Damages for Unlicensed Use

Omri Ben-Shahar†

This Article investigates the distinction between breach of license and infringement of property rights and how damages ought to be measured for each. It identifies two remedial puzzles. First, under current law the line between breach of a license contract and infringement of a property right is murky, and thus minor differences between violations could lead to major differences in damage measures. Second, damages for infringement are augmented in a subtle but distortive way by giving owners an option to choose between the greater of two computation measures, each based on different information. The Article argues that these existing remedial patterns are not justified. It provides an alternative framework for determining whether a violation is breach or infringement. In a nutshell, violations involving activities that an owner would want to license in a separate transaction, or not license at all, should be regarded as infringements and sanctioned more severely.

Introduction

This Article investigates the difference between breach and infringement. If a licensee makes an unlicensed use, did he breach the contract or did he infringe upon the property rights of the licensor? Is he liable for breach or for infringement remedies? This is a distinction that has important implications for measuring damages. It has proven to be a difficult line to draw, raising issues that are regarded as "among the knottiest" in intellectual property adjudication.[1]

Consider the following example: A copyright owner licenses the right to publish his novel in a specific medium, say, in paperback, to a licensee. The licensee commits one of three wrongful acts: (1) he launches the distribution prematurely, thereby cutting into the owner's revenue from other media of distribution; (2) he distributes the work in additional media that were not covered by the license; (3) he makes changes to the text of the work, cutting chapters and revising the story's ending. In each of these cases, did he commit a breach of contract? Or did he infringe upon the owner's copyright? Are damages limited to the owner's lost profits, which might often be low or hard to prove, or could the damages instead be measured by the violator's profits, which are higher and easier to prove?

---

† Frank and Bernice J. Greenberg Professor of Law, The University of Chicago Law School.
I am grateful to Lee Fennell, Saul Levmore, Ariel Porat, David Schwartz, and participants at two workshops in Chicago for helpful discussions.

1 Melville B. Nimmer and David Nimmer, 3 *Nimmer on Copyright* § 12.01[A] at 12-5 (Mathew Bender 2010).

In the first Part of this Article, I examine the conceptual structure of the breach-versus-infringement remedial doctrines. I highlight two puzzling patterns. The first puzzle has to do with the way the law divides the work between breach and infringement, and more generally between contract and property. I argue that the rules determining which damage rule applies are mechanical, almost arbitrary, and devoid of normative foundations. They do not conform to any discernible policy concern. That is, the choice of remedy is not a product of optimal calibration of the sanction but rather a function of technical characterization of the violation.

The second puzzle concerns the manner in which infringement damages are calculated. In a nutshell, the law allows the aggrieved owner to choose one of two computation measures of recovery. The first is based on ex post information: the actual lost profit, or the actual profit realized by the infringer, as they are known at the time of the dispute resolution. The second is based on ex ante values: the expected value of the infringed right prior to the infringement, before the actual loss or profit became known. Both measures are sensible if pursued consistently. The anomaly arises, I show, from the way they are combined. In a subtle way, the law entitles the aggrieved owner to choose the *greater of* the two measures, ex post or ex ante loss. If the ex post loss is high, it will be chosen; if it is low, the owner can choose the ex ante value instead. As a result, the expected recovery is bolstered, creating two distortions. First, recovery exceeds the injury; and second, the excess recovery depends on factors that are wholly irrelevant to the remedial goals. Surprisingly, the expected recovery depends on the *volatility* of the value of the infringed right.

After describing these patterns of recovery for unlicensed use, the Article explores reasons to treat infringement more harshly than contract breach. Part II of the Article finds that some of the standard justifications for adjusting remedies—imperfect enforcement and precontractual investments—do not easily explain the doctrinal puzzles we observe. Part III then provides a roadmap to resolving the breach-versus-infringement problem. It identifies situations in which enhanced property protection for the owner is efficient. In these situations, a violation ought to be classified as infringement. Breach or infringement, it argues, cannot be distinguished along definitions relating to the "nature" of contract or intellectual property (IP); rather, they are labels affixed to the conclusion of the inquiry into when damages should be bolstered.

I. TWO REMEDIAL DICHOTOMIES

A. Breach versus Infringement: The Contract–Property Boundary

The first remedial dichotomy arises in cases in which the parties negotiated a license but the licensee overreached and made unauthorized uses. This wrongful action by the licensee could be both a breach of the license contract, giving rise to the common law's contract remedies, and an infringement of the licensor's intellectual property, with remedies provided by statute. Returning to the example of the author who licensed paperback publishing rights to a licensee who proceeded to violate the license—which remedy is the author entitled to, the lost profit damages of contract law or the statutory damages of intellectual property law?

In copyright cases, recovering for infringement could be valuable to the owner because the Copyright Act grants him a disgorgement remedy.[2] Disgorgement damages could be substantially higher than the normal contract damages that measure the rightholder's lost profits. In patent cases, the shift from contract to infringement remedies could also increase the magnitude of damages. Further, unlike contract recovery, infringement of intellectual property opens the door to recovery of treble damages and attorneys' fees in certain cases,[3] as well as a longer statute of limitations.[4] Other times, the owner might prefer contract damages. Suing for breach of license does not involve the risk of patent invalidation;[5] or breach of contract may be easier to prove than patent infringement.[6]

Thus, in the paperback publishing example, if the licensee violates the terms of the license by disseminating the paperback edition prematurely, what is the copyright holder's remedy? The copyright holder's lost profits are measured by the reduced sales of the hardcover edition that result from the early launching of the paperback. Recovery of this loss is the ordinary contract expectation damage remedy. The infringer, however, enjoyed increased sales due to the premature release of the paperback. Recovery of this wrongfully received profit is the ordinary remedy for copyright infringement. The two measures could be dramatically different. The lost profits from another month of

---

2 See 17 USC § 504(b) ("The copyright owner is entitled to recover . . . any profits of the infringer that are attributable to the infringement and are not taken into account in computing the actual damages.").

3 See 35 USC §§ 283–85 (patent); 15 USC § 1117 (trademark); 17 USC §§ 502–05 (copyright).

4 See Robert P. Merges, *A Transactional View of Property Rights*, 20 Berkeley Tech L J 1477, 1509 (2005).

5 See id at 1511.

6 See *Eli Lilly and Co v Genentech, Inc*, 17 USPQ2d 1531, 1534 (SD Ind 1990).

sales of hardcover books could be small, while the increased profit from premature sales of paperbacks might be substantial.[7]

Both the contract damage rule and the infringement remedy are sensible. Each is consistent with the fundamental remedial principles of their respective areas of law, contracts and IP. The problem in their application is the fuzzy boundary between the two. In any individual case, it is not clear as a matter of legal doctrine which measure applies. The rules determining when the aggrieved party is entitled to the infringement remedy and when he is restricted to the contract remedy are technical, almost arbitrary, and seemingly devoid of normative foundations. In the remainder of this section, I outline some of the distinctions drawn by the law to sort out breach versus infringement.

