01 (“[T]he opportunity to relitigate might, as a practical matter, grant monopoly privileges to the holders of invalid patents.”); *Blonder-Tongue*, 402 US at 342–43; *Lear*, 395 US at 663–64; *In re Cipro*, 348 P3d at 850; *Bilski v Kappos*, 561 US 593, 656 (2010) (Stevens concurring in the judgment) (“Of course, patents always serve as a barrier to competition for the type of subject matter that is patented.”); Malani and Masur, 101 Georgetown L J at 652, 657, 671 (cited in note 18); Dorr, Note, 51 Denver L J at 113 (cited in note 20); Miller, 19 Berkeley Tech L J at 688–90 (cited in note 14); Lemley and Shapiro, 19 J Econ Persp at 90–92 (cited in note 18); T. Randolph Beard, et al, *Quantifying the Cost of Substandard Patents: Some Preliminary Evidence*, 12 Yale J L & Tech 240, 244–45 (2010).

Clearly, some patents do confer market power, at least some of the time. If patents never conferred market power, there would be no point to having a patent system.⁶³ Moreover, there are a number of examples of patents that have allowed their owners to raise prices,⁶⁴ so the possibility of patent market power is certainly a real one.

But just as it is recognized that some patents confer market power, it is widely understood today that many patents do not. As a result, market power cannot be assumed from the mere fact of a patent grant. Moreover, it is not safe to infer (as many do) that a challenged patent confers market power simply because two parties find it profitable to fight over it. The following sections consider each argument for patent market power in turn.

1. Market power cannot be assumed in patent rights generally.

In the standard framing of the costs and benefits of a patent challenge, the patent at issue creates a product monopoly.⁶⁵ This circumstance is an exceedingly familiar one to theorists, as it is often found in the most basic economic models of how the patent system rewards invention. Professors F.M. Scherer and David Ross's textbook treatment of the competitive effects of patents is typical: "If the [patented] product is really new and useful, it creates a wholly new demand curve . . . that did not exist previously. With an exclusive right to make and sell its product, the patent holder is a monopolist."⁶⁶

This approach is appealing—and theoretically useful—because it allows the costs of the patent monopoly to be crisply compared

⁶³ See Katz, 49 Ariz L Rev at 841–42 (cited in note 33).

⁶⁴ The best examples come from the pharmaceutical industry, in which generics typically offer the same drug at a discount of 20 percent or more after the original developer's patent has expired. See David Reiffen and Michael R. Ward, *Generic Drug Industry Dynamics*, 87 Rev Econ & Stat 37, 43–44 (2005); Richard G. Frank and David S. Salkever, *Generic Entry and the Pricing of Pharmaceuticals*, 6 J Econ & Mgmt Strategy 75, 89 (1997).

⁶⁵ See, for example, *Actavis*, 133 S Ct at 2236; *Cardinal Chemical*, 508 US at 100–01; *Blonder-Tongue*, 402 US at 342–43; *Lear*, 395 US at 663–64; *In re Cipro*, 348 P3d at 850.

⁶⁶ F.M. Scherer and David Ross, *Industrial Market Structure and Economic Performance* 622 (Houghton Mifflin 3d ed 1990). See also Steven Shavell and Tanguy van Ypersele, *Rewards versus Intellectual Property Rights*, 44 J L & Econ 525, 529 (2001) ("Under the patent system, the innovator's incentive to invest in research is the monopoly profits he would earn."); Suzanne Scotchmer, *Innovation and Incentives* 36 (MIT 2004) ("Intellectual property rights make the proprietor a monopolist."); Edmund W. Kitch, *Elementary and Persistent Errors in the Economic Analysis of Intellectual Property*, 53 Vand L Rev 1727, 1733 (2000) (observing the typicality of this approach).

to a presumed baseline in which, as Scherer and Ross put it, “there [are] no patent protection and no other barriers to the imitation of the innovator’s invention.”⁶⁷ In other words, if the patent is in force, the owner has a monopoly; if not, perfect competition ensues. From this “monopoly-on/monopoly-off” modeling, the path to the conclusion that patent challenges serve the public interest is not difficult to follow. If a challenge succeeds, consumers get the perfectly competitive scenario instead of the monopoly scenario—a clear public benefit.

But there is a complication here lurking in plain sight: many patents do not confer much market power at all. Patent monopolies in the economic sense of the term—those that have the competitive effects predicted by textbook models like Scherer and Ross’s—are the exception, not the rule. As Professor Kenneth Dam succinctly observed some years ago, “[L]eading companies may obtain 1,000 or more patents in a single year, and yet many such firms are unlikely ever to obtain even a single monopoly in any market.”⁶⁸ Another way of reaching the same conclusion is by examining the rate at which patent holders pay the fees required to renew their patent rights and the rate at which they allow those rights to lapse. If every patent conferred more than a slight degree of power in a product market of any consequence, then every patent would easily be worth paying renewal fees costing less than \$1,000 for each year of patent term.⁶⁹ And yet every day hundreds of patents are allowed to lapse for failure to pay such fees.⁷⁰ Indeed, by their fourth year, about 16 percent of patents have lapsed, and, by their twelfth year, more than 53 percent of patents have lapsed.⁷¹ These data flatly rebut the proposition that patents always or even typically confer market power.⁷²

⁶⁷ Scherer and Ross, *Industrial Market Structure* at 622 (cited in note 66). A few pages later, Scherer and Ross warn that the real world is more complicated. *Id.* at 624.

⁶⁸ Kenneth W. Dam, *The Economic Underpinnings of Patent Law*, 23 *J Legal Stud* 247, 250 (1994) (citation omitted).

⁶⁹ If a patent owner fails to pay the maintenance fees due at certain required intervals, the patent lapses and becomes part of the public domain. See 35 USC § 41(b)(2). Today, the total maintenance fees for the typical patent over the course of an approximately seventeen-year patent term are \$12,600. See 37 CFR § 1.20(e)–(g). Previously, the fees were significantly lower. See Kimberly A. Moore, *Worthless Patents*, 20 *Berkeley Tech L J* 1521, 1525 (2005) (describing maintenance fees at the time of the study, totaling \$7,000 over the term of the patent).

⁷⁰ See Saurabh Vishnubhakat, *Expired Patents*, 64 *Cath U L Rev* 419, 435 (2015).

⁷¹ See Moore, 20 *Berkeley Tech L J* at 1526, 1531 (cited in note 69).

⁷² Some of these nonrenewed patents may have conferred market power at some point, but lost their significance due to technical obsolescence. See notes 140–47 and accompanying text. So, more precisely, nonrenewal suggests that the patent lacked market

This observation—that the majority of issued patents do not appear to create monopoly or even market power—is not new. In fact, there is widespread consensus among courts, commentators, and the antitrust agencies that patents should *not* be presumed to convey market power.⁷³ This was not always the case—for the better part of the last century, courts presumed that the producer of a product covered by one of its own patents enjoyed market power, both for purposes of the patent misuse doctrine⁷⁴ and for purposes of antitrust analysis.⁷⁵ But Congress abrogated the former presumption in 1988,⁷⁶ and in 2006 the Supreme Court scotched the latter presumption as well in the landmark case *Illinois Tool Works Inc v Independent Ink, Inc.*⁷⁷ Citing the “vast majority of academic literature on the subject,”⁷⁸ the “virtual consensus among economists,”⁷⁹ and the position of the antitrust agencies, the Court overruled its earlier precedent and declined to impose even a rebuttable presumption that patents confer market power for purposes of antitrust analysis.⁸⁰

power by the time the maintenance fee came due. In the other direction, it would be wrong to assume that every renewed patent *does* confer market power, for patents can offer other sources of private value as well. See generally Clarisa Long, *Patent Signals*, 69 U Chi L Rev 625 (2002) (describing how patents can be used to convey valuable information about a firm).

⁷³ See *Illinois Tool Works Inc v Independent Ink, Inc.*, 547 US 28, 38–42 (2006); Herbert Hovenkamp, *Economics and Federal Antitrust Law* § 8.3 at 219 (West 1985); Dam, 23 J Legal Stud at 250 (cited in note 68); Russell Lombardy, Comment, *The Myth of Market Power: Why Market Power Should Not Be Presumed When Applying Antitrust Principles to the Analysis of Tying Agreements Involving Intellectual Property*, 8 St Thomas L Rev 449, 468–69 (1996); William M. Landes and Richard A. Posner, *The Economic Structure of Intellectual Property Law* 374 (Belknap 2003); Herbert Hovenkamp, et al, *IP and Antitrust: An Analysis of Antitrust Principles Applied to Intellectual Property Law* § 4.2 at 4-8 to -9 (Wolters Kluwer 2d ed 2015 & Supp 2016); Nancy T. Gallini and Michael J. Trebilcock, *Intellectual Property Rights and Competition Policy: A Framework for the Analysis of Economic and Legal Issues*, in Robert D. Anderson and Nancy T. Gallini, eds, *Competition Policy and Intellectual Property Rights in the Knowledge-Based Economy* 17, 22 (Calgary 1998); Kitch, 53 Vand L Rev at 1730 (cited in note 66); *Antitrust Guidelines for the Licensing of Intellectual Property* § 2.2 at *4 (DOJ and FTC, Apr 6, 1995), archived at <http://perma.cc/2MRN-RUSL>.

⁷⁴ See, for example, *Morton Salt Co v G.S. Suppiger Co*, 314 US 488, 490–91 (1942); *United States v Loew's Inc*, 371 US 38, 45–46 (1962). For a discussion of these doctrinal developments, see *Illinois Tool Works*, 547 US at 38–40; Michael A. Carrier, *Unraveling the Patent-Antitrust Paradox*, 150 U Pa L Rev 761, 775 n 35 (2002) (collecting cases).

⁷⁵ See, for example, *International Salt Co v United States*, 332 US 392, 395 (1947).

⁷⁶ Act of Nov 19, 1988 § 201, Pub L No 100-703, 102 Stat 4674, 4676, codified at 35 USC § 271(d)(5).

⁷⁷ 547 US 28, 31 (2006).

⁷⁸ *Id.* at 43 n 4.

⁷⁹ *Id.* at 45.

⁸⁰ See *id.* at 44–46.

So the fact that patents do not typically confer product monopolies (or even market power) has been accepted for at least a decade.⁸¹ But when it comes to assessing the benefits of patent challenges, the “monopoly” framing appears quite resilient. For example, court decisions written in the last few years can still be found describing the value of patent challenges in terms of a presumed patent monopoly.⁸² Even the Supreme Court, notwithstanding its holding in *Illinois Tool Works*, continues to express concern that the public should not “continually be required to pay tribute to would-be monopolists without need or justification.”⁸³ In light of the Court’s own recognition of the dubiousness of assuming market power, the persistence of this language is really quite puzzling.⁸⁴

But even if patents *in general* do not usually confer market power, perhaps it is reasonable to presume market power in cases in which challenges actually arise. After all, the fact that two parties find a patent worth litigation might suggest that that particular patent is one of the minority conferring market power. The reasonability of this inference is the subject of the next Section.

⁸¹ But see Katz, 49 Ariz L Rev at 893–97 (cited in note 33) (criticizing *Illinois Tool Works*).

⁸² See, for example, *In re Cipro*, 348 P3d at 850; *Applied Medical Resources Corp v United States Surgical Corp*, 352 F Supp 2d 1119, 1126 (CD Cal 2005).

⁸³ *Actavis*, 133 S Ct at 2233, quoting *Lear*, 395 US at 670. See also *Cuozzo Speed Technologies, LLC v Lee*, No 15-446, slip op at 16 (US June 20, 2016), quoting *Precision Instrument Manufacturing Co v Automotive Maintenance Machinery Co*, 324 US 806, 816 (1945) (“[I]n addition to helping resolve concrete patent-related disputes among parties, inter partes review helps protect the public’s ‘paramount interest in seeing that patent monopolies . . . are kept within their legitimate scope.’”) (ellipsis in original).

⁸⁴ One potential explanation is that when courts and commentators refer to a “patent monopoly,” they do not really mean it—that is, they are using a shorthand for “exclusive rights,” without intending to refer to monopolies in an economic sense. See Edmund W. Kitch, *Patents: Monopolies or Property Rights?*, 8 Rsrch L & Econ 31, 33 (1986) (observing the ambiguous use of the term “monopoly”). But this explanation presents problems of its own. If “patent monopoly” is not meant to imply market power, then removal of market power cannot be the supposed public benefit of patent litigation, and it becomes necessary to find a *different* theory to justify the long-standing judicial doctrines (and more recently proposed reforms) to encourage challenges and discourage settlement. As this Article admits, patent challenges might well produce public benefits other than the one considered here, but such alternative theories have not been invoked by courts or developed with much specificity by scholars. See Part I. Instead, the relevant authorities seem to assume that the benefits of ending “patent monopolies” are self-evident. See note 42 and accompanying text. In short, when courts and commentators speak of “patent monopolies” in this context, they appear to be drawing on the term’s economic implications as the basis for promoting patent challenges, not simply using casual language.

2. Inferring market power from a patent dispute.

As the prior Section discussed, without knowing more, it would be quite risky to assume that any given patent confers market power. However, if the goal of the inquiry is to understand how patent challenges affect competition, one might need to ask a slightly different question: Is it reasonable to assume that patents *that are the subject of challenges* confer market power? Whatever the probability might be that a patent in the general pool confers market power, it is possible that challenged patents are different in some way, and that these differences make them more likely to confer market power than patents at large.⁸⁵ This Section considers whether it is reasonable to assume that a challenged patent confers market power.

One reason for thinking that challenged patents might be more likely to confer market power than patents in general is that the existence of a patent dispute reveals that the contested rights have some value to the parties fighting over them. Patent litigation is expensive—the cost of seeing a single case through to trial can easily reach into the millions of dollars.⁸⁶ So if a patent is not important, one would expect that the parties would quickly give up the fight. But when a patent owner and a challenger *are* willing to spend significant sums pursuing the conflict, this might suggest that the patent is one of the minority of patents that indeed confers market power.⁸⁷

There are really two steps at work in this commonly adopted inference. The first is that the level of the parties' investment in a dispute reflects the private value that those parties have at stake in that dispute. The second is that the presence of private value at stake indicates that the challenged patent confers market power. Neither step holds under all conditions.

⁸⁵ See Katz, 49 *Ariz L Rev* at 864 (cited in note 33) (postulating that the intellectual property rights that are litigated are concentrated on "intellectual goods high in commercial value, likely without many close substitutes").

⁸⁶ See *AIPLA 2015 Report* at 37 (cited in note 37).

⁸⁷ See Miller and Gal, 32 *Yale J Reg* at 155 (cited in note 18); Brief of Professor F.M. Scherer as *Amicus Curiae* in Support of Respondent, *Illinois Tool Works Inc v Independent Ink, Inc*, Docket No 04-1329, *7 (US filed Sept 28, 2005) (available on Westlaw at 2005 WL 2427642) ("The willingness of plaintiffs in American judicial proceedings to expend such large sums demonstrates that the patents at issue are among the few patents with truly significant value."). See also Malani and Masur, 101 *Georgetown L J* at 657 (cited in note 18) (arguing that challenges will tend to target patents with greater deadweight losses); Katz, 49 *Ariz L Rev* at 864 (cited in note 33).

The easier of the two steps is the first: the presence of a live patent dispute suggests there is some significant private value at stake. Intuitively, it seems irrational to spend more litigating a case than the case itself is worth.⁸⁸ So, if the private stakes are small, it would be better to settle the dispute than to continue fighting it. For exactly this reason, patent litigation is a generally accepted indicator of private value.⁸⁹

However, what is useful as a general indicator does not necessarily hold true in all cases. For example, this inference breaks down in the context of nuisance suits. The same significant litigation costs that suggest a disputed patent has high private value also create the opportunity for abuse in low-value cases. Knowing the costs of defending an infringement claim are high, a patent holder could bring a weak case in hopes of settling for a share of the defendant's avoided defense costs.⁹⁰ (Symmetrically, a challenger could initiate a claim against a plainly valid patent in hopes of settling for a share of the patent owner's costs of fighting to preserve it.)⁹¹ Even if nuisance assertions are common, such cases should not be expected to proceed very far, since neither party has an interest in actually litigating them. But when bargaining breaks down or a party miscalculates, it is possible that such disputes could go on for a surprisingly long time. Because of the possibility of nuisance claims and other abusive tactics, it is simply not true that private value must inexorably follow from the fact of a patent dispute.⁹²

The second step of the inference is more problematic. Once it is established that a patent dispute does involve significant private value, it is tempting to assume that this value must come

⁸⁸ See D. Rosenberg and S. Shavell, *A Model in Which Suits Are Brought for Their Nuisance Value*, 5 Intl Rev L & Econ 3, 4 (1985).

⁸⁹ See John R. Allison, et al, *Valuable Patents*, 92 Georgetown L J 435, 439–43 (2004); Jean O. Lanjouw and Mark Schankerman, *Characteristics of Patent Litigation: A Window on Competition*, 32 RAND J Econ 129, 129–30 (2001).

⁹⁰ See *Innovation Act Report* at 21 (cited in note 17) (describing witnesses' reports of such nuisance suits).

⁹¹ See Dolin, 56 BC L Rev at 932–34 (cited in note 16).

⁹² See Salem M. Katsh, Jack E. Brown, and F.M. Scherer, Panel Discussion, *The Value of Patents and Other Legally Protected Commercial Rights*, 53 Antitrust L J 535, 547 (1984). Note that a high number of nuisance suits might *itself* be a reason to restrict parties' access to settlement. See generally David Rosenberg and Steven Shavell, *A Solution to the Problem of Nuisance Suits: The Option to Have the Court Bar Settlement*, 26 Intl Rev L & Econ 42 (2006). However, this argument for restricting settlement is distinct from the theory that patent challenges increase competition, and indeed is not limited to patent cases at all.

from the disputed patent's market power. This is, after all, consistent with the most common justification for issuing patents in the first place: inventors are given valuable market power as a reward for their inventive contributions.⁹³ So when private value shows up in a particular patent challenge, it seems reasonable to think that the patent system is working according to its theory, and that the challenged patent is indeed one that confers market power.⁹⁴

Market power is a plausible explanation for the private value in a patent challenge, but it is not the only one. In fact, there are a number of ways a patent suit can come to have private significance without the underlying patent actually conferring market power. Several of the ways this can happen are better addressed in subsequent sections, but one will be introduced here to illustrate the basic concept.⁹⁵

One way that private value can exist without market power is through the phenomenon of patent holdup. Patent holdup occurs when a firm makes technology-specific investments with imperfect information about the rights that will be necessary to practice that technology.⁹⁶ If a firm invests in a technology that turns out to infringe a patent, the owner of the infringed patent may be in a position to extract a portion of the value of these investments, potentially up to the cost at which the infringing firm could switch to an alternate technology.⁹⁷ When this occurs, the patent owner may be able to extract rents in excess of what the

⁹³ See Scherer and Ross, *Industrial Market Structure* at 622 (cited in note 66); Landes and Posner, *The Economic Structure of Intellectual Property Law* at 296–97 (cited in note 73).

⁹⁴ See Katz, 49 *Ariz L Rev* at 865–67 (cited in note 33) (explaining why enforcement of patents that confer market power is more likely than enforcement of patents that do not); Malani and Masur, 101 *Georgetown L J* at 652, 657 (cited in note 18).

⁹⁵ See Part II.B.2 (describing the possibility of portfolio-level litigation) and Part II.C.2 (describing the possibility of litigation motivated by damages for past infringement). Several commentators have previously observed that social value and private value in a patent case are not necessarily coterminous. See, for example, Allison, et al, 92 *Georgetown L J* at 440 (cited in note 89) (distinguishing social value from private value); Katz, 49 *Ariz L Rev* at 866–67 (cited in note 33).

⁹⁶ See Mark A. Lemley and Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 *Tex L Rev* 1991, 1995 (2007) (modeling a situation in which this can occur); Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting*, 1 *Innovation Pol & Economy* 119, 125 (2000).

⁹⁷ See Lemley and Shapiro, 85 *Tex L Rev* at 2003 (cited in note 96); Alexander Galetovic, Stephen Haber, and Ross Levine, *An Empirical Examination of Patent Holdup*, 11 *J Competition L & Econ* 549, 556 (2015) (providing an example of holdup).

infringer would have been willing to pay if the parties had negotiated before the infringer sunk any costs.⁹⁸

To illustrate this possibility, consider three firms planning to sell 3D printers. Each firm spends \$10 million designing and prototyping its model. Company A and Company B employ technologies that are completely in the public domain, so they have no patent liabilities. Company C intends to employ only public domain technology, but unluckily includes a feature in its design that infringes a patent belonging to some nonpracticing entity, P. The feature does not add any particular value over A or B's models, but because it is integrated at a very basic level, C can avoid infringement only by going back to the drawing board and starting over, incurring another \$10 million in design and prototyping costs. Unless, of course, P grants C a license, which P is perfectly willing to do—for a fee.

This is a clear case of patent holdup. P's invention does not have any benefit over public domain alternatives, so C would not have agreed to pay anything for the technology if it had had perfect information about the patent landscape before designing its product. But because C inadvertently sunk investments into P's technology without prior arrangement, it has given P an opportunity to extract a one-time payment that reflects the costs of C's design-around rather than the value of P's technology.

