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Enhanced Damages for Patent Infringement: A Normative Approach

Keith N. Hylton*

August 2016

Abstract: In *Halo Electronics v. Pulse Electronics* the Supreme Court granted greater discretion to lower courts to enhance damages for patent infringement. This paper takes a normative approach to patent infringement damages. Its underlying premise is that the goal of a damages regime should be to maximize society's welfare. Patent damages should therefore balance society's interest in encouraging innovation against the need to regulate infringement incentives. Although the analysis here is mostly normative and draws heavily on the economic theory of penalties, the aim of this paper is to provide a set of practical guidelines courts can follow in explaining, justifying, and developing rules to structure the discretion that *Halo* has returned to them.

Keywords: patent infringement, enhanced damages, optimal patent infringement damages, loss internalization, gain elimination, damages multiplier, Halo Electronics

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In *Octane Fitness v. Icon Health*,¹ the Supreme Court overturned a highly restrictive rule adopted by the Federal Circuit governing the award of attorney's fees in patent infringement litigation. To justify an award of attorney's fees, the Federal Circuit had required a finding of (1) an objectively baseless lawsuit (2) brought in bad faith.² The new standard established in *Octane* gives discretion to courts to award attorney's fees in cases that seem exceptional based on the facts or the law.³

The question immediately generated by *Octane* was whether the move toward greater discretion over fee awards would be extended to the matter of enhanced damages for patent infringement. Section 284 of the Patent Act permits courts to increase damages up to three times the patentee's loss.⁴ As in the case of attorney's fees, the Federal Circuit had adopted a highly restrictive standard for enhanced damages.⁵ *Octane* encouraged litigants to challenge the Federal Circuit's interpretation of the enhancement provision of Section 284. Two patentees, Halo Electronics and Stryker Corporation, responded to the encouragement by filing certiorari petitions in the Supreme Court seeking to overturn the Federal Circuit's standard on enhanced damages and put in its place a standard providing greater discretion to courts on the matter.⁶ The Supreme Court responded on June 13, 2016, in *Halo Electronics v. Pulse Electronics*,⁷ siding with the patentees. The new standard established in *Halo* grants discretion to courts to enhance damages within guidelines suggested by "nearly two centuries of application and interpretation of the Patent Act."⁸

This paper takes a normative approach to patent infringement damages. Its underlying premise is that the goal of a damages regime should be to maximize society's welfare. Patent damages should therefore balance society's interest in encouraging innovation against the need to regulate infringement incentives. This balancing approach generates an optimal standard for awarding enhanced damages and guidelines for determining the size of the damages multiplier. On the legal standard, the approach developed here illuminates the factors that should be taken into consideration in the enhancement analysis, and, more importantly, the reasons those factors should be considered. On the precise size of the multiplier, this approach suggests principles that both justify and constrain the multiplier: (1) the elimination of gains from willful infringement, (2) the multiplication of damages for covert infringement, and (3) the social interest in enhancing damages where the ratio of the social to the private benefit from the patent is high.

¹ 134 S. Ct. 1749 (2014).

² *Id.* at 1752 (citing *Brooks Furniture Mfg., Inc. v. Dutailier Int'l, Inc.*, 393 F.3d 1378 (2005)).

³ *Id.* at 1756.

⁴ Patent Act of 1952, 35 U.S.C. § 284 (2011).

⁵ *In re Seagate Tech., LLC*, 497 F.3d 1360 (Fed. Cir. 2007) (en banc).

⁶ *Stryker Corp. v. Zimmer, Inc.*, 782 F.3d 649 (Fed. Cir. 2015), *cert. granted*, 136 S. Ct. 356 (2015); *Halo Elecs., Inc. v. Pulse Elecs., Inc.*, 769 F.3d 1371 (Fed. Cir. 2014), *cert. granted*, 136 S. Ct. 356 (2015).

⁷ No. 14-1513, 2016 U.S. LEXIS 3776 (U.S. June 13, 2016).

⁸ *Id.* at *24.

Although the analysis here is mostly normative and draws heavily on the economic theory of penalties,⁹ the aim of this paper is to provide a set of practical guidelines courts can follow in explaining, justifying, and developing rules to structure the discretion that *Halo* has returned to them. *Halo* provides an opportunity for courts to integrate deterrence policy more closely with the rules governing the enhancement of damages for patent infringement.

I. Legal Background

On the question of enhanced damages, the relevant portion of the Patent Act, Section 284, is rather sparse. It says that

When damages are not found by a jury, the court shall assess them. In either event the court may increase the damages up to three times the amount found or assessed.¹⁰

A quick glance at these words should leave a reader with the impression that they were intended to grant courts discretion over enhanced damages, up to the limit of trebling. In spite of the seemingly high degree of discretion granted by Section 284, the Federal Circuit erected a set of significant restrictions on the discretion of courts to enhance damages in *Seagate*, which required a threshold finding of an objectively high likelihood of infringement coupled with subjective bad faith.¹¹ A finding of subjective bad faith would be appropriate only where the defendant either knew or should have known of the high likelihood of infringement.¹² Only after establishing the objective and subjective components required by *Seagate* could a court consider the traditional “totality of the circumstances” factors used to determine the degree of enhancement.¹³ In addition, the Federal Circuit had adopted a *de novo* standard of review for the objective portion of the *Seagate* test.¹⁴

⁹ Gary S. Becker, *Crime and Punishment: An Economic Approach*, 76 J. Pol. Econ. 169 (1968); Richard A. Posner, *An Economic Theory of the Criminal Law*, 85 Columbia L. Rev. 1193 (1985); Keith Hylton, *Theory of Penalties and Economics of Criminal Law*, 1 Rev. L. & Econ. 175 (2005); Keith N. Hylton & Haizhen Lin, *Innovation and Optimal Punishment, with Antitrust Applications*, 10 Comp. Law & Econ. 1 (2014).

¹⁰ Patent Act of 1952, 35 U.S.C. § 284 (2011).

¹¹ *Id.* at 1371. Only after such a finding may a court consider the traditional “totality of the circumstances” factors used to determine whether enhancement was appropriate. The Federal Circuit’s standard appears to focus on the probability of infringement, viewed both objectively and subjectively. *See, e.g.*, *Bard Peripheral Vascular, Inc. v. W.L. Gore & Assocs., Inc.*, 682 F.3d 1003, 1005 (Fed. Cir. 2012); *Powell v. Home Depot U.S.A., Inc.*, 633 F.3d 1221, 1236 (Fed. Cir. 2011); *Seagate*, 497 F.3d at 1371. The requirement of an objectively high likelihood implies that the facts and law should, to a reasonable person, point to a conclusion that it was far more likely than not that infringement occurred. The additional requirement of subjectively bad faith implies that the facts must indicate that it was far more likely than not that the infringing party knew that he was infringing the patent – that his own subjective prediction of the likelihood of infringement was nearly the same as the objective probability.

