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Indeterminism and the Property-Patent Equation

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INTRODUCTION

How should one construct optimal property rules in high-technology markets? The task is far from straightforward, given the prodigious rates of innova-

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tion in the field.¹ In such a rapidly evolving environment, policymakers must approach many issues *de novo*. From an Internet service provider's desire to control activity on its servers to a pharmaceutical company's efforts to frustrate the emergence of generic drugs, lawmakers face an eclectic and ever-evolving array of scenarios.² In the new economy,³ such fundamental concepts as ownership, exclusivity, and alienability prove controversial and unsettled. Ideally, policymakers could look to related areas of law for guidance. The most obvious candidate would be the law governing real property, but, at first blush, these traditional principles seem far removed from the reality of high-tech markets.

Nevertheless, some commentators see prescriptive parallels in the rules properly brought to bear on owners of physical and intellectual property.⁴ This analogy can provide normative guidance in even the most difficult cases. An Internet service provider should be free to control its own servers but should lack means to control communal hubs, in much the same way that homeowners can enjoy exclusive possession of their domiciles while also being required to share communal rights of access with others.⁵ A person's right to alienate her intellectual property should be as free and unfettered as the right to alienate person-ality.⁶ At its core, the invocation of traditional property rules might suggest that intrusion upon an exclusive right be met with an unqualified ability to enjoin

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1. See RICHARD A. POSNER, *ANTITRUST LAW* 246 (2d ed. 2001) (observing the extraordinarily rapid pace of innovation in the new economy).
 2. Compare *Intel Corp. v. Hamidi*, 71 P.3d 296 (Cal. 2003) (denying Intel the right to enjoin use of its servers by a former employee), with C. Scott Hemphill, *Paying for Delay: Pharmaceutical Patent Settlement as a Regulatory Design Problem*, 81 N.Y.U. L. REV. 1553 (2006) (detailing pioneer drug manufacturers' efforts to protect their markets by excluding generic entry).
 3. The "new economy" refers to markets that sell information goods in nontangible form. Intellectual property features prominently in this setting, given that most information goods are protected by patent or copyright.
 4. See Richard Epstein, *The Property Rights Movement and Intellectual Property: A Response to Peter Menell*, 30 REGULATION 58 (2008). See generally Mark Lemley & Phil Weiser, *Should Property or Liability Rules Govern Information?*, 85 TEX. L. REV. 783 (2007) (discussing the circumstances in which strong rights to exclude, often found in real property settings, should be applied to the intellectual domain); Peter S. Menell, *The Property Rights Movement's Embrace of Intellectual Property: True Love or Doomed Relationship?*, 34 ECOLOGY L.Q. 713 (2007) (criticizing the property rights movement).
 5. See Epstein, *supra* note 4, at 60.
 6. See U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, *ANTITRUST GUIDELINES FOR THE LICENSING OF INTELLECTUAL PROPERTY* § 2.0 (1995), available at <http://www.justice.gov/atr/public/guidelines/0558.pdf> [hereinafter GUIDELINES] (regarding "intellectual property as being essentially comparable to any other form of property" and advocating the efficiency benefits of licensing).

that activity. In short, one possessing intellectual property should be as free to exclude others as a homeowner is to eject a trespasser from her property.⁷

If one incorporates this principle of property law into the law of patents, it becomes easier to espouse specific and consistent rules in the face of evolving technology. The ultimate question, of course, is whether the importation of laws developed with respect to tangible property is proper. This Article seeks to add a new perspective to this debate by focusing on an acute distinction between real and intellectual property. The legal rights associated with tangible property are generally secure, but it is well-settled that patentees enjoy no more than probabilistic rights—they hold lottery tickets that may or may not yield exclusive power.⁸ This asymmetry produces a variety of normative limitations and qualifications on an analogy between these related, yet distinct, bodies of law.

As a general matter, the issue of certainty implicates both the epistemological and consequential qualities of ownership and should inform the optimal construction of property rights accordingly. The Article draws two specific conclusions. First, there may be good normative ground for tempering the exclusive rights properly associated with highly probabilistic intellectual property rights. Second, in an environment of free contract, one should be concerned that a patentee may be able to transform the aoristic right granted to it by Congress into a certain one, thus deriving a greater pecuniary return than was inherent in the “patent bargain.” The legitimacy and scope of the power to exclude lie at the heart of this transformative process, creating a spectrum that charts a direct association between patent certainty and freedom of contract.

Indeterminism thus bears significant repercussions for the property-patent equation. This Article charts the positive source of the divergence in determinism between intellectual and tangible property and explores the normative repercussions of that departure for the formulation of both substantive patent law and ideal restraints on freedom of contract. The capricious nature of intellectual property rights need not strip the property-patent equation of all legitimacy. Rather, the temptation to borrow wholesale from the law governing real property must be met with sensitivity for the distinctions between the property characteristics at issue.

Nevertheless, it is easy to exaggerate the differences between these two bodies of law. The idea that traditional property law invariably grants unyielding rights to exclude others is mistaken. Far from Blackstone’s famous depiction of a property right as “that sole and despotic dominion which one man claims and exercises over the external things of the world, in total exclusion of the right of

7. See Frank H. Easterbrook, *Intellectual Property Is Still Property*, 13 HARV. J.L. & PUB. POL’Y 108, 109 (1990) (“Patents give a right to exclude, just as the law of trespass does with real property. Intellectual property is intangible, but the right to exclude is no different in principle from General Motors’ right to exclude Ford from using its assembly line . . .”).

8. See generally Mark A. Lemley & Carl Shapiro, *Probabilistic Patents*, 19 J. ECON. PERSP. 75 (2005).

any other individual in the universe,”⁹ the body of law that actually has developed is quite flexible.¹⁰ Even in the domain of real property, the law does not grant an unqualified right to injunctive relief in all circumstances. Rather, it introduces a liability rule in high-transaction cost environments where the cost of bargaining would exceed the benefit, as well as in cases of uncertainty, which are not systemic in physical property but nevertheless exist in some form.¹¹ The world of physical property thus bears witness to a rich body of law, upon which policymakers in the intellectual setting can draw readily. Strong property rights, of course, play an important role with respect to both tangible and intellectual property, but their limitations should be apparent in both settings. By construing the property-patent equation in such terms, one can appreciate that even cases that which strip patentees of an automatic right to injunctive relief, are entirely consistent with traditional principles of ownership.

Part I of the Article explores the relationship between intellectual and real property and the nature of the “right to exclude” that is typically thought to define property rights, and it explains how that exclusivity is less inflexible than often is thought. Given traditional property law’s embrace of liability rules in appropriate circumstances, it follows that an analogy between physical and intellectual property does not suggest that injunctions always should be awarded in cases of patent infringement. The heart of the Article lies in Part II, which observes the high level of uncertainty associated with patents and explains the normative consequences of that indeterminism for a patentee’s right to exclude rivals. It also considers the limits that should be placed on patentees’ attempts to secure their probabilistic property rights. Part III considers how the stochastic nature of today’s patents could be improved but explains that some residual uncertainty is inevitable. Nevertheless, such a low level of indeterminism may be without significant normative consequence. A brief conclusion follows.

I. INTELLECTUAL PROPERTY, THE PROPERTY RIGHTS MOVEMENT, AND THE RIGHT TO EXCLUDE

A. *The Property-Patent Equation*

1. The Relationship Between Intellectual and Real Property

Despite the obvious contextual differences between intellectual and physical property, there is no question that their analogy has been both influential and widely received. The Patent Act provides that “patents shall have the attrib-

9. 2 WILLIAM BLACKSTONE, COMMENTARIES *2.

10. See *infra* Section I.B.

11. See James E. Krier & Stewart J. Schwab, *Property Rules and Liability Rules: The Cathedral in Another Light*, 70 N.Y.U. L. REV. 440, 450-51 (1995); Daphna Lewinsohn-Zamir, *The Choice Between Property Rules and Liability Rules Revisited: Critical Observations from Behavioral Studies*, 80 TEX. L. REV. 219, 220 (2001).

utes of personal property.”¹² The Supreme Court has noted that “patents . . . have long been considered a species of property.”¹³ The Justice Department and Federal Trade Commission’s influential antitrust guidelines on the licensing of intellectual property stress the importance of this relationship.¹⁴ And the right of a patentee to enjoin infringement of its claimed invention—surely the definitive characteristic of a property right—has been recognized and respected,¹⁵ at least until recently.¹⁶

There are many parallels to draw between physical and intellectual property rules. In both cases, private ownership spurs desirable rates of investment and consumption. With respect to land, economists have warned of the tragedy of the commons that can arise in the absence of private property rights. In such situations, each consumer fails to internalize the full social cost of his consumption.¹⁷ This yields excessive use and results in long-run degradation of the relevant resource.¹⁸ Similarly, a rational actor has little incentive to devote her limited resources to improving a piece of land when others are free to appropriate the value of her labor. As a result, the law recognizes a property right in tangible property, which allows owners to internalize the value of their actions.¹⁹ Such internalization causes their actions to mirror the social optimum.²⁰ The definitive characteristic of such property rights, of course, is the right to exclude. In

12. 35 U.S.C. § 261 (2006).

13. Fla. Prepaid Postsecondary Educ. Expense Bd. v. Coll. Sav. Bank, 527 U.S. 627, 642 (1999).

14. See GUIDELINES, *supra* note 6.

15. See, e.g., George M. Sirilla et al., *Will eBay Bring Down the Curtain on Automatic Injunctions in Patent Cases?*, 15 FED. CIR. B.J. 587, 594 (2006) (noting that the then-applicable rule that injunctions should generally issue upon a showing of infringement “reflects the long-held belief that the right to exclude is inherent in a patent”).

16. See *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388 (2006).

17. See D. Benjamin Barros, *Group Size, Heterogeneity, and Prosocial Behavior: Designing Legal Structures to Facilitate Cooperation in a Diverse Society*, 18 CORNELL J.L. & PUB. POL’Y 203, 216-17 (2008).

18. See Garrett Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243, 1244-45 (1968).

19. See STEVEN SHAVELL, *FOUNDATIONS OF ECONOMIC ANALYSIS OF LAW* 11-20 (2004).

20. In practice, it is impossible to internalize fully the benefits of one’s investment in land. Passersby and other third parties derive utility from improvements. As a result, the Blackstonian view of property as “that sole and despotic dominion which one man claims and exercises over the external things of the world, in total exclusion of the right of any other individual in the universe,” BLACKSTONE, *supra* note 9, at *2, is unattainable in practice. Thus, positive externalities exist, and even private ownership yields suboptimal rates of investment.

particular, that exclusivity equates to injunctive relief in the case of trespass, so that a person may enjoy her property “in total exclusion of the right of any other individual in the universe.”²¹

In the case of intellectual property, much of the same reasoning applies. Valuable information is costly to produce yet difficult to maintain exclusive control of and cheap to disseminate.²² The result is that unbridled markets will undercompensate inventors, leading to suboptimal rates of investment in “Science and useful Arts.”²³ As with realty and personalty, bestowing the inventors of useful, nonobvious, and novel technologies with property rights allows them to internalize the social gains of their scientific contributions and devote socially desirable levels of investment to the innovative process.²⁴

Yet acceptance of the property-patent equation has been far from ubiquitous. According to Professor Peter Menell, the fields of real and intellectual property “derive from different philosophical foundations, embody different rules and institutions, and reflect different political constituencies.”²⁵ Similarly, Richard Stallman—an outspoken critic of the concept of intellectual property—considers that the reference to information as “property” operates as “a catch-all to lump together disparate laws” that “originated separately, evolved differently, cover different activities, have different rules, and raise different public policy issues.”²⁶

In practice, those who debate the virtues of analogizing the two fields of law typically divide into proponents of either property or liability rules.²⁷ A property right is typically defined as ownership that confers an absolute power to control the use and disposition of an asset.²⁸ Use of the asset by others necessarily is

21. *Id.*

22. See Clarisa Long, *Patent Signals*, 69 U. CHI. L. REV. 625, 631-32 (2002).

23. U.S. CONST. art. I, § 8, cl. 8.

24. Again, it should be noted that full internalization of an invention's value is impossible. This is particularly true in the intellectual domain, where valuable information is notoriously difficult to maintain to the exclusion of third parties. Unlike with the case of tangible property, however, there are overriding considerations in favor of full, unfettered dissemination once a certain financial return has been acquired. Thus, it is generally true that we do *not* want inventors to internalize the full social value of their inventions.

25. Peter S. Menell, *Intellectual Property and the Property Rights Movement*, 30 REGULATION 36, 38 (2007).

26. Richard M. Stallman, Did You Say “Intellectual Property”? It's a Seductive Mirage (Sept. 27, 2009), <http://www.gnu.org/philosophy/not-ipr.xhtml>.

27. See generally Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089 (1972) (providing the definitive discussion on the proper circumstances in which property and liability rules should be employed).

28. See Richard A. Epstein, *A Clear View of The Cathedral: The Dominance of Property Rules*, 106 YALE L.J. 2091, 2091 (1997).

contingent on the owner's consent.²⁹ A liability rule, in contrast, strips an owner of the ability to exclude others, so that anyone can consume the relevant resource upon payment of a price deemed appropriate by some third party.³⁰

The debate has yielded great discord, but neither legal regime has achieved hegemony. The property rights movement (PRM) advocates powerful rights to exclude, which yield significant ex ante incentives to innovate and facilitate efficient Coasian bargaining through contract.³¹ Others promote the primacy of liability rules, stressing the transaction costs associated with pervasive bargaining, the threat of strategic hold-out, and the search costs inherent in a law that grants an inventor an unqualified right to exclude—all shortcomings deemed endemic in property rules.³² In turn, the PRM criticizes the enforcement dilemma inherent in the liability approach, given the theoretical difficulty of defining an optimal access price and the inevitable and disproportionate social cost of attempting to estimate it in practice.³³ Property rights advocates further note that such fears such as irrational hold-out—most often voiced in the context of patent thickets and experimental use—are not supported by empirical evidence.³⁴ Instead, strong, overlapping property rights give rise to their own solution through patent pools, portfolio cross-licenses, standard-setting organizations (SSOs), and invent-around.³⁵

29. *Id.*

30. *Id.*

31. Some commentators also note that powerful rights to exclude are deontologically justified, although it is widely accepted that a purely utilitarian calculus informs the construction of patent rules. See Peter Lee, *The Evolution of Intellectual Infrastructure*, 83 WASH. L. REV. 39, 53-54 (2008) (“The Supreme Court has recognized that ‘the ultimate goal of the patent system is to bring new designs and technologies into the public domain through disclosure.’ While acknowledging the valuable contributions of inventors, the Court has accordingly rejected any moral rights or Lockean labor theory justifications for granting patents.” (footnotes omitted)).