The possibility of patent holdup has recently received a substantial amount of attention from scholars.⁹⁹ But when assessing the value of patent challenges, courts and commentators have consistently overlooked that holdup can create significant private stakes without creating significant consequences for competition. In the example above, the infringer (C) has an urgent interest in challenging P's patent—if C can show the patent is invalid, it can avoid the need to pay for a license or to change its product. Similarly, P has a very real interest in defending the patent and seeking remedies against C. This dispute clearly involves significant private stakes, and it would not be at all surprising to find the parties spending substantial sums to carry on the fight. But the

⁹⁸ See Lemley and Shapiro, 85 *Tex L Rev* at 2010–11 (cited in note 96); Katz, 49 *Ariz L Rev* at 866 n 154 (cited in note 33) (acknowledging the possibility of “opportunistic” enforcement).

⁹⁹ See, for example, Lemley and Shapiro, 85 *Tex L Rev* at 2010–11 (cited in note 96); John M. Golden, “*Patent Trolls*” and *Patent Remedies*, 85 *Tex L Rev* 2111, 2124–45 (2007); J. Gregory Sidak, *Holdup, Royalty Stacking, and the Presumption of Injunctive Relief for Patent Infringement: A Reply to Lemley and Shapiro*, 92 *Minn L Rev* 714, 718–19 (2008); Galetovic, Haber, and Levine, 11 *J Competition L & Econ* at 549 (cited in note 97).

public interest in competition is a different question. Since in this example C is the only manufacturer facing the holdup threat, P's claim does not affect C's competitors' costs. Moreover, because P's claim gets its value from the threat of forcing a one-time redesign, the holdup here will not even affect C's marginal costs going forward. The stakes for competition could therefore be quite small, notwithstanding the large private interest in the dispute. While C would love to avoid paying \$10 million to P (just as P would love to collect \$10 million from C), whether or not C pays P will not necessarily have an effect on competition in the relevant product market—that is, the prices at which Companies A, B, and C will eventually sell their 3D printers.¹⁰⁰

The fact that P is a nonpracticing entity simplifies this example, but it is not the point. If instead of stumbling upon P's patent, C had instead inadvertently infringed the patent of some fourth competitor, Company D, the result would be the same. D would be in a position to collect a windfall of somewhere between \$0 and \$10 million. C's balance sheet would be set back an equivalent amount. But, without more, this one-time transfer of cash from one competitor to another will not necessarily affect the price, volume, or features of 3D printers in the market in which all these firms compete.¹⁰¹

To be sure, sometimes holdup can affect competition. The extent to which it does will depend on the scope of the patent claims and the structure of the relevant market. Continuing with the 3D printer example, the consequences for consumers would be quite different if all (or even many) of the firms in the market had inadvertently sunk costs based on the same infringing technology, or if P had separate patents covering each of the respective approaches taken by Companies A, B, and C. As P's royalty demands begin to affect multiple firms, the likelihood increases that those firms may be able to pass some portion of these costs on to consumers, resulting in the higher prices and reduced output that

¹⁰⁰ Of course, it is possible to conjure circumstances in which even a one-time payment *could* affect competition: for example, if the fee forces a competitor from the market or dissuades new competitors from entering. The claim here is not that holdup *never* reduces competition, only that it does not inexorably lead to that result.

¹⁰¹ The case of holdup involving competitors is more complicated, because it introduces the possibility that the firms will use settlement as an opportunity to diminish their incentives to compete with each other in the future. For example, if C and D enter an ongoing royalty arrangement, there may be an effect on future competition. Again, a reduction in competition is possible, though not inevitable.

are symptomatic of market power.¹⁰² But holdup alone does not create market power. To the contrary, it can vest a patent dispute with significant private stakes without market power being at issue at all.

Some readers may object at this point on the grounds that cases of patent holdup are instances in which the patent system is not functioning correctly and that, as a result, the public has a special interest in how these cases are resolved. Nothing here suggests otherwise. Patent holdup could very well be a serious systemic problem, since it creates the potential for deviation between the reward a patent holder receives and the value of the underlying technology. These distributional consequences might justify policy interventions to make holdup less profitable. And those justifiable interventions might even include measures to encourage patent challenges.¹⁰³ But, critically, this would all be rooted in a *different* theory of how patent challenges benefit the public—that, for some reason, patent challenges hold the key to addressing the pernicious effects of patent holdup. For purposes of the theory that patent challenges *increase competition*, patent holdup sometimes will and sometimes will not be associated with market power. And the cases in which holdup does not involve market power actually weaken the inference that challenged patents reliably affect competition, since the holdup itself provides an alternate explanation for dispute.

The claim here is not that challenged patents never or even rarely confer market power. In fact, patent-based market power might be the single most common explanation for the fact of a patent dispute.¹⁰⁴ But it is not the only explanation, and the existence of these competing possibilities means that one cannot reliably infer

¹⁰² See *Federal Trade Commission v Indiana Federation of Dentists*, 476 US 447, 460–61 (1986).

¹⁰³ The “might” in this sentence merits special emphasis, as increasing the rate of patent challenges is not an obvious or inevitable response to the problem of patent holdup. The opportunity for holdup occurs because of the difficulty of predicting patent infringement liabilities before sinking costs into particular technologies. Lemley and Shapiro, 85 *Tex L Rev* at 1995 (cited in note 96). There are a number of policy tools that could be expected to counteract this—for example, requiring more explicit claims, reducing damages when a defendant demonstrates due diligence to avoid infringement, or issuing fewer patents in general. It is possible that a generalized policy of encouraging patent challenges could have a place in a sensible package of reforms to address holdup, but the case for this would need to be made.

¹⁰⁴ See Katz, 49 *Ariz L Rev* at 866 (cited in note 33).

market power from the existence of a patent challenge.¹⁰⁵ As one insightful commentator puts it, “[N]ot every dispute that involves intellectual goods necessarily implies the existence of market power, [but] a significant number of them probably do.”¹⁰⁶ At best this is a working assumption, not a hard-and-fast rule.

It is difficult to estimate how often this inference fails. At a minimum, there are at least some litigated cases in which the disputed patent confers no market power at all.¹⁰⁷ But even if those cases could be dismissed as outliers, the potential for divergence between private interest and public significance likely leads to overestimation of the benefits of patent challenges in significant numbers of cases. As subsequent sections discuss, there are a variety of ways a patent suit can become valuable to litigants quite apart from the market power of the patent in question. Once these alternate sources of value are considered, the private stakes of a dispute become a dubious proxy for the competitive significance of a patent. This complication thus affects both the likelihood that a given challenge will benefit the public by increasing competition and the magnitude of those benefits when it does.

B. Successful Challenges Reduce Market Power

Another condition necessary for a patent challenge to increase competition relates to the patent owner’s competitive position in the absence of the challenged patent. Even if that patent confers market power, invalidating it may not make much difference if its owner’s position is redundantly secured by other means.

When assessing the benefits of patent challenges, courts and commentators often assume that the removal of a patent will have the effect of increasing competition.¹⁰⁸ But in reality the competitive effects of removing a patent can be more complicated. In some

¹⁰⁵ Several other ways that a dispute can take on private significance without necessarily affecting competition are discussed in Parts II.B.2 and II.C.2.

¹⁰⁶ Katz, 49 *Ariz L Rev* at 867 (cited in note 33).

¹⁰⁷ The clearest example of this is probably challenges brought against already-expired patents. See Part II.C.2.

¹⁰⁸ Unlike the condition of market power, which is often mentioned quickly, it is rare to find any discussion—one way or the other—about the possibility of redundant protection reducing the competitive benefits of patent challenges. See, for example, *Actavis*, 133 S Ct at 2236; *Cardinal Chemical*, 508 US at 100–01; *Blonder-Tongue*, 402 US at 342–43; *Lear*, 395 US at 663–64; *In re Cipro*, 348 P3d at 850; Malani and Masur, 101 *Georgetown L J* at 652, 657, 671 (cited in note 18); Dorr, Note, 51 *Denver L J* at 113 (cited in note 20); Miller, 19 *Berkeley Tech L J* at 688–90 (cited in note 14); Lemley and Shapiro, 19 *J Econ Persp* at 90–92 (cited in note 18); Burstein, 83 *Geo Wash L Rev* at 538–42 (cited in note 18). To be clear, in other contexts, many of the same commentators have observed the

cases, the removal of a single patent may be insufficient to actually make the disputed technology available to the public. Moreover, the existence of redundant protection—especially large patent portfolios—may cause firms to spend substantial sums litigating patents of little individual competitive significance, further weakening the inference that a challenged patent must be one that confers market power. This Section explores both of these complications in turn.

1. Inventions may remain proprietary despite successful challenges.

In the standard account, a successful challenge removes an important technology from the exclusive control of a single competitor and instead places it into the public domain. Even in cases for which the first half of that description is correct—the disputed technology is indeed important—the second half requires separate consideration. In many cases, overlapping patent rights can result in something less than perfect competition even after a patent is struck down, reducing the benefits available at the end of a successful challenge.

Sometimes a single patent really is all that stands between the public and open access to an important technology.¹⁰⁹ When a patent like that is removed, the story of what happens next is simple. The (former) patent owner no longer enjoys market power. Other firms embrace and improve the now freely available technology. Rigorous competition ensues. This seems to be the picture courts have in mind when assessing the value of patent challenges.¹¹⁰

Often, however, redundant protection complicates the assumption that a single successful challenge will allow everyone to begin selling competing products without constraint. In many

possibility of overlapping patent protection. See, for example, Shapiro, 1 *Innovation Pol & Economy* at 121 (cited in note 96); Jonathan S. Masur, *Costly Screens and Patent Examination*, 2 *J Legal Analysis* 687, 689 (2010); Lemley and Shapiro, 85 *Tex L Rev* at 2006 (cited in note 96); Michael J. Burstein, *Exchanging Information without Intellectual Property*, 91 *Tex L Rev* 227, 277–78 (2012).

¹⁰⁹ *The Metso Minerals, Inc v Powerscreen International Distribution, Ltd*, 526 Fed Appx 988 (Fed Cir 2013), litigation described below appears to be such an example. See Part II.C.2.

¹¹⁰ See, for example, *Actavis*, 133 S Ct at 2234–35; *In re Cipro*, 348 P3d at 850; *Blonder-Tongue*, 402 US at 346; *Lear*, 395 US at 670.

fields, overlapping patent protection is the norm.¹¹¹ For example, the process of building a chip that can communicate over WiFi or cellular networks easily implicates thousands of patents owned by dozens of competitors.¹¹² And the problem can get even worse than that—a finished smartphone might involve hundreds of thousands of patents.¹¹³ In some fields, patent rights may be so dense and held by so many disparate owners that the result is a “thicket” that makes further entry cost prohibitive.¹¹⁴

The observation that overlapping and redundant rights can restrict access to patented technologies is not new. Yet when discussing the benefits of patent challenges, many courts and commentators overlook this complication, apparently assuming that a single challenger victory will be sufficient to put the disputed technology in the public domain.¹¹⁵

An accurate assessment of a challenge’s potential benefits for competition must take redundant barriers to competition like these into account. When hundreds or thousands of patents are necessary to make a particular product, the competitive effect of knocking out one or two of them will be small. Consider, for example, a wireless standard that requires using five hundred different patents (well on the low end, as far as these standards go).¹¹⁶ Suppose for the sake of illustration that these patents are

¹¹¹ See Herbert Hovenkamp, Mark Janis, and Mark A. Lemley, *Anticompetitive Settlement of Intellectual Property Disputes*, 87 Minn L Rev 1719, 1738–39 (2003).

¹¹² See Lemley and Shapiro, 85 Tex L Rev at 2025–28 (cited in note 96).

¹¹³ See *id.* at 1992; David Drummond, *When Patents Attack Android* (Google, Aug 3, 2011), archived at <http://perma.cc/HKA3-QV9A>; RPX Corp, *Form S-1 Registration Statement under the Securities Act of 1933* *59 (SEC, Sept 2, 2011), archived at <http://perma.cc/2WT3-LPM5>; Joel R. Reidenberg, et al, *Patents and Small Participants in the Smartphone Industry* *8–9 (Center on Law and Information Policy at Fordham Law School, Jan 15, 2015), archived at <http://perma.cc/3N4H-BUJ9>.

¹¹⁴ See generally Shapiro, 1 Innovation Pol & Economy 119 (cited in note 96); Bronwyn H. Hall, Christian Helmers, and Georg von Graevenitz, *Technology Entry in the Presence of Patent Thickets* (IFS Working Paper W16/02, Jan 16, 2016), archived at <http://perma.cc/B452-YPVM>. But see Jonathan M. Barnett, *The Anti-Commons Revisited*, 29 Harv J L & Tech 127, 135 (2015) (arguing that outside specialized circumstances, anti-commons problems are unlikely to arise or persist).

¹¹⁵ See note 108.

¹¹⁶ Yoo-Jin Han, *Analysis of Essential Patent Portfolios via Bibliometric Mapping: An Illustration of Leading Firms in the 4G Era*, 27 Tech Analysis & Strategic Mgmt 809, 817 (2015) (noting that thousands of patents have been declared essential to the LTE wireless standard); *In re Innovatio IP Ventures, LLC Patent Litigation*, 2013 WL 5593609, *2, 41–43 (ND Ill) (crediting testimony that there are about three thousand patents that are potentially essential to the WiFi standard). See also Alexander Galetovic and Kirti Gupta, *Royalty Stacking and Standard Essential Patents: Theory and Evidence from the World Mobile Wireless Industry* *13 (Hoover IP² Working Paper Series No 15012, Feb 2016), archived at <http://perma.cc/U5ZZ-S2AU>.

owned by five different owners, with one hundred patents each.¹¹⁷ After a successful challenge to one such patent, competition looks exactly the same—there may now be only 499 patents at play, but the permission of all five patent-owning firms is still necessary to sell a standard-compliant product without infringing. If somehow the challenger were to succeed in knocking out one hundred patents all owned by the same company, competition would likely benefit from the elimination of one of the five essential licensors.¹¹⁸ But even still, it would be wrong to say the technology is in the public domain, with four hundred patents still remaining in the hands of four different firms.

The degree to which patent rights overlap varies by technology area, but it is hardly a fringe phenomenon. Commentators have noted that large numbers of patents are often necessary to offer products or implement features in industries such as software, semiconductors, biotechnology, and smartphones.¹¹⁹ Even in the pharmaceutical industry, long cited as a counterexample in which patents still map directly onto products, scholars have recently observed that multiple patents are often necessary to actually compete in the marketplace.¹²⁰

When moving a technology into the public domain is a multi-step and uncertain process like this, it is difficult to assess exactly which steps yield public benefits. For example, sometimes a few successful challenges may seem initially insignificant, only to become quite important once other barriers to entry disappear. Similarly, if the various patents necessary to use a particular technology expire at different times, knocking out a select group of

¹¹⁷ A high concentration of ownership is typical, though scholars have also observed a long tail of firms with a handful of patents essential to the standard. See, for example, Donald J. Goodman and Robert A. Myers, *3G Cellular Standards and Patents* *3–6 (IEEE, June 13, 2005), archived at <http://perma.cc/6XV8-W3CS>.

¹¹⁸ See Lemley and Shapiro, 85 *Tex L Rev* at 2014–17 (cited in note 96) (predicting an increase in the total royalties that must be paid for a product based on the number of firms holding essential patents); Galetovic and Gupta, *Royalty Stacking and Standard Essential Patents* at *13 (cited in note 116). However, competitive harm may not be neatly correlated with the number of essential licensors. See Lemley and Shapiro, 85 *Tex L Rev* at 2014–17 (cited in note 96).

¹¹⁹ See, for example, Dan L. Burk and Mark A. Lemley, *The Patent Crisis and How the Courts Can Solve It* 83–92 (Chicago 2009); Shapiro, 1 *Innovation Pol & Economy* at 119 (cited in note 96); Michael A. Heller and Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 *Sci* 698, 699 (1998).

¹²⁰ See Lisa Larrimore Ouellette, Note, *How Many Patents Does It Take to Make a Drug? Follow-On Pharmaceutical Patents and University Licensing*, 17 *Mich Telecomm & Tech L Rev* 299, 316–17 (2010). See also Rebecca S. Eisenberg, *The Role of the FDA in Innovation Policy*, 13 *Mich Telecomm & Tech L Rev* 345, 355–56 (2007).

those patents could hasten the day when the technology enters the public domain.¹²¹ Therefore, in some cases, the effect of redundant protection may be to reduce, rather than eliminate entirely, a challenge's potential benefits for competition.

2. Distinguishing patent market power from portfolio market power.

As the prior Section discussed, redundant protection can reduce or eliminate the procompetitive benefits of a successful patent challenge. In addition, overlapping patent rights further complicate the inference that litigated patents confer market power in the first place.¹²² This Section evaluates how portfolio-level fights can cause divergence between the private and public interests in a patent dispute.

When a patent owner and a challenger become enmeshed in a dispute, it is tempting to assume that the patents that are the legal subject of the case are also the economic motivation for the case. Indeed, this is the intuitive and conventional explanation for what is happening in patent litigation—a challenger is investing in legal process in hopes of acquiring access to a patented technology.¹²³ But sometimes disputants have more complex motivations, and in cases like these, the value of the disputed technology itself may not fully explain the parties' actions.

In many industries, it is common for firms to have significant and diversified patent portfolios, while at the same time having significant and diversified operations.¹²⁴ The resulting blend of patent assets and liabilities creates the possibility of patent disputes with much larger stakes than the availability or cost of any single technology. Against such a backdrop, any individual patent case may be part of a much larger battle between firms, and may have little to do with the technology that happens to be the topic of legal inquiry.

To illustrate, consider the long-running, multijurisdictional dispute between Apple and Samsung. The war began in the

¹²¹ See Part II.C.1 (discussing timing effects).

¹²² See Part II.A.2.

¹²³ See, for example, Lemley and Shapiro, 19 *J Econ Persp* at 88, 91 (cited in note 18); Miller, 19 *Berkeley Tech L J* at 679–81, 729 (cited in note 14); Elhauge and Krueger, 91 *Tex L Rev* at 285, 297–98 (cited in note 47); Malani and Masur, 101 *Georgetown L J* at 652, 658 (cited in note 18); Miller and Gal, 32 *Yale J Reg* at 143 (cited in note 18).

¹²⁴ See Gideon Parchomovsky and R. Polk Wagner, *Patent Portfolios*, 154 *U Pa L Rev* 1, 27, 43 (2005).

spring of 2011 when Apple sued Samsung in the Northern District of California for infringement of several of its design patents.¹²⁵ Samsung swiftly responded, bringing patent complaints against Apple in Japan, South Korea, and Germany.¹²⁶ From there, the dispute quickly spread to other forums, including the District of Delaware and the International Trade Commission.¹²⁷ By the end of the summer, the parties were litigating nineteen cases in nine countries, seeking injunctions, exclusion orders, and billions of dollars in damages against each other.¹²⁸

Five years on, Apple and Samsung have spent hundreds of millions of dollars on this fight without reaching a conclusion.¹²⁹ They have endured multiple trials, made repeated trips to the Federal Circuit, and seen jaw-dropping verdicts handed down and taken away.¹³⁰ Clearly, there are significant private interests at

¹²⁵ See generally Complaint for Patent Infringement, Federal False Designation of Origin and Unfair Competition, Federal Trademark Infringement, State Unfair Competition, Common Law Trademark Infringement, and Unjust Enrichment, *Apple Inc v Samsung Electronics Co*, Civil Action No 11-1846 (ND Cal filed Apr 15, 2011) (available on Westlaw at 2011 WL 1461508).

¹²⁶ See Chloe Albanesius, *Samsung Countersues Apple for Patent Infringement* (PCMag, Apr 22, 2011), archived at <http://perma.cc/2ZJ5-L6E2>.

¹²⁷ See generally Apple Inc.'s Complaint under Section 337 of the Tariff Act of 1930, as Amended, *In the Matter of Certain Electronic Digital Media Devices and Components Thereof*, Inv No 337-TA-796 (ITC filed July 5, 2011) (available on Westlaw at 2011 WL 3556057); Complaint for Patent Infringement, *Samsung Electronics Co v Apple Inc*, Case No 11-cv-00573 (D Del filed June 29, 2011) (available on Westlaw at 2011 WL 2566600).

¹²⁸ Florian Mueller, *Apple vs. Samsung: List of All 19 Lawsuits Going On in 12 Courts in 9 Countries on 4 Continents* (Foss Patents, Aug 20, 2011), archived at <http://perma.cc/T6W7-6TNY>. See also Chloe Albanesius, *Every Place Samsung and Apple Are Suing Each Other* (PCMag, Sept 14, 2011), archived at <http://perma.cc/HW6M-PER5>; Mike Snider and Jon Swartz, *Apple-Samsung Legal Outcome Won't Likely End Feud* (USA Today, May 5, 2014), archived at <http://perma.cc/3R5R-HLUW>; Tim Bradshaw and Simon Mundy, *Apple Ruling Redraws Battle Lines* (Aug 26, 2012), online at <http://www.ft.com/cms/s/0/fa28dc5a-ef55-11e1-b1e5-00144feabdc0.html> (visited Sept 18, 2016) (Perma archive unavailable); Choe Sang-Hun, *Samsung Wants Courts in 2 Nations to Bar iPhone* (NY Times, Oct 5, 2011), online at <http://www.nytimes.com/2011/10/06/technology/samsung-to-seek-block-on-iphone-in-europe.html> (visited Aug 26, 2016) (Perma archive unavailable).

