

ARTICLE

“LOSER PAYS” IN PATENT EXAMINATION

*Neel U. Sukhatme**

ABSTRACT

Many scholars and practitioners believe there are too many “weak” patents—those that should not have issued but somehow get approved by the U.S. Patent and Trademark Office (PTO). To the extent they exist, such patents unnecessarily tax real innovation and generate welfare losses for society.

Some commentators have focused on the PTO’s failure to exclude weak patents, or the damage caused by these patents in litigation, often by patent trolls. But this scholarly discussion misses the point. The present Article argues that weak patents largely stem from a pricing problem: namely, a patent applicant pays higher patent fees when she succeeds (i.e., receives PTO approval) than when she fails (i.e., is rejected by the PTO).

The Article explains why such pricing is precisely backwards, penalizing good patent applications instead of bad ones. It then proposes a novel remedy: import “loser pays” concepts from litigation into patent examination. By forcing unsuccessful patent applicants to pay more, a loser-pays system disincentivizes weak applications and improves application quality.

* Associate Professor, Georgetown University Law Center. The author thanks Michael Abramowicz, Colleen Chien, Alan Devlin, Paul Janicke, D. Bruce Johnson, Bruce Kobayashi, Jonathan Masur, Adam Mossoff, Tejas Narechania, Lisa Larrimore Ouellette, Michael Risch, Mike Seidman, Gerry Spann, Russell Stevenson, David Super, Jay Thomas, Greg Vetter, David Vladeck, and Stephen Yelderman; participants at the 2016 Works-In-Progress Intellectual Property Colloquium at the University of Washington, PatCon6 at Boston College Law School, the George Mason Law and Economics Colloquium, and the Georgetown University Faculty Workshop; and Kapree Harrell for excellent research assistance. All errors are the author’s own.

The Article also describes how a loser-pays system could lower patent examiners' burden and discourage continuation applications, both of which slow down patent examination. In doing so, the Article sketches out a new patent system that is at once more efficient and more effective in weeding out weak patents.

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I. INTRODUCTION

Many scholars believe the U.S. patent system is not working as intended.¹ The purpose of this system, which dates back to the country’s founding,² is to incentivize innovation, by giving creators of new and useful inventions a period of exclusivity to prevent others from free-riding on their discoveries.³ But today’s patent system faces a number of vexing challenges. Patents often take many years to issue.⁴ Patent litigation can cost millions, if not tens of millions, of dollars.⁵ The presence of patent thickets—patches of dense, overlapping patent rights whose boundaries are difficult to discern—makes it difficult for businesses to know whether they will be sued if they commercialize a new innovation.⁶ And perhaps most saliently, non-practicing entities (NPEs, often called “patent assertion entities,” or more

1. See, e.g., DAN L. BURK & MARK A. LEMLEY, *THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT* 3–4 (2009); JAMES BESSEN & MICHAEL J. MEURER, *PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK* 11, 54 (2008); John R. Thomas, *Collusion and Collective Action in the Patent System: A Proposal for Patent Bounties*, 2001 U. ILL. L. REV. 305, 305 (2001) (“The patent system has reaped a dubious harvest from policies of the past decade.”); 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, 589–91 (1999); Cf. John M. Golden, *Proliferating Patents and Patent Law’s “Cost Disease,”* 51 HOUS. L. REV. 455, 457, 463 (2013) (arguing that claims of a patent “crisis” might be overstated).

2. See U.S. CONST. art. I, § 8, cl. 1, 8 (“The Congress shall have Power To . . . promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.”); see also Patent Act of 1790, ch. 7, 1 Stat. 109, 109–12 (Apr. 10, 1790) (repealed 1793) (first federal patent act).

3. See 35 U.S.C. § 271(a) (2012) (enabling a patentee to prohibit others from making, using, selling, offering for sale, or importing the patented invention in the United States).

4. The average time from patent application filing to issuance has ranged from two to four years. See, e.g., Mark A. Lemley & Kimberly A. Moore, *Ending Abuse of Patent Continuations*, 84 B.U. L. REV. 63, 71 (2004) (finding average pendency of 2.47 years for patents issued between 1976 and 2000); see also Dennis Crouch, *Patent Pendency Time Series and Why Care About Prosecution Delays*, PATENTLY-O (Sept. 10, 2012), <http://www.patentlyo.com/patent/2012/09/patent-pendency-time-series-and-why-care-about-prosecution-delays.html> [<http://perma.cc/7UMA-8QCG>] (median pendency steadily increased to a peak of over 3.6 years in 2009, and slightly declined to about 3.25 years in 2012).

5. See Christopher B. Seaman, *Reconsidering the Georgia-Pacific Standard for Reasonable Royalty Patent Damages*, 2010 BYU L. REV. 1661, 1725 (citing Am. Intell. Prop. L. Ass’n, *Report of the Economic Survey 2009* at I-129 (2009)). For suits where the amount at risk was between \$1 million and \$25 million, average patent litigation costs were about \$3.1 million. *Id.*

6. See, e.g., Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting*, in 1 INNOVATION POLICY AND THE ECONOMY 119, 120–21 (Adam B. Jaffe et al. eds., 2001) (defining a patent thicket as “a dense web of overlapping intellectual property rights that a company must hack its way through in order to actually commercialize new technology”).

notoriously, “patent trolls”) file lawsuits that hold-up business and arguably tax real innovation.⁷

Many commentators believe these problems stem from the presence of “weak” or “bad” patents. Although definitions vary, most commentators agree that weak patents are those that, when examined closely, do not meet the statutory requirements of patentability but nonetheless somehow received approval by the U.S. Patent and Trademark Office (PTO).⁸

To the extent they exist, weak patents are problematic because they serve no socially useful purpose.⁹ The whole point of patents is to incentivize innovation by allowing individuals and companies to recoup the fixed costs incurred in inventing and commercializing new products and services by giving them a limited term monopoly.¹⁰ Because weak patents are not legitimate “inventions,” there is no reason to grant a legal monopoly for these creations.

Moreover, scholars have documented the myriad costs that weak patents can impose on society. These include: costs borne by patent examiners who wade through piles of bad patent

7. See generally Robert P. Merges, *The Trouble with Trolls: Innovation, Rent-Seeking, and Patent Law Reform*, 24 BERKELEY TECH. L.J. 1583, 1586–88 (2009). NPEs are technically different from patent assertion entities (PAEs). NPEs do not necessarily assert patents against others; they just do not practice the patents they own. James Bessen & Michael J. Meurer, *The Direct Costs from NPE Disputes*, 99 CORNELL L. REV. 387, 387 (2014). On the other hand, PAEs’ main goal is to assert patents they do not practice against alleged infringers.

8. See, e.g., Stephen Yelderman, *Improving Patent Quality with Applicant Incentives*, 28 HARV. J.L. & TECH. 77, 78, 82–83 (2014) (“Over the last decade, legal scholars from every corner have come forward to decry the unacceptably high number of invalid patents issued by the U.S. Patent and Trademark Office (‘USPTO’) and to suggest reforms to reduce it.”); Jonathan S. Masur, *Costly Screens and Patent Examination*, 2 J. LEGAL ANAL. 687, 687 (2010) (“Due in large part to the incentives the PTO places upon its own employees, patent office review has acquired a reputation as an extremely poor screen against non-novel or otherwise invalid patents.” (citations omitted)); Jay P. Kesan, *Carrots and Sticks to Create a Better Patent System*, 17 BERKELEY TECH. L.J. 763, 765 (2002).

9. Some scholars have argued that evidence of a weak patents “problem” is equivocal. For example, Adam Mossoff has noted that while bad actors have always existed in the patent system, “whether such bad actors exist in large enough numbers today to cause a breakdown in the patent system requiring a systemic intervention via legislation or regulation is an entirely different question—and it is a question that remains largely unanswered.” *Demand Letters and Consumer Protection: Examining Deceptive Practices by Patent Assertion Entities: Hearing Before the Subcomm. on Consumer Prot., Prod. Safety, and Ins. of the S. Comm. on Commerce, Sci., and Transp.*, 113th Cong. 36 (2013) (Statement by Adam Mossoff, Professor of Law). Regardless, the “loser pays” proposal described here will improve patent application quality even if weak patenting does not rise to the level of a systemic problem.

10. BESSEN & MEURER, *supra* note 1, at 88.

applications;¹¹ costs borne by companies and market participants who face suit from weak patentees and must spend wastefully to avoid such suits;¹² costs borne by society at large due to problems such as patent thickets and frivolous patent litigation;¹³ and costs borne by consumers who have to pay supra-competitive prices if a weak patentee is able to leverage her patent to exercise market power.¹⁴

Scholars have generated a number of explanations for the presence of weak patents. Many of these theories focus on the details of the PTO examination process. For example, numerous scholars have suggested that patent applicants' ability to file endless continuation applications, which precludes the PTO from finally rejecting a patent application, have led to a proliferation of weak patents.¹⁵ Others argue the PTO has insufficient time and resources to adequately review applications.¹⁶ And Michael Frakes and Melissa Wasserman posit that the way the PTO is financed might incentivize it to overgrant patents in certain technology areas.¹⁷

11. Lemley & Moore, *supra* note 4, at 74.

12. See, e.g., ADAM B. JAFFE & JOSH LERNER, *INNOVATION AND ITS DISCONTENTS*, 29–31 (3d prtg. 2007) (tracing the tremendous increase in patent applications, patent issuances, and patent litigation suits to the creation of the U.S. Circuit Court of Appeals for the Federal Circuit in 1982, which hears all patent appeals, and changes in how the PTO was financed in the early 1990s).

13. See, e.g., Shapiro, *supra* note 6, at 124; Stuart J.H. Graham & Ted Sichelman, *Why Do Start-Ups Patent?*, 23 *BERKELEY TECH. L.J.* 1063, 1068 (2008) (“[Because] patent litigation is uncertain, costly, and takes a long time to resolve[,] . . . patentees with weak patents are able to exploit the patent system by suing, or even by simply threatening to sue, their competitors.”).

14. Cf. Graham & Sichelman, *supra* note 13, at 1071 (“[T]he most common explanation for why patentees file is to protect their ability to maintain supra-competitive prices on their products and services.”). These costs include downstream effects, as improperly granted patents can stifle follow-on innovation. See, e.g., Alberto Galasso & Mark Schankerman, *Patents and Cumulative Innovation: Causal Evidence from the Courts*, 130 *Q.J. ECON.* 317, 320–23 (2015) (taking advantage of random assignment of federal circuit judges to empirically measure the effect of patent invalidation on subsequent innovation); Bhaven Sampat & Heidi L. Williams, *How Do Patents Affect Follow-On Innovation? Evidence from the Human Genome* (Nat'l Bureau of Econ. Research, Working Paper No. 21666, 2015).

15. Lemley & Moore, *supra* note 4, at 68, 74–75; see also *id.* at 105–18 (suggesting ways to curb patent continuations).

16. See, e.g., Michael D. Frakes & Melissa F. Wasserman, *Is the Time Allocated to Review Patent Applications Inducing Examiners to Grant Invalid Patents?: Evidence from Micro-Level Application Data 4*, 19–20 (Nat'l Bureau of Econ. Research, Working Paper No. 20337, 2014) (empirically finding that examiners have insufficient time to search for relevant prior art and reject patent applications).

17. See Michael D. Frakes & Melissa F. Wasserman, *Does the U.S. Patent and Trademark Office Grant Too Many Bad Patents? Evidence from a Quasi-Experiment*, 67

Other scholars have suggested the perceived increase in weak patents stems from unnecessary expansions in what constitutes patentable subject matter. For example, some have suggested that weak patents have increased due to the rise of business method and software patents,¹⁸ as well as the use of “functional claiming” for such inventions.¹⁹ Others suggest more generally that the patentable subject matter inquiry has strayed too far from patent law’s utilitarian underpinnings.²⁰

Commentators have also focused on how deficiencies in the patent litigation process can empower weak patentees and increase the damage they cause.²¹ Much of this discussion relates to patent trolls, who arguably hold up legitimate innovation by suing and seeking settlements from businesses that have incurred large fixed costs in creating products.²² Indeed, some scholars have suggested that patent trolls disproportionately use weak patents to achieve their goals.²³

But most of the scholarly discussion on weak patents glosses over a fundamental point: weak patents stem from weak patent applications.²⁴ So why do people file weak

STAN. L. REV. 613, 635, 644–45 (2015) (uses natural experiment to measure whether PTO’s inability to finally reject patent applications leads to patent overgranting).

18. See, e.g., Thomas, *supra* note 1, at 306 (“This chorus of complaints [about weak patents] enjoys an increasing resonance with regard to business methods, computer software, and other inventions that until recently were believed without the patent system.”); Kesan, *supra* note 8, at 765 (noting that the PTO’s “inability to accurately determine the scope of information that is already in the public domain or is the subject of other patents” is particularly problematic “in areas such as computer software where identifying the relevant prior art is often difficult”).

19. See Mark A. Lemley, *Software Patents and the Return of Functional Claiming*, 2013 WIS. L. REV. 905, 907, 911–12 (2013) (explaining resurgence of functional claiming, where “software patentees have increasingly been claiming to own the function of their program, not merely the particular way they achieved that goal”).

20. See, e.g., David S. Olson, *Taking the Utilitarian Basis for Patent Law Seriously: The Case for Restricting Patentable Subject Matter*, 82 TEMP. L. REV. 181, 189, 215 (2009) (“The extension of patentability to new areas of innovation—some of which likely do not need the additional incentive—causes problems for the patent system in another way: it overburdens the patent office and, correspondingly, the PTO issues more bad patents.”); see also Alan Devlin & Neel Sukhatme, *Self-Realizing Inventions and the Utilitarian Foundation of Patent Law*, 51 WM. & MARY L. REV. 897, 939–45 (2009) (arguing against patent protection for certain types of business method patents).

