

# The Deterioration of Appropriate Remedies in Patent Disputes

By Dirk Auer, Geoffrey A. Manne, Julian Morris, & Kristian Stout

Intellectual Property Practice Group

## About the Authors:

Dirk Auer is the Senior Fellow for Law & Economics at the International Center for Law & Economics (ICLE). Geoffrey A. Manne is the President of ICLE. Julian Morris is a Senior Scholar at ICLE. Kristian Stout is Associate Director at ICLE. ICLE is a nonprofit, nonpartisan research center that promotes the use of law & economics to inform public policy debates. ICLE has received financial support from numerous companies and individuals, including firms with interests both supportive of and in opposition to the ideas expressed in this work. The ideas expressed here are the authors' own and do not necessarily reflect the views of ICLE's advisors, affiliates, or supporters.

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## Other Views:

- Kai-Uwe Kuhn, *Standard Setting Organizations Can Help Solve the Standard Essential Patents Licensing Problem*, COMPETITION POL'Y INT'L (March 4, 2013), <https://www.competitionpolicyinternational.com/standard-setting-organizations-can-help-solve-the-standard-essential-patents-licensing-problem/>.
- Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991 (2006), <https://faculty.haas.berkeley.edu/shapiro/stacking.pdf>.
- Mark A. Lemley & A. Douglad Melamed, *Missing the Forest for the Trolls*, 13 COLUM. L. REV. 117 (2013), [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2269087](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2269087).

Property rights are an essential economic institution. As the great UCLA economist Harold Demsetz famously argued, property rights spur specialization, investment, and competition, which in turn increase productivity, innovation, and wealth throughout the economy.<sup>1</sup>

The same holds true for intellectual property rights, including patents, which are no less important than their traditional counterparts in facilitating innovation and the efficient organization of productive economic activity, particularly in the modern, high-tech economy.<sup>2</sup> A wealth of literature indicates that much, if not most, of the value of innovation is passed on to consumers in the form of lower prices and higher quality goods and services.<sup>3</sup> Indeed, as Nobel Laureate William Nordhaus finds, even in the presence of patents to facilitate the appropriability of the value of innovation by inventors, “only a miniscule fraction of the social returns from technological advances over the 1948-2001 period was captured by producers, indicating that most of the benefits of technological change are passed on to consumers rather than captured by producers.”<sup>4</sup> Thus, although measurement problems plague such research, there is strong evidence that nations with greater levels of patent protection have historically achieved significantly higher innovative output than those with lower levels of patent protection.<sup>5</sup>

Nevertheless, a significant body of academic and policy work has argued—with very real policy success—that patent

- 1 Harold Demsetz, *Toward a Theory of Property Rights II: The Competition Between Private and Collective Ownership*, 31 J.L. STUD. S653, S665 (2002) (“The single most important force behind our growing use of private ownership has been the productivity gains that result from specialization.”). See also Harold Demsetz, *Toward a Theory of Property Rights*, 47 AM. ECON. REV. PAPERS & PROC. 347 (1967).
- 2 See generally Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & ECON. 265 (1977); F. Scott Kieff, *Property Rights and Property Rules for Commercializing Inventions*, 85 MINN. L. REV. 697 (2001).
- 3 See, e.g., Edwin Mansfield, *Social and Private Rates of Return from Industrial Innovations*, 91 Q.J. ECON. 221 (1977); Adam Jaffe, *Technological Opportunity and Spillover of R&D: Evidence from Firms' Patents, Profits, and Market Value*, 76 AM. ECON. REV. 984 (1986).
- 4 William D. Nordhaus, *Schumpeterian Profits in the American Economy: Theory and Measurement 1* (Nat'l Bureau of Econ. Research, Working Paper No. 10433, 2004), available at <http://www.nber.org/papers/w10433>.
- 5 See, e.g., Zorina Khan & Kenneth L. Sokoloff, *Institutions and Democratic Invention in 19th-Century America: Evidence from “Great Inventors,” 1790-1930*, 94 AM. ECON. REV. 400 (2004). See also Josh Lerner, *The Economics of Technology and Innovation: 150 Years of Patent Protection*, 92 AM. ECON. REV. 221 (2002); Albert G.Z. Hu & I.P.L. Png, *Patent Rights and Economic Growth: Evidence from Cross-Country Panels of Manufacturing Industries*, 65 OXFORD ECON. PAPERS 675 (2013) (finding faster growth and higher value in patent intensive industries in countries that improve the strength of patents); Stephen Haber, *Patents and the Wealth of Nations*, 23 GEO. MASON L. REV. 823 (2015); Bronwyn H.

rights in the U.S. have been too strong.<sup>6</sup> The past two decades have witnessed a significant weakening of patent protection in the U.S. as courts, legislators, and several private organizations have progressively chipped away at some of the key features of patent protection. This includes the availability of injunctions, the amount of damages awarded to victims of patent infringement, and other, more subtle changes, such as curbs on fee-shifting between parties to patent litigation.

Behind many of these changes lies a powerful intellectual movement, alleging that excessive patent protection is holding back western economies. These critics chiefly fear that the owners of the standard essential patents (“SEPs”) crucial to much of modern technology are charging their commercial partners too much for the rights to use their patents—referred to as patent holdup and royalty stacking<sup>7</sup>—and that so-called patent trolls (“patent-assertion entities” or “PAEs”) are deterring innovation by small startups by employing “extortionate” litigation tactics.<sup>8</sup> Oversimplifying, the argument is that, by selecting certain winning technologies, standardization artificially weakens implementers’ bargaining position vis à vis patent holders. Accordingly, critics argue that the royalties charged by SEP holders should not exceed those that they could have obtained before their technology was included in a standard. However, there is little evidence beyond occasional anecdotes to support the first of these concerns, and a growing body of empirical research points in the opposite direction.<sup>9</sup> And the latter concern, while real, is complex, and the optimal policy response should address these complexities more than typical proposals do. Yet despite the limited evidence and complexities, policymakers have been quick to act on them.

It may even be the case that the policy changes that have been made are impeding the ability of owners of SEPs to enforce their rights to such an extent that they are now being

under-rewarded. Most notably, there is at least some evidence to suggest that the looser enforcement of IP rights is resulting in *holdout* behavior (i.e., situations where would-be licensees avoid concluding a license agreement because they know that they are shielded from legal repercussions for infringement).<sup>10</sup>

While this does not appear to have resulted in a marked decrease in innovative output so far, there is certainly a risk of that happening, especially if lawmakers continue to alter the legal regime in ways that systematically disadvantage patent holders. Indeed, although the causes are unclear, already there are concerns about secular stagnation and the slowdown in productivity growth.<sup>11</sup> In that context, policies that weaken incentives to innovate seem like the height of folly. Moreover, since many important innovations bear fruit only many years after the initial investment in research and development, any subsequent change of course may have few short-term benefits and might even have short-term costs, making it politically difficult if not impossible to change course once more significant adverse effects on innovation start to appear.

Against this backdrop, this article uses the analytical framework of law and economics to offer insights into what policies can help reduce unnecessarily burdensome patent litigation and thereby accelerate the pace of technological progress. Among other things, law and economics enables us to better understand the incentive effects of different rules regarding the enforceability of patents and the optimal balance of remedies to produce the greatest social welfare. The article begins by discussing the critical role that patents play in fostering dynamic technology markets (Section I). It then reviews recent legal and policy developments concerning the availability of injunctions (Section II) and the size of damage awards (Section III). It then considers other legal rules and procedures that may affect innovation incentives (Section IV). We conclude by discussing the policy implications of these developments (Section V).

## I. PATENTS FACILITATE INVESTMENTS AND EXCHANGES IN SOME OF THE MOST DYNAMIC SECTORS OF THE ECONOMY

As suggested above, patents likely play an important role in providing inventors with incentives to innovate. But the role of

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Hall & Rosemarie Ham Ziedonis, *The Patent Paradox Revisited: An Empirical Study of Patenting in the US Semiconductor Industry, 1979-1995*, 32 RAND J. ECON. 125 (2001) (identifying “two ways in which the pro-patent shift in the U.S. legal environment appears to be causally related to the otherwise perplexing surge in U.S. patenting rates, at least in the semiconductor industry”); Nikos C. Varsakelis, *The Impact of Patent Protection, Economy Openness and National Culture on R&D Investment: A Cross-country Empirical Investigation*, 30 RES. POL’Y 1067 (2001) (“Patent protection is a strong determinant of the R&D intensity, and countries with a strong patent protection framework invest more in R&D.”).

6 See, e.g., ADAM B. JAFFE & JOSH LERNER, *INNOVATION AND ITS DISCONTENTS: HOW OUR BROKEN PATENT SYSTEM IS ENDANGERING INNOVATION AND PROGRESS, AND WHAT TO DO ABOUT IT* (2004); MICHELE BOLDRIN & DAVID K. LEVINE, *AGAINST INTELLECTUAL MONOPOLY* (2008); DAN L. BURK & MARK A. LEMLEY, *THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT* (2009).

7 See, e.g., Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991 (2006).

8 See, e.g., Mark A. Lemley & A. Douglas Melamed, *Missing the Forest for the Trolls*, 113 COLUM. L. REV. 2117 (2013).

9 See, e.g., Alexander Galetovic, Stephen Haber, & Ross Levine, *An Empirical Examination of Patent Holdup*, 11 J. COMPETITION L. & ECON. 549 (2015). For a recent, detailed discussion of this literature, see Dirk Auer & Julian Morris, *Governing the Patent Commons*, 38 CARDOZO ARTS & ENT. L.J. 121 (forthcoming 2020).

10 See Bowman Heiden & Nicolas Petit, *Patent Trespass and the Royalty Gap: Exploring the Nature and Impact of Patent Holdout*, 34 SANTA CLARA HIGH TECH. L.J. 179, 211 (2017) (“At a general level, patent trespass can be said to arise when a SEP holder’s licensing revenue decreases, because some (or all) technology implementers avert, either temporarily or permanently, the conclusion of a licensing agreement on terms that correspond to recognized industry practices.”). See also Richard A. Epstein & Kayvan B. Noroozi, *Why Incentives for Patent Holdout Threaten to Dismantle FRAND, and Why It Matters*, 32 BERKELEY TECH. L.J. 1381 (2017) (“By ‘patent holdout’ we mean the converse problem—that an implementer refuses to negotiate in good faith with an innovator for a license to valid patent(s) that the implementer infringes, and instead forces the innovator to either undertake significant litigation costs and time delays to extract a licensing payment through a court order, or else to simply drop the matter because the licensing game is no longer worth the candle.”).

11 See Nicholas Bloom, *Innovation Is Getting More Expensive: Behind the Slowdown in Productivity Growth*, FOREIGN AFF. (Jun. 7, 2018), <https://www.foreignaffairs.com/articles/world/2018-06-07/innovation-getting-more-expensive>. See also Nicholas Bloom et al., *Are Ideas Getting Harder to Find?*, 110 AM. ECON. REV. 1104 (2020).

patents in the *commercialization* of ideas is probably even more important. Property rights in general, and patent protections more specifically, reduce the cost of transacting, thus enabling firms to specialize.<sup>12</sup> Critically, this means that the patent system encourages and enables not just *invention* but also *innovation* by providing the basic, enforceable property rights that facilitate (theoretically) efficient organizations of economic resources and the negotiations necessary to coordinate production among them. F. Scott Kieff, a United States Federal Trade Commissioner, explained it well when he argued that IP rights are akin to “beacons in the dark, drawing to themselves all of those potential complementary users of the IP-protected-asset to interact with the IP owner and each other. This helps them each explore through the bargaining process the possibility of striking contracts with each other.”<sup>13</sup>

The role of patents in facilitating the commercialization of invention can be illustrated with a simple example: Imagine a world where one firm has invented a next-generation widget (i.e., it has discovered all the information necessary to conceive it). Imagine further that the firm that invented the widget has no manufacturing capacity, but that one or more manufacturers would be willing to implement the technology. For the widget to be brought to market, one of the following needs to occur:

- The inventor vertically integrates, either by acquiring a manufacturer or developing the necessary capacity in-house;
- The manufacturers vertically integrate by acquiring the inventor, discovering alternative means for accomplishing the desired effect of the invention, or even committing outright misappropriation of the invention;
- The inventor and manufacturers sign a series of mutually beneficial contracts whereby the necessary information to enable each to adequately practice and distribute the invention is exchanged for monetary compensation.