¹²⁹ Apple's Motion for Attorneys' Fees, *Apple Inc v Samsung Electronics Co*, Case No 11-cv-01846, *7 (ND Cal filed Dec 5, 2013) (available on Westlaw at 2013 WL 8445649). See also Jennifer Smith and Steve Eder, *How Apple Got Its Case Across: Lawyers Presented a Clear Story Line for Technology Giant; Samsung's Argument Was Harder to Explain* (Wall St J, Aug 26, 2012), online at <http://www.wsj.com/articles/SB10000872396390444230504577613663578617748> (visited Oct 18, 2016) (Perma archive unavailable).

¹³⁰ See, for example, *Apple, Inc v Samsung Electronics Co*, 926 F Supp 2d 1100, 1120 (ND Cal 2013) (ordering a new trial on \$450 million of damages while upholding \$599 million of the jury's award); Michael B.G. Froman, United States Trade Representative,

stake in this dispute. But it would be missing the forest for the trees to view each case in isolation, as if the motivation for this multiyear, multinational, multimillion-dollar battle was really to secure access to features like swiping to unlock a smartphone or automatically detecting whether an external microphone is connected.¹³¹ Rather, it is widely understood that these individual, patent-level fights are really tactical salvos to obtain more favorable terms in an eventual global settlement.¹³²

Portfolio-level litigation like this further complicates the relationship between the private stakes in a dispute and the market power of the patents at issue. Apple holds over ten thousand US patents; Samsung holds more than one hundred thousand (though not all related to smartphones).¹³³ Undoubtedly, each firm enjoys some degree of market power as a result of its patent portfolio. But it is difficult to reach any conclusions about the competitive significance of the individual patents at issue, because the fight between the firms is so much larger. Moreover, it is quite possible that each firm's market power would remain practically unchanged no matter how these particular cases are resolved.¹³⁴

This wrinkle is a direct consequence of a trend, previously noted by Professors Gideon Parchomovsky and Polk Wagner, in which the value of patents has less to do with their individual

Letter to Irving A. Williamson, Chairman of the United States International Trade Commission *3 (Aug 3, 2013), archived at <http://perma.cc/8X7K-J68Y> (vetoing the exclusion order of the iPhone 4, iPad 3G, and various earlier models).

¹³¹ For a description of the technologies at issue, see Amended Complaint for Patent Infringement, *Apple Inc v Samsung Electronics Co*, Case No 12-cv-00630, *4–5 (ND Cal filed Aug 31, 2012) (available on Westlaw at 2012 WL 3793136); Imran Chaudhri, et al, *Unlocking a Device by Performing Gestures on an Unlock Image*, US Patent No 8,046,721 (filed June 2, 2009); Limited Exclusion Order, *In the Matter of Certain Electronic Digital Media Devices and Components Thereof*, Inv No 337-TA-796, *2–3 (ITC filed Aug 9, 2013); Timothy Johnson and Achim Pantfoerder, *Audio I/O Headset Plug and Plug Detection Circuitry*, US Patent No 7,912,501 (filed Jan 5, 2007).

¹³² See Victoria Ho, *Little Real Consumer Impact from Apple-Samsung Fight*, *Business Times Singapore* (Aug 30, 2012) (observing that “these complex patent battles tend to result in global settlements with cross-licensing deals”); Miyoung Kim, *Samsung Can Bounce Back from Defeat* (TradeArabia, Aug 25, 2012), archived at <http://perma.cc/U99T-NG5C> (predicting that an eventual settlement will leave the two firms “firmly in control of the \$200 billion-plus global smartphone market”).

¹³³ Details are available in the *Patent Assignment Database* (US Patent and Trademark Office), archived at <http://perma.cc/7BHE-5VXA>.

¹³⁴ In the case of Apple and Samsung, each firm enjoys numerous competitive advantages and extremely valuable intellectual property, and would likely continue to do so with or without the individual patents at issue in these cases. See *The World's Most Valuable Brands* (Forbes, 2016), online at <http://www.forbes.com/powerful-brands/list/> (visited Aug 26, 2016) (Perma archive unavailable) (ranking Apple first and Samsung eleventh on a list of the most valuable brands).

significance and more to do with their role in a firm's larger patent portfolio.¹³⁵ As Parchomovsky and Wagner observe, a strategic collection of distinct-but-related patents may confer advantages on their holders that individual patents cannot.¹³⁶ As a result, it is possible that the market power underlying a dispute comes from the strength of a firm's portfolio, rather than the importance of any individual patent in that portfolio.¹³⁷

The effect of patent portfolios may be to either raise or reduce the competitive significance of individual patent litigations. For example, if a firm holds a few patents on all of the practical ways of building a particular product, a seemingly unimportant case involving just one of those patents could hold the key to introducing competition in the relevant market.¹³⁸ On the other hand, if a firm enjoys massively redundant patent protection (as Apple and Samsung do), any single patent case may have little chance of making much difference for the overall competitiveness of the field—the remedies available to a patent court (declaring the patents before it invalid or noninfringed) are just too narrow. But, critically, the difference between the first case and the second cannot be inferred from the parties' apparent interest in the litigation. The full picture of the dispute may be much larger than the individual patents that happen to be before the court.

C. The Patent Challenge Is Timely

A third condition necessary for patent challenges to increase competition relates to timing. Even if an individual patent is a but-for source of market power, a challenge may have little effect on competition if it does not take effect until it is too late. Because patent-derived market power is already time limited, any additional benefit for competition has to come from ending that market power sooner, rather than just at all. This Section evaluates

¹³⁵ See Parchomovsky and Wagner, 154 U Pa L Rev at 27, 43 (cited in note 124). See also John H. Barton, *Antitrust Treatment of Oligopolies with Mutually Blocking Patent Portfolios*, 69 Antitrust L J 851, 853–56 (2001) (describing the use of portfolios in the semiconductor and biotechnology sectors).

¹³⁶ Parchomovsky and Wagner, 154 U Pa L Rev at 27–28 (cited in note 124).

¹³⁷ See Michael Risch, *Patent Portfolios as Securities*, 63 Duke L J 89, 103 (2013); Herbert Hovenkamp, *Response: Markets in IP and Antitrust*, 100 Georgetown L J 2133, 2139 (2012); Kitch, 53 Vand L Rev at 1739 (cited in note 66).

¹³⁸ See, for example, *Rite-Hite Corp v Kelley Co*, 56 F3d 1538, 1548 (Fed Cir 1995) (observing that the only acceptable substitute product that would not infringe the patent in suit would infringe a *different* patent held by the plaintiff).

how the timing of patent challenges affects their potential to increase competition.

1. Potential benefits of a challenge diminish with time.

Courts commonly describe the costs of an invalid patent using an implicitly static model. If the patent remains in force, it imposes some monopoly deadweight loss; if the patent challenge is successful, competition ensues and these losses are avoided.¹³⁹ This framing obscures the temporal nature of patent rights and can lead to overestimation of the competitive consequences of patent challenges.

Both legally and practically, the exclusive rights granted by a patent are limited in time. By statute, a patent expires twenty years after its application filing date.¹⁴⁰ Upon expiration, the invention passes into the public domain and is free for anyone to use without payment of royalties.¹⁴¹ Moreover, patents may become technologically or economically obsolete long before they expire.¹⁴² New inventions make the old ways comparatively undesirable, demoting what was previously the cutting edge to a second- or third-best position.¹⁴³ Even if the original technology remains important, subsequent developments may render the scope of its patent protection inadequate by revealing trivial ways to design around and avoid the patent owner's exclusive rights.¹⁴⁴

These temporal constraints on patent rights must be taken into account to assess whether (and how much) a challenge increases competition over the appropriately conceived baseline. The exclusive rights of a patent will necessarily end of their own

¹³⁹ See, for example, *Blonder-Tongue*, 402 US at 342–43; *Actavis*, 133 S Ct at 2234; *Lear*, 395 US at 663–64; *In re Cipro*, 348 P3d at 850.

¹⁴⁰ 35 USC § 154(a)(2). Terms are presumptively twenty years from the application's filing date, but they can be adjusted slightly to account for delays at the Patent Office. See 35 USC § 154(b). Patents that were granted based on applications pending prior to June 8, 1995, have the option of an alternative term calculation based on issue date. See 35 USC § 154(c).

¹⁴¹ *Kimble v Marvel Entertainment, LLC*, 135 S Ct 2401, 2407 (2015).

¹⁴² See *Kitch*, 8 Rsrch L & Econ at 34, 38–39 (cited in note 84).

¹⁴³ See Rosemarie Ham Ziedonis, *Don't Fence Me In: Fragmented Markets for Technology and the Patent Acquisition Strategies of Firms*, 50 Mgmt Sci 804, 808 (2004) (describing the short life span and high costs of semiconductor facilities).

¹⁴⁴ For example, the development of compact, low-power computer systems made it easy to avoid claims written with older platforms in mind. See generally *Hughes Aircraft Co v United States*, 717 F2d 1351 (Fed Cir 1983); *Energy Transportation Group, Inc v William Demant Holding A/S*, 697 F3d 1342 (Fed Cir 2012). In some cases, the doctrine of equivalents may be available to update old claim language to the new technology. See *Energy Transportation Group*, 697 F3d at 1352–55.

accord in some fixed number of years following their grant. Because of this inevitable end, the issue in a patent challenge is never really whether the patented technology will belong to a single owner or be placed into the public domain. Rather, it is a question of *when* it enters the public domain.

Understood this way, the potential benefits for competition depend significantly on when a patent challenge occurs.¹⁴⁵ Early in a valuable patent's life, a patent challenge has the potential to free the public of many years of patent-based exclusivity. But with each passing day, the moments of technological obsolescence and legal expiration draw nearer, and the promised benefits for competition shrink accordingly. At some point (certainly on the day the patent expires, but oftentimes before then), a successful patent challenge will have no forward-going effect on competition whatsoever.¹⁴⁶

Time takes a toll on every patent challenge. Almost inevitably, some of a patent's term is spent before a patent challenge even begins. In fact, the average patent suit by a product-producing company begins about nine years after the disputed patent was filed.¹⁴⁷ Once a patent challenge does commence, adjudicating the dispute typically takes years—one study observed a median time from filing of suit to judgment of 658 days.¹⁴⁸ And that is just the time until the district court's work is complete.¹⁴⁹ Appeals, reversals, retrials, and so on can easily tack on years.¹⁵⁰ Given the

¹⁴⁵ The word "potential" should be emphasized here, because these timing effects are independent of the other requirements necessary for a patent challenge to increase competition. The following discussion assumes a successful challenge to a patent that is a but-for cause of reduced competition. See Parts II.A–B, D.

¹⁴⁶ In a recent study, Professors Alberto Galasso and Mark Schankerman tested the effect that a decision by the Federal Circuit invalidating a patent has on future citation to that patent, using these inbound citations as a proxy for increased follow-on innovation in the relevant technology area. Consistent with the prediction above that the competitive effects of a patent challenge diminish as a patent ages, they found that the citation effect was larger for younger patents—and that there was no effect for patents invalidated fifteen years after issuance. Galasso and Schankerman, 130 Q J Econ at 343–44 (cited in note 59).

¹⁴⁷ See Brian J. Love, *An Empirical Study of Patent Litigation Timing: Could a Patent Term Reduction Decimate Trolls without Harming Innovators?*, 161 U Pa L Rev 1309, 1335 (2013). The average suit brought by a nonpracticing entity begins even later. *Id.*

¹⁴⁸ See Jay P. Kesan and Gwendolyn G. Ball, *How Are Patent Cases Resolved? An Empirical Examination of the Adjudication and Settlement of Patent Disputes*, 84 Wash U L Rev 237, 288 (2006).

¹⁴⁹ See *id.* at 266 n 192.

¹⁵⁰ Patent textbooks are largely populated with cases that were not resolved quickly. Perhaps the most famous example is the *Festo* family of opinions. The case began in 1988 and went to trial in 1994. After multiple interventions by the Supreme Court and en banc

time-limited nature of patents and all of the legal process that must occur before a challenge is complete, it would be wrong to conclude that patent challenges free the public from a perpetual or even twenty-year monopoly.¹⁵¹

Further complicating matters, it is difficult to state any general conclusions about the stage of adjudication that must be reached for a patent challenge's effects on competition to take hold. In some instances, an intermediate ruling by the district court may signal the challenged patent's weakness, and thus allow the challenger or competitors to enter the market or expand output based on increased expectations of the challenge's success. For example, before a patent trial, a district court will hold a *Markman* hearing to determine what the asserted claims actually mean.¹⁵² If the court construes the claims extremely broadly or extremely narrowly, this intermediate order may foretell a high likelihood that the patent will later be found invalid or not infringed. In a case like that, the benefits for competition may begin to accrue shortly after the claim construction order, when the signs of a likely victory become clear to the challenger and other competitors. But other cases are not like that. Sometimes a claim construction order favors the patent holder or is ambiguous in light of facts that remain to be determined at trial. And it is always possible that a contested claim construction will later be overturned on appeal.¹⁵³ For the same reason, even the district

decisions by the Federal Circuit, the case was finally decided in 2007. See *Festo Corp v Shoketsu Kinzoku Kogyo Kabushiki Co*, 493 F3d 1368, 1370–76 (Fed Cir 2007) (summarizing the case history); *Festo Corp v Shoketsu Kinzoku Kogyo Kabushiki Co*, 553 US 1093, 1093 (2008) (denying certiorari). One of the patents at issue in the case expired in 1999, the other in 1990. See *Festo Corp v Shoketsu Kinzoku Kogyo Kabushiki Co*, 1993 WL 1510657, *7, 12–13 (D Mass). A more recent example is the decade-long litigation between Akamai and Limelight, which was resolved only after a jury trial, five Federal Circuit opinions, and a trip to the Supreme Court. See generally *Akamai Technologies, Inc v Limelight Networks, Inc*, 805 F3d 1368 (Fed Cir 2015), cert denied, 136 S Ct 1661 (2016); *Akamai Technologies, Inc v Limelight Networks, Inc*, 797 F3d 1020 (Fed Cir 2015) (en banc) (per curiam); *Akamai Technologies, Inc v Limelight Networks, Inc*, 786 F3d 899 (Fed Cir 2015); *Limelight Networks, Inc v Akamai Technologies, Inc*, 134 S Ct 2111 (2014); *Akamai Technologies, Inc v Limelight Networks, Inc*, 692 F3d 1301 (Fed Cir 2012) (en banc) (per curiam); *Akamai Technologies, Inc v Limelight Networks, Inc*, 629 F3d 1311 (Fed Cir 2010). The patent at issue expires in 2019. See F. Thomson Leighton and Daniel M. Lewin, *Global Hosting System*, US Patent No 6,108,703 (filed May 19, 1999).

¹⁵¹ Note that the timelines for recently created administrative review proceedings in the Patent Office can be quite different—a topic explored in Part III.A.

¹⁵² See *Markman v Westview Instruments, Inc*, 517 US 370, 388 (1996).

¹⁵³ See J. Jonas Anderson and Peter S. Menell, *Informal Deference: A Historical, Empirical, and Normative Analysis of Patent Claim Construction*, 108 Nw U L Rev 1, 6, 36 (2014) (observing a 25.6 percent reversal rate on a per-claim basis between 2005 and 2011).

court's determination of infringement or validity may not always trigger immediate benefits for competition, as one or more appeals may be necessary to fully resolve the challenge—a process that can take years.¹⁵⁴ Therefore, depending on the case, a challenge's consequences for competition can accrue gradually and may not be fully realized until the litigation is complete.

In many patent cases, the effects of time likely reduce, but do not eliminate, the incremental benefits a patent challenge may yield for competition. For example, in the data observed by one study, the median patent case was adjudicated 11.3 years after the underlying patent was filed¹⁵⁵—about 56 percent of the way through a presumptive 20-year term. Ignoring the effects of time could thus lead to a significant overestimation of the competitive harms avoided by a successful patent challenge. Of course, this does not mean the median patent challenge produces *no* benefit. While the public benefits of eliminating 8.7 years of patent-based market power are less than the benefits of eliminating 20 years of patent-based market power, they can nonetheless be substantial.¹⁵⁶

But there are also cases in which the passage of time may erode the bulk of any potential benefits for competition. For example, according to one study, about a quarter of all patent suits did not even begin until the last five years of the disputed patent's life—and, again, patent litigation itself often drags on for years.¹⁵⁷ The combination of late filing and noninstantaneous adjudication means that a significant number of patent challenges are not resolved until quite late in a patent's life: 13.2 percent of patent

It is possible that such reversals will become less common in light of recently increased deference in questions of claim construction. See *Teva Pharmaceuticals USA, Inc v Sandoz, Inc*, 135 S Ct 831, 835 (2015).

¹⁵⁴ See note 150.

¹⁵⁵ John R. Allison and Mark A. Lemley, *Empirical Evidence on the Validity of Litigated Patents*, 26 AIPLA Q J 185, 236 (1998). Note that, given the age of this study, the majority of patents it observed would have had terms calculated by adding seventeen years to their *issue* date. See Patricia Montalvo, Comment, *How Will the New Twenty-Year Patent Term Affect You? A Look at the Trips Agreement and the Adoption of a Twenty-Year Patent Term*, 12 Santa Clara High Tech L J 139, 143–44, 147–48 (1996). The distinction here is minor: the median patent case was adjudicated 7.8 years after the disputed patent issued, Allison and Lemley, 26 AIPLA Q J at 236 (cited in note 155), or about 46 percent of the way through a term calculated using the old methodology.

¹⁵⁶ For example, in the pharmaceutical context, each year of patent term avoided sometimes yields hundreds of millions of dollars in public benefits. See note 59 and accompanying text.

¹⁵⁷ See Love, 161 U Pa L Rev at 1341 (cited in note 147). These late-in-life patent filings are disproportionately filed by nonpracticing entities. *Id* at 1340–41. Among nonpracticing entities, the number is even higher—38.2 percent of suits are filed within five years of expiration. *Id* at 1341.

suits filed by product-producing companies terminated in the last three years of the statutory patent term, while 49.6 percent of suits filed by nonpracticing entities resolved this late.¹⁵⁸ Another study confirmed the existence of these late-in-life adjudications: substantial numbers of cases were resolved in the thirteenth or fourteenth year after the patent was granted, significant numbers through the twentieth, and some litigation even took place as late as year twenty-five.¹⁵⁹ Although statistics are not available on this point, a nonnegligible number of patent challenges appear to involve patents that have already expired.

One might wonder why litigants would continue fighting over a patent near or after its expiration date. The short answer (elaborated upon in the next Section) is that these cases include claims for past damages, and thus can involve significant private stakes long after the disputed patent has expired.¹⁶⁰ But any potential for the resolution of these cases to affect future competition has clearly come and gone.¹⁶¹

As with the conditions discussed in the prior sections, this complication does not mean patent challenges can never produce public benefits. In fact, the rate of litigation tends to peak in the

¹⁵⁸ *Id.* at 1341.

¹⁵⁹ See Allison, et al, 92 Georgetown L J at 477 (cited in note 89). It is possible that some of this extremely late litigation involves drug patents awarded extended terms under 35 USC § 156, which allows for up to five additional years of patent term to compensate for delays in the FDA approval process. See *Eli Lilly & Co v Medtronic, Inc.*, 496 US 661, 669–74 (1990) (explaining the operation of this provision). See also Eisenberg, 13 Mich Telecomm & Tech L Rev at 351–52 (cited in note 120). However, this explanation cannot account for all late-stage litigation, since such cases can be found involving nonpharmaceutical patents as well. See note 150 (describing the *Festo* family of opinions). For examples of nonpharmaceutical cases open as of this writing and involving patents with less than a year of term remaining, see generally *Bally Gaming, Inc v Euniverse, Inc.*, Case No 03-cv-00062 (D Nev filed Jan 31, 2003) (involving US Patent No 5,816,918); *Pall Corp v 3M Purification, Inc.*, Case No 03-cv-00092 (EDNY filed Jan 8, 2003) (involving US Patent Nos 4,680,118, 5,690,765, and 5,543,047).

¹⁶⁰ See, for example, Complaint, *Pall Corp v Cuno Inc.*, Case No 03-cv-00092, *5 (EDNY filed Jan 8, 2003) (available on Westlaw at 2003 WL 24229717).

¹⁶¹ These cases could have an effect on future competition if courts would enforce agreements to pay royalties on sales after a patent expires. For example, if the owner of an important patent licensed an entire industry on the condition that they pay royalties for a hundred years, there might well be a public interest in a challenge to that patent so long as the obligation to pay royalties was in force. But the Supreme Court recently affirmed its long-standing rule that such terms are not enforceable, ensuring that the public's competitive interest in a patent challenge really does end by the time the patent does. See *Kimble*, 135 S Ct at 2413 (reaffirming a "categorical principle that all patents, and all benefits from them, must end when their terms expire").

early years of a patent's life,¹⁶² suggesting that many patent challenges at least begin at a time when they have the potential to benefit the public. But substantial numbers of challenges begin later than that, and all litigation takes time. The later a challenge is resolved, the smaller its potential effect on prospective deadweight losses. In some cases, the effects of timing may cause a patent challenge to become incapable of having any forward-going effect on competition at all.

