

N O R T H W E S T E R N
JOURNAL OF TECHNOLOGY
AND
INTELLECTUAL PROPERTY

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I. INTRODUCTION

¶1 Economic analysis has ranged throughout intellectual property law. As information and innovation have played an increasing role in society and the economy, many articles and books have explored the question of the proper scope of intellectual property rights. The basic analysis is now familiar:¹ without intellectual property law, there would be insufficient incentives to invent, create, and build commercial goodwill.² Developing new drugs, producing movies, or building popular brands can cost millions. If others could freely copy those works, then the incentive to invest would be greatly diminished. On the other hand, intellectual property protection itself is costly. Patents and copyrights can deter even innovation, especially improvements on existing works. Trademark rights can hamper speech about consumer products. Rights holders may use monopoly power to set profit-maximizing prices high enough to deter many potential users. Enforcement of rights (applications, litigation, consulting with lawyers) can entail transaction costs.

¶2 So much of the literature attempts to roughly balance the benefits of intellectual property protection against its costs.³ But the balancing of necessity is often guesswork, involving incommensurable values. In discussing fair use in copyright, one might try to

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¹ See, e.g., WILLIAM M. LANDES & RICHARD A. POSNER, *THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW* 11 (2003); Mark A. Lemley, *Ex Ante versus Ex Post Justifications for Intellectual Property*, 71 U. CHI. L. REV. 129 (2004) (discussing incentive theory and rebutting nascent rival theories).

² See, e.g., Stephen Breyer, *The Uneasy Case for Copyright: A Study of Copyright in Books, Photocopies, and Computer Programs*, 84 HARV. L. REV. 281 (1970) (early article by now-Justice Breyer assessing copyright's fit with its incentive rationale).

³ Intellectual property law can serve other economic purposes as well. See, e.g., Yochai Benkler, *Intellectual Property and the Organization of Information Production*, 22 INT'L REV. L. & ECON. 81 (2002); Paul J. Heald, *A Transactions Cost Theory of Patent Law*, 66 OHIO ST. L.J. 473 (2005); Timothy Wu, *Copyright's Communications Policy*, 103 MICH. L. REV. 278 (2004) (analyzing how copyright regulates competition between information providers).

balance the apple of incentives to authors against the oranges of costs of protection to potential users (educators, consumers, other authors that would like to make use of the work). To take a current controversy, Google seeks to create a searchable database by scanning copyrighted books. Whether the benefits to scholars, students, and other readers outweigh the costs to authors and publishers cannot be balanced against each other arithmetically, rather only by value judgments.⁴

¶3 Accordingly, the economic analysis of intellectual property is extremely convincing at a general level but provides little guidance as to doctrinal specifics. The free-rider problem presented by the public good aspect of information goods can clearly be reduced by legal rules (patent, copyright, trademark) creating property rights in some categories of information. But the economic analysis of specific aspects of intellectual property law rarely shows how one particular rule will best achieve a balance. Legal doctrine reflects this analytic impasse. The Supreme Court has recognized the balancing of interests: “The more artistic protection is favored, the more technological innovation may be discouraged; the administration of copyright law is an exercise in managing the trade-off.”⁵ But neither the Court nor commentators has offered an approach that balances costs versus benefits at the margins of protection.

¶4 *Intellectual Property: Economic and Legal Dimensions of Rights and Remedies*⁶ (“*Economic Dimensions*”) lays a promising foundation for such an approach. *Economic Dimensions* aptly describes the approach, because it focuses on a measure of legal rights that is key, yet nevertheless sidelined in most economic analysis of intellectual property law: remedies. The analysis of monetary remedies alone would make *Economic Dimensions* an important work in intellectual property, especially as monetary remedies emerge from under the shadow of injunctive relief, as the Supreme Court gives guidance in *eBay Inc. v. MercExchange, L.L.C.*⁷ But the book will resonate far more broadly in intellectual property law and theory. The book’s general theory is that monetary damages in intellectual property cases should be the greater of the infringer’s profits or the rights holder’s lost profits, with pragmatic adjustments to accommodate specific policy considerations in different areas of the law. In short, such potential damages are sufficient to deter infringers, without creating incentives for over enforcement or deterring legitimate uses. The authors then show how that modest sounding theory provides guidance in other areas of intellectual property, using the examples of liability standards, potential defendants, standing, and measurement of monetary damages. A theory for appropriate damages, they show, helps guide in deciding who should be liable for damages, what mental state should be required for liability, who should be entitled to collect, and how to go about measuring damages. Thus, the book offers an attractive

⁴ The influence of value judgments is not necessarily a bad thing. Although intellectual property is quite amenable to economic analysis, much more than economics is at stake in intellectual property policy. See, e.g., Neil W. Netanel, *Locating Copyright Within the First Amendment Skein*, 54 STAN. L. REV. 1 (2001) (analyzing conflict between the copyright’s grant of exclusive rights and freedom of expression); Pamela Samuelson, *Should Economics Play a Role in Copyright Law and Policy?*, 1 U. OTTAWA L. & TECH. J. 1 (2003) (discussing proper place of economics within intellectual property law and policy).

⁵ *MGM Studios Inc. v. Grokster, Ltd.*, 545 U.S. 913, 125 S. Ct. 2764, 2775 (2005).

⁶ ROGER D. BLAIR & THOMAS F. COTTER, *INTELLECTUAL PROPERTY: ECONOMIC AND LEGAL DIMENSIONS OF RIGHTS AND REMEDIES* (2005).

⁷ 126 S. Ct. 1837 (2006).

basis for reforming intellectual property law by balancing incentives to creators against costs of intellectual property protection.