¹² *Id.*

¹³ *Reid Corp. v Portec, Inc.*, 970 F.2d 816, 826-827 (Fed. Cir. 1992) (“[T]he paramount determination in deciding to grant enhancement . . . is the egregiousness of the defendant’s conduct based on all the facts and circumstances.”).

¹⁴ *Bard*, 682 F.3d at 1005.

The Supreme Court held in *Halo* that the Federal Circuit’s approach reflected an erroneous interpretation of Section 284.¹⁵ The new standard of *Halo* discards the threshold test focusing on the probability of infringement, and in its place adopts a flexible standard that takes into account other variables.¹⁶

This paper is not an effort to reexamine the statutory interpretation question, at least not directly. It focuses on the normative questions of the appropriate standard for enhanced damages and the appropriate range for enhanced damages.

II. Normative Question

How should patent damages be determined? What goals should a damages award for patent infringement seek to secure? In trying to answer these questions I will start by ignoring the distinction between compensatory and punitive damages and consider the question of optimal damages generally. An optimal damages award may be greater or less than the compensatory level.¹⁷

The question of optimal damages has been examined in greatest depth in the torts context.¹⁸ Analyses of optimal damages have been prominent in the modern law and economics literature, but the question of optimal damages has been examined less directly in writings as far back as Bentham.¹⁹

A. Damages Theory

The optimal damages literature has distinguished two general types of damages awards. One is *loss-internalizing* damages, the other is *gain-eliminating* damages.²⁰ In this part, I will review these theories of damages and suggest applications to patent infringement litigation. The torts literature on which I rely typically examines damages awards in the context of a lawsuit between

¹⁵ See *Halo*, 2016 U.S. LEXIS 3776, at *19.

¹⁶ *Id.* at *19 (“As with any exercise of discretion, courts should continue to take into account the particular circumstances of each case in deciding whether to award damages, and in what amount. Section 284 permits district courts to exercise their discretion in a manner free from the inelastic constraints of the Seagate test.”).

¹⁷ Keith N. Hylton, *Punitive Damages and the Economic Theory of Penalties*, 87 *Geo. L. J.* 421, 424-439 (1998)

¹⁸ See, e.g., Guido Calabresi and A. Douglas Melamed, *Property Rules, Liability Rules and Inalienability: One View of the Cathedral*, 85 *HARV. L. REV.* 1089 (1972); WILLIAM M. LANDES & RICHARD A. POSNER, *THE ECONOMIC STRUCTURE OF TORT LAW* 58-62 (1987); David D. Haddock, Fred S. McChesney & Menahem Spiegel, *An Ordinary Economic Rationale for Extraordinary Legal Sanctions*, 78 *CAL. L. REV.* 1, 8 (1990); Hylton, *supra* note 17; A. Mitchell Polinsky & Steven Shavell, *Punitive Damages: An Economic Analysis*, 111 *HARV. L. REV.* 869, 878-896 (1998).

¹⁹ JEREMY BENTHAM, *AN INTRODUCTION TO THE PRINCIPLES OF MORALS AND LEGISLATION* (H. Frowde ed., Clarendon Press 1907) (1781).

²⁰ Hylton, *supra* note 17, at 421.

a victim and an “injurer.”²¹ Here, I will refer to a lawsuit between a victim and an infringer. Also, I use the term infringement here in its most general sense to refer to any infringement of a legal right – whether an ordinary tort or case of patent infringement. In spite of this general definition, I will use examples mostly from patent infringement to illustrate the arguments.

1. Loss Internalization

Under the loss internalization approach, the damages award should seek to internalize to the infringing party the total social loss generated by the infringement.²² Thus, if the infringement has injured more than one person, and if there will be only one damages award issued for the infringement, the damages award should force the infringer to pay a sum that internalizes the losses of all of the victims. Internalization implies that the infringer will anticipate ex ante incurring the entire loss to society as if it were his own.

The simplest case representing the internalization function of damages is that of a single infringer and single victim. To keep matters simple at the outset, I assume that the loss suffered by the single victim constitutes the entire social loss associated with the infringement of that victim’s right. The infringer must decide whether to take care to avoid the infringement. Taking care is costly. Intentional injuries are simply a special case of this model where the cost of taking care represents the forgone gain from the intentionally injurious act. Thus, if the infringer does not anticipate having to pay damages to the victim, he will not take care. Moreover, optimal internalization would encourage the infringer to take care whenever it is socially desirable for him to do so.²³ Under the standard economic approach, care is socially desirable whenever the ex ante total costs to society are smaller when the infringer takes care than when he does not take care.²⁴

Consider a simple example. Suppose the cost of taking care (for the infringer) to avoid infringement is \$20. If the infringer takes care, the probability of infringement occurring will be .25. If the infringer does not take care, the probability of infringement occurring will be .75. In addition, let the harm from infringement be \$100. Taking care is socially desirable under these assumptions because the cost of care is less than the incremental social harm from failing to do

²¹ E.g. STEVEN SHAVELL, *ECONOMIC ANALYSIS OF ACCIDENT LAW* 5 (1987).

²² *Id.*; Catherine M. Sharkey, *Punitive Damages as Societal Damages*, 113 *YALE L.J.* 347, 365 (2003) (“The goal is to force tortfeasors, and others similarly situated, to internalize harms to society caused by their conduct.”); See Polinsky & Shavell, *supra* note 18, at 878.

²³ Polinsky & Shavell, *supra* note 18, at 879 (“If damages equal harm, potential injurers will in theory have socially correct incentives to take precautions. Specifically, they will be induced to spend money on precautions if the expenditure is socially worthwhile in the sense that the expenditure reduces the harm by a greater amount.”).

²⁴ See Keith N. Hylton, *Duty in Tort Law: An Economic Approach*, 75 *FORDHAM L. REV.* 1501, 1503 (2006) (“If the cost of taking care is less than the expected injury costs that could be avoided by taking care, the actor should be encouraged to take care in order to reduce overall social costs.”); see also Richard Posner, *A Theory of Negligence*, 1 *J. LEGAL STUD.* 29, 33 (1972).

so: $\$20 < (.75 - .25)(\$100)$. On the other hand, suppose the cost of taking care is \$60 instead of \$20. In this case, since $\$60 > \50 , it is not socially desirable for the infringer to take care.

A damages award set at full compensation will induce the infringer to take care ex ante whenever it is socially desirable for him to do so. Thus, if the damages award is set equal to the victim's loss, an infringer for whom the cost of taking care is \$20 (low-cost infringer) will take care, while an infringer for whom the cost of taking care is \$60 (high-cost infringer) will not take care. A full compensation damages award in this case fully internalizes society's losses to the infringer, and therefore generates socially desirable care on the part of the infringer.