21. See, e.g., R. Polk Wagner, *Understanding Patent-Quality Mechanisms*, 157 U. PA. L. REV. 2135, 2141–42 (2009) (“Perhaps the most obvious consequence of low patent quality is the increase in litigation observed over the past decade or so—both in terms of raw filings and ‘litigation intensity,’ gauged by the number of suits filed per in-force patent.”); Masur, *supra* note 8, at 691–92.

22. See Merges, *supra* note 7, at 1590–91.

23. See *infra* note 42 and accompanying text.

24. A notable exception is a recent article by Stephen Yelderman that focuses on ways to alter applicant incentives to improve patent application quality. See generally Yelderman, *supra* note 8.

applications? And how can we stop such applications from being filed or granted?

The present Article recognizes that the current patent system inadvertently encourages the filing of weak applications due to an anomaly in how the PTO charges patent application fees. In particular, the Article recognizes a pricing problem: a successful patent applicant—that is, one who succeeds in obtaining a patent—ends up paying more fees than if he were unsuccessful and his application were rejected by the PTO. This pricing is precisely backwards: instead of supporting patent “winners” we are subsidizing patent “losers.”²⁵ As explained below, such a policy has little merit from an economic standpoint.

The Article then addresses this problem with a novel solution: we should incorporate loser-pays principles into patent examination. Put plainly, weak patent applications impose social costs and generate few social benefits. Such applications, which are more likely to fail the patent review process, should cost patent applicants significantly more money than they do currently. Because weak patent applications are less likely to pass PTO scrutiny than strong ones, by charging more to unsuccessful applicants we can disincentivize weak applications from being filed in the first place.²⁶ And by using payments from “loser” applicants to subsidize “winner” applicants, we can

25. Of course the word “loser” as used here is not intended to cast any moral aspersion on these patent applicants—rather, it is simply a standard term borrowed from litigation to identify a class of applicants who should pay heightened patent fees under this proposal. The Article also deals with the issue of “undeserved losers”—those whose application was improperly denied. *See infra* notes 122–23 and accompanying text.

26. The Article’s novel proposal builds on previous scholarship related to patent fees and application quality. For example, Jay Thomas has argued that weak applications could be deterred by awarding a bounty to third parties who successfully challenge the validity of pending applications, with this bounty funded by a penalty paid by the applicant. *See generally* Thomas, *supra* note 1. Bernard Caillaud and Anne Duchêne present a technical model of patent prosecution, showing formally the potential benefits of introducing penalties for rejected applications. *See* Bernard Caillaud & Anne Duchêne, *Patent Office in Innovation Policy: Nobody’s Perfect*, 29 INT’L J. INDUS. ORG. 242, 243, 247–48 (2011); Jing-Yuan Chiou, *The Patent Quality Control Process: Can We Afford an (Rationally) Ignorant Patent Office?* 13–14 (May 1, 2008) (unpublished manuscript) (http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1099948 [<http://perma.cc/54ZY-YK> T4]) (mentioning that application fees can be used to deter weak patents); *see also* Alan C. Marco & James E. Prieger, *Congestion Pricing for Patent Applications* 2–3 (Aug. 3, 2009) (unpublished manuscript) (http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1443470 [<http://perma.cc/M2XW-NHBC>]) (proposing increase in application fees when there is a backlogged queue of applications). More recently, Stephen Yelderman focuses on applicant incentives and suggests requiring applicants to post completion bonds to deter amendment or cancellation of patent claims. *See* Yelderman, *supra* note 8, at 120–21; *see also* Masur, *supra* note 8, at 687 (arguing that the high cost of obtaining a patent “will disproportionately select against patents that are harmful to overall social welfare, while leaving beneficial patents almost entirely untouched”).

further incentivize the filing of better applications. Importantly, such a system will improve application quality, regardless whether we think weak patents rise to the level of a systemic problem.²⁷

In describing the merits of a loser-pays system, the Article explains how loser pays would deter two types of low-quality patent applications: those that would have been rejected anyway and those that would have resulted in weak patents. By deterring the former group, a loser-pays system relieves patent examiners from having to waste time on poor quality applications that they would have rejected anyway. By deterring the latter group, loser pays turns the uncertainty of patent approval into an efficiency-enhancing chilling effect, by stemming the inflow of applications that would have become weak patents.

Moreover, the additional revenue raised from patent “losers” could be used to subsidize patent “winners,” such as by lowering fees when a patent issues. The Article describes a number of ways to structure this subsidy. For example, the subsidy amount could depend on the ratio of winners to losers within an invention classification. Accordingly, successful applications in a field filled with bad applications would receive a larger subsidy. Such an approach would allow loser pays to have the most bite in areas in which weak patent applications are the most problematic.

The Article also explains how loser pays is especially advantageous when it is imported into an *ex parte* context or application setting, such as patent examination. For example, while loser pays might encourage strategic behavior by parties in traditional lawsuits, these concerns are absent in *ex parte* proceedings. As the Article details, a loser-pays, *ex parte* system merely forces an unsuccessful patent applicant to internalize a negative externality that it is imposing on others.

More fundamentally, loser pays could positively shape *ex ante* applicant behavior. In particular, the Article discusses how loser pays gives potential applicants who are uncertain of the quality of their invention more incentive to assess quality before filing. By incentivizing such information gathering, loser pays will further increase the quality of filed applications. Moreover, the Article explains why a loser-pays system would be more effective in disincentivizing weak applications than merely raising front-end patent fees for all applicants.

The Article proceeds as follows. Section II briefly surveys the leading theories on weak patents, focusing on patent

27. See generally Mossoff, *supra* note 9.

examination, patentable subject matter, and litigation. Section III identifies the essential pricing problem—namely, the PTO’s de facto “winner pays” system of patent fees. This section explains why such a pricing scheme does not make economic or policy sense.

Section IV proceeds to review the economics of loser pays and explains its special virtues in ex parte proceedings and application settings. Section V then describes how loser pays could be incorporated into patent examination and discusses how recent passage of the America Invents Act might empower the PTO to implement loser pays without further congressional authorization. Section VI highlights potential pitfalls to avoid and features for policymakers to customize. Section VII concludes.

II. EXISTING THEORIES ON WEAK PATENTS

Many (though not all) scholars believe the presence of weak patents is one of the most pressing problems facing the U.S. patent system today.²⁸ But they differ greatly on the proximate causes of this problem. This section briefly surveys the various dimensions of this scholarly discussion, which has focused largely on ineffective patent examination, overly expansive patentable subject matter, and inefficient patent litigation.

A. *Ineffective Examination*

A common refrain is that the U.S. Patent and Trademark Office does an inadequate job screening out weak patents.²⁹ Some scholars believe this is because examiners have insufficient time and/or resources to conduct a proper examination.³⁰ PTO examiners are allotted an average of 19 hours to review a patent application, from beginning to end.³¹ This is likely insufficient to determine whether the application meets the statutory standards

28. See *supra* note 9.

29. See, e.g., Kesan, *supra* note 8, at 765 (“Much of [the] criticism [of the PTO] is directed at the quality of the patents that are granted by the Patent Office. It is widely suggested that the Patent Office issues patents that are either ‘facially’ invalid or broader than the actual innovation disclosed in the patent application.”); see also Matthew Sag & Kurt Rohde, *Patent Reform and Differential Impact*, 8 MINN. J.L. SCI. & TECH. 1, 2, 8 (2007) (“The United States patent system is facing a crisis of confidence. There is a widespread perception that changes in the standards of patentability, the increasing importance of the information economy and the sheer volume of applications before the United States Patent and Trademark Office (Patent Office) have combined to overwhelm the patent system.”).

30. See Frakes & Wasserman, *supra* note 16, at 8.

31. *Id.*

of patentability—most notably, whether it is novel and nonobvious. This problem is likely to be more acute for complicated technologies, such as in software or biotechnology.³² Since it might be easier for an examiner just to approve an application than finally reject it, insufficient review time might lead to weak patent approvals.³³

So if we want to improve the PTO's ability to reject weak patent applications, we might want to reform the examination process and, in particular, allocate more resources to examiners. This would give them more time to catch weak applications. But perhaps this would be a waste—as Mark Lemley has noted, since very few issued patents ever make it to litigation, it makes less sense to greatly increase spending up front on patent examination and more sense to try and improve the patent litigation process.³⁴

Moreover, the fundamental problem might not lie with the examiners at all, as weak patentability standards might be the underlying cause of weak patents. In particular, some scholars have favored combatting weak patents by raising the standard of nonobviousness—the requirement that an invention be nonobvious at the time it was invented to a person having ordinary skill in the relevant field of invention.³⁵

Although each of these approaches may reduce the number of weak patents, they all rely on the PTO to change its behavior.

32. See *id.* at 3 (using fact that allotted examination times decrease when examiners receive certain promotions to empirically assess the effect of a time crunch on the quality of examiner review); see *id.* at 2 n.3 (interviewing examiners about the time crunch, and as one noted “rather than doing what I feel is ultimately right, I’m essentially fighting for my life”); see also Olson, *supra* note 20, at 189–90.

33. This is because the United States, unlike other prominent patent jurisdictions, allows patent applicants to file unlimited continuation applications to keep prosecution going after a “final” rejection. Lemley & Moore, *supra* note 4, at 68. Many scholars have argued in favor of limiting or eliminating continuation applications to end this practice. See, e.g., *id.* at 93–94.

34. Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1496, 1501 (2001) (“Because so few patents are ever asserted against a competitor, it is much cheaper for society to make detailed validity determinations in those few cases than to invest additional resources examining patents that will never be heard from again. In short, the PTO doesn’t do a very detailed job of examining patents, but we probably don’t want it to.”).

35. As Gregory Mandel colorfully explains: “A dark storm is brewing around the core requirement that an invention be non-obvious to receive a patent. A loud, nearly universal, chorus contends that decision-makers apply the nonobviousness standard too leniently, allowing patent monopolies on trivial innovations with devastating effects.” Gregory Mandel, *The Non-Obvious Problem: How the Indeterminate Nonobviousness Standard Produces Excessive Patent Grants*, 42 U.C. DAVIS L. REV. 57, 59, 63–64 (2008). But see *id.* at 60 (using a model to argue that “the recent perceived surge in patent grants on obvious inventions may result not from too low a nonobviousness standard, but from an indeterminate nonobviousness requirement”).

As discussed later in this Article, a more powerful approach would be to change incentives so that applicants are less likely to file weak patent applications in the first place.

B. *Overly Expansive Patentable Subject Matter*

In recent years, many patent scholars have turned their attention to a fundamental question: should certain invention categories be eligible for patent protection in the first place?³⁶ The patentable subject matter debate has increased in ferocity over the past few years, driven in large part by the perceived rise of weak patents in software and business methods,³⁷ and the questionable activities of patent trolls. This debate is not just academic, as the U.S. Court of Appeals for the Federal Circuit (which hears all patent appeals) and the U.S. Supreme Court have increasingly suggested that whole categories of inventions might be non-patentable.³⁸ Indeed, the future of medical diagnostic methods,³⁹ business methods, and software as patentable subject matter is in significant doubt.⁴⁰

It is unclear where the current movement to curb patentable subject matter will end up. Even though weak patents pose significant costs, it is possible that limiting patentable subject matter might be a treatment that is worse than the disease. And even if narrowing patentable subject matter reduces the number of weak patents, it will only do so for those patents in the subject

36. See, e.g., Devlin & Sukhatme, *supra* note 20, at 909–10; Olson, *supra* note 20.

37. Companies began filing business method patents in increasing numbers after the Federal Circuit’s seminal *State Street Bank* decision in 1998. Devlin & Sukhatme, *supra* note 20, at 907; see also *State St. Bank & Tr. Co. v. Signature Fin. Grp.*, 149 F.3d 1368 (Fed. Cir. 1998).

38. See, e.g., Olson, *supra* note 20, at 185 (discussing the Federal Circuit’s limitation of patentable subject matter); see also Jasper L. Tran, *Software Patents: A One-Year Review of Alice v. CLS Bank*, 97 J. PAT. & TRADEMARK OFF. SOC’Y 532, 541–42 (2015) (estimating the majority of software patents are now invalid under *Alice*).

39. See *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1294 (2012) (unanimously holding that a diagnostic process that used a metabolite level cutoff to determine whether dosage level was too high or too low was an unpatentable natural law); see also *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1373, 1378 (Fed. Cir. 2015) (applying *Mayo* and finding as unpatentable a method that determined fetal characteristics by collecting cell-free fetal DNA in maternal plasma and serum).

40. See *Alice Corp. Pty. v. CLS Bank Int’l*, 134 S. Ct. 2347, 2355–57 (2014) (holding that a computerized escrow service for facilitating financial transactions was an abstract idea not eligible for patent protection). Interestingly, changes to patent eligibility requirements might also affect patent prosecutors by altering the legal malpractice claims that might be brought against them. See, e.g., *Encyclopaedia Britannica, Inc. v. Dickstein Shapiro LLP*, 128 F. Supp. 3d 103, 110–11 (D.D.C. 2015), *aff’d*, No. 15-7100, 2016 WL 3545138 (D.C. Cir. June 10, 2016) (awarding judgment on the pleadings to a patent law firm in a legal malpractice case where the firm missed a prosecution deadline because the underlying invention was not patent-eligible).

areas that are limited. For example, if the Supreme Court eventually eliminates all software patents, that would not directly affect weak patents in other areas.