First, the answer depends on whether the license is exclusive or not. For example, in the above premature-publishing example, if the licensee had an *exclusive* license to publish the paperback edition, his wrongful act is merely a breach of contract. The reason given by the court is mechanical: an exclusive license is regarded as a transfer of the "ownership" of the copyright rights, and the exclusive licensee—as the person who now owns some copyright rights—is "incapable of infringing a copyright interest that is owned by him."[8] He is only "capable of breaching the contractual obligations imposed on him by the license."[9] If, instead, the license were not exclusive, the breaching licensee could be liable for copyright infringement damages.[10]

A second doctrinal wrinkle that divides the work between contract and IP remedies is the promise–condition distinction. If the licensee breaches a promissory obligation under the license agreement, then he is held in breach and is liable only for contract damages. If, on the other hand, the licensee fails to satisfy a condition precedent, then the license effectively does not exist, and, in the absence of a contract, the violator is liable for infringement remedies.[11] For example, if a licensee fails to comply with a contractual provision to affix the correct copyright notice

7 See *United States Naval Institute v Charter Communications, Inc*, 936 F2d 692, 694 (2d Cir 1991) (involving a dispute in which the profit from lost hardcover sales was estimated at less than $35,000, while the profit from additional paperback sales was alleged to exceed $700,000—a multiple of 20).

8 Id at 695, quoting *Cortner v Israel*, 732 F2d 267, 271 (2d Cir 1984).

9 *Charter Communications*, 936 F2d at 695.

10 See *Sun Microsystems, Inc v Microsoft Corp*, 188 F3d 1115, 1121 (9th Cir 1999) (noting that generally a "'copyright owner who grants a nonexclusive license to use his copyrighted material waives his right to sue the licensee for copyright infringement' and can sue only for breach of contract").

11 See, for example, *Graham v James*, 144 F3d 229, 236–37 (2d Cir 1998); Nimmer and Nimmer, 3 *Nimmer on Copyright* § 10.15[A][2] at 10-116 (cited in note 1); Edwin E. Richards, *Drafting Licenses to Guide Whether Potential Disputes Lie in Contract or Infringement*, 7 Computer L Rev & Tech J 45, 51–52 (2002).

to the materials reproduced under the license, is this a breach of its license obligation or a failure to satisfy a condition upon the license? There may be some superfluous logic to the distinction between obligations and conditions—contract damages are relevant only when contract obligations kick in, whereas failure of a condition suggests that the obligations never arise—but the rules determining when contract provisions are conditions and when they are promissory obligations are notoriously fluid[12] and inadequate to provide a sound foundation for the election of remedy. Indeed, the above scenario, in which the licensee failed to affix a proper copyright notice, was held at times to be a failure of condition, making the violation an infringement of copyright,[13] and at other times a breach of obligation, making the violation subject only to contract breach remedies.[14]

A third distinction working to mark off the elusive boundary between breach and infringement is between *limitations on the scope of the license* and *affirmative covenant*. Consider, for example, a provision stating that "the licensee agrees to engage only in specific use X." It may be characterized as a limitation on the scope of the license, and a licensee who makes use beyond X therefore does not have a license for it, thus committing an infringement. Alternatively, it may be characterized as a negative promise by the licensee, "the licensee promises not to make uses other than X," in which case a licensee whose use goes beyond X would be in breach of a promise, subject only to breach of contract remedies.[15] Unfortunately, the distinction between "scope of license" and "negative promise" is a semantic one, at best, and most license provisions are both.[16] It is all the more superficial given that courts can find in any license limitation a blanket *implied*

12 See, for example, *Howard v Federal Crop Insurance Corp*, 540 F2d 695, 698 (4th Cir 1976) (holding that clauses titled "condition" in an insurance policy can still be classified as promises to avoid forfeiture); *Harmon Cable Communications v Scope Cable Television, Inc*, 468 NW2d 350, 358 (Neb 1991) ("Courts have struggled for centuries with differentiating between conditions and promises."). See also Restatement (Second) of Contracts § 227 (1981) (offering three general interpretive canons to guide courts in discerning and enforcing contractual conditions).

13 See, for example, *County of Ventura v Blackburn*, 362 F2d 515, 520 (9th Cir 1966); *National Comics Publications, Inc v Fawcett Publications, Inc*, 191 F2d 594, 600 (2d Cir 1951).

14 See, for example, *Fantastic Fakes, Inc v Pickwick International, Inc*, 661 F2d 479, 487 (5th Cir 1981).

15 See, for example, *SCO Group, Inc v Novell, Inc*, 2007 WL 2327587, *40 (D Utah); *Sun Microsystems*, 188 F3d at 1121–22. In the latter case, the infringement–breach dichotomy mattered for the purpose of preliminary remedies. An infringement of IP gives rise to the presumption of irreparable harm and to preliminary injunction, whereas a breach of license does not.

16 It is not even clear whether this distinction is a matter for contract interpretation. Courts recognize that the question whether the provision is a limitation on the scope or an affirmative covenant is a matter for interpretation of the license contract, but they also say that the canons of interpretation from contract law cannot interfere with federal copyright law and policy. See *Sun Microsystems*, 188 F3d at 1122; *S.O.S., Inc v Payday, Inc*, 886 F2d 1081, 1088 (9th Cir 1989).

promise not to exceed the bounds of the license restriction or to commit any infringement. This transforms every infringement into a breach of contract.[17] For example, when the license states that the licensee's products may not compete with the licensor's, a violation by the licensee is held to be both breach and infringement, thus allowing the licensor to choose the remedy.[18]

Some of the rules regarding the breach–infringement interface come from jurisdictional disputes. Federal courts have exclusive jurisdiction over copyright infringement actions, whereas state courts adjudicate contract disputes. When a complaint asserts breach of license and infringement of copyright—does it arise under copyright law or under contract law? Courts utilize a variety of tests to determine whether the complaint requires construction of the Copyright Act or of the contract.[19] Many courts hold that the complaint arises under the Copyright Act if it is for a remedy granted by the Act—a "well-pleaded complaint rule" that gives the plaintiff the outright choice.[20] This choice is constrained by a variety of tests: whether the dispute is "informed by the substantive law of copyright,"[21] whether it is within the "subject matter of copyright,"[22] whether there is more than "an aroma of copyright,"[23] and more.