32. See generally Yochai Benkler, *An Unhurried View of Private Ordering in Information Transactions*, 53 VAND. L. REV. 2063, 2068-69 (2000) (contrasting the virtues of public and private ordering).

33. See Epstein, *supra* note 28.

34. See F. Scott Kieff, *Property Rights and Property Rules for Commercializing Inventions*, 85 MINN. L. REV. 697, 719-27 (2001) (arguing that patents do not create a hold-out problem but in fact promote innovation and commercialization).

35. See, e.g., Daniel F. Spulber, *Unlocking Technology: Antitrust and Innovation*, 4 J. COMPETITION L. & ECON. 915, 963 (2008). Patent pools are entities that accumulate and license blocking patents. They serve a valuable role in bypassing the undesirable economic phenomenon of royalty stacking, which can hinder or even prevent the commercialization of technologies that require the use of intellectual property-protected information. Sometimes a small number of companies that possess large patent portfolios can achieve the same result by cross-licensing one another. SSOs are comprised of industry participants and seek to agree on a

Despite the controversy, most scholars accept the primacy of property rules in situations where few transacting parties are involved and where strategic hold-out is absent.³⁶ In such settings, liability rules foster an environment of costly ex post litigation over indeterminate concepts of “reasonable” royalty rates, frustrate efficient contracting, and create a systemic risk of patentee undercompensation.³⁷

A crucial question, therefore, is whether traditional principles of land law incorporate liability or property rules. If one wishes to draw an analogy between the laws governing intellectual and real property, the rules sought to be incorporated by that analogy must be understood. As explored below, the idea that the law of real property is synonymous with a property rule is mistaken.

2. The Property-Patent Equation as a Right To Exclude

At its most fundamental, the equation between patents and physical property might imply that the law should provide the holders of each with inviolable exclusive rights, the breach of which gives rise to automatic injunctive relief. As this Section explains, however, this analogy does not support such a conclusion. Instead, a critical review of real property law reveals that a liability rule may be the optimal result in certain circumstances.

Nevertheless, patent law long reflected the view that infringement should result in an absolute right to exclude. Indeed, in a 2005 decision subsequently reversed by the Supreme Court, the Federal Circuit opined: “Because the ‘right to exclude recognized in a patent is but the essence of the concept of property,’ the general rule is that a permanent injunction will issue once infringement and

common standard for all in an industry to use. They typically are used in situations where a number of possible standards can be employed. Free market competition to establish a dominant standard involves wasteful, “winner-takes-all” rivalry, which can be avoided through the SSO process.

36. Hold-out is a tactic in which a patentee withholds its proprietary claims until industry lock-in allows it to appropriate a greater pecuniary return than was inherent in its ex ante technological contribution. See Mark A. Lemley, *Ten Things To Do About Patent Holdup of Standards (and One Not To)*, 48 B.C. L. REV. 149, 153-54 (2007).
37. Note that numerous courts have recognized the dangers inherent in a liability approach. See, e.g., *Odetics, Inc. v. Storage Tech. Corp.*, 14 F. Supp. 2d 785, 795 (E.D. Va. 1998) (“[W]ere an injunction not to issue[, the patentee] would suffer significant irreparable harm, namely the loss of its statutory right to license or not to license its patent to whomever it wishes.”); *Shiley, Inc. v. Bentley Labs., Inc.*, 601 F. Supp. 964, 970 (C.D. Cal. 1985) (“[M]onetary damages are generally considered to be inadequate. This inadequacy results from the nature of the patent right itself—the right to exclude others.”). While such cases are sound in principle, they can be criticized insofar as they facilitate the extraction of rents by patentees of a value reflective of ex post lock-in, rather than ex ante value in the presence of choice.

validity have been adjudged.”³⁸ The rationale for allowing the owner of physical or intellectual property to enjoin trespass is important. As noted, the alternative to an injunction is monetary relief, which threatens to undercompensate property holders by providing them with less than would have induced them to license *ex ante* and creates *ex post* litigation costs over nebulous concepts of “proper” damages.³⁹

The Supreme Court recently dealt the property-patent equation a crushing blow—at least if one interprets that analogy as requiring the incorporation of a property rule. In *eBay Inc. v. MercExchange, L.L.C.*, the Court stripped a patent-holder of the very right that is ostensibly guaranteed to it by the Patent Act—namely, the right to exclude.⁴⁰ More specifically, it held that a patentee does not enjoy a presumptive right to injunctive relief upon a finding of infringement but must instead satisfy the traditional equitable factors that support such a remedy.⁴¹ This unanimous holding flew in the face of those who had urged the Court in an amicus brief to treat patent rights as one would treat tangible property and recognize the right to exclude as largely sacrosanct in both cases.⁴² The Court’s unequivocal rejection of that stance undermined the property rights movement and, quite understandably, spurred some to declare the death of the PRM’s normative contribution to contemporary debate.⁴³

The *eBay* decision is monumental. Did the Court properly reject the property-patent equation in stripping patentees of a presumptive right to injunctive relief? Are the patent and physical property laws sufficiently distinct as to warrant idiosyncratic rules? The answer lies in a fundamental discrepancy that underlies the analogy between patents and physical property. This weakness lies in the probabilistic nature of intellectual property rights, which display a level of

38. *MercExchange, L.L.C. v. eBay, Inc.*, 401 F.3d 1323 (Fed. Cir. 2005) (quoting *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1246-47 (Fed. Cir. 1989)), *rev’d*, 547 U.S. 388 (2006).

39. See Craig Allen Nard, *Certainty, Fence Building, and the Useful Arts*, 74 IND. L.J. 759, 768 (1999).

40. *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388 (2006). The Patent Act grants an inventor the right to exclude others from making, using, offering to sell, selling, or importing the patented invention. See 35 U.S.C. § 271 (2006). Similarly, the Court had previously stressed the primacy of “the long-settled view that the essence of a patent grant is the right to exclude others from profiting by the patented invention.” *Dawson Chem. Co. v. Rohm & Haas Co.*, 448 U.S. 176, 215 (1980).

41. *eBay*, 547 U.S. at 391.

42. See Brief Amici Curiae of 52 Intellectual Property Professors in Support of Petitioners, *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388 (2006) (No. 05-130).

43. See Richard J. Lazarus, *The Measure of a Justice: Justice Scalia and the Faltering of the Property Rights Movement Within the Supreme Court*, 57 HASTINGS L.J. 759 (2006).

indeterminism that may significantly undermine a literal invocation of traditional principles of real property law.⁴⁴

From this perspective, one might imagine that *eBay*—far from constituting a perpetual rejection of property rules in the IP field—merely revealed an otherwise underappreciated fault in the property-patent equation. In contrast to adherents to the property rights movement,⁴⁵ the Article finds *eBay* entirely consistent with traditional jurisprudence governing real property. Although there is a gross disparity in the level of uncertainty that characterizes intellectual and tangible property, the latter body of law has in fact developed a rich set of rules to cover instances of inadvertent infringement over property of nebulous and ill-defined boundaries. Those promoting a closer union between the intellectual and traditional property domains should, contrary to PRM advocates' assertions, embrace *eBay*'s suggestion that injunctive relief should be denied in appropriate settings.⁴⁶

B. *Defining the Right To Exclude*

If one seeks to inform the construction of ideal intellectual property rules by analogy to the law applied to traditional property, it is necessary to understand the substance of the latter body of law. After all, PRM advocates urge the adoption of traditional principles of exclusivity in the intellectual realm.

How is the right to exclude defined in the context of physical property? The substance of that right was most famously articulated by William Blackstone as “that sole and despotic dominion which one man claims and exercises over the external things of the world, in total exclusion of the right of any other individual in the universe.”⁴⁷

Were the Blackstonian view an accurate depiction of traditional property rights, an analogy between those rights and IP would result in the importation of unqualified and dogmatic rights to exclude. Yet, circumstances unique to the intellectual setting require that otherwise powerful rights to exclude be qualified in appropriate circumstances. Ever-expanding and controversial patentable subject matter, imperfect access to information, nebulous patent claims of indeterminate scope and validity (the focus of this Article), and the phenomenon of ex post hold-up create an environment in which injunctive relief should be de-

44. This Article builds on a prior critique of the nebulous and uncertain nature of intellectual property rights and the implications of that indeterminism for the formulation of optimal legal rules. See Alan Devlin, *The Stochastic Relationship Between Patents and Antitrust*, 5 J. COMPETITION L. & ECON. 75 (2009).

45. See Richard A. Epstein, Op-Ed., *Court Soft on Property Rights*, FIN. TIMES, May 16, 2006, <http://www.ft.com/cms/s/2/6a9ade66-e4ef-11da-80de-0000779e2340.html>.

46. One can certainly criticize the four traditional factors in equity that formed the basis of the Court's test in *eBay*, even though, properly informed, these could be employed to optimal end.

47. See BLACKSTONE, *supra* note 9, at *2.

nied in certain situations. From this perspective, a property-patent equation in the literal Blackstonian sense would be definitively undesirable in some settings.

The property rights movement has been accused of advocating just such a nefarious position. Professor Menell, for instance, posited recently that PRM advocates are attempting to “shoehorn intellectual property into an idealized Blackstonian conception of property as exclusive and inviolate.”⁴⁸ From this perspective, an analogy from physical to intellectual property would allow patentees to enjoin infringement in all scenarios. This presumably would include situations that involve strategic ex post hold-out by patent trolls (nonpracticing and nonlicensing patentees) and others.⁴⁹ Such an extreme position may be problematic.

The idea that traditional property rights invariably entail a rigid right to exclude, however, is quite inaccurate. To the contrary, such rights are notable for their malleability, given their demonstrable ability to facilitate efficient outcomes in distinct circumstances by assuming a variety of forms.⁵⁰ It would be highly misleading to suggest that traditional property law accurately reflects the Blackstonian conception of exclusivity. Indeed, as has been noted elsewhere, Blackstone himself had anything but a Blackstonian view of property rights in England at the time of his great work.⁵¹

The law of tangible property shows great sensitivity to the circumstances of different contexts—it is neither uniform nor dogmatic in its provision of injunctive relief. As demonstrated most authoritatively by Judge Richard Posner,

48. See Menell, *supra* note 25, at 37–38.

49. The author does not agree with some commentators’ view that injunctions should be denied where the patented technology is but a minor part of the infringer’s activity. The relevant criterion should involve both the accused infringer’s notice of the patent before initiating its investment and the patentee’s willingness to market or license its technology to third parties. For a representative case that placed undue weight on the centrality of the patented technology to the infringing product, see *z4 Techs., Inc. v. Microsoft Corp.*, 434 F. Supp. 2d 437, 441 (E.D. Tex. 2006) (“Here, product activation is a very small component of the Microsoft Windows and Office software products that the jury found to infringe z4’s patents. The infringing product activation component of the software is in no way related to the core functionality for which the software is purchased by consumers.”).

50. See Robert H. Cutting, “One Man’s Ceilin’ Is Another Man’s Floor”: *Property Rights as the Double-Edged Sword*, 31 ENVTL. L. 819, 865 (2001); Carol M. Rose, *Crystals and Mud in Property Law*, 40 STAN. L. REV. 577 (1988).

51. See Richard A. Epstein, *Intellectual Property: Old Boundaries and New Frontiers*, 76 IND. L.J. 803, 817 (2001) (“Blackstone’s vision of ownership as the sole and despotic dominion of property no longer squares with a sensible account of private property. But to his credit, Blackstone backed off this rhetorical flourish in giving an early and elegant explanation of why it was necessary that the state have the power of eminent domain to deal with the need to assemble the land needed for highways.”); David B. Schorr, *How Blackstone Became a Blackstonian*, 10 THEORETICAL INQUIRIES L. 103 (2009).

property law has largely conformed to the principles of the Coase Theorem.⁵² It creates a strong property rule in low-transaction cost environments where parties are likely to contract privately so that the relevant right ends up being allocated efficiently.⁵³ In such settings, the law seeks to bestow the property right on the party most likely to place the greatest utility on possessing it. Doing so eliminates the social cost of transacting and affects the relative wealth of the parties in a presumably favorable way. Low-transaction cost settings usually exist when the parties affected by the creation of a property right are both limited in number and readily identifiable.⁵⁴

In circumstances where transaction costs are likely to exceed the social benefit to parties of contracting to an efficient outcome, the initial allocation of a property right becomes determinative.⁵⁵ The cost of error is high because if the government mistakenly grants the right to the wrong party, private contracting will not lead to an efficient outcome. In this setting—where the cost of contracting is prohibitive—it generally is optimal to implement a liability rule.⁵⁶

Far from constituting a doctrinaire body of law that creates a determinative property right in all contexts, traditional property law displays considerable flexibility in application. This aspect of the law has led commentators to define it largely as creating “a bundle of rights,” rather than an unqualified right to exclude in all circumstances.⁵⁷

There are many instances in which the law recognizes that property rules and automatic injunctive relief are ill-suited to the traditional realm. For instance, given disproportionate transaction costs relative to the value sought, the law implies reciprocal easements between neighbors, thus permitting activity that might otherwise be deemed nuisance.⁵⁸ Such neighbors need not bargain for permission to engage in a conversation, or play music of moderate volume, that can be heard from a bounding property. Similarly, water rights in the eastern United States are significantly communalized due to the ease with which water can be accessed, in addition to its plentiful supply.⁵⁹ In that setting, ripar-

52. See RICHARD A. POSNER, *ECONOMIC ANALYSIS OF LAW* 31-87 (6th ed. 2003).

53. See Henry E. Smith, *Exclusion and Property Rules in the Law of Nuisance*, 90 VA. L. REV. 965, 994-95 (2004).

54. See Gideon Parchomovsky & Peter Siegelman, *Selling Mayberry: Communities and Individuals in Law and Economics*, 92 CAL. L. REV. 75, 95 (2004) (“Although there is no definitive answer, the consensus view in law and economics is clear on at least one issue: transaction costs should increase as the number of parties in the negotiations increases.”).

55. See POSNER, *supra* note 52, at 34, 61.

56. *Id.* at 67-71.

57. See, e.g., Michael A. Heller, *The Tragedy of the Anticommons: Property in the Transition from Marx to Markets*, 111 HARV. L. REV. 621, 662 (1998).

58. See Epstein, *supra* note 51, at 816.

59. See POSNER, *supra* note 52, at 35.

ian owners can use water in any way that does not unduly interfere with others' use of the same body of water.⁶⁰ Contrast this situation to that of the dry West, where consumption gives rise to a property right because water is more difficult to obtain.⁶¹ Moreover, the power of eminent domain represents perhaps the quintessential deviation from the Blackstonian conception of absolute exclusivity. Recognizing the problem of hold-out, and the many inefficiencies associated therewith, the law allows the government to seize private property upon payment of market value.⁶² These examples demonstrate that "ownership" and "exclusivity" possess distinct and malleable meanings, depending on the relevant context. Property is indeed a softer and more flexible concept than would be implied from Blackstone's classic articulation.