¶15 Remedies are key to legal rights, although they receive relatively little attention in law school and legal scholarship. Questions of substantive rights usually get the most attention. But remedies often determine how substantive rights play out in the real world. To take a humble example, suppose a retailer sells a somewhat defective computer desk to a consumer, in clear breach of contract. If contract law supplies the remedies, the retailer has little to fear. Bringing a breach of contract action would require the consumer to pay a lawyer. A successful action would likely bring only the remedy of damages measured by the difference between the value of the table as promised and delivered – likely less than the fees to pay the lawyer. But a consumer protection statute may provide a different set of remedies for the same breach: damages, statutory damages, attorney’s fees. The leverage would now strongly favor the consumer. Such potential remedies affect the incentives of parties. Ex ante, the retailer has a greater incentive not to sell defective merchandise.

¶16 The same is true of intellectual property law: the real measure of rights is the remedies available. *Economic Dimensions* makes two considerable contributions to intellectual property scholarship: it shines a light on remedies, an area neglected until now, and it provides an approach that might allow for a more nuanced analysis of intellectual property doctrine.

II. A GENERAL THEORY OF DAMAGES RULES

¶17 *Economic Dimensions* presents a general theory of damages rules, starting with patent law, and generalizing to other type of intellectual property protection. One considering investing resources in developing an invention will consider the likely costs (such as the costs of research and development) and likely profits from the product over the relevant time. Where the present value of the likely profits exceeds the present value of the likely costs, there is an incentive to undertake the project.⁸ To the extent that others can copy the fruits of research and development, the likely profits are reduced, meaning that the incentive to innovate is reduced. The book makes one important assumption, by taking the present scope of patent rights as given.⁹ The book discusses how to fashion remedies to preserve that incentive structure. The optimal remedy would deter infringement by making the likely damages from infringement greater than the likely profits from infringement (essentially, the flip side of preserving the profits of the inventor).¹⁰

¶18 The analysis then considers a range of cases with respect to comparative efficiency.¹¹ The potential infringer may not have invented the invention, but may be more efficient at practicing it. A manufacturing company may be able to produce and

⁸ BLAIR & COTTER, *supra* note 6, at 42-44.

⁹ Although it makes the analysis more difficult, the authors do not assume that a patent gives the patentee market power (as opposed to exclusive rights to sell the invention in competition with other products in the relevant market). The Supreme Court recently overturned the long-standing presumption in antitrust law that a patent holder has market power in the relevant market. See *Ill. Tool Works Inc. v. Indep. Ink, Inc.*, 126 S. Ct. 1281 (2006).

¹⁰ BLAIR & COTTER, *supra* note 6, at 45-46.

¹¹ *Id.* at 49-57.

market an electronics gadget more efficiently than the tinkerer that created it. The potential infringer may also be less efficient at practicing the invention. A potential copier may lack the expertise and equipment of the inventor of a gizmo. But, because the copier has no research and development costs to defray, he could still sell the gizmo at a lower price, even though it costs more to make per gizmo. So comparative inefficiency may not be a bar to infringement. Depending on the pricing strategies of the patentee and infringer, one or both could fail to make any profits on selling the invention.

¶9 In an idealized case of perfect information, costless enforcement, and perfect monopolies for patent holders, an optimal remedy might be award of a licensing fee where the infringer was more efficient than the patentee.¹² This would permit the patentee to profit from its patent, but also permit the most efficient use of the patent. But such a case is too rare to serve as the general baseline for remedies. Information is rarely perfect, enforcement of patent rights is costly, and most patented inventions do not confer monopolies but rather face competitors in the marketplace. A more general baseline, which preserves the incentives both in the typical case and in the idealized case, would depend on whether the infringer was more efficient than the inventor. Where the infringer was more efficient, he would be required to hand over his profits to the inventor. Where the infringer was less efficient, he would be required to pay for the lost profits of the patentee.¹³ Such an abstract rule might be difficult to apply in practice, because it would require the court to determine whether the infringer or the patentee was more efficient at using the patent. That would be a difficult factual determination, because it would require figuring out and comparing the respective marginal costs of production – a thorny mix of accounting and marketing issues. But the two rules can be collapsed into a simpler, general theory of intellectual property damages: damages should be the greater of the infringer’s profits or the patentee’s lost profits. This concise rule proves to have considerable analytic power.

¶10 Some have argued that a smaller measure of damages would provide sufficient incentive for invention, and yet encourage more use of the invention.¹⁴ In short, if the damages for infringement were lesser, then there would be marginally less deterrence of infringement. This would mean more infringement – but that could be a good thing, if it means society is getting more use out of the invention. Some delay and uncertainty in patent enforcement could thus increase social welfare.¹⁵ *Economic Dimensions* puts forward several arguments against such an approach. Calculating such a partial damages rule to balance diminished incentives to inventors against increased gains to users would be difficult to do with sufficient precision.¹⁶ Neither has been quantified, so it would have to rest on heroic assumptions. The rationale also applies only where the patent holder has monopoly power, but most patent holders do not.¹⁷ One could reduce those problems by only making small reductions in damages – but that would undercut the incentives for infringement.

¹² *Id.* at 57.

¹³ *Id.* at 57-59.

¹⁴ *Id.* at 61-66.

¹⁵ *Id.* at 62.

¹⁶ *Id.* at 64-65.

¹⁷ *Id.* at 65-66.