C. Inefficient Litigation

Whatever problems might exist in examination have likely been exacerbated by inefficiencies in patent litigation. Patent infringement suits are among the most expensive and contentious of all legal cases. According to a 2009 study, the average patent infringement suit with at least \$25 million at stake had \$6.25 million in attorneys' fees.⁴¹ And the number of such suits has greatly increased over the past twenty years.⁴²

This focus on litigation, in turn, inevitably turns toward patent trolls—patent-owning companies that do not practice the underlying inventions but seek to stop or obtain licensing payments from others who arguably practice the inventions. Some scholars associate patent trolls with the problem of weak patents. For example, John Allison, Mark Lemley, and Joshua Walker have shown that NPEs tend to assert weak patents, noting that the most litigated patents include ones owned by NPEs, and that these patents are most likely to fail when taken to a judgment.⁴³

Although reforming patent litigation rules could substantially reduce problems with weak patents, it is unlikely to be a total fix. Indeed, weak patents that are not litigated could still cause potential damage, as applicants are unsure whether they will ever be sued.⁴⁴ Moreover, problems such as patent thickets will likely not be resolved by fixing patent litigation alone.

41. See Seaman, *supra* note 5, at 1725 (citing Am. Intell. Prop. L. Ass'n, *Report of the Economic Survey 2009* at I-129 (2009)).

42. See, e.g., JAFFE & LERNER, *supra* note 12, at 29–31.

43. John R. Allison, Mark A. Lemley & Joshua Walker, *Patent Quality and Settlement Among Repeat Patent Litigants*, 99 GEO. L.J. 677, 680–81, 692–93 (2011). Cf. George L. Priest & Benjamin Klein, *The Selection of Disputes for Litigation*, 13 J. LEGAL STUD. 1, 17–24 (1984) (predicting that plaintiff win rates should be near 50% in cases that go to trial, which are cases in which divergent expectations of parties are sufficiently large to prevent settlement). Brian Love has also observed that NPEs disproportionately allege infringement based on patents (often software patents) that are nearing expiration. 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, 1312, 1328–29, 1342–44 (2013). Software patents also seem more likely to be obsolete toward the end of their term, suggesting that many such suits might not be related to technology that existed when the patent was first issued. *Id.* at 1342.

44. See Wagner, *supra* note 21, at 2140 (noting uncertainty costs associated with too weak patents).

III. THE PROBLEM WITH PATENT PRICING

The previous section explained how the weak patents discussion has largely centered on problems encountered during patent examination and litigation—after a patent has issued. But scholars have largely neglected an antecedent point: weak patents stem from weak patent applications.⁴⁵ Indeed, such applications might be weaker than the underlying patent, since patent claims are often narrowed and clarified during prosecution in response to rejections from a patent examiner.⁴⁶

So we should ask: do current PTO policies encourage the filing of weak applications? Unfortunately, the answer is “yes.” As this section explains, the PTO’s current pricing system is de facto “winner pays,” where an applicant who succeeds in obtaining a patent pays higher fees than if that applicant had failed to obtain patent protection. This fee structure increases the prevalence of weak patents.

A. PTO Financing and Patent Fees

The PTO is financed in an unusual way. Unlike most other government agencies, the PTO depends on fees from its users (patent applicants and patentees) to fund its operations,⁴⁷ which are principally patent examination costs.⁴⁸ Accordingly, Congress (which historically has set these fees) and the PTO (which recently gained the power to adjust any patent fee) must decide on a fee structure that raises sufficient revenue to cover the PTO’s expenses.⁴⁹

45. *But see* Yelderman, *supra* note 8, at 88–89 (focusing on weak patent application problem); *see also* Michael Abramowicz & John F. Duffy, *Ending the Patenting Monopoly*, 157 U. PA. L. REV. 1541, 1543–44, 1604 (2009) (proposing system of private patent examining firms, where the USPTO could randomly audit and fine firms that approve low quality patents); Wagner, *supra* note 21, at 2171 n.91 (noting that Abramowicz and Duffy use fines “to police poor quality prosecution providers rather than patentees themselves, but there is of course no reason that the basic structure of their approach could not be applied [to patentees as well]”); *see also id.* at 2146 (observing that “low patent quality” stems from “incentives that encourage patentees to draft patent applications that effectively obscure the true scope of the invention and its relationship to the prior art”).

46. *See* Thomas D. Brainard, *Patent Claim Construction: A Graphic Look*, 82 J. PAT. & TRADEMARK OFF. SOC’Y 670, 673–74 (2000).

47. *See* U.S. PATENT & TRADEMARK OFFICE, PERFORMANCE AND ACCOUNTABILITY REPORT FISCAL YEAR 2012, at 9 (2012), <http://www.uspto.gov/about/stratplan/ar/USPTOFY2012PAR.pdf> [<http://perma.cc/6QQA-X4LM>] [hereinafter 2012 PTO REPORT]. The PTO became fully dependent on user fees in 1990 as part of the Omnibus Budget Reconciliation Act (OBRA), Pub. L. No. 101-508, 104 Stat. 1388, 1388–91 (1990). *Id.*

48. 2012 PTO REPORT, *supra* note 47, at 72.

49. Leahy–Smith America Invents Act, Pub. L. 112-29, § 10, 125 Stat. 284, 316 (2011); H.R. REP. NO. 112-98, at 49 (2011). In particular, the PTO gained the power to set

Every applicant must pay at least some fees to the PTO, whether their application finally issues into a patent or not. Other fees must be paid only by those who successfully obtain a patent. As shown below, it is this dynamic, combined with the PTO's unusual financing structure, that creates a system of "winner pays" pricing for patents.

1. *Front-End Fees and RCEs.* The first fees that all patent applicants must pay are known as "front-end fees."⁵⁰ Although the PTO breaks these fees into three categories ("filing," "search," and "examination"), all three are required and due upon filing.⁵¹ These fees must be paid regardless whether one's application succeeds or fails.

Front-end fees are intended to pay for patent examination—namely, the process by which the PTO determines whether an application meets the statutory criteria for patentability.⁵² In reality, however, "the Office sets basic 'front-end' fees . . . below the actual cost of carrying out [patent examination]."⁵³ Not surprisingly, then, front-end fees are relatively low—\$1,600, even though the estimated average total cost of examining a utility patent application in 2011 was \$3,569.⁵⁴

or adjust any patent fee as part of the America Invents Act (AIA). See Leahy-Smith America Invents Act, Pub. L. 112-29, § 10, 125 Stat. 284, 316 (2011).

50. Any reference to "patent" in this Article refers to utility patents. The PTO does issue two other kinds of patents (design and plant), but the vast majority of patented inventions receive utility patents. See 35 U.S.C. §§ 161, 171 (2012); see, e.g., U.S. PATENT AND TRADEMARK OFFICE, U.S. PATENT STATISTICS CHART, Calendar Years 1963–2015, http://www.uspto.gov/web/offices/ac/ido/oeip/taf/us_stat.htm [<http://perma.cc/7K2R-LZ3G>] (showing that utility applications comprised over 94% of patent filings and grants in 2014).

51. See 35 U.S.C. § 41; MPEP § 607 (9th ed. Rev. 7, Nov. 2015).

52. In particular, an invention that covers patentable subject matter must be useful, novel, and nonobvious to a person having ordinary skill in the relevant art. 35 U.S.C. §§ 101–03. Showing that a patent is useful (also called the "utility" requirement) is not a significant barrier for most applicants. Applicants generally need only show the invention has some minimal benefit and could at least theoretically be used. See Nathan Machin, *Prospective Utility: A New Interpretation of the Utility Requirement of Section 101 of the Patent Act*, 87 CAL. L. REV. 421, 426, 433 (1999). An invention typically lacks novelty if it was described in an earlier-filed patent or published patent application with another inventor, or if it was "patented, described in a printed publication, or in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention." 35 U.S.C. § 102(a)(1) (2012). Nonobviousness is often the toughest hurdle for patent applicants to surmount, and has been called the "ultimate condition of patentability." See, e.g., Jeanne C. Fromer, *The Layers of Obviousness in Patent Law*, 22 HARV. J.L. & TECH. 75, 75 (2008) (citing NONOBVIOUSNESS—THE ULTIMATE CONDITION OF PATENTABILITY (John F. Witherspoon ed., 1980)).

53. Setting and Adjusting Patent Fees, 78 Fed. Reg. 4212, 4216 (Jan. 18, 2013) (to be codified at 37 C.F.R. pts. 1, 41, and 42).

54. The PTO recently increased front-end fees for utility patents from \$1,260 to \$1,600 in 2013 by exercising new fee-setting authority granted to it under the America Invents Act. *Id.* at 4227.

Patent applicants might also pay other fees during prosecution.⁵⁵ For example, an examiner often issues a “final office action” that rejects an application. But a final office action is not really final. Rather, an applicant can always continue prosecuting her application by filing a request for continued examination (RCE) and paying the associated fee.⁵⁶ Doing so repeatedly allows the applicant to continue prosecution indefinitely,⁵⁷ perhaps until she has sufficiently worn down the examiner or persuaded him the invention is patentable.⁵⁸ Both unsuccessful applicants and ones who are eventually successful might decide to pay RCE fees during prosecution.⁵⁹

Like front-end fees, the PTO subsidizes RCE fees. Until recently, RCE fees were \$930 for each RCE that an applicant chose to file.⁶⁰ This was significantly below the “average historic cost of performing the services associated with an RCE (\$1,882)[.]”⁶¹ Perhaps mindful of this disparity, the PTO increased fees in 2013 to \$1,200 for the first RCE and \$1,700 for any subsequent RCE.⁶² Still, this fee structure maintains a “subsidization design” to keep the price for first RCEs at about 75% of their processing cost.⁶³

Why does the PTO subsidize front-end fees and RCE fees? It explains that doing so “enables the Office to provide lower costs to enter the patent system, making it easier for inventors to pursue patents for their innovations . . . [which in turn] foster[s]

55. Applicants often incur extension fees when they take longer than the statutory minimum time to respond to the patent application. *See* 37 C.F.R. § 1.17(a) (2015) (\$200 fee for one-month extension, \$600 fee for two-month extension, and \$1,400 fee for three-month extension).

56. In 2013, the PTO exercised its authority under the America Invents Act and increased RCE fees to \$1,200 for the first request and \$1,700 for each subsequent request. *See* Setting and Adjusting Patent Fees, 78 Fed. Reg. at 4228–29. Prior to that, RCE fees were \$930 for each request (whether first or subsequent). *Id.* So the cost for filing an RCE is at most slightly more than the initial front-end fees.

57. *See supra* note 33.

58. Alternatively, an applicant who faces a final rejection can appeal to the Patent Trial and Appeal Board. *See* 35 U.S.C. § 134(a) (2012). The current fee for such an appeal is \$800, with an additional \$1,300 due upon requesting an oral argument before the Board. *See* 37 C.F.R. § 41.20(b)(1)–(b)(3) (2013).

59. This might be a category of fees that weak applicants are more likely to pay, since their applications might be more likely to receive final rejections and hence require RCEs. *See* Yelderman, *supra* note 8, at 82–83. Still, any given applicant pays more total fees if her application eventually ripens into a patent as compared to if her application fails and is abandoned.

60. Setting and Adjusting Patent Fees, 78 Fed. Reg. at 4224. As of 2013, about 30% of applicants who filed an RCE filed two or more RCEs. *Id.* at 4229.

61. *Id.* at 4245.

62. *Id.* at 4224.

63. *Id.* at 4246.

innovation by facilitating access to the patent system.”⁶⁴ So by lowering front-end application fees, which both successful and unsuccessful patent applicants must pay, the PTO makes access to the patent system relatively inexpensive. To the extent we believe that patents incentivize innovation, having lower front-end fees should increase innovation.⁶⁵

2. *Back-End Fees.* Given the way the PTO is financed, having front-end fees and RCE fees that are below cost implies that the PTO must obtain additional revenue from someplace else. This revenue comes from back-end fees, which are paid only by successful patent applicants.⁶⁶

The first set of back-end fees are issue fees, which are due after the PTO sends a notice of allowance on claims in the application. Currently, issue fees are \$960,⁶⁷ which greatly exceeds the PTO’s estimated cost of \$257 in actually issuing a patent.⁶⁸ If the PTO does not approve a patent application, that applicant never has to pay an issue fee. So unsuccessful applicants never have to pay issue fees.

Next, after a patent issues, a patentee must pay periodic maintenance fees to prevent her patent from lapsing. Such fees are due at three-and-a-half, seven-and-a-half, and eleven-and-a-half years after patent issuance.⁶⁹ These fees are \$1,600, \$3,600, and \$7,400, respectively.⁷⁰ Since it costs the PTO virtually nothing to maintain a patent, these fees are priced well above cost.⁷¹ Maintenance fees, then, are another category of fees that successful patent applicants must pay to keep their patents from lapsing.⁷²

64. *Id.* at 4214 (emphasis omitted).

65. *See id.* at 4216; *see also* Neel U. Sukhatme, *Regulatory Monopoly and Differential Pricing in the Market for Patents*, 71 WASH. & LEE L. REV. 1855, 1885–86 (2014) (“[D]iscounting (whether hyperbolic or not) suggests that changes in front-end fees will affect potential patent applicants’ behavior more than similar changes to back-end fees.”).

66. *See* Setting and Adjusting Patent Fees, 78 Fed. Reg. at 4214 (“The [PTO’s] current fee structure includes statutory fees (set by Congress) that provide lower, below cost fees on the front end of the patent process (e.g., filing, searching, and examination fees), which are in turn balanced out by higher, above cost fees on the back end (i.e., issue and maintenance fees).”).

67. *See id.* at 4236.