2. Distinguishing future significance from past liabilities.

There is yet another way that overlooking the effects of time can lead to misconceptions about the value of patent challenges. Recall that, because few patents turn out to be technically or economically significant, it is common to try to infer that a given patent confers market power from the fact that the parties find it worthwhile to fight over it.¹⁶³ As the prior sections have noted, there are a number of ways that inference can fail.¹⁶⁴ In addition, the passage of time and the accumulation of damages can cause divergence between the private and public significance of a dispute, further weakening the inference that the private value of a patent suit comes from patent market power.

Patent challenges are often conceived of as cases of prospective entry: the patent holder enjoys a monopoly in a properly defined product market, and the challenger is a potential competitor waiting in the wings.¹⁶⁵ Because the challenger has not yet entered the market, no liabilities for past infringement are in the picture—the dispute is entirely about who may practice the invention in the future. This posture supports the common inference that a challenged patent must be one that confers market power. Otherwise, if the disputed technology was not important, why would the incumbent firm and the potential entrant bother fighting over it?¹⁶⁶

¹⁶² See Allison, et al, 92 Georgetown L J at 477 (cited in note 89).

¹⁶³ See Part II.A.1.

¹⁶⁴ See Parts II.A.2 and II.B.2.

¹⁶⁵ See, for example, *Actavis*, 133 S Ct at 2233; *Lear*, 395 US at 670–71; *Blonder-Tongue*, 402 US at 346–47; Lemley and Shapiro, 19 J Econ Persp at 88, 91 (cited in note 18); Miller, 19 Berkeley Tech L J at 679–81, 729 (cited in note 14); Elhauge and Krueger, 91 Tex L Rev at 285, 297–98 (cited in note 47); Malani and Masur, 101 Georgetown L J at 652, 658 (cited in note 18).

¹⁶⁶ See Malani and Masur, 101 Georgetown L J at 657–58 (cited in note 18); Katz, 49 Ariz L Rev at 864 (cited in note 33).

There are indeed some cases that look like this. For example, challenges to pharmaceutical patents under the Hatch-Waxman Act are almost always cases of prospective entry. The Act itself ensures that pharmaceutical patent owners will have the opportunity to sue for infringement before any allegedly infringing sales are made in the United States.¹⁶⁷ Moreover, the commencement of patent litigation in this way automatically delays FDA approval of the generic for thirty months.¹⁶⁸ After that, the challenger may have the option of entering before the case is over, but that is a risky option, in practice rarely invoked.¹⁶⁹ Throughout the life of a Hatch-Waxman challenge, control over future drug sales remains firmly the focal point. As a result, Hatch-Waxman cases almost always involve patents with multiple years of term ahead, and never involve expired patents.¹⁷⁰

However, this is not how most patent disputes come about.¹⁷¹ Outside of the pharmaceutical industry, it is rare for potential patent defendants to seek out licenses in advance, and it is quite difficult for patent holders to commence suit before some use or sale of the invention has occurred.¹⁷² A typical case comes to court because a patent holder has observed some conduct she believes

¹⁶⁷ FDA-regulated drugs may not be sold without prior approval. 21 USC § 355(a). Beginning the approval process as a generic challenger constitutes a technical act of infringement, which gives the patent-holding firm an opportunity to file suit. 35 USC § 271(e)(2). See also *FTC Generic Drug Study* at *6–7 (cited in note 14).

¹⁶⁸ See *FTC Generic Drug Study* at *6–7 (cited in note 14).

¹⁶⁹ See Panattoni, 30 *J Health Econ* at 132–33, 136 (cited in note 59). There is some variation in whether generic challengers who prevail in district court take the risk of entering at the soonest possible moment or wait to see the outcome of the appeal. However, those who take the risk of entry pending appeal overwhelmingly prevail on appeal, so damages almost never accrue. See *FTC Generic Drug Study* at *22 (cited in note 14).

¹⁷⁰ The average period of exclusivity remaining at the end of a Hatch-Waxman challenge is 6.5 years. See Panattoni, 30 *J Health Econ* at 127 (cited in note 59). Patents with less than a year left are rare, and patents that have expired are nonexistent. See *id.* at 134–35.

¹⁷¹ Hatch-Waxman litigation comprises less than 10 percent of all patent cases. According to data provided by Lex Machina, of the 10,891 patent complaints filed in 2014 and 2015, 900 involved abbreviated new drug applications—approximately 8.3 percent. This is consistent with data previously reported by Professors Christopher A. Cotropia and Mark A. Lemley, who found 1,871 district court opinions in patent infringement cases decided between January 2006 and February 2008, with 78 of those addressing abbreviated new drug applications—about 6.7 percent. See Christopher A. Cotropia and Mark A. Lemley, *Copying in Patent Law*, 87 *NC L Rev* 1421, 1444, 1451 & n 125 (2009).

¹⁷² See *The Evolving IP Marketplace: Aligning Patent Notice and Remedies with Competition* *51–55, 80–81 (FTC, Mar 2011), archived at <http://perma.cc/JL7Z-V5VJ>; Mark A. Lemley, *Ignoring Patents*, 2008 *Mich St L Rev* 19, 21–22; Panattoni, 30 *J Health Econ* at 126 (cited in note 59) (“FDA regulated drugs are the only products for which potential competitors must resolve conflicting patent claims before entering.”).

to be infringing and has failed to reach agreement with the alleged infringer.¹⁷³ The patent suit follows entry, not the other way around.

This sequence of events introduces a private interest wholly missing from a hypothetical case of prospective entry: damages for past infringement. Once some allegedly infringing act has occurred, the private value of a dispute will typically involve the questions of *both* who must pay compensation for past use of the technology and who has the right to control it in the future. These dual motivations make it impossible to equate the parties' private motivations for the case with the future competitive significance of the technology. Damages give the parties a financial interest that can exist with or without any consequences for the public's interest in future competition.

Moreover, because patent adjudication is not instantaneous, the blend of past and future interests that make up the private value of a dispute will shift over time. A case that starts off being predominantly about the future—motivated, say, by both the prospect of damages for the past six months and control over the technology for the next five years—might be predominantly about the past by the time the challenge is complete. Five years on, those same parties may find they still have plenty worth fighting over, but that does not mean the patented technology remains important for the public. As a case goes on, the private stakes in the litigation tend to increase, even as the forward-going consequences for competition decrease. (Indeed, without this effect it would be very hard to explain why any case continues after the underlying patent has expired.)¹⁷⁴

The passage of time can cause the private and public significance of a patent challenge to diverge in otherwise-unremarkable

¹⁷³ Potential infringers need not sit around and wait to be sued. Procedural mechanisms allow a potential infringer to take matters into her own hands, either by bringing her patent challenge in the form of a declaratory judgment action or by invoking administrative review in the Patent Office. See La Belle, 20 Geo Mason L Rev at 57, 60–62 (cited in note 18). To bring a declaratory judgment action, the prospective infringer needs to at least have planned (if not actually taken) concrete steps toward the allegedly infringing activity. See *SanDisk Corp v STMicroelectronics, Inc*, 480 F3d 1372, 1381 (Fed Cir 2007). Like Hatch-Waxman challenges, such cases are atypical—according to data from Lex Machina, declaratory judgment actions constitute less than 10 percent of patent cases. The new administrative review procedures created by the AIA are discussed in Part III.A.

¹⁷⁴ See notes 157–62 and accompanying text.

cases. For example, consider a recent Federal Circuit case involving Metso Minerals and Powerscreen International.¹⁷⁵ The case began in March 2006, after Metso sued its direct competitor for past and ongoing infringement of its patent on a mobile, road-hauled material processing plant.¹⁷⁶ On all accounts, this challenge seemed likely to produce public benefits. It did not appear to be a case of patent holdup.¹⁷⁷ The dispute came neither particularly early nor late in the patent's life—the patent was issued in 1996, and would not expire until 2014.¹⁷⁸ The market for this technology was significant—Metso and Powerscreen's sales alone exceeded \$200 million,¹⁷⁹ and there were three other competitors potentially infringing the patent as well.¹⁸⁰ This was not a case of a portfolio-level fight; Metso asserted a single patent, and Powerscreen did not counter with any claims of infringement of its own patents.¹⁸¹ But for the patent in this case, the market was quite competitive.¹⁸² In short, there was every reason to believe that exclusive use of the patented technology provided a significant competitive advantage and that a successful challenge would put the technology squarely in the public domain.

¹⁷⁵ See generally *Metso Minerals, Inc v Powerscreen International Distribution, Ltd*, 526 Fed Appx 988 (Fed Cir 2013).

¹⁷⁶ See Complaint, *Metso Minerals Inc v Powerscreen International Distribution Ltd*, Case No 06-cv-01446, *3 (EDNY filed Mar 29, 2006) ("Metso's Complaint").

¹⁷⁷ In the words of the district court, "The Defendants admitted at the trial that they were aware of Metso's '618 patent during the 1998 design of the Defendants' infringing mobile screeners." Memorandum of Decision and Order, *Metso Minerals, Inc v Powerscreen International Distribution Ltd*, Case No 06-cv-01446, *6 (EDNY filed Dec 8, 2011).

¹⁷⁸ Metso's earliest US filing date was September 7, 1994, so the twenty-year term expired on September 7, 2014. See Malachy J. Rafferty, *Mobile Aggregate Material Processing Plant*, US Patent No 5,577,618 (filed Sept 7, 1994); Plaintiff Metso's Motion for Attorney Fees, *Metso Minerals, Inc v Powerscreen International Distribution Ltd*, Case No 06-cv-01446, *1 (EDNY filed March 17, 2011) ("Metso's Motion for Attorney Fees") ("Metso s[EEKS] . . . damages from October 2007 through the expiration of Metso's patent on September 7, 2014.").

¹⁷⁹ See Transcript of Trial, in Joint Appendix, *Metso Minerals, Inc v Powerscreen International Distribution Ltd*, Civil Action No 11-01572, JA0017445–46 (Fed Cir 2013).

¹⁸⁰ Plaintiff Metso's Motion for a Permanent Injunction, *Metso Minerals, Inc v Powerscreen International Distribution Ltd*, Civil Action No 06-01446, *6 (EDNY filed Jan 19, 2011) (available on Westlaw at 2011 WL 861625) ("Metso's Motion for a Permanent Injunction"). See also Brian O'Sullivan, *The Crunch Bunch*, 41 Intl Construction 25, 26 (Sept 2002).

¹⁸¹ See generally Answer and Counterclaims, *Metso Minerals Inc v Powerscreen International Distribution Ltd*, Civil Action No 06-cv-01446 (EDNY filed June 16, 2006) (available on Westlaw at 2006 WL 5281362) ("Powerscreen's Answer"); Metso's Complaint (cited in note 176). Metso and its various subsidiaries did hold a portfolio of several hundred patents at the time, but none appears immediately relevant to this technology, and they never entered the dispute.

¹⁸² Metso's Motion for a Permanent Injunction at *5–6 (cited in note 180).

In the beginning, Powerscreen's interest in challenging the patent seemed to align with the public's interest in increased competition. Along these lines, the challenger invested substantial sums—likely into the millions of dollars¹⁸³—making arguments that if successful would have made the invention freely available to all.¹⁸⁴ But things did not go as Powerscreen hoped. Instead, in 2010, a jury found the patent valid and willfully infringed by Powerscreen, and awarded Metso \$15.8 million in compensatory damages.¹⁸⁵ After the trial, the court entered a permanent injunction that prohibited Powerscreen from selling eleven of its models found to infringe Metso's patent.¹⁸⁶ The court also awarded interest and doubled Metso's damages based on the jury's willfulness finding, bringing Powerscreen's total liability to well over \$31 million.¹⁸⁷

By now Powerscreen clearly had plenty at stake in the litigation, and so it continued its fight with postjudgment motions and ultimately an appeal.¹⁸⁸ At last, its challenge fell on receptive ears. On May 14, 2013, the Federal Circuit decided Metso's patent was obvious and reversed the district court.¹⁸⁹ The previously patented material processor was at last in the public domain.¹⁹⁰

Ignoring the passage of days, this would seem to be a significant victory for consumers—thanks to Powerscreen's efforts, a clearly valuable technology once exclusively in the hands of a single competitor was now free for all to use. But by the time

¹⁸³ Although Powerscreen's costs are not a matter of public record, Metso claimed that the litigation cost it over \$7 million. Metso's Motion for Attorney Fees at *4 (cited in note 178).

¹⁸⁴ See Powerscreen's Answer at *9–10 (cited in note 181).

¹⁸⁵ See Metso's Motion for Attorney Fees at *1 (cited in note 178).

¹⁸⁶ See Permanent Injunction Order, *Metso Minerals, Inc v Powerscreen International Distribution Ltd*, Case No 06-cv-01446, *1 (EDNY filed Jan 19, 2011). The court delayed implementation of the injunction until July 2011. See *Metso Minerals, Inc v Powerscreen International Distribution Ltd*, 788 F Supp 2d 71, 77–78 (EDNY 2011). It later modified and clarified the injunction. See Order, *Metso Minerals, Inc v Powerscreen International Distribution Ltd*, Case No 06-cv-01446, *2–3 (EDNY filed July 21, 2011).

¹⁸⁷ See *Metso Minerals, Inc v Powerscreen International Distribution Ltd*, 833 F Supp 2d 333, 341 (EDNY 2011).

¹⁸⁸ See generally Defendants' Notice of Motion and Motion for Judgment as a Matter of Law Pursuant to Fed. R. Civ. P. 50, *Metso Minerals Inc v Powerscreen International Distribution Ltd*, Case No 06-cv-01446 (EDNY filed Apr 5, 2011); Notice of Appeal, *Metso Minerals Inc v Powerscreen International Distribution Ltd*, Case No 06-cv-01446 (EDNY filed Aug 18, 2011).

¹⁸⁹ See *Metso Minerals*, 526 Fed Appx at 998.

¹⁹⁰ See generally *Metso Minerals, Inc v Powerscreen International Distribution, Ltd*, 134 S Ct 933 (2014) (denying certiorari). See also *Blonder-Tongue*, 402 US at 343 (holding that collateral estoppel applies to a patentee in all future cases once a patent claim has been ruled invalid).

Powerscreen accomplished this, the patent was nearly at its expiration date anyway. Comparing the date of the Federal Circuit's order to the end of the patent's term, Powerscreen's costly efforts accelerated the technology's entry into the public domain by less than sixteen months.¹⁹¹ What's more, it is not clear that the patent remained economically important so late in its life. Powerscreen represented to the district court that it had completed a design-around on June 23, 2011¹⁹²—nearly two years before the litigation would ultimately conclude. Indeed, on February 29, 2012, Powerscreen reported to its investors in a securities filing that it had implemented a noninfringing alternative design across its entire product line, and as a result claimed that “the judgment and injunction do not affect the continued sale or use of any current model of Powerscreen mobile screening plants.”¹⁹³ On appeal to the Federal Circuit, Powerscreen invoked multiple arguments in hopes of reducing the district court's damages award, but did not even raise the issue of the ongoing, permanent injunction entered against it.¹⁹⁴ By the time the case concluded, it seems the parties were fighting entirely over the past.

¹⁹¹ It is possible that Powerscreen's decision to challenge Metso's patent lowered the costs of other firms in the industry, which apparently used similar technology for years without paying royalties to or being sued by Metso. See text accompanying note 180. (This possibility can be only speculative based on the facts available in the public record, since it was never determined whether these other firms were indeed infringing, and it is possible that, at some point, one or more of them took a license from Metso confidentially.) But even supposing these other firms were using the patented technology for many years without a license, it can hardly be said that they were off the hook while Powerscreen's challenge was pending. As long as Metso's patent remained valid, these competitors would expect that their decisions about how many units to sell (and whether to develop noninfringing alternatives) could potentially affect their future damages liability—particularly after the district court found Metso's patent valid and infringed by Powerscreen. Thus, the Metso patent likely continued to reduce competition as the case wore on, notwithstanding Powerscreen's pending challenge.

¹⁹² See Memorandum in Support of Defendants' Rule 59 and 60 Motion to Alter, Amend or Vacate the Permanent Injunction and Opposition to Plaintiff Metso's Motion to Amend the Court's Permanent Injunction Order, *Metso Minerals Inc v Powerscreen International Distribution Ltd*, Case No 06-cv-01446, *7 (EDNY filed June 23, 2011) (available on Westlaw at 2011 WL 11708241).

¹⁹³ See Terex Corp, *Form 10-K Annual Report pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 for the Fiscal Year Ended December 31, 2011* *34 (SEC, Feb 29, 2012), archived at <http://perma.cc/HT6K-YR JW>. In some circumstances, a noninfringing substitute may be more expensive or less desirable than the original infringing model, which may mean that the patent retains competitive significance despite the availability of an alternative design.

¹⁹⁴ See Brief for Defendants-Appellants Powerscreen International Distribution, Limited (Now Known as Terex GB Limited), Powerscreen New York, Inc., and Emerald Equipment Systems, Inc., *Metso Minerals, Inc v Powerscreen International Distribution, Ltd*, Case Nos 2011-1572, 2012-1168, 2012-1169, *85 (Fed Cir filed Aug 2, 2012) (available on

The Metso-Powerscreen litigation illustrates the perils of inferring competitive significance from the fact that two parties find a patent dispute worth fighting. From the very beginning, Powerscreen was facing substantial liability for its past conduct, since it had been selling the accused product continuously for nearly six years.¹⁹⁵ And, as the litigation dragged on, even the parties' prospective interests morphed into backward-looking liability as well—potential damages for 2007, 2008, 2009, and so on.¹⁹⁶ By the time the case came before the Federal Circuit, Powerscreen had at least \$31 million riding on the outcome, but the chance for the case to affect future competition had largely passed.

To be clear, this is not to say that the outcome of a case like this one “doesn't matter.” As discussed in Part I, the public likely has an interest in seeing that the costs and benefits of the patent system are allocated properly, and that interest includes the proper administration of both backward- and forward-looking remedies.¹⁹⁷ But that is a different theory of the benefits of patent litigation, one with its own limitations and uncertainties.¹⁹⁸ The theory that patent challenges increase competition requires that the challenged patent be an ongoing source of market power,¹⁹⁹ and this condition does not hold once a case becomes entirely about the allocation of liability for past infringement.

Standing alone, the presence of a damages claim does not mean a challenge lacks potential benefits for competition. But whenever a damages claim is present, it is dangerous to assume that a patent remains competitively significant simply because the parties continue to fight over it. And this appears to be the case in the majority of patent suits. According to data from Lex Machina, among non-Hatch-Waxman patent cases in which a

Westlaw at 2012 WL 3647793); Brief of Defendant-Appellant Terex Corporation, *Metso Minerals, Inc v Powerscreen International Distribution, Ltd*, Case Nos 2011-1572, 2012-1168, 2012-1169, *8–10 (Fed Cir filed Aug 2, 2012) (available on Westlaw at 2012 WL 3647794). To be sure, prevailing on its obviousness argument allowed Powerscreen to avoid both damages and the injunction. But the appellants' choice to focus on damages without even questioning the injunction reveals something about the comparative significance of each remedy.

¹⁹⁵ See Plaintiff Metso's Motion for Pre-judgment and Post-judgment Interest, *Metso Minerals, Inc v Powerscreen International Distribution Ltd*, Case No 06-cv-01446, *6–7 (EDNY filed Mar 25, 2011).

¹⁹⁶ The damages found by the jury related only to sales through the end of fact discovery in 2007. However, the court made clear that it intended to later remedy Powerscreen's subsequent infringement as well. See Metso's Motion for Attorney Fees at *1 (cited in note 178).

¹⁹⁷ See Part I.C.

¹⁹⁸ See Part I.C.

¹⁹⁹ See Part II.A.1.

remedy was granted, money damages were awarded approximately 77 percent of the time.²⁰⁰ Therefore, to ignore the possibility that damages may be the reason a dispute continues is to overlook a complicating factor present in more cases than not.

There are, however, categories of cases to which this objection does not apply. For example, in Hatch-Waxman challenges, money damages were awarded in less than 3 percent of cases litigated through the remedies phase,²⁰¹ so the presumption that a Hatch-Waxman case involves a question of prospective entry is generally correct. Similarly, challenges brought by licensees who continue to pay royalties while the suit is pending (sometimes called “nonrepudiating licensees,” since they do not repudiate their license agreements) will not typically involve claims for damages.²⁰² But both of these categories constitute a small percentage of all patent cases.²⁰³

It is worth noting that two of the more recent Supreme Court patent opinions to espouse the value of patent challenges were in cases that happened to belong in these exceptional categories: challenges instigated by nonrepudiating licensees (*MedImmune, Inc v Genentech, Inc*²⁰⁴) and challenges brought pursuant to Hatch-Waxman (*Actavis*²⁰⁵). Neither case therefore involved any claims of past infringement. This may explain why the posture of prospective entry has become a common way to frame the benefits

²⁰⁰ Specifically, in patent cases filed between 2000 and 2015 *not* involving Hatch-Waxman challenges and containing both a litigated judgment and a remedy, district courts entered permanent injunctions (with no damages) in 119 cases, awarded money damages (with no injunction) in 205 cases, and provided both remedies in 203 cases. Thus, money damages were awarded in 408 out of the 527 cases (or 77 percent) in which a litigated judgment was followed by a remedy.