¶11 The authors next extend the model to trade secrets, copyrights, and trademarks.¹⁸ Like patents, trade secrets and copyrights provide an incentive for innovation by providing protections against copying information. The same approach to remedies would then apply (assuming, as with patents, that the present scope of trade secret and copyright sets the correct incentive structure).¹⁹ Trademark law, however, is not simply an incentive to create trademarks. It plays several economic roles: encouraging sellers to create goodwill for their goods or services by protecting their source identifier; reducing search costs for consumers (by forbidding use of confusingly similar marks); and encouraging coordinated investment in production and marketing.²⁰ Although the role of trademarks is different, it also serves to create incentives by protecting an exclusive market right. Like patent or copyright infringement, then, harm to the trademark holder may be measured either by the infringer's profits or by the trademark holder's lost profits. So the same general rule can be applied in each area as a first approximation, subject to adjustment for the varying policies in each area.²¹

¶12 This general damages rule adds an important insight to analysis of intellectual property law, which serves to unify what appear to be a disparate collection of remedies rules. It also shows that restitution damages and expectation damages are really based on the same principle. Restitution is sometimes viewed as resting on different legal and moral principles than other measures of damages.²² The concept of restitution is often linked to various types of unjust enrichment. One that has unjustly enriched herself at another's expense should return the property as a matter of fairness. Expectation damages, most prominent in breach of contract, rest on the idea of protecting the expectations of parties, in order to provide appropriate incentives. But the general damages theory links the two, protecting the incentive of patents by using a measure based on restitution or expectation simply on whether the infringer gained more than the patentee lost. Thus, in intellectual property, restitution and expectation become largely overlapping concepts.

III. TESTING AND ADAPTING THE GENERAL THEORY

¶13 *Economic Dimensions* develops a general theory of remedies for intellectual property cases, but the focus of the book is intellectual property law, not theory for theory's sake. As a tool for economic analysis of intellectual property, the general theory provides a baseline for comparison to the existing set of remedies provisions. The theory holds up well when compared to the remedies that Congress and the courts have applied. The theory largely explains remedies that on their face may seem quite different. In some aspects, remedies under the law differ from what the theory would prescribe. For some cases, special policies explain the disparity. In other cases, the law might do well to conform itself to the theory.

¹⁸ *Id.* at 68.

¹⁹ *Id.* at 66.

²⁰ *Id.* at 66-67.

²¹ *Id.* at 67-69.

²² See, e.g., Douglas Laycock, *The Scope and Significance of Restitution*, 67 TEX. L. REV. 1277 (1989) (contrasting restitution with other theories of damages).

¶14 Patent law differs from the general rule in one important aspect. The general rule would permit the patentee to recover the greater of her lost profits (expectation damages) or the actual profits of the infringer (restitution damages). Patent law has a slightly different standard, under which the patentee may recover either her lost profits or a reasonable royalty. Thus, the restitution option is to recover whatever hypothetical royalty the court determines that the parties would have negotiated.²³ Such a rule may be justified as an alternative to recovery of the infringer's profits on the grounds that an accurate determination of profits is too difficult. Although profits may simply be the difference between cost and revenue, the details of such calculations can be devilish. The costs of a product are not easily determined, because of the difficulty of apportioning the many related outlays (rent, salary, research, marketing, raw materials) to particular products. Revenue can likewise be difficult to determine accurately, especially because there may be a question as to what role patent infringement played in sales of the product, as opposed to marketing, the seller's reputation, and other factors. But the hypothetical reasonable royalty is not necessarily easier to figure out. All the foregoing factors could be involved, in addition to deciding just how the parties would have likely settled their negotiation. Indeed, courts may effectively follow the general rule. In awarding a hypothetical royalty, the court often grants something that is similar in amount to the defendant's profits. So the legal rule in practice may not differ much from the general theory.²⁴

¶15 Copyright presents a greater challenge to the theory. Copyright's rule for actual damages fits nicely with the theory. A successful plaintiff may seek either her lost profits or the infringer's profits attributable to the infringement. But copyright law gives the copyright holder another option: statutory damages. Statutory damages are not dependent upon the profits of the copyright holder or the infringer. Rather, the statute provides that the infringer is liable for a range from \$750 to \$30,000 per work infringed (subsequent to adjustment down to zero for some innocent infringers and adjustment up to \$200,000 for willful infringers). Such damages can be far greater than lost profits. An individual that downloaded some thirty songs was liable for \$22,500: statutory damages at \$750 per song.²⁵ Lost profits may have been around \$40 or less, at ninety-nine cents per song.

¶16 *Economic Dimensions* suggests why that particular rule may vary so widely from the general theory, and why the rationale is limited to copyright, as opposed to patent and trademark.²⁶ Where infringement has considerable commercial importance, statutory damages may not matter. If a movie studio infringes the copyright in a screenplay, the actual damages may be millions, whether measured by the studio's profits or the screenwriter's lost profits. That would exceed the normal range of \$30,000 per work, and even the enhanced upper limit of \$200,000. Even for smaller cases of infringement, if copyright holders could detect them all and recover damages, profits would likely serve as a sufficient measure.

¶17 But copyrighted works may be subject to a "potential underenforcement problem."²⁷ Movies, songs, software, and other works circulate widely and are often

²³ BLAIR & COTTER, *supra* note 6, at 71-73.

²⁴ *Id.* at 74.

²⁵ See *BMG Music v. Gonzalez*, 430 F.3d 888 (7th Cir. 2005).

²⁶ BLAIR & COTTER, *supra* note 6, at 77-80.

²⁷ *Id.* at 78.

infringed privately, from unauthorized downloading of music to casual duplication of software. Damages based merely on profits do little to discourage such infringement. If a consumer has a choice between paying 99 cents per song for 40 songs or downloading them for free with a small chance of subsequently paying that same 99 cents per song, she has reason to choose the unauthorized route. Indeed, because the measure is profits rather than revenue, actual damages could be even less than 99 cents per song. Statutory damages can change the incentives. If the consumer is potentially liable for \$750 (or more) per song, then even the small risk of enforcement may be outweighed by the large potential liability, especially for a risk averse defendant.²⁸ This preserves the incentive structure of copyright protection.