12 See Demsetz, *supra* note 1. See also Armen A. Alchian, *Specificity, Specialization, and Coalitions*, 140 J. INSTITUTIONAL & THEORETICAL ECON. 34 (1984) (“All the components of property rights to a resource need not be held in common. It is possible to sell or delegate the rights to decide uses separately from the rights and thereby obtain the gains of specialization, or separation, of use decision from control and ownership, where ownership is the right to the marketable value.”).

13 United States International Trade Commission, Views of the Honorable F. Scott Kieff, Commissioner, on the United States Federal Trade Commission’s and the United States Department of Justice Antitrust Division’s Joint Guidelines for the Licensing of Intellectual Property (Sept. 23, 2016) at 4-5, available at <https://www.justice.gov/atr/file/897081/download>. See also, e.g., Jonathan M. Barnett, *The Anti-Commons Revisited*, 29 HARV. J.L. & TECH. 127 (2015); Daniel F. Spulber, *How Patents Provide the Foundation of the Market for Inventions*, 11 J. COMPETITION L. & ECON. 271 (2015); F. Scott Kieff & Anne Layne-Farrar, *Incentive Effects from Different Approaches to Holdup Mitigation Surrounding Patent Remedies and Standard-Setting Organizations*, 9 J. COMPETITION L. & ECON. 19 (2013); F. Scott Kieff & Troy A. Paredes, *The Basics Matter: At the Periphery of Intellectual Property*, 73 GEO. WASH. L. REV. 174 (2004); Naomi R. Lamoreaux & Kenneth L. Sokoloff, *Intermediaries in the U.S. Market for Technology, 1870–1920*, in FINANCE, INTERMEDIARIES, AND ECONOMIC DEVELOPMENT 209 (Stanley L. Engerman, et al. eds., 2003).

While the existence of intellectual property rights may facilitate each of these solutions (IP rights can be used as securities to finance vertical integration, for example),<sup>14</sup> the third solution would be significantly more costly—or even impossible—in their absence. In other words, the ability to patent innovations tremendously reduces the cost of bringing those innovations to market by enabling inventors to specialize in the production of ideas and to transfer rights in their inventions, through enforceable agreements (i.e., contracts), to parties that have the requisite specialized resources to develop and market them.

By clearly defining the boundaries of each party’s rights, patent law creates one of the necessary conditions for mutually advantageous exchanges to take place. In the words of Ronald Coase, “[w]ithout the establishment of this initial delimitation of rights there can be no market transactions to transfer and recombine them.”<sup>15</sup>

Another key aspect of patent law is that it enables inventors to exclude third parties from making, using or selling their inventions.<sup>16</sup> These rights—and the legal tools that allow them to be enforced (e.g., injunctions and damages)—are essential to spur mutually advantageous exchanges. They ensure that potential licensees cannot free-ride on each other, hoping to reverse engineer an invention once it has been placed on the market by one of them (or by the inventor).

Injunctions, in particular, play a critical role in cementing these rights.<sup>17</sup> Perhaps more than any other tool, they guarantee that the unlawful use of inventions can quickly be terminated by the rightsholder. In so doing, they bring potential licensees to the negotiating table. And, by the same token, *weakening* patent rights may result in patent holdout, whereby firms strategically decide to infringe others’ patents or delay license negotiations.<sup>18</sup> Even if one ignores the reduced incentives to innovate that this may entail (i.e., it damages the inventor’s ability to recoup costs and threatens the viability of commercialization opportunities),<sup>19</sup> this type of behavior has other highly deleterious effects as well. For example, patent holders may respond by resorting to expanded reliance upon trade secret protection and otherwise inefficient vertical

14 See, e.g., Spulber, *supra* note 13, at 272 (“[P]atents support the market for inventions in several important ways: (1) by increasing transaction efficiencies and stimulating competition, (2) by establishing what I term ‘the market for innovative control’ that provides incentives for efficient investment, and (3) by promoting the financing of invention and innovation.”).

15 Ronald H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 8 (1960). Notably, Coase was here referring to *liability rules*, but the general observation applies equally well to “ownership” of both liability and property.

16 35 U.S.C. § 271 (2010).

17 See *infra* Section II.A.

18 See Heiden & Petit, *supra* note 10.

19 See Epstein & Noroozi, *supra* note 10, at 1389 (“[A]nother aspect of the IEEE’s policy revision, as well as two Federal Circuit decisions, . . . have incorrectly deprived innovators of any share of the benefits from the standardization of their technological contributions, creating further distortions in the FRAND framework with significant negative follow-on effects in the innovation marketplace.”).

integration.<sup>20</sup> This may reduce the number of commercialized inventions either overall or that ultimately fall into the public domain twenty years later (after a patent would have expired). Similarly, the inability to enforce their rights may discourage rightsholders from taking part in collaborative efforts to develop new technologies (e.g., through standardization efforts), similarly constraining the extent of valuable innovation. In short, on the margins, reducing the incentives provided by the patent system will tend to lower the relative openness of technology- and science-driven industries.

Particularly in highly dynamic industries characterized by fast-paced change and cross-pollination of ideas through fluid employment and rapid development cycles, weakening IP protection can have a dramatic effect. Firms in dynamic markets need some ability to appropriate and protect the fruits of their labor.<sup>21</sup> Reducing the protection afforded by patents will urge them to turn toward inferior (costlier, slower, etc.) alternatives to achieve this protection. In other words, injunctions and related doctrines provide property holders with the ability to operate quickly and in the open with the knowledge that they can continue to adequately commercialize their inventions.

The technology standardization space perfectly illustrates the importance of these issues. Many of the most high-profile modern technologies are the fruit of large-scale collaboration coordinated through standards developing organizations (SDOs). These include technologies such as Wi-Fi, 3G, 4G, 5G, Blu-Ray, USB-C, and Thunderbolt 3.<sup>22</sup> This type of collaboration would surely be far more costly without well-delineated property rights and the legal means to enforce them. The reasonable assurances of protection through patent rights provides innovators the security they need to share the information necessary to enable the creation of these organizations. The patent system enables modern firms of all sizes in a dynamic economy to coordinate their behavior to produce modern marvels like the smartphone. The coordination necessary for this sort of feat is hard to imagine without some form of enforceable property right in inventions.

This is not to say that some of these features could not be replicated by private ordering or internalized by mergers. *Theoretically* Samsung or Apple could invent and produce all of

the technologies necessary to produce their devices, but the cost for such devices would likely be astronomical and the development time would be measured in years, not months. Absent compelling evidence that these alternative institutions or hierarchies *would* emerge, policymakers should proceed with caution, or risk killing the goose that lays the golden eggs.

At the very least, the fact that many of the most dynamic industries in the world—notably the smartphone and computer hardware industries—develop technologies collaboratively within SDOs is evidence that the benefits of patent protection go well beyond incentives to innovate.

## II. THE MISGUIDED SHIFT AWAY FROM INJUNCTIVE RELIEF

Historically, one of the most important features of property rights in general, and patents in particular, is that they provide owners with almost absolute power to exclude use by third parties. As leading law and economics scholar Richard Epstein notes, “Property rights are, in this sense, made absolute because the ownership of some asset confers sole and exclusive power on a given individual to determine whether to retain or part with an asset on whatever terms he sees fit.”<sup>23</sup> In the case of physical property, such exclusion is achieved through laws against trespass (the use of real property without permission), nuisance (imposition of adverse effects on property such as noise and pollution), and conversion (the taking of chattels without permission).<sup>24</sup> In the case of IP, exclusion is achieved through rights established by statute.<sup>25</sup> For example, the owner of a patent is granted the exclusive right to determine who may use the product or process specified in the patent, usually for 20 years after filing.

These laws would be meaningless, however, without the ability to enforce them and remedy breaches. And one of the most important remedies is the injunction. In its most general sense, an injunction is a court order either requiring or prohibiting certain acts.<sup>26</sup> In the context of IP rights, injunctions are usually applied by courts as a means of prohibiting the unauthorized or unlicensed use of a patented technology.

The period of exclusivity established by a patent works in tandem with the injunctive power to both create an incentive to invest and—perhaps more critically—to facilitate the licensing of inventions.<sup>27</sup> There are many reasons that someone may invent a new product or process, but if they are to be optimally encouraged to distribute that product—and thus generate the associated social welfare—the ability to engage supply chains to

20 See, e.g., Jonathan M. Barnett, *Intellectual Property as a Law of Organization*, 84 So. CAL. L. REV. 785, 816 (2011) (“Weak or no patents can have adverse effects on innovation even if it appears that the relevant market ‘adequately’ supports innovation by recourse to integration. . . . While integration may enable those firms to accrue returns sufficient to cover even substantial R&D costs, they may still be forfeiting specialization gains that could be accrued under contract-based organizational forms that would be feasible under lower levels of expropriation risk. And the most weakly integrated firms that would have existed under stronger forms of patent protection cannot be observed at all.”).

21 See, e.g., Kenneth J. Arrow, *Economic Welfare and the Allocation of Resources for Invention*, in NBER, *THE RATE AND DIRECTION OF INVENTIVE ACTIVITY: ECONOMIC AND SOCIAL FACTORS* 609 (1962) (“We have then three of the classical reasons for the possible failure of perfect competition to achieve optimality in resource allocation: indivisibilities, *inappropriability*, and uncertainty.”) (emphasis added).

22 For a discussion of the numerous technologies that have been brought about through standardization, see Auer & Morris, *supra* note 9.

23 Richard A. Epstein, *The Clear View of The Cathedral: The Dominance of Property Rules*, 106 YALE L.J. 2091 (1996).

24 See, e.g., Henry E. Smith, *Exclusion and Property Rules in the Law of Nuisance*, 90 VA. L. REV. 965 (2004).

25 See, e.g., 35 U.S.C. § 101 (2018).

26 See *Injunction*, Wex Legal Dictionary, <https://www.law.cornell.edu/wex/injunction>.

27 See Epstein, *supra* note 23, at 2101 (“In the usual case, the system tries to stop the invasion so as to require that the alteration of property rights takes place by voluntary transaction. Damages are a second-tier remedy. As with the necessity rules, it would be a mistake to treat injunctions and damages as dichotomous and mutually exclusive remedies.”).

fully commercialize the invention is crucial.<sup>28</sup> If a patent holder believes that the path to commercialization and remuneration is hindered by infringers, she will have less incentive to invest fully in the commercialization process (or in the innovation in the first place). Because infringement affects both the initial incentive to innovate as well as the complex process of commercialization, courts have historically granted injunctions against those who have used a patent without proper authorization.

#### A. Damages Alone Are Often Insufficient

Injunctions are almost certainly the most powerful means of enforcing property rights and remedying breaches. Nonetheless, courts may sometimes award damages either in addition to or as an alternative to the award of an injunction.<sup>29</sup> But it is often difficult to establish the appropriate size of an award of damages when intangible property—such as invention and innovation in the case of patents—is the core property being protected.