If the PRM advocate does not promote an absolute injunctive right in cases of infringement, what does she hope to attain by analogy to the law of tangible property? The answer lies not in an unqualified invocation of ideological principles but rather in strong property rules in a context of surmountable transaction costs. The fruit of this analogy gives meaning to the concept of a "right to exclude." This subtlety is best expressed by one of the foremost defenders of the PRM position, Professor Richard Epstein:

[A]ll complex property systems, wherever located, require some mix of absolute and common elements to maximize the value of the underlying resources. Stated otherwise, [the] supposed absolutist position [of the PRM] is anything but. One starts off with land (but not water) with the presumption that the right to exclude, use, and dispose of property is absolute. But in the next breath the law subjects that initial presumption to scrutiny in order to find those situations where the reconfiguration of rights . . . will lead to overall social improvements, typically by increasing in high transaction costs settings the value of property entitlements through the forced transformation of property rights.⁶³

So understood, the property-patent equation is more subtle than it first may appear. Indeed, the point of the analogy may be thought of as a defense of the primacy of property rules in situations facilitative of them. As in the physical realm, property rights over information allow efficient Coasian contracting in settings of sufficiently limited transaction costs. In the intellectual setting, therefore, one should start with the presumption that a right to injunctive relief is appropriate. Other things being equal, from an *ex ante* perspective, only where transaction costs are sufficiently pronounced should society revisit its presumption of a property rule.⁶⁴ Thus, it is not at all clear that a property-patent equa-

60. *Id.*

61. *Id.*

62. *Id.* at 55.

63. Epstein, *supra* note 4, at 60.

64. The *ex ante* qualification ensures that parties are able to reach an efficient outcome. In an *ex post* setting, lock-in may facilitate a patentee's artificial extraction

tion warrants the introduction of unqualified rights to exclude in all settings that involve patented technologies. Rather, optimal laws display sensitivity to the merits of property vis-à-vis liability rules in each unique setting.

This approach gives meaning to the “right to exclude.” Of course, the analogy is complicated by idiosyncrasies unique to the intellectual arena. As noted, the increasing scope of patentable subject matter, the proliferation of patentees who neither own nor license their proprietary technology, and the fact of ex post hold-out combine to dilute the normative case for strong property rights in the patent field. Yet these factors need not be determinative. They are not systemic but, rather, context-specific issues that arise within the realm of patent law. Most crucially, these traits are eminently observable by judges. If one concludes that these traits are sufficiently severe to justify the denial of injunctive relief, then courts should be able to deny such relief under the rubric of the public interest.

Although the aforementioned concerns are self-contained, the dilemma of uncertainty is not. This Article charts the stochastic nature of patent rights and explains the normative repercussions of that indeterminism for the analogy to traditional principles of property law. Unfortunately, the uncertain nature of patents is systemic, applying in nearly all patent cases before judicial resolution has been achieved. While concerns of patent trolls and ex post pecuniary extraction through strategic hold-out may implicate the relationship between physical and intellectual property in certain cases, the fact of indeterminism applies in nearly all. The following Part explores the implications of this uncertainty on the ideal formulation of rights to exclude in the patent realm, in addition to further rights derivative of that exclusivity.

II. PROBABILISTIC PATENTS: CONSEQUENTIAL AND EPISTEMOLOGICAL IMPLICATIONS

A. *Patent Rights, Indeterminism, and the Contrast with Physical Property*

When one conceives of a “property right” and its associated ability to exclude others, one tends to think in absolute terms. If a person owns a piece of property, upon which a stranger decides to set up shop, the owner has a right to eject the trespasser from his land by obtaining an injunction.⁶⁵ While there may be some uncertainty over the precise geographic reach of a particular person’s lot, one seldom encounters serious questions over the legitimacy of a plaintiff’s free- or leasehold interest in the land.

of monopoly rents beyond the value of its technology. Separately, this Article’s focus on indeterministic patent rights involves consideration of whether the right to exclude should be limited by that uncertainty, irrespective of transaction costs.

65. See Richard R.W. Brooks, *The Relative Burden of Determining Property Rules and Liability Rules: Broken Elevators in the Cathedral*, 97 Nw. U. L. REV. 267, 313-14 (2002).

The world of patent law is different. For those unfamiliar with the nature of prosecution at the Patent and Trademark Office (PTO) and the reality of patent litigation, the level of uncertainty underlying such intellectual property rights is astonishing. The fact of “probabilistic patents” has significant repercussions for one seeking to analogize the laws of physical and intellectual property. The right to injunctive relief and contractual rights that are derivative of the exclusivity inherent in a patent grant, in particular, are implicated.⁶⁶ This Section proceeds by exploring the extent, and explaining the cause, of issued patents’ uncertainty.

1. The Stochastic Nature of Patent Rights

The stochastic nature of patents derives from two major sources of uncertainty—probabilistic validity and indeterminate scope. The former emanates from the PTO’s failure to apply the requirements of patentability accurately during the prosecution process.⁶⁷ The latter results from the well-documented limitations of language in explaining the nature of a claimed invention concisely.⁶⁸ Indeed, patent cases often involve pretrial proceedings, known as *Markman* hearings, in which courts engage in claim construction to determine what the relevant patents cover as a matter of law.⁶⁹ Until this formal determination, patentees and potential infringers must engage in probabilistic assessments of what conduct will be found to infringe a particular patent.

Patents are valid only if their award is consistent with the various technical requirements of patentability laid down by the Patent Act.⁷⁰ Yet, there is no question that many patents are awarded in contravention of one or more provisions of that Act. This shortcoming emanates from the PTO’s inability to conduct a sufficient review of patentability.⁷¹ Empirical evidence is at once instructive and disheartening. Historically, statistical studies indicated that patents were invalidated in court at rates of 60-70%.⁷² Although there has been some

66. See *infra* Section III.B.

67. See Doug Lichtman & Mark A. Lemley, *Rethinking Patent Law’s Presumption of Validity*, 60 STAN. L. REV. 45, 46-67 (2007).

68. See, e.g., Lemley & Weiser, *supra* note 4, at 793-94; Katherine J. Strandburg, *What Does the Public Get?: Experimental Use and the Patent Bargain*, 2004 WIS. L. REV. 81, 102.

69. The name arises from the case of *Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996), in which the Supreme Court held that claim construction is a matter of law for a judge, and not a question of fact for the jury.

70. See 35 U.S.C. §§ 101-103 (2006).

71. See ADAM B. JAFFE & JOSH LERNER, *INNOVATION AND ITS DISCONTENTS: HOW OUR BROKEN PATENT SYSTEM IS ENDANGERING INNOVATION AND PROGRESS, AND WHAT TO DO ABOUT IT* (2004); Lichtman & Lemley, *supra* note 67, at 46-67.

limited improvement, contemporary studies are far from encouraging. Modern estimates suggest that patents litigated to judgment will be invalidated in 42-50% of cases.⁷³

Given the central importance of patent indeterminacy to this Article, it is worth specifying a number of the leading empirical studies on this matter. In 1998, Professors John Allison and Mark Lemley studied three hundred patent cases and found that challenged patents were invalidated at a rate of 46%.⁷⁴ They found this result to be similar to preceding empirical work.⁷⁵ Two years later, Professor Kimberley Moore surveyed 1209 decisions in patent trials and determined that patentees lost 42% of the time.⁷⁶ Similarly, in 2004, Professors Jean Lanjouw and Mark Schankerman found that “[w]in rates were close to 50%” in the cases they analyzed from between 1978 and 1999.⁷⁷

Perhaps one should approach these results with some caution, given that there may be an element of selection bias underlying the studies. It is an open question whether the average quality of patents litigated to judgment is representative of the larger pool of patents issued by the PTO. One would expect the owners of strong patents to prevail prior to summary judgment, presumably through some form of favorable settlement. Nevertheless, the foregoing empirical studies paint a depressing portrait of litigated patent quality, even if the specific findings exaggerate the poor quality of patents more generally.

Other indicia of quality also raise concern, however. The growth in successful patent applications at the PTO has been twice as large as the growth experi-

72. See P.J. Federico, *Adjudicated Patents, 1948-54*, 38 J. PAT. OFF. SOC'Y 233, 236 tbl.2 (1956); see also GLORIA K. KOENIG, *PATENT INVALIDITY: A STATISTICAL AND SUBSTANTIVE ANALYSIS* 4-41 n.35.2 (rev. ed. 1980) (finding that courts upheld the validity of patents in only 35% of cases).

73. See John R. Allison & Mark A. Lemley, *Empirical Evidence on the Validity of Litigated Patents*, 26 AIPLA Q.J. 185, 205 (1998) (observing that nearly 50% of all litigated patents are struck down); Donald R. Dunner, J. Michael Jakes & Jeffrey D. Karceski, *A Statistical Look at the Federal Circuit's Patent Decisions: 1982-1994*, 5 FED. CIR. B.J. 151 (1995); Jean O. Lanjouw & Mark Schankerman, *Protecting Intellectual Property Rights: Are Small Firms Handicapped?*, 47 J.L. & ECON. 45, 59 (2004) (finding that win rates are close to 50% in patent cases); Glynn S. Lunney, Jr., *Patent Law, the Federal Circuit, and the Supreme Court: A Quiet Revolution*, 11 SUP. CT. ECON. REV. 1, 37-38 (2004) (finding that patent owners succeed about 30% of the time at the Federal Circuit and suggesting that the availability of injunctive relief explains the departure from a 50% success rate); Kimberly A. Moore, *Judges, Juries, and Patent Cases—An Empirical Peek Inside the Black Box*, 99 MICH. L. REV. 365, 385 (2000) (taking a sample of cases over the period from 1983-99 and finding that patentees won 58% of the 1209 decisions in patent trials).

74. Allison & Lemley, *supra* note 73, at 205-06.

75. *Id.* at 206.

76. Moore, *supra* note 73, at 385.

77. Lanjouw & Schankerman, *supra* note 73, at 59.

enced by the agency's international counterparts.⁷⁸ This can be explained on the ground that applicants view the PTO as more likely to grant an application that would be rejected elsewhere.⁷⁹ In addition, the agency itself has recognized allowance error rates from 3 to 7%.⁸⁰

Given the preceding evidence of the expected validity of patents issued by the PTO, it follows that a patentee possesses what is, in effect, a highly probabilistic right to exclude.⁸¹ Indeed, patents have been referred to as "lottery tickets" for just this reason.⁸²

Yet the fact of uncertainty emanates from more than validity alone. After all, the holder of an unquestionably valid patent has exclusionary power only if its claims are read in such a way as to capture a challenged practice. Until a court engages in claim construction through a *Markman* hearing, however, there may be a great deal of ambiguity concerning the meaning and scope of a claimed invention.⁸³ Patentees and potential infringers must therefore engage in probabilistic determinations of what courts will likely conclude.⁸⁴ With land, there may be some uncertainty as to the precise metes and bounds of particular lots. Patents may be thought of similarly, but the boundary of uncertainty is apt to be far broader.

The problem derives from the limitations of language.⁸⁵ The canons of construction used to guide the interpretation of claims "are notoriously soft and

78. See JAFFE & LERNER, *supra* note 71, at 143.

79. *Id.* But see Rochelle Dreyfuss, *Pathological Patenting: The PTO as Cause or Cure*, 104 MICH. L. REV. 1559, 1563 (2006) (explaining this disparity on the ground of differing national laws and the expense of obtaining international protection).

80. See USPTO Oversight Hearing Before the Subcomm. on Courts, the Internet, and Intellectual Property of the H. Comm. on the Judiciary, 109th Cong. 3 (2005) (statement of Jon W. Dudas, Under Sec'y of Commerce for Intellectual Prop. and Dir. of the U.S. Patent and Trademark Office), available at <http://www.uspto.gov/web/offices/com/speeches/2005sep08.pdf>.

81. See Lemley & Shapiro, *supra* note 8.

82. *Id.* at 80-83.

83. Indeed, even the courts struggle in making this determination. See, e.g., David L. Schwartz, *Practice Makes Perfect? An Empirical Study of Claim Construction Reversal Rates in Patent Cases*, 107 MICH. L. REV. 223 (2008).

84. For a good illustration of how unpredictable claim construction can be, see *Kinetic Concepts v. Blue Sky Med. Group*, 554 F.3d 1010, 1017-21 (Fed. Cir. 2009) (struggling with the meaning of something as ostensibly prosaic as "treating a wound").

85. See, e.g., Thomas Chen, Note, *Patent Claim Construction: An Appeal for Chevron Deference*, 94 VA. L. REV. 1165 (2008). To make matters worse, the judiciary recently has displayed some reluctance to engage in the construction of explicitly disputed claims. See *IP Cleaning S.p.A. v. Annovi Reverberi, S.p.A.*, No. 08-CV-147-BBC, 2008 WL 5119586 (W.D. Wis. Dec. 4, 2008); *Eppendorf AG v. Bio-Rad Labs., Inc.*, No. 07-CV-623-BBC, 2008 WL 2788553 (W.D. Wis. Jul. 11, 2008).

often conflict.”⁸⁶ The doctrine of equivalents, which enables a patentee to enjoin activity that does not literally infringe its claims, complicates the analysis further.⁸⁷ Worse still, the resulting uncertainty is compounded many times over by the sheer number of patents that may exist in a given field. Although the shortcoming seemingly would be addressed by 35 U.S.C. § 112, which invalidates indefinite patent claims, the standard used to inform that provision is edentulous. Only those claims that are “insolubly ambiguous” are invalid.⁸⁸ This, of course, is a low standard and one that does little to remedy the problem of ambiguity in patent claims.

For the company wishing to commercialize a product, the foregoing facts pose an extraordinary challenge. If the company wishes to avoid infringing anyone’s patent, it first must survey the relevant field. This initial step may be inordinately difficult. A single product in high-tech markets—semiconductors providing a prime example—may entail the use of literally thousands of patented technologies.⁸⁹ Once all relevant patents have been identified (or, more realistically, once the company hopes all have been identified), they must be reviewed to determine whether they claim some aspect of the proposed product. Yet, this determination must be reached by examining a variety of written claims, many crafted with deliberate ambivalence in the hope of enhancing the scope of the claimed invention, and then determining whether those claims could be expanded through the doctrine of equivalents to capture the proposed product. Inevitably, definite conclusions will prove elusive. Certainty will only arise *ex post*, following infringement proceedings in court, or conceivably following re-examination if the company believes a potentially blocking patent is anticipated or obvious given the prior art. The result has been aptly deemed a minefield by some commentators.⁹⁰

This conclusion is far from academic. The difficulty of claim construction—and the uncertainty that emanates from it—can perhaps best be illustrated through empirical evidence. Representatively, Judge Kimberley Moore

86. Alan R. Madry, *Legal Indeterminacy and the Bivalence of Legal Truth*, 82 MARQ. L. REV. 581, 588 (1999).

87. See *Royal Typewriter Co. v. Remington Rand, Inc.*, 168 F.2d 691, 692 (2d Cir. 1948).

88. See, e.g., *Microprocessor Enhancement Corp. v. Tex. Instruments, Inc.*, 520 F.3d 1367 (Fed. Cir. 2008); see also *Aristocrat Techs. Austl. Pty Ltd. v. Int’l Game Tech.*, 521 F.3d 1328 (Fed. Cir. 2008) (employing § 112 to invalidate a claim).