68. *Id.* Until recently, this disparity was even greater—issue fees were \$1,770 until the PTO reduced them in 2013. *Id.*

69. *See* 35 U.S.C. § 41(b)(1)–(b)(2) (2012) (stating that patentees have up to six months to pay maintenance fees, so long as they pay a surcharge).

70. Setting and Adjusting Patent Fees, 78 Fed. Reg. at 4236.

71. *Id.* at 4237. In 2013, these fees were increased from \$1,150, \$2,900, and \$4,810, respectively. *Id.* at 4236–37.

72. *See id.* at 4237.

B. “Winner Pays” Pricing and Weak Patents

The presence of issue fees and maintenance fees is why a patent “winner,” whose application is approved, pays higher fees than if he had been a patent “loser.” But how does “winner pays” pricing encourage weak patent applications?

The answer lies in an asymmetry between weak and non-weak applications. In particular, each patent applicant always has an outside option: to abandon her application and curtail any costs going forward. This option is generally more valuable for weak applicants than non-weak ones.

To understand why, consider an individual with a marginal invention that he knows might not be patentable. This individual might rationally file a weak patent application, since the cost of failure is relatively low but the potential upside is high.⁷³ Indeed, given the low cost of filing and the non-zero chance that any application will be rejected, the applicant could file a number of related applications. Such an applicant might view each application probabilistically (like a lottery ticket)⁷⁴ and the whole slew of applications like assets in a portfolio.⁷⁵

If the individual is lucky, he might sneak one or more of his applications past an overworked or underprepared examiner, who misses relevant prior art and fails to reject the weak application. If the individual is unlucky, all he has lost are front-end application fees and the expense of preparing the application. He need not pay any back-end fees, and he is not punished for submitting a low-quality application. Moreover, the applicant can always exercise his option to abandon his

73. The potential upside may be high even for a marginal invention because it is often difficult for an outside party to assess how much a patent is worth, and hence, the patent might have high value in litigation or licensing. See Allison et al., *supra* note 43, at 710–11. This might be particularly problematic in more “abstract” inventive categories, such as software and business methods. *Id.* Moreover, an individual might have dozens or even hundreds of (potentially weak) patents, making the valuation problem significantly more complicated. The patentee could then leverage this stack of patents into a favorable settlement or licensing agreement, a practice that is likely the business model for many patent assertion entities.

74. See Mark A. Lemley & Carl Shapiro, *Probabilistic Patents*, J. ECON. PERSP., Spring 2005, at 75, 80–83; see also *id.* at 75 (“When a patent holder asserts its patent against an alleged infringer, the patent holder is rolling the dice. If the patent is found invalid, the property right will have evaporated.”).

75. See Gideon Parchomovsky & R. Polk Wagner, *Patent Portfolios*, 154 U. PA. L. REV. 1, 5–6, 27 (2005) (“The true value of patents inheres not in their individual worth, but in their aggregation into a collection of related patents—a patent portfolio.”). The incentives for multiple filings also stem to some extent from the fact that there is likely to be a significant fixed cost for filing one patent application, but lesser marginal costs for additional related applications, since large portions of the first application can be reused in subsequent filings. *Id.* at 52–53.

application and thereby not incur any more patent-related fees.

Contrast this applicant to an inventor who has an invention he truly believes is novel and valuable. Because he values his invention more highly, he is less likely to exercise his outside option to abandon. Rather, this applicant is more likely to pursue prosecution all the way through, and to pay any back-end fees required to issue and maintain his patent.

In addition, in some ways a low-value inventor faces lower costs than a high-value inventor. This is because a potential cost of patent application filing is the disclosure of the invention to competitors.⁷⁶ To the extent we believe this disclosure is costly to the applicant and valuable to the recipient (which is disputed among scholars), the cost of such disclosure is lower for weak applicants than stronger ones, because a weak applicant is not disclosing anything of value.⁷⁷

These examples demonstrate that the type of applicant who is most likely to abandon prosecution is one for whom the resulting patent is worth less anyway, because his invention has low private value. As Jonathan Masur has argued, weak patentees are more likely to have this sort of application, since patents that have low private value are more likely to also have low social value.⁷⁸ And patents that have low social value are more likely to be weak patents.⁷⁹

One can also look at the problem in terms of price sensitivity. Weak patent applicants are more likely than non-weak applicants to be price sensitive when it comes to patent

76. See Alan Devlin, *The Misunderstood Function of Disclosure in Patent Law*, 23 HARV. J.L. & TECH. 401, 414 (2010) (noting that reverse engineering of products by competitors can drive down price and prevent the inventor from recouping costs of research and development).

77. See, e.g., *id.* at 403–04 (“[T]he extent to which patent documents successfully teach the inner workings of cutting-edge technologies is quite limited . . . to the extent patents are drafted in a manner that is actually capable of conveying accurate information, third parties’ disinterest stymies the disclosure function.”); Note, *The Disclosure Function of the Patent System (or Lack Thereof)*, 118 HARV. L. REV. 2007, 2019–20 (2005). But see Lisa Larrimore Ouellette, *Do Patents Disclose Useful Information?*, 25 HARV. J.L. & TECH. 545, 566–67 (2012) (finding via surveys that nanotechnology researchers did not avoid reading patents out of fear of infringement).

78. See Masur, *supra* note 8, at 689, 701–02. In particular, Masur distinguishes between a patent’s private value (its value to its owner) and its social value (its value to society). *Id.* He argues that patents with low private value but high social value are likely to be very rare, and that patents with high social value are likely to have high private value, because of the monopoly rights awarded to the patentee. *Id.* at 690, 702. Accordingly, high up front patent costs likely discourage patents that have low private value and low social value, which is socially optimal. See *id.* at 690–91, 702–03.

79. *Id.* at 702, 710–11.

fees, since they have less to gain from an issued patent. As such, a winner pays system, with low front-end costs, disproportionately benefits them, as it requires few up front expenses and charges more to those who actually succeed in obtaining patent protection.

Even more problematic, a winner pays system gives an inventor little incentive to assess the quality of her invention up front, since she doesn't pay anything extra if her application fails. This is especially unfortunate because the inventor is likely in the best position to assess whether her invention is patentable (i.e., whether it comprises patentable subject matter that is novel and non-obvious).⁸⁰

Of course, the argument here does not mean the patent system should abolish back-end fees. Indeed, such fees can be useful—for example, back-end maintenance fees can be used to weed out patents that no longer have much value, since these fees must be paid at periodic intervals after a patent has issued and they cannot be prepaid.⁸¹ Hence, a patentee must keep track when her maintenance fees are due and budget so that the fees can be paid at the appropriate time to keep the patent from lapsing.

But while back-end fees have some justification, we create new problems when successful applicants are asked to pay higher fees than unsuccessful ones. Put differently, weak patents stem to a large extent from the fact that we let unsuccessful patent applicants off cheaply while asking successful patentees to foot the bill. In an ideal system, the weak patentees would be asked to pay at least to the same extent as the non-weak patentees.

80. Winner-pays pricing exacerbates another problem with inventor information gathering that has been identified by previous scholars: the presence of willful infringement penalties, which arguably discourage patent applicants from researching relevant prior art. See, e.g., Devlin, *supra* note 76, at 404; Mark A. Lemley & Ragesh K. Tangri, *Ending Patent Law's Willfulness Game*, 18 BERKELEY TECH. L.J. 1085, 1100–01 (2003).

81. John M. Golden, *Patent Privateers: Private Enforcement's Historical Survivors*, 26 HARV. J.L. & TECH. 545, 603 (2013) (analogizing to patent enforcement and noting that “privateering regulations restricted entry to the business by requiring posting of a substantial bond, thereby both restricting the numbers of investors or groups of investors who could support privateering ventures”); see *id.* (“Sharply increased fees or, at least, altered fee schedules for patent prosecution and maintenance might be one way of helping to stem a perceived flood of poor-quality patents.” (citing Brian J. Love, *Let's Use Patent Fees to Stop the Trolls*, WIRED (Dec. 20, 2012), <http://www.wired.com/opinion/2012/12/how-to-stop-patent-trolls-lets-use-fees> [<http://perma.cc/5VVU-T2S2>]) (proposing increasing maintenance fee toward end of patent term to deter troll litigation)).

IV. THE ECONOMICS OF LOSER PAYS

The last section described how the current patent system has a de facto winner pays pricing regime that encourages weak applications. The next two sections explain the features of loser-pays systems, and how the PTO could adopt such a system to better disincentivize weak applications.

The present section begins with a brief overview of the previous scholarly literature on loser pays, which has focused on the traditional litigation context. It further describes how fee shifting might have special benefits in ex parte proceedings or application settings, a more general point that has been neglected by scholars. This discussion sets up Section V, which applies loser pays to patent examination.

A. *Loser Pays in Inter Partes Proceedings*

Many scholars have studied loser-pays systems (also known as fee-shifting or “English rule” systems)⁸² in the context of litigation. The benefits and costs of loser pays vis-à-vis non-loser-pays systems (also known as “American rule” systems)⁸³ are well known but worth reviewing in this context.

A chief advantage of loser pays in litigation is that it arguably disincentivizes the filing of frivolous cases.⁸⁴ To illustrate, suppose a plaintiff is deciding whether to bring a frivolous suit against a defendant. In a non-loser-pays jurisdiction, a plaintiff knows a defendant might settle such a case, even though it lacks merit, just to avoid paying attorneys’ fees. In a loser-pays jurisdiction, by contrast, the defendant is less likely to settle, since he knows that he can recover his attorneys’ fees if he prevails, as is likely. As such, there is less incentive ex ante for the plaintiff to bring a frivolous “strike suit” in a loser-pays jurisdiction.

Another advantage is that loser pays enables some plaintiffs with deserving claims but limited resources to bring suit. This is because these plaintiffs anticipate winning the suit and recovering their attorneys’ fees. Accordingly, high attorneys’ fees are unlikely to deter these plaintiffs from filing their meritorious claims.

82. Walter Olson & David Bernstein, *Loser Pays: Where Next?*, 55 MD. L. REV. 1161, 1161 & n.1 (1996).

83. *Id.*

84. See, e.g., *id.* at 1161 (claiming that loser pays “discourages speculative litigation—among the most persistent problems facing the American litigation system—and it limits the tactical leverage parties with weak cases can obtain by threatening to inflict the cost of litigation on their opponents.”).

Loser pays has some well-known disadvantages as well. For example, a sufficiently risk-averse plaintiff might not bring suit or will accept a less favorable settlement under a loser-pays system even if she has a meritorious claim.⁸⁵ To illustrate, suppose you are an individual plaintiff suing a large corporation on a shareholder derivative suit. Even if you have a meritorious case, there is likely a non-zero probability you will lose. If you are sufficiently risk-averse and do not have much saved capital, you might forego suit, despite the strength of your case. Given that meritorious derivative suits have positive externalities (that is, society benefits when they are successfully brought because they deter bad corporate conduct), society as a whole is worse off because you did not sue.

Loser pays also increases the possibility for strategic behavior by parties by encouraging them to increase their litigation expenses in order to induce settlement.⁸⁶ To illustrate, suppose you are an individual patentee with a highly meritorious claim of patent infringement against a large corporation. If you are litigating in a loser-pays jurisdiction, then the corporate defendant could rack up exorbitant legal expenses, not because it needs to but because it wants to pressure you to settle. Knowing that you would be unable to pay these expenses in the possible but unlikely scenario in which you lose, you might be more willing to settle the case earlier for a smaller amount.

85. See, e.g., ALAN DEVLIN, *FUNDAMENTAL PRINCIPLES OF LAW AND ECONOMICS*, 225 (2015) (“For any given case, the possible payoffs under a ‘loser-pays’ system vary more than under the American rule. For that reason, a trial is even less attractive to a risk-averse litigant under the English rule than it is under a regime in which each side bears its own costs.”); see also Richard A. Posner, *An Economic Approach to Legal Procedure and Judicial Administration*, 2 J. LEGAL STUD. 399, 428 (1973) (“The greater variance of returns under the English rule makes the expected value of litigation less for risk-averse litigants, which will encourage settlements if risk aversion is more common than risk preference.”).

86. The potential distortions caused by loser pays in litigation are well known. See, e.g., Anup Malani & Jonathan S. Masur, *Raising the Stakes in Patent Cases*, 101 GEO. L.J. 637, 673 (2013) (“[I]t is well understood that the English Rule can cause distortions in litigation behavior by encouraging litigants to increase their litigation expenditures, figuring that their opponents will eventually have to pay.” (citing Robert D. Cooter & Daniel L. Rubinfeld, *Economic Analysis of Legal Disputes and Their Resolution*, 27 J. ECON. LIT. 1067, 1073 (1989))); see also James W. Hughes & Edward A. Snyder, *Litigation and Settlement Under the English and American Rules: Theory and Evidence*, 38 J. LAW & ECON. 225, 227 (1995) (“It is well established in both the theoretical and empirical literature that the English rule causes litigants to increase their legal expenditures. Litigants expect, with some positive probability, that their legal fees will be paid by their rival. The higher the litigant’s subjective probability of winning at trial, the lower is the party’s expected marginal cost of potentially compensable expenditures.”).

B. Loser Pays in Ex Parte or Application Settings

Although loser pays has been well-studied in litigation, scholars have typically overlooked its potential in ex parte proceedings and application settings. This is not surprising, because it's not readily apparent what fee shifting means in this context. Most basically, how can there be both a "winner" and a "loser" if there is only one party involved in a proceeding? And regardless, how would fees be shifted from one party to the other?

The key insight here is that even though parties may be involved in separate proceedings, the administrative or decision-making body that interacts with them can shift fees across these proceedings. So even though there cannot be both a "winner" and a "loser" in any one proceeding, there are winners and losers in separate proceedings, and fees can be transferred among them.