Consider the example of a chattel that has been taken without the owner's consent. If that chattel is a family heirloom of distinctive quality—a vase that has been handed down through the generations, for example—the value of the item to the legitimate owner may be greater than the value that could be obtained through a market transaction. The appropriate remedy in such cases is the return of the item. By contrast, if the item can readily be replaced—a current-model television for example—monetary damages would likely be adequate. The difference between these two items relates to the degree to which their value to the owner is idiosyncratic; the more idiosyncratic, the more difficult it is accurately to adjudge monetary value and thereby ensure that the rightful owner of the property is adequately restituted. Thus, the more idiosyncratic the property, the more appropriate it is to use an injunction—to require the return of the object—to remedy its misappropriation.

Patents are certainly idiosyncratic, but they are also highly valuable and tradeable in commercial markets. The key feature of patents in this latter respect is that their value is uncertain *ex ante*. The value of a particular invention or discovery cannot be known until it is either integrated into the end-product that will be distributed to consumers or actually used by consumers. This uncertainty creates a need for patent holders to carefully structure their risk and reward calculus such that the commercialization of the invention can reasonably be expected to generate a profit (which in turn goes back to the initial incentives to even proceed

with the expensive R&D process to create the invention in the first place).

Particularly with highly complex innovations—such as in pharmaceuticals and technology—the degree of risk taking and the required investment of capital is large, and the foregone opportunities can be massive. As such, it will often be difficult or impossible to adequately calculate appropriate monetary damages for the unauthorized use of a patent, even if the *ex post* value of the patent is knowable. So while it will be necessary to establish damages for violations after the fact, it will nearly always be appropriate to award injunctions to deter ongoing violations and to allow the property owner to do their own value calculations based on their investments, sunk costs, and—critically—lost opportunities that were foregone in order to realize the particular invention.

And there are several other reasons why courts have historically seen fit to supplement damages for violations of property rights with injunctions. In the context of *physical property rights*, consider a situation in which A's actions have caused harm to B's property. If B is able to demonstrate that the harm was caused by A (even if unintentionally), the courts will typically require A to pay compensation to B such that he is returned, so far as possible, to his initial state. Unfortunately, it is often difficult to evaluate the actual harm done in such cases, especially if that harm has a subjective element. It is also plausible that the appropriate damages exceed the infringer's ability to pay—in which case damages would insufficiently compensate the property right holder. Moreover, there can also be situations when B fears that A might be about to cause irreparable harm to its property. Or instances where A's actions continue to cause harm to B despite an initial damages award. In all of these cases, injunctive relief may be necessary to ensure the effective enforcement of property rights. The application of injunctive relief thus acts to demarcate clearly the property rights of the two parties.

In the context of *intellectual property*, the potential inadequacy of monetary damages has been repeatedly acknowledged by courts.<sup>30</sup> Indeed, one prong of the four-factor test for injunctions specifically questions whether other remedies (including damages) may provide a property holder with *adequate relief*.<sup>31</sup> As noted above, if innovators expect to be under-rewarded for their investments, they will have less incentive to innovate in the first place.

Unfortunately, this risk is often overlooked by critics who argue that courts should limit the award of injunctions to reduce the problem of patent holdup, which happens when patent holders opportunistically extract royalties from implementers, particularly in the context of SEPs.<sup>32</sup> According to these critics, the problem

28 See, e.g., Barnett, *supra* note 20, at 856 (“Strong patents provide firms with opportunities to disaggregate supply chains through contract-based relationships, which in turn give rise to trading markets in intellectual resources, whereas weak patents foreclose those options.”).

29 See, e.g., Doris Johnson Hines & J. Preston Long, *The Continuing (R)evolution of Injunctive Relief in the District Courts and the International Trade Commission*, IP LITIGATOR (Jan./Feb. 2013), available at <https://www.finnegan.com/en/insights/articles/the-continuing-r-evolution-of-injunctive-relief-in-the-district.html> (citing Tracy Lee Sloan, *The 1988 Trade Act and Intellectual Property Cases Before the International Trade Commission*, 30 SANTA CLARA L. REV. 293, 302 (1990) (“Out of 221 intellectual property cases between 1974 and 1987, the ITC found that only five failed to establish sufficient injury . . . for injunctive-type relief.”)).

30 See, e.g., eBay Inc. v. MercExchange, L.L.C., 547 U.S. 388, 395 (2006) (“[Courts’ inclination to grant injunctions for patent infringement] is not surprising, given the difficulty of protecting a right to exclude through monetary remedies that allow an infringer to use an invention against the patentee’s wishes.”) (Roberts, C.J., concurring).

31 *Id.* at 391.

32 See, e.g., Lemley & Shapiro, *supra* note 7; Joseph Farrell et al., *Standard Setting, Patents, and Hold-Up*, 74 ANTITRUST L.J. 603 (2007). For a contrary view highlighting the absence of evidence that patent holdup is

of patent holdup is compounded by the availability of injunctions that strengthen the bargaining position of rightsholders.

But while popular accounts often focus on alleged holdup problems, undermining property rights may lead to the opposite harm: patent holdout.<sup>33</sup> Patent holdout occurs when a potential licensee opts to infringe, rather than license, a patent because the potential costs from licensing outweigh the costs associated with litigation if the patent holder enforces the patent.<sup>34</sup> When legal doctrine is altered to make it relatively harder for patent holders to enforce their property rights, the threat of holdout—and a concomitant destruction of the incentive to create and commercialize patentable material—increases.

Indeed, one important feature of injunctions is that they do not impose a suboptimal deal on either party. A prevailing patent holder does not receive a windfall as a result of an injunction, but is merely able to guarantee that private bargaining over a license will take place (or else there will be no license). This makes injunctions inherently less worrisome because they do not entail substituting the judgment of a generalist court for that of the commercial expertise of the would-be bargaining parties. The injunction threat might change the potential *range* of bargaining (by frustrating the ability of potential infringers to attempt to implement at no or low cost initially, for instance). But the interests of the patentee are almost always to license the patent; the patent is worthless to them otherwise.

Removing the injunction option, however, not only changes the bargaining range (and makes infringement a valid business option), but, by extension, it lowers the expected returns of investing in the creation and commercialization of patents, in the first place.<sup>35</sup> Further, lack of an effective injunction remedy perversely incentivizes *more* litigation activity relative to the baseline. With a no-injunction presumption, a potential licensee has a diminished incentive to negotiate with a patent holder. Instead, it can refuse to license, infringe the patent, try its hand in court, avoid royalties entirely until litigation is finished, and in the end never be forced to pay a higher royalty in damages than it would have if it had negotiated at the outset. As long as the expected cost of litigation is less than the expected gain from infringing without paying any royalties, potential licensees will always have an incentive to pursue this strategy. The net result is a shift in bargaining power so that, even when license agreements are struck, royalty rates are lower than they would otherwise be, as well as an increased likelihood of infringement. It also

establishes this lower royalty rate as the “customary” rate, which ensures that subsequent royalty negotiations, particularly in the standard-setting context, are artificially constrained.

This effect is multiplied in the SEP context in which the nominal fair, reasonable, and non-discriminatory (“FRAND”) royalty rate is said to be determined with reference to the ex ante bargaining position—that is, before the true value of the patent is known once it has been implemented and commercialized. As a result, the inability to seek an injunction against an infringer further ensures that patent holders operate with reduced incentives to invest in technology and to enter into standards because they are precluded from benefiting from any subsequent increase in the value of their patents once they do so. As Richard Epstein, Scott Kieff, and Dan Spulber write:

The simple reality is that before a standard is set, it just is not clear whether a patent might become more or less valuable. Some upward pressure on value may be created later to the extent that the patent is important to a standard that is important to the market. In addition, some downward pressure may be caused by a later RAND commitment or some other factor, such as repeat play. The FTC seems to want to give manufacturers all of the benefits of both of these dynamic effects by in effect giving the manufacturer the free option of picking different focal points for elements of the damages calculations. The patentee is forced to surrender all of the benefit of the upward pressure while the manufacturer is allowed to get all of the benefit of the downward pressure.<sup>36</sup>

The importance of injunctions in the SEP context, and their effect on licensing rates, has been well-recognized by policymakers. For instance, in a report published in 2011, the FTC argued that:

The threat of an injunction can lead an infringer to pay higher royalties than the patentee could have obtained in a competitive technology market.

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The patentee can use the threat of an injunction to obtain royalties covering not only the market value of the patented invention, but also a portion of the costs that the infringer would incur if it were enjoined and had to switch.<sup>37</sup>

In other words, the FTC endorses the idea that injunctions affect bargaining range during infringement proceedings, which in turn affects their ex ante bargaining range. The FTC thus concludes that courts award damages that exclude the value derived from the threat of injunctions.<sup>38</sup>

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occurring, see Keith Mallinson, *Mallinson on Patent Holdup and Holdout*, WISEHARBOR (Aug. 16, 2016), <https://www.wisesharbor.com/pdfs/Mallinson%20on%20Holdup%20and%20Holdout%20for%20IP%20Finance%2016%20Aug%202016.pdf>.

33 See generally Heiden & Petit, *supra* note 10; see also Epstein & Noroozi, *supra* note 10.

34 See Epstein & Noroozi, *supra* note 10.

35 See, e.g., Mark Schankerman & Suzanne Scotchmer, *Damages and Injunctions in Protecting Intellectual Property*, 32 RAND J. ECON. 201 (2001) (“The only role of damages and injunctions is to set ‘threat points’ for negotiating licenses. The terms of each license are negotiated in the shadow of what would happen otherwise, and in this way, the enforcement regime determines how profitable the patent is for its owner.”).

36 Richard Epstein, F. Scott Kieff, & Daniel Spulber, *The FTC, IP, and SSOs: Government Hold-Up Replacing Private Coordination* 21 (Stanford Law and Econ. Olin, Working Paper No. 414, 2011), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1907450](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1907450).

37 FEDERAL TRADE COMMISSION, *THE EVOLVING IP MARKETPLACE: ALIGNING PATENT NOTICE AND REMEDIES WITH COMPETITION* 4 (2011), available at <http://www.ftc.gov/os/2011/03/110307patentreport.pdf>.

38 *Id.* at 190 (“A reasonable royalty damages award that is based on high switching costs, rather than the ex ante value of the patented technology compared to alternatives, overcompensates the patentee. It improperly

But while the premise is correct, the normative conclusion that the FTC draws does not follow. The higher licensing fees obtained by the threat of injunctions are a feature, not a bug, of the system. They reward licensees that have concluded ex ante license agreements (and who have not, therefore, wasted judicial resources when private bargaining was available), relative to those that have declined to do so. This is precisely the return on risk and innovation that patents are intended to secure.

Compounding this miscalculation, opponents of injunctions overestimate the extent of the threat of patent *holdup* by employing an inappropriate estimation of the proper willingness of potential licensees to negotiate. It is, of course, not optimal to set remedies such that patent holders are over-incentivized to withhold licenses by threatening litigation in order to increase their royalties over the efficient level. But determining whether a potential licensee is really willing to license at a reasonable rate, or is instead holding up negotiation to gain its own litigation-driven bargaining power, is not straightforward. And the measure of willingness commonly employed by commentators—including the FTC—is mistaken.

The crux of the problem is the identification of a willing licensee as one who would license at a hypothetical, ex ante rate absent the threat of an injunction and with a different risk profile than an after-the-fact infringer. The FTC’s definition of a willing licensee assumes a willingness to license only at a rate determined when an injunction is not available, and under the unrealistic assumption that the true value of a SEP can be known ex ante. Not surprisingly, then, the Commission finds it easy to declare an injunction invalid when a patentee demands a higher royalty rate in an actual negotiation, with actual knowledge of a patent’s value and under threat of an injunction.