89. See Lemley & Weiser, *supra* note 4, at 797.

90. James R. Atwood, *Securing and Enforcing Patents: The Role of Noerr/Pennington*, 83 J. PAT. & TRADEMARK OFF. SOC’Y 651, 652 (2001); Jay P. Kesan & Andres A. Gallo, *Why “Bad” Patents Survive in the Market and How Should We Change?—The Private and Social Costs of Patents*, 55 EMORY L.J. 61, 70 n.38 (2006).

conducted a study which concluded that the Federal Circuit reversed 34.5% of appealed claim constructions.⁹¹

When all these factors are combined, it becomes clear that patents bestow highly stochastic exclusionary rights on their holders. A 2006 study by Professor Paul Janicke and LiLan Ren focused on the success rate of patentees when factors beyond validity alone are considered.⁹² They discovered that once validity, noninfringement, and enforceability all are considered, “accused patent infringers have been winning patent infringement suits at a rate of three to one.”⁹³

The reader perhaps should pause momentarily to reflect on the significance of this statistic. A patent’s value emanates from its legal ability to exclude others from practicing the claimed invention. Yet Janicke and Ren discovered that when a patentee attempts to exclude what it calculates (by some probabilistic metric) to be infringing activity, its probability of success is, on average, a mere 25%.

Such profound legal uncertainty has a variety of implications for the proper rules brought to bear on patentees. For policymakers seeking to inform their construction of optimal IP laws, the law of traditional property may therefore constitute an awkward reference point. Were a statistician to conduct an empirical survey of real property owners’ judicial success rates in obtaining relief in cases of appropriation, trespass, or encroachment, one would expect to find a wildly different outcome than in the intellectual property case. The fact of indeterminism therefore constitutes a point of marked departure between intellectual and physical property.

Yet, the importance of these distinctions between real and intellectual property can be exaggerated. The especially fragmented nature of patent ownership, the primary importance of cumulative innovation, and the increased incidence of ex post hold-up may be characteristic of the intellectual domain, but they do not define it. They are issues that arise in some, not all, intellectual property cases. More important still, such issues are not endemic to the world of patents. Traditional property law has encountered similar difficulties—albeit on a more modest scale—and has developed a rich body of doctrine from which the intellectual property policymaker can borrow.

The extent of the indeterminism surrounding patents issued by the PTO, however, throws tangible and intellectual property into potentially critical relief. The fact of probabilistic patents conceivably could undermine the cause of the property rights movement. One cannot make any unyielding a priori assump-

91. Kimberly A. Moore, Markman *Eight Years Later: Is Claim Construction More Predictable?*, 9 LEWIS & CLARK L. REV. 231, 233 (2005); see also Christian A. Chu, *Empirical Analysis of the Federal Circuit’s Claim Construction Trends*, 16 BERKELEY TECH. L.J. 1075, 1104 (2001) (finding that the Federal Circuit overturned 29.6% of appealed claim constructions).

92. See Paul M. Janicke & LiLan Ren, *Who Wins Patent Infringement Cases?*, 34 AIPLA Q.J. 1 (2006).

93. *Id.* at 3.

tions about the expected validity of patent rights.⁹⁴ Nevertheless, the existence of uncertainty does not undermine fatally the property-patent equation.⁹⁵ Although the level of indeterminism is far more modest in the traditional realm, the law of realty does offer some helpful guidance in how it deals with cases of innocent encroachment on property with ill-defined borders.⁹⁶

2. The Source of Patents' Uncertain Quality

Before exploring the implications of patent uncertainty on the right to exclude, it is important to explain the source of that indeterminism. As the asymmetric certainty that characterizes tangible and intellectual property has significant repercussions for the property-patent equation, it is helpful to explore how that analogy may benefit from enhanced certainty in the patent field. In order to create more secure rights, however, a policymaker first must comprehend the source of the current weakness in patent prosecution.

The PTO's difficulties arise most obviously from the combination of an ever-increasing volume of applications and inadequate funding. The number of applications filed with the PTO has increased from 164,558 in 1990 to 295,926 in 2000, 390,733 in 2005, and over 450,000 in 2007.⁹⁷ Such a vast and growing volume of applications has created an enormous backlog.⁹⁸ Representatively, in 2007, the PTO received 456,154 applications but issued only 182,930 patents.⁹⁹ The results are predictable. As of 2008, there were more than 1.2 million patent applications pending at the PTO.¹⁰⁰ The difficulty is exacerbated further by the increasing complexity of many applications, particularly in the relatively new

94. In contrast, one can make sound a priori assumptions about situations where a nonlicensing and nonpracticing patentee seeks to enjoin a productive enterprise. Such facts are largely self-evident from a cursory look at the case itself. In contrast, the validity and scope of a given patent right must await judicial determination.

95. See *infra* Section II.B.

96. See *id.*

97. See U.S. Patent and Trademark Office, Table of Annual U.S. Patent Activity Since 1790 (Apr. 16, 2009), http://www.uspto.gov/go/taf/h_counts.pdf.

98. See *The Cost of Ideas*, *ECONOMIST*, Nov. 13, 2004, at 71 (noting with great concern that “[l]ast year, the PTO received around 350,000 [patent] applications and currently has a backlog of over half a million to review”).

99. See U.S. Patent and Trademark Office, *supra* note 97; U.S. Patent and Trademark Office, Patenting Trends: Calendar Year 2007 (Feb. 21, 2008), http://www.uspto.gov/go/taf/pat_tro7.htm.

100. See U.S. PATENT & TRADEMARK OFFICE, PERFORMANCE AND ACCOUNTABILITY REPORT: FISCAL YEAR 2008, at 117 tbl.3 (2008), available at <http://www.uspto.gov/about/stratplan/ar/2008/2008annualreport.pdf>.

fields of patentable subject matter (software, business methods, biotechnology, and nanotechnology).¹⁰¹

In addition to these particularized problems, a number of systemic shortcomings undermine the PTO's ability to conduct as reliable and scrutinizing a review as the courts. Most obviously, the ex parte nature of prosecution limits the amount of information available to the relevant examiner.¹⁰² Competitors in the applicant's market may possess critical information, yet they are prohibited from contributing to the process in any way.¹⁰³ Additionally, it stands to reason that the applicant often will have a greater familiarity with the prior art than the appointed examiner, yet the prospective patentee is under no duty to search that art prior to submitting an application.¹⁰⁴ An applicant need only disclose prior art of which she is aware.¹⁰⁵ A considerable information asymmetry between the examiner and applicant results, which compromises the quality of the prosecution process.¹⁰⁶

Beyond these factors, there are some negative incentives that may impact the performance of examiners. Some have argued in particular that the practice of continuations has been abused by some prospective patentees to pressure examiners into approving an unworthy application.¹⁰⁷ Because of this practice, an examiner cannot make a determined applicant go away. An examiner can issue what is misleadingly known as a "final rejection," but the disappointed yet persistent applicant can start the process all over again by paying an additional filing fee.¹⁰⁸ Given that this process can be repeated ad nauseum, it is possible that some applicants will eventually wear down an initially recalcitrant examiner or

101. See *id.* at 18; National Association of Patent Practitioners, Comments on the Changes To Implement the Patent Business Goals, http://www.uspto.gov/ip/rules/comments/adv_business_goals/a08.jsp.

102. See Lichtman & Lemley, *supra* note 67, at 54-55.

103. This rule likely is a necessary evil. IP policy suggests that an inventor whose application is rejected should be able to resort to trade secret protection. Excluding rivals from the prosecution process is necessary to accomplish this goal.

104. See *Frazier v. Roessel Cine Photo Tech, Inc.*, 417 F.3d 1230, 1238 (Fed. Cir. 2005) ("[A]s a general rule, there is no duty to conduct a prior art search, and thus there is no duty to disclose art of which an applicant could have been aware." (quoting *FMC Corp. v. Hennessy Indus., Inc.*, 836 F.2d 521, 526 n.6 (Fed. Cir. 1987))).

105. See Katherine Nolan-Stevaux, *Inequitable Conduct Claims in the 21st Century: Combating the Plague*, 20 BERKELEY TECH. L.J. 147, 147 (2005).

106. See Kevin Mack, *Reforming Inequitable Conduct To Improve Patent Quality: Cleansing Unclean Hands*, 21 BERKELEY TECH. L.J. 147, 148 (2006).

107. See Mark A. Lemley & Kimberly A. Moore, *Ending Abuse of Patent Continuations*, 84 B.U. L. REV. 63 (2004).

108. *Id.* at 68.

perhaps be appointed a new examiner.¹⁰⁹ It also has been suggested that cultural norms at the PTO predispose the prosecution process toward the liberal granting of patents.¹¹⁰ In addition, some posit that there may be some pecuniary incentive for an examiner to grant an application.¹¹¹ A final problem, hardly limited to the PTO setting, involves the allure of the private sector. Given the higher salaries available outside the PTO, the agency struggles to maintain its top examiners.¹¹²

In short, information asymmetry between the examiner and applicant,¹¹³ the non-adversarial nature of the proceeding,¹¹⁴ pecuniary incentives for examiners to grant applications,¹¹⁵ the placement of the burden of persuasion for the patentability determination on the examiner rather than the applicant,¹¹⁶ and the practice of continuations¹¹⁷ combine to cause the unsatisfactory performance witnessed at present.

B. *The Implications of Uncertainty on the Right To Exclude*

The property-patent equation is complicated by a number of factors that are likely to be unusually pronounced in the setting of intellectual property. Fragmentation, overlapping rights, the sheer volume of patents covering some fields, and the phenomenon of nonpracticing, nonlicensing patent trolls seeking to hold up commercialized technologies complicate an analogy between the law of traditional property and that of intellectual property. A more nuanced view of this relationship, however, reveals that these phenomena do not constitute a point of collective departure from the traditional setting. While a limited appeal

109. A recent important decision of the Federal Circuit has reduced this danger. In *McKesson Information Solutions, Inc. v. Bridge Medical, Inc.*, 487 F.3d 897 (Fed. Cir. 2007), the court held that an applicant's failure to disclose that its previous attempt had been rejected by a former examiner amounted to misuse.

110. See Matthew Sag & Kurt Rohde, *Patent Reform and Differential Impact*, 8 MINN. J. L. SCI. & TECH. 1 (2007).

111. See John R. Thomas, *Collusion and Collective Action in the Patent System: A Proposal for Patent Bounties*, 2001 U. ILL. L. REV. 305, 324.

112. 147 Cong. Reg. 21,673 (2001) (statement of Rep. Conyers) ("The PTO cannot hire or retain qualified patent examiners with advanced scientific degrees; they prefer the more lucrative salaries in the private sector.").

113. See Mack, *supra* note 106, at 148.

114. See Lichtman & Lemley, *supra* note 67, at 54.

115. See Thomas, *supra* note 111, at 324.

116. See Christopher R. Leslie, *The Anticompetitive Effect of Unenforced Invalid Patents*, 91 MINN. L. REV. 101, 108 (2006).

117. See, e.g., Lemley & Moore, *supra* note 107 (discussing the problem of continuations, which allow disappointed applicants to continuously refile their patent applications and prevent examiners from permanently rejecting them).

to the stark case of large-scale trespass on another's land would dictate an overly literal right to exclude in the intellectual domain, the law of realty bears witness to a far vaster scope of unique contexts—and unique solutions—than may appear at first. By imposing liability rule solutions in high-transaction cost and other appropriate environments, traditional property law displays sensitivity to the vicissitudes of circumstance. When one construes the law of realty from this perspective, the property-patent equation involves a highly nuanced inquiry.

But what of the probabilism underlying a patentee's right to exclude? How should this impact a court's decision to deny or grant an injunction? Can the law of real property aid in answering these questions? Given the uncertainty underlying all patent grants *ex ante*, the implication for equitable relief clearly is significant. Putting aside issues of patent trolling, sequential investment, and strategic hold-out—all of which are eminently identifiable by a court on a case-specific basis—concern over the validity of a patent may in itself constitute a worthy ground for adopting a liability rule.

Cracks in the foundation of a person's property right clearly implicate his ability to enforce that right in a manner of his choosing. As applied to the request for injunctive relief, the contrast between intellectual and tangible property becomes all the more paramount. Society suffers an unambiguous social loss when a court grants an injunction to a patentee erroneously. This is because the unwarranted exclusivity enjoyed by the prevailing patentee denies countless consumers access to the technology. With real property, no matter how the court decides, only one owner will possess the property. Conceivably, even if the court grants the property right to the wrong person, the outcome still may be efficient if the victor places higher utility on the resource than the competing claimant. We can, however, unequivocally conclude that an erroneous determination of patent validity is a social welfare-reducing outcome.

As a result, improvidently granted patents should be invalidated. With respect to the right to exclude, one must recall that the injunction is the primary mechanism that the holder of a mistakenly awarded patent can use to create social welfare losses. Before a court grants injunctive relief, one would expect the questions of validity and scope to be resolved determinatively. More specifically, should not the holder of a probabilistic patent necessarily possess a weaker right to exclude another than one who possesses a definite right?

The Supreme Court seems to think so. In the *eBay* decision, the Court held that patentees do not enjoy a presumptive right to injunctive relief upon a showing of infringement.¹¹⁸ Although the Court's decision was rather cursory, there is some ground for believing that patent indeterminism played at least some role in its decision. In particular, Justices Kennedy, Stevens, Souter, and Breyer, in concurrence and writing with an eye toward controversial business method patents, noted the importance of the "potential vagueness and suspect validity of some of these patents may affect the calculus under [the Court's enunciated] test."¹¹⁹

118. See *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388 (2006).

119. *Id.* at 397 (Kennedy, J., concurring).

Was this decision correct? One might be tempted to criticize immediately the Court's judgment on the basis that any uncertainty underlying the relevant property right has been resolved by the time judicial relief is forthcoming. After all, by then, any claims of patent invalidity or non-infringement have been resolved in favor of the patentee. From this perspective, the preceding discussion of weak patents and poor prosecution at the PTO would seem decidedly academic. If it turns out that an inventor was awarded a patent correctly, then the right to exclude inherent in that grant should be respected—irrespective of the expected validity of other intellectual property rights.