Now consider a case where there is more than one victim. Whenever the infringer causes harm, he imposes a loss of \$100 each on two victims. To bring the example within the realm of patent law, suppose one victim is the patentee and the other victim is a licensee or retailer of the patentee's product.²⁵ Now it would be desirable for the low-cost infringer to take care (since $\$20 < \$100 = (.75-.25)(\$200)$) and also for the high-cost infringer to take care (since $\$60 < \100). If only the patentee can sue for infringement, then the damages award of \$100 would be insufficient to generate socially optimal care. The optimal damages award for this scenario would require an enhancement of the damages award by a multiplier of two.

Next, consider a case of covert or concealed infringement. While many instances of infringement are open and obvious, some instances may be difficult to discover. For example, the infringing technology may be buried deep within a complicated product, such as an automobile, and therefore likely to be discovered only through luck or a careful search.²⁶ Suppose that when the infringer injures the patentee, the patentee will discover the identity of the infringer, or indeed the infringement itself, with a probability of only 20 percent. Again it is socially desirable for the low-cost infringer – that is, the infringer whose cost of taking is only \$20 – to take care. But the low-cost infringer will not take care in this case because $\$20 > (.75-.25)(.2)(\$100) = \$10$. To fully internalize ex ante the loss caused by the infringer, the court will

²⁵ *Indep. Wireless Tel. Co. v. Radio Corp. of America*, 269 U.S. 459, 466 (1926) (“It is urged on behalf of the respondent that in equity the real party in interest, the exclusive licensee whose contract rights are being trespassed upon by the infringer, should be able without the presence of the owner of the patent to obtain an injunction and damages directly against the infringer. We recognize that there is a tendency in courts of equity to enjoin the violation of contract rights which are invaded by strangers in a direct action by the party injured, instead of compelling a roundabout resort to a remedy through the covenant, express or implied, of the other contracting party. But such a short cut, however desirable, is not possible in a case like this.”); *Mosaid Tech., Inc. v. Freescale Semiconductor, Inc.*, 2013 WL 1819769 (E.D. Tex. Apr. 29, 2013) (dismissing a patent infringement claim brought by an exclusive licensee for lack of standing); *Aspex Eyewear, Inc. v. Miracle Optics, Inc.*, 434 F.3d 1336 (Fed. Cir. 2006); *Intellectual Prop. Dev., Inc. v. TCI Cablevision of Cal., Inc.*, 248 F.3d 1333 (Fed. Cir. 2001).

²⁶ *See Intamin Ltd. v. Magnetar Technologies, Corp.*, 483 F.3d 1328, 1338 (Fed. Cir. 2007) (patented magnetic braking system for amusement park rides could not be ascertained by a simple visual inspection); *Antonious v. Spalding & Evenflo Companies, Inc.*, 275 F.3d 1066, 1070 (Fed. Cir. 2002) (patentee purchased and dissected a golf club head to discover potential infringement of patent directed to an improved perimeter weighting structure for metal golf club heads.); *Judin v. U.S.*, 110 F.3d. 780, 782 (Fed. Cir. 1997) (difficult to determine whether accused optical communications device infringed patent without reverse-engineering the accused device); Ashraf Zahr, *Levels of “Reasonable Inquiry” In Electronics Patent Cases*, Law 360 (June 5, 2014, 10:20 AM), <http://www.law360.com/articles/536202/levels-of-reasonable-inquiry-in-electronics-patent-cases> (finding that the some electronic devices may contain infringing software that cannot be analyzed because the source code is unavailable; some may contain indiscernible components due to their size).

have to enhance damages by multiplying the compensatory award by a factor of 5. Generally, if a court awards full compensation damages in a setting where some infringers may escape identification, infringers will fail to take socially desirable care.²⁷

Summing up the foregoing, in the standard case where there is only a single infringement victim and the identity of the infringer easy to determine, full compensation awards are sufficient to internalize the social losses resulting from infringement. However, when there are multiple victims or when the identity of the infringer is difficult to determine, the full compensation award is insufficient to internalize ex ante the social loss from infringement, and as a result generates less than socially desirable care on the part of infringers. In these instances, compensatory damages should be multiplied to approach the optimal level of deterrence.

The examples considered so far involve measurable losses suffered by identifiable victims. But these assumed circumstances may not describe every real world case of infringement. Suppose, for example, that the infringement imposes some losses that are difficult to measure.²⁸ Many commentators have noted that lost profits from patent infringement are often difficult to determine.²⁹ Alternatively, suppose the victim has suffered measurable losses that are disallowed by the legal system. For example, in the patent infringement context, patentees generally cannot recover foreign lost profits in the U.S.³⁰ Yet another example would consist of losses imposed on specific victims who cannot be identified or determined – consider, for example, the problem or orphan works in copyright law.³¹ To induce socially optimal care on the part of the infringer, these types of losses should be internalized ex ante to the infringer. But they cannot be internalized by a compensatory damages award because they are not measurable or not legally compensable. The only substitute to precise measurement of losses that could

²⁷ For the general argument covering torts, see Mitchell Polinsky & Steven Shavell, *Punitive Damages: An Economic Analysis*, 111 Harv. L. Rev. 869, 888 (1998). Cf. *Kemezy v. Peters*, 79 F.3d 33, 35 (7th Cir. 1996) (“Suppose a person who goes around assaulting other people is caught only half the time. Then in comparing costs . . . of the assaults with the benefits to him, he will discount the costs . . . by 50 percent, and so in deciding whether to commit the next assault he will not be confronted by the full social cost of his activity.”).

²⁸ E.g. *Kemezy v. Peters*, 79 F.3d 33, 34 (7th Cir. 1996) (Posner, J. noting, in the general torts context, that some emotional injuries may be exceedingly difficult to measure).

²⁹ Robert S. Frank & Denise W. Defranco, *Patent Infringement Damages: A Brief Summary*, 10 Fed. Cir. B.J. 281, 281-289 (2000) (an award of lost profits requires proof of but-for causation; the patentee who cannot prove causation is entitled to a reasonable royalty award but determining such a royalty is often difficult.)

³⁰ For example, foreign lost profits due to patent infringement generally are not recoverable in the U.S. See *Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.*, 711 F.3d 1348, 1371-1372 (Fed. Cir. 2013) (holding that patentees are not entitled to compensatory damages for lost foreign sales that are allegedly foreseeable result of the domestic infringement of patents); *Microsoft Corp. v. AT & T Corp.*, 550 U.S. 437, 454-455 (2007) (“The presumption that United States law governs domestically but does not rule the world applies with particular force in patent law. The traditional understanding that our patent law operates only domestically and does not extend to foreign activities is embedded in the Patent Act itself, which provides that a patent confers exclusive rights in an invention within the United States.”); *WesternGeco LLC v. ION Geophysical Corp.*, 791 F.3d 1340, 1349 (Fed. Cir. 2015) (damages cannot be awarded for lost profits resulting from lost contracts for services to be performed abroad).