This definition of willing licensee ignores a crucial difference between the two situations. One should expect that a patent will be worth more when its value is clear from its use in the market, it has been determined to be valid, and there is a threat of injunction. “[A]verage ‘reasonable royalty’ damage awards set rates more than double estimated average negotiated patent royalties. This difference is at least in part attributable to the uncertainty surrounding the strength and value of untested patents.”<sup>39</sup> As Epstein, Kieff, and Spulber discuss in critiquing the FTC’s 2011 Report:

In short, there is no economic basis to equate a manufacturer that is willing to commit to license terms before the adoption and launch of a standard, with one that instead expropriates patent rights at a later time through infringement. The two bear different risks and the late infringer should not pay the same low royalty as a party that sat down at the bargaining table and may actually have contributed to the value of the patent through its early activities. There is no economically

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reflects the economic value of investments by the infringer rather just than the economic value of the invention. To prevent damage awards based on switching costs, courts should set the hypothetical negotiation at an early stage of product development, when the infringer is making design decisions.”)

39 Roger G. Brooks & Damien Geradin, *Interpreting and Enforcing the Voluntary FRAND Commitment* 28 (July 20, 2010), available at [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1645878](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1645878).

meaningful sense in which any royalty set higher than that which a “willing licensee would have paid” at the pre-standardization moment somehow “overcompensates patentees by awarding more than the economic value of the patent . . . .

Even with a RAND commitment, the patent owner retains the valuable right to exclude (not merely receive later compensation from) manufacturers who are unwilling to accept reasonable license terms. Indeed, the right to exclude influences how those terms should be calculated, because it is quite likely that prior licensees in at least some areas will pay less if larger numbers of parties are allowed to use the same technology. Those interactive effects are ignored in the FTC calculations.<sup>40</sup>

Then-FTC Commissioner Maureen Ohlhausen articulated some of this problem in her dissent from the FTC’s proposed settlement in *Google/Motorola*:

[T]he majority says little about what “appropriate circumstances” may trigger an FTC lawsuit other than to say that a fair, reasonable, and non-discriminatory (“FRAND”) commitment generally prohibits seeking an injunction. By articulating only narrow circumstances when the Commission deems a licensee unwilling (limitations added since *Bosch*), and not addressing the ambiguity in the market about what constitutes a FRAND commitment, the Commission will leave patent owners to guess in most circumstances whether they can safely seek an injunction on a SEP.<sup>41</sup>

The critical question over the ambiguity (or simple wrongheadedness) of what constitutes a “reasonable” royalty, and thus whether a potential licensee is “willing” or not, is regularly ignored on an implicit and flawed assumption that reasonableness is readily determined by a party’s willingness to accept only estimated, ex ante royalty rates. But this means that any effort by a patent holder to capture any of the ex post value of its patents met with a refusal is likely to be deemed an act of patent holdup (by the patentee) rather than holdout (by the potential licensee), when it is at least as likely to be the latter.

This is not to say that the theoretical fear of patent holdup (or “royalty-stacking” or “patent thickets”) and the costs they may impose should be dismissed out of hand: there are trade-offs, to be sure. But there is no basis for the one-sided presumption that patentees, not implementers, always have the upper hand. For one thing, the empirical literature on the topic is inconclusive, at best.<sup>42</sup> Moreover, throughout history, patent thickets have often

40 Epstein, Kieff, & Spulber, *supra* note 36, at 21-23.

41 Motorola Mobility LLC and Google Inc., FTC File No. 121-0120, 3-4 (Jan. 3, 2013) (Dissenting Statement of Commissioner Maureen K. Ohlhausen), available at [https://www.ftc.gov/sites/default/files/documents/public\\_statements/statement-commissioner-maureen-ohlhausen/130103googlemotorolaohlhausenstmt.pdf](https://www.ftc.gov/sites/default/files/documents/public_statements/statement-commissioner-maureen-ohlhausen/130103googlemotorolaohlhausenstmt.pdf).

42 See, e.g., David E. Adelman & Kathryn L. DeAngelis, *Patent Metrics: The Mismeasure of Innovation in the Biotech Patent Debate*, 85 TEX. L. REV. 1677, 1679-82 (2007); James Bessen, *Patent Thickets: Strategic Patenting*

been solved through private ordering solutions.<sup>43</sup> And while some commentators make it sound as if injunctions threaten to cripple complex innovations like smartphones by preventing device makers from licensing essential technology on viable terms,<sup>44</sup> companies in this space have been perfectly capable of orchestrating large-scale patent licensing campaigns. The relevant policy question is whether the legal rules and remedies are set in such a way that they facilitate efficient negotiation and minimize the risk and cost of such imperfect solutions when negotiation fails. It is by no means clear that strong restrictions on the availability of injunctions for patent holders is conducive to that end.

### B. eBay v. MercExchange

The Supreme Court's 2006 ruling in *eBay Inc. v. MercExchange, LLC* significantly limited patent holders' ability to obtain permanent injunctions.<sup>45</sup> Injunctions have long been a mainstay of copyright and patent laws in the U.S. For instance, the Patent Act clearly states that, "The several courts having jurisdiction of cases under this title may grant injunctions in accordance with the principles of equity to prevent the violation of any right secured by patent, on such terms as the court deems reasonable."<sup>46</sup> Likewise, the U.S. Copyright Act provides that "Any court having jurisdiction of a civil action arising under this title may, subject to the provisions of section 1498 of title 28, grant temporary and final injunctions on such terms as it may deem reasonable to prevent or restrain infringement of a copyright."<sup>47</sup>

At first sight, these statutes seem to have at least two important implications. On the one hand, their drafters undoubtedly saw injunctions as a central piece of both patent and copyright laws in the U.S. On the other hand, the right to obtain an injunction is not absolute. Instead, the drafters submitted injunctions to a reasonableness standard. As explained below, the Supreme Court said this much in its *eBay* ruling.<sup>48</sup> This raises the question: when is it reasonable for courts to grant such injunctions?

Outside of patent law, courts had long applied a four-factor test in order to decide whether injunctions were appropriate.<sup>49</sup>

The Supreme Court summarized the contours of this test in its *eBay* ruling:

According to well-established principles of equity, a plaintiff seeking a permanent injunction must satisfy a four-factor test before a court may grant such relief. A plaintiff must demonstrate: (1) that it has suffered an *irreparable injury*; (2) that *remedies available at law*, such as monetary damages, are *inadequate* to compensate for that injury; (3) that, considering *the balance of hardships between the plaintiff and defendant*, a remedy in equity is warranted; and (4) that the *public interest* would not be disserved by a permanent injunction.<sup>50</sup>

However, in the realm of *permanent patent injunctions*, there were significant uncertainties as to how (and whether) this test should be administered. In its *eBay* ruling, the Supreme Court attempted to stake out a middle ground between two antagonistic approaches to permanent patent injunctions, one defended by the district court and the other by the court of appeals: "[While] the District Court denied MercExchange's motion for permanent injunctive relief . . ., [t]he [] Federal Circuit reversed, applying its 'general rule that courts will issue permanent injunctions against patent infringement absent exceptional circumstances.'"<sup>51</sup>

The Supreme Court concluded that the traditional four-factor test (applied by courts in equity to determine whether a permanent injunction should be granted) was equally applicable to permanent patent injunctions. But the Court provided little detail as to how the test should be applied in practice. Its main conclusion was simply that "The decision whether to grant or deny injunctive relief rests within the equitable discretion of the district courts, and that such discretion must be exercised consistent with traditional principles of equity, in patent disputes no less than in other cases governed by such standards."<sup>52</sup> That said, while the Court failed to describe how the four-factor test should be applied to patent injunctions, it did offer examples of approaches that were not appropriate. In doing so, the Court explicitly excluded what had previously been the Federal Circuit's standard practice when assessing permanent patent injunctions. For decades, the Federal Circuit—which handles appeals in patent lawsuits—had awarded injunctions when claimants established that their patent was valid and infringed.<sup>53</sup> Under the new *eBay* ruling, this approach was no longer tenable:

In reversing the District Court, the Court of Appeals departed in the opposite direction from the four-factor

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of *Complex Technologies* 1–4 (2003) (Research on Innovation Working Paper), available at <http://www.researchoninnovation.org/thicket.pdf>.

43 Adam Mossoff, *The Rise and Fall of the First American Patent Thicket: The Sewing Machine War of the 1850s*, 53 ARIZ. L. REV. 165, 209, 211 (2011).

44 See, e.g., Lemley & Shapiro, *supra* note 7; Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools and Standard-Setting*, in 1 INNOVATION POLICY AND THE ECONOMY 119–26 (Adam B. Jaffe, Josh Lerner & Scott Stern eds., 2001); Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 SCIENCE 698, 698 (1998).

45 *eBay*, 547 U.S. 388.

46 35 U.S.C. § 283 (2018).

47 17 U.S.C. § 502 (2018).

48 *eBay*, 547 U.S. at 392.

49 *Weinberger v. Romero-Barcelo*, 456 U.S. 305, 311–13 (1982); *Amoco Production Co. v. Gambell*, 480 U.S. 531, 542 (1987).

50 *eBay*, 547 U.S. at 391 (emphasis added).

51 *Id.* Although the District Court recited the traditional four-factor test, 275 F. Supp. 2d at 711, it appeared to adopt certain expansive principles suggesting that injunctive relief could not issue in a broad swath of cases. Most notably, it concluded that a "plaintiff's willingness to license its patents" and "its lack of commercial activity in practicing the patents" would be sufficient to establish that the patent holder would not suffer irreparable harm if an injunction did not issue.

52 *eBay*, 547 U.S. at 388.

53 Miranda Jones, *Permanent Injunction, a Remedy by any Other Name is Patently Not the Same: How eBay v. MercExchange Affects the Patent Right of Non-Practicing Entities*, 14 GEO. MASON L. REV. 1035, 1049 (2007)



test. The court articulated a “general rule,” unique to patent disputes, “that a permanent injunction will issue once infringement and validity have been adjudged. . . .”

Just as the District Court erred in its categorical denial of injunctive relief, the Court of Appeals erred in its categorical grant of such relief.<sup>54</sup>

As a result, the ruling significantly narrowed the circumstances under which patent holders could obtain permanent injunctions.

Such a development is hard to square with guiding principles of IP law. Indeed, as numerous authors have observed, injunctions are a distinguishing feature of IP protection.<sup>55</sup> And this is true in the Patent Act, which explicitly gives inventors the *right to exclude* third parties from using their inventions.<sup>56</sup> The wording of the statute would be meaningless if third parties could routinely force exchanges simply by paying damages to the inventor.<sup>57</sup> This is not to say that the right to obtain injunctions is absolute, of course. But, reflecting the centrality of the right to exclude, the Federal Circuit developed its automatic injunction rule in intentional contrast to the traditional four-factor test for injunctions in other contexts.<sup>58</sup> In doing so, it also adopted a rule in consonance with the long-established approach of courts of equity to the awarding of patent remedies: “In due course, however, the realization emerged that, in situations where an infringement did in fact exist (and was continuing), denying the holder an injunction was tantamount to rendering the patent’s grant of exclusivity meaningless.”<sup>59</sup>

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(“The Federal Circuit summarized decades of permanent injunction holdings in a general rule: absent exceptional circumstances, a court will issue a permanent injunction in patent cases following a clear showing of validity and infringement.”).

54 *eBay*, 547 U.S. at 394.

55 See, e.g., Shyamkrishna Balganesh, *Demystifying the Right to Exclude: Of Property, Inviolability, and Automatic Injunctions*, 31 HARV. J.L. & PUB. POL’Y 593 (2008); Mark P. Gergen et al., *The Supreme Court’s Accidental Revolution? The Test for Permanent Injunctions*, 112 COLUM. L. REV. 203 (2012).