This position has some intuitive force. Society hardly gains by diluting the exclusivity of unquestionably legitimate property rights, at least insofar as the other factors potentially warranting a liability solution are absent.¹²⁰ Strong rights to exclude ensure that the deserving inventor reaps sufficient pecuniary reward to justify her *ex ante* investment and risk. The alternative leads inexorably to patentee undercompensation.¹²¹ Consistent with these considerations, until 2006, U.S. law provided that as a general rule “a permanent injunction [would] issue once infringement and validity ha[d] been adjudged.”¹²² This appears consistent with a focus on the legitimacy of intellectual property.

Nevertheless, the fact of *ex post* validity may be misleading and could result in the issuance of a greater number of injunctions than is socially desirable. In this regard, it is important to recognize the threshold distinction between uncertainty on the basis of prediction and postdiction.¹²³ The former is worthy of our exclusive attention in formulating optimal legal policy. The latter incorporates a danger of hindsight bias that may move us to adopt inefficient rules in an *ex post* setting. Given the necessarily limited information available *ex ante*, policymakers are forced to make decisions and formulate rules based on probabilistic assessments of the future. A decision can be rational (and therefore “correct”) even if it turns out after the fact to have been the wrong one. A gambler with a ninety-nine percent chance of winning is rational in his decision to play his hand, even if he is unfortunate enough to lose. As applied to the world of IP, the fact that a court ultimately finds a patent valid does not mean a presumption of such validity is warranted *ex ante*. A judicial determination that infringement of a valid patent has taken place does not necessarily counsel an award of injunctive relief. In certain circumstances, the *ex ante* prospect of a certain patent being found both valid and infringed may be highly attenuated. A liability rule occasionally be may desirable in such situations.

120. Such distinct grounds include, in particular, incidences of patent trolling. See, e.g., John M. Golden, “Patent Trolls” and Patent Remedies, 85 TEX. L. REV. 2111 (2007).

121. See Epstein, *supra* note 28, at 2093.

122. See *MercExchange, L.L.C. v. eBay, Inc.*, 401 F.3d 1323, 1338 (Fed. Cir. 2005).

123. For an excellent discussion on this matter more generally, see Ehud Guttel & Alon Harel, *Uncertainty Revisited: Legal Prediction and Legal Postdiction*, 107 MICH. L. REV. 467 (2008).

One focusing on the issue of uncertainty in property rights conceivably could argue that *eBay* was a profoundly poor decision, given the facts there at issue. Where, as there, a plaintiff's patent has been proven infringed and not found invalid, one might posit that an injunction generally should follow. This position could be supported on the ground that any indeterminism underlying the scope and validity of the relevant patent has been resolved by the time final judicial relief is forthcoming. Such a perspective, of course, would mistake the *ex ante* and *ex post* states of the world, with serious repercussions for policy. The indeterminism that society should be concerned with is that which existed before a court's resolution of the issues. Depending on the level of uncertainty *ex ante*, liability rules may in fact prove superior.

Thus, for the purpose of constructing optimal rules, one need be concerned with *ex ante* incentives only. Here, the property-patent equation is most helpful. Although patents are far more suspect in terms of expected validity, the law of traditional property unquestionably can aid us. Consider the case of inadvertent trespass onto land of ill-defined contours. More specifically, envision a situation in which a person constructs a building or structure on his land that extends in some way onto the land of a neighbor. Such encroachment obviously implicates the neighbor's exclusion rights. From a Blackstonian perspective, the neighbor's right to an injunction would be unqualified, allowing her to enjoy her property "in total exclusion of the right of any other individual in the universe."¹²⁴ In short, one might expect a property rule to protect the innocent landowner from such instances of encroachment.

Consistent with the literal Blackstonian view, the general rule is that a mandatory injunction is the appropriate remedy for a person whose land has been encroached upon by an adjoining neighbor.¹²⁵ Similarly, cases of repeated or continuing trespass on real property give rise to a right to relief by injunction.¹²⁶ Perhaps surprisingly, however, this Blackstonian approach is far from unqualified. In many cases, particularly those entailing land of nebulous boundaries, courts have jettisoned injunctive relief in favor of a liability rule.

The fact of innocent trespass is central to the law's analysis of such situations. Inadvertence is intimately related to the clarity of a neighbor's borders. A person who knowingly constructs a building or structure that extends onto another's land does so at his own risk, for he has no rights against the encroached neighbor.¹²⁷ Black letter law provides that an injunction shall issue against such

124. See BLACKSTONE, *supra* note 9, at *2.

125. See, e.g., *Bonde v. Bishop*, 245 P.2d 617, 620 (Cal. Ct. App. 1952); *Shattles v. Field, Brackett & Pitts, Inc.*, 261 So. 2d 795, 797-98 (Miss. 1972); *Santilli v. Morelli*, 230 A.2d 860, 863 (R.I. 1967).

126. See, e.g., *Brackin v. Porter*, 120 So. 2d 693, 695 (Ala. 1960); *Bartholomew v. Staheli*, 195 P.2d 824, 832 (Cal. Ct. App. 1948).

127. This principle has long been established. See, e.g., *Morgan v. Veach*, 139 P.2d 976, 980-81 (Cal. Ct. App. 1943); *Johnson v. Killian*, 27 So. 2d 345, 346 (Fla. 1946); *Pra-*

intentional encroachment, irrespective of the balance of convenience—even if the landowner suffers de minimis harm and the trespasser will suffer considerable cost in removing the offending structure.¹²⁸

In contrast, where a neighbor unknowingly encroaches on another's property, the court may decline to grant an injunction where the border of the relevant property was ill-defined, the ensuing trespass was inadvertent, the harm to the landowner is limited, and the cost to the encroacher from having to tear down its sunk investment is greatly disproportionate to the landowner's harm.¹²⁹ The innocence of the trespasser is a sine qua non for the denial of injunctive relief.¹³⁰ Such innocence invariably turns on whether the borders of the encroached property were apparent or reasonably discoverable upon inspection. Although such uncertainty goes to the scope of the landowner's right (akin to claim construction in the patent context), the effect on ex ante incentives is

delt v. Lewis, 130 N.E. 785, 787 (Ill. 1921); Van De Carr v. Schloss, 101 N.Y.S.2d 48, 51-52 (N.Y. App. Div. 1950).

128. See, e.g., *Golden Press, Inc. v. Rylands*, 235 P.2d 592, 595 (Colo. 1951) (holding with regard to a deliberate encroachment of another's land that "equity may well require its restoration regardless of the expense of removal as compared with damage suffered therefrom"); *Tyler v. Haverhill*, 172 N.E. 342, 343 (Mass. 1930) ("[O]ne who knows of claims to land which he proposes to use as his own, proceeds at his peril if he goes forward in the face of protests from the claimant and places structures upon the land."); *Tucker v. Howard*, 128 Mass. 361, 363 (1880) (finding that a person who built a wall encroaching on a neighbor's land did so at his peril, given that he had been served with process and notice of the neighbor's property rights).
129. See, e.g., *Nixon v. Harper*, 8 Conn. Supp. 8, 10 (Conn. Super. Ct. 1940) ("A mandatory injunction to remove the offending structure should not issue. 'Where . . . there has been an innocent mistake . . . or where the conduct of the defendant was not willful and inexcusable, and where the granting of the injunction would cause damage to the defendant greatly disproportionate to the injury of which plaintiff complains and it appear that damages will adequately compensate the latter . . . it would be inequitable to grant a mandatory injunction.'" (citation omitted) (first and third alterations in original)).
130. See, e.g., *D'Andrea v. Pringle*, 52 Cal. Rptr. 606, 610 (Cal. Ct. App. 1966); *Capodilupo v. Vozzella*, 704 N.E.2d 534, 535 (Mass. App. Ct. 1999) (holding that a landowner is generally entitled to injunctive relief, even if the encroachment was unintentional or negligent and the cost of removal is comparatively substantial, but that removal will not be ordered where the encroachment was made innocently and the cost of removal would be greatly disproportionate); *Lynch v. Union Inst. for Sav.*, 34 N.E. 364, 365 (Mass. 1893) (denying injunctive relief where, by an innocent mistake, structures had been erected slightly upon the plaintiff's land and where the damage that would be caused by removal to the defendant would be greatly disproportionate); *Owenson v. Bradley*, 197 N.W. 885, 888 (N.D. 1924); *Carrier v. Lindquist*, 37 P.3d 1112, 1120 (Utah 2001). *But see* *Marcus v. Brody*, 149 N.E. 673, 674 (Mass. 1925) (granting an injunction notwithstanding the fact of innocent trespass).

similar to what might be the case if the landowner's ownership of the land itself were questioned (similar to the question of patent validity). In both cases, the breadth and force of the owner's right to exclude are implicated.

Long-established principles of land law therefore deny injunctive relief in certain cases of innocent encroachment over land of nebulous definition. The analogy to the world of patents could not be plainer. As Judge Easterbrook has noted, there is no difference in principle between a patentee's and a landowner's right to exclude: "Patents give a right to exclude, just as the law of trespass does with real property."¹³¹ A neighbor constructing on what he reasonably believes to be his land may operate in a somewhat indeterminate environment *ex ante*, but all uncertainty disappears once the matter is resolved in court. Yet, notwithstanding the unquestionable presence of a valid property right held by the wronged neighbor, the law declines to adopt a property rule. As a result, some landowners are denied the right to exclude that would initially seem to define the substance of their legal ownership. The situation is no different in cases of patent infringement where patentees seek to enjoin infringing activity. A commercializing entity may survey the prior art and conclude—based on its subjective construction of the patent claims it has uncovered—that its planned activities will not implicate any proprietary technologies. Its action in "encroaching" on another's patented technology may be every bit as innocent as a neighbor's accidental construction on the border of another's property, if not more so. In addition, uncertain legality turns on more than scope. Even if a property right over a given technology is brought to its attention, it may determine based on its knowledge of the prior art that the relevant claim is invalid as obvious or anticipated. Indeed, the level of indeterminism underlying an asserted patent claim is apt to be more severe than would be associated with innocent encroachment in the physical realm.

The preceding analogy implies a number of conclusions. As a general matter, the property-patent equation suggests that injunctive relief may be properly denied in the intellectual setting on the ground of uncertainty. Further insights help identify the specific traits of cases in which monetary damages should be awarded in lieu of equitable relief.

First, a liability rule should be implemented if the patentee was aware of the infringing use but did not seek to apprise the infringer of its patent rights until significant, sunk investment had taken place. This is equivalent to the law's denial of an injunction where a landowner declines to apprise her encroaching neighbor of the boundary of her property, which creates an estoppel.¹³² Of course, this conclusion would not apply if the infringing party either knew of the patent or maintained willful ignorance of the state of the art in the field.¹³³

131. Easterbrook, *supra* note 7, at 109.

132. This refers to the common law doctrine of estoppel by acquiescence. See, e.g., *Davidson v. Van Lengen*, 266 N.W.2d 436, 439 (Iowa 1978).

133. Unfortunately, this analysis is complicated by some idiosyncrasies of the patent field. Of particular note is the phenomenon in which myriad inventors maintain deliberate ignorance of the prior art to stave off future claims of willful infringe-

Second, a court should be hesitant to grant an injunction where an infringement defendant scoured the prior art for blocking patents, failed to uncover one, and successfully commercialized a product. A predicate condition underlying this conclusion would be that the patentee charging infringement not market or license its technology. Such activity would amount to notice as a matter of law. One might analogize such marketing or licensing to a landowner's use of his property up to the boundary point. One hardly could claim innocence when encroaching onto another's land that is being visibly cultivated or employed for some other self-evident purpose.¹³⁴

The nature of infringement is a further prerequisite to denying an injunction on this ground. Where the infringed patent constitutes but a small part of the relevant product, the case for damages is surely stronger (though not a ground for denying equitable relief in itself). This might be thought of as tantamount to trespassing onto land through construction. Before courts deny injunctions in such cases, they require that there be a considerable asymmetry between the harm caused to the property owner from encroachment and the sunk cost suffered by the involuntary encroacher who would have to tear down his construction. The harm to the patentee in cases of marginal infringement is

ment that could expose them to treble damages. Fortunately, a recent decision of the Federal Circuit, which significantly increased the standard for a showing of willful infringement, bears the potential to alleviate this problem. *In re Seagate Tech., LLC*, 497 F.3d 1360 (Fed. Cir. 2007) (en banc). Regardless, though, intellectual property law should treat a deliberately ignorant infringer the same way traditional property law treats a neighbor who negligently commences construction with indifference to the precise boundary of another's land. In both cases, with other things being equal, injunctive relief should be forthcoming. In addition to promoting the efficiencies of a property regime—namely, by incentivizing a potential infringer to negotiate for permission with the property holder *ex ante*, rather than going through the indeterminate expense of *ex post* litigation over damages—this approach would further counter the perverse tendency for inventors to ignore the prior art.

134. While it is true that another's use of one's land may be more readily apparent to one's neighbor than a company's licensing or commercialization of its patented technology is to its competitors, there are overriding public policy reasons to find constructive notice in both cases. A company that is employing its patented technology to commercial end must be allowed the full right to exclude any infringing practice of the relevant invention. Only by granting a property right can society ensure that entities invent and commercialize easily appropriated technologies. The case for a liability rule is most compelling where the patentee is neither employing nor licensing its intellectual property right but is sitting on it in the hope of ambushing an unsuspecting company that actually sells goods to the public. By analogy to the world of land law, one could characterize such a patent troll as being similar to the landowner who remains silent as his neighbor innocently encroaches onto his land.

limited.¹³⁵ If a patentee is neither commercializing nor licensing her invention, it is difficult to argue that she is suffering substantial harm from another's inadvertent use of that knowledge. Such is the nature of non-exclusivity in consumption of information.¹³⁶ In stark contrast, the harm to a company that has succeeded in marketing a valuable product from having to shut down its operation would be vastly disproportionate to the patentee's harm. Such factual circumstances map perfectly the courts' denial of injunctive relief in cases of mistaken encroachment. Unfortunately, actual examples of such cases abound, which makes the availability of a liability rule in such cases critical.¹³⁷

In sum, the patentee who brings suit in any of the foregoing circumstances should be denied injunctive relief in much the same setting as a landowner whose property is encroached upon by a neighbor's construction.

A more difficult case would involve a company that, having surveyed the field, discovers a potentially blocking patent but concludes on the basis of expert advice that its proposed commercialization would not amount to infringement of the claims. Alternatively, the company might receive advice that the potentially infringed claim was likely invalid, for example on the basis of the prior art. Under current principles of patent law, such facts would be determinative in defeating a claim of willful infringement but would play no role in convincing a court to adopt a liability, in place of property, rule.¹³⁸ In the patent setting, liability rules are employed, or equivalently injunctive relief is denied, where the four factors in equity favor that result.¹³⁹ One could entertain an analogy to the physical setting, where a person might seek professional advice

135. "Marginal infringement" may be defined for the present purposes as infringement, even if unquestioned, of a patent that provides only a marginal addition to the commercialized product for which an injunction has been sought.