Moreover, the determination of breach versus infringement depends on the rules of contract cancellation. The license itself may contain a reversion clause that automatically terminates the licensee's rights.[24] Or the license can be affirmatively rescinded as a result of a material breach (for example, nonpayment of royalties).[25] When the breach

17 See, for example, *Shaw v E.I. DuPont de Nemours and Co*, 226 A2d 903, 905–07 (Vt 1966); Phillip B.C. Jones, *Violation of a Patent License Restriction: Breach of Contract or Patent Infringement?*, 33 IDEA 225, 229 (1993).

18 See *SCO Group*, 2007 WL 2327587 at *39–41.

19 See James M. McCarthy, Comment, *Federal Subject Matter Jurisdiction: When Does a Case Involving the Breach of a Copyright Licensing Contract "Arise Under" the Copyright Act?*, 19 U Dayton L Rev 165, 175–84 (1993).

20 See *T.B. Harms Co v Eliscu*, 339 F2d 823, 828 (2d Cir 1964). See also *Bassett v Mashantucket Pequot Tribe*, 204 F3d 343, 355 (2d Cir 2000).

21 *SAPC, Inc v Lotus Development Corp*, 699 F Supp 1009, 1012 (D Mass 1988).

22 *La Resolana Architects, PA v Clay Realtors Angel Fire*, 416 F3d 1195, 1199 n 2 (10th Cir 2005).

23 Nimmer and Nimmer, 3 *Nimmer on Copyright* § 12.01[A][2] at 12-22.4 (cited in note 1).

24 See Richards, 7 Computer L Rev & Tech J at 52 (cited in note 11) (recommending the inclusion of an express reversion clause in licensing agreements so as to preserve the availability of infringement remedies).

25 See *Graham*, 144 F3d at 237–38 ("A material breach of a covenant will allow the licensor to rescind the license and hold the licensee liable for infringement for uses of the work thereafter."); Nimmer and Nimmer, 3 *Nimmer on Copyright* § 10.15[A][3] at 10-118 (cited in note 1) (defining a material breach in this context as a breach of "so substantial a nature that [it] affect[s] the very essence of the contract and serve[s] to defeat the object of the parties").

of the license is such that it grants the owner the power to revoke the license, the owner has a clear path to infringement remedies: he cancels the license, and with the license no longer in place, the only remaining ground for recovery is copyright infringement. In fact, the same violation can give rise to damages both for breach (prior to the license termination) and for infringement (for the period following termination).[26] It is hard to explain, though, why the mechanical act of affirmative termination should affect the magnitude of damages.

In sum, the law entitles the rightholder to two types of remedies—two causes of action—but does not draw a clear and reasoned boundary between the causes of action. Small, hairsplitting differences in facts or characterization could lead to dramatic, discontinuous jumps in the magnitude of damages. At times, the owner would be allowed to choose which remedy to claim and could wait to plead the count that provides the higher recovery.[27] Judge Benjamin Cardozo explained that

> [t]he author who suffers infringement of his copyright at the hands of a licensee may . . . seek redress under the statute by action in the federal courts. But that is not in all circumstances the only remedy available. If the same act is not merely an invasion of the statutory right of property, but is also the breach of a contract . . . he may count upon the breach or the abuse, and have relief accordingly.[28]

Other times, there is no choice—the remedy is dictated by legal doctrine—but from the licensee's perspective the remedy could turn on unpredictable or superficial factors.

B. Ex Post versus Ex Ante Measures of Damages

A second remedial dichotomy arises in cases in which the violation is clearly an infringement. The violator infringed by committing an unlicensed, unauthorized use. If detected and found liable for infringement, what is the measure of damages that the violator owes the owner? Patent and copyright law give the owner yet another choice.

26 See, for example, *Wisconsin Alumni Research Foundation v General Electric Co*, 880 F Supp 1266, 1274–76 (ED Wis 1995).

27 See Merges, 20 Berkeley Tech L J at 1505–13 (cited in note 5). Generally, parties can join in the complaint a claim for disgorgement and a claim for expectation damages, postponing the election of the remedy until it becomes clear, at trial, which of the two measures is greater. Courts even permit plaintiffs to amend their complaints and shift the basis of recovery. See, for example, *Matarese v Moore-McCormack Lines, Inc*, 158 F2d 631, 633 (2d Cir 1946); *Frontier Management Co v Balboa Insurance Co*, 658 F Supp 987, 994 (D Mass 1986).

28 *Underhill v Schenck*, 143 NE 773, 775 (NY 1924).

Consider patent law first. One measure of damages—which I will label the "ex post measure"—sets the recovery according to the actual profit that the patentee lost as a result of the infringement.[29] It may be difficult to identify and prove the exact lost profits, but if the evidentiary burden is overcome, the aggrieved patentee may recover his actual loss. This is an ex post measure because it depends on information that becomes available post-infringement, at trial, regarding the realization of business outcomes.

Alternatively, the patentee can forgo ex post recovery and collect instead an "ex ante measure" of damages, equal to the value that would have attached to the right prior to infringement, before the parties acquire information about the actual value of the license to the infringer or the lost profits of the patentee. The ex ante measure is estimated as the hypothetical royalties that the owner would have negotiated in a hypothetical license, had the infringer approached him and sought to secure a license.[30] This hypothetical royalty measure is merely an educated guess—an average. It reflects the *expected value* of the patent to both parties and their relative bargaining power, based on information that was available pre-infringement.[31] It is an intermediate quantum that depends more on market data and the distribution of profits than on the actual realized value of the patent.

Both the ex post and the ex ante measures are sensible. Each conforms to a different remedial conception. The ex post measure serves with great accuracy the "make whole" principle. The ex ante measure mimics the bargain that would have been struck. It is the gap-filler that protects the patentee's market position. The problem is that they are *both* available, so the plaintiff, who has a choice of which one to claim, can opt for the greater of the two.[32]

To understand why this prerogative to choose the greater of the two measures is problematic, let us assess the expected value of the combined remedy. At the time of infringement, the ex post damage that would accrue to the patentee, in terms of lost profit, is uncertain.

29 35 USC § 284.