¶18 But the analysis also highlights the interplay between remedies and the assumptions the authors make about the scope of intellectual property protection. It assumes that the existing basket of rights represents the optimal arrangement, and therefore the remedies should preserve that balance between the rights of copyright owners and the interests of others in access to the work. Another view might be that a certain amount of unauthorized use has always been part of copyright norms, that although copyright owners have the exclusive right to market their works, small unauthorized uses are part of the social bargain between creators and users. If that is the case, then the availability of statutory damages creates potential costs of overenforcement. Moreover, it could discourage even noninfringing behavior, such as where someone does not make a fair use of a copyrighted work for fear of possible liability.²⁹

¶19 Patents and trademarks do not have similar statutory damages rules. This difference may be explained by the relative detectability of infringement.³⁰ Infringements of patents and trademarks are more likely to involve market activity which is less costly for the rights holder to monitor. Trademark infringement, by definition, involves marketing the product to potential buyers. Trademark infringement is use of a symbol in commerce that is likely to confuse consumers. If the use of the symbol is likely to confuse consumers, then it is likely also a use that could be detected by the trademark holder, who will gather market information not just to protect trademark rights but for other purposes, such as marketing research and strategic planning. Patent infringement need not occur in public. But the sort of infringement that is most likely to result in lost profits (or profits to the infringer) is marketing or licensing an infringing product. In addition, because patent law applies to functional aspects, infringers are likely to be active in a market similar to the patent holder, because they are marketing to potential buyers of product to serve the same functional need.³¹ So markets are more likely to carry news of infringement to rights holders with patents and trademarks than with copyrights, which can explain the exceptional use of statutory damages in copyright.

²⁸ *Id.* at 77-78.

²⁹ *Cf.* Wendy J. Gordon, *Fair Use as Market Failure: A Structural and Economic Analysis of the Betamax Case and its Predecessors*, 82 COLUM. L. REV. 1600 (1982) (analyzing role of fair use doctrine as response to market failure, with exclusive rights taken as baseline).

³⁰ BLAIR & COTTER, *supra* note 6, at 79.

³¹ *Id.* at 79-80.

¶20 Trademark law also comports largely with the general theory, permitting the trademark owner to recover either her own lost profits or the profits of the infringer.³² Once again, however, there is a particular deviation. The plaintiff may recover the profits of the infringer only in the case of willful infringement. But that restriction makes sense in light of the particular role that trademark protection plays, distinguishing between different sellers in a market. Supposing defendant's use of ZAZU for hair coloring products infringes plaintiff's ZAZU mark for a hair salon, determination of defendant's profits could be difficult. Beyond allocating costs and revenue, the hard question would be how much of defendant's profits were attributable to use of the mark.³³ Presumably, defendant could have made revenue using some other mark. Deciding how much defendant's revenue was increased by infringement could involve a lot of guessing about the dynamics of that particular market.

¶21 Where infringement is willful, however, the allocation problem is reduced. Willful infringement is likely to involve such activity as selling knock-off products bearing a mark prized by consumers. In that case, most of defendant's profits would likely be attributable to the use of the mark. So the requirement of willfulness serves to make litigation more efficient, by sparing judicial resources from making apportionment decisions in the more difficult cases. Moreover, the rule preserves the incentive structure of trademarks, by being more forgiving where infringement is in good faith and harsher where infringement is willful, thus deterring the uses most likely to undercut the incentives created by trademark protection.³⁴

¶22 *Economic Dimensions* provides a general theory for damages that has considerable explanatory power across the board in intellectual property law. The general aspects of the theory are echoed in patent, copyright, and trademark, providing a unifying framework for otherwise disparate seeming rules. Within each body of law, there are departures from the approach of the general theory. But those departures prove consistent with the underlying rationale, preserving the incentive structure of intellectual property, while adapting it to the particular social roles of patent, copyright, and trademark.

IV. IMPLICATIONS FOR INTELLECTUAL PROPERTY DOCTRINE

¶23 The authors use their general theory as a tool for analyzing some intellectual property rules closely related to remedies: liability standards, potential defendants, and standing. These rules govern the questions of who can sue for infringement, who they can sue, and what level of fault is required. The rules do not go strictly to the scope of substantive rights (such as the obviousness standard in patents or the adaptation right in copyright) but are linked to remedies: who can recover and who must pay. But, as the authors show, they play a considerable role in affecting the incentives provided by those substantive rights.

¶24 Patent, copyright, and trademark are often considered strict liability rules. To show infringement of a patent, one need only show that the defendant made (or used or sold or distributed) the patented invention. The defendant need not have intended to

³² *Id.* at 84-85.

³³ *Id.* at 86.

³⁴ *Id.* at 94-95.

infringe or even known of the invention or the patent. An engineer that develops a new skunk detector in her lab and sells it may be liable for infringement of an existing patent on a similar invention. Copyright and trademark likewise have no mental state requirement. Infringement does not require willfulness, intent, or negligence. Innocent infringers are liable. Looking only to the scope of substantive rights, then, intellectual property appears to have a set of strict liability rules.

¶25 When the incentives created by the remedies rules are considered, however, those rules function more like negligence or intent rules.³⁵ Patent law has a marking requirement as part of its remedies provisions. A patentee may place a patent notice, like “Pat. 5,670,990,” which appears on the bottom of many computer mice, to use an example at hand. A patent notice is not necessary to maintain patent validity. Anyone who made (or used or sold or distributed) the patented mouse would be liable for infringement whether the notice appeared or not. But the infringer is not liable for damages unless proper patent notice gave her potential warning of possible infringement and she nevertheless infringed. This remedies rule makes liability effectively depend upon intentional or negligent infringement.

¶26 Copyright likewise has rules that effectively condition liability on some level of culpability.³⁶ There is no infringement liability in copyright without proof of copying. In other words, the defendant must have used material copied from the copyrighted work. Like the patent notice requirement, this means that liability depends on infringement despite some level of warning. Trademark’s rules provide a similar, if more generalized, type of warning.³⁷ Infringement requires that a typical consumer would likely be confused by the similarity between plaintiff’s and defendant’s marks in the marketplace context. Just as the patent notice gives some warning to potential infringers, the mark itself acts as a warning sign to others not to use similar marks. In addition, the damages available are lesser where infringement is not willful.