³¹ Consider, for example, orphaned intellectual property rights, the most common example of which is the orphaned copyright. An orphaned work is a work with a valid copyright but whose owners cannot be determined. See, e.g., *Authors Guild, Inc. v. HathiTrust*, 755 F.3d 87, 92 (2d Cir. 2014) (noting that the copyright holder of “orphan work” cannot be readily identified or located).

potentially induce optimal care would be the employment of a multiplier for the inadequate damages award.

I have considered losses suffered directly by victims. However, there are other losses that result from infringement. The most important “other” loss is the sapping of the incentive to innovate that occurs as a result of infringement. If a potential patentees discover that their patents can be infringed without full compensation, they will have a diminished incentive to innovate. That diminishment in the incentive to innovate causes a loss in society’s welfare, by leading to a reduction in the rate of entry of new products or technological processes to the market. To induce optimal care by the infringer, this loss should be internalized.

To better organize the conceptual categories of harm, I will follow Bentham by distinguishing categories of primary and secondary losses.³² Primary losses are losses suffered directly by identifiable victims.³³ Secondary losses are losses suffered by society generally, or by unidentifiable victims.³⁴ Consider, as an analogous case, crime. Crime victims suffer directly from each instance of crime. However, society in general suffers too as potential victims change their behavior in anticipation of the possibility of crime. This second set of losses, resulting from changes in behavior, fall in the category of secondary harms.

2. Gain Elimination

The second general category of damages consists of awards that seek to eliminate the infringer’s gain.³⁵ For this type of award, the goal is not to internalize ex ante the social loss from the infringer’s conduct, but to eliminate ex ante the prospect of gain to the infringing party. Under this approach to damages, the only data of relevance to the court would be information bearing on the infringer’s gain.³⁶ The purpose of such an award would be to completely deter the infringer by eliminating any gain from the activity of infringement.

The reason gain elimination may be necessary is that loss internalization does not necessarily deter all instances of infringement. Loss internalization deters only those instances of infringement where the gain from infringement (or the cost of avoiding infringement) is less than the incremental social loss resulting from the infringement. To return to the example considered earlier of one victim and one infringer, internalizing the loss would deter infringement by the low-cost infringer but would not deter infringement by a sufficiently high-cost infringer. The gain elimination approach would deter infringement by all infringers, whether the gain from

³² Bentham, *supra* note 19, at 152 (“[M]ischief may be frequently distinguished, as it were, into two shares or parcels: the one containing what may be called the primary mischief; the other, what may be called the secondary.”); Hylton, *supra* note 17, at 435-439.

³³ BENTHAM, *supra* note 19, at 152.

³⁴ *Id.*

³⁵ Hylton, *supra* note 17, at 421.

³⁶ See Keith N. Hylton, *A Theory of Wealth and Punitive Damages*, 17 *Widener L. J.* 927 (2008).

infringement (cost of avoiding infringement) is high or low. The gain-eliminating award would have the same effect on incentives as an injunction.

Why might it be desirable to deter infringement by *all* potential infringers no matter how high the gain from infringement? There are two reasons presented in the literature on optimal damages. One is that if the transaction cost of securing consent to an otherwise infringing act is low, then potential infringers should be encouraged by the law to seek consent.³⁷ Applying this general prescription to the patent context, if the transaction cost of obtaining a license from the patentee is low, the potential infringer should obtain a license.³⁸ The transaction cost of securing a license would be low in a setting where the boundary of the patent is clear and the burden of negotiating a license small.³⁹ In this setting, a gain-eliminating award would induce infringers to seek a license instead of infringing. Since transaction costs are low, society would prefer all infringers to seek a license rather than incur litigation and other costs associated with non-compensable losses from infringement.

Under the gain elimination approach, there may still be a need to multiply the award based on the defendant's gain.⁴⁰ If the likelihood that the infringer will be identified is less than one, then it may be necessary to multiply damages to restore the gain-eliminating threat from the damages award. For example, if the likelihood of the infringer being identified is only 20 percent, then the infringer's gain would have to be multiplied by a factor of 5 to generate an award that would eliminate the infringer's ex ante expectation of gain.

The other justification provided in the literature for the gain-eliminating award is to prevent infringements where the gain to the infringer is very likely to always be less than the incremental harm to society.⁴¹ Of course, in this special case, compensatory awards that fully incorporate the social loss would also work just as well to deter infringement. But the gain-eliminating award might still be preferable here given the risk that the compensatory award may not fully incorporate the social loss – for example, not all victims may be able to identify the infringer, or bring an action for damages, or prove their damages. It is not clear that this scenario has a broad application to patent law, given that infringement generally benefits society to some degree by increasing use or consumption of the patented technology. Still, there may be special cases where this special theory of gain elimination may be applicable. For example, in a setting where

³⁷ Calabresi & Melamed, *supra* note 18; Hylton, *supra* note 17, at 446 (“[The] costs of imposing a penalty sufficient to eliminate the offender’s gain are minimal, because if the offender’s gain exceeds the victim’s loss, the offender can arrange a consensual transaction.”).

³⁸ Paul J. Heald, *Optimal Remedies for Patent Infringement: A Transactions Cost Approach*, 45 Hous. L. Rev., 1165, 1200 (2008).

³⁹ See James Bessen & Michael J. Meurer, *The Patent Litigation Explosion*, 45 LOY. U. CHI. L.J. 401, 403 (2013) (“Patents differ from real property where the boundaries of a plot of land and the validity of a title usually can be verified at little cost and with little uncertainty. In contrast, the validity of a patent may be challenged and firms often have difficulty determining whether a technology infringes the boundaries of a patent’s claims.”).

⁴⁰ See Hylton, *supra* note 17, at 452; see also *TXO Prod. Corp. v. Alliance Res. Corp.*, 509 U.S. 443, 459-462 (1993) (holding that a punitive damages award that is over 526 times as large as the compensatory damages award is not “grossly excessive” after consideration of the relevant factors, including the defendant’s bad faith, reprehensible conduct, and potential financial gains.”).

⁴¹ See Hylton, *supra* note 17, at 460-464; Brief of Keith N. Hylton as Amicus Curiae in Support of Respondents at 15-16, *State Farm Mut. Auto. Ins. Co. v. Campbell*, 538 U.S. 408 (2003) (No. 01-1289).

perfect price discrimination generated socially efficient consumption of the patented technology, an act of infringement should be treated as purely wasteful of social resources, and therefore subjected to a penalty designed to eliminate the expectation of gain to the infringer.

3. Extending Damages Theory to Intellectual Property

To this point I have applied the basic theory of damages using the same formal structure that has been used in the torts literature. However, intellectual property arguably presents new issues that might require a different treatment of the theory than observed in the torts context.

The most important difference is the innovation concern that I described earlier within the category of secondary costs. In theory, secondary costs may be observed in almost any setting where victims are injured – because the risk of incurring an injury that will not be compensated in full may affect the behavior of potential victims. Given this, one could argue that damages awards should always be enhanced to take secondary costs into account.