30 35 USC § 284 (allowing the award of "damages adequate to compensate for the infringement, but in no event less than a reasonable royalty"). See, for example, *Panduit Corp v Stahlin Bros Fibre Works, Inc*, 575 F2d 1152, 1157 (6th Cir 1978) ("When actual damages, e.g., lost profits, cannot be proved, the patent owner is entitled to a reasonable royalty."); *Georgia-Pacific Corp v United States Plywood Corp*, 318 F Supp 1116, 1120 (SDNY 1970) (listing the factors relevant to the calculation of a reasonable royalty).

31 See *Lucent Technology, Inc v Gateway, Inc*, 580 F3d 1301, 1325, 1332 (Fed Cir 2009) ("The hypothetical negotiation tries, as best as possible, to recreate the *ex ante* licensing negotiation scenario and to describe the resulting agreement . . . to elucidate how the parties would have valued the patented feature.").

32 See *Bandag, Inc v Gerrard Tire Co*, 704 F2d 1578, 1583 (Fed Cir 1983) (explaining that a reasonable royalty is "merely the floor below which damages shall not fall"); *Panduit*, 575 F2d at 1157.

If, by the time litigation occurs, the ex post lost-profit measure turns out to be high, the patentee will then claim and recover his actual lost profits. If, instead, this measure turns out to be low or zero, then the patentee will claim and recover not the actual loss but rather the ex ante damage equal to the hypothetical royalty. Thus, if we analogize the ex post profit to a lottery (in the sense that it is unknown early on whether it will be high or zero value), the "greater of" remedial regime gives the claimant an inflated portfolio of claims. He can recover the actual prize when the lottery draw is "win," and he can recover the expected value of the lottery when the draw is "loss." The expected value of the recovery is greater than the expected value of the lottery! That is, the patent is worth more when infringed, because the recovery rights exceed the expected stream of profits when not infringed.

To illustrate, imagine a lottery with a 1 percent chance of winning a prize of $1,000 and a 99 percent chance of winning $0. The expected value of the lottery is $10. Under the "greater of" recovery regime, the claimant recovers $1,000 if he wins (with a probability of 1 percent), and $10 if he loses (with a probability of 99 percent). The expected value of the recovery is just about $20, twice the expected value of the lottery.

This "greater of" structure of remedies is not unique to patent infringement.[33] It arises also under copyright law. A copyright owner can disgorge the infringer's actual profit, or—if this measure turns out to be too low (if the infringer made no profit)—he can recover statutory damages under § 504(c) of the Copyright Act.[34]

The effect of a "greater of" regime is distortive because the portfolio of damages it creates ends up depending on arbitrary, irrelevant factors. That is, infringements that create the same expected harm at the time they are committed potentially lead to different expected recoveries. To see why, compare three patents with the same expected profit of $1,000. They differ in the distribution of profits:

- Patent 1 creates a 100 percent chance of $1,000 in profits.
- Patent 2 creates a 50 percent chance of $2,000 in profits (and a 50 percent chance of $0).

33 For a general discussion of this type of problem in various areas of the law, see Omri Ben-Shahar and Robert A. Mikos, *The (Legal) Value of Chance: Distorted Measures of Recovery in Private Law*, 7 Am L & Econ Rev 484, 489–509 (2005); Saul Levmore, *Obligation or Restitution for Best Efforts*, 67 S Cal L Rev 1411, 1423–30 (1994).

34 17 USC § 504(c)(1) ("[T]he copyright owner may elect . . . to recover, instead of actual damages and profits, an award of statutory damages . . . in a sum of not less than $750 or more than $30,000 as the court considers just.").

- Patent 3 creates a 1 percent chance of $100,000 in profits (and a 99 percent chance of $0).

Assume that in all three cases, a license or infringement would deprive the patentee of the profit. The royalty that a risk-neutral patentee would therefore charge for a hypothetical license—the ex ante measure—is $1,000. To make the patentee whole in case of infringement, the expected value of the recovery schedule should also equal $1,000. Under the "greater of" regime, however, the expected recovery for infringement would vary. For infringement of Patent 1, expected recovery will be $1,000, because there is no uncertainty about profits. For infringement of Patent 2, expected recovery will be $1,500: the patentee has a 50 percent chance of recovering the actual loss of $2,000, and a 50 percent chance of recovering the hypothetical royalty of $1,000. The weighted sum is (0.5 × $2,000) + (0.5 × $1,000) = $1,500. And for infringement of Patent 3, expected recovery will be just under $2,000: the patentee has a 1 percent chance of recovering its actual loss of $100,000, and a 99 percent chance of recovering the hypothetical royalty of $1,000. The weighted sum is (0.01 × $100,000) + (0.99 × $1,000) = $1,990.[35]

In other words, the "greater of" regime entitles the patentee to recover the actual value of the patent (measured by the profit he would have made), bundled with a *put option* to sell this right to the infringer for the hypothetical license fee of $1,000. The excess recovery under this regime equals the value of the put option. The more volatile the ex post value of the asset—Patent 3 is more volatile than Patent 2, which is more volatile than Patent 1—the more valuable the put option, and the more substantial the excess recovery enjoyed by the patentee. The expected recovery depends not only on the expected value of the patent, but also its volatility.

Thus, as with the first dichotomy (the license–infringement duality), here too the law entitles the rightholder to two types of remedy. The two remedies differ not by the type of interest protected but rather by the information input into the measurement, or, more precisely, the time when this information is sampled. Infringements that look the same ex ante in terms of their economic impact end up being treated differently by the law of remedies. Again, small differences (now, having to do with the variance of profits) could lead to dramatic, discontinuous jumps in the value of the remedial options.

35 One can imagine scenarios in which the expected recovery is even higher. A patent that creates a 50 percent chance of a $10,000 gain and 50 percent chance of an $8,000 loss has an expected value of $1,000, and the expected recovery is $5,500.

II. Reasons for the Remedial Structure

This Part explores possible rationales for the existing remedial structure. Specifically, it looks at two features that the discussion above uncovered. First, we saw that infringement by a licensee leads, on average, to harsher remedies than breach of the license. That is, the option to elect a remedy from IP law operates to increase the burden of liability that a breaching licensee faces. Can this damage booster be explained? Second, we saw that there are some specific patterns that affect the licensor's choice of remedy and open the door for greater recovery. Are these the right factors to use as damage boosters?