²⁰¹ According to data from Lex Machina, in patent cases filed between 2000 and 2015 involving Hatch-Waxman challenges and containing both a litigated judgment and a remedy, district courts entered permanent injunctions (with no damages) in 107 cases, never awarded money damages without an injunction, and provided both remedies in 3 cases. Thus, money damages were awarded in 3 out of the 110 cases in which a litigated judgment was followed by a remedy.

²⁰² See Part III.B.

²⁰³ As discussed in note 171, Hatch-Waxman disputes represent a tiny fraction of the patent cases filed each year. The exact percentage of patent challenges brought by nonrepudiating licensees is unknown, but appears to be in the single digits at most. See Cotropia and Lemley, 87 NC L Rev at 1442, 1446 (cited in note 171) (observing that complaints alleged a prior business relationship with the defendant in only 5.2 percent of cases). Challenges by nonrepudiating licensees would necessarily be a subset of this already small group of cases.

²⁰⁴ 549 US 118, 134–36 (2007).

²⁰⁵ *Actavis*, 133 S Ct at 2227–30. But see *Medtronic, Inc v Mirowski Family Ventures, LLC*, 134 S Ct 843, 851 (2014).

of patent challenges, notwithstanding the atypicality of such cases.

D. The Patent Challenge Is Successful

The final condition necessary for a patent challenge to increase competition turns on outcome: the challenger has to win. The point is a simple one (and has been made before²⁰⁶). An otherwise-perfect challenge—one in which the patent confers market power, with no other obstacles to competition, and with significant forward-looking competitive effects—does not reduce market power if the patent holder emerges victorious.

But even this seemingly simple condition requires qualification. As other scholars have noted, in some instances, the outcome of a challenge may be a partial victory for the patent holder and a partial victory for consumers.²⁰⁷ For example, even in a case in which the patent is found valid and infringed (and thus the challenger loses), a narrow claim construction that occurs along the way can reduce the scope of the disputed patent and potentially reduce its competitive significance going forward. In the other direction, a case in which the patent is found valid but not infringed (and thus the challenger wins) may turn out to be a less-than-complete victory for consumers. Because the patent remains in force, it lingers on to potentially raise the costs and restrict the activities of other firms in the market. Invalidity judgments are special in that they completely free the public of the prospective effects of the patent.²⁰⁸ When that is not the outcome of a case, a challenge may deliver something less than its full procompetitive potential.

There are limits to what can be accomplished by recognizing this condition, since the outcome of a challenge is not known in advance. But still, there are two consequences worth noting. First, the expected benefits of a challenge must be discounted to

²⁰⁶ Indeed, of all the conditions necessary for a patent challenge to increase competition, this one has by far enjoyed the widest recognition. See, for example, *Actavis*, 133 S Ct at 2234; *In re Cipro*, 348 P3d at 864; Hemphill, 109 Colum L Rev at 634 (cited in note 45); Elhauge and Krueger, 91 Tex L Rev at 290 (cited in note 47); Farrell and Shapiro, 98 Am Econ Rev at 1349–50 (cited in note 47); Hovenkamp, Janis, and Lemley, 87 Minn L Rev at 1759–60 (cited in note 111); Daniel A. Crane, *Exit Payments in Settlement of Patent Infringement Lawsuits: Antitrust Rules and Economic Implications*, 54 Fla L Rev 747, 780 (2002).

²⁰⁷ See Malani and Masur, 101 Georgetown L J at 649 (cited in note 18); Ford, 99 Cornell L Rev at 109–10 (cited in note 18); Parchomovsky and Stein, 113 Colum L Rev at 1513–20 (cited in note 18).

²⁰⁸ See *Blonder-Tongue*, 402 US at 349–50.

reflect the chance that it will not succeed. This is not a trivial factor. When patent challenges are litigated to a final decision, the underlying patents are found valid slightly more than half the time.²⁰⁹ And, unfortunately, the costs of a challenge are incurred with certainty, regardless of the outcome. So, even after all the other necessary conditions are accounted for,²¹⁰ the expected benefits for competition must be further discounted based on this dependency.

The second consequence is that not all patent challenges are created equal. While the outcome of a challenge cannot be known in advance, it may be possible to estimate its chance of success, which is an important factor in its expected value to the public. When it comes to allocating scarce resources to additional patent challenges, interventions that direct attention to the cases in which success is more likely will tend to produce greater benefits for competition, all else equal.

* * *

As discussed above, the primary benefit of patent challenges cited by courts and commentators depends on a series of conditions that are only sometimes present. When one or more of these conditions are lacking—when a patent does not confer market power, the patent's owner enjoys redundant sources of technical exclusion or market power, the patent challenge is not resolved in time, or the challenger loses—the patent challenge may fail to deliver its promised benefits for competition.

Evaluated individually, it is possible that each condition holds in the vast majority of cases. But problematically, *all* of these conditions must hold for a patent challenge to increase competition. This conjunctive relationship—the fact that the promised public benefits can be lost by a single one of these individually reasonable assumptions failing—greatly increases the risk that a given patent challenge will not produce any benefits for competition at all. For purposes of illustration, suppose that each of the four conditions holds 90 percent of the time. The probability

²⁰⁹ See Allison and Lemley, 26 *AIPLA Q J* at 205 (cited in note 155) (finding a 54 percent validity rate); Allison, Lemley, and Schwartz, 92 *Tex L Rev* at 1787 (cited in note 50) (finding a 57.6 percent validity rate). Challengers are somewhat more successful on arguments of noninfringement, see Allison, Lemley, and Schwartz, 92 *Tex L Rev* at 1788 (cited in note 50), but for the reasons discussed above, the competitive effects of those victories are likely less significant. See note 53 and accompanying text.

²¹⁰ See Parts II.A–C.

that all four will hold in a given case—assuming independence—is given by $(0.9) \times (0.9) \times (0.9) \times (0.9)$. Thus, a collection of individually reasonable assumptions might together hold only about 65 percent of the time.

It is difficult to put a number on how frequently each condition fails.²¹¹ But the available empirical evidence suggests not only that each condition *can* fail, but also that each does so in nonnegligible numbers of cases. Moreover, even in cases in which all the necessary conditions are present, these same factors may substantially limit the magnitude of the available benefits. For example, even when a patent challenge is resolved in time to provide some benefits for competition, the passage of days may have reduced the size of those benefits to a fraction of their original potential. Add in the effect of a firm's patent portfolio, and the benefits are reduced further still. As a result, there are likely many cases in which the most commonly cited benefit of patent challenges either is completely unavailable or has significantly smaller magnitude than previously assumed.

It is worth noting that the empirical understandings motivating these objections have become known only quite recently. For example, the Supreme Court acknowledged the problems of assuming patents confer market power in 2006.²¹² The significance of patent portfolios was recognized in the legal literature starting only in 2005.²¹³ Many of the data cited regarding the timing and outcomes of patent challenges were published in that era as well—some of it only in the last few years.²¹⁴ Viewed in this light, the century-old view that patent challenges reliably increase competition was perhaps reasonable at the time it was originally adopted. But recent empirical evidence reveals that the conventional view hews much closer to patent theory than it does to the reality of contemporary patent litigation.

III. IMPLICATIONS

As discussed in Part II, the prediction that patent challenges result in increased competition relies on several implicit assumptions, and these assumptions do not always hold. To the contrary,

²¹¹ The final condition—that the challenge be successful—is the exception here, because there *are* precise data available regarding the rate at which patent challenges succeed. See note 209 and accompanying text.

²¹² See generally *Illinois Tool Works*, 547 US 28.

²¹³ See generally Parchomovsky and Wagner, 154 U Pa L Rev 1 (cited in note 124).

²¹⁴ See notes 146–48, 153.

there are identifiable categories of cases in which the benefits of increased competition are smaller than previously thought or completely unavailable. This Part explores the consequences of this complication for the long-held view regarding the procompetitive benefits of patent challenges.

Throughout this discussion, it should be remembered that this Article is focused on a specific theory about the benefits of patent challenges—that they increase competition by removing or reducing unjustified market power. There are other potential benefits the public might plausibly obtain from patent litigation, and it is possible that these benefits justify policies designed to encourage challenges (or discourage their settlement).

Even so, the existence of thin spots in the dominant theory of how patent challenges benefit the public has a number of consequences. Long-standing patent doctrines have been rooted in the public's interest in free competition, and the conditions introduced in the prior Part raise new questions about these doctrines' ability to serve their stated purpose. Accepting the stated goal of increasing competition as a legitimate one, there may be ways that goal can be better served. For example, if there are substantial benefits for competition available in some challenges but not others, it may be valuable to steer resources to the cases in which these benefits are most likely.

These implications span the legislative, judicial, and administrative domains. Part III.A evaluates whether the administrative patent challenge mechanisms created by the America Invents Act are likely to increase competition. Part III.B considers a subset of patent challenges long favored by the Court—those brought by existing licensees—and exposes several weaknesses in this judicially created policy. Part III.C evaluates the Hatch-Waxman Act and several other bounty systems more recently proposed by commentators to determine whether the challenges induced by these policies are likely to benefit competition. Part III.D considers how antitrust law should regard patent settlements, particularly in light of the Court's 2013 decision in *Actavis*.

A. Administrative Review under the AIA

One of the most significant patent reforms in recent years was the expansion of postissuance review procedures in the Patent Office under the 2011 AIA.²¹⁵ As the Supreme Court has explained,

²¹⁵ See AIA § 6, 125 Stat at 299–313.

the purpose of these new procedures is not simply to “resolve . . . disputes among parties,” but to “help[] protect the public’s paramount interest in seeing that patent monopolies are kept within their legitimate scope.”²¹⁶ This Section briefly introduces the new procedures and evaluates how they compare with ordinary patent litigation in terms of their ability to produce benefits for competition.²¹⁷

The two primary innovations of the AIA are post-grant review (PGR) and inter partes review (IPR). PGR allows a party to challenge a patent on any grounds in the first nine months after a patent issues.²¹⁸ The process begins by a challenger filing a petition identifying the specific claims he believes to be improperly issued and paying a fee. The patent owner then has three months to respond with any arguments as to why PGR should not be instituted.²¹⁹ The Patent Office has three months to consider the petition,²²⁰ and may institute a PGR only if the petition “demonstrate[s] that it is more likely than not that at least 1 of the claims challenged in the petition is unpatentable.”²²¹

If the Patent Office institutes PGR, the question of the claims’ validity goes to trial before the Patent Trial and Appeal Board (PTAB), an administrative court composed of administrative patent judges.²²² From this point forward, the proceedings are similar to litigation in district court, with several important distinctions. First, the challenger need show unpatentability only by “a preponderance of the evidence,” as compared to the “clear and convincing” standard applicable in district court challenges.²²³ Second, discovery is “limited to evidence directly related to factual assertions advanced” by a party,²²⁴ somewhat more restrictive

²¹⁶ *Cuozzo Speed Technologies, LLC v Lee*, No 15-446, slip op at 7–8, 16 (US June 20, 2016) (quotation marks and ellipsis omitted) (discussing inter partes review).

²¹⁷ It should be noted that the stated purposes of these reforms also included “mak[ing] the patent system more efficient and improv[ing] the quality of patents and the patent system.” *America Invents Act Report* at 48 (cited in note 16). Therefore, increasing competition may be an important benefit of these procedures, but it should not be regarded as the exclusive measure of their success.

²¹⁸ 35 USC § 321. For a lengthier introduction to these procedures, see generally Dolin, 56 BC L Rev 881 (cited in note 16).

²¹⁹ 35 USC § 323; 37 CFR § 42.207(b).

²²⁰ 35 USC § 324(c).

²²¹ 35 USC § 324(a). The Patent Office may also grant PGR to resolve “novel or unsettled legal question[s]” relevant to other patents. 35 USC § 324(b).

²²² See 35 USC §§ 6(a), 326(c).

²²³ Compare 35 USC § 326(e) with *Microsoft Corp v i4i Limited Partnership*, 131 S Ct 2238, 2242 (2011) (applying the “clear and convincing” standard).

²²⁴ 35 USC § 326(a)(5).

than the standard applicable in district court.²²⁵ Third, the PTAB is required to reach a decision within twelve months (extendable to eighteen months when “good cause” is shown).²²⁶

The other significant challenge mechanism created by the AIA is *inter partes* review.²²⁷ IPR is, in many ways, similar to PGR, with three important distinctions. First, under IPR, a challenger can argue unpatentability only on the basis of lack of novelty or obviousness in view of prior patents or printed publications.²²⁸ Therefore, other legal requirements for patentability (such as indefiniteness, enablement, and patentable subject matter) are beyond the scope of the review.²²⁹ Second, and in contrast to the short window for requesting PGR, the IPR process is available essentially anytime.²³⁰ Third, the threshold required to institute IPR is slightly lower—a challenger need only show “a reasonable likelihood of success.”²³¹ The statutory timeline and other burdens of proof are the same.²³²

As discussed above, one way a challenge in district court may fail to increase competition is by coming too late and taking too long. In this regard, PGR has a significant advantage that increases the likelihood it will deliver benefits for competition: by law, it must be initiated (if at all) early in the patent’s life—within nine months of the patent’s issuance.²³³ So even if resolution takes

²²⁵ Compare 35 USC § 326(a)(5) with FRCP 26(b)(1) (“Parties may obtain discovery regarding any nonprivileged matter that is relevant to any party’s claim or defense and proportional to the needs of the case . . .”).

²²⁶ 35 USC § 326(a)(11). Another difference, not relevant here, is that a patent owner may amend her claims during the course of PGR. 35 USC § 326(d).

²²⁷ Technically, *inter partes* review is a modification of and replacement for *inter partes* reexamination. See AIA § 6(a), 125 Stat at 299–304.

²²⁸ 35 USC § 311(b).

²²⁹ Compare 35 USC § 311(b) with 35 USC § 321(b) (defining the scope of PGR).

²³⁰ The only timing constraint is that IPR cannot be filed until after the window for PGR has closed and any PGRs that were filed have reached conclusion. See 35 USC § 311(c).

²³¹ 35 USC § 314(a). See also The Patent Reform Act of 2011, S 23, 112th Cong, 1st Sess (Jan 25, 2011), in 157 Cong Rec 3428 (Mar 8, 2011) (statement of Sen Kyl) (characterizing the standard to institute PGR as “slightly higher” than the standard to institute IPR).

²³² Compare 35 USC §§ 311–19 with 35 USC §§ 321–29. A third procedural mechanism, called “covered business method review,” is in many ways a hybrid of the two, allowing any argument for invalidity (like PGR) at any time in the patent’s life (like IPR). See Dolin, 56 BC L Rev at 920–22 (cited in note 16). However, it is limited to certain technology areas and is available only if the challenger has already been sued or “charged with [] infringement.” *Id.*

²³³ 35 USC § 321(c). However, the opportunity for PGR reopens after a patent has been reissued, which does introduce the possibility of late-in-life challenges. See 35 USC § 321(c).

a few years, a successful challenge will necessarily clip a significant amount of patent term. There remains a risk that the patented technology will become obsolete before then, but the early challenge requirement helps on this front, too. Moreover, a shorter period for damages to accumulate increases the likelihood that a PGR will be rooted in future value rather than past liabilities.²³⁴

The same cannot be said of IPR, for which there is no deadline for filing a petition.²³⁵ Therefore, the window for IPR is similar to that of civil litigation, with all of its risks of late-term (or even postterm) adjudication.²³⁶ Indeed, in the first six months that the IPR procedure was in place, the average patent age at the time of petition filing was seven years and three months²³⁷—roughly comparable to the age of patents that are challenged in district court.²³⁸ Moreover, initial observation suggests that there will be a long tail of very old patents in the IPR process, just as there is in traditional litigation.²³⁹

The promised, headline benefit of PGR and IPR is speed.²⁴⁰ By law, the Patent Office must resolve either form of review within twelve months of its initiation (although, as noted above, the Patent Office can extend this by an additional six months).²⁴¹ However, it is slightly misleading to focus solely on that timeline, since up to six months may be spent determining whether PGR

²³⁴ Unfortunately, this potential benefit is largely mooted by the alternatives of bringing either an IPR or a district court challenge at any time after that. The legislative history suggests that these alternatives were preserved out of a concern that in some industries it may be impractical to bring challenges so early in a patent's life. See *Matal*, 21 Fed Cir Bar J at 602 (cited in note 16).

²³⁵ In fact, a number of authorities appear to contemplate IPR of expired patents. See 37 CFR § 42.100(b) ("A claim in an unexpired patent shall be given its broadest reasonable construction in light of the specification of the patent in which it appears.") (emphasis added); *In re Cuozzo Speed Technologies, LLC*, 793 F3d 1297, 1301 (Fed Cir 2015) (Prost dissenting from denial of rehearing en banc) ("[W]hen claims in post-grant proceedings . . . have expired, the broadest reasonable interpretation standard does not apply.").

²³⁶ Civil litigation can similarly begin after a patent expires, due to the trailing statute of limitations for patent infringement. See 35 USC § 286.

²³⁷ See *Harnessing Patent Office Litigation: A Look at the First Six Months of Inter Partes Review Proceedings before the United States Patent and Trademark Office; 9/16/2012 to 3/16/2013* *2 (Harness Dickey), archived at <http://perma.cc/5KLU-N3DS> ("First Six Months of *Inter Partes* Review").

²³⁸ See *Lanjouw and Schankerman*, 32 *RAND J Econ* at 135 (cited in note 89) (estimating that 45 percent of case filings occur within seven years of the application date).

²³⁹ In the first six months of the Patent Office's new IPR procedures, the oldest patent was nearly eighteen years old at the beginning of proceedings. See *First Six Months of Inter Partes Review* at *2 (cited in note 237).

²⁴⁰ See *Matal*, 21 Fed Cir Bar J at 622 (cited in note 16).

²⁴¹ See 35 USC §§ 316(a)(11), 326(a)(11).

or IPR should be instituted at all.²⁴² Once the time for this “pre-institution” business is considered, the total time from the filing of a petition to a decision by the PTAB can take up to eighteen months—or twenty-four months, in cases in which the Patent Office grants itself an extension. And the PTAB’s eventual decision on the merits is itself subject to (nonexpedited) appellate review by the Federal Circuit.²⁴³

In the early days of these procedures, the Patent Office has been using almost all of the time allowed by statute. For example, during the first year of IPR, the median time from the filing of a request for IPR to the issuing of a final written decision was 532 days—just shy of the eighteen-month maximum.²⁴⁴ Perhaps unsurprisingly, the Patent Office’s work started fast and has been gradually slowing down as more requests have been filed.²⁴⁵ During the same time period, the Patent Office issued approximately 99 percent of its written decisions within nineteen months of an initial request,²⁴⁶ but it is possible that the numbers could slip further if the Patent Office begins granting a substantial number of extensions for cause.

Another factor that will determine whether these procedures yield benefits for competition is the frequency with which they are invoked against patents that are but-for sources of market power.²⁴⁷ On this front, there are reasons to fear that IPR and PGR may be no better than traditional patent litigation. First, the lower costs of IPR and PGR may reduce the private value necessary to justify continuing a dispute, which may actually make it less likely that a challenged patent confers market power.²⁴⁸ For

²⁴² See 35 USC §§ 313–14, 323–24.

²⁴³ See Dolin, 56 BC L Rev at 915–19 (cited in note 16). Moreover, because PGR and IPR proceedings address only validity, not infringement, there may still be issues in a challenge that require litigation after the proceedings have run their course. *Id.* at 918–20.

²⁴⁴ Data courtesy of Lex Machina. The following data are based on IPRs filed from the opening of the process in September 2012 until November 1, 2013. The 2013 cutoff is necessary to avoid overrepresentation of cases that resolved quickly.

²⁴⁵ For example, in the first six months of IPR, the Patent Office made grant decisions within an average of fifty-four days. See *First Six Months of Inter Partes Review* at *2 (cited in note 237). Over time, that number has risen to seventy-six days. See *Harnessing Patent Office Litigation: A Look at Thirty Three Months of Inter Partes Review Proceedings before the United States Patent and Trademark Office; 9/16/2012 to 6/16/2015* *2 (Harness Dickey), archived at <http://perma.cc/D9V4-C782>.

²⁴⁶ Data courtesy of Lex Machina.

²⁴⁷ See Parts II.A–B.

²⁴⁸ The median attorney’s fees from filing to PTAB hearing are about \$275,000 per side, significantly less than the \$600,000 to \$5 million of district court litigation. See *AIPLA 2015 Report* at 37–38 (cited in note 37).

example, it is possible that the lower cost of an IPR might lead to more challenges motivated by holdup or nuisance value instead of the competitive significance of the patent itself.²⁴⁹ Second, as with district court challenges, these procedures could be used as tools in larger, portfolio-level fights that do not necessarily turn on the significance of individual patents.²⁵⁰ (In the early days of these procedures, scholars have already observed cases in which IPRs appear to have been used for retaliation or extortion.)²⁵¹ Third, in the case of IPR, the prospect of a challenge late in a patent's life raises the possibility that a dispute may be driven by past liabilities rather than future control. As a result, it appears quite possible that these procedures will be invoked (at least sometimes) to challenge patents that do not actually confer market power.