However, intellectual property appears to be distinguishable from general torts because of the importance of costly investment in innovation. For investments that are induced by the promise of intellectual property protection, the loss of such protection would alter investment behavior significantly. This is different from the torts setting because few potential victims in the torts context make investments conditional on the guarantee of compensation from the tort system. For example, expenditure on health care can be viewed as a common type of investment. Few people, however, would change their decisions about seeking medical care if told that the tort system might not compensate them for a specific tortious injury that might occur in the future.

The presence of substantial and concentrated secondary costs – i.e., costs of numerous and unidentifiable victims – provides a special justification, in addition to the justifications from the torts literature canvassed earlier, for enhancing damages in the intellectual property setting. As is true of all cases of secondary costs, the precise level would be difficult to estimate.⁴² However, a general policy of doubling or trebling damages might be preferable to simply awarding full compensation damages.

The secondary costs category should be expanded further to include social benefits (the negative of costs) from infringing activity. Although infringement is often looked upon as bad conduct within intellectual property law circles, it provides a benefit to society. The infringer enhances society's welfare by providing a cheaper version of a patented good to society. This is no different in general than a rival entering and offering a substitute product at a much lower price than an incumbent monopolist. In the general case of rival entry, we encourage the entry and applaud its effects on consumer welfare.

⁴² Hylton, *supra* note 17, at 439 (“In many instances, we can neither observe offender gains nor accurately estimate social losses.”).

The social gain from infringement is therefore a benefit from the infringing activity which can be set against the loss to innovation incentives. If the gain from infringement were always greater than the losses from destroying innovation incentives, then there would be no case for enhancement of damages – indeed, damage awards should then be reduced below full compensation.

B. Determinants of Optimal Damages

So far I have presented the general case for enhancing damages based on the internalization principle and on the complete deterrence principle. I have not considered the form an optimal damages multiplier should take. This is a different concern from justifying enhancement because the specific form of or algorithm for determining an optimal award in the patent infringement context will depend on the need to balance incentives for innovation and incentives for infringement.

The first consideration that should go into an assessment of the optimal damages award is the social value of the patented innovation. This is an important factor distinguishing the damages assessment in intellectual property from the ordinary torts setting. In the ordinary torts setting, the social loss from failing to protect an individual from harm is generally captured by the loss to the individual. If a driver negligently kills someone who contributes \$1 million each year to support a family, the net present value of that stream of income support is taken as a measure of the loss *to society* resulting from the driver's negligence.

In the intellectual property context, however, the value of the patent that has been infringed is not a measure of the social value of the patent. The social value of the patent is the sum of the expected social welfare surplus generated by the patent less the costs of litigation and taking care to avoid infringement. The expected welfare surplus is the sum of the expected welfare surplus over the scenarios where infringement occurs and where it does not occur. If infringement reduces the incentive to innovate, it reduces social welfare by the extent of the patent's social value, not by the extent of the patent's private value. Further, it is possible that the patent's social value exceeds its private value; moreover, it is also possible that the patent's private value is positive while its social value is negative.

In deciding how generous a damages award should be, a tradeoff must be considered. On one side, increasing damages reduces the rate of infringement and therefore increases the static or "deadweight" loss from intellectual property protection. On the other side, increasing damages spurs investment in innovation, both by reducing the risk of infringement and protecting or even enhancing the financial reward from innovation. The benefit to society from encouraging innovation is determined by the social value of the patent and by the degree to which innovation is sensitive to the reward. Just as the Hand Formula from torts compares the burden of

precaution to the expected loss avoided (the probability of the loss multiplied by the severity),⁴³ a rough cost-benefit standard for determining patent damages would compare, on the margin, the social burden of increasing damages (static cost) with the social benefit (elasticity of innovation multiplied by its social value).

This suggests that as the social benefit from patent protection increases, or as the social burden of protection falls, the damages award should increase too. The most generous award will provide maximal encouragement of innovation to the extent that it enhances society's welfare. Such an award would induce investment in innovation as long as the gain to society is at least as great. An award that protects the lost profits and also provides an enhancement up to the residual surplus to consumers generated by the patent would satisfy this objective. This formula for optimal damages would be too generous in cases where the innovation was of little value to society. But for the most socially valuable innovations, this formula could generate awards greater than the trebling required by Section 284.

III. The Legal Standard

Returning to the legal question, what is the ideal standard for enhanced damages? The foregoing economic analysis suggests that the standard for enhanced damages should be consistent with the static versus dynamic cost tradeoff that determines optimal damages. As the social value of the patent increases, or if given a substantial social value the sensitivity of innovation increases, the likelihood of enhanced damages should increase too.

A. Enhancement Factors

In general, the balancing of economic interests implied by this analysis suggests a multi-factored "reasonableness" standard for assessing damages.⁴⁴ Many if not all of the factors taken into account in the general torts setting for enhancing damages should be part of the assessment of enhanced damages in the patent infringement context. Enhanced (punitive) tort damages may be awarded after a finding that the injurer's conduct was reprehensible, wanton, malicious, or reckless.⁴⁵ In addition, courts have used several factors to determine the degree to which

⁴³ *United States v. Carroll Towing Co.*, 159 F.2d 169, 173 (2d. Cir. 1947) (L. Hand, J.) ("[T]he owner's duty, as in other similar situations, to provide against resulting injuries is a function of three variables: (1) The probability that she will break away; (2) the gravity of the resulting injury, if she does; (3) the burden of adequate precautions.").

⁴⁴ John Golden, *Reasonable Certainty in Contract and Patent Damages* (work in progress prepared for Harv. J. L. & Tech. in association with a symposium on "Private Law and Intellectual Property"), 2016.

⁴⁵ W. PAGE KEETON ET AL., *PROSSER AND KEETON ON THE LAW OF TORTS* § 2, at 9-10 (W. Page Keeton et al. eds., 5th ed. 1984) ("Something more than the mere commission of a tort is always required for punitive damages. There must be circumstances of aggravation or outrage, such as spite or 'malice,' or a fraudulent or evil motive on the part of the defendant, or such a conscious and deliberate disregard of the interests of others that the conduct may be called wilful or wanton.").

damages should be enhanced. The traditional factors for enhancement of tort damages were set out in *Green Oil v. Hornsby*⁴⁶ as follows:

(1) Punitive damages should bear a reasonable relationship to the harm that is likely to occur from the defendant's conduct as well as to the harm that actually has occurred. (2) The degree of reprehensibility of the defendant's conduct should be considered. The duration of this conduct, the degree of the defendant's awareness of any hazard which his conduct has caused or is likely to cause, and any concealment of that hazard, and the existence and frequency of similar past conduct should all be relevant in determining this degree of reprehensibility. (3) If the wrongful conduct was profitable to the defendant, the punitive damages should remove the profit and should be in excess of the profit, so that the defendant recognizes a loss. (4) The financial position of the defendant would be relevant. (5) All the costs of litigation should be included, so as to encourage plaintiffs to bring wrongdoers to trial. (6) If criminal sanctions have been imposed on the defendant for his conduct, this should be taken into account in mitigation of the punitive damages award. (7) If there have been other civil actions against the same defendant, based on the same conduct, this should be taken into account in mitigation of the punitive damages award.⁴⁷

These factors cannot all be transported “as is” from the torts to the patent infringement setting. Some of the *Green Oil* factors are not relevant for patent infringement litigation – specifically factors (6) and (7) – and should therefore not be incorporated into an assessment of damages for patent infringement.