Such an approach retains many of the advantages of loser pays in the traditional, inter partes context—namely, the threat of punishment (for the loser) and reward (for the winner) can curb frivolous applications and encourage good ones, as a meritorious applicant anticipates being reimbursed for her fees.

Moreover, some of the disadvantages of loser pays that arise in inter partes proceedings are not present in the ex parte setting. For example, we are concerned in litigation that parties will strategically rack up high attorneys' fees because my loss is directly your gain—if you strategically incur higher attorney fees and win, that raises my costs. When two parties are going head-to-head in a zero-sum fight, it makes sense for them to manipulate their fees to increase their leverage and try to induce a favorable settlement.

These issues are much reduced or even absent in the context of ex parte or applications settings. In such cases, separate parties are not adverse to one another. Rather, they each have separate proceedings before some decision-maker (in the case of patents, the PTO).⁸⁷ If the number of proceedings or applications before a decision-maker is large (as is the case with the PTO), it seems unlikely that parties have any strong incentive to act strategically to affect other parties' fees.

87. In other instances, the decision-maker might be another administrative agency, an adjudicative body or even a non-governmental institution. For example, the Article briefly discusses later how loser pays could be applied to the law review submissions process. See *infra* note 150. In that context, a law review articles committee might be the decision-maker.

To be sure, this is not to say that loser-pays systems are unequivocally better than non-loser-pays systems in all ex parte contexts. As noted for litigation, a sufficiently risk-averse plaintiff in a loser-pays system might forego suit even if she has a meritorious claim. Such concerns might still arise for similar individuals in a loser-pays ex parte system, as a sufficiently risk-averse individual (perhaps one with limited resources) might forego initiating an otherwise meritorious ex parte proceeding.

Still, such problems will often be surmountable. As discussed below in the patent context, we might expect such individuals to be small or micro entities, which are groups that already receive a fee discount in their patent fees. If groups of people who are resource-constrained can be identified ex ante, then pricing could be altered for them, to prevent their risk aversion from shutting them out of the system altogether.⁸⁸

Regardless, the present Article shows how loser pays is an underappreciated but potentially valuable tool in ex parte proceedings and application settings. It is likely to be most valuable in any context in which applicants face low costs but potential high benefits in applying. This is particularly true when there are significant costs associated with filtering out bad applications, or allowing bad applications to be approved. In this sense, loser pays raises the stakes of the application proceeding, which often leads applicants’ incentives to become better aligned with social incentives.

V. IMPLEMENTING LOSER PAYS IN PATENT EXAMINATION

The idea of raising stakes to improve outcomes in *patent litigation* is not a new one. Indeed, Anup Malani and Jonathan Masur have suggested that doing so might help address the weak patents problem.⁸⁹ Others have looked more

88. This kind of differential pricing is called third-degree price discrimination. See Sukhatme, *supra* note 65, at 1875, 1886–87. See also *id.* at 1887 n.121 (“It is reasonable to assume that given their small size, [small and micro entities] have a lower willingness or ability to pay PTO fees than other patent applicants. Accordingly, by charging these individuals less money, the PTO is, on the margin, allowing some small entities or micro-entities to enter the market for patents when they would otherwise be priced out if they did not receive any discounts.”).

89. See Malani & Masur, *supra* note 86, at 686–87 (proposing “patents [that] are upheld at trial be given a reward—in the form of a patent extension—on top of the damages they usually get in court. Similarly, patent owners whose patents are held invalid by a court should be forced to pay a penalty to patent challengers.”). *Cf. id.* at 674 (noting in the context of patent litigation that fee shifting “could unreasonably diminish incentives to bring patent challenges, including worthwhile challenges to invalid patents”).

directly at the effect of fee shifting in the context of patent litigation.⁹⁰

But there has been no systematic study of how loser-pays rules might be adapted to *patent examination*. Because patent examination is an *ex parte* proceeding, the way in which fee shifting might work in this context is more subtle. This section proposes some possible ways to implement loser pays in patent examination to deter weak applications.

A. *Fee Forfeitures and Fee Refunds*

If we want to implement loser pays in patents, what is the best way to do so? A naïve approach would be to levy a penalty on an applicant at the end of patent examination. In such a system, for example, an applicant might be charged a fee after he receives a final rejection, he declines to appeal, and he does not file an RCE.

The problems with such a system are plain. Although this approach would disincentivize the filing of bad applications, it would also create a perverse incentive to file RCEs in an attempt to stave off paying the final penalty. The goal of loser pays is to limit bad applications, not to encourage applicants to double down on them, which is what applicants would do in such a system.

Moreover, this sort of system would be hard to administer—indeed, the PTO would have to compel an applicant to pay fees at the end of prosecution, after he has lost his chance to get a patent. Although there might be ways to compel compliance (perhaps through the tax system, or by blacklisting a noncompliant applicant from future filings), such heavy-handed techniques seem less than optimal.

90. See, e.g., Mark Liang & Brian Berliner, *Fee Shifting in Patent Litigation*, 18 VA. J.L. & TECH. 59, 66, 92–93 (2013) (concluding that “fee shifting might not reduce the number of patent cases and would not drive down the cost of cases that are filed”); Kesan, *supra* note 8, at 795–96 (arguing in favor of one-way fee shifting in favor of accused infringers); SOLVEIG SINGLETON, PATENTS AND LOSER PAYS: WHY NOT?, PROGRESS ON POINT 4–5 (2006), http://www.pff.org/issues-pubs/pops/pop13.3patents_losers.pdf (arguing that fee shifting might reduce nuisance suits); Ranganath Sudarshan, *Nuisance-Value Patent Suits: An Economic Model and Proposal*, 25 SANTA CLARA COMP. & HIGH TECH. L.J. 159, 181 (2009) (noting that fee-shifting rule would be over-inclusive, since “a legitimate (non-nuisance) patent plaintiff simply cannot know *a priori* whether a patent is valid or infringed with certainty”); Neal S. Vickery, *Don’t Forget About the Little Guys: Trolls, Startups, and Fee Shifting*, 13 COLO. TECH. L.J. 171, 171, 190 (2015) (noting that fee shifting “has not been a substantial deterrent to frivolous lawsuits from sophisticated plaintiffs” because it occurs post judgment); see *id.* at 172, 182–83 (proposes that a patent “plaintiff [should be required] to post a bond that can be used to cover some or all of the costs of discovery, which will be repaid if the startup is found to be infringing”).

A somewhat better approach to implement loser pays would be to require applicants to post a bond at the outset, when they file their patent application. Some or all of this bond could then be returned to the applicant when she succeeds in obtaining a notice of allowance.⁹¹ Moreover, as discussed later,⁹² this bond could be supplemented with an additional monetary reward that comes from “loser applicants.”

Still, a system that ties returning the bond to receiving a notice of allowance would be less than ideal. This is because a notice of allowance is awarded only at the end of a successful prosecution.⁹³ So this system would give weak applicants a greater incentive to never abandon their applications—rather, they will fight, perhaps by filing one or more RCEs or appeals. As noted above, this is not something we want to encourage.⁹⁴

Instead, a better idea is to return an upfront bond only if the applicant obtains a notice of allowance before receiving a final rejection. To illustrate, suppose the applicant is required to submit a \$10,000 bond upon filing his application. If the applicant receives a notice of allowance without ever being finally rejected, he will recover his entire bond.⁹⁵ On the other hand, if the applicant receives a final rejection, he would lose the bond, even if he subsequently obtains a patent after filing an RCE or pursuing an appeal.⁹⁶

Note that the amount returned to a winning applicant could be calibrated based on the PTO’s policy objective.⁹⁷ For example, instead of returning the full \$10,000, the PTO might instead return only a portion of the bond to a winning applicant. For example, if the PTO returns \$8,400, then a winning applicant

91. Stephen Yelderman recently proposed a somewhat similar scheme in which applicants could post a per-claim completion bond that they would forfeit when they amend or cancel their claims. *See Yelderman, supra* note 8, at 120–21. His goal was to curtail applicants’ practice of filing broad claims that could be narrowed later in prosecution. *Id.*

92. *See infra* section V.C.

93. Yelderman, *supra* note 8, at 82.

94. Another problem with that approach is that applicants could file broad, weak claims and simply narrow them during prosecution until they receive a notice of allowance and hence, a bond refund. *Id.* at 103. Since applicants would know this *ex ante*, it would blunt the impact of loser pays in deterring weak applications from being filed in the first place.

95. The simple examples discussed here ignore the time value of money, though that could certainly also be taken into account by returning the bond with interest.

96. Yelderman, *supra* note 8, at 120–21.

97. Currently, fees are returned to applicants only if the fee was mistakenly paid or in excess of what was required, or if the PTO chooses not to institute a reexamination proceeding in response to a request for reexamination or supplemental examination. *See MPEP*, § 607.02 (9th ed. Rev. 7, Nov. 2015).

would end up paying $\$10,000 - \$8,400 = \$1,600$, which is the current front-end fee. Under such a system, a winning applicant would end up spending the same amount as an applicant under the current system ($\$1,600$), and a losing applicant would end up spending much more ($\$10,000$).

The loser-pays systems described here would deter the filing of weak applications, so long as weak applications are more likely on average to receive a final rejection than strong ones. This last assertion will be true if PTO examiners are, at least to some extent, correctly identifying and rejecting weak applications.⁹⁸

Put differently, even though many weak applications become patents, a weak application should on average be less likely to pass PTO muster as compared to a strong one, all else being equal. Apart from its intuitive appeal, there is also data to suggest this baseline assertion is true.⁹⁹

Accordingly, a loser-pays system like the one envisioned here would decrease the returns from filing weak applications, thereby deterring such applications from ever being filed. Moreover, the system would encourage applicants to improve their application quality, such as by narrowing their claims

98. Some have argued that the PTO's compensation scheme encourages examiners to approve patent applications. *See, e.g.*, Florian Schuett, *Patent Quality and Incentives at the Patent Office*, 44 RAND J. OF ECON. 313, 328–29 (2013) (explaining that PTO examiners receive a bonus based on the number of applications processed, which would bias them toward application approval); JAFFE & LERNER, *supra* note 12, at 136; Frakes & Wasserman, *supra* note 16, at 72–74, 72 n.16, 73 n.18. Others have suggested the opposite might sometimes be true. *See* Sean Tu, *The Luck/Unluck of the Draw: An Empirical Study of Examiner Allowance Rates*, 2012 STAN. TECH. L. REV. 1, 7, <http://journals.law.stanford.edu/sites/default/files/stanford-technology-law-review/online/tu-luckunluckofthedraw.pdf> [<http://perma.cc/H3YX-JVAA>] (arguing that the PTO's "count" system, which is used to judge examiner productivity, "gives junior examiners a greater incentive to reject patents"). Regardless who is correct, loser pays is more effective if patent examiners are reviewing applications based on their merits rather than external considerations.

99. For example, the PTO recently noted in a publication, "In the Computers and Communication sector, which includes a large majority of the controversial software and business method patents, allowance rates are relatively lower (allowance rate of 49.8%)." Michael Carley, Deepak Hegde & Alan Marco, *What Is the Probability of Receiving a US Patent?* 8 (U.S. Patent and Trademark Office, Working Paper No. 2, 2013), <http://ssrn.com/abstract=2367149> [<http://perma.cc/7RBZ-RZTL>]. A lower allowance rate conforms with the general consensus that this sector contains more weak applications. That the PTO is rejecting more applications here suggests they are catching at least some of these weak ones. *See also* Zhen Lei & Brian D. Wright, *Why Weak Patents? Are U.S. Examiners Ignorant of the Quality of the Patents They Grant?* 1 (unpublished manuscript) (on file with author) (suggesting that PTO "examiners are by and large not ignorant of the quality of patents they issue" and measuring patent weakness by comparing parallel application outcomes at the PTO and European Patent Office). Still, such evidence is not dispositive and more research needs to be done to test the baseline assertion here.

and providing a more useful disclosure in their specification. This would in turn improve patent quality.

Moreover, by disincentivizing weak patent applications from being filed, loser pays would stem the overall flow of patent applications. All else being equal, each PTO examiner would then have more time to review each patent application. If we think PTO examiners would do a better job of reviewing applications if they had more time per application, then loser pays helps move us in that direction. Hence, an ancillary benefit of loser pays is that it could improve the overall quality of patent examination, in addition to improving the overall quality of filed applications.

B. Disincentivizing Continuations

One potential limitation of the loser-pays systems described thus far is that while they might not encourage continuations, they do not actively discourage them either. This is because an applicant who receives a final rejection forfeits his fee, regardless what he does next. As such, his decision whether to file an RCE or appeal is not affected.

We may instead want to discourage continuations on weak applications by reducing the recoverable bond amount as prosecution proceeds. Consider again the original example where the applicant pays a \$10,000 bond upon filing. As before, if the applicant receives a notice of allowance, he receives his entire bond back, plus whatever reward is given to him. If the applicant receives a final rejection, however, the maximum amount he can recover is halved to \$5,000.

At this point, the applicant has a choice: file an RCE or an appeal, or abandon the application. If the applicant abandons, the \$5,000 will be returned to him. If he files an RCE or an appeal and wins, he will also win back the \$5,000. But if he files an RCE or appeal and fails, he will forfeit the entire \$10,000, regardless what he chooses to do subsequently in prosecution.

Such a system would disincentivize both bad applications and bad RCEs. The initial bond posting would discourage bad applicants from filing in the first place. And halving the initial bond amount after an applicant receives a rejection would disincentivize poorer quality applicants from filing an RCE. Although such an approach would be slightly more complicated to administer, it could reduce

weak filings as well as deter lengthy prosecutions of weak applications.¹⁰⁰

C. Prizes

All of the above proposals support, in one way or another, fee refunds for successful applicants and fee forfeitures for unsuccessful ones. But a true loser-pays system takes things a step further: it provides prizes to successful patent applicants proportional to the fees that are forfeited by unsuccessful ones. Such a system has certain advantages.