56 35 U.S.C. § 154 (1952) (“Every patent shall contain a short title of the invention and a grant to the patentee . . . of the right to exclude others from making, using, offering for sale, or selling the invention”). See also *eBay*, 547 U.S. at 392 (“To be sure, the Patent Act also declares that ‘patents shall have the attributes of personal property,’ including ‘the right to exclude others from making, using, offering for sale, or selling the invention.’”) (citations omitted).

57 See Balganesh, *supra* note 55, at 599 (“The *eBay* decision thus calls into question, rather starkly, the meaning and relevance of the right to exclude, both within the domain of intellectual property and in the wider subjects of real and personal property, at least insofar as each remains premised on the idea of exclusion. If property is no longer automatically associated with exclusionary relief, is it meaningless to continue characterizing the right to exclude as its central attribute?”). See also Epstein, *supra* note 23, at 2091.

58 See, e.g., *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1246–47 (Fed. Cir. 1989) (“Infringement having been established, it is contrary to the laws of property, of which the patent law partakes, to deny the patentee’s right to exclude others from use of his property.”).

59 *Id.* at 647 (citing 2 JOSEPH STORY, COMMENTARIES ON EQUITY JURISPRUDENCE AS ADMINISTERED IN ENGLAND AND AMERICA (W.H. Lyon, Jr. ed., 14th ed. 1918) (1836)).

### C. Post-eBay

Predictably, the *eBay* ruling led lower courts to grant fewer permanent injunctions in patent litigation suits, and numerous empirical studies have shown that the *eBay* ruling made permanent injunctions harder to obtain in patent litigation. For instance, one study found that, in the two years following the *eBay* ruling, twenty-four district court decisions granted injunctions, and ten denied them.<sup>60</sup> This is echoed by another study which concluded that courts granted injunctions at a rate of roughly two-to-one.<sup>61</sup> Finally, an extensive study by Kirti Gupta and Jay Kesan concluded that permanent injunctions were 44.1% less likely to be granted after the *eBay* ruling (and 33% less likely for preliminary injunctions).<sup>62</sup> The authors also show that the reduction in injunctions was stronger for PAEs.<sup>63</sup>

Critics of injunctions had hoped that reducing the availability of injunctions would have a positive effect on innovation—notably by reducing patent holdup.<sup>64</sup> But empirical research by Alexander Galetovic, Stephen Haber, and Ross Levine suggests that this was not the case: Overall, the *eBay* decision does not appear to have significantly affected innovation levels in patent-intensive industries.<sup>65</sup> Other authors have reached a similar conclusion.<sup>66</sup> However, the fact that the *eBay* ruling has not *yet* reduced innovation is no guarantee that it will not do so in the future. Likewise, as this paper makes abundantly clear, the *eBay* ruling is but one of many policy developments that have weakened the legal protections afforded to patent holders (or that threaten to do so). While each of these developments might not *individually* have a statistically significant effect on innovation (which is what the Galetovic, et al. paper looks at in relation to the *eBay* ruling), the cumulative effect of these changes could be much larger. In other words, available evidence suggests that the threat of injunctions is unlikely to cause patent holdup and reduce innovation. However, this does not suggest

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60 See Benjamin Petersen, *Injunctive Relief in the Post-eBay World*, 23 BERKELEY TECH. L.J. 193, 196 (2008).

61 See also Robin M. Davis, *Failed Attempts to Dwarf the Patent Trolls: Permanent Injunctions in Patent Infringement Cases Under the Proposed Patent Reform Act of 2005 and eBay v. MercExchange*, 17 CORNELL J.L. & PUB. POL’Y 431, 444 (2008).

62 Kirti Gupta & Jay P. Kesan, *Studying the Impact of eBay on Injunctive Relief in Patent Cases* 33 (Hoover Inst. Working Grp. on Intellectual Prop., Innovation, & Prosperity, Working Paper No. 17004, 2017).

63 *Id.* at 35.

64 Lemley & Shapiro, *supra* note 7, at 2045 (“The Supreme Court’s recent decision in *eBay Inc. v. MercExchange*, *L.L.C.* also promises to help solve holdup problems by making permanent injunctions.”).

65 Galetovic, Haber, & Levine, *supra* note 9, at 571 (“We could not reject the null hypothesis that there was no change in the relative rates of innovation in SEP-reliant industries after the *eBay* decision.”).

66 See Filippo Mezzanotti & Timothy Simcoe, *Patent Policy and American Innovation After eBay: An Empirical Examination*, 48 RES. POL’Y. 1271, 1280 (2019) (“The *eBay* decision marked a turning point in U.S. patent policy in the minds of many observers, but we find no evidence that it had a dramatic impact—positive or negative—on American innovative performance.”).

that systematically weakening the patent system would have no effect on technological progress.

One of the important features of injunctions that critics miss is that they are not solely a tool for simple exclusion from property, but a tool that *promotes efficient bargaining*.<sup>67</sup> If a property holder ultimately has the right to exclude infringers, there is relatively more weight placed on the importance of initial bargaining for licenses. Post-*eBay*, “efficient infringement” becomes a viable choice for firms seeking to maximize profits. Thus, implementing firms seeking to pay as little as possible for the use of an invention have incentives to disregard the bargaining process with a patent holder altogether. The relative decline in the importance of injunctions narrows the bargaining range, and the narrower range of prices an implementing firm will offer means agreement is less likely even if it does bargain. Where rightsholders can be reasonably expected to enforce their patent rights, by contrast, the bargaining range is expanded and agreement more likely because the cost of negotiating for a license in the first place is relatively smaller than always (or more often) opting for “efficient infringement”; that is, infringement becomes less efficient.

The ultimate tension is not between seeking damages or an injunction, but between whether a firm opts to commercially negotiate or legally litigate and face the risk of some combination of damages and injunction on the back end. This reality is particularly important in the context of SDOs where implementers and innovators are in a constant dance both to maximize their own profits as well as to facilitate the product of a joint agreement that binds each party. Permitting one party through weakened legal doctrine to circumvent or artificially constrain the bargaining process inappropriately imbalances the careful commercial relationships that should otherwise exist.

In the SEP context, furthermore, it is rarely mentioned that “an implementer’s decision to reject a certifiably FRAND license and continue to infringe is contrary to the spirit of the FRAND framework as well.”<sup>68</sup> In such situations, the threat of an injunction is plainly important. But it is worth noting what it is important *for*.

It is not typically the case that a negotiation process ends with an injunction and a refusal to license, as critics sometimes allege. Rather, the threat of an injunction is important in hastening an infringing implementer to the table and ensuring that protracted litigation to determine the appropriate royalty (which is how such disputes *do* usually end) is costly not only to the patentee, but also to the infringer. As James Ratliff and Daniel Rubinfeld note:

[T]he existence of that threat does not lead to holdup as feared by those who propose that a RAND pledge implies (or should embody) a waiver of seeking injunctive relief. If RAND terms are reached by negotiation, the negotiation is not conducted in the shadow of an injunctive threat but rather in the shadow of knowledge that the court will impose a set of terms if the parties do not reach agreement

themselves. *The crucial element of this model that substantially diminishes the likelihood that the injunctive threat will have real bite against an implementer willing to license on RAND terms is the assumption that an SEP owner maintains its obligation to offer a RAND license even if its initial offer is challenged by the implementer and, further, even if the court agrees with the SEP owner that its initial offer was indeed RAND.* Thus any implementer that is willing to license on court-certified RAND terms can avoid an injunction by accepting those RAND terms without eschewing any of its challenges to the RAND-ness of the SEP owner’s earlier offers.<sup>69</sup>

Concerns about the holdup threat of injunctions are overstated because the implementer can always accept a royalty rate that is either offered by the patent holder or certified by a court without waiving its right to contest whether such a rate is FRAND. If it will not do either, then it is an “unwilling licensee,” appropriately enjoined from implementing the patent. The alternative view—that the failure to reach agreement over royalties presumptively means that the patent holder is offering supra-FRAND terms—is unwarranted. Coupled with the unavailability of injunctive relief, such an approach puts a heavy thumb on the bargaining scales. Of course, licensees will often prefer to pay less than they are able to negotiate, but this is not a reality that supports interfering in the bargaining process. The purpose of patents is to facilitate the creation of incentives to generate the overall production of social welfare desired: it is not to guarantee that a particular party to a negotiation achieves its preferred terms.

### III. OTHER CHANGES HAVE REDUCED THE VALUE OF PATENTS

Injunctive relief is not the only area of patent litigation that has become more hostile to inventors. Several other changes to the rules relating to patent law enforcement have contributed to a broader weakening of legal certainty around patent licensing. This includes calls for courts to curtail the amount of damages awarded to owners of SEPs. Changes to the rules regarding fee-shifting and the establishment of inter partes review by the U.S. Patent and Trademark Office are also of concern. Last but not least, there has also been significant pressure for SDOs to restrict the terms under which standard essential technologies can be licensed.

#### A. Damages Awards Have Also Faced Downward Pressure

Injunctive relief is not the only area of patent litigation that has become more hostile to patentees. The same policymakers and scholars who have been calling for courts to curb injunctions have also complained that patent holders—especially those that operate in the SEP space—routinely obtain exorbitant damages awards from courts and juries.

Some critics, for example, have argued that courts routinely award “unreasonable” damages to patent holders.<sup>70</sup> This is purportedly the case in some instances where courts ignore “apportionment” rules and award damages that are based on an end-device’s “Entire Market Value” (“EMV”) rather than the

<sup>67</sup> See, e.g., Schankerman & Scotchmer, *supra* note 35.

<sup>68</sup> James Ratliff & Daniel L. Rubinfeld, *The Use and Threat of Injunctions in the RAND Context*, 9 J. COMP. L. & ECON. 14 (2013).

<sup>69</sup> *Id.* at 7 (emphasis added).

<sup>70</sup> William F. Lee & A. Douglas Melamed, *Breaking the Vicious Cycle of Patent Damages*, 101 CORNELL L. REV. 385 (2016).

so-called “Smallest Saleable Patent Practicing Unit” (“SSPPU”). As Brian Love put it:

The entire market value rule allows for recovery of patent infringement damages based on the value of an entire product or device containing an infringing component, rather than on the value of the infringing component alone.

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Until courts abandon current doctrine and apply the entire market value rule only when the patented component of the accused devices truly accounts for the entire market demand for the infringed device, patentees will continue to be unjustly rewarded.<sup>71</sup>

Likewise, Mark Lemley and Carl Shapiro have argued that “[t]he way reasonable royalties are calculated, particularly for component inventions, has made them into a tool for patentees to capture more than their fair share of a defendant’s profit margins.”<sup>72</sup>

These critiques seem to have gained some traction with some courts and SDOs. Indeed,

the principal focus of Lemley and Shapiro’s work has been to discourage the availability of injunctions in the context of products that practice multiple patents, such as mobile handsets that practice numerous SEPs. Lemley and Shapiro advise courts to deny injunctions “when the product that would be enjoined contains multiple components, of which only one is the subject of the patent in suit”—a factual description that applies to nearly every product in the modern marketplace, including many pharmaceutical products.<sup>73</sup>

In a very high-profile move, the Institute of Electrical and Electronics Engineers (“IEEE”) (one of the leading SDOs) changed its internal rules in 2015 in order to, effectively, impose component level pricing for standard essential patents.<sup>74</sup> Contributors of essential patents must routinely make so-called FRAND pledges, whereby they guarantee that their technology will be licensed at fair, reasonable, and non-discriminatory rates. Under IEEE’s modified internal rules, firms that base license fees on the EMV would no longer meet the FRAND benchmark.<sup>75</sup> In turn, this may limit the damages that these inventors can claim if their patents are infringed.