A. Imperfect Enforcement

Not all violations are enforced. One of the main reasons for imperfect enforcement is imperfect detection—the likelihood that the infringer will escape sanction. A familiar feature of an optimal damages rule is the imperfect detection multiplier. The idea is straightforward: when the probability of detection of the wrongful act is less than 1, the magnitude of the damages has to be multiplied by the inverse of this probability. Thus, for example, if the probability of detection is one-third, then the damages need to be multiplied by three. What the wrongdoer gains by not being detected some of the time he loses in those cases in which he is detected and faces augmented damages. The key is to inflict on the wrongdoer an expected damage payment that is invariant to the probability of detection, so as to maintain optimal deterrence.[36]

What does this basic framework tell us about the dichotomous remedial structures of IP law? We saw that the effect of the mingled-remedy regime is to create a supercompensatory structure in which the rightholder is compensated, in expected value terms, for more than his loss. Thus, it might be conjectured that the excess compensation is a way to offset the underdeterrence arising from imperfect detection. Some rightholders never detect or sue; those that do detect the infringements and sue are overcompensated. And overall, optimal deterrence is maintained.

Consistent with this conjecture, the first relevant distinction is between cases in which a license exists and cases in which one does not. If the unauthorized use occurred in the presence (and thus in breach) of a license, then the probability of detection by the rightholder is

[36] See Gary S. Becker, *Crime and Punishment: An Economic Approach*, 76 J Polit Econ 169, 170–80 (1968); Richard A. Posner, *Economic Analysis of Law* 218 (Aspen 7th ed 2007); A. Mitchell Polinsky and Steven Shavell, *Punitive Damages: An Economic Analysis*, 111 Harv L Rev 869, 888 (1998).

likely to be *higher* than if the unauthorized use occurred in the absence of a license. Owners know the parties to whom they license rights. They know where to look if they want to monitor their licensees, and they anticipate the timing, the location, and the medium of the use. Unlicensed infringers, by contrast, are strangers. They could be anywhere, anytime, operating in any format or medium. Detection of their infringing activities is more erratic and less likely. Thus, within the universe of unauthorized users, the probability of detection is higher when the unauthorized user also happens to be a licensee.

By virtue of facing a higher probability of detection, licensees who commit unlicensed uses should face lower damage multipliers. In many instances, it is plausible to assume that the probability of detecting unauthorized uses by licensees is actually close to 1, in which case they need not face any multiplier at all for there to be adequate deterrence. These detected violator-licensees should be liable only for the harm caused (the owner's lost profit), but not beyond. Unlicensed infringers, by contrast, who were detected against the odds, should face a damage multiplier and pay more than the harm they caused. Accordingly, a simple rule that awards contract damages rather than infringement damages anytime the infringer also happens to be a licensee goes in the right direction.

Despite this possible deterrence justification for the remedial dichotomy, I am skeptical whether the actual rules operate in a desirable way. For one, an election of remedies is a clumsy way to achieve a multiplier. If the reason to multiply damages is the low probability of detection, this—and not the election of the greater among several sanctions—should be the explicit multiplying criterion. Perhaps the disgorgement remedy is the best the law can do to raise deterrence, given the practical constraints. One constraint is the information about the probability of detection, which courts often do not have and cannot utilize to set the perfect multiplier. Another constraint is the inability of infringers to pay the full punitive measure; all they have is the money that they earned through infringement, which can be readily disgorged. Thus, combining remedies and giving the aggrieved plaintiff the option to choose the greater can be viewed as a quick mechanical fix for underdetection, even if imperfect. This is the same technique that the law uses in other contexts. For example, fiduciary doctrines entitle a principal to choose a remedy against a breaching fiduciary agent. If the agent embezzles the principal's money and invests it, the agent is liable for the greater of his benefit (equal to his investment profits) and the principal's loss (the nominal sum stolen).[37]

There is a more fundamental problem, however, with the imperfect detection rationale for the dichotomous remedy regime. If violations committed by licensees are detectable, then they require no multiplier. The law that gives the aggrieved owner a bolstered right to recover—either by choosing an infringement remedy or through the "greater of" ex post and ex ante measures of damages—multiplies the sanction in the wrong set of cases.

Worse, both remedial dichotomies work to increase liability in the opposite direction from that suggested by the detection rationale. Consider the effect of the "greater of" ex post and ex ante damages. Recall from the example above that the multiplier effect is generated by the *variance* of ex post profits. The greater the variance, the higher the expected damage. (In that example, Patent 3, with a 1 percent likelihood of $100,000 in profits, generated double the expected recovery of Patent 1, with a 100 percent likelihood of $1,000 in profits, even though both had the same expected value.) There is no a priori reason to think that high variance in the patentee's profits would correlate with low probabilities of detection. For one, if the probability of detection depends on investment made by the patentee to detect, it is possible that the patentee would invest more when the patent has the potential for extremely high profits. Furthermore, it often is the case that the probability of detection is correlated with the *infringer's* success, not with the patentee's profits. The more profitable the infringement, the more likely it is to attract the attention of the patentee (despite any efforts that the infringer might make to hide its profits). Generally, infringements of patents are easy or difficult to detect depending more on how they are used by the infringer than how profitable they are to the patentee. Thus, the choice of remedy that the law grants the owner is worth more in cases of *high* detection probability—contrary to the deterrence rationale.

Consider also the multiplier effect achieved through the breach–infringement duality. It, too, is inconsistent with optimal deterrence theory. The law grants the aggrieved licensor a right to recover infringement damages even when the violation is easily detectable. For example, a licensee who violated the scope of the license could be easier to detect than one who violated a negative promise. It may be easier to detect an egregious violation by a licensee who ventures into

37 See Restatement (Second) of Agency § 407 (1958); Ben-Shahar and Mikos, 7 Am L & Econ Rev at 512 (cited in note 33) (illustrating the emergence of a "greater of" remedial regime under fiduciary law).

wholly unrelated activities (the book distributor who revises the book's ending) than a more subtle violation that is within the licensed activity (the distributor who launches the book prematurely).

In sum, imperfect detection and enforcement does not appear to provide a normative justification for the remedial structure in breach-of-license cases. We have to look elsewhere.

B. Costly Ex Ante Search

Not all infringements are deliberate violations of rights known to be protected by IP law. Many innovative technologies and products happen to overlap with existing rights in ways that are not obvious, nor easy to predict.[38] Thus, parties may infringe inadvertently, as a result of insufficient prior search for existing property rights.[39] As long as potential infringers are aware of the hazard of inadvertent infringement, the damages they will have to pay for such infringements will operate as inducement by law to undertake an advance search. Metaphorically, the more land mines in the path, and the more damaging those land mines are, the more cautious the traveler is likely to be, and the more he will invest in mine detectors. Some travelers will choose to stay off the path.