¶27 So patent, copyright, and trademark all effectively condition liability on some level of negligence. Such rules jibe well with the incentive structure underlying the general theory. In particular, they give rights holders an incentive to provide notice of their claims, thus reducing the likelihood of infringement and thereby maintaining the profits that provide the incentive for invention and creation. That said, the authors show how the rules could be tailored to more closely serve the existing incentive structure. The patent notice requirement, for example, can permit knowing infringers to escape liability. The rule could be tailored somewhat, so that knowing infringers would be liable even in the absence of marking. This would preserve the incentives created by patents generally.

¶28 The rules governing potential parties differ in several respects from what the general theory would provide. Potential defendants, especially in patent law, are more broadly defined than would be necessary to protect the incentive structure of patents.³⁸ If an inventor holds a patent on television technology, that patent would be infringed by a manufacturer that made infringing sets, by the wholesale distributor, by the retailer, and even by a consumer that used an infringing television. Where the profits from infringement can be captured by the commercial parties, such a broad range of defendants

³⁵ *Id.* at 99-102.

³⁶ *Id.* at 102-04.

³⁷ *Id.* at 104-05.

³⁸ *Id.* at 132-33.

would be unnecessary to protect the interests of the patentee. Making more than one party liable makes sense, because a single defendant may be judgment proof or may not secure sufficient profits to compensate the patentee, but applying liability all the way along the line to cover private, noncommercial use by a consumer goes well beyond that rationale. In addition, such potential liability along the chain introduces some risk and therefore costs to all transactions involving technology, without the counterbalance of increasing the incentives for inventors. So application of the general theory here serves less to explain existing rules than to support relaxing the liability standards in patent, especially with respect to end users. But the authors also recognize that such theoretical risks are reduced by other incentives to patent holders. In practice, patentees rarely sue consumers.³⁹ Consumers are not attractive defendants, and are not likely to be liable for substantial damages (statutory damages are available in copyright but not patent). Consumers are also the end market for the invention, so the patentee also has good reason not to make enemies of them.

¶29 The analysis also provides some caution about the direction in which technology may be taking the liability rules. Patent probably applies too broadly to consumers at present, but in practice patentees rarely apply such rights. Copyright, unlike patent, does not confer exclusive rights over the *use* of the work and so to date has had little applicability to consumers. This jibes well with the general theory, under which liability of commercial infringers is generally sufficient to protect the incentives to create. But as works increasingly appear in digital form, the practical extent of copyright has expanded. Using a digital work (a game, an image, a song) involves making a copy of it, if only a temporary copy in the working memory of a computer. So now the copyright owner's right to make copies in practice effectively may cover the use of a work by a consumer. This convergence between copyright and patent, by extending the scope of copyright protection, may take copyright beyond the existing incentive structure. Moreover, where patent holders have tended to leave consumers alone, copyright owners have shown considerable interest in using digital rights management to monitor and control consumer use of works.

¶30 With respect to the rules of standing (rules governing who can sue to enforce intellectual property rights), the book's analysis provides strong arguments for revising the existing rules.⁴⁰ Both patent and copyright have complicated, formalistic rules governing standing. In patent, only the patent owner has standing to sue for infringement of the patent. If the patent holder has sold the exclusive rights to use the invention, the exclusive licensee has no standing to sue for infringement. Suppose an engineer invents a new portable music player. She grants a manufacturer the exclusive right to make and sell the device, in exchange for a hefty lump sum. Another manufacturer makes and sells infringing music players. The exclusive licensee cannot sue for infringement, even though it owns the exclusive right being infringed. The inventor is the only one with standing to sue, even though the infringement may not cause her any harm because she has parted with the right in question and received full payment. The theory behind the rule is that allowing licensees to sue would create the possibility of duplicative litigation or put the validity of the patent at issue in cases where the patent holder was not a party,

³⁹ *Id.* at 143-44.

⁴⁰ *Id.* at 160-207.

able to protect its rights. But viewing the matter through the incentive framework of *Economic Dimensions*, the matter looks quite different. The party with the greatest incentive to litigate to protect the patent rights is the exclusive licensee. The validity of the patent as a whole may or may not matter to the inventor, who has sold some of the exclusive rights, and perhaps all the rights with financial importance. Moreover, the restrictions on standing also reduce the transferability of patent rights. Exclusive rights are less valuable to potential licensees where the buyer of the rights does not have standing to enforce them. Even nonexclusive licensees, in some cases, would suffer from infringement and have stronger incentives to enforce the patent than would the inventor. The standing rules would be better based on economic reality than legal formalism.

¶31 Copyright likewise has formalistic standing rules. Copyright restricts standing to the owner of an exclusive right at the time of infringement. A screenwriter lacked standing to sue for infringement of a screenplay she wrote, even though the copyright and any claims for infringement had been transferred to her prior to the litigation.⁴¹ She had written the work as an employee of the movie studio, who therefore owned the copyright at the time of the infringement. So the screenwriter, even though she had actually written the screenplay and now owned its copyright and had been assigned the claim for infringement, lacked standing to sue. Only the *former* owner of the copyright now had standing to sue (even though it had nothing to gain by doing so, having transferred the copyright and the claim for infringement). Such a result elevates legal form over economic substance.

¶32 Copyright is somewhat less formalistic than patent, because an exclusive licensee may sue for copyright infringement. The authors suggest a possible reason for the distinction, that the validity of copyrights is less often litigated than with patents, and so there is less danger of litigating validity in the absence of the copyright owner. But copyright's standing rules still use formalities that undercut its own underlying incentive structure.