These administrative challenge procedures do have several important advantages over district court litigation. Recall that a challenge's expected benefits for competition turn significantly on its likelihood of success.²⁵² Ordinary civil litigation rules do not screen out weak cases very aggressively, allowing a challenger to impose (and incur) the costs of a challenge even if it has a very low chance of success on the merits.²⁵³ The AIA's new procedures, by contrast, are conditioned on a more meaningful front-end screen: an IPR challenge may proceed past the petition stage only if the Patent Office determines that success is "reasonably likely"²⁵⁴—or, in the case of PGR, that success is "more likely than not."²⁵⁵ The drafters of the AIA intended these thresholds to be

²⁴⁹ Professor Gregory Dolin has detailed a number of potential ways that these procedures can be abused. See generally Dolin, 56 BC L Rev 881 (cited in note 16).

²⁵⁰ See *id.* at 944–45.

²⁵¹ See *id.* at 932–34, 944–47.

²⁵² See Part II.D.

²⁵³ Pleading a patent case is typically a straightforward exercise, and surviving summary judgment simply requires creating a genuine dispute as to a material fact. See FRCP 56(a). The elevated pleading standards of *Bell Atlantic Corp v Twombly*, 550 US 544 (2007), and *Ashcroft v Iqbal*, 556 US 662 (2009), were not immediately applied in patent cases, see *In re Bill of Lading Transmission and Processing System Patent Litigation*, 681 F3d 1323, 1334 (Fed Cir 2012), but this was recently changed by action of the Judicial Conference. See Jennifer H. Burdman and William J. Sauers, *The State of Patent Law: The Interplay of Recent, Pending, and Proposed Changes*, 27 Intel Prop & Tech L J 9, 10–11 (Oct 2015). Nonetheless, *Twombly*'s plausibility standard remains a significantly lower bar than the thresholds for PGR and IPR.

²⁵⁴ See 35 USC § 314(a).

²⁵⁵ 35 USC § 324(a).

demanding, and expected that very few patents subjected to IPR or PGR would turn out to be valid.²⁵⁶

Although these thresholds were apparently motivated by concerns about overburdening the Patent Office,²⁵⁷ they may also have the previously unappreciated benefit of channeling scarce resources to the challenges that promise greater expected public benefits. If the high bars to instituting PGR or IPR dissuade parties from filing weak petitions, then challenges with a low probability of providing public benefits will not even begin (at least not in this particular forum).²⁵⁸ If challengers take their chances anyway, the private and public costs of disposing of an unlikely challenge are significantly smaller: the costs of an IPR terminated at the petition stage are less than a tenth of the costs of a patent case decided by a district court on summary judgment.²⁵⁹ So, if the legal standards for instituting PGR and IPR petitions are implemented properly, they may work to channel resources away from long shot challenges and toward the challenges that are most likely to succeed.

In this regard, the data from the early days of IPR are promising.²⁶⁰ In the first few years, the Patent Office has instituted IPR in about 70 percent of the petitions filed.²⁶¹ However, this high

²⁵⁶ See Matal, 21 Fed Cir Bar J at 607–09 (cited in note 16); 112th Cong, 1st Sess (June 22, 2011), in 157 Cong Rec E1184 (June 23, 2011) (statement of Rep Smith) (“Very few patents that undergo [PGR] are likely to be valid patents.”); 112th Cong, 1st Sess, in 157 Cong Rec 3375 (Mar 7, 2011) (statement of Sen Sessions) (“[T]he bill will allow the PTO to avoid accepting [IPRs] that were unlikely to win in any event.”).

²⁵⁷ See Matal, 21 Fed Cir Bar J at 607–09 (cited in note 16).

²⁵⁸ To be sure, there may very well be cases in which the expected public benefits are substantial despite a low probability that the challenge will be successful. For example, a challenge to the patent on a blockbuster drug might promise hundreds of millions of dollars of expected benefits, even if it has only a low (say 10 percent) chance of invalidating the patent. The argument here is not that low-probability challenges should be barred entirely, but that the high thresholds to institute PGR and IPR may helpfully tend to direct resources toward high-probability challenges.

²⁵⁹ According to self-reported data by practitioners, the median cost through the petition stage of IPR was \$80,000. See *AIPLA 2015 Report* at 38 (cited in note 37). In district court cases with \$1 million to \$10 million at risk, the median cost of litigating through the end of fact discovery was \$950,000. *Id.* at 37.

²⁶⁰ It is too soon to have meaningful data on PGR. As of July 31, 2016, only a handful of PGRs had been filed. See *Patent Trial and Appeal Board Statistics *3–4* (US Patent and Trademark Office, July 31, 2016), archived at <http://perma.cc/9DRR-2UFS> (“July 2016 PTAB Statistics”).

²⁶¹ See *id.* at *7–8. In fiscal year 2015, 801 petitions for IPR were granted and 426 were denied (a 65 percent grant rate). In fiscal year 2014, 557 petitions for IPR were granted and 193 were denied (a 74 percent grant rate). *Id.* In fiscal year 2013, 167 petitions for IPR were granted and 26 were denied (an 86 percent grant rate). *Patent Trial and Appeal Board Statistics *7* (US Patent and Trademark Office, June 30, 2015), archived at

institution rate appears to be the result of strong petitions rather than lax application of the standard. According to the most recent summary of IPRs completed to date, only 15 percent of final written decisions upheld all claims, while a full 70 percent of final written decisions found all instituted claims unpatentable.²⁶² Or, to look at it slightly differently, of the 14,458 claims that have so far been subject to a final written decision, approximately 81 percent have been found to be not patentable during IPR.²⁶³ That is a substantially higher rate of invalidation than the much more resource-intensive process of district court litigation.²⁶⁴ (Ordinarily, a comparison between the outcomes of one process and the outcomes of a different process could be dismissed as a product of selection effects, but here selection effects are actually the point: the IPR process appears to be focusing litigation resources on challenges with a higher probability of success than typical district court cases.)²⁶⁵

This advantage is compounded when one considers that not all successful challenges are created equal—some outcomes can produce only slight benefits for competition (such as a finding of noninfringement), while others are more likely to produce significant competitive effects (such as a finding of invalidity).²⁶⁶ Moreover, as Professor Roger Ford has explained, there are a number

<http://perma.cc/G6NP-PBC7> (“June 2015 PTAB Statistics”). Thus, the average grant rate across these years was 70.3 percent, though the number has been trending downward.

²⁶² *July 2016 PTAB Statistics* at *10 (cited in note 260).

²⁶³ *Id.* at *12. An additional 2,123 claims were cancelled or disclaimed by their owners before reaching a final written decision. *Id.* Note that a significant number of claims for which IPR was instituted did not actually reach a final written decision, likely due to settlement. See *id.* at *10, 12. Through July 31, 2016, this was the case for about 28 percent of the claims for which IPR has terminated, and about 38 percent of cases. See *id.* Note that this does *not* mean that IPRs settle at this rate. Because settled cases inevitably terminate more quickly than cases reaching a written decision, settled cases will be overrepresented in the observed terminations to date. Still, given the high rate of patent settlement in general, it is not at all surprising that some cases will settle between the institution of an IPR and the completion of the trial.

²⁶⁴ See Allison and Lemley, 26 *AIPLA Q J* at 205 (cited in note 155) (finding that 46 percent of patents subject to a final validity decision were ruled invalid).

²⁶⁵ But, even still, there are other factors at work here that complicate the comparison. First, as noted above, once an IPR is instituted, a challenger has the benefit of a lower burden of proof—more patents *should* be invalidated under a preponderance of the evidence standard than under a clear and convincing evidence standard. Second, during IPR, the Patent Office construes claims more broadly (“broadest reasonable interpretation”) than district courts do in litigation. See *Cuozzo Speed Technologies*, No 15-446, slip op at 7–8, 15–16. See also Dolin, 56 *BC L Rev* at 916 (cited in note 16) (discussing both practices). Finally, the option of settlement—in either district court or IPR proceedings—makes it difficult to make any conclusive inferences from these statistics.

²⁶⁶ See Part II.D.

of ways that district court litigation may encourage challengers to make noninfringement arguments (with comparatively smaller potential benefits for competition) over invalidity arguments.²⁶⁷ District court litigation is open not only to long shot arguments, but to long shot arguments that are unlikely to have far-reaching competitive effects.

Because PGR and IPR procedures can be used to challenge only a patent's validity, they focus litigation resources on the issues that are most likely to confer a public benefit for competition. While arguments about the proper scope of an asserted patent or a particular defendant's noninfringement remain available in district court, these administrative review processes offer a cheaper, faster mechanism to a party who is willing to bring a particularly promising form of challenge—an invalidity argument against a patent that in fact has a high likelihood of invalidity.

This analysis has several implications for how the Patent Office should administer these proceedings going forward. First, speed matters. Although the statute permits three months to rule on a petition and twelve months to issue a written decision, there are benefits to moving more quickly than that when possible. Moreover, the "good cause" standard for an extension of time should be closely guarded, so as to prevent any further delays except when strictly necessary. Finally, the Patent Office should institute PGRs and IPRs cautiously, recognizing that its careful selection of the most compelling petitions plays an important role in allocating scarce resources to the challenges most likely to increase competition.

B. Encouraging Challenges by Licensees

One of the most significant judicial interventions to encourage patent challenges has been the "unmuzzling" of licensees under *Lear, Inc v Adkins*²⁶⁸ and its progeny.²⁶⁹ As the Court reasoned in *Lear*, "Licensees may often be the only individuals with enough economic incentive to challenge the patentability of an inventor's discovery."²⁷⁰ On this logic, otherwise-enforceable contracts and long-standing equitable doctrines have been cleared away to enable

²⁶⁷ See Ford, 99 Cornell L Rev at 102–12 (cited in note 18).

²⁶⁸ 395 US 653, 670–71 (1969).

²⁶⁹ See *Standard Industries, Inc v Tigrett Industries, Inc*, 397 US 586, 588 (1970) (Black dissenting from the affirmance by an equally divided Court) (calling *Lear* a "major change in the field of patent law").

²⁷⁰ *Lear*, 395 US at 670.

challenges by licensees, so that the public will not be “continually [] required to pay tribute to would-be monopolists without need or justification.”²⁷¹ This Section evaluates the *Lear* doctrine’s ability to achieve its stated goal.

Prior commentators have disputed *Lear*’s premise that licensees possess an economic incentive to challenge the patents they have licensed.²⁷² However, the analysis of the prior Part raises a more fundamental question for *Lear*: How likely is it that licensee challenges, even when they are brought, will actually produce the procompetitive benefits the Court assumed?

As a category, patent challenges by licensees have several promising features. First, the posture of a challenge by a licensee implies that there is an ongoing royalty arrangement between the parties.²⁷³ This strongly suggests that a successful patent challenge would lower the licensee’s (and possibly other competitors’) marginal costs going forward—and therefore likely lead to lower prices for consumers in the future. Second, many of the complications raised above seem unlikely to apply in a case of a licensee challenge. For example, it would be unwise for a licensee to break with a licensor holding a large portfolio of critical patents, since the licensee will need to successfully challenge all of them to pull off the gambit. For this reason, it seems likely that a handful of victories will be sufficient to free the licensee of the licensor. Similarly, under ordinary circumstances it is hard to see how breaching a license agreement would provide much holdup or nuisance value. In sum, the posture of a typical licensee challenge suggests a good chance of increasing competition and benefitting consumers if litigated to conclusion.

²⁷¹ *Id.* at 670–71. For *Lear*’s effects, see *Warner–Jenkinson Co v Allied Chemical Corp.*, 567 F2d 184, 187–88 (2d Cir 1977); *Panther Pumps & Equipment Co v Hydrocraft, Inc.*, 468 F2d 225, 230–32 (7th Cir 1972); *Massillon–Cleveland–Akron Sign Co v Golden State Advertising Co.*, 444 F2d 425, 427 (9th Cir 1971); *Atlas Chemical Industries, Inc v Moraine Products*, 509 F2d 1, 6 (6th Cir 1974). See also *MedImmune*, 549 US at 135–36.

²⁷² A larger number of commentators have opined that market incentives to challenge patents will be inadequate. See, for example, Thomas, 2001 U Ill L Rev at 333 (cited in note 18); Miller, 19 Berkeley Tech L J at 687–88 (cited in note 14); Malani and Masur, 101 Georgetown L J at 668–69 (cited in note 18); Farrell and Merges, 19 Berkeley Tech L J at 952 (cited in note 18); Lemley and Shapiro, 19 J Econ Persp at 88 (cited in note 18); Risch, 85 Ind L J at 1022 (cited in note 18); Parchomovsky and Stein, 113 Colum L Rev at 1487, 1513–14 (cited in note 18).

²⁷³ If the parties had agreed to a fully paid-up license, there would be no reason to bring a challenge later on. Therefore, the existence of a licensee challenge implies an ongoing obligation to pay royalties.

The fly in the licensee challenge ointment is timing. As discussed in the prior Part, the promised benefits for competition can be lost if that challenge comes too late or drags on too long. And, on this front, patent challenges by licensees do not appear so promising.

Empirical studies on the characteristics of licensee challenges are sorely lacking. But there is reason to fear that these cases will come later than average and may be especially prone to resolution toward the end of (or after) a patent's term. One reason for this hypothesis is a practical consideration: there is a lot that has to happen before a licensee challenge can arise. First, the potential licensor must identify the potential licensee and begin the process of working out an arrangement. After that, both parties must actually agree to terms—a process that takes time and may involve a first round of patent litigation and settlement.²⁷⁴ Then, circumstances must somehow change, such that the licensee now finds it desirable to reopen a previously settled arrangement.²⁷⁵ Finally, the licensee must actually take the leap of mounting a challenge, which may involve some amount of research and contingency planning before reigniting the dispute. With all of this extra backstory, it seems likely that the typical licensee challenge would involve a patent at least a few years older than the average challenge brought by a nonlicensee.

In addition to these practical considerations, there are strategic reasons why licensee challenges might tend to occur very near the end of the challenged patent's life. As the Supreme Court has observed, a licensee terminating its license to bring a challenge takes a number of significant risks. If the challenge is unsuccessful, the (former) licensee may no longer be able to serve its existing customers.²⁷⁶ It may face treble damages for willful infringement.²⁷⁷ It may sacrifice a substantial portion of its prior revenue stream.²⁷⁸ The benefits of a successful challenge may be

²⁷⁴ In some cases, this process of identification and negotiation takes place before the licensed patent actually issues. See, for example, *Lear*, 395 US at 657–60. The St. Jude license from the University of Michigan discussed later was similarly entered into prior to issuance. See text accompanying notes 284–86.

²⁷⁵ In some cases, however, this change of heart could come about quickly. For example, after *MedImmune*, an accused infringer could take a license and then immediately resume the fight as a nonrepudiating licensee. See notes 305–09 and accompanying text.

²⁷⁶ See *MedImmune*, 549 US at 133–34.

²⁷⁷ *Id.*

²⁷⁸ *Id.*

substantial, but the consequences for a failed challenge can be disastrous.²⁷⁹

One way a licensee can manage these downside risks is by bringing a challenge late in a patent's term. Doing so is still a gamble—patent litigation is expensive, and the threat of treble damages is real.²⁸⁰ But if the licensee can time the challenge so that it is not resolved until after the patent's term has run, the licensee will not risk any interruption to its ability to sell the product.²⁸¹ Timed right, the risk of loss can be postponed until after the patented technology is in the public domain. In this way, late challenges allow firms to take calculated gambles to reduce their royalty payments without jeopardizing their ability to continue their existing activities.

The availability of this strategy also provides an answer to a question that has puzzled commentators post-*Lear*: Why would a licensee *ever* invest in a patent challenge? As others have noted, doing so would seem to put the challenger at a disadvantage, because the firm mounting the challenge incurs its full costs, but its competitors will frequently share in any future benefits.²⁸² However, the answer to this may be a simple one: by bringing a challenge late in the patent's term, the licensee can skip royalty payments while the case is pending *and* avoid conferring a benefit on competitors, since, by the time the challenge is resolved, the invention would have been in the public domain anyway. Perversely, licensees may have an incentive to time their challenges precisely so that the public benefits are minimized.²⁸³

²⁷⁹ *Id.*

²⁸⁰ Moreover, delaying a challenge reduces the upsides of success as well, since it means more time spent paying royalties before contesting them.

²⁸¹ This would not be true if there were a meaningful risk of a court entering a preliminary injunction against the licensee. However, given the Supreme Court's policy of encouraging licensee challenges, such an outcome appears extremely unlikely. *Lear* forbids requiring royalty payments from a licensee while a challenge is pending. See *Lear*, 395 US at 673. It would be quite surprising (and inconsistent with the reasoning of *Lear*) for a court to enjoin the licensee during the same time period.

²⁸² See Miller, 19 Berkeley Tech L J at 687–88 (cited in note 14); Farrell and Shapiro, 98 Am Econ Rev at 1349 (cited in note 47). Challenges to patent validity (as opposed to arguments against infringement) seem especially unlikely, since a single invalidity judgment renders a patent unenforceable against the world. See *Blonder-Tongue Laboratories, Inc v University of Illinois Foundation*, 402 US 313, 329 (1971).

²⁸³ In some cases, there may be rapid benefits for competition as soon as a challenge is brought. For example, licensees who cease royalty payments at the beginning of a challenge may pass some of these savings on to consumers. As another example, nonlicensees could enter the market in hopes that the challenge will eventually succeed. But because the outcome of the challenge is uncertain until its conclusion, both of these groups will need to make their pricing decisions with an eye on the *possibility* that the challenge will

Without further empirical study, it is difficult to say how common this strategy may or may not be. However, it is easy to see how the benefits of licensee challenges can be lost through delay. Consider a recent dispute between the University of Michigan and St. Jude Medical. Back in September 1997, St. Jude took an exclusive license to the university's patent pending method of manufacturing synthetic heart valves.²⁸⁴ That agreement required St. Jude to pay 5 percent of its net profits on certain valve products sold in the United States and a slightly lesser royalty elsewhere.²⁸⁵ Soon thereafter, in May 1998, the University of Michigan was awarded US Patent No 5,746,775 (the '775 Patent).²⁸⁶

For nearly fourteen years, things went along smoothly enough, with St. Jude apparently paying out millions of dollars in royalties over time.²⁸⁷ Then, in 2011, a dispute over the calculation of certain royalties broke out, and the university filed suit for breach of contract about a year later.²⁸⁸ St. Jude unsurprisingly counterclaimed for unjust enrichment and a declaration of invalidity.²⁸⁹ At the time, the '775 Patent had about three years left in its term.²⁹⁰

From there, a familiar story played out. St. Jude decided to invoke the newly created IPR procedure and filed an IPR petition in November 2012.²⁹¹ Following the procedures described in the prior Section, the university had a three-month opportunity to respond, and then the Patent Office had a three-month period to

end in failure—and that they may ultimately owe enhanced damages for each additional unit they sold without paying royalties. See *MedImmune*, 549 US at 133–34.

²⁸⁴ *Regents of the University of Michigan v St. Jude Medical, Inc*, 2013 WL 673797, *1 (ED Mich).

²⁸⁵ *Id.*

²⁸⁶ See Robert J. Levy and Danielle Hirsch, *Method of Making Calcification-Resistant Bioprosthetic Tissue*, US Patent No 5,746,775 (filed Oct 21, 1993).

²⁸⁷ Complaint, *Regents of the University of Michigan v St. Jude Medical, Inc*, Case No 12-cv-12908, *4 (ED Mich filed July 2, 2012) (available on Westlaw at 2012 WL 2839545) (discussing the alleged overpayment of \$4.3 million for non-US royalties between 2009 and 2011).

²⁸⁸ *Id.* at *3–5.

²⁸⁹ See St. Jude Medical Inc.'s Answer to First Amended Complaint of Regents of the University of Michigan and First Amended Counterclaim by St. Jude Medical, *Regents of the University of Michigan v St. Jude Medical, Inc*, Case No 12-cv-12908, *17–18 (ED Mich filed Dec 17, 2012).

²⁹⁰ Because the '775 Patent was filed in 1993 and issued in 1998, its expiration was set for 17 years after issuance, or May 5, 2015. See 35 USC § 154(b).

²⁹¹ See St. Jude Medical, Inc.'s Motion to Stay Pending the USPTO's *Inter Partes* Review of the Validity of Patent No. 5,746,775, *Regents of the University of Michigan v St. Jude Medical, Inc*, Case No 12-cv-12908, *4–5 (ED Mich filed May 6, 2013) ("St. Jude Medical's Motion to Stay").

consider the petition.²⁹² At last, the Patent Office instituted IPR in May 2013.²⁹³ The parties took discovery. The PTAB heard argument. And, on the last day allowed by law, the PTAB issued a written decision finding the challenged claims unpatentable. The date was May 1, 2014²⁹⁴—about a year before the disputed patent was set to expire.²⁹⁵

Unhappy with this result, the University of Michigan then appealed the PTAB's decision to the Federal Circuit.²⁹⁶ At this point, the lackadaisical pace of an appellate court took hold, with multiple extensions of time both requested and granted.²⁹⁷ While the appeal was pending, the '775 Patent expired.²⁹⁸ The passage of time had mooted any forward-going consequences for competition, essentially cabining the stakes of the case to those of a simple contract dispute.