The threshold finding of reprehensibility in tort law has generally relied on either a finding of maliciousness or recklessness.⁴⁸ Malicious conduct is intentional and evinces a desire to injure the victim.⁴⁹ Conduct is generally classified as intentional when the injurer has acted while knowing with substantial certainty that he would inflict a harm on the victim.⁵⁰ Reckless conduct is not necessarily intentional in this sense, but it indicates indifference to the interests of the potential victim or victims. In general, an injurer acts recklessly if he knows of the high probability of harm created by his conduct and the burden of avoiding the harm is slight.⁵¹

⁴⁶ 539 So.2d 218 (1989).

⁴⁷ *Id.* at 223-224.

⁴⁸ See *State Farm Mut. Auto. Ins. Co.*, 538 U.S. at 419 (finding that court will consider whether the tortious conduct evinced a reckless disregard of the health or safety of others and whether the harm is the result of intentional malice when determining reprehensibility); *Kolstad v. American Dental Ass'n*, 527 U.S. 526, 526 (1999) (noting that the “egregious conduct” requirement for punitive awards may be met by a defendant’s evil motive or intent.).

⁴⁹ OLIVER WENDELL HOLMES, *THE COMMON LAW* 130 (1887) (“It has been shown, in dealing with the criminal law, that, when we call an act malicious in common speech, we mean that harm to another person was intended to come of it, and that such harm was desired for its own sake as an end in itself.”); *BMW of North Am., Inc. v. Gore*, 517 U.S. 559, 589 (1996) (finding that “malice includes any wrongful act without just cause or excuse ... with an intent to injure the ... property of another”).

⁵⁰ RESTATEMENT (THIRD) OF TORTS: LIAB. FOR PHYSICAL & EMOTIONAL HARM § 1 (Am. Law Inst. 2010); KEETON ET AL., *supra* note 45, § 8, at 34.

⁵¹ See RESTATEMENT (THIRD) OF TORTS: LIAB. FOR PHYSICAL & EMOTIONAL HARM § 2(b) (Am. Law Inst. 2010).

The *Green Oil* factors for determining the degree of enhancement can also be applied to patent infringement. First, the probability assessment at the heart of the recently overturned *Seagate* willfulness standard should remain an important enhancement factor under any reasonableness inquiry. The initial distinction in a probability analysis should be that between intentional copying of an existing technology and independent discovery. There is actually a spectrum between these two endpoints, but for simplicity I will discuss only the endpoints. The independent discoverer who develops an infringing technology is guilty of infringement, but has not acted with the intent of a deliberate trespasser. The case for imposing a penalty that strips any gains from such an infringer would therefore be weak.⁵² It may be socially desirable to enhance damages even in this case, for deterrence purposes, but in general these are not strong cases for enhancement.

The intentional copier of an existing technology presents a more complicated scenario because there are special cases within this category. An infringer can become an intentional copier in many ways: he can attempt in good faith to design around an existing patent, resulting in a substitute technology that he reasonably believes is non-infringing; he can attempt in good faith to design around an existing patent, resulting in a substitute technology that he believes in good faith, though not reasonably, is non-infringing; he can copy an existing technology while reasonably believing that it is not protected by a valid patent or that his copy is not infringing; he can copy an existing technology while believing in good faith, though not reasonably, that it is not protected by a valid patent or that his copy is not infringing; he can copy an existing technology while knowing full well that it is protected by a valid patent and that his copy is infringing. The strength of the case for enhancement varies among these categories, generally becoming stronger as one moves from the first to the last category. This is so, for two reasons. First, the intention to copy with knowledge of the resulting legal violation increases as one moves from the first to the last category, which suggests that the effectiveness of a damages award in controlling incentives to infringe should increase as well. Second, as one moves closer to the last category, the effectiveness of a damages award that eliminates the prospect of gain from an intentional violation should increase.

Consistent with the economic analysis in this paper and with the *Green Oil* template, the severity of the harm to society should be considered in the enhanced damages determination. In the patent context, the severity of the harm to society will be related to the patent's value to society as well as its monetary value to the patentee. Under this consideration, the infringement of a legally strong patent that promises enormous benefits to society – such as a cure for a debilitating disease or condition – should be a factor supporting enhanced damages. On the other hand, a patent with a relatively low social value – for example, one of questionable validity because of obviousness or abstraction – would be a poor candidate for damages enhancement.

Taking the severity of the social harm into account is an important step in any reasonableness analysis of damages. The Hand Formula from negligence doctrine, for example, weighs the burden of taking care against the product of the probability of harm and the severity of harm. For a given probability of harm, the case for finding negligence increases as the severity of harm

⁵² Hylton, *supra* note 17, at 455-458.

increases. The same should hold in the patent context. For any fixed likelihood of infringement, enhancement should be more likely as the severity of the social harm from infringement increases.

The same considerations of probability and severity apply in the intentional (and reckless) torts context as well, which may have clearer application to the infringement setting. There are many examples of reckless conduct where the probability of harm is low. Consider, for example, dropping large bricks from a freeway overpass. If the traffic is not dense, the likelihood of hitting a car is likely to be low. However, the severity of the harm is quite high, and therefore almost any court would consider such conduct reckless and appropriate for enhanced damages. Similarly, in the patent infringement context, the likelihood of infringement may be less than fully obvious, but if the infringer deliberately copies knowing that the social harm could be great, enhancement of damages should be considered.

A third factor suggested by *Green Oil*, the difficulty in identifying the infringer and especially any steps the infringer has taken to avoid identification or conceal the infringing conduct, should be considered in the enhancement of damages. Efforts to conceal infringement should be considered as evidence that the infringer acted with an intent to infringe. If such efforts reduce the likelihood that a patentee will discover the identity of the infringer, they should be included in the factors that support an enhancement of infringement damages.

Past activity as an infringer should count in favor of enhanced damages. Evidence of past infringement reveals the nature of the infringer's thinking and the perceived benefits he receives from infringement. If in the presence of a known risk of being held liable, and with experience of being found liable in the past, the infringer continues to engage in infringement, then his conduct clearly indicates that normal compensatory damages are insufficient to deter his infringing conduct. Since the private benefits from infringement are hidden from the public and known only to the infringer, evidence of past conduct effectively reveals some of the infringer's private information with respect to his own perceived benefits.