There is plenty of writing on the hardship, under existing systems, facing parties who want to commercialize an idea and need to identify and navigate through prior rights.[40] In a crowded landscape of registered patents, for example, it is costly to predict whether any particular use would run into the protected halos of other patents. A substantial investment in search precaution is required to maneuver the tight line between original and licensed innovation on one end and infringement on the other.[41]

It is impossible to identify the optimal level of search precaution in the abstract, but two observations are relevant to the context of unlicensed use. First, the easier it is to search and find prior rights, the

38 Stewart E. Sterk, *Property Rules, Liability Rules, and Uncertainty about Property Rights*, 106 Mich L Rev 1285, 1332–33 (2008) (noting that "patent law presents potential users with significant uncertainty" because of the range of possible ways to classify inventions and the unclear scope or validity of existing patents).

39 See Jonathan S. Masur, *Patent Liability Rules as Search Rules*, 78 U Chi L Rev 187, 191–92 (2011); Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting*, in Adam B. Jaffee, Josh Lerner, and Scott Stern, eds, 1 *Innovation Policy and the Economy* 119, 126 (MIT 2001).

40 See, for example, Ted Sichelman, *Commercializing Patents*, 62 Stan L Rev 341, 368 (2010) (describing how parties planning to commercialize must wade through "patent thickets," where "patent trolls"—firms or persons that choose not to commercialize or develop their patented inventions—"extract unwarranted rents" in the form of settlements or licenses).

41 See Masur, 78 U Chi L Rev at 192 (cited in note 39).

more substantial the damage measure ought to be. Substantial damages induce ex ante search, which is a good result when search is cheap and productive. If the infringement occurred in an area in which the patent landscape is barren, where it is easy to identify potential conflicting claims, and where infringement is therefore obvious or blatant—and presumptively deliberate—damages may well be bolstered. There is no risk that high damages would lead to excessively costly search, because search is cheap. If, instead, infringement occurred in a crowded patent environment, or where many registered patents are likely to be invalidated, where innovative claims vary subtly and incrementally, and where infringement is often a close call, damages multipliers run the risk of inducing search that is too costly. This is a version of the chilling effect of patent thickets, but here the distortion is not in chilling innovation altogether, but rather in inducing excessive precaution in prior search.

The social objective to reduce excessive ex ante search has various implications, not all immediately relevant to the present context. For example, it may yield a useful distinction between infringers who compete with the rightholders versus those who develop a new product or market.[42] The former are more likely to be aware of potentially infringed rights—those embedded in the existing, competed-against products—and should find it relatively easy to search for existing rights. Or this framework suggests that developers of products that implicate numerous existing patents, for whom it is costly to identify all potential conflicting claims, should face lower liability.[43]

It does not appear, though, that the excessive search concern can justify different treatment of infringers who exceeded and breached their licenses. Within the population of infringers, those who also happen to be licensees and who breached the scope of their licenses

---

42 For a related argument that injunctions should be uniquely available to commercializing patentees, see Benjamin H. Diessel, Note, *Trolling for Trolls: The Pitfalls of the Emerging Market Competition Requirement for Permanent Injunctions in Patent Cases Post-*eBay, 106 Mich L Rev 305, 333–44 (2007).

43 See Mark A. Lemley, *Distinguishing Lost Profits from Reasonable Royalties*, 51 Wm & Mary L Rev 655, 671 (2009); Mark A. Lemley and Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 Tex L Rev 1991, 2035–40 (2007). Notice that this rationale for differentiating the remedies available to commercializing versus noncommercializing patentees is different from the one invoked by courts and commentators in the aftermath of the Supreme Court's decision in *eBay Inc v MercExchange, LLC*, 547 US 388 (2006) (adopting a four-factor test for determining whether to grant injunctive relief in patent infringement suits). There, the concern was with granting injunctions in favor of nonpracticing patentees. Injunctions would enable them to expropriate a greater chunk of the surplus generated by their licensees. See, for example, Richard A. Epstein, *The Disintegration of Intellectual Property? A Classical Liberal Response to a Premature Obituary*, 62 Stan L Rev 455, 485–95 (2010). Here, in contrast, the concern is that a higher liability burden would divert parties to choose voluntary transactions too often, even when it is the costlier, inefficient mode of transfer.

are systematically more likely to know and anticipate the conflicting rights. A licensee is one who already identified the rightholder, acknowledged the rightholder's valid claim, and completed any necessary search of the scope of the right. If this licensee now engages in an unlicensed use, it is *not* because he was unaware of the conflicting right nor because verifying this right was too costly. A distributor who breaches the license by making an unauthorized use does not need to undertake costly search to know that he is crossing a boundary. Thus, the law that uniquely exempts the breaching licensee from supercompensatory damages is inconsistent with the search rationale.

C. Incentives to Negotiate a License

A canonical rationale for supercompensatory remedies is the incentive they create for consensual transfers. To avoid the harsh sanction, so goes the argument, a potential violator would contract for the right—would negotiate and secure a paid-for license.[44] When the costs of negotiating a license are lower than the cost of dispute resolution, such incentive is desirable.

Unfortunately, this perspective does not explain the remedial rules for unlicensed use. Specifically, it does not explain why already-licensed parties who exceed the scope of their licenses and commit unauthorized uses sometimes face a *smaller* expected remedy relative to infringers who never had any license in the first place. Licensees are parties who have greater proximity to the rightholders. They know who the rightholder is, and they have contracted successfully before, suggesting that transaction costs are not prohibitive. On the other hand, infringers who are strangers and are not licensees may find it costly to contract with the rightholders. Thus, the idea that parties should face stiff remedies so that they will be induced to negotiate and transact is more powerful and desirable when such parties are likely to have low transaction costs. It would imply that licensees ought to face harsher remedies for unlicensed use than the ones strangers face—the opposite of what the law does.

Still, it may be argued that while transaction costs are higher for stranger cases, adjudication costs are also higher. Courts could have greater difficulty determining the appropriate remedy in stranger cases, relative to cases in which a prior license exists. When a license already exists, there may be some metric for ascertaining the value of the right to the owner and the licensee, as well as their relative bargaining strengths. The difficulty courts continue to face when

44 See, for example, Roger D. Blair and Thomas F. Cotter, *An Economic Analysis of Damages Rules in Intellectual Property Law*, 39 Wm & Mary L Rev 1585, 1632 (1998).

assessing infringement-by-strangers remedies further suggests that it would be desirable to induce parties to transact by threatening them with high damages. I am skeptical, however, whether this explanation can account for the doctrinal technique by which licensees receive more lenient treatment. Recall that *exclusive* licensees face lower damages relative to *nonexclusive* licensees.[45] When there are many licensees, it is easier to quantify damages by reference to the thicker market. Thus, if assessment errors were the underlying reason for using stiff remedies, then they would be used *less* often in cases of nonexclusive licenses.