136. There is another close connection here to the case of physical encroachment: If the owner is actually using the land (whether for cultivation or other activities), trespass onto it interferes with his enjoyment of his property.

137. The seemingly paradigmatic example is *NTP, Inc. v. Research in Motion, Ltd.*, 418 F.3d 1282, 1326 (Fed. Cir. 2005), where the district judge, upon a finding of willful infringement, issued an injunction ordering the defendant to cease and desist infringing the patents. This would have had the effect of shutting down the entire BlackBerry network in the United States; public outrage ensued. Nevertheless, *Research in Motion* does not serve as an example of a case where a liability rule should have been implemented. Given that the infringement was willful, the existence of ex post social harm masks the fact that employing a property rule incentivizes potential infringers in the future to negotiate licenses ex ante. Research in Motion learned a painful lesson. In March 2006, it settled the case for \$612.5 million.

138. See *In re Seagate Tech., LLC*, 497 F.3d at 1371 (Fed. Cir. 2007) (en banc) ("[T]o establish willful infringement, a patentee must show by clear and convincing evidence that the infringer acted despite an objectively high likelihood that its actions constituted infringement of a valid patent.").

139. See *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388 (2006).

concerning the metes and bounds of his neighbor's property and then erect a structure within what he believes erroneously to be his land. In such a scenario, one might imagine that a court would place weight on the pursuit of professional advice in weighing whether to award an injunction or not.

Yet, for a variety of reasons, courts should not always deny equitable relief on the basis of a patent's uncertainty alone. Granting damages in all such cases would fail to incentivize desirable behavior. If a company encounters a blocking patent that may be invalid, a property rule would encourage the company either to avail of the PTO's reexamination process or to obtain a license and then seek a declaratory judgment of invalidity.¹⁴⁰ Still, a court should look favorably on an infringer's efforts to avoid infringement. This, in conjunction with other pertinent facts of the kind discussed above, should weigh on the decision of whether to grant an injunction.¹⁴¹

Thus, the Supreme Court's holding in *eBay*—far from constituting an inescapable and direct affront to the property rights movement—may reflect proper principles of traditional property law. Nevertheless, the decision can be criticized for the vagueness of the test enunciated by the Court, which would allow injunctive relief where the patentee has suffered irreparable injury, monetary damages are inadequate to compensate for the injury, the balance of hardships favors an injunction, and the public interest would not be disserved by the remedy.¹⁴² This, of course, is the traditional four-factor test applied by courts in equity, but it does not specify the appropriate approach in a patent case. The Court specifically rejected the contention that the fact that a patentee is neither practicing nor licensing the patented technology itself satisfies the test.¹⁴³ So, how should courts apply this test in practice? The Court gave little guidance.¹⁴⁴

140. Until recently, the ability of a patent licensee to bring suit for a declaratory judgment was limited. In 2007, under pressure from a decision of the Supreme Court in a related context, the Federal Circuit held that the offer of a patent license gives the recipient standing to bring an action for declaratory judgment. *See Sandisk Corp. v. STMicroelectronics, Inc.*, 480 F.3d 1372 (Fed. Cir. 2007).

141. It must be emphasized that damages should not always be awarded in lieu of equitable relief. Indeed, courts should generally be predisposed toward granting injunctive relief in cases of proven infringement of a valid patent. One situation where a property rule should unquestionably be employed would involve patents that have been previously upheld as valid, whether through litigation or reexamination. The scrutiny brought to bear on patents under these circumstances not only goes a long way toward resolving their validity and scope but could be expected to grant industry participants notice of the intellectual property rights.

142. *See eBay*, 547 U.S. at 391.

143. *Id.*

144. *See The Supreme Court: 2005 Term—Leading Cases*, 120 HARV. L. REV. 125, 337 (2006) (explaining that “*eBay* raises more questions about the grant of permanent injunctions than it answers”).

Appeal to the property-patent equation can aid one seeking to apply the four-factor test in the setting of intellectual property. The locus of the relevant inquiry surely will be in the public interest prong of the standard. The first two elements of the test—irreparable injury and inadequacy of remedy at law—are essentially identical. In the patent setting, the balance of hardships may sometimes be subsumed within the public interest prong. This is because patent policy is a tool developed to promote social welfare. If the balance of hardships is strongly against granting a patentee an injunction—presumably because a non-practicing and non-licensing plaintiff is seeking to hold up a product innocently commercialized by a defendant—it is likely that granting an injunction in favor of the plaintiff would disserve the public interest.

The preceding discussion has explained how traditional principles of land law can aid courts in deciding whether to grant injunctive relief with respect to a probabilistic property right. In particular, such relief should be denied: (1) where a patentee failed to apprise an infringer of its property right (thus facilitating the defendant's inadvertent infringement in an environment of limited information and high uncertainty), or (2) where a defendant engaged in an active search of the prior art, failed to identify the pertinent patent that covers but a small portion of the infringing product, and the patentee neither licenses nor markets its technology. As noted, the fact that an infringer identified a potentially blocking patent but received expert advice to the effect that the patent was either invalid or would not be infringed should not determine whether or not an injunction should be denied but should be weighed in the relevant calculus.

A final word is due with regard to preliminary injunctions. In this setting, the fact of indeterminism is of central and inescapable importance. A precondition to awarding injunctive relief is that the movant establish a strong probability of success on the merits.¹⁴⁵ Yet, in the patent setting, determinative resolution of questions of validity must generally await the close of discovery. Given the systemic uncertainty underlying patent rights, one would expect that preliminary injunctive relief would be treated as inappropriate in all but the clearest infringement disputes. Fortunately, the law is attuned to this danger and will entertain such a request only where a patentee “clearly shows” that his patent is valid and infringed.¹⁴⁶ To do so, a plaintiff must rely on more than force of words. A patentee will be able to satisfy the standard only by either pointing to a prior adjudication of validity in a suit taken by it against another party¹⁴⁷ or providing evidence of industry-wide acquiescence in the face of a patent.¹⁴⁸ This tenet of the law is eminently desirable.

145. See, e.g., *Dr. Seuss Enters. v. Penguin Books USA, Inc.*, 924 F. Supp. 1559, 1562 (S.D. Cal. 1996).

146. See *Atlas Powder Co. v. Ireco Chemicals*, 773 F.2d 1230, 1233 (Fed. Cir. 1985).

147. See *Hybritech Inc. v. Abbott Labs.*, 849 F.2d 1446, 1452 (Fed. Cir. 1988).

148. For a classic explanation of this position, see *Blount v. Societe Anonyme du Filtre Chamberland Systeme Pastuer*, 53 F. 98, 102-03 (6th Cir. 1892). See also *Eli Lilly &*

C. *Stochasticism and Implications for the "Zone of Exclusion"*

The law of traditional property helps inform the right to exclude that paradigmatically defines every patent grant. As explored, even though the level of uncertainty associated with these intellectual property rights is far greater than that associated with real property rights, traditional land law has a wealth of doctrine with which to inform the construction of patent rules. Far from importing dogmatic rights to injunctive relief, a nuanced and proper appeal to the law of tangible property is most helpful. Ultimately, the fact of indeterminism does not undermine the legitimacy of the property-patent equation.

Nevertheless, the existence of aoristic patent rights does have another, far more significant, effect on the viability of that equation. Quite apart from the question of whether to apply a property or liability rule in incidences of patent infringement is the issue of how to regulate potentially nefarious conduct that is justified on the basis of the underlying patent's exclusive force. As explored initially by the author elsewhere, an unconstrained patentee may take steps artificially to enhance the exclusive force of its highly probabilistic right.¹⁴⁹ Doing so would allow it to reap the pecuniary rewards of more secure property.

To achieve this end, a patentee may do one of two things. First, it may assign its proprietary technology to a third party. This would cause the assignee to assume the full risk of invalidity.¹⁵⁰ The efficacy of this approach, however, is limited by the fact that the assignee will require a premium, and thus discount the contract price, to compensate it for taking on that risk. In addition, information asymmetry or indeterminate future commercial worth may deny a patentee a purchase price that would be justified *ex post*. Ultimately, such an arrangement will only prove attractive to a patentee if the assignee has a greater appetite for risk or if the patentee needs to realize an approximation of the long-run value immediately.

The second, likely more effective, possibility is for a patentee to internalize the risk of invalidity but contract with those most likely to challenge the legitimacy of its intellectual property. The precise arrangement could take numerous forms, from reciprocal assurances not to sue to creating a joint venture, but the quintessential example is provided by the phenomenon of reverse exclusionary agreements in the pharmaceutical industry.¹⁵¹

Thus, a patentee who wishes to enhance the expected validity (and hence pecuniary return) of its intellectual property has numerous avenues open to

Co. v. Generix Drug Sales, Inc., 460 F.2d 1096 (5th Cir. 1972); Julien v. Gomez & Andre Tractor Repairs, Inc., 438 F. Supp. 763, 765 (M.D. La. 1977).

149. See Devlin, *supra* note 44.

150. Alternatively, though less effectively, a patentee could license its IP rights to a third party with contractual conditions that require the licensee to continue paying royalties even if the relevant patent is found invalid.

151. See Hemphill, *supra* note 2.

him. In all events, the various constituent elements of patents' uncertainty are implicated by rival action. A patent's value comes from its ability to exclude others from practicing a valuable invention. The enforcement of one's intellectual property rights necessarily comes at the cost of competitors. Thus, rivals who conclude that an enforced patent right is vulnerable to invalidation or a possible finding of noninfringement have every incentive to challenge that intellectual property, whether in court or in front of the PTO via reexamination.

This process is immensely valuable given the highly imperfect level of review given to applications throughout prosecution.¹⁵² One must recall that the patent laws are "an exception to the general rule against monopolies"¹⁵³ and are justified on the ground of a quid pro quo. Society suffers the loss of free consumption of valuable public goods in order to induce innovators to make future generations of such goods available. Where a patent is granted mistakenly by the PTO, consumers are improperly denied free access to valuable information that belongs in the public domain. It is for this reason that the Supreme Court has emphasized the pressing need to facilitate the challenge of potentially invalid patents.¹⁵⁴

This policy perspective is crucial because a profit-maximizing patentee will rationally seek to contract with rivals to forego such challenge. Given free rein, such entities will be able to secure their intellectual property. Of course, such contractual arrangements will bear a cost for the relevant patentees, as there necessarily will be a wealth transfer to horizontal competitors. But the arrangements will not yield distributional or allocative gains in favor of society and consumers. Strong policy grounds therefore suggest limits on patentees' freedom of contract.

How does the property-patent equation apply to this issue? As is true of other policy challenges involving intellectual property, appeal to long-established principles of traditional property law may be tempting. But, unlike the case of exclusivity in the face of infringement, a close analogy here between real and intellectual property law may be highly misleading.

One tempted to draw a prescriptive parallel in this setting might conclude that a property owner has an absolute right to pay a person who threatens to commit trespass to refrain from such conduct. In the case of land, an owner's

152. Indeed, Professor Lemley has opined that such rival-induced, post-grant litigation is eminently desirable. See Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 Nw. U. L. REV. 1495, 1510-11 (2001). Professor Lemley draws this conclusion because the vast majority of patents scrutinized by the PTO will never achieve commercial viability, so that capital devoted to perfecting the accuracy of their review is money wasted. In contrast, market participants have no incentive to attack the validity of a worthless patent. Thus, money spent on post-grant disputes will involve a truly exhaustive qualitative assessment of the most valuable intellectual property and accordingly will be well-spent.

153. *Precision Instrument Mfg. Co. v. Auto. Maint. Mach. Co.*, 324 U.S. 806, 816 (1945).

154. *See Lear, Inc. v. Adkins*, 395 U.S. 653, 670-71 (1969).

actions in having to obtain a lawyer and demonstrate to the court that he is entitled to an injunction are costly. Importantly, the costs so suffered exist irrespective of the expected validity of the owner's property right. Gradations in that expectation will affect the extent, but not the existence, of such cost. Thus, even where a landowner has an undisputable right to exclusive possession, that owner rationally might pay one who threatens to trespass a sum less than the cost of obtaining judicial relief. In short, one who observes traditional law would likely conclude that a property owner has a right to contract with a potential trespasser to preclude such trespass in the future.

A near perfect analogy to this situation has been created by some courts with respect to prospective patent infringement. By far the best example exists in the pharmaceutical industry. Given the compelling social need for affordable drugs, Congress sought to enhance the availability of generics. To do so, it passed the Hatch-Waxman Act, which created an expedited process for generic drug manufacturers to enter markets currently being served only by pioneer drug producers.¹⁵⁵ The cost of researching, developing, obtaining regulatory authorization for, and commercializing a brand-name drug is infamous.¹⁵⁶ The Act allows generic manufacturers to bypass this protracted process and instead submit an "abbreviated new drug application" (ANDA), which demonstrates that the particular applicant's drug is bioequivalent with its brand-name counterpart.¹⁵⁷ In doing so, an applicant can rely on safety and efficacy studies previously submitted by the brand-name drug producer.¹⁵⁸

Some applicants file an ANDA with a Paragraph IV certification alleging that the incumbent brand name drug patent is either invalid or not infringed.¹⁵⁹ This act constitutes patent infringement.¹⁶⁰ To induce the patentee to bring suit, the Act provides that if the pioneer producer files a patent infringement suit within forty-five days, the FDA cannot approve the generic drug for thirty months, absent a judicial determination of invalidity or non-infringement.¹⁶¹

The Hatch-Waxman Act therefore creates a powerful conduit for generic drug producers to enter patent-protected markets in an expeditious manner. Of course, such entry only can take place if the incumbent's patent is found invalid or not infringed, but—consistent with general policy highlighted above—

155. 21 U.S.C. § 355 (2006).

156. See, e.g., Amy M. Bunker, *Deadly Dose: Counterfeit Pharmaceuticals, Intellectual Property and Human Health*, 89 J. PAT. & TRADEMARK OFF. SOC'Y 493, 507 (2007).

157. 21 U.S.C. § 355(j).

158. See *Mylan Pharms., Inc. v. Thompson*, 268 F.3d 1323, 1325-26 (Fed. Cir. 2001).

159. 21 U.S.C. § 355(j)(2)(A)(vii)(IV); Elizabeth Stotland Weiswasser & Scott D. Danzis, *The Hatch-Waxman Act: History, Structure, and Legacy*, 71 ANTITRUST L.J. 585, 600-04 (2003).

160. 35 U.S.C. § 271(e)(2)(A).

161. 21 U.S.C. § 355(j)(5)(B)(iii).