Similarly an infringer who continues to infringe after being notified has revealed his own assessment that the risk of being held liable is an insufficient deterrent. Damages should therefore be enhanced to restore the deterrence capability.

Fourth, the profitability of the conduct to the infringer should be a factor in enhancement. Take the case of a large firm that infringes the patent of a smaller firm. If the large firm is a more efficient producer because it can take advantage of economies of scale, it should be able to compensate the small firm completely and still profit from infringement. In the absence of an injunction against the infringing activity, damages will have to serve as a substitute deterrent. Damages should therefore be enhanced to provide the appropriate level of deterrence.

The fourth *Green Oil* factor, litigation costs, is already incorporated into the patent statute, as noted in *Octane*. However, recovery for attorney's fees may not compensate for all of the costs of litigation. Litigation imposes both direct and indirect costs. The indirect costs come in the form of opportunity costs borne by management that must take time away from work to pursue infringers and to litigate against them. To the extent that indirect costs can be reduced to the

minimum amount that could not be avoided by the plaintiff, they should be considered directly attributable to the infringer. These indirect costs should be taken into account in the enhancement analysis.

Admittedly, patent litigation can be time consuming and distracting for innovators.⁵³ The Wright brothers are said to have spent much of their careers consumed in patent litigation.⁵⁴ An excessive or obsessive approach to litigation should not be permitted to give rise to a claim for enhanced damages. However, these concerns are insufficient to justify a refusal to incorporate reasonable indirect costs into the enhancement analysis.

The reasonableness approach suggested here is not very different from the totality of circumstances approach to determining willfulness that had been adopted by the Federal Circuit before the *Seagate* standard. Under the totality-of-circumstances test, the following factors were used to determine willfulness:

- (1) Whether the infringer had actual knowledge of an existing patent;
- (2) whether there is a good-faith belief on the part of the infringer that the patent is invalid or not infringed;
- (3) whether an infringer received a competent opinion;
- (4) whether the infringer made a good-faith effort to design around the patent;
- (5) whether the infringer's behavior and tactics at trial are consistent with a finding of good faith;
- (6) whether there was deliberate copying;
- (7) the infringer's motivation;
- (8) the size and finances of the infringer;
- (9) the closeness of the case;
- (10) the duration of the misconduct;
- (11) whether the infringer took remedial steps;
- (12) whether the infringer made any attempts to conceal the infringement; and
- (13) the defendant's motivation for harm.⁵⁵

All of these factors are consistent with a flexible, multi-factored approach to enhancement. I have extended the pre-*Seagate* test by including direct consideration of the severity of the social harm from infringement. However, to some degree this consideration is captured by an analysis of the closeness of the case. The factors that indicate that a patent is likely to be found valid in court generally reflect a rational tradeoff of the dynamic and static costs of patent protection. Given the administrative difficulty of attempting to measure the severity of the social harm, inclusion of consideration of the closeness of the case (the strength of the patent and the likelihood the activity infringed) may be the best approximation possible of a social severity analysis.

B. Elaboration on Intentionality and Social Harm

⁵³ See, e.g., Daniel A. Crane, *Exit Payments in Settlement of Patent Infringement Lawsuits: Antitrust Rules and Economic Implications*, 54 FLA. L. REV. 747, 757-762 (2002).

⁵⁴ See, e.g., *Wright Co. v. Herring-Curtiss Co.*, 204 F. 597 (W.D.N.Y. 1913), aff'd, 211 F. 654 (2d Cir. 1914); *Wright Co. v. Paulhan*, 177 F. 261 (C.C.S.D.N.Y.) (L. Hand, J.), rev'd, 180 F. 112 (2d Cir. 1910); Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 888 (1990).

⁵⁵ *Reid Corp.*, 970 F.2d. 816, 827 (Fed. Cir. 1992); Jon E. Wright, Comment, *Willful Patent Infringement and Enhanced Damages—Evolution and Analysis*, 10 Geo. Mason L. Rev. 97, 107-108 (2001);

The law traditionally has distinguished general (intent to act) and specific (intent to harm) intent.⁵⁶ This distinction mirrors that between good faith (acting with no intent to harm) and bad faith (acting with intent to harm).⁵⁷ The law also distinguishes conduct on reasonableness grounds. Thus, on intentionality alone, the most innocent actor is one who has acted in good faith and reasonably. The next step in the movement away from innocence is the actor who has acted in good faith but unreasonably. The final category is bad faith. The case for enhancement of damages increases in the order of these of these categories.

Compared to the common law concept of reasonableness, it may seem initially to be unfair to permit a plaintiff to obtain a damages award of any amount against an infringer who has acted in good faith and on the basis of a reasonable belief of legality. However, the difference between patent infringement and negligence is that a finding of patent infringement incorporates a finding of social harm that is divorced from the infringer's ability to perceive the specific social harm generated by his conduct, whereas a finding of negligence assumes that the tortfeasor did foresee the specific social harm from his conduct. Still, the approach of patent law is not entirely foreign to tort law; trespass routinely holds defendants liable even though they have acted in good faith and with a reasonable belief of legality.⁵⁸

Another consideration on the question of intentionality is the distinction between the meaning of willfulness in the torts and patent infringement settings. As noted earlier, *Seagate* adopted a willfulness requirement as a precondition to enhancement on the theory that this is also the general approach of tort law.⁵⁹ While it is true that a finding of willfulness or recklessness is a

⁵⁶ See *United States v. Aluminum Co. of America*, 148 F.2d 416, 432 (2d Cir. 1945) (L. Hand, J.) (characterizing specific intent as “an intent which goes beyond the mere intent to do the act.”); Ronald A. Cass & Keith N. Hylton, *Antitrust Intent*, 74 S. Cal. L. Rev. 657, 663 (“[W]e see only three [legal standards] in . . . the common law generally: strict or per se liability coupled with general intent, reasonableness coupled with general intent, and reasonableness coupled with specific intent.”); William Roth, *General vs. Specific Intent: A Time for Terminological Understanding in California*, 7 Pepp. L. Rev. 67, 72 (1979) (distinguishing “specific intent,” which describes purposeful conduct requiring a greater degree of mental culpability, from “general intent,” which denotes conduct requiring a degree of fault less than purpose, such as recklessness or negligence).

⁵⁷ E.g., *Rawlings v. Apodaca*, 151 Ariz. 149, 162 (1986) (acting intentionally with knowledge that the conduct was likely to cause unjustified, significant damage is sufficient to show bad faith); *Burned Oil Co. v. Grynberg*, 320 F. App'x 222, 230 (5th Cir. 2009) (“Bad faith is more than bad judgment or negligence: it is a neglect or refusal to fulfill some duty or some contractual obligation, not prompted by an honest mistake as to one's rights or duties, but by some interested or sinister motive and implies the conscious doing of a wrong because of dishonest purpose or moral obliquity.”) (internal quotations omitted).