Similarly, courts have often based their calculations of patent infringement damages on the smallest saleable

component into which the underlying patent is incorporated.<sup>76</sup> Although this may seem like a small detail, it is of the highest importance for innovators. At first sight, it might seem like the choice of a small royalty base could be compensated by applying a higher percentage when royalties are calculated. But the problem is more fundamental.

Take the example of a 5G chipset. This piece of technology is far more valuable when combined with a high-end smartphone that can make full use of its capabilities, of course, but the smartphone and every innovation it contains is *also* made more valuable by the combination with the cellular chipset. In fact, virtually all of the value of a smartphone would be lost if the modem were removed (and reduced if limited to a slower, lower-quality chipset). In other words, the value of the smartphone and virtually every component in it depends in significant part upon the modem technology with which it is combined.

By basing their damages calculations on the value of the smallest saleable component, however, courts effectively prevent innovators from benefiting from these synergies, even if the parties would, in the absence of the court’s calculation method, voluntarily agree to a very different allocation of royalties. In the shadow of that prospect, it becomes extremely difficult for a patentee to negotiate a royalty for the true, synergistic value of its technology. And given that innovation is almost systematically based on combining existing elements to new effects, a rule that prevents innovators from benefitting from such synergies can be expected to impede innovation in the first place and limit the extent of efforts to combine technologies in innovative ways.

And this is not just a problem for damages calculations. Some antitrust authorities and courts have gone even further, arguing that SEP license fees calculated on the EMV may infringe *antitrust* law. This was the case for Judge Lucy Koh’s ruling in the recent *FTC v. Qualcomm* case, now on appeal to the Ninth Circuit.<sup>77</sup> The ruling cited the Federal Circuit’s *Quanta* case to support its assertion that Qualcomm’s pricing method was not FRAND because its royalties were not based on the value of the SSPPU.<sup>78</sup> But that case is inapposite, as is the underlying logic of assessing the FRAND-ness of a royalty rate by comparing it to the royalty a court would arrive at by applying its standard method of apportioning damages for infringement in the absence of any licensing agreement. While the rule of apportionment may be relevant (if not sensible) for determination of royalties by a court after a finding of infringement, there is no reason to assume that that assessment should be in any way instructive of the boundaries of a reasonable FRAND royalty rate negotiated by private parties

71 Brian J. Love, *Patentee Overcompensation and the Entire Market Value Rule*, 60 STAN. L. REV. 263, 263-93 (2007).

72 Lemley & Shapiro, *supra* note 7, at 2044.

73 Epstein & Noroozi, *supra* note 10, at 1406 (quoting Lemley & Shapiro, *supra* note 7, at 2036).

74 See Press Release, IEEE, IEEE Statement Regarding Updating of its Standards-Related Patent Policy (Feb. 8, 2015), available at <https://perma.cc/TV9H-V6RK>.

75 *Id.*

76 See, e.g., *Cornell Univ. v. Hewlett-Packard Co.*, 609 F. Supp. 2d 279 (N.D.N.Y. 2009); *In re Innovatio IP Ventures, LLC*, 2013 WL 5593609, at \*1 (N.D. Ill. Oct. 3, 2013). For a detailed discussion of these cases, see Anne Layne-Farrar, *The Patent Damages Gap: An Economist’s Review of U.S. Statutory Patent Damages Apportionment Rules*, 26 TEX. INTELL. PROP. L.J. 34 (2018).

77 *FTC v. Qualcomm Inc.*, 411 F. Supp. 3d 658 (2019).

78 *Id.* at 783 (citing *Virnetx, Inc. v. Cisco Sys., Inc.*, 767 F.3d 1308, 1327 (Fed. Cir. 2014)).

in an arms-length licensing agreement.<sup>79</sup> Indeed, such an approach drives a wedge between judicial royalty determinations and actual practice:

[U]sing the price of the smallest salable patent-practicing component as a royalty base deviates from real-world practice . . . , [where] the patent holder and the licensee often use the value of the downstream product as a royalty base, even when no evidence indicates that the patented feature drives the demand for the downstream product.<sup>80</sup>

Where common practice throughout an industry is to determine royalties based on the entire product, it can hardly also be in any way indicative of the exercise of market power.

### *B. Fee-Shifting Standards Increase the Likelihood of Litigation Over Negotiation*

In the U.S., in general each party is responsible for its own litigation costs associated with prosecuting or defending a patent. However, the Patent Act permits that the court, “in exceptional cases may award reasonable attorney fees to the prevailing party.”<sup>81</sup> This exception has been interpreted with varying degrees of liberality by the courts. In the 2005 case *Brooks Furniture v. Dutailier*, the Federal Circuit narrowed the interpretation of “exceptional cases” such that it would apply only:

[W]hen there has been some material inappropriate conduct related to the matter in litigation, *such as willful infringement, fraud or inequitable conduct in procuring the patent, misconduct during litigation, vexatious or unjustified litigation*. . . . Absent misconduct in conduct of the litigation or in securing the patent, sanctions may be imposed against the patentee only if both (1) the litigation is brought in subjective bad faith, and (2) the litigation is objectively baseless.<sup>82</sup>

The problem with this approach, however, is that, in conjunction with the Patent Act’s presumption of validity,<sup>83</sup> it

results in an asymmetrical assignment of burdens and access to attorneys’ fees between a patentee and an accused infringer:

Under the present system, the high costs of junk patents are directly tied to the legal presumption of validity that is applied to all issued patents, under which the litigant challenging validity bears the burden of proving invalidity under a higher standard of proof than that which usually applies in civil cases.<sup>84</sup>

This means that, while a patentee may be able to obtain sanctions for an accused infringer’s willful infringement, it is substantially more difficult for an accused infringer to obtain sanctions for a patentee’s bad faith assertion of the validity of its patent. While on its face this might seem to offer additional protection for patentees by putting a thumb on the scale in their favor in litigation, it is mainly beneficial for PAEs that rely on the threat of judicial remedies (rather than a patent’s true market value) to extract payment; it is less helpful for parties with valid patents and valid claims acting in good faith.

In 2014, the Supreme Court ruled in *Octane Fitness v. ICON Health* that the *Brooks Furniture* court’s interpretation was too narrow and should be rejected and replaced with a more discretionary framework:

An “exceptional” case, then, is simply one that stands out from others with respect to the substantive strength of a party’s litigating position (considering both the governing law and the facts of the case) or the unreasonable manner in which the case was litigated. District courts may determine whether a case is “exceptional” in the case-by-case exercise of their discretion, considering the totality of the circumstances.<sup>85</sup>

There are good arguments for permitting fee-shifting in some patent cases. Indeed, the primary concern when contemplating fee-shifting relates to improper attempts by PAEs to extract rents from implementers. Most frequently, this occurs when PAEs engage in one or more of the acts specifically described as “exceptional” in *Brooks Furniture*, such as vexatious or unjustified litigation, or bringing litigation either in bad faith or without any solid basis.<sup>86</sup> Early evidence also suggests that courts have rightly continued to permit fee-shifting in cases of willful infringement since *Octane*.<sup>87</sup>

The precise implications of *Octane* and a liberalized fee-shifting regime are not yet clear, but there is research demonstrating that fee-shifting can work to deter meretricious

79 See Brief of the Honorable Paul R. Michel (Ret.) as Amicus Curiae Supporting Appellant, *Qualcomm*, 411 F. Supp. 3d 658 (“Indeed, an attempt to dictate that businesses must negotiate patent licenses based on the SSPPU concept for each licensed patent and each licensed product would be highly counterproductive and infeasible. Such a rule would force parties to engage in patent-by-patent and component-by-component negotiations, greatly magnifying transaction costs. Instead, licensing parties should remain free to use all the valuation and efficiency tools available to them, as would any rational, competitive firm. This will most efficiently lead to effective negotiations and equitable agreements for all.”).

80 J. Gregory Sidak, *The Proper Royalty Base for Patent Damages*, 10 J. COMPETITION L. & ECON. 989, 1020 (2014).

81 35 U.S.C. § 285 (2018).

82 *Brooks Furniture Mfg., Inc. v. Dutailier Int’l, Inc.*, 393 F.3d 1378, 1381 (2005).

83 See 35 U.S.C. § 282 (“A patent shall be presumed valid.”). In *Microsoft Corp. v. i4i Ltd. Partnership*, 564 U.S. 91 (2011), the Supreme Court confirmed that the presumption of validity can be overcome only with clear and convincing evidence of invalidity.

84 F. Scott Kieff, *The Case for Preferring Patent-Validity Litigation Over Second-Window Review and Gold-Plated Patents: When One Size Doesn’t Fit All, How Could Two Do the Trick?*, 157 U. PENN. L. REV. 1937, 1950-51 (2009).

85 *Octane Fitness, LLC v. Icon Health & Fitness, Inc.*, 572 U.S. 545, 554 (2014).

86 *Id.*

87 Hannah Jiam, *Fee-Shifting and Octane Fitness: An Empirical Approach Toward Understanding Exceptional*, 30 BERKELEY TECH. L.J. 635 (2015).

suits.<sup>88</sup> Further, in the wake of *Octane*, there is some evidence that courts are shifting fees more often.<sup>89</sup> One shortcoming of the available literature is the difficulty in determining exactly what the post-*Octane* shifts may signal. In an ideal world, all meretricious suits would be subject to sanction or dismissal, and all meritorious suits would proceed on the merits. We do not live in such a world.

Liberalizing fee-shifting will have mixed effects. First, courts have evidently been applying the standard set out in *Octane* somewhat unevenly.<sup>90</sup> But more to the point, the *Octane* change permits courts to essentially second-guess even meritorious litigants pursuing patent protection in good faith. Hindsight is 20/20, and judges who have been witness to an extended legal process and production of evidence could come to see an otherwise good faith plaintiff who loses as having brought a frivolous claim.

While the fee-shifting regime laid out in *Octane* might not be perfect, it is not *intentionally* biased against the interests of patent holders. Much will depend on how the courts use their discretion. But one thing *Octane* does not clearly do (except perhaps accidentally) is to overcome the problem of asymmetry brought about by the operation of the heightened burden of proof under the presumption of validity. And to the extent it does, it does not clearly differentiate between good and bad faith assertions of validity that map onto the distinction between abusive PAE litigation and valid infringement litigation. Indeed, it is plausible under *Octane* that even a valid effort by a SEP holder to enforce its patent by means of an injunction could be deemed an “unreasonable manner” of litigation.

Meanwhile, many voices have called for the introduction of more widely applied fee-shifting mechanisms in US patent disputes, including some who have proposed a blanket shift towards loser-pays (also known as the English Rule).<sup>91</sup> One key

goal of this proposed policy is to dull patentees’ incentives to litigate. As Megan la Belle summarizes:

Congress passed the America Invents Act, the most significant overhaul to the U.S. patent system in over half a century, in 2011. Yet, less than two years later, calls for further reform began. *More than a dozen bills were introduced in Congress between 2013 and 2015, many of which included fee shifting provisions.* The fee provisions in these bills varied. *Some were one-way, awarding fees only to the accused infringer, while others were two-way, allowing either prevailing party to recover. Certain of these bills targeted PAEs, while others drew no distinctions based on the identity of the parties.*<sup>92</sup>

These initiatives essentially boil down to a “patent troll tax” that deters PAEs from, allegedly, seeking “nuisance settlements,” knowing defendants will seek to avoid litigation costs.<sup>93</sup> Unfortunately, as under *Octane*, good faith enforcement efforts may also be deterred.