Congress clearly sought to induce challenge of suspect patents by generic entrants.¹⁶²

An intriguing and heavily divisive issue has emerged from this setting, in which pioneer drug manufacturers have been settling infringement litigation between themselves and generic entrants. On the face of this alone, such settlement should not be of concern—the courts have promoted the myriad virtues of the private resolution of disputes.¹⁶³ However, such arrangements have been accompanied by “reverse exclusionary payments,” pursuant to which brand-name drug producers agree to pay generic entrants vast sums of money to stay out of the relevant markets until the pertinent patents have expired.¹⁶⁴

At least one court has condemned this phenomenon as *per se* illegal.¹⁶⁵ In *In re Cardizem*, HMR, a brand-name manufacturer of Cardizem CD, and Andrx, a potential generic manufacturer of the same drug, entered into a reverse agreement.¹⁶⁶ The Sixth Circuit opined:

Andrx kept its generic product off the market and HMR paid Andrx \$89.83 million. By delaying Andrx’s entry into the market, the Agreement also delayed the entry of other generic competitors, who could not enter until the expiration of Andrx’s 180-day period of marketing exclusivity, which Andrx had agreed not to relinquish or transfer. There is simply no escaping the conclusion that the Agreement, all of its other conditions and provisions notwithstanding, was, at its core, a horizontal agreement to eliminate competition in the market for Cardizem CD throughout the entire United States, a classic example of a *per se* illegal restraint . . .¹⁶⁷

162. This inference is clear from the fact that the Hatch-Waxman Act was introduced in reaction to *Roche Products, Inc. v. Bolar Pharmaceutical Co.*, 733 F.2d 858 (Fed. Cir. 1984), which had held that the defendant’s experimental use to derive FDA-required data infringed the pioneer drug manufacturer’s patent. See also H.R. REP. NO. 98-857, pt. 1, at 14 (1984), *reprinted in* 1984 U.S.C.C.A.N. 2647, 2647 (stating that the intent of the Act was to “make available more low cost generic drugs”). In enacting the legislation, Congress created incentives for generic producers to enter patent-protected markets beyond the prospect of financial return from entry alone. In this regard, the Hatch-Waxman Act provides that the first company to file an ANDA will be granted the exclusive right to market a generic version of the pioneer drug for one hundred and eighty days after the relevant triggering date. 21 U.S.C. § 355(j)(5)(B)(iv).

163. See *In re Ciprofloxacin Hydrochloride Antitrust Litig.*, 544 F.3d 1323, 1333 (Fed. Cir. 2008) (discussing judicial support for settlement).

164. See generally Hemphill, *supra* note 2 (discussing the phenomenon of reverse exclusionary payments).

165. See *In re Cardizem CD Antitrust Litig.*, 332 F.3d 896 (6th Cir. 2003).

166. *Id.*

167. *Id.* at 907-08.

Given the presence of intellectual property, which creates lawful monopoly, the court obviously was wrong to characterize the agreement as a classic form of *per se* illegal behavior. While market-sharing agreements are paradigmatic examples of illegal conduct, the presence of a lawful patent complicates the analysis. Nevertheless, on the facts of *In re Cardizem*, there is little question that the scope of the exclusionary agreement exceeded that of the patent, so that illegality properly followed.¹⁶⁸ But what of the situation in which there is a genuine dispute as to whether a proposed generic infringes an incumbent's patent? Intellectual property explicitly provides its owner with the right to exclude others, so why should that owner not be free to pay others not to infringe?

The situation, of course, is very much like the hypothetical landowner paying a prospective or actual trespasser to vacate his land. Nevertheless, there are differences. For one, the cost to a patentee of enforcing its right is exponentially larger than the cost to a landowner of obtaining an injunction. Indeed, patent litigation often is characterized as the sport of kings.¹⁶⁹ On the other hand, there is a far greater externality created by a foregone opportunity to invalidate improvidently granted patents, given the public goods nature of information. The ensuing question, therefore, is whether the courts should treat a patentee who pays others not to infringe or challenge its right in the same way that they would a real property owner in an otherwise analogous setting.

The most recent answer to this question was provided by the Federal Circuit in late 2008. In *In re Ciprofloxacin*, the court held that patents create a legal zone of exclusion.¹⁷⁰ It elaborated:

We conclude that in cases such as this, wherein all anticompetitive effects of the settlement agreement are within the exclusionary power of the patent, the outcome is the same whether the court begins its analysis under antitrust law by applying a rule of reason approach to evaluate the anti-competitive effects, or under patent law by analyzing the right to exclude afforded by the patent. The essence of the inquiry is whether the agreements restrict competition beyond the exclusionary zone of the patent.¹⁷¹

The Federal Circuit's holding is entirely consistent with a literal property-patent equation. Yet, unlike the adoption of a property or liability rule, focus on that equation is misplaced in this setting. The Federal Circuit may be criticized for treating a highly probabilistic legal right as one would a right of conclusive and irrefutable validity. The holder of the latter right has no ability to enhance arti-

168. This is most obviously true with regard to the generic entrant's agreement not to relinquish its one hundred and eighty day period of exclusivity, which had the effect of ensuring that entry by other generics would be delayed.

169. See, e.g., James Bessen & Michael J. Meurer, *Lessons for Patent Policy from Empirical Research on Patent Litigation*, 9 LEWIS & CLARK L. REV. 1, 2 (2005).

170. See *In re Ciprofloxacin Hydrochloride Antitrust Litig.*, 544 F.3d 1323, 1336 (Fed. Cir. 2008).

171. *Id.*

ficially or unilaterally the expected validity of its property in a manner that will prove injurious to society at large. Unfortunately, the former does.

Properly viewed, then, a patentee's "zone of exclusion" is commensurate with the legitimacy of the intellectual property protection awarded to it. In particular, treating the holder of a stochastic patent as one would the owner of a conclusively valid property right is both incongruous and potentially dangerous. Doing so may allow private parties to appropriate benefits for themselves in excess of what was intended by Congress and what was inherent in the "patent bargain." In this setting, the policymaker should approach with caution the suggestion that patents be treated in identical fashion to realty.

Nevertheless, recognition of the probabilistic nature of patent rights conclusively dictates neither the legality nor the illegality of reverse exclusionary agreements. The final analysis is complicated in particular by the presumption of patent validity, which notably was used by the Federal Circuit to reject the contention that courts should weigh the expected legitimacy of the patents underlying the reverse agreement.¹⁷² It also is complicated by the legitimate concerns of creating optimal incentives for pharmaceutical companies that obtain the most secure property protection society will grant them. Nevertheless, an optimal approach requires greater sensitivity to the crucial asymmetry in the average legitimacy of real and intellectual property.

III. CURING THE DEFICIENCY: IMPROVING THE PROSECUTION PROCESS

A. *Increasing the Quality of Issued Patents*

Many patents issued by the PTO are qualitatively deficient. In particular, a dearth of pecuniary resources, an increase in the number of applications, a proliferation of subject matter, examiners' inability to dispose of an unworthy application once and for all, the nonadversarial nature of the proceeding, information asymmetry, and the fact that an applicant does not bear the burden of patentability combine to limit the PTO's ability to assess applications accurately.¹⁷³ The resulting deprivation in the quality of output strains the property-patent equation and creates significant normative limitations on a patentee's freedom of contract and right to equitable relief.

There have been numerous suggestions for reform. Professors Doug Lichtman and Mark Lemley advocate a particularly novel idea, which focuses on "gold-plated" patents.¹⁷⁴ Pursuant to their suggestions, applicants would select one of two standards of review. Those seeking the present level of scrutiny would have their applications assessed in much the same way as examiners in-

172. *Id.*

173. *See infra* Subsection II.A.2.

174. Lichtman & Lemley, *supra* note 67. "Gold-plated" patents are defined as those that are protected by unassailable presumptions of validity, which render them far stronger (and hence more valuable) than current patents. *Id.* at 61-63.

spect current applications. Unlike the present system, however, resulting patents would not benefit from an undeserved presumption of validity, which frustrates efficient post-grant review by the courts.¹⁷⁵ A second, more selective mode of review would also be available for applicants willing to pay a premium. Such applications also would be subject to a truly scrutinizing level of review that would ensure that the requirements of patentability are met. The fruit of this process would be a “gold-plated” patent, protected by a near-insurmountable presumption of validity. Although this proposal has promise, there still are no signs that it will evolve beyond the hypothetical.

In the short term, reexamination provides perhaps the most promising, realistic solution. Unfortunately, the full potential gains of this process have yet to be realized. Indeed, some question whether reexamination and other PTO reforms are likely to result in an appreciable increase in patent quality at all.¹⁷⁶ In particular, the fact that parties availing of inter partes reexamination are barred from raising grounds of unpatentability that they “could have raised” in front of the PTO has driven most entities away from reexamination and toward litigation.¹⁷⁷

Fortunately, some demonstrable gains have occurred in the past two years. The PTO recently has taken numerous steps to improve the quality of the prosecution process and has designated such improvement as a top priority.¹⁷⁸ In 2007, it hired and trained 1215 new examiners, expanded its Patent Training Academy to enhance new hires’ training, and enhanced industry partnerships.¹⁷⁹ More importantly, during the same year the PTO introduced an accelerated examination program. Pursuant to this initiative, applicants who perform a pre-examination search of the prior art and provide the relevant examiner with a comparison of that search to the claimed invention can obtain a patent within a year.¹⁸⁰ In 2008, the PTO hired an additional 1211 examiners.¹⁸¹ In addition, it

175. See Lemley, *supra* note 152, at 1523-30.

176. See *Fed. Circuit’s Chief Judge Doubts That PRO Reforms Will Solve Patent Litigation Problem*, 77 Pat. Trademark & Copyright J. (BNA) 152 (Dec. 12, 2008); see also Paul R. Michel, Chief Judge, U.S. Court of Appeals for the Fed. Circuit, *Where Are We Now on Patent System Improvements and How Can We Best Make Further Progress?*, Address Before the Federal Trade Commission Hearing on the Evolving IP Marketplace (Dec. 5, 2008) (transcript available at <http://pub.bna.com/ptcj/FTCMichel1205.pdf>).

177. See 35 U.S.C. § 315(c) (2006); Lois Matelan, *The Continuing Controversy Over Business Methods Patents*, 18 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 189, 205-06 (2007).

178. See U.S. PATENT AND TRADEMARK OFFICE, PERFORMANCE AND ACCOUNTABILITY REPORT: FISCAL YEAR 2007, at 16-19 (2007), available at <http://www.uspto.gov/web/offices/com/annual/2007/2007annualreport.pdf>.

179. *Id.*

180. *Id.* at 18.

181. U.S. PATENT AND TRADEMARK OFFICE, *supra* note 100, at 16.

continues to monitor the performance of its examiners through the use of quality assurance specialists.¹⁸²

Of potentially great importance is the PTO's announcement in 2008 that the peer-to-patent initiative it launched in 2007 would be extended until June 15, 2009.¹⁸³ This initiative is a serious attempt to improve the quality of issued patents by exposing applications to direct public scrutiny. The process involves public participation, which can take the form of uploading prior art, discussing posted patent applications, and analyzing previously submitted references.

As noted, abuse of the continuation process has led some commentators to question the reliability of patent prosecution.¹⁸⁴ To the PTO's credit, it has attempted to impose limits on the number of continuations that an applicant can seek. This has proven highly controversial and has encountered fierce resistance from some industry representatives. The PTO's rules were enjoined through a preliminary injunction on October 31, 2007.¹⁸⁵ A final injunction issued on April 1, 2008.¹⁸⁶ For the time being, efforts to prevent abuse of the continuation process have been stymied.

Nevertheless, there is some evidence of improvement in the prosecution process. In particular, the PTO's allowance rate has declined dramatically in the last five years.¹⁸⁷ Not all agree, however, that the patent grant rate is an appropriate metric by which to judge the quality of issued patents.¹⁸⁸ In particular, this reduction may have been counteracted largely by an increase in Requests for Continued Examination (RCEs), rather than translating into a meaningful decrease in the abandonment rate.¹⁸⁹

182. As an interesting aside, the Federal Circuit recently affirmed the PTO's right to fire a quality assurance specialist, whose job it was to review examiner decisions for error but who was found through a sample of his cases to have erred in more than 35% of them. *See Pal v. Dep't of Commerce*, 301 F. App'x 984 (Fed. Cir. 2008).

183. Press Release, U.S. Patent and Trademark Office, USPTO Extends and Expands Peer Review Pilot (July 16, 2008), <http://www.uspto.gov/web/offices/com/speeches/08-26.htm>.

184. *See supra* note 102 and accompanying text; *see also* Lemley & Moore, *supra* note 107.

185. *See Tafas v. Dudas*, 511 F. Supp. 2d 652 (E.D. Va. 2007).

186. *See Tafas v. Dudas*, 541 F. Supp. 2d 805 (E.D. Va. 2008).

187. *See, e.g.,* D. Christopher Ohly et al., *It Is Not So Obvious: The Impact of KSR on Patent Prosecution, Licensing, and Litigation*, 36 AIPLA Q.J. 267, 286 (2008).

188. *See* Ron D. Katznelson, *Bad Science in Search of "Bad" Patents*, 17 FED. CIR. B.J. 1, 24-28 (2008).

189. RCEs occur under 35 U.S.C. § 132(b) (2006), pursuant to which an applicant can seek further examination of a rejected application. Under current standards—and despite the PTO's unsuccessful efforts to limit the number of continuations—the PTO can never issue a literally “final” rejection. *See Tafas*, 541 F. Supp. 2d 805 (enjoining the PTO's attempt to limit the number of continuations, RCEs, and divi-

In November of 2008, the Board of Patent Appeals and Interferences (BPAI) in *Ex parte Miyazaki* lowered the threshold of ambiguity employed by the PTO to require an applicant to define its claims with greater specificity.¹⁹⁰ More specifically, the BPAI held:

[W]e employ a lower threshold of ambiguity when reviewing a pending claim for indefiniteness than those used by post-issuance reviewing courts. In particular, rather than requiring that the claims are insolubly ambiguous, we hold that if a claim is amenable to two or more plausible claim constructions, the USPTO is justified in requiring the applicant to more precisely define the metes and bounds of the claimed invention by holding the claim unpatentable under 35 U.S.C. § 112, second paragraph, as indefinite.¹⁹¹

This is an important decision. The claims of a patent define the invention.¹⁹² Therefore, any equivocation in the claims translates into a concomitant ambiguity in the scope of exclusivity. The Federal Circuit's standard requires that a claim be "insolubly ambiguous"—a standard doubtless derived in part from the presumption of validity attaching to every patent granted by the PTO.¹⁹³ Of course, the PTO is subject to no such presumption, even in a setting of reexamination.¹⁹⁴ The BPAI's ruling thus makes some sense and allows the PTO to reduce the indeterminacy of issued patents. Before the decision, claims subject to multiple plausible constructions—shown above to be a major contributor to the indeterminacy of patent rights—were not indefinite. This legal principle facilitated a situation in which potential infringers lack effective means to assess whether they are in fact infringing and, moreover, whether the relevant claims are anticipated under the prior art. This, of course, contributes to the stochastic nature of IP enforcement and undermines the right to exclude, which is meant to define such property. As noted, this limitation serves not only to undermine the cause for injunctive relief in the case of alleged infringement but also to implicate the validity of derivative contractual rights. As the PTO continues to enhance the quality of its determinations, and hence the expected validity and determinacy of the patents it issues, the case for a more literal property-patent equation becomes stronger.

sional applications). Disappointed applicants can continue to seek examination as many times as they choose.