III. Breach or Infringement?

Why do some violations by the licensee constitute breach while others constitute infringement? What is the principle determining which is which? I argue in this Part that the existing legal rules searching for the line to draw between breach and infringement are methodologically misguided. There is no natural, technical boundary between the two that can be identified by invoking principles of contract and property—there is no "subject matter" or "aroma" of copyright—nor can the problem be resolved by reliance on abstract contract interpretation canons.

Instead, the line between breach and infringement has to come from a more basic inquiry: What is the best way to protect an owner's entitlement? Breach or infringement is not the test but rather the *conclusion*—the label we should affix to the result of an analysis of optimal remedies. Characterizing a violation as an infringement usually means that the remedy is augmented, to deter such violation in the first place. In contrast, characterizing a violation as breach of contract usually means that the remedy merely acts as a price, giving the violator an option to breach and pay damages. Sometimes the law wants to deter one-sided taking of the entitlement to preserve the owner's privilege to choose its counterpart. Other times the law merely prices the entitlement and gives the violator a call option.

There is by now a mature literature studying the choice between the two vehicles of entitlement protection—the familiar division between property rules and liability rules, prices and sanctions, markets and involuntary takings, and the like. Breach versus infringement is yet another manifestation of this fundamental divide. Within this methodology, the challenge is to determine when the presence of a

45 See text accompanying notes 8–10.

contract—an IP license—changes the owner's protection from a property rule to a liability rule, and when it does not.

A. Should All Violations Be "Breach"?

We can begin by asking why all violations do not constitute "breach." Why not apply a simple rule that, once a license is entered into, all violations are breach, such that the licensee can never commit infringements? Any unlicensed use by a licensee would involve contract damages and nothing more. The licensed paperback publisher, for example, would only be in breach—not infringement—regardless of the nature of his violation, be it a wrongfully timed distribution of the copies, or publication of unlicensed media, or the outrageous rewriting of the ending of the story. The magnitude of damages might vary according to the gravity of the breach, but in either case they would follow the standard contract measure equal to the owner's lost profits.

This rule would constitute a call option granted to the licensee to take any element of the entitlement and pay for it. It would make licenses "chunkier"—getting a license would now amount to getting a bundle of call options on other rights, which nonlicensed parties do not have. For one, such chunky licenses would become more expensive. More importantly, though, this chunky license regime is objectionable for the same reasons that a universal call option regime is objectionable in any other context involving strangers. Strangers do not have call options over the IP entitlements of owners, or over any other property rights.

Why? We can say that a system of options—either to buy or to sell without the consent of the counterparty—subjects people to disruption of their freedom to privately allocate their resources. Even if the strike price of the call option—the compensation to be paid to the owner—is correctly assessed, and even if the result is consistent with ex post efficiency, namely, more efficient users of the property end up owning it, there are good reasons to object to transfers based on call options. The idea that people want to determine the allocation of their private resources and want to choose their licensed counterparties can be based on what some refer to as "autonomy," but it may also be grounded in familiar economic reasoning. The ability to choose the identity of the buyer-transferee enables an owner to make valuable determinations that would be forfeited if the owner were subjected to call options. Listed below are some values that would be affected by the identity of the transferee.

Timing. First, an owner wants to determine the privately desirable timing for the transfer, rather than have that dictated by the taker. This is particularly valuable in a market with volatile prices, or when there are tax consequences to the realized transaction. For example, ownership of a financial security is often nothing more than a right to select the timing to buy and sell. The value of assets stripped of the timing prerogative could decline substantially and participation in these markets would diminish.

Asset mix. Second, an owner wants to fit together the desired portfolio of diverse assets so as to balance risks and returns. Substituting an asset for cash would change the character of the portfolio and its exposure to risk, and it could affect the value of holding onto other assets in ways that are difficult to assess or compensate. Moreover, assets are assembled to complement each other and attain extra value within the assemblage. A collector of art, for example, would lose more than the market value of a painting that singularly complemented the entire collection.

Valuable relationships. Third, an owner may want to choose the identity of the transferee to generate additional business and to bolster investments in relationships. The sale may be but one element of an ongoing enterprise, and it is the value of this enterprise that is at stake. For example, selling land adjacent to one's home involves choosing one's neighbor, which could be quite valuable. Or the right to choose a patent licensee could lead to a symbiosis with the licensed entity, affecting the value of the end product.

Continued stake in the asset. Fourth, owners may care who owns the asset or some rights in it because they continue to have a property stake in it. A hotel proprietor, for example, wants to control who occupies any single room because each tenant's behavior can affect the value that can be derived from other parts of the property. Or a franchisor wants to control the use of the business trademark because the licensee's use of it affects its value to other franchisees and to the business as a whole.

There are surely more economic reasons why an owner would want to control the transfer of property. The owner may have prior conflicting commitments and contracts regarding the use of the property; or the owner may desire to punish some poor-behaving individuals and past violators by excluding them from the property (reputation sanctions would not work if ostracized parties can break the boycott by exercising call options); or the owner may want to freeze the asset in order to increase demand and market price for other assets he owns; and, of course, an owner may attach idiosyncratic value to the property—for example, "keep it in the family"—that cannot be accurately assessed in damages.

Subjecting owners to call options would lead to these losses, but it could also lead to another effect: owners taking measures to prevent the taking of their property—building "fences." If you can move into my home without my consent, my right to recover compensatory damages may not dissuade me from installing preventive measures: locks, fences, dogs, and the like. If you can use my IP without my consent, I will install digital locks and access restrictions, design products that create less exposure to such unilateral takings, or try to bribe you to cease. These wasteful activities are spared if the remedy operates to deter the encroacher from one-sided action. This is the same reason why people commonly object to the other type of options—“put” options that enable sellers to impose unsolicited sales upon buyers. Think of all the spam emails and junk offers that consumers receive. They are enough of a nuisance that “do not call” mechanisms needed to be devised.[46] But if sellers had put options—if they were allowed to deliver the product without the buyers’ saying yes and charge the buyers a legally set price—people would have to be constantly on guard to dodge these unsolicited sales and avoid getting stuck with the wrong set of benefits.