More problematically, these proposals wrongly assume that inventors are *systematically* the ones who have the upper hand in licensing negotiations. But this does not have to be the case. In a world where courts have become increasingly reluctant to grant injunctions, and where there has been increasing pressure to reduce damages awards, the cost of patent infringement has almost certainly decreased. In turn, this improves the bargaining position of licensees and makes patent holdout behavior more attractive. As a result, to the extent that a general regime of fee-shifting is justified,<sup>94</sup> there is little reason to design one that is deliberately tilted *against* the interests of inventors, any more than there is to maintain one that is deliberately tilted in their favor.<sup>95</sup>

### C. Inter Partes Review Undermines the Certainty of Patent Rights

Critics of the current patent system have turned to administrative process in an attempt to address the problem of junk patents.<sup>96</sup> The 2011 America Invents Act established an expansive inter partes review process (IPR) which allows *anyone* (other than the patent owner) to challenge the validity of a patent through an administrative post-grant review by the U.S. Patent and Trademark Office (PTO).<sup>97</sup> Under IPR, the threshold for challenging a patent is much lower than it had been under

88 Christian Helmers et al., *The Effect of Fee Shifting on Litigation: Evidence from a Policy Innovation in Intermediate Cost Shifting* (TSE Working Papers 16-740, 2017), available at <https://ideas.repec.org/p/tse/wpaper/31251.html>.

89 See, e.g., Colleen V. Chien, et al., *Enhanced Damages, Litigation Cost Recovery, and Interest in PATENT REMEDIES AND COMPLEX PRODUCTS: TOWARD A GLOBAL CONSENSUS* 90-114 (C. Bradford Biddle, et al., eds. 2019), available at <https://www.cambridge.org/core/books/patent-remedies-and-complex-products/enhanced-damages-litigation-cost-recovery-and-interest/D81F3F599BA6447F97B60B0247D1D0C9/core-reader>. See also Darin Jones, *A Shifting Landscape for Shifting Fees: Attorney-Fee Awards in Patent Suits After Octane and Highmark*, 90 WASH. L. REV. 505 (2015).

90 See Mateo J. de la Torre, *The Troll Toll: Why Liberalized Fee-Shifting in Patent Cases Will Do More Harm Than Good*, 101 CORNELL L. REV. 813 (2016), available at <https://scholarship.law.cornell.edu/cgi/viewcontent.cgi?article=4696&context=clr>.

91 See, e.g., Emily H. Chen, *Making Abusers Pay: Deterring Patent Litigation by Shifting Attorneys’ Fees*, 28 BERKELEY TECH. L.J. 351, 381 (2013) (“Abusive litigation practices and nonmeritorious patent infringement claims are real and present dangers in the current patent litigation ecosystem, imposing significant social costs. Therefore, these practices must be addressed in a swift manner. . . . By implementing a fee-shifting provision, under which the loser must pay the winner’s legal fees, complainants in patent actions will be more likely to pause and reconsider each new infringement action before it is filed—and even during litigation itself in order to avoid risking responsibility for paying the defendant’s legal costs.”).

92 Megan M. La Belle, *Fee Shifting for PTAB Proceedings*, 24 TEX. INTELL. PROP. L.J. 367, 384 (2016) (emphasis added).

93 See, e.g., David Rosenberg & Steven Shavell, *A Model in Which Suits are Brought for their Nuisance Value*, 5 INT’L REV. L. & ECON. 3 (1985).

94 But see de la Torre, *supra* note 90, at 850 (“Awarding attorneys’ fees liberally in patent cases and curtailing the Federal Circuit’s ability to second-guess such decisions is a framework that will likely create more negative effects than improvements for litigants, patentees, and the patent and civil litigation systems.”).

95 See Kieff, *supra* note 84, at 1952-55.

96 They would be better off addressing junk patents by dealing with the problem of the asymmetrical operation of the presumption of validity in the litigation context.

97 35 U.S.C. Ch. 31 § 311-19 (2018); *Inter Partes Review*, UNITED STATES PATENT AND TRADEMARK OFFICE (May 9, 2017), <https://www.uspto.gov/patents-application-process/appealing-patent-decisions/trials/inter-partes-review>.

re-examination (the only administrative option for third parties to challenge patents prior to the introduction of IPR).<sup>98</sup>

There are several important differences between IPR and adjudication in an Article III court. Most notably, the Patent Trial and Appeal Board (PTAB) applies lower standards of proof when conducting the IPR, and challengers are not required to have standing. Regarding the lower standards of proof, Professor Joanna Shepherd has noted:

In federal court, patents are presumed valid and challengers must prove each patent claim invalid by “clear and convincing evidence.” In IPR proceedings, no such presumption of validity applies and challengers must only prove patent claims invalid by the “preponderance of the evidence.” In addition to the lower burden, it is also easier for challengers to meet the standard of proof in IPR proceedings. In federal court, patent claims are construed according to their “ordinary and customary meaning” to a person of ordinary skill in the art. In contrast, the PTAB uses the more lenient “broadest reasonable interpretation” standard; this more lenient standard can result in the PTAB interpreting patent claims as “claiming too much” (using their broader standard), resulting in the invalidation of more patents.<sup>99</sup>

Of course, the invalidation of more patents is considered by its proponents to be the very goal of IPR.<sup>100</sup> And to the extent that IPR results in the less costly invalidation of a larger number of patents that would not have withstood more rigorous legal challenges in federal court *without* also erroneously invalidating good patents, this is a positive outcome. But it is not clear that achieving this positive outcome is optimal, if it is done in by administrative agency action, removed from the full set of protections and responsibilities of the Federal Rules of Civil Procedure that apply to all civil litigation. As Scott Kieff has noted:

While desirable in the abstract, these goals [establishing a mechanism for deciding validity that is faster or less expensive than court] are dangerous when taken out of the context of their conflicting counterparts among the set of goals associated with civil litigation generally (such as accuracy and finality). That is, before simply trying to change some characteristics of this highly complex and interconnected system, we should at least consider the

full range of concerns explored earlier in the discussion of intellectual approach.<sup>101</sup>

Kieff’s approach employs the tools of New Institutional Economics (including the economic analysis of law)

to highlight the ways that property rights in intangible assets can be structured so as to improve economic development, innovation, and competition by encouraging private actors to interact and strike deals with each other rather than with legislators, regulators, judges, and the powerful political constituents who influence these government actors.<sup>102</sup>

For IPR, the most obvious problems are the use of attenuated procedures to adjudicate constitutionally protected property rights, and the relative lack of finality and determinateness that the process imposes on such property rights. As Justice Neil Gorsuch noted in dissenting from the Supreme Court’s decision upholding IPR, “[a]llowing the Executive to withdraw a patent . . . ‘would be to deprive the applicant of his property without due process of law, and would be in fact an invasion of the judicial branch of the government by the executive.’”<sup>103</sup> Once a patent examination has been made and a patent issued, even if not all degrees of *heightened* protection are warranted, surely lessened protection is not appropriate either. As Professor Epstein notes:

The initial review process should give rise to some confidence that the patent has been rightly issued so that the odds that a post-issue review will correct some previously unknown error are lower than they would have been if the patent had initially been issued without any review at all. This argument renders problematic all iterations of post-issuance IPR.<sup>104</sup>

Moreover, it is not clear that the IPR approach actually does much to improve the quality of issued patents. As Professor Gregory Dolin notes:

Congress has adopted an overly simplistic approach that can be described as “one set of eyes is good, two is better, three is better still, etc.” But as it turns out, the relationship between patent quality (however defined), certainty of patent rights, and the number of levels of review is not linear. Importantly, more opportunities to challenge issued patents also means more opportunities to engage in abusive practices to undermine legitimate patent rights.<sup>105</sup>

98 See, e.g., Brian J. Love & Shawn Ambwani, *Inter Partes Review: An Early Look at the Numbers*, 81 U. CHI. L. REV. DIALOGUE 105 (2014) (“Compared to requests for *inter partes* reexamination, petitions for IPR are currently granted at a similar rate, but once instituted, they result in the elimination of every challenged claim about twice as often, reach a final decision almost twice as quickly, and make accused infringers almost twice as likely to win motions to stay co-pending litigation.”).

99 Joanna Shepherd, *Inter Partes Review Jeopardizes the Social Contract Between Drug Makers and Patients*, TRUTH ON THE MARKET (Oct. 22, 2017), <https://truthonthemarket.com/2017/10/22/inter-partes-review-jeopardizes-the-social-contract-between-drug-makers-and-patients/>.

100 See, e.g., Craig Beuerlein & Graham Dufault, *Why STRONGER is Weaker: The Imbalance of Automatic Injunctions and No Post-Grant Review*, ACT THE APP ASSOCIATION (July 1, 2019), <https://actonline.org/2019/07/01/why-stronger-is-weaker-the-imbalance-of-automatic-injunctions-and-no-post-grant-review/>.

101 Kieff, *supra* note 84, at 1947.

102 *Id.* at 1941.

103 *Oil States Energy Services, LLC v. Greene’s Energy Group, LLC*, 584 U.S. \_\_\_, 138 S. Ct. 1365, 1385 (2018) (Gorsuch, J., dissenting) (quoting *McCormick Harvesting Machine Co. v. Aultman*, 169 U.S. 606, 612 (1898)).

104 Richard A. Epstein, *The Supreme Court Tackles Patent Reform: A Series of Articles Examining Oil States Energy Services, LLC v. Greene’s Energy Group, LLC*, 19 FEDERALIST SOC’Y REV. 132, 139 (2018), available at <https://fedsoc.org/commentary/publications/the-supreme-court-tackles-patent-reform-why-the-supreme-court-should-end-inter-partes-review-in-oil-states>.

105 Gregory Dolin, *Dubious Patent Reform*, 56 B.C. L. REV. 881, 883 (2015).

Thus, for example, as Professor Shepherd notes, the lack of any standing requirement in IPR has perversely resulted in “reverse patent trolling,”

in which entities that are not litigation targets, or even participants in the same industry, threaten to file an IPR petition challenging the validity of a patent unless the patent holder agrees to specific pre-filing settlement demands. The lack of a standing requirement has also led to the exploitation of the IPR process by entities that would never be granted standing in traditional patent litigation—hedge funds betting against a company by filing an IPR challenge in hopes of crashing the stock and profiting from the bet.<sup>106</sup>

In addition, there is evidence that the PTAB has been politicized, as has been documented by Professor Saurabh Vishnubhakat.<sup>107</sup> Consider, for example, the following exchange, which occurred during oral arguments in the *Yissum* case:

Judge Taranto: And, anytime there has been a seeming other outlier, you’ve engaged the power to reconfigure the panel so as to get the result you want?

Patent Office: Yes, your Honor.

Judge Taranto: And, you don’t see a problem with that?

Patent Office: Your Honor, the Director is trying to ensure that her policy position is being enforced by the panels.<sup>108</sup>

Vishnubhakat offers numerous other examples of the apparent abuse of administrative discretion by the PTAB and observes:

The sum of these illustrations of Patent Office panel-stacking is that the ostensibly neutral and independent adjudicatory process that the AIA put in place has been overlaid with a system of adjustments and distortions that are much more outcome-driven in nature and much more beholden to the agency’s political hierarchy than a narrative of impartial technocracy might suggest.<sup>109</sup>

The IPR process is embraced by critics of patents generally, and it is rooted in a valid concern with the over-issuance of junk patents. But it has not substantially added value to the system and has further undermined the incentives necessary for the production of innovative and expensive-to-produce technologies and pharmaceuticals.