¶33 The authors suggest several ways in which the existing standing rules could be tailored to better fit the purposes of intellectual property. But they also put forward a much more elegant solution. Limiting standing and bringing in extra parties are responses to hazards like inefficient litigation, or determination of rights in the absence of affected parties. The existing standing rules address those hazards rather bluntly and unsuccessfully. But those hazards are hardly unique to intellectual property law. Rather, the rules of civil procedure provide a number of mechanisms to straightforwardly address them in a fashion tailored to the particular case. A wise approach might simply be to have a broad standing rule, as in most areas of law, that one injured by infringement has standing to sue.⁴² Then rules like joinder of necessary parties and intervention could be used to foster efficient and just litigation.

¶34 *Economic Dimensions* similarly applies its analytical framework to the existing rules for calculating monetary damages. The patent rules governing remedies have grown through accretion, as the courts, especially the Federal Circuit, have fashioned guidelines in the light of particular cases. What the authors aptly call a “miscellany of rules” govern the calculation of damages in patent cases. The book makes a persuasive

⁴¹ See *Silvers v. Sony Pictures Ent., Inc.*, 402 F.3d 881 (9th Cir. 2005) (en banc).

⁴² BLAIR & COTTER, *supra* note 6, at 206-07.

argument that, as in tort law, a general rule of requiring “but-for” and proximate cause would be more efficient and at least as accurate as the application of the present rules, which are complicated, somewhat inconsistent, and rely on some outmoded economic models of patents.⁴³

¶35 *Economic Dimensions* approach to intellectual property law offers a powerful tool to both explain and reform intellectual property law. The analysis draws strength from its pragmatic approach, combining a persuasive abstract theory with practical adjustments for differing contexts. The point of the discussion is never theory for its own sake, rather how economic analysis can help clarify and revise intellectual property law.

V. BROADER USE OF THE ANALYSIS

¶36 The analytical approach of *Economic Dimensions* rests on the incentive structure of intellectual property. The authors dissect the law of remedies, liability standards, standing, and monetary remedies, making persuasive arguments for how those areas should be best understood. In so doing, the book stays close to remedies, the doctrinal basis of its theoretical approach. This section takes the focus on incentives and applies it to a change in patent law in a way that could ameliorate two of patent’s most problematic areas, patent quality and claim interpretation. *Economic Dimensions* shows that adjusting the remedies rules affects the incentive structures for innovation and creation. This section explores whether permitting a defense of independent creation could likewise preserve the incentive for innovation while reducing the costs of invalid patents and uncertain claim interpretation.

¶37 Patent quality – or lack thereof – is a wide-ranging issue in intellectual property. In patent litigation, around half of the patents contested are held to be invalid. It may be that litigated patents are not a representative sample. A small percentage of patents end up in lawsuits, and possibly invalid patents are overrepresented in that sample.⁴⁴ But several factors make it likely that the USPTO would issue patents on claims that ultimately do not meet the statutory requirements. Applicants are not required to search and disclose to the USPTO all relevant technology in the area. The USPTO itself has access to only some of the previous work in any area. So a USPTO examiner may not know of “prior art” that shows that a claimed invention is not truly new and non-obvious. Patent subject matter has also expanded considerably in recent years, embracing areas once thought unpatentable, such as biotechnology, computer programs, and business methods. Unlike longstanding areas of science where the knowledge in an area may be relatively well catalogued, business methods and computer programs may be in public use but not catalogued in scientific treatises.

¶38 Finally, USPTO examiners are human, with limited time and resources. The time and information required to determine whether an invention is truly new on the face of the earth may be much greater than an examiner has available. Indeed, it has been elegantly put that seeking high patent quality would be waste of resources.⁴⁵ When

⁴³ *Id.* at 208-62.

⁴⁴ Which suits go to trial may depend on such factors as the information available to the parties and their confidence of success. *Cf.* Keith N. Hylton, *Asymmetric Information and the Selection of Disputes for Litigation*, 22 J. LEGAL STUD. 187 (1993).

⁴⁵ *See* Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1525 (2001).

patents are truly tested in litigation, it requires millions of dollars in resources to determine whether the patent should have been issued. Both sides hire experts, researchers, and patent counsel and from that expensive adversary process, a considerable information base emerges for a court to make an informed decision. If the USPTO were to undertake similarly thorough examination processes, then patent fees might be millions of dollars – even though most patents have no commercial value and result in no disputes.⁴⁶ Rather, having a relatively limited examination makes economic sense, leaving it to litigation to devote resources to a few number of contested patents. In short, a strategy of “rational ignorance” in patent examination makes sense.

¶39 Recent years have seen many proposals to improve patent quality. Reform has focused on improving the efficiency and accuracy of the examination process by the USPTO. Congress could clarify the standards that the USPTO uses to grant patents, to clarify the uncertainty created by the case law. A pre-grant opposition process could be created. Before being issued, a patent would be published and interested parties could file opposition proceedings, to bring forward prior art not available to the USPTO. A broader reexamination process would likewise allow parties to challenge existing patents. The subject matter of patents could be limited, or special rules formulated for examination in areas where prior art may be readily available (such as software, which is often not widely published). Patent examiners could be paid more and treated better (to attract and keep better examiners)⁴⁷ and given more time to examine patents.

Reform of the examination process is likely to improve patent quality only marginally. The basic insight of rational ignorance still obtains: to have a markedly more accurate examination process, the system would have to devote comparable resources to examination of a patent that it does to litigation of a patent.

¶40 The problem of claim interpretation contributes great uncertainty to patents. Every patent is different. The rights of a patent holder are defined by the claims drafted by the inventor (and her counsel). The rights of an inventor are not defined by reference to the invention itself, but rather by the words she uses to claim her invention. A pivotal stage in a patent case is often the *Markman* hearing, in which the trial court interprets the scope of the claims.⁴⁸ Many appeals in patent cases involve review of the trial court’s interpretation. Patent litigation often turns on such interpretive issues as whether a patent claim used the word “adjacent” to mean “next to” or “near to,”⁴⁹ or what the inventor meant by claiming that her computer screen interface was “aesthetically pleasing.”⁵⁰

¶41 The basic insight of *Economic Dimensions* is that the incentive structure of intellectual property depends not just on the substantive rights, but on such matters as remedies, standing, and potential defendants. One such rule differs considerably in copyright and patent law. Copyright law recognizes a defense of independent creation. Patent law does not. If an author writes a book that by coincidence is substantially similar to an existing book, it does not infringe the copyright in the first-written book.