Nevertheless, we know that call options are used occasionally in situations in which these considerations are not present. The most prominent application of call options is damages for breach of contract: the contractual entitlement can be taken for a price—expectation damages.[47] But not all breaches: some are subject to the call option regime, others not. A mail carrier who fails to deliver a package containing a spare mill shaft in time, or who loses it, would have to pay expectation damages to the client.[48] But a carrier who opens the package, appropriates the shaft, and uses it for profit (for example, sells it to another mill) would be subject to harsher remedies, including disgorgement of profit,[49] intended to deter rather than price the infraction. The two breaches are different because only the latter gives rise to the set of concerns that underlie the owner’s right to choose. The client already decided to ship the shaft and already chose the carrier to perform the shipping, but he did not yet choose whether to sell the shaft and to whom. If the carriage delivery promise is broken, the client’s only loss is the direct advantage he anticipated. If, on the other hand, the package were to be sold by the carrier without permission, the client would suffer additional losses. He might prefer to sell it by himself and find a higher valuing buyer; or he might bear an unwanted or uninsured risk by the premature sale; or other assets of the client would lose value—the mill might be worthless, his client relationships

46 See Michael E. Shannon, Note, *Combatting Unsolicited Sales Calls: The “Do-Not-Call” Approach to Solving the Telemarketing Problem*, 27 J Legis 381, 382 (2001).

47 See Ian Ayres, *Optional Law: The Structure of Legal Entitlements* 96–98 (Chicago 2005) (“The promisor can ‘take’ by breaching the contract, but only if he or she pays damages.”).

48 See *Hadley v Baxendale*, 156 Eng Rep 145 (Ex 1854).

49 Restatement (Third) of Restitution § 39 (2005).

might suffer; or other commercial investments the client made may be squandered. The consequences from the sale of the shaft are ones that the client has not yet elected or anticipated. Forcing them on him would bring about the inefficient effects of call options.

B. Distinguishing Breach and Infringement

This account sheds some light on the dividing line between the different violations of an IP license. Return to the paperback-edition publisher. His premature distribution of copies is a costly breach, but it does not implicate the owner's right to choose or any of the costs of unwanted call options. The owner already decided to carve out this right and alienate it, and he chose this publisher to run the paperback business. True, the owner's interest in synchronizing the paperback license with other licenses—here, hardcover distribution—was partially thwarted by the unfulfilled promise. But the loss is pecuniary, and it is fully compensable by expectation damages. And, importantly, the potential occurrence of such breach would not drive the owner to take preventive measures—to build virtual fences.

On the other hand, if the paperback publisher were to violate the owner's entitlement by, say, rewriting the book's ending, or by distributing the work in other media, then the author-owner's other concerns would be implicated. Even if the owner does not suffer any immediate pecuniary loss of sales (the revised ending may generate increased sales!), he may lose some potential value of the creation. He may have planned a sequel based on the original plot; or he prefers to license other media distribution to other parties, more suitable to advance some goals or investments of the owner; or an aesthetic value has been compromised; his reputation may be affected, not to mention his moral rights. If a licensee had the privilege to commit any violation and be subject only to contract damages, then owners would lose the ability to carve out different rights to different parties. Once the first license was given, the licensee would have a chunky call option on all additional rights. The potential benefits from partitioning different rights to different licensees, from creating numerous licensing relationships, and from harnessing a diverse portfolio of specializations would be squandered.

Further, an owner who can only get lost profits as a result of this type of violation would likely take self-help measures to prevent such takings. He would self-publish, or license the publication only to trustworthy and reputable publishers (forgoing discounts offered by entrants), or use content dissemination media that cannot be altered, or alter the timing of the various distribution modes, or charge higher prices.

Thus, for the same reasons that strangers should not have call options on owners' IP rights, licensees too should not have the option to take rights that go beyond what they acquired through the license—

rights that the owners would want to license separately. In fact, there is a reason to treat violations by licensees even more harshly than violations by strangers. Stiff penalties for nonconsensual takings would induce violators to negotiate the additional use right with the owner. When there is already a preexisting narrower license, this incentive to negotiate is desirable because transaction costs are comparatively low. By virtue of having negotiated the original license, the parties are known to be able to reach agreement; they have identified each other and can overcome contracting hurdles.

One way to identify the optimal reach of call options is to mimic the lines parties draw through the use of liquidated damages. When the violator is intended to have a call option, we often find that parties include a liquidated damages clause in their license contracts to account for this option.[50] Many contracts contain definitions of material breach and assign a damages figure. Timely performance is one of the more common triggers of liquidated damages and "late fees." In fact, courts correctly interpret the presence of a contracted-for remedy scheme as an indication that the violation to which this scheme applies is merely breach, not infringement.[51] That is, anticipating that such behavior might occur, the parties stipulated the remedial consequence and did not deem it necessary to take any other precaution against it. A law that assesses expectation damages for these offenses merely mimics what many parties already do.

But parties do not write liquidated damage clauses to deal with the distributor's change of book content, because they do not want to set a price for such behavior: they want to eliminate it. They may take some precautions against such violations (for example, by checking the publisher's page proofs). But, mostly, they rely on the law to deter them altogether.

CONCLUSION

This Article identified two distortions that emerge from the unclear boundaries between legal rules. The first fuzzy boundary is between breach and infringement. Two courses of conduct that are almost identical in circumstances could lead to dramatically different remedial consequences by being classified differently, one as breach of contract and the other as infringement of a property right. The second fuzzy boundary is between an ex post versus an ex ante measure of damages. As information about the loss emerges, there are different ways

---

50 See, for example, *Monsanto Co v McFarling*, 363 F3d 1336, 1339 (Fed Cir 2004).

51 See *Sun Microsystems, Inc v Microsoft Corp*, 81 F Supp 2d 1026, 1032 (ND Cal 2000).

to calculate it. But, it turns out, the probabilistic nature of the loss creates a portfolio of remedies that overcompensate rightholders.

These problems are not unique to remedies for unlicensed use. The contract–property boundary is a fundamental design feature in private law. For example, the law applying to physical neighbors, and specifically the law that assesses recovery for breach of neighbors' rights, has to make subtle choices between contractual and disgorgement measures, between cost-based and benefit-based measures. Or the law of precontract, applying to parties who entered a negotiation, searches for sanctions that walk a delicate line between contract and property, between harm and benefit.

Likewise, the problematic interface between ex post and ex ante measures of recovery is a general problem that comes up often, anytime the law has to assess recovery for a probabilistic harm or benefit. Actions that appear identical ex ante may—like lottery tickets or insurance policies—have different ex post valuations. The analysis in this Article focused on the stochastic value of IP rights, but it can shed similar light on remedies for other probabilistic entitlements: investments in improving others' property or in insuring it, appropriation of chances, assessment of unrealized value, and the like. In various areas, the law of remedies allows parties to choose among several recovery measures, effectively granting them supercompensation.