First, and most obviously, prizes increase the stakes in patent examination. By rewarding successful patent applicants and penalizing unsuccessful ones, loser pays provides applicants with extra incentives to be successful. And successful applications are more likely to be narrower, better drafted, and of higher quality. So prizes for good applications, in combination with penalties for bad ones, should increase the quality of patent applications and subsequent patents.

Prizes also increase the potential returns for all applicants, and hence they might increase both strong and weak applicants' incentives to file. Still, to the extent we believe that a weak application is on average more likely to be rejected than a strong one (a baseline assumption discussed earlier), we would expect prizes to incentivize stronger applications more than they incentivize weaker ones. Moreover, to the extent an applicant can control the quality of his application (i.e., he can raise the quality by more narrowly claiming a credible invention and improving his disclosure), we should expect that prizes would generally increase application quality across the board.

Prizes are also an easy way for the PTO to implement fee forfeiture without biasing its incentives during application

100. Of course, not all RCEs or appeals are bad; sometimes a continuation or appeal might lead the PTO to accept an application it had improperly rejected. This is a social good, at least to the extent we think patents incentivize invention.

Still in many situations, RCEs and appeals will impose more social costs than benefits. For example, an RCE might lead to more PTO errors, if the agency caves to insistent applicants and approves filings it had properly rejected at first. And regardless of outcome, RCEs and appeals always generate extra transaction costs.

The partial bond approach described here allows the PTO to balance these social benefits and costs. If RCEs tend to be socially beneficial (which will be more likely if most applications are good and if chances are high the PTO will correct an improper rejection in an RCE), the PTO should decrease the fees an applicant loses if she unsuccessfully pursues an RCE. If RCEs tend to be socially wasteful (which will be more likely if they generate high transaction costs and if chances are high an RCE will lead to either more errors or the same outcome), then the PTO should increase the fees at risk for applicants who pursue RCEs.

review. As noted previously, unlike most agencies, the PTO runs on user fees. If the PTO receives additional fees when it issues final rejections—as would be the case if it implemented fee forfeiture—then we might be concerned that the PTO would issue such rejections more frequently, not on the merits but because it is in the agency’s economic interest to do so.¹⁰¹

If loser pays is implemented with prizes, however, this should not be a problem. In a true loser-pays scheme, the costs paid by the losers are received by the winners. Hence, any additional revenue that is received by the PTO through loser-pays penalties would be returned to successful applicants.¹⁰² This system is thus revenue neutral by design, and PTO incentives are not altered.¹⁰³

Prizes also give the PTO additional flexibility in pursuing various policy objectives, since they could be implemented in a number of different ways. Most basically, the PTO could set prizes based on the average number of “winner” and “loser” applicants. For example, the PTO has recently suggested that 47.5% of progenitor applications (those unrelated to any previously filed application) received a notice of allowance but no final rejection.¹⁰⁴ Since about one-half of the applicants here are

101. This might not just be a hypothetical concern. Recent research by Michael Frakes and Melissa Wasserman suggests the PTO responds to financial incentives in its granting behavior. *See generally* Michael D. Frakes & Melissa F. Wasserman, *Does Agency Funding Affect Decisionmaking?: An Empirical Assessment of the PTO’s Granting Patterns*, 66 VAND. L. REV. 67, 79–80, 82 (2013). Regardless, it’s possible that we want the PTO to issue more final rejections as a policy matter. But if so, that should be the stated policy objective and not an inadvertent effect of adopting a fee forfeiture scheme.

102. Conceivably, the PTO could instead spend the money on other policy objectives, so long as these objectives do not directly benefit the agency (and hence the PTO’s incentives remain unaltered). Alternatively, any extra PTO fees could be siphoned off by Congress and appropriated elsewhere in a process known as fee diversion. *See id.* at 76–78. Still, we might be concerned that such programs would provide some indirect benefits to agency officials that would lead to a bias in favor of rejection. *Id.* at 109–10. Instead, a loser-pays system with prizes could be revenue-neutral by design and avoid this potential problem.

103. Current law might require the PTO to return money collected from forfeited bonds anyway. *See Leahy–Smith America Invents Act*, Pub. L. No. 112-29, § 10, 125 Stat. 316 (2011). Even though the PTO now has limited control over its fees, it is not supposed to charge fees merely to increase its revenues and gain profit. Instead, it is instructed to “set or adjust by rule any fee” in order “to recover the aggregate estimated costs to the Office for processing, activities, services, and materials relating to patents.” *Id.* Collecting forfeited bonds and not returning them to applicants in the form of prizes would arguably run afoul of this directive.

104. *See* Carley et al., *supra* note 99, at 4. This percentage is the sum of the percentage of applications approved on a first office action (11.4%), and the percentage who received a non-final rejection and a notice of allowance, but no final rejection (36.1%). Out of the remaining applications, 2.3% were abandoned before a first action, 14.5% were abandoned between receiving a non-final and final rejection,

“winners,” that suggests setting a prize equal to the bond amount—so if losers pay \$10,000, winners will receive \$10,000.

Indeed, a nice feature of loser pays is that the prize amount naturally depends on the number of loser applications that are received. For example, as the quality of applications improves in a loser-pays system, the reward decreases. To illustrate, suppose that after loser pays is instituted, application quality increases, and now two-thirds of applicants receive a notice of allowance before a final rejection. In such a system, the reward would decrease to \$5,000.¹⁰⁵

Note there are countless other possible permutations. For example, instead of having a variable prize, one could have a fixed amount for the prize and a variable amount for the penalty. Or the PTO could conduct these same calculations on an industry-specific basis, based on the proportion of losers and winners in a particular technology category. The point is that prizes give the PTO substantial flexibility in implementing a loser-pays regime, while remaining revenue-neutral overall.

D. AIA, Cost-Benefit Analysis, and Pilot Fee Program

To what extent could the PTO implement loser pays in patent examination under current law? As noted, the America Invents Act (AIA) empowered the PTO to set any patent fees such that it recovers its “aggregate estimated costs.”¹⁰⁶ In other words, the PTO should be revenue-neutral; it should not set fees and gain profits like a revenue-maximizing monopolist.¹⁰⁷ Still, the statute appears to implicitly empower the PTO to subsidize certain activities and penalize others, so long as total fees match total costs.¹⁰⁸

Indeed, the PTO has already taken advantage of this fiscal freedom. When exercising its new fee setting authority for the

and 38.7% received a final rejection. *Id.* The data were drawn from 1996–2005 filing cohorts. *Id.*

105. Now, for every three applicants, one is a “loser” and two are “winners.” So the \$10,000 paid by the one loser applicant is split among the two winners, with each receiving a \$5,000 prize.

106. Leahy–Smith America Invents Act § 10 (instructing the PTO to “set or adjust by rule any fee” in order “to recover the aggregate estimated costs to the Office for processing, activities, services, and materials relating to patents”); *see supra* notes 48, 102 and accompanying text.

107. For more discussion on the PTO’s fee setting authority under the AIA, *see* Sukhatme, *supra* note 65, at 1913–16.

108. *See supra* note 103 and accompanying text (describing how the PTO only recovers fees to cover administrative costs); *infra* note 119 and accompanying text (describing how individuals and some small entities qualify for subsidies, which include patent applications fees).

first time in 2013, the PTO stated that it was setting front-end fees below their actual costs “[t]o encourage innovators to take advantage of patent protection.”¹⁰⁹ Since these lower front-end fees must be covered by higher back-end fees, the PTO is implicitly deciding to tax successful patentees in order to subsidize applicant access to the patent office.

Implementing a loser-pays system would also seem to be within the PTO’s power under the AIA. A system in which penalties from patent losers are redistributed to patent winners, after first covering PTO expenses, is revenue-neutral. The PTO need not retain any additional fees under a loser-pays system than under the current fee system, thereby complying with the letter of the AIA.

Indeed, one could credibly argue that the agency might actually be *mandated* to follow a loser-pays approach. This is because, as an executive branch agency within the Department of Commerce, the PTO must follow executive orders mandating cost-benefit analysis when it promulgates “economically significant” regulations.¹¹⁰ As Jonathan Masur has recently argued, when exercising its fee-setting authority, the PTO must consider both the social benefits and social costs of fee changes.¹¹¹ For example, it should quantify the effect of fee changes on patent benefits (such as dynamic incentives to invent) and patent costs (such as costs due to patent thickets, deadweight loss caused by monopoly pricing, and administrative costs of the patent system).¹¹²

So would a loser-pays system fare better under cost-benefit analysis than the current fee structure? Very likely the answer is “yes,” though a thorough empirical investigation is needed to know for sure. To begin, loser pays will almost certainly lower social costs associated with patents. By reducing the number of weak patents, loser pays will reduce the potential for patent assertion entities to exploit weak patents to hold up companies and thereby tax real innovation. It will also reduce the contribution of weak patents to patent thickets and lead to patents with narrower and clearer claims, providing more notice

109. Setting and Adjusting Patent Fees, 78 Fed. Reg. 4211, 4216 (Jan. 18, 2013).

110. See Jonathan S. Masur, *CBA at the PTO*, 65 DUKE L.J. 1701, 1702, 1706 (2016). President Reagan first introduced cost-benefit analysis via executive order in 1981, and every president since then has kept that mandate in place. *Id.* at 1702 (first citing Exec. Order No. 12,291, 3 C.F.R. § 127 (1982); then citing Exec. Order No. 12,866, 3 C.F.R. § 638 (1994) (Clinton); and then citing Exec. Order No. 13,563, 3 C.F.R. § 215 (2012) (Obama)).

111. See generally *id.*

112. See *id.* at 1724–25.

to potential infringers and other innovators. Relatedly, by reducing the number of weak patents, loser pays will lessen whatever deadweight loss these patents cause.

More directly, loser pays will lower PTO administrative review costs by deterring weak applications from being filed in the first place, and by improving the quality of the applications that are filed. It may even lower future patent litigation costs, to the extent that weak patents are litigated.

Second, loser pays seems unlikely to harm dynamic incentives to invent. By lowering the cost for “winner” applications (through fee reductions and prizes), loser pays is subsidizing and thereby encouraging inventions that, on average, are likely to be more welfare-enhancing. It accomplishes this by raising expenses for “loser” applications, but such inventions are on average likely to be of lower social value.¹¹³ Both of these effects are not so trivial to estimate; still, at first glance, loser pays seems promising in terms of its effect on innovation incentives.¹¹⁴

Even if one disagrees that the PTO has the power or obligation to implement loser pays, the agency could implement a more conservative approach that would certainly not require any congressional authorization: a voluntary pilot program that allows applicants to opt into loser pays. When filing a patent application electronically (as most applicants do), the PTO could ask applicants whether they want to be in the “normal” filing program or a loser-pays pilot program. Examination of an application would otherwise proceed in exactly the same way under either program.¹¹⁵ Although the system could be implemented in a number of different ways, a simple approach would be to limit the pilot program to a fee refund, without an additional prize component. So participants who opt into loser

113. See Masur, *supra* note 8, at 687 (explaining how patent fees screen out inventions that produce lower, rather than higher, social welfare).

114. In analyzing this Article’s loser-pays proposal, Lisa Ouellette recently suggested the PTO already had the power, and perhaps even some sort of obligation, to impose loser pays. She further commented, “If the PTO’s current fee structure were compared with Sukhatme’s [loser-pays proposal] under a correct application of CBA, I think Sukhatme’s would win.” See Lisa Larrimore Ouellette, *Neel Sukhatme: Make Patent Examination Losers Pay*, WRITTEN DESCRIPTION (July 13, 2016), <http://writtendescription.blogspot.com/2016/07/neel-sukhatme-make-patent-examination.html> [<http://perma.cc/734D-HJAB>].

115. The PTO would hide from its examiners information on what program an applicant has selected (and prohibit applicants from disclosing this information in communications with their examiner). Hence, examiners would not be influenced by the applicant’s decision, and the only effect of choosing loser pays would be on the fees the applicant pays and the prizes she might be awarded.

pays will pay higher front-end fees but receive a full refund if they obtain a notice of allowance before getting a final rejection.

Would applicants actually opt into the pilot fee program? That would likely depend on how much higher the front-end fees for the pilot program are relative to standard front-end fees. Regardless, one would expect that higher-quality patent applicants would be more likely to select the loser-pays program, since they are more likely to believe they will win back their fees. Additionally, one might view opting into loser pays as a positive signal during subsequent litigation—an applicant who chooses loser pays is sufficiently confident that their invention was patentable that they selected the riskier (but potentially more rewarding) loser-pays path.¹¹⁶

VI. POTENTIAL OBJECTIONS AND REFINEMENTS

Having laid out how loser pays could be implemented in patent examination, the present section addresses potential pitfalls to avoid, as well as a number of refinements.

A. *Risk Aversion and Fairness Concerns*

One might be concerned that loser pays might disincentivize some resource-constrained or risk-averse inventors from applying for a patent. Or put differently, if we increase the fees on losing applicants, perhaps we are biasing the system against the individual inventor, who is less able to pay such fees if he loses.