Notably, the *Lear* decision that sought to encourage licensee challenges like this one *did* consider the effects of timing. In fact, the reason the Court held that licensees should not be compelled to pay royalties while a challenge is pending is that such a requirement “would give the licensor an additional economic incentive to devise every conceivable dilatory tactic in an effort to postpone the day of final judicial reckoning.”²⁹⁹ However, the Court failed to notice that its rule gave *both* parties incentives to engage in dilatory tactics. The patent holder and the challenger have an interest in minimizing the opportunity for third parties to avoid paying royalties as a result of the litigation. And the longer the

²⁹² See text accompanying notes 219–21.

²⁹³ *St. Jude Medical's Motion to Stay* at *4 (cited in note 291).

²⁹⁴ See Patent Owner's Notice of Appeal, *St. Jude Medical, Cardiology Division, Inc v Board of Regents of the University of Michigan*, Case No IPR2013-00041, *2 (Fed Cir filed June 27, 2014) (“University of Michigan's Notice of Appeal”).

²⁹⁵ See note 290.

²⁹⁶ See generally University of Michigan's Notice of Appeal (cited in note 294).

²⁹⁷ See Docket, *Board of Regents of the University of Michigan v St. Jude Medical, Cardiology Division, Inc*, Case No 14-01723 (Fed Cir filed Aug 14, 2014).

²⁹⁸ Although the patent's validity and assessment of any past royalties were still very much live and contested issues, the parties elected to settle their dispute later that summer. See generally Stipulated Order of Dismissal with Prejudice and without Costs, *Regents of the University of Michigan v St. Jude Medical, Inc*, Case No 12-cv-12908 (ED Mich filed Jun 25, 2015) (available on Westlaw at 2015 WL 10520394).

²⁹⁹ *Lear*, 395 US at 673.

dispute drags on, the smaller will be the benefits the challenge produces for everyone else.³⁰⁰

However, there is a discrete subset of licensee challenge that avoids this problem entirely: challenges brought by nonrepudiating licensees. To put this distinction in context, the typical licensee challenge begins when the licensee ceases to pay royalties.³⁰¹ The licensee may then seek a declaratory judgment or wait to be sued for breach of contract and raise patent defenses in a counterclaim. In this paradigm (the “repudiating licensee”), the licensee gets immediate interim relief from its royalty obligations, and the patent owner’s potential damages begin accruing right away. This chain of events creates instant (and potentially substantial) private stakes in the dispute, which can persist whether or not the patent continues to have any relevance for future competition.

By contrast, in the case of a challenge by a nonrepudiating licensee, the licensee continues to abide by the terms of the license agreement, making royalty payments and complying with other terms of that contract.³⁰² But while remaining in good standing, the licensee petitions for IPR or seeks a declaratory judgment on its patent defenses.³⁰³ If the challenge succeeds, the licensee can then cease paying royalties without consequence.³⁰⁴ But if the challenge fails, the licensee does not face any liability for having brought the challenge. In this way, damages do not accrue—the licensee has not breached and is not an infringer—and the licensee sees a benefit only *after* the case is over.

Challenges by nonrepudiating licensees raise a host of concerns. Until the Supreme Court’s 2007 *MedImmune* decision, there was a question whether courts enjoyed Article III jurisdiction in such a posture.³⁰⁵ (They do.)³⁰⁶ There is also something unseemly about a licensee attacking a patent while continuing to enjoy the benefit of its license to that very patent. For this reason, it is possible that long-standing equitable doctrines may preclude

³⁰⁰ There is a clear parallel here with the interest Hatch-Waxman litigants may have in arranging their patent settlements in a way that minimizes consumer surplus. See generally C. Scott Hemphill, *Paying for Delay: Pharmaceutical Patent Settlement as a Regulatory Design Problem*, 81 NYU L Rev 1553 (2006).

³⁰¹ See Rochelle Cooper Dreyfuss and Lawrence S. Pope, *Dethroning Lear? Incentives to Innovate after MedImmune*, 24 Berkeley Tech L J 971, 971–72 (2009) (explaining that before *MedImmune*, licensee challenges had to begin with a breach of contract).

³⁰² See *MedImmune*, 549 US at 137.

³⁰³ See, for example, *id* at 122–23.

³⁰⁴ See Dreyfuss and Pope, 24 Berkeley Tech L J at 975–76 (cited in note 301).

³⁰⁵ *MedImmune*, 549 US at 120–21.

³⁰⁶ *Id* at 131–32.

these challenges completely—a question the *MedImmune* Court did not reach.³⁰⁷ But, perhaps counterintuitively, challenges by nonrepudiating licensees are actually *more* likely to increase competition than ones brought by licensees who first breach their agreements.

Several features of the nonrepudiating posture assure that a licensee's interest in bringing a patent challenge will be closely aligned with the public's interest in competition. First, because the nonrepudiating licensee does not get any benefit until the patented technology is in the public domain, such a challenger has an incentive to move the process along as swiftly as possible.³⁰⁸ Moreover, this same feature builds in a check on the kinds of challenges that the licensee will pursue: if a technology is on the verge of obsolescence, or the remaining term is so short that a challenge cannot be completed in time to make much difference, that challenge will not be brought.³⁰⁹ And if a challenge starts out promising but goes south, the private interest in the suit will wane as well. Because of this alignment between private interest and public significance, the challenges mounted by nonrepudiating licensees will almost always have the potential to increase competition.

But aside from this distinct subcategory, the prospects for licensee challenges to increase competition are not so bright. There is an irony here. Since its inception, the *Lear* doctrine has been concerned with creating private incentives for licensees to bring patent challenges.³¹⁰ But by assuming that a public interest in competition is always present, the Court created a rule that allows patent suits to rapidly accumulate private value that can exist independently of any future importance for the disputed technology. Moreover, the same rule allows challengers to behave strategically to avoid passing the benefits of the challenge along

³⁰⁷ *Id.* at 135–36 (noting that “[r]espondents appeal to the common-law rule that a party to a contract cannot at one and the same time challenge its validity and continue to reap its benefits,” but finding the rule irrelevant to the question of Article III jurisdiction).

³⁰⁸ As the *Lear* Court noted, the patent holder may still seek to delay resolution, but at least one party has an interest in moving the case forward. *Lear*, 395 US at 673–74.

³⁰⁹ For this reason, one would expect challenges by nonrepudiating licensees to be brought near the beginning or middle of a patent's life. For reference, the patent at issue in the Court's 2007 *MedImmune* decision is set to expire in 2018. See Shmuel Cabilly, et al, *Methods of Producing Immunoglobulins, Vectors and Transformed Host Cells for Use Therein*, US Patent No 6,331,415 (filed June 10, 1988); *MedImmune, Inc v Genentech, Inc*, 2007 WL 5760839, *3 n 2 (CD Cal).

³¹⁰ See *Lear*, 395 US at 673–74.

to competitors or consumers. As a result, the very licensee challenges *Lear* privileged seem to be particularly ineffective vehicles for the doctrine's stated goal of increasing competition.

C. Hatch-Waxman and Other Bounty Systems

Another major intervention to induce more patent challenges was promulgated by legislation. One of the key features of the 1984 Hatch-Waxman Act was the creation of a regulatory bounty, which holds out the promise of a potential duopoly to the first firm to challenge a pharmaceutical patent. If that first-filed challenge is successful, the challenger receives a 180-day exclusivity period during which only it and the patent holder can sell the previously patented drug.³¹¹ The purpose of this temporary duopoly is to make it profitable for generics to challenge pharmaceutical patents and thereby increase the rate of such challenges.³¹² Extensive study of the Act has shown that it has led to a substantial increase in the number of patent challenges and a significant reduction in prices for many drugs.³¹³ This Section offers a few insights into why Hatch-Waxman has been so successful in the field of pharmaceuticals and identifies several challenges with implementing similar bounty programs in other technology areas.

Many scholars have recognized that the role of patents in the pharmaceutical industry is a special one. Among all technical fields, drug production is regarded as the one in which patents play the most significant role in recouping research and development costs.³¹⁴ In many ways, the economics of the pharmaceutical industry very closely fit the conventional textbook theories of how

³¹¹ 21 USC § 355(j)(5)(B)(iv). The two-step recipe of being (1) the first challenger and (2) successful in that challenge is often (mistakenly) equated with being "the first successful challenger." This is incorrect: if the first challenger loses and a subsequent challenger succeeds, no regulatory exclusivity period is awarded. See *Actavis*, 133 S Ct at 2235; Hemphill, 81 NYU L Rev at 1583–86 (cited in note 300).

³¹² See Miller, 19 Berkeley Tech L J at 725 (cited in note 14); *FTC Generic Drug Study* at *4–5 (cited in note 14).

³¹³ See *FTC Generic Drug Study* at *8–9 (cited in note 14) (summarizing data); Grabowski and Vernon, 10 *PharmacoEconomics Supp 2* at 121 (cited in note 59); Panattoni, 30 *J Health Econ* at 132–33, 136 (cited in note 59).

³¹⁴ See Richard C. Levin, et al, *Appropriating the Returns from Industrial Research and Development*, 1987 Brookings Papers on Econ Activity 783, 816; Edwin Mansfield, *Patents and Innovation: An Empirical Study*, 32 *Mgmt Sci* 173, 180 (1986); Wesley M. Cohen, Richard R. Nelson, and John P. Walsh, *Protecting Their Intellectual Assets: Appropriability Conditions and Why U.S. Manufacturing Firms Patent (or Not)* *28 (NBER Working Paper No 7552, Feb 2000), archived at <http://perma.cc/L97X-94LB>.

patents are supposed to work. Developing new drugs is fantastically expensive.³¹⁵ Without some form of legal protection, the costs of copying would be low. Often, the metes and bounds of a breakthrough can be well-defined, and exclusive rights to that breakthrough confer market power sufficient to recoup the patent owner's investment. Because the field is already heavily regulated, detection of infringement is cheap, and enforcement is highly effective.

On the flipside, these same distinctive characteristics—the ways that drug patenting hews closely to the theoretical case for having a patent system—cause Hatch-Waxman challenges to satisfy the conditions necessary to increase competition almost every time. First, the technical scope of exclusivity afforded by a patent frequently corresponds to a specific drug or treatment method that a physician might order for a patient, and therefore confers some degree of market power.³¹⁶ Second, because secrecy is less effective and redundant protections are slimmer than in other fields, a successful challenge is very likely to put the underlying treatment into the public domain.³¹⁷ Third, because generics are prohibited from entering the market until years after a challenge has begun, Hatch-Waxman litigation is almost entirely about future control and very rarely involves liability for past infringement.³¹⁸ The only common way completed Hatch-Waxman cases fail to increase competition is by the patent owner prevailing in court.³¹⁹

In view of Hatch-Waxman's success, a number of commentators have called for the creation of similar bounty systems to encourage challenges in other fields.³²⁰ However, as discussed in the

³¹⁵ Exactly how expensive, though, is a matter of debate. See Burk and Lemley, *The Patent Crisis* at 80 (cited in note 119).

³¹⁶ Even when a number of largely undifferentiated treatment methods are available, pharmaceutical patents appear to confer some market power. See Henry Grabowski, et al, *Does Generic Entry Always Increase Consumer Welfare?*, 67 *Food & Drug L J* 373, 385–88 (2012) (describing the market for oral contraceptives and the effect of generic entry).

³¹⁷ See notes 109–14 and accompanying text.

³¹⁸ See notes 167–69 and accompanying text.

³¹⁹ See Panattoni, 30 *J Health Econ* at 132–33, 136 (cited in note 59). The price and quantity effects of generic entry following a successful Hatch-Waxman challenge have been studied extensively. See generally, for example, Henry G. Grabowski and John M. Vernon, *Brand Loyalty, Entry, and Price Competition in Pharmaceuticals after the 1984 Drug Act*, 35 *J L & Econ* 331 (1992); Grabowski, et al, 67 *Food & Drug L J* 373 (cited in note 316) (discussing price effects).

³²⁰ Note, however, that their arguments for doing so are not necessarily limited to increasing competition. See, for example, Malani and Masur, 101 *Georgetown L J* at 672 (cited in note 18) (arguing that invalid patents function as a tax on legitimate innovation).

prior Part, the characteristics that make Hatch-Waxman challenges likely to increase competition are not always present in patent challenges generally. Therefore, to the extent a new bounty initiative seeks to increase competition,³²¹ it is critical that the bounty induce the right kind of patent challenges. Otherwise, it may simply lead to expensive litigation without producing the claimed public benefit, or, worse, direct resources away from challenges that could have increased competition.³²²

Without careful design, it is possible that a bounty system may induce challenges that are even *less* likely to increase competition than patent challenges in general. Recall that, for a challenge to increase competition, it must be directed at a patent that confers market power.³²³ One can try to infer market power from the fact of a patent challenge, but, as discussed above, there are competing explanations for any given patent suit: it might be a nuisance suit, a case of holdup, or an isolated salvo in a portfolio-level fight.³²⁴ Introducing a cash prize for a successful challenge further complicates the attempted inference, because it creates the possibility that a challenger will show up to chase the bounty without having much interest in the disputed technology itself. A simple cash prize for defeating a patent will not necessarily draw challenges to the most important patents, and may induce wasteful bounty-seeking litigation having nothing to do with the public's interest in competition.

One way to address this concern is to tie the prize to some measure of the value of the patented technology. For example, Professor Joseph Scott Miller proposes that the size of the bounty should be based on the patent holder's past profits from practicing the patented technology.³²⁵ This eliminates the problem of challenges to patents that were never commercially significant, but introduces a different one: it may disproportionately induce challenges related to technologies whose commercial significance lies completely in the past. At the beginning of a patent's life (when a

by competing companies); Miller, 19 Berkeley Tech L J at 705 (cited in note 14). See also Kesan, 17 Berkeley Tech L J at 763, 795–97 (cited in note 21).

³²¹ This is a commonly cited goal of bounty proposals, but it is not the only one. Obviously, a bounty program designed for another purpose could be considered successful even if it does not increase competition.

³²² See Leslie, 91 Minn L Rev at 172 (cited in note 47) (noting that bounties risk inducing challenges to unimportant patents).

³²³ See Part II.A.

³²⁴ See Part II.A.2.

³²⁵ See Miller, 19 Berkeley Tech L J at 712 (cited in note 14).

challenge could do the most good for competition), the patent holder will have no past profits. As time goes on, the incentives to challenge increase, and the public benefit decreases. Perversely, the prize for invalidating a patent peaks only after the patent has lost its legal or commercial significance. As a result, Miller's proposal seems liable to induce the fiercest litigation over previously valuable patents, rather than patents likely to affect the public's future interest in competition.³²⁶

There may very well be a public interest in encouraging litigation around previously valuable technologies, but it is not the public's interest in forward-going competition.³²⁷ If the goal is to draw challengers to the cases most likely to affect future competition, the size of the bounty should turn on the future value of the patented technology. However, this is much easier said than done, for predicting the long-term significance of a technology is widely recognized to be guesswork. (Miller acknowledges this difficulty as well; in fact, it is the very reason he recommends looking to past value instead.)³²⁸ Moreover, for such a regime to work, courts would not only need to determine future value accurately, but they would also need to do so using a transparent and predictable methodology, so that potential challengers could assess their expected payouts *before* bringing a patent challenge. This further compounds the difficulty: the incentives created to challenge a patent will depend on potential challengers' estimation of how the court will estimate the future value of the underlying technology—a two-step guessing game.³²⁹

³²⁶ Professors Anup Malani and Jonathan Masur propose a bounty based on “the period of valuable patent life . . . effectively at risk during the lawsuit”—including both past and future years of potentially infringing activity. Malani and Masur, 101 *Georgetown L J* at 662 n 105 (cited in note 18). Helpfully, this prevents the size of the bounty from peaking on the day a patent expires, but it nonetheless offers a private reward based partly on past years' activities—potentially even in cases involving expired patents. Thus, both the Miller proposal and Malani-Masur proposal could lead to bounty-hunting cases in which no future competitive consequences are at stake.

³²⁷ For example, there may nonetheless be a substantial public interest in the distributional consequences of cases involving expired patents or obsolete technology, see Part I.C, and the bounties proposed by prior commentators might very well advance that interest. The point here is only that bounties calculated based on past value cannot be expected to induce the challenges that have the greatest significance for future competition.

³²⁸ See Miller, 19 *Berkeley Tech L J* at 719–20 (cited in note 14). See also Malani and Masur, 101 *Georgetown L J* at 662, 672 (cited in note 18) (acknowledging that their assumption of constant value may over- or underestimate technological significance in future years).

³²⁹ See Louis Kaplow, *The Value of Accuracy in Adjudication: An Economic Analysis*, 23 *J Legal Stud* 307, 315–16 (1994) (noting that investments in ex post accuracy are valuable only to the extent that the relevant actors can predict the results ex ante).

Here lies the genius of Hatch-Waxman: the size of the bounty is determined by market mechanisms and with minimal judicial or administrative discretion. Potential challengers can plan around a predictable prize: a statutory period of 180 days of joint exclusivity. At the same time, the value of that exclusivity depends directly on the future significance of the technology. If, by the time the challenge is complete, the technology has no more value, the bounty will not have any value either. If the technology becomes more important with time, the value of the bounty increases with it. Hatch-Waxman's prize is simultaneously simple and dynamic.

Unfortunately, as good as this mechanism is for pharmaceuticals, there are several reasons it would be difficult to transplant to other technology areas. First, in fields in which many patents are involved in making a finished product, it is unclear how the reward for challenging one of those patents should be divided to reflect these overlapping sources of patent value. Hatch-Waxman-style exclusivity is simple when the loss of a single patent puts the technology in the public domain, but it becomes substantially more complicated when the competitive effects of a patent challenge are subtler.

More problematically, a reward of short-term exclusivity may not be worth very much in industries in which patent enforcement is expensive and imperfect. A successful Hatch-Waxman challenger gets its 180 days of actual joint exclusivity at no extra cost because a well-funded government agency (the FDA) enforces this exclusivity as part of an existing regulatory regime. But this cheap, strong enforcement mechanism is the exception, not the rule. FDA-regulated drugs are the only products for which entrants are regularly required to sort out patent rights prior to entry.³³⁰ In fields in which licensing prior to use is rare, enforcement is expensive, and infringement boundaries are hard to draw, a short-term right may be of little practical value. Within some range, a policymaker could counteract these obstacles by lengthening the time of the bounty exclusivity, but this comes at the price of delaying and reducing the public's benefits from the successful challenge.

³³⁰ See Aidan Hollis, *Closing the FDA's Orange Book*, 24 Reg 14, 15–16 (Winter 2001); Panattoni, 30 J Health Econ at 127 (cited in note 59). See also Herbert Hovenkamp, Mark D. Janis, and Mark A. Lemley, *Balancing Ease and Accuracy in Assessing Pharmaceutical Exclusion Payments*, 88 Minn L Rev 712, 716 (2004). The requirement to address patent rights as part of the FDA approval process extends to drugs intended for animals, but does not reach medical devices. Compare 21 USC § 360b with 21 USC § 360e.

Simply put, in the many fields in which the exclusive rights of patents do not function like clean on/off switches, it may be impractical to use those exclusive rights to define the prize for a successful challenge.³³¹

Perhaps there are other fields besides pharmaceuticals in which the market mechanism of Hatch-Waxman-style exclusivity can be successfully implemented. However, the design of a patent bounty system is a humbling undertaking, and it should not be assumed that expanding the Hatch-Waxman model to other industries will produce similar results.

D. Antitrust and Patent Settlement

Another area that has recently drawn a significant amount of attention is the antitrust analysis that should apply to the settlement of patent challenges. It has long been established that restraints contained in a patent settlement can potentially run afoul of the antitrust laws, just as they can in any agreement.³³² It is a separate question, however, whether the loss of the patent challenge itself might be a harm cognizable under the antitrust laws. Despite the urging of commentators that antitrust law should be invoked to discourage certain patent settlements,³³³ courts were historically hesitant to find antitrust harm within the exclusionary scope of presumptively valid patent rights.³³⁴ But in *Actavis*, the Supreme Court moved the law distinctly in that direction, raising a number of questions about how future antitrust courts should think about the loss of potential competition as a result of a patent settlement. This Section evaluates the conditions necessary for a settlement to work this particular form of anticompetitive harm, and concludes that caution is advised before applying *Actavis* as expansively as some have urged.

³³¹ See Lemley and Shapiro, 19 J Econ Persp at 87–90 (cited in note 18).

³³² See *Actavis*, 133 S Ct at 2232 (collecting cases); Herbert Hovenkamp, *Anticompetitive Patent Settlements and the Supreme Court's Actavis Decision*, 15 Minn J L Sci & Tech 3, 18–19 (2014).

³³³ See, for example, Elhauge and Krueger, 91 Tex L Rev at 283 (cited in note 47); Michael A. Carrier, *Unsettling Drug Patent Settlements: A Framework for Presumptive Illegality*, 108 Mich L Rev 37, 67–75 (2009); Hemphill, 81 NYU L Rev at 1612–16 (cited in note 300); Hovenkamp, Janis, and Lemley, 87 Minn L Rev at 1720–21 (cited in note 111); Lemley and Shapiro, 19 J Econ Persp at 90–95 (cited in note 18); Shubha Ghosh, *Beyond Hatch-Waxman*, 67 Rutgers U L Rev 779, 783 (2015).