190. *Ex parte Miyazaki*, 89 U.S.P.Q.2d (BNA) 1207 (BPAI Nov. 19, 2008), available at <http://www.uspto.gov/web/offices/dcom/bpai/prec/fdo73300.pdf>.

191. *Id.* at 1211.

192. See *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) ("It is a 'bedrock principle' of patent law that 'the claims of a patent define the invention to which the patentee is entitled the right to exclude.'" (quoting *Innova/Pure Water, Inc., v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004))).

193. 35 U.S.C. § 282; *Kinetic Concepts, Inc. v. Blue Sky Med. Group, Inc.*, 554 F.3d 1010, 1022 (Fed. Cir. 2009).

194. See *Lichtman & Lemley*, *supra* note 67.

Surveying some of these developments, Professor Epstein—one of the leading proponents of the property rights movement—recently opined that improvements in the prosecution process could lead to *eBay*'s being overturned.¹⁹⁵ Irrespective of whether this turns out to be the case, it surely remains true that genuine, sustained improvement in the prosecution process would have a marked impact on the construction of optimal patent rules.

B. *Residual Uncertainty and Implications*

The prosecution process never will be perfect; it never will achieve a level of reliability that would eliminate entirely the bad-patent dilemma. The sheer vastness of the prior art, in conjunction with the ever-increasing complexity of technology, will ensure that some residual error will persist. At the same time, the lure of the private market will continue to entice the best examiners, which complicates recruiting and retention. It is doubtless that additional difficulties will persist. Perfection is an unattainable goal.

Some residual indeterminism is therefore inevitable. The relevant question, though, is this: What are the normative repercussions of that uncertainty on the property-patent equation, a patentee's ability to obtain injunctive relief, and its freedom to enter into contractual arrangements that implicate policy issues surrounding the exclusivity of its property right?

The purpose of this Section is to clarify what is inherent in the preceding analysis. The fact of indeterminism has distinct and appreciable repercussions for the property-patent equation, though the precise nature of such consequences depends largely on degree. This Article has considered two major issues associated with the property rights movement; namely, whether property or liability rules should govern instances of patent infringement, and whether the questionable validity and imprecise scope of many patents should constrain patentees' freedom of contract. In both settings, the probabilistic nature of patents is far more pronounced than is the case with regard to physical property. Nevertheless, conventional principles of property law have some instructive value in cases of patent infringement. These principles make clear that objectively indeterminate property borders may lead to inadvertent and economically unavoidable trespass in cases where the relevant property owner does not provide notice. In such situations, property rules should give way to a liability solution. A similar analogy can be applied to patent jurisprudence.

What if the prosecution process improves in the manner envisaged above? As the expected validity of patents granted by the PTO increases, a priori skepticism should retreat. The normative case for a liability rule will diminish in parallel with enhanced patent quality. An infringer's right to posit that her infringement was both inadvertent and unavoidable decreases in direct proportion to the qualitative performance of the PTO during prosecution. In short, the more secure the property right, the greater the case for injunctive re-

195. See Richard Epstein, Op-Ed., *Breaking the Patent Logjam*, FIN. TIMES, Aug. 28, 2008, <http://www.ft.com/cms/s/0/bf055c78-7508-11dd-ab30-0000779fd18c.html>.

lief.¹⁹⁶ There is thus strong ground for Professor Epstein's contention that improvements in the prosecution process could lead to a retraction of *eBay*.

Although improved certainty would enhance a patentee's claim for injunctive relief, the larger effect surely would lie in freedom of contract. Section III.C explored how unconstrained patentees would, and do, regulate the validity of their intellectual property by reaching mutually beneficial arrangements with rivals. By foreclosing those most likely to challenge the validity of their exclusive rights, such patentees artificially elevate the exclusive force of their intellectual property rights. In the conventional setting of land, where rights are relatively deterministic, the ability of a property owner to pay others not to trespass is unquestioned. Yet, as explored, the uncertain nature of patents severely complicates the question of whether a patentee should have equivalent contractual freedom.

As the PTO improves the prosecution process, the case for drawing a literal patent-property equation with regard to reverse exclusionary payments will grow stronger. A patentee's right to agree with others not to challenge the validity of its patent is proportional to the expected legitimacy of its intellectual property. As that property grows more secure, the Federal Circuit's focus on a "zone of exclusion" that legitimizes otherwise improper conduct will become increasingly desirable.

In sum, potential improvements in the PTO's procedures offer the possibility of resolving the difficulties imposed by indeterminism on the property-patent equation. Although patents of unquestionable legitimacy will prove elusive, significant improvements in prosecution will result in a strong foundational backing for a close property-patent equation. Were such advances to take place, heuristic concerns would favor treating rights of strong expected validity largely as sacrosanct. As a result, prosecution need not be flawless to bring an analogy between real and intellectual property to its logical limit.

CONCLUSION

The property rights movement has been criticized for promoting a dogmatic and ideological analogy between intellectual and physical property. Critics object in particular to the improper extraction of formalistic rights to exclude from the traditional setting.¹⁹⁷ Given the numerous idiosyncrasies of the intellectual domain, some view the idea of a "property" right within it as incongruous and misleading.¹⁹⁸ A person's right to injunctive relief against invasion of his land is distinct from a patentee's right to prevent others from practicing her invention. In particular, the former setting involves private goods that are

196. Obviously, concerns of patent trolling, as facilitated through sequential investment and fragmented ownership, would persist, but the normative ground for denying injunctive relief on the basis of indeterminism would be eviscerated.

197. See, e.g., Menell, *supra* note 25.

198. *Id.*

subject to rivalry in consumption—the normative case for exclusion is stronger when trespass directly impairs the owner’s use or enjoyment of his property.¹⁹⁹ More fundamentally still, the innumerable overlapping patents in certain high-tech fields create an impenetrable “thicket” that frustrates quixotic conceptions of Coasian bargaining and acts only as an anticommons that paradoxically forecloses innovation.²⁰⁰ One’s exclusion of another from his land is isolated; a single patentee’s ability to enjoin production of a semiconductor chip that implicates thousands of patents creates powerful negative externalities.²⁰¹ Given such distinctions, many view the worlds of patent law and traditional property as sufficiently distinct to be unworthy of direct analogy.

Yet, this view is myopic. Particularly from a utilitarian perspective, there is much in common between these two fields. Exclusivity is justified in both situations to spur optimal investment in resources and to allocate valuable goods efficiently. Though significant distinctions do exist between the intellectual and physical worlds, these differences are both readily observable and relatively contained. More importantly still, those ostensible discrepancies in fact yield valuable insights into the formulation of optimal policy. The realm of traditional property law is far less homogeneous in providing exclusion rights than a cursory glance would suggest. Similarly, the right to injunctive relief in that setting is considerably less sacrosanct than many believe. Indeed, several cutting problems in the intellectual arena—sequential investment, *ex post* hold-out, and high transaction cost settings—find direct analogy in the traditional realm. Although these issues may be more pronounced in the patent field, the policy foundations are closely related. Ultimately, courts are eminently capable of distinguishing issues unique to a particular intellectual property matter from a garden variety case of trespass in traditional property law. What distinctions do exist, therefore, are contained.

The issue of uncertainty constitutes a potentially glaring exception. For those who would promote the cause of a property-patent equation, the systemic indeterminism that underlies all patent grants constitutes a point of marked departure from the world of traditional property. Patentees possess stochastic rights only—ones that would seem to render toothless a foundational analogy between the physical and intellectual domains. In particular, how can one compare a landowner’s right to eject a trespasser from his land to a patentee’s right to injunctive relief in a setting of indeterminate infringement that only becomes evident *ex post*? One who possesses a probabilistic property right should not enjoy the same exclusivity as one whose ownership is unquestioned. Given the vast disparity in both expected validity and clarity in scope, the fact of stochasticism has significant implications for the property rights movement.

199. Some commentators look beyond the utilitarian justification for property and find further reason for treating intellectual and tangible goods in distinct fashion.

200. See Heller, *supra* note 57.

201. See Lemley & Weiser, *supra* note 4.

Yet, this Article argues that patent uncertainty, seemingly a point of irreconcilable divergence from traditional property, in fact bears a complex and potentially helpful relationship to the law of real property. Going to the heart of the property-patent equation—namely, the extent to which the law of real property can be used to justify injunctive relief in the case of patent infringement—traditional property doctrine bears the potential for most desirable application in the new economy. Although the indefiniteness associated with intellectual property is far more pronounced than what may be associated with realty, the law governing the latter provides some normative guidance.

Most paradigmatically, inadvertent trespass onto another's land—coupled with sunk investment and nebulous boundaries—may lead to the imposition of a liability rule and the loss of a right to injunctive relief for the property owner. Sound reasoning underlies this element of the law, and it would seem no less applicable to the world of IP. Where an infringer has conducted a meaningful search, where the omitted patent, which is neither licensed nor marketed, is lost amongst thousands in an impenetrable thicket, and where the patent's indeterminate claims—even had they been discovered—would have lead a potential infringer to conclude as a matter of probability that its planned activity is non-infringing, analogy to the law of real property would similarly suggest the implementation of a liability rule. Allowing a non-practicing patentee to enjoin the activity of an innocent infringer following massive investment by the latter creates perverse incentives, inefficiencies, and wealth transfers of questionable desirability.

The fact of indeterminism is central to this inquiry, for if an infringer had means by which to demarcate the extent of others' proprietary ownership *ex ante*, strong rights to exclude *ex post* would induce potential infringers to enter into efficient licensing arrangements before they begin commercialization. So construed, the recent phenomenon of maintaining deliberate ignorance of the prior art would provide no ground for denying an injunction to the holder of an infringed patent. One can appreciate that traditional principles of property law are readily applicable to contemporary issues in the realm of patents, notwithstanding the unique level of uncertainty underlying the latter.

The foregoing reveals an important point—the ubiquity of probabilistic patents strains an analogy between physical and intellectual property only if one characterizes the law of real property as entailing dogmatic and unqualified rights to exclude. Such obviously is not the case.

Nevertheless, there are limitations to the property-patent equation. In particular, the extent of the divergence in certainty necessitates distinct legal standards covering owners' freedom of contract. In this sense, a patentee's "right to exclude" implicates not only his right to injunctive relief but also the justification for contractual arrangements that might otherwise be constrained as a matter of public policy. Perhaps the most central constraint is created by anti-trust law. Recognizing patent law as an exception to the long-established rule

against monopolies,²⁰² many courts have found anticompetitive behavior within the scope of a patent as immune from antitrust oversight.²⁰³ The legitimacy of this view would seem to be affected heavily by the nature of the underlying property right. In particular, the greater the certainty of a patentee's temporary monopoly, the greater the legal case for allowing her to engage in exclusionary behavior within the purview of her grant.

Given current standards of legitimacy, however, significant policy concerns are implicated by a patentee's ability to enhance artificially the certainty of its exclusive right. More specifically, private, artificial enhancement of a patent right results in a windfall gain for the relevant patentee but no corresponding boon for social welfare. Although society unquestionably should pursue the goal of improving the expected validity of patent rights, the way to achieve this is by enhancing the quality of the prosecution process. The owner of a probabilistic patent is not entitled to the full profit that would accompany a property right of unquestionable validity precisely because its exclusive right is derived from a flawed process. Treating such IP rights as sacrosanct confers an unearned benefit on inventors who may not properly have qualified for protection.

The Federal Circuit's conclusion in *In re Ciprofloxacin* initially seems consistent with a property-patent equation. Were a trespasser to occupy part of one's land, no one would question one's right to pay him to leave. Enforcing one's right in court necessarily involves expense, so such an arrangement may be eminently desirable from the perspective of the property owner. Such is also the case with a patentee, who is faced with the prospect of litigating infamously expensive claims of infringement and invalidity.²⁰⁴ Even the holder of a conclusively valid patent would pay a premium to a challenger to avoid judicial costs.

Yet, the weakness of the analogy is apparent. While there may be some uncertainty as to the precise metes and bounds of a particular lot, the question of whether the holder of the relevant freehold or leasehold interest has a legitimate right typically will be straightforward. Obviously, the equivalent question in the intellectual domain leads to a different answer. The Federal Circuit's focus on a "zone of exclusion" can be criticized for treating a probabilistic right as being tantamount to a conclusive one. A reverse agreement may protect a patent that would be found invalid, unenforceable, or not infringed in court. This policy insight is far from esoteric—the courts have long stressed the importance of invalidating improvidently granted IP rights.²⁰⁵ *In re Ciprofloxacin* may be construed as drawing an uncritical analogy to principles of traditional property law

202. See *Precision Instrument Mfg. Co. v. Auto. Maint. Mach. Co.*, 324 U.S. 806, 816 (1945) (“[A] patent is an exception to the general rule against monopolies . . .”).

203. See, e.g., *In re Ciprofloxacin Hydrochloride Antitrust Litig.*, 544 F.3d 1323 (Fed. Cir. 2008).

204. See, e.g., *Bessen & Meurer*, *supra* note 169, at 2.

205. This is a point that has been emphasized by the Supreme Court. See *Lear, Inc. v. Adkins*, 395 U.S. 653, 670-71 (1969).

and, in doing so, allowing a patentee to extract greater social wealth than was inherent in the patent bargain.

The (presently) inescapable fact of suspect patent validity thus has significant repercussions for those who favor the direct implementation of rules established long before in the physical realm. While the latter body of law does indeed display sensitivity and prudence in the presence of uncertain property boundaries—thus offering a rich body of law from which the IP policymaker can draw—the property-patent equation is not unqualified. Nevertheless, courts and commentators generally should promote property rules in the patent law setting, thus creating optimal incentives for initial invention, commercialization, and *ex ante* negotiation, where that context accommodates such a rule. Here, conventional principles of property law would seem most instructive, given their implementation of a liability solution only in the presence of preclusive transaction costs, innocent trespass coupled with sunk investment, or *ex post* hold-out.²⁰⁶

206. See POSNER, *supra* note 52, at 55.