This is an important concern, but one that need not be problematic in practice if properly addressed. First, note that loser pays disproportionately deters weak applications rather than strong ones. Although some good applications might be deterred, it seems unlikely that most worthwhile innovations would be foregone by a relatively modest bond increase.¹¹⁷ Moreover, we should not be troubled if a risk-averse applicant

116. Ideally, the pilot program described here would be designed as a proper field experiment that uses randomization to permit inferences about the effect of loser pays on application quality. *See generally* Glenn W. Harrison & John A. List, *Field Experiments*, 42 J. ECON LIT. 1009 (2004). One way to do this would be to take all applicants who opt into the loser-pays system and randomly assign them into a treatment group (that enters the loser-pays system) or a control group (that is fed back into the standard-fee system). One could then examine various metrics of patent quality to see the effect of the loser-pays program on the two groups.

117. Moreover, the presence of prizes will disproportionately incentivize good applicants, which reduces the need for excessively high fee forfeitures in a loser-pays system. *See supra* Section V.C (explaining how prizes give the PTO flexibility in implementing various policy objectives, as they can be implemented in a variety of different ways).

eschews patent protection due to loser pays but nonetheless decides to create and commercialize the invention. Patents are not needed to incentivize these kinds of “inevitable” inventions, so these inventions do not need patent protection.¹¹⁸

In any event, the PTO has already instituted discounted fees for small and micro inventors as a way to address potential concerns about patent fees deterring resource-constrained or risk-averse inventors.¹¹⁹ Small entities pay one-half of standard PTO fees, and micro entities pay just one-quarter of standard fees. The PTO could apply these rules in the bond context, where small and micro entities would have their upfront bond amounts halved and quartered, respectively.¹²⁰

Still, others might question more generally whether a fee forfeiture regime is fair. For example, suppose the examiner makes a mistake and improperly rejects the application. Later the applicant gets the mistake reversed on appeal or during an RCE and successfully obtains the patent. Why shouldn't this applicant get back his full bond?¹²¹

To begin, note that even under the current system, if an examiner errs and improperly issues a final rejection, an applicant will generally need to pursue an RCE or an appeal in order to correct the error. The fees expended for these proceedings are not refundable. So examiners' mistakes costs applicants money even today.

In the aggregate, loser pays actually improves on this current dynamic. Although some good applicants may be “undeserved losers” in any one particular case, those good applicants on average should fare better under loser pays because they will win more often than they lose and hence collect more prizes than fees.¹²² Put

118. See generally Devlin & Sukhatme, *supra* note 20 (arguing that patents should be awarded only to the extent necessary to incentivize invention); see also Olson, *supra* note 20, at 195, 203 (explaining how patent grants can be inefficient in incentivizing invention in certain subject matter areas).

119. Individuals, small businesses, or nonprofits can qualify as small entities. See 37 C.F.R. § 1.27 (2015) (defining “small entities”). A subset of these (including inventors who have filed fewer than four previous patent applications and whose previous year's gross income was less than three times of median household income) can qualify for micro entity status. See 35 U.S.C. § 123(a)–(c) (2012) (defining “micro entity”).

120. See 35 U.S.C. § 41(h) (2012) (providing a 50% fee reduction for small entities); Leahy–Smith America Invents Act, Pub. L. No. 112-29, § 10(b), 125 Stat. 284, 316–17 (2011) (specifying a 75% fee reduction for micro entities).

121. A related concern is that some examiners might be more lenient than others. Some applicants, therefore, will get unlucky and draw a tougher examiner, which, on the margin, will affect their likelihood of obtaining patent protection.

122. In a larger sense, society will benefit on average from a loser-pays rule because it will lead to higher quality patents—ones that actually incentivize innovation and are not weak. Given that utilitarianism is the guiding principle behind patents themselves, this

differently, by providing patent winners with a reward (even if that reward is merely a fee refund), we lower in expectation what their fees are when they file a patent application. That incentivizes applicants who repeatedly file “good” applications, particularly if they are price-sensitive.¹²³

At any rate, the PTO can always temper the proposed system to decrease the number of undeserved losers. First, instead of forfeiting an applicant’s bond when she receives a final rejection, the PTO might allow her one RCE or appeal. At the end of that process, if the applicant still does not receive a notice of allowance, she forfeits the bond. This more conservative approach would give these applicants one more bite at the apple before fee forfeiture occurs.¹²⁴

Second, the PTO could exempt some applicants from a loser-pays system unless they affirmatively “opt in.” Such an approach might make sense for certain applicants who might have more difficulty assessing their application quality *ex ante*. For example, one such group of applicants might be *pro se* applicants.¹²⁵ Since these applicants do not have the benefit of a patent attorney or agent to prepare and review their patent application, they might be less able to assess their application quality *ex ante* (and also less likely to be aware of the nuances of a loser-pays system).¹²⁶

consideration is what should primarily guide policy. *See generally* Devlin & Sukhatme, *supra* note 20 (explaining the utilitarian basis for patent law); *see also* Olson, *supra* note 20, at 183, 192, 203 (applying a utilitarian perspective to the public goods problem).

123. A loser-pays system also does not shut out undeserved losers altogether, as they can still continue prosecution (albeit at higher overall cost than under the current system). And as noted previously, any additional fees that resource-constrained applicants will be asked to pay is tempered by the fact that they would be eligible for small or micro entity fees. *See supra* notes 119–20 and accompanying text.

124. The PTO already moved in a similar direction in 2013, when it instituted higher fees for second or subsequent RCEs relative to fees for first RCEs. *See* Setting and Adjusting Patent Fees, 78 Fed. Reg. 4212, 4224 (Jan. 18, 2013). In setting this final rule, the PTO also noted that “around 70 percent of RCE applications filed in a year are for first RCEs and the remaining 30 percent are for a second or subsequent RCE. Given this data, it is reasonable to expect that most outstanding issues are resolved with the first RCE.” Setting and Adjusting Patent Fees, 78 Fed. Reg. at 4229.

125. *Pro se* applicants likely make up a small percentage of total applicants. For example, I previously found that out of approximately 517,510 issued patents between 1994 and 1998, only 23,852 (or 4.61%) were prosecuted by *pro se* applicants. *See generally* Neel U. Sukhatme & Judd N.L. Cramer, *Who Cares About Patent Term? Cross-Industry Differences in Term Sensitivity* 8–12 (Princeton Univ. Dep’t of Econ., Working Paper, 2014), <https://irs.princeton.edu/sites/irs/files/event/uploads/Sukhatme,%20Who%20Cares%20About%20Patent%20Term.pdf> [<http://perma.cc/X3EE-JTTT>] (describing the dataset used to calculate the preceding statistic). Of course, *pro se* applications likely make up a larger percentage of total patent applications that are filed (since their applications seem more likely to be rejected).

126. Still, even these applicants might be incentivized by loser pays toward filing stronger applications in the first place. Even if an applicant is uninformed, so long as he knows he is uninformed, there are concrete steps he can take to improve his

Similarly, the PTO might want to exclude from loser pays less experienced patent applicants. These might include, for example, those who have prosecuted fewer than four patent applications and qualify for micro-entity status. Like pro se applicants, “less experienced” applicants might be excluded from loser pays unless they affirmatively opt in to the system.¹²⁷

B. *Prior Art Concerns*

Somewhat relatedly, one might be concerned that loser pays would be unfair to those who are unaware of certain relevant prior art, particularly obscure printed publications that describe the claimed invention.¹²⁸ Since loser pays raises the stakes of patent examination, one might be concerned that it punishes those individuals who have neither the resources nor the ability to seek out this kind of prior art before filing their application.

Again, this concern can be readily addressed. As a preliminary matter, note that not just any printed publication can count as prior art. Rather, only references that are “public[ly] accessib[le]” constitute printed publications for purposes of prior art.¹²⁹ So it is a limited subset of printed publications that might prove problematic here.

More importantly, the PTO typically does not rely on printed publications to reject patent applications. Rather, it rejects applications primarily based on prior U.S. patents and published U.S. patent applications.¹³⁰ One recent empirical article found

patent filings. For example, he can look at relevant prior art to see whether the asserted invention is actually novel. Most prior art that’s likely to be cited by an examiner is readily accessible online via the PTO website or Google Patents. See *infra* Section VI.B (addressing concerns under loser pays when invalidating prior art cited by the examiner is so obscure that it is unlikely to have been found by the average applicant). Second, even an uninformed applicant can write more targeted patent claims with a more realistic scope. This involves adding limitations to claims to curtail excessive breadth.

127. Alternatively, one could structure the system as an “opt out” system—that is, pro se or inexperienced applicants would be presumed to select into loser pays unless they opt out. Research on the difference between “opt in” and “opt out” systems suggests the former is likely to be more protective of applicants and hence a better choice if one is concerned about the effect of loser pays on such applicants. See, e.g., Richard H. Thaler & Shlomo Bernartzi, *Save More Tomorrow™: Using Behavioral Economics to Increase Employee Saving*, 112 J. POL. ECON. S164 (2004) (concluding that an “opt-in” employee savings plan is more successful at getting people to save).

128. See 35 U.S.C. § 102(a)(1) (2012) (“A person shall be entitled to a patent unless . . . (1) the claimed invention was patented, described in a printed publication, or in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention”).

129. See *In re Hall*, 781 F.2d 897, 898–99 (Fed. Cir. 1986).

130. See, e.g., Thomas, *supra* note 1, at 318 (“Persistent commentary also reports

that in a 1% random sample of all utility patents issued in 2007, patents and published patent applications made up 64% of all cited prior art, and examiners accounted for only 6% of all cited non-patent art and foreign patents.¹³¹

Given that patents and prior published applications are easily accessible and searchable on the USPTO website and on Google, it is reasonable to presume that most applicants can find relevant prior art in these categories.¹³² Similarly, given that many foreign patents—often granted by the European Patent Office or the Japan Patent Office—are also searchable online, it makes sense to presume that applicants can find these references too, at least to the extent they are available in English.

In the relatively rare case in which an examiner rejects an application based on a written publication that the examiner herself found, the PTO could suspend the loser-pays rule and treat the applicant as if she had applied under a standard fee regime. In other words, loser pays might be reserved only for situations where the PTO issues final rejections based on patents or published patent applications, or applicant-submitted prior art.

C. *Why Not Just Raise Patent Fees?*

One might argue for a simpler approach—why not just raise patent fees, without instituting loser pays? Natural candidates for such fee increases include RCE fees and front-end patent fees (i.e., filing, search and examination fees). While merely raising these fees might be a bit simpler and has some merit,¹³³ such approaches would also be less effective in deterring weak applications as compared to loser pays.

First, consider raising RCE fees. Higher fees would deter continuations and they would disproportionately affect weak

that the Patent Office has increasingly relied upon previously issued patents as prior art.” (citing Wayne M. Kennard, *Software Patents as a Weapon: Are You Ready to Rumble?*, in 19TH ANNUAL INSTITUTE ON COMPUTER LAW 1123, 1135 (PLI Patents, Copyrights, Trademarks & Literary Prop. Course Handbook Series No. 547, 1999)).

131. See Christopher A. Cotropia, Mark A. Lemley & Bhaven Sampat, *Do Applicant Citations Matter?*, 42 RES. POL’Y 844, 846 (2013).

132. Scuttling a patent with obscure publications is more likely in patent litigation, where a defendant has both the means and incentive to find such references. See Doug Lichtman & Mark A. Lemley, *Rethinking Patent Law’s Presumption of Validity*, 60 STAN. L. REV. 45, 66 (2007). To the extent one is troubled with this phenomenon, it reflects a deeper problem with the patent system that has nothing to do with loser pays.

133. As Jonathan Masur has noted, raising patent fees would deter weak applications, but it would deter some non-weak ones as well, though likely to a lesser extent than bad ones. See Masur, *supra* note 8, at 710–12 (explaining how patent fees disproportionately screen out patents with lower social value).

applications, which are more likely to require continuations. But they would not directly deter the *filing* of weak applications in the first place. Put differently, a weak applicant would still get a chance at sneaking an application by an examiner in his initial prosecution. Only if this gambit fails would the applicant be forced to decide whether to file an RCE. As such, heightened RCE fees would not effectively deter weak application filings in the first instance.¹³⁴

A more promising approach is to raise front-end fees, which would deter some weak applications from being filed. Still, such an approach would also be less effective than a loser-pays regime. This is because of the way loser pays magnifies differences between patent winners and losers.

To see this, consider our current winner pays system. If front-end patent fees are increased substantially, then both patent winners and patent losers will pay more for access to the patent system. Patent losers will have greater losses; patent winners will have smaller gains. The increased fees will deter some applicants from filing patent applications, and these are more likely to be applicants with relatively low-value inventions.¹³⁵ To the extent we believe these patents are weak and would only issue when the patent office makes an error, this filtering mechanism is socially beneficial, as it prevents these applications from being filed in the first place.

But there is a second way in which weak patent applications could be reduced: incentivize those individuals who do file applications to file higher quality ones. Inventors might improve application quality in a number of ways, such as by clarifying the invention description, better familiarizing themselves pre-filing with the relevant prior art, and perhaps most importantly, drafting narrower patent claims that do not read on the prior art.

Merely increasing front-end fees might incentivize such improvements, but it would do so less effectively than loser pays. The reason for this is that merely increasing fees does not change the “wedge” between patent winners and patent losers; that is, it does not change the incremental dollar amount that winners receive over losers.

A formal model is beyond the scope of the present discussion, but higher front-end fees on their own will not induce

134. This result also holds for more extreme approaches that ban continuations altogether (or perhaps ban second or subsequent continuations). Note that such approaches are akin to raising continuation fees to infinity.

135. We should not be troubled that such applications are deterred by higher fees, since these low private value inventions also likely have low social value. See Masur, *supra* note 8, at 710–12.

risk-neutral patent applicants—which might include many corporate or repeat applicants—to take extra care when drafting applications they file. This is because both the upside gains from obtaining a patent, and the downside losses if no patent is obtained, are shifted by the same dollar amount. From the perspective of risk-neutral applicants, nothing has changed in terms of optimizing their applications, so they will draft their applications the same way under either fee regime.