#### *D. Private Institutions Have Also Weakened Some Key Elements of Patent Protection*

The same critics who have been calling for policymakers and courts to weaken the protections available to inventors have also urged private institutions to adopt similar changes. These calls for reform have mostly focused upon the internal rules of SDOs.<sup>110</sup>

Innovation through SDOs is a pivotal part of the digital economy. Standardized technologies enable a vast ecosystem of complex digital devices to interact seamlessly. In turn, this allows firms to specialize, boosting innovation and providing consumers with cheaper goods.<sup>111</sup> Despite these groundbreaking advances, however, the inner workings of SDOs have been subject to important criticism.<sup>112</sup> The gist of this pushback is that SDOs have not been doing everything in their power to avert patent holdup and royalty stacking—even though reliable empirical evidence of these harms is lacking.<sup>113</sup>

SDOs make numerous critical decisions that can affect the development and commercialization of technological standards. Chief among these are the terms under which successful technologies can be licensed.<sup>114</sup> Participants in the standardization process routinely select pieces of technology that then become “essential” to a subsequent standard, and this may increase the market power of inventors.<sup>115</sup> In extreme cases, inventors may even attempt to capture the economic rents of implementers that develop products incorporating their technology.<sup>116</sup>

Traditionally, SDOs have sought to address these market power issues by requiring that SEP holders license their patents under FRAND terms. But critics have argued that this is insufficient. Instead, they urge SDOs to adopt internal rules that limit the ability of SEP holders to seek injunctions, and that determine the method according to which royalties should be calculated.<sup>117</sup>

These calls have not fallen upon deaf ears. Several high-profile SDOs have altered their internal rules along the lines

106 Joanna Shepherd, *The Hatch-Waxman Integrity Act of 2018—Reestablishing Balance in the Drug Industry*, TRUTH ON THE MARKET (Dec. 17, 2018), <https://truthonthemarket.com/2018/12/17/the-hatch-waxman-integrity-act-of-2018-reestablishing-balance-in-the-drug-industry/>.

107 Saurabh Vishnubhakat, *Disguised Patent Policymaking*, 76 WASH. & LEE L. REV. 1667 (2019).

108 Audio Transcript of Oral Argument at 47:20, *Yissum Research Development Co. of the Hebrew University of Jerusalem v. Sony Corp.*, Nos. 2015-1342, 2015-1343 (Fed. Cir. Dec. 7, 2015), [www.perma.cc/S6AQ-C6EE](http://www.perma.cc/S6AQ-C6EE), cited in Vishnubhakat, *supra* note 107, at 1678.

109 Vishnubhakat, *supra* note 107, at 1684.

110 Mark A. Lemley, *Ten Things to Do About Patent Holdup of Standards (and One Not To)*, 48 B.C. L. REV. 155 (2007). See also Fiona Scott Morton & Carl Shapiro, *Patent Assertions: Are We Any Closer to Aligning Reward to Contribution?*, in 16 INNOVATION POLICY AND THE ECONOMY 89, 109 (Josh Lerner & Scott Stern eds., 2016).

111 See, e.g., Auer & Morris, *supra* note 9, at 103.

112 See, e.g., Josh Lerner & Jean Tirole, *Standard-Essential Patents*, 123 J. POL. ECON. 547 (2015) (arguing that competition between SDOs prevents them from adopting socially optimal internal rules).

113 See Auer & Morris, *supra* note 9.

114 SDOs usually adopt internal rules that dictate the terms on which winning technologies are selected and can subsequently be licensed by inventors. For an empirical overview of these heterogeneous rules, see Justus Baron & Daniel F. Spulber, *Technology Standards and Standard Setting Organizations: Introduction to the Searle Center Database*, 27 J. ECON. & MGMT. STRAT. 462 (2018).

115 See, e.g., Joanna Tsai & Joshua D. Wright, *Standard Setting, Intellectual Property Rights, and the Role of Antitrust in Regulating Incomplete Contracts*, 80 ANTITRUST L.J. 157 (2015). See also Scott Morton & Shapiro, *supra* note 110, at 109.

116 See Lemley & Shapiro, *supra* note 7, at 1991.

117 See Lemley, *supra* note 110, at 155.

suggested by critics. This has resulted in a further weakening of the protections afforded to patent holders.

Most notably, the IEEE made sweeping reforms to its IP policy. Under new rules adopted in 2015, IEEE prohibits SEP holders from seeking injunctions against so-called “willing licensees.”<sup>118</sup> The IP policy also mandates that royalties for SEP licenses be based on the value of the smallest saleable component that practices the essential patent, and that these royalties should not include any of the added value created by the patent’s inclusion in a standard.<sup>119</sup> In short, by greatly reducing the availability of injunctions, these rules tilt the bargaining range against SEP holders. And they further depress royalty rates by limiting the terms that inventors can include in their license agreements.

IEEE is not the only SDO to have contemplated policies of this sort. For instance, the European Telecommunications Standards Institute (ETSI) seriously considered plans to bar SEP holders from seeking injunctions against “willing licensees,” though the proposed reforms were ultimately shelved.<sup>120</sup>

The problem with the weakening of patent protections in the context of technology standards is that it may undermine the R&D investment leading to the development of SEPs in the first place, as well as the participation of potential SEP holders in the standardization process. In a recent speech, Assistant Attorney General Makan Delrahim aptly summarized the potentially nefarious consequences of the developments in SDO rules:

Any discussion regarding injunctive relief should include the recognition that in addition to patent holders being able to engage in patent “hold up,” patent implementers are also able to engage in “hold out” once the innovators have already sunk their investment into developing a valuable technology. Additionally, a balanced discussion should recognize that some standard-setting organizations may make it too easy for patent implementers to bargain collectively and achieve sub-optimal concessions from patent holders that undermine the incentive to innovate.<sup>121</sup>

FRAND obligations are themselves a constraint on the ability of patentees to recoup their investments, and firms may

refrain from participation in SDOs simply because they impose a FRAND obligation.<sup>122</sup> Unsurprisingly, there is empirical evidence that further limitations on patent enforcement and protection imposed by SDOs can exacerbate this dynamic:

The positive effect of patent protection on the strategic complementarity between a firm’s R&D spending and its participation in the development of open standards has important policy implications. We particularly predict that a policy change resulting in an increased profitability of patents would be associated with increased participation of R&D-intensive firms in standards development. We confirm this prediction. . . .<sup>123</sup>

Participation in SDOs is also a function of the extent of patent protection. “[C]ompared with other commonly used means of appropriation, such as secrecy, complexity, and lead time, patents offer a higher level of compatibility with the processes adopted by open standards organizations.”<sup>124</sup>

In short, the current antagonism towards patent holders extends beyond government institutions. The actions of private parties, most notably IEEE’s revised IPR policy, also threaten to weaken the protection afforded to inventors. While it is difficult to pinpoint the exact cause of this shift, it seems almost certain that pressure from regulatory authorities and lobbying by interested parties both played a part.<sup>125</sup> If left unchecked, however, this trend could ultimately stifle investments in one of the most dynamic areas of the economy.

#### IV. CONCLUSION

Patent law is consistently evolving. This is usually a good thing. Laws created over a century ago will not always be a perfect fit for today’s circumstances. However, it is often difficult to know how the seemingly small changes brought to a field of law will play out in the future.

The developments discussed in this article might seem like small details, but they are part of a wider trend whereby U.S. patent law is becoming increasingly inhospitable for inventors. This is particularly true when it comes to the enforcement of SEPs by means of injunction.

Critics of the traditional patent system overlook the crucial role that injunctions play in cementing IP rights and facilitating transactions around them. More than any other tool, injunctions (and the threat thereof) bring would-be licensees to

118 See IEEE, IEEE-SA STANDARDS BOARD BYLAWS 16 (2019), available at [https://standards.ieee.org/content/dam/ieee-standards/standards/web/documents/other/sb\\_bylaws.pdf](https://standards.ieee.org/content/dam/ieee-standards/standards/web/documents/other/sb_bylaws.pdf). For a discussion of willing licensees in the context of the patent holdup/holdout debate, see *supra* notes 38–41 and accompanying text.

119 *Id.* See also Press Release, IEEE, *supra* note 74.

120 See, e.g., Sophia Anatalis, *ETSI IPR committee continues discussions on injunctive relief*, ETSI (July 25, 2014), <https://www.etsi.org/events/9-news-events/news/812-2014-07-news-etsi-ipr-committee-continues-discussions-on-injunctive-relief>.

121 Makan Delrahim, “*Telegraph Road: Incentivizing Innovation at the Intersection of Patent and Antitrust Law*,” 19TH ANNUAL BERKELEY-STANFORD ADVANCED PATENT LAW INSTITUTE (Dec. 7, 2018), available at <https://www.justice.gov/opa/speech/assistant-attorney-general-makan-delrahim-delivers-remarks-19th-annual-berkeley-stanford>. Another paper similarly argues that “the risk of technology leakages may deter R&D-intensive firms from participating in the development of open standards. Patents tend to reduce this risk: so, when firms have a strong patent position, it should be less likely that an increase in their R&D effort reduces the extent of such participation.” Justus Baron, Cher Li, &

Shukhrat Nasirov, *Why Do R&D-Intensive Firms Participate in Standards Organizations? The Role of Patents and Product-Market Position* 5 (Apr. 1, 2019), available at [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3287475](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3287475).

122 See Anne Layne-Farrar, Gerard Llobet & Jorge Padilla, *Payment and Participation: The Incentives to Join Cooperative Standard Setting Efforts*, 23 J. ECON. & MGMT. STRAT. 24 (2014).

123 Baron, et al., *supra* note 121, at 4.

124 *Id.* at 27.

125 See Tsai & Wright, *supra* note 115, at 158. See also IPWatchdog & Kristen Osenga, *The IEEE IPR Policy Amendments: Strategic Behavior and Feedback Loops*, IPWATCHDOG (Sept. 11, 2019), <https://www.ipwatchdog.com/2019/09/11/ieee-ipr-policy-amendments-strategic-behavior-feedback-loops/id=113162/>.



the negotiating table because they enable rightsholders to prevent unauthorized uses of their inventions by third parties. Owners can thus take part in negotiations without bargaining distortions skewing in favor of one party or the other. Contrary to critics' claims, this is a critical part of the patent system. Not only do injunctions prevent courts from acting as price regulators, but by enabling inventors and complementary resource owners to earn a return on their investments, they create economic conditions that encourage innovation in the first place.

This backdrop—and the arguable overcorrection by courts and legislatures in recent years—likely explains why some legislators have recently put forward bills that seek to reinforce the U.S. patent system. A bipartisan bill put forward in 2017, for instance, would replace *eBay*'s injunction analysis with the courts' previous presumption that injunctions should be granted when patents are valid and infringed.<sup>126</sup> In 2019, the Inventor Rights Act was introduced, and it seeks to create a rebuttable presumption in favor of injunctions and abolish the IPR process.<sup>127</sup> There have also been efforts to come up with legislation that would make more inventions eligible for patent protection (though such efforts are still far from coming to fruition).<sup>128</sup>

These bills have come up because, since *eBay* and the IPR changes wrought by the AIA, the relative predictability of investing in the development of patentable technologies has declined. The findings of the Inventor Rights Act frame the problem well:

Recent changes to patent laws and procedures and Supreme Court decisions have adversely affected inventors such that the promise of . . . “securing for limited times to inventors the exclusive right to their discoveries” is no longer attainable . . . Inventors are denied the fundamental right to “exclude others” by the Supreme Court’s 2006 decision in *eBay Inc. v. MercExchange, LLC* . . .<sup>129</sup>

The increasing enmity of courts and private institutions towards robust patent enforcement also spurred the USPTO, National Institute of Standards and Technology, and the DOJ to issue a strongly worded statement that urges policymakers to continue applying appropriate remedies—including injunctions—in SEP disputes.<sup>130</sup> In the meantime, while the macroeconomic effects of the shift towards weaker patent

protection are still uncertain, its consequences can already be observed at a more granular level.

The antitrust case brought by the FTC against Qualcomm—currently pending before the Ninth Circuit—perfectly encapsulates this trend.<sup>