⁴⁶ See Kimberly A. Moore, *Worthless Patents*, 20 BERKELEY TECH. L.J. 1521 (2005).

⁴⁷ For information and analysis of patent quality reform with considerable insight into the operations of the USPTO, see <http://www.iplaw-quality.com/> (website of Gregory Ahorian, editor and publisher of the Internet Patent News Service).

⁴⁸ *Markman v. Westview Instruments, Inc.*, 52 F.3d 967 (Fed. Cir. 1995).

⁴⁹ See *Free Motion Fitness, Inc. v. Cybex Int’l*, 423 F.3d 1343 (Fed. Cir. 2005).

⁵⁰ See *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342 (Fed. Cir. 2005).

But if an inventor invents a machine that by coincidence falls within the claims of the patent on an existing invention, that does infringe the patent. If one assumes that issued patents reflect the optimal balance to preserve the incentive structure of patents, such a distinction might make sense for several reasons.

¶42 We can take the approach of *Economic Dimensions* more broadly by dropping some of its limiting assumptions. Such a path has been the story of economic analysis in law. To take contract law as an example, the first wave of law and economics, relying on the Coasean approach, viewed contract law as a matter of gap-filling: contracts should be interpreted and applied as the parties would have agreed, had they negotiated the point. This approach relied on standard assumptions of market economics, such as fully informed parties. Dropping those assumptions allowed the use of game theory (with its focus on interactions where parties have access to different information). Under this approach, contract law also serves to create information-forcing defaults, rules that do not mimic the bargain the parties would reach in a hypothetical negotiation, but rather give parties incentives to disclose information in their actual negotiation.⁵¹ This approach still relied on assumptions such as parties being rational maximizers and the assumption that legal rules were of primary importance in affecting behavior. Both those assumptions are under fire, as law and economics has turned to behavioral economics (which has shown that rather than rational maximizing, people rely on various heuristics)⁵² and norms⁵³ (the considerable effect that non-legal standards have on the actual behavior of people).⁵⁴

¶43 On a smaller scale, relaxing the assumptions in *Economic Dimensions* would allow broader use of its analytical approach. A basic working assumption of the analysis is that the present set of intellectual property rights is socially optimal, an assumption that is “perhaps heroic,”⁵⁵ but allows a baseline for the analysis. If around half of patents are invalid, however, and patent claims are difficult to interpret, then issued patents may well not reflect that balance accurately. An independent creation defense might reduce those problems, while leaving the incentive structure intact.

¶44 The problems of patent quality and claim interpretation are interdependent.⁵⁶ Every claim is different, and claims are left to interpretation in future cases involving technology that may not even exist when the patent application is examined. An obscure patent may issue on a machine or piece of software that never makes it to market. Years later, other inventors market products that have been developed completely independently. Nevertheless, language being as flexible as it is and the patent examination being as difficult as it is, the language of the earlier patent may be read broadly enough to encompass the new technology. But a defense of independent creation would bar infringement in such a case.

⁵¹ See Ian Ayres & Robert Gertner, *Filling Gaps in Incomplete Contracts: An Economic Theory of Default Rules*, 99 YALE L.J. 87, 88 (1989).

⁵² See, e.g., BEHAVIORAL LAW AND ECONOMICS (Cass Sunstein ed., Cambridge U. Press 2000).

⁵³ See, e.g., Richard H. McAdams, *The Origin, Development, and Regulation of Norms*, 96 MICH. L. REV. 338, 412 (1997).

⁵⁴ Economic analysis continues to find new frontiers. See, e.g., Terrence Chorvat, Kevin McCabe & Vernon Smith, *Law and Neuroeconomics*, 13 SUP. CT. ECON. REV. 35 (2005).

⁵⁵ BLAIR & COTTER, *supra* note 6, at 263.

⁵⁶ Indeed, under the doctrine of prosecution history estoppel, claims may be construed in light of the communications between the inventor and the USPTO regarding the application. See, e.g., Douglas Lichtman, *Rethinking Prosecution History Estoppel*, 71 U. CHI. L. REV. 151 (2004).

¶45 An independent creation defense might reduce the incentives to create.⁵⁷ But such reduction would be marginal. An inventor would still be entitled to the full basket of exclusive rights over all the commercial uses that flowed from her invention. She could not, however, expect to recover profits from those that developed a similar product independently. She could reduce the chance of that happening, however, by publicizing her invention within the field. Once it was well known to those in the field, others would be hard put to claim they developed the same thing independently. In addition, a key insight from *Economic Dimensions* is that reform of patent rules can be tailored, as they show in the various possible sets of rules governing such matters as remedies or standing. Likewise, an independent creation defense could be tailored to balance such factors as incentive,⁵⁸ evidentiary burdens (to prevent copiers from falsely using the independent creation defense), and remedies (such as proving that independent invention may not be a complete defense but may reduce the available remedy).

¶46 The possible reduction in incentives would likely be outbalanced by other effects of an independent creation defense. It would eliminate the marginal cases where words of an existing patent claim reach future technology, developed without reference to the patent claim. This would reduce costs of litigation by eliminating certain vexing issues of claim interpretation. It would also benefit inventors by reducing two risks: the risk of being captured in the claims of a patent that they never heard of, and the inherent risks of claim interpretation.