By contrast, loser pays will induce risk-neutral applicants to file higher quality applications. As noted, this is because loser pays increases the returns for filing a winning patent application relative to a losing one. Hence, it will encourage applicants to file better (generally narrower) applications, thereby increasing their chances of being approved.

The dynamic is a bit more complicated for risk-averse applicants but economic theory suggests a similar result: higher front-end fees may improve application quality, but loser pays will produce even greater improvements. To see why, first note that risk-averse applicants do not perceive equal dollar changes to their upside and downside equally. Due to their risk aversion, raising fees by a set amount across the board decreases an applicant’s utility more when her application fails than when it succeeds. For example, a \$500 fee increase “hurts” an applicant more when her application is rejected than when it is approved. As such, heightened front-end fees raise the relative cost of patent rejection, thereby encouraging applicants to avoid rejection by improving their application quality, such as by filing narrower patent claims.

But loser pays achieves an even stronger result for risk-averse applicants. Again, this is because loser pays increases the wedge between patent winners and losers. Put differently, raising fees across the board is a “stick” that penalizes both patent losers and patent winners, though risk-averse losers feel the pain a bit more. By contrast, loser pays only applies the stick to patent losers, and instead provides a “carrot” (a fee reduction or prize) for patent winners. Putting the carrot and stick together encourages risk-averse applicants to file higher quality applications than would be achieved by raising front-end fees across the board.

Finally, as a practical matter, relying solely on front-end fees to deter weak applications might require a huge increase, which might have unintended bad consequences.¹³⁶ Instead, the PTO

136. See, e.g., Wagner, *supra* note 21, at 2172 (noting that “more radical approaches” to improving patent quality include “limit[ing] patenting to 100,000 filings per year” or

can improve application quality with smaller increases to front-end fees using loser-pays regime than if it relies on front-end fee increases alone. As such, loser pays can deter weak applications while staying true to the patent system's long-standing policy of setting low front-end fees to keep the system relatively affordable and accessible to all.¹³⁷

D. Sensitivity to Application Fees

In order for loser pays to have any bite, applicants must be sensitive to changes in patent application fees. In other words, patent fees must be high enough such that applicants actually change their behavior in response to fee changes. Some might be concerned that applicants might not respond to a loser-pays scheme if, for example, the underlying patent fees or prizes pale in comparison to the cost of hiring a patent attorney or agent to prosecute an application.

While this concern might have some merit, it is unlikely to be problematic in practice. First, empirical evidence suggests that applicants do, in fact, respond to relatively small changes in patent fees. For example, Gaétan de Rassenfosse and Adam Jaffe recently analyzed the effect of the Patent Law Amendment Act of 1982, which substantially increased fees from filing to grant (from approximately \$239 to \$800) and introduced maintenance fees (\$400, \$800, and \$1,200, at 3.5, 7.5, and 11.5 years, respectively).¹³⁸ Using a difference-in-differences methodology and various measures of patent quality, they estimated that fees disincentivized the filing of low quality patents—specifically, the fees filtered out 16%–17% of patents in the lowest quality decile and 24%–30% of patents in the lowest quality quintile.¹³⁹

“rais[ing] direct costs ten-fold” but that such approaches would “also have serious (and probably negative) effects on the basic incentive structure of the patent system—effects large enough to swamp any losses from low quality patents”).

137. See *supra* text accompanying note 63.

138. See Gaétan de Rassenfosse & Adam Jaffe, *Are Patent Fees Effective at Weeding Out Low Quality Patents?* 6 (Nat'l Bureau of Econ. Research, Working Paper No. 20785 2014), <http://www.nber.org/papers/w20785> [<http://perma.cc/AK6M-SDJG>]; see also Gaétan de Rassenfosse & Bruno van Pottelsberghe de la Potterie, *On the Price Elasticity of Demand for Patents*, 74 OXFORD BUL. ECON. & STAT. 58, 66 (2012) (using fee increases to estimate price elasticities); U.S. PATENT & TRADEMARK OFFICE, USPTO SECTION 10 FEE SETTING—DESCRIPTION OF ELASTICITY ESTIMATES 10–12 (2013) [hereinafter USPTO SECTION 10 FEE SETTING], http://www.uspto.gov/aia_implementation/aia_section_10_elasticity_supplement.pdf [<http://perma.cc/GL75-FHNJ>] (estimating of price elasticity of demand for changes in user fees).

139. Rassenfosse & Jaffe, *supra* note 138, at 4. The quality measures the authors used were the number of citations a patent receives (average decreased after the fee increase), the number of claims (average increased), the family size—i.e., number of jurisdictions in which a patent application was filed (average increased), and the number of times a patent is renewed (average increased). *Id.* at 8–9. Some might disagree with these measures, but that they all responded to the fee change in the predicted direction gives some support for the proposition

These results suggest that changes in fees can impact applicant behavior, particularly by disincentivizing weaker patent applications.¹⁴⁰ As this Article has argued, there are good reasons founded in economics that suggest loser pays will be even more effective than simple fee increases in disincentivizing weak applications.¹⁴¹

Moreover, if the PTO implements loser pays and observes that applicants are not sufficiently changing their behavior—for example, the quality of filed applications does not improve—it always has the option of further increasing front-end fees and/or patent prizes, to increase the wedge between patent winners and losers. At some point, fees will undoubtedly have an effect as hypothesized here and suggested by the empirical evidence: that is, they will disincentivize weak patent applications and improve the quality of those applications that are filed.

E. Claim or Application Level

Another wrinkle to consider is whether loser pays should be implemented at the patent claim level or the patent application level. A patent application generally has multiple claims, each of which technically covers a separate invention and is considered separately by the patent examiner. So if some claims are allowable but others are rejected, is an applicant a patent “winner” or “loser?”¹⁴²

If loser pays is implemented at the claim level, then a bond would be posted for each claim; applicants would receive rewards for good claims and forfeit their bonds on bad ones.¹⁴³ Although a claim-based approach might be workable, it would likely water down the stakes and reduce the benefits of loser pays.

To see why, consider an applicant with twenty claims, nineteen of which are good and one of which is weak. If loser pays is implemented on a per-claim level, this applicant has

that heightened fees disproportionately discouraged weak applications.

140. The fact that patentees, including large corporations, often decide not to renew patents rather than pay maintenance fees suggests that patentees’ behavior is shaped at least in part by patent fees. See Sukhatme, *supra* note 65, at tbl.1 app. (showing percentage of patents maintained in different invention subcategories); see also USPTO SECTION 10 FEE SETTING, *supra* note 138, at 10–11, 12 tbl.1.

141. See *supra* section VI.C.

142. The PTO will not send a notice of allowance unless all pending claims are accepted. See *generally* MPEP, § 607.02 (9th ed. Rev. 7, Nov. 2015). However, an examiner may indicate in a final office action that some claims are allowable, and that a notice of allowance would be in order if any pending rejected claims are canceled. *Id.*

143. Stephen Yelderman proposed bond forfeiture when applicants amend or cancel claims. See Yelderman, *supra* note 8, at 120–21.

little incentive to amend or cancel that last claim to avoid a final rejection, since the penalty is likely to be minimal for just one claim (especially if she is rewarded for the nineteen other good claims). Accordingly, the applicant has little incentive *ex ante* to avoid putting that one claim in the application in the first place, or to halt prosecution on that claim after it has been filed.

On the other hand, if loser pays is an all-or-nothing proposition—either all of your claims are accepted before a final office action or else you forfeit your bond—then the applicant has a much stronger incentive to cancel or amend weak claims during prosecution, and to avoid filing them in the first place. This approach raises the stakes by labeling an application a patent winner only if it receives a notice of allowance, with all pending claims allowable.

Accordingly, to maximize the deterrent effect of loser pays on weak applications, it should be implemented at the patent application level. Only if all pending claims are allowable should an applicant be deemed a patent winner; otherwise, he should be subject to fee forfeiture.

F. Post-Grant Proceedings

Finally, some might contend it is preferable to address weak patents through post-grant proceedings, whether in traditional patent litigation or through inter partes proceedings before the newly-created Patent Trial and Appeal Board (PTAB). In particular, since most patents are never litigated or licensed, one might wonder why we should devote any resources *ex ante* to making sure that patent applications are of higher quality.¹⁴⁴

While this argument has some merit for approaches that require devoting more resources to improving PTO examination quality, it has much less force when applied to patent applicant behavior. The advantage of a loser-pays system is that it induces applicants to file better patent applications from the outset. It achieves this goal without requiring any additional PTO expenditures, since the mere prospect of heightened fees for patent losers and lower fees or prizes for winners is enough to induce better applications.

More importantly, there are significant disadvantages to relying primarily on post-grant proceedings to deter weak patents. As Polk Wagner has noted, the penalty that a patent

144. See Lemley, *supra* note 34, at 1496, 1509–10.

will be invalidated in subsequent litigation is “woefully inadequate to deter low-quality filing behavior: its application is probabilistic, and the simple elimination of the low-quality patent is an insufficient cost to the holding patentee to deter strategic portfolio behavior.”¹⁴⁵ And even if one imposes fines against patentees whose patents are invalidated in litigation, applicants will highly discount these fines since the prospect of litigation is so remote, both in terms of likelihood and temporally.¹⁴⁶ So these fines will have little impact on ex ante application quality.¹⁴⁷

Additionally, even if weak patents are subsequently identified and eliminated in post-grant proceedings, there are costs associated with the uncertainty associated with the patent validity in the meantime.¹⁴⁸ One can conceptualize this uncertainty as a tax that makes patent-related business decisions, such as whether to sell or license a technology, more costly.¹⁴⁹ Loser pays greatly decreases this uncertainty by improving the overall quality of filed applications and granted patents.

VII. CONCLUSION: FIXING THE PRICING OF PATENTS

The best way to prevent weak patents is to deter weak patent applications. In our current system, successful patent applicants pay more than unsuccessful ones. As the present Article has shown, this makes little sense from an economic or policy-making standpoint.

Rather, the U.S. Patent and Trademark Office should import loser-pays principles into patent examination. Doing so would reduce the number of poor quality applications and hence the workload of PTO examiners, which in turn would likely improve their quality of review. Loser pays in patent examination would

145. See Wagner, *supra* note 21, at 2170.

146. See Sukhatme, *supra* note 65, at 1884–86.

147. Fines in PTAB proceedings may be more effective, since such proceedings are intended to move quickly and appear to be growing in popularity. See, e.g., Yasser El-Gamal, Ehab M. Samuel & Peter D. Siddoway, *The New Battlefield: One Year of Inter Partes Review Under the America Invents Act*, 42 AIPLA Q. J. 39 (2014). Still, it is hard to believe that a fine in a post-grant proceeding would ever be as effective as an equivalent fine in a loser-pays system in deterring weak applications from the outset.

148. See Wagner, *supra* note 21, at 2140 (“[A] patent system characterized by low patent quality sows substantial uncertainty at all levels of the patent system: uncertainty about the validity of granted patents, uncertainty about the scope of granted patents, uncertainty about whether a particular invention is patentable, and uncertainty about whether a valid patent will be fully enforced.”).

149. See *id.* More generally, to the extent that patent law, when correctly implemented, actually incentivizes innovation, then errors in the patent-granting process could harm innovation. See *id.* at 2141.

also increase the quality of filed applications, as applicants would have greater ex ante incentives to assess and improve application quality. These changes in applicant behavior would decrease the number of weak applications and resulting weak patents.¹⁵⁰

Of course, even if we fix the pricing of patents, that would not help us remove already-existing weak patents. But at least it would meaningfully address the problem going forward, at the earliest possible stage, before a weak patent application is even filed. More importantly, it would move our patent system closer to the ideal in which spurious invention is disincentivized and true innovation is properly rewarded.

150. While not the focus of this paper, this Article appears to be the first to propose importing loser-pays principles into an ex parte proceeding or application setting. Hence, the principles discussed here might apply in a number of different areas. As an illustration, consider an application process that is familiar to many law students—the law review submission process. Currently, authors pay a low, per-journal flat fee if they submit their articles electronically (as most do nowadays) through services such as ExpressO or Scholastica. Accordingly, there is little incentive for authors to target where they send their articles, or to be conservative in the number of journals to which they apply. The results of this system are familiar and unfortunate—authors apply to too many journals at once, and use offers from lower-ranked journals to obtain offers at higher-ranked journals.

The problem here is that there is no significant additional cost for authors when they blanket-apply to multiple journals. Loser pays might fix this submission system. For example, each law review could charge authors a significant application fee (e.g., \$50). If the author does not receive an offer from the journal, or if he rejects an offer from the journal, the money is forfeited. If the author receives an offer and accepts it, he receives a prize that is based on the number of “losing” submissions in the cycle. This prize will be higher for more selective journals that receive more submissions (since the number of “losers” will be higher for those journals).

Such a system would disincentivize individuals with low quality pieces and encourage them to spend more time trying to improve the quality of their articles before submitting them. Moreover, authors would have an incentive to target certain journals that might be a good match for their article rather than applying blindly. Law review editors would also benefit because the number of submissions would decrease, and *ceteris paribus*, the time to review each submission would increase.

Interestingly, using fees in a creative way to improve journal selection is not merely a hypothetical exercise posed here. The *Journal of Financial Economics*, for example, refunds fees on the final submission if a paper is accepted, or if the journal took an abnormally long time to review the submission. And the *Journal of Finance* awards annual prizes for the top three papers published that year in the journal (\$10,000 for the top paper, and \$5,000 for two distinguished papers). A similar approach might be used to improve the law review submission and selection process.