³³⁴ See, for example, *United States v Singer Manufacturing Co*, 374 US 174, 196–97 (1963); *United States v Masonite Corp*, 316 US 265, 277 (1942).

A bit of background is necessary to introduce the holding of *Actavis* and how it is likely to affect antitrust scrutiny of settlements in the future. The case arose in the distinctive context of a Hatch-Waxman challenge, with several generic manufacturers seeking to defeat a pharmaceutical patent.³³⁵ Though a successful challenge would have given the first generic challenger 180 days of joint regulatory exclusivity (and the other challengers the ability to enter the market after that), the generic challengers instead opted to settle for a significant cash payment from the patent owner.³³⁶ Such an arrangement is called a “reverse-payment settlement,” because the payment went from the patent holder to the patent challengers (the opposite of how settlement payments usually go). In return, the generic firms dropped their challenges and agreed not to enter the market until much later in the patent term.³³⁷ The Federal Trade Commission brought suit alleging that this agreement violated the antitrust laws; the district court and Eleventh Circuit, however, held that the defendants’ decision to end the case was immune from such scrutiny, since its anticompetitive effects (if any) were exclusively within the scope of the patent.³³⁸

In allowing the FTC’s claim to proceed, the Supreme Court declined to hold these arrangements either *per se* legal or *per se* illegal. Instead, it instructed lower courts to employ antitrust law’s rule of reason.³³⁹ But the Court also seemed to go further than that, stating in dicta that certain settlements could be presumed anticompetitive. In the words of the Court:

An unexplained large reverse payment itself would normally suggest that the patentee has serious doubts about the patent’s survival. And that fact, in turn, suggests that the payment’s objective is to maintain supracompetitive prices to be shared among the patentee and the challenger rather than face what

³³⁵ Under the framework of the Hatch-Waxman Act, these prospective manufacturers initiated the challenge by certifying to the FDA that their proposed generics would not infringe the relevant patent and that, in any event, the patent was invalid. See *Actavis*, 133 S Ct at 2227–30; 21 USC § 355(j)(2)(A)(vii). This certification technically constitutes infringement, see 35 USC § 271(e)(2)(A), creating a basis for a patent suit in which infringement and validity can be adjudicated. See *Actavis*, 133 S Ct at 2228–29 (explaining this statutory scheme).

³³⁶ *Actavis*, 133 S Ct at 2227.

³³⁷ *Id* at 2229.

³³⁸ *Id* at 2229–30.

³³⁹ *Id* at 2227, 2237.

might have been a competitive market—the very anticompetitive consequence that underlies the claim of antitrust unlawfulness.

...
In sum, a reverse payment, where large and unjustified, can bring with it the risk of significant anticompetitive effects.³⁴⁰

Such a payment, the Court explained nearby, has the “potential for genuine adverse effects on competition,”³⁴¹ because it “amounts to a purchase by the patentee of the exclusive right to sell its product, a right it . . . [might] lose if the patent litigation were to continue.”³⁴² Commentators have dubbed this the “*Actavis* Inference”—the proposition that a settlement agreement containing a large, unexplained payment to a challenger creates an inference of both market power and cognizable antitrust harm.³⁴³

Much has been written regarding the application of antitrust law to Hatch-Waxman settlements.³⁴⁴ These debates need not be recounted here, for the complications raised in the prior sections are for the most part not relevant in the case of a Hatch-Waxman challenge. (As discussed above, various features of pharmaceutical patenting and its accompanying regulatory regime ensure that these challenges will typically be directed at patents that are but-for causes of prospective market power.)³⁴⁵ But nothing explicitly limits *Actavis* to Hatch-Waxman challenges,³⁴⁶ and the potential effects of the case on other forms of patent settlement are significant.

³⁴⁰ *Actavis*, 133 S Ct at 2236–37.

³⁴¹ *Id.* at 2234, quoting *Federal Trade Commission v. Indiana Federation of Dentists*, 476 US 447, 460–61 (1986).

³⁴² *Actavis*, 133 S Ct at 2234.

³⁴³ Aaron Edlin, et al, *The Actavis Inference: Theory and Practice*, 67 Rutgers U L Rev 585, 585 (2015). See also Joshua P. Davis and Ryan J. McEwan, *Deactivating Actavis: The Clash between the Supreme Court and (Some) Lower Courts*, 67 Rutgers U L Rev 557, 578–79 (2015); Rebecca S. Eisenberg and Daniel A. Crane, *Patent Punting: How FDA and Antitrust Courts Undermine the Hatch-Waxman Act to Avoid Dealing with Patents*, 21 Mich Telecomm & Tech L Rev 197, 235 (2015).

³⁴⁴ See generally, for example, Bruce H. Kobayashi, et al, *Actavis and Multiple ANDA Entrants: Beyond the Temporary Duopoly*, 29 Antitrust 89 (Spring 2015); Aaron Edlin, et al, *Actavis and Error Costs: A Reply to Critics*, Antitrust Source 1 (Oct 2014); Carrier, 108 Mich L Rev 37 (cited in note 333). See also Hemphill, 81 NYU L Rev at 1612–16 (cited in note 300); Hovenkamp, Janis, and Lemley, 87 Minn L Rev at 1749–63 (cited in note 111); Crane, 54 Fla L Rev at 747 (cited in note 206).

³⁴⁵ See Part III.C.

³⁴⁶ While nothing in the Court’s opinion explicitly limits this rule to Hatch-Waxman challenges, in a few places the Court seems to assume that only Hatch-Waxman challenges will be affected by its holding. See *Actavis*, 133 S Ct at 2227, 2230.

Throughout the *Actavis* opinion, the Court invokes assumptions that are generally sound in the context of Hatch-Waxman challenges but that are problematic if applied elsewhere. For example, the Court seems to assume a one-to-one relationship between patents and products.³⁴⁷ It assumes a successful challenge would put the patented technology in the public domain.³⁴⁸ It assumes that the dispute's private value arises from monopoly power and that the but-for world is one of perfect competition.³⁴⁹ And it invokes a hypothetical challenge resolved a decade before the disputed patent expires.³⁵⁰ Given all of this, a number of problems emerge if the opinion is applied to non-Hatch-Waxman cases for which the Court's simplifying assumptions no longer hold.³⁵¹

The potential for error will depend significantly on how the language quoted above is ultimately understood. Because *Actavis* appears to establish an inference of market power and anticompetitive effects in cases involving unjustified reverse payments, it will be critical for future courts to define what exactly counts as a "reverse payment."³⁵² Clearly, a naked transfer of cash from the patent owner to the challenger qualifies. But "reverse payment" will likely be understood to include other things as well. Consideration can come in many forms, and it would seem quite blinkered to watch only for wire transfers flowing in the wrong direction.³⁵³ Rather, commentators have suggested that detecting reverse payments will require evaluating the entire bundle of commitments made in a settlement and looking for unjustified consideration flowing from the patent holder to the challenger.³⁵⁴ This could come in any number of forms: agreeing to perform services at below-market rates, promising not to compete in other product lines, or offering a discount on royalties or damages.³⁵⁵

³⁴⁷ See *id.* at 2234.

³⁴⁸ *Id.*

³⁴⁹ *Id.* at 2235.

³⁵⁰ *Actavis*, 133 S Ct at 2234.

³⁵¹ Several commentators, pre- and post-*Actavis*, have argued that scrutiny of patent settlements should not be limited to pharmaceutical cases. See, for example, Elhauge and Krueger, 91 *Tex L Rev* at 285 (cited in note 47); Ghosh, 67 *Rutgers U L Rev* at 796–97 (cited in note 333).

³⁵² See Michael A. Carrier, *Payment after Actavis*, 100 *Iowa L Rev* 7, 9 (2014); Aaron Edlin, et al, *Activating Actavis*, 28 *Antitrust* 16, 16 (Fall 2013).

³⁵³ See Edlin, et al, 67 *Rutgers U L Rev* at 592 (cited in note 343); Davis and McEwan, 67 *Rutgers U L Rev* at 568–70 (cited in note 343). Indeed, the Government's brief and Chief Justice John Roberts's dissent explicitly anticipated this extension. See *Actavis*, 133 S Ct at 2245 (Roberts dissenting).

³⁵⁴ See Edlin, et al, 67 *Rutgers U L Rev* at 601–02 (cited in note 343).

³⁵⁵ *Id.* at 595–601.

Though the full extent of what may constitute a reverse payment is still being developed, the majority of courts that have confronted this question have already expanded *Actavis* beyond the simple case in which the patent holder pays cash.³⁵⁶

Even if this rule is sensible enough in cases involving Hatch-Waxman challenges, defining reverse payments to include non-cash consideration could render *Actavis* incredibly far-reaching if applied to patent settlements in general. Because the typical patent plaintiff seeks both damages and an injunction,³⁵⁷ a settlement agreement will need to address both matters as well. The danger is that almost any settlement could expose the parties to an allegation that the resolution of damages includes a hidden reverse payment. Patent damage calculation is a famously uncertain art,³⁵⁸ and the number agreed on for settlement purposes will almost always be smaller than what the plaintiff might have claimed at trial. Any disposal of a damages claim—again, conspicuously lacking in most Hatch-Waxman cases—at a perceived discount could turn a traditional “forward” payment into the kind of reverse payment from which *Actavis* might infer anticompetitive effects.

For example, consider a patent challenge with a 50 percent chance of success. A defendant facing \$100 million of potential damages for its past infringement might happily agree to settle for \$50 million to cap its liability and avoid the expense of trial. For similar reasons, the patent holder might prefer a guaranteed \$50 million over a chance of winning \$100 million, and trial costs are saved on its end, too. For both sides, a settlement like this one reduces uncertainty and expense. This is the traditional and perhaps least exciting kind of settlement, in which the parties strike a bargain somewhere in between the plaintiff’s best possible outcome and the defendant’s best possible outcome and avoid the expense and risks of trial.

But a court applying a broader definition of reverse payment might perceive trouble here. Comparing the \$50 million settlement to the \$100 million damages claim, the patent challenger has in fact received a \$50 million “discount” on its damages liability

³⁵⁶ See *In re Aggrenox Antitrust Litigation*, 94 F Supp 3d 224, 242 (D Conn 2015) (collecting cases).

³⁵⁷ See note 200 and accompanying text.

³⁵⁸ See Jonathan S. Masur, *The Use and Misuse of Patent Licenses*, 110 Nw U L Rev 115, 117–18 (2015) (describing the challenges of assessing patent damages).

in exchange for dropping the challenge. That is valuable consideration flowing from the patent holder to the challenger, and could constitute an implicit reverse payment, even as the currency transfer flows the other way. Once such a reverse payment is perceived, the *Actavis* framework would then give the parties the opportunity to explain why they settled for \$50 million rather than the full \$100 million. But the opinion itself offered only two acceptable answers: litigation costs avoided and services rendered.³⁵⁹ Neither can save the parties in this example. The litigation costs avoided might explain \$2 million of the implicit reverse payment,³⁶⁰ and there are no services rendered by the patent challenger, leaving the parties with an unexplained \$48 million reverse payment. And although the Court did not mention any other acceptable explanations for an apparent reverse payment, it did strongly suggest that the one the parties could truthfully give here—the uncertainties of prevailing at trial—would be a wrong answer.³⁶¹ In fact, it is exactly such payments to avoid the chance of losing at trial that the Court sought to discourage.³⁶²

This Article is not the first to observe that implicit reverse payments can be found in traditional settlements of cases involving claims for past damages.³⁶³ In fact, the *Actavis* Court was explicitly aware of this possibility, and claimed that it had no intention of disturbing the conventional understanding that such damages discounts were not a cause for antitrust concern.³⁶⁴ But there is reason to doubt the Court's commitment to this supposed distinction. First, its holding appears to open the door to this very result. Unless reverse payments are limited to cash transfers (a rule that could be easily circumvented³⁶⁵), the potential to perceive implicit reverse payments in cases involving damage claims

³⁵⁹ See *Actavis*, 133 S Ct at 2236; Edlin, et al, 28 *Antitrust* at 18 (cited in note 352); Eisenberg and Crane, 21 *Mich Telecomm & Tech L Rev* at 235–36 (cited in note 343).

³⁶⁰ See *AIPLA 2015 Report* at I-115 (cited in note 37) (reporting attorney's fees in Hatch-Waxman litigation).

³⁶¹ *Actavis*, 133 S Ct at 2236–37. See also Davis and McEwan, 67 *Rutgers U L Rev* at 578 (cited in note 343).

³⁶² *Actavis*, 133 S Ct at 2236.

³⁶³ See, for example, Marc G. Schildkraut, *Patent-Splitting Settlements and the Reverse Payment Fallacy*, 71 *Antitrust L J* 1033, 1048 (2004); Crane, 54 *Fla L Rev* at 776 (cited in note 206). See also *Asahi Glass Co v Pentech Pharmaceuticals, Inc.*, 289 F Supp 2d 986, 994 (ND Ill 2003).

³⁶⁴ *Actavis*, 133 S Ct at 2233. See also *id* at 2243 (Roberts dissenting).

³⁶⁵ See text accompanying notes 353–55.

is pervasive.³⁶⁶ So while the Court disclaimed any intention of capturing such settlements, the logical extension of its rule would seem to do exactly that. Second, and perhaps more tellingly, the Court does not explain *why* the traditional ability to settle damage claims at a discount should be preserved in the first place. If failure to litigate a claim results in a loss of potential competition, what difference does it make whether the settlement takes a more foreign or familiar form? On the Court's own reasoning, preserving the ability to settle patent cases in the traditional way seems rather arbitrary or, at best, like a nod to the need for incremental change.³⁶⁷

This is where the observations of the prior Part are significant—they can explain why parties should ever be permitted to settle patent claims, and for reasons that are more satisfying than preserving tradition alone. The simple answer is that patent settlements avoid significant costs, to the parties and others, and that the expected benefits for competition they forfeit are in many cases small to begin with. To be clear, this is not an answer the Court *would* give, in light of its long-standing assumption that patent challenges save the public from being “continually [] required to pay tribute to would-be monopolists without need or justification.”³⁶⁸ But as the prior Part discussed, patent challenges are not as reliably procompetitive as courts and commentators have assumed.

To illustrate, consider again the \$50 million settlement of the \$100 million damage claim introduced above. Everyone would agree that this damages discount is attributable to some question about the patent's scope or validity—in other words, there was *some* chance that the challenger might have won her case.³⁶⁹ But

³⁶⁶ This is not to say the result is inevitable. For example, Professor Michael Carrier has proposed a test that would distinguish between damage forgiveness and other compensation. See Carrier, 100 Iowa L Rev at 7 (cited in note 352). But this is Carrier's construction, not the Court's, and in any event he would still subject damage forgiveness to some level of scrutiny. *Id.* at 35, 44–47.

³⁶⁷ This tension did not escape the *Actavis* dissent, which noted, “[W]hen a patent holder licenses its product to a licensee[,] . . . surely it takes away some chance that its patent will be challenged by that licensee. According to the majority's reasoning, that's an antitrust problem that must be analyzed under the rule of reason.” *Actavis*, 133 S Ct at 2245 (Roberts dissenting). See also Crane, 54 Fla L Rev at 774–76 (cited in note 206) (concluding that the form of settlement cannot reliably distinguish pro- and anticompetitive agreements).

³⁶⁸ See *Actavis*, 133 S Ct at 2233, quoting *Lear*, 395 US at 670.

³⁶⁹ See *Actavis*, 133 S Ct at 2236.

contrary to *Actavis*,³⁷⁰ that does not mean that the purpose of the settlement was to maintain monopoly profits. In fact, without knowing significantly more, it is impossible to determine whether this settlement had any effect on competition at all. This could be a case of holdup, with the damages driven entirely by inadvertent infringement rather than the value of the underlying technology.³⁷¹ The technology could be obsolete by now; for that matter, the patent itself could be expired.³⁷² The challenger may have stood no chance of ever using the technology without infringing other rights of the patent holder, whether or not she had prevailed in this particular challenge.³⁷³ There could be any number of portfolio-level explanations and complications to the otherwise-simple tale of patent damages settled at a discount.³⁷⁴

The sobering conclusion here is that the analysis necessary to properly assess the competitive effects of patent settlements is substantially more complex than previously appreciated. Prior to *Actavis*, many courts had concluded that even inquiring into the likelihood of a patent challenge's success was too much to ask—that “[t]he antitrust game . . . would not be worth that litigation candle.”³⁷⁵ Indeed, the *Actavis* Inference itself was an attempt to avoid exactly such an undertaking.³⁷⁶ As Professors Rebecca Eisenberg and Daniel Crane have observed, “Everybody seems to agree that reviewing the merits is too much for the courts to swallow—they disagree only over whether the default position should be antitrust immunity or liability.”³⁷⁷

But the merits of a patent challenge are not even the half of it. To be sure, in order to accurately assess the competitive promise of a (settled) challenge, a court would indeed need to evaluate its likelihood of success.³⁷⁸ But it would also need to consider whether the challenged patent conferred forward-going market

³⁷⁰ See *id.*

³⁷¹ See text accompanying notes 96–98.

³⁷² See text accompanying notes 142–43.

³⁷³ See notes 111–20 and accompanying text.

³⁷⁴ See notes 124–38 and accompanying text.

³⁷⁵ *Actavis*, 133 S Ct at 2234.

³⁷⁶ See *id.* at 2236.

³⁷⁷ Eisenberg and Crane, 21 *Mich Telecomm & Tech L Rev* at 237 (cited in note 343). To be clear, Eisenberg and Crane are summarizing only the opinions of courts and the FTC; a number of commentators (including Crane) have suggested that antitrust courts will need to spend some time exploring the merits of the underlying patent claims. See, for example, Hovenkamp, Janis, and Lemley, 87 *Minn L Rev* at 1759–60 (cited in note 111); Crane, 54 *Fla L Rev* at 780–82 (cited in note 206).

³⁷⁸ See Part II.D.

power.³⁷⁹ It would need to evaluate whether a successful challenge would actually have reduced that market power.³⁸⁰ And it would need to assess the likely time frame in which any competitive benefits could have been obtained, had the claim proceeded.³⁸¹ Answering these questions would likely require inquiry not only into the strength of the challenged patent, but also into any number of overlapping and competing intellectual property rights as well.

All of this suggests extreme caution is in order when applying *Actavis*. The opinion left lower courts substantial discretion to fashion the presumptions and burdens of proof applicable in these cases.³⁸² If history is any guide, there is reason to fear that the long shadow of Hatch-Waxman may significantly affect how these rules develop, even if they apply to cases having nothing to do with Hatch-Waxman at all. Indeed, the *Actavis* Inference itself is rooted in assumptions that do not reliably hold outside the highly regulated and distinctive domain of pharmaceuticals. To avoid this result, courts should be mindful that Hatch-Waxman challenges are in many ways exceptional, and should announce presumptions only after giving extensive thought to how they will operate in the many industries in which the function of patents does not hew so closely to the theoretical models found in economics textbooks.

CONCLUSION

For nearly a century, courts have assumed that patent challenges benefit the public by increasing competition. This claim appears to be rooted in a belief that the patent system operates in practice as it is supposed to work in theory. But a wealth of recent scholarship has shown that the real-world operation of the patent system is significantly more nuanced than simple models of the economic effects of the patent system allow. When patents no longer function as binary monopoly-on/monopoly-off entitlements, the effects of removing patent rights become substantially more complicated.

This Article has described a number of ways that the assumptions underlying the simple models can fail. In identifiable categories of cases, the benefits of patent challenges for competition

³⁷⁹ See Part II.A.

³⁸⁰ See Part II.B.

³⁸¹ See Part II.C.

³⁸² See *Actavis*, 133 S Ct at 2237–38. See also Hovenkamp, 15 Minn J L Sci & Tech at 23–24 (cited in note 332).

may be small. In some cases, these benefits may not be available at all. Therefore, policies intended to increase competition by encouraging patent litigation may fail on their own terms if they do not yield the right kind of patent challenges. All patent cases are not created equal, and their significance for competition can change radically over time.

However, it is important to recognize the limits of the present analysis. First, as noted above, there may be other public benefits produced by patent challenges, and these benefits may justify policies to encourage litigation even in cases offering little (or no) chance of increasing competition. These alternative theories about the potential benefits of patent litigation are the subject of future study. As a result, this Article does not reach any conclusion about whether there is too much or too little patent litigation in general.

Finally, it should be emphasized that this Article evaluates the competitive effects of patent challenges, not *patents*. The fact that a particular patent challenge cannot affect competition does not mean that the underlying patent did not harm competition in the first place. For example, in the case of a challenge that fails to increase competition because it was resolved late in the patent's life, it is quite possible that the challenged patent caused a lot of harm to competition during its useful life—judicial scrutiny simply came too late to mitigate the damage. As a result, it would be wrong to equate skepticism of the value of patent litigation with skepticism of the value of patent examination. In fact, the limited ability of patent litigation to reduce the ex post costs of patent grants might suggest a need for *more* scrutiny prior to issuance by the Patent Office—another topic for future study.