¶47 By contrast, reforms in the patent examination process may be less likely to ameliorate the risks of such a case. A pre-grant opposition process, for example, serves

⁵⁷ It has been argued that an independent creation defense would not inefficiently reduce the incentives to inventors, indeed might overall increase the incentive to invent. See Stephen M. Maurer & Suzanne Scotchmer, *The Independent Invention Defense in Intellectual Property*, 69 *ECONOMICA* 535 (2002) (arguing that independent creation defense would not inefficiently reduce incentive to invent, while it would increase the use of the invention); Samson Vermont, *Independent Invention as a Defense to Patent Infringement*, 105 *MICH. L. REV.* (forthcoming 2006), available at <http://www.gmu.edu/departments/law/faculty/papers/docs/06-27.pdf> (arguing that independent creation defense would not reduce incentive below that necessary to spur inventors). Compare Mark Lemley, *Should Patent Infringement Require Proof of Copying?*, (Jan. 4, 2007) (response to Prof. Vermont, suggesting that rather providing a complete defense, independent invention should be taken into account by creating prior use rights and in the application of the doctrines of obviousness, willful infringement, and remedies). See also John S. Leibovitz, *Inventing a Nonexclusive Patent System*, 111 *YALE L.J.* 2251 (2002) (arguing that economic efficiency is consistent with a theoretical regime where independent inventors would receive independent patents on the same invention). Such arguments assume that the patent system itself is according valid patents to inventors. This paper discusses the independent creation defense with a much different assumption – that a substantial number of issued patents are invalid – and seeks to use the independent creation defense to lower the costs of that systemic problem. For an argument that the possibility of patent invalidity should permit a temporary defense of independent creation until a court has ruled on the validity of the patent, see Michelle Armond, *Introducing the Defense of Independent Invention to Motions for Preliminary Injunctions in Patent Infringement Lawsuits*, 91 *CAL. L. REV.* 117 (2003) (arguing that, because patents may be held invalid at trial, independent invention should be a defense against injunctive relief).

⁵⁸ A rule (based on enablement, as opposed to an independent creation defense) that would have similar effect would be to restrict the scope of patent claims to the state of the art when the application was filed, as opposed to reaching after-developed technology. See Robin Feldman, *Rethinking Rights in Biospace*, 79 *S. CAL. L. REV.* 1 (2005) (proposing such a rule for biotechnology patents). Such a rule would in effect protect independent creators of more advanced technology, as opposed to the present rule which applies patents to after-developed technology within their scope.

as an effective guard only where affected parties are aware of the application and the risk it may encompass their innovation. But it is unlikely that innovators generally could constantly monitor the published patent applications with the necessary level of scrutiny. It would require considerable resources even to attempt to keep up with all the patent activity within a field. As discussed above, determining whether a patent is valid requires considerable resources, from researching the prior art to consulting experts in the field. To the extent that patent quality relies on oppositions, it simply places those costs on interested parties, rather than on the patent office. Moreover, it may not be clear until several years after the patent issues that it potentially encompasses an independently developed technology.

¶48 An independent creation defense could also be justified by the difficulty of fact-finding, just as *Economic Dimensions* reasons with awards of trademark damages. Although the optimal rule might award damages measured by defendant's profits, such a determination would be difficult to make in most cases and awarding a reasonable royalty is likely to be just as accurate. In a similar vein, an independent creation defense would in many cases be a proxy for determination issues of novelty and inventiveness (whether the first patent was really new and non-obvious), enablement (whether the first patent disclosed information that reasonably encompassed the second invention), and claim interpretation.⁵⁹

¶49 An independent creation defense would also bolster the incentive structure of patents in an important sense. Patents do not just encourage invention. They provide incentives to invent, disclose, and commercialize.⁶⁰ With no independent creation defense, an inventor may choose to draft a broad patent application on an invention with no present commercial use. The patent may then sit in a drawer while innovation in the field continues. At some point, commercial products in the field may fall within the broad terms of the patent claim, at which point the inventor can seek licensing fees. With an independent creation defense, there would be no infringement if the products were developed without reference to the patented technology. Such inventors would have incentives not just to seek patent protection, but also to more widely disclose and commercialize their technology. At the extreme, the independent creation defense would torpedo "submarine" patents, where an inventor files a patent application and delays the examination process while technology in the field advances, seeking issuance of the patent only when products on the market will be subject to the new patent (on old technology).⁶¹

⁵⁹ A recent Federal Circuit case obliquely relates independent creation to claim construction. The court suggested that the alleged infringer's knowledge of a patented invention would be relevant to claim construction. See *Wilson Sporting Goods Co. v. Hillerich & Bradsby Co.*, 442 F.3d 1322 (Fed. Cir. 2006). By implication, someone that produced the same invention independently would be held less likely to infringe the claims, as construed.

⁶⁰ BLAIR & COTTER, *supra* note 6, at 13.

⁶¹ See *Symbol Techs., Inc. v. Lemelson Med., Educ. & Res. Found., LP*, 422 F.3d 1378 (Fed. Cir. 2005) (holding that a patent may be rendered unenforceable by unreasonable, unexplained delay in prosecuting the patent).

VI. CONCLUSION

Economic Dimensions comes at an opportune time for development of intellectual property law. It provides a useful tool for evaluating intellectual property doctrine in light of its underlying incentive structure. As the law adjusts to new technologies and new social norms, arguments abound about the proper role of intellectual property law and policy. In patents, Congress is working on the first major reform legislation since 1952, while the Supreme Court has taken up several cases on key issues. In copyright, the law is straining to accommodate digitization and networking. Trademark likewise struggles with issues like balancing trademark rights against free speech, and technological issues like search engine use of trademarks in keyword advertising. In each case, the present economic paradigm balances noncommensurate values. *Economic Dimensions* provides an approach that balances apples and apples. The book does not claim to offer a solution to such vexing problems but does offer a flexible and pragmatic tool for analysis.