⁵⁸ *Dougherty v. Stepp*, 18 N.C. 371, 372 (1835) (per curiam) (“It is the entry that constitutes the trespass. There is no statute, nor rule of reason, that will make a wilful entry into the land of another, upon an unfounded claim of right, innocent, which one, who sat up no title to the land, could not justify or excuse.”); RESTATEMENT (SECOND) OF TORTS § 164 cmt. a (Am. Law Inst. 1965) (“If the actor is and intends to be upon a particular piece of land in question, it is immaterial that he honestly and reasonably believes that he has the consent of the lawful possessor to enter, or, indeed, that he himself is its possessor.”); W. PAGE KEETON ET AL., PROSSER AND KEETON ON THE LAW OF TORTS § 13, at 74 (W. Page Keeton et al. eds., 5th ed. 1984) (“The defendant is liable for an intentional entry although he has acted in good faith, under the mistaken belief, however reasonable, that he is committing no wrong.”).

⁵⁹ *Seagate*, 497 F.3d at 1370 (noting that willfulness is not unique to patent law and has an established meaning in civil context).

precondition to an award of punitive damages in tort law, recklessness in tort law is determined by a balancing test that incorporates both the probability of harm and the severity.⁶⁰ Thus, an accurate importation of the concept of willfulness from tort law into patent law would include a multiplicity of factors, as suggested here, even at the threshold stage of determining willfulness.

IV. The Damages Multiplier

The second important normative question is what the proper damages multiplier should be. There is no reason offered in the economic analysis of damages to believe that the multiplier of three observed in current law is necessarily optimal.

Economic analysis suggests that the optimal damages amount should vary by case.⁶¹ However, it would probably be too administratively burdensome to calculate an optimal damages multiplier based on measures of consumer welfare for every case. A schedule or range of multipliers would be less burdensome to implement. Still, even with a range, there is no reason suggested in the economics literature to believe that the range should consist only of numbers between one and three.

The question of feasibility might seem to be troubling in the absence of evidence that any other scheme other than trebling had ever been adopted. However, other schemes have been adopted. The first patent statute, the Patent Act of 1790, provided unfettered discretion to the court, providing no more guidance than “damages as shall be assessed by a jury.”⁶² The patent statute was amended in 1793 to provide for a mandatory minimum of treble damages. In other words, the 1793 patent statute permitted courts to apply a multiplier greater than three but prohibited the application of a multiplier less than three. These examples suggest that the deterrence concern was given greater weight in the early period of American intellectual property law than today.

The Clayton Act provides another example of a mandatory multiplier. Under the Clayton Act, a federal court must apply a multiplier of three to compensatory damages for an antitrust injury.⁶³ Courts do not have the discretion to apply a lesser or greater multiplier.

These examples suggest that it is certainly administratively feasible to adopt a multiplier scheme that differs from the current rule of discretionary enhancement up to a multiple of three. The analysis of economics here suggests that discretion over the multiplier should be given to courts, and that a multiplier greater than three could be ideal in some cases. In cases where there is *no* evidence of reprehensible conduct, concealment, or unusually high social value attached to the patent, courts should have the discretion to award only compensatory damages. On the other

⁶⁰ See Restatement (Third) of Torts: Liab. for Physical & Emotional Harm § 2(b) (Am. Law Inst. 2010)

⁶¹ See, e.g., Hylton, *supra* note 17.

⁶² Patent Act of Apr. 10, 1790, ch.7, § 4, 1 Stat. 109 (repealed 1793).

⁶³ Clayton Act, 15 U.S.C. § 15 (1982).

hand, in cases where the deterrence concern is especially great, courts should have the discretion to exceed the trebling provision.

How high should courts permit the damages multiplier to go? The first principle that ought to guide courts is that whenever the infringer would continue to enjoy a profit from willful infringement even after paying treble damages, the court should have discretion to enhance damages to a level that would eliminate the willful infringer's expected gain from infringement. By "willful" infringement, I refer to cases of deliberate and knowing infringement of the sort that would satisfy the *Seagate* standard for enhanced damages.

A second principle that should guide courts is that for cases of concealment or where the identity of the infringer is difficult to determine, courts should have discretion to apply a multiplier greater than three to correct for the deterrence dilution that would otherwise result. This discretion should exist even in cases where the facts do not indicate deliberate and knowing infringement. The reason for this rule is to deter infringement by actors who are able to conceal their infringement, or in settings where infringers know that detection is unlikely.

A third principle is that where the ratio of the social value to the private value of the patent is considerably greater than three, courts should have the discretion to go above a multiplier of three. Establishing that the social value of the patent is much greater than the private value is not necessarily difficult. The private value is determined by the profit derived from the patent. The social value (ex post) is determined by the residual consumer surplus purchasers of a patented product receive. If, for example, the consumer surplus is an order of magnitude greater than the profit to the patentee, a court should have discretion to enhance damages to reflect the correspondingly greater importance of deterrence.

Although it may be too administratively burdensome for a court to implement the third principle in full, rough short cuts can be developed for some cases. Consider, for example, the hepatitis C drug Sovaldi, which requires a treatment regime costing \$84,000.⁶⁴ The alternative is a liver transplant that costs roughly \$300,000.⁶⁵ A simple, back-of-the-envelope estimate of the total consumer surplus generated by Sovaldi would multiply the number of patients receiving the drug by the difference between costs of the two treatment regimes, \$216,000. Assuming a 44 percent profit margin on Sovaldi,⁶⁶ this leads to rough estimate of 6 for the ratio of consumer surplus to the profit from Sovaldi. Thus, the third principle suggests for this case, if the patent for Sovaldi were to be infringed, an optimal multiplier of 6, rather than the trebling provided by statute.

V. Conclusion

⁶⁴ John LaMattina, What Price Innovation? The Sovaldi Saga, *Forbes* (May 29, 2014, 8:25 AM), <http://www.forbes.com/sites/johnlamattina/2014/05/29/what-price-innovation-the-sovaldi-saga/#79e597701ce1>.

⁶⁵ *Id.*

⁶⁶ Robert Glatter, Bitter Pill to Swallow: Can the US Market Bear the Cost of Sovaldi?, *Forbes* (June 28, 2014, 5:53 PM), <http://www.forbes.com/sites/robertglatter/2014/06/28/bitter-pill-to-swallow-can-the-us-market-bear-the-cost-of-sovaldi-2/#2671f5931f36> (noting that the profit margin was 44% for the first quarter of 2014).

The justification for enhancing damages for patent infringement is quite similar to that for enhancing damages for any tort. The literature applying economics to tort law, and tort doctrine itself, have generated a number of theories as well as specific factors that patent courts could consider in the damages enhancement analysis. These theories and legal tests can be used to provide guidance to courts in developing a modernized common law of damages for patent infringement. *Halo* grants courts significant discretion in determining whether damages for patent infringement should be enhanced, but that discretion need not be unstructured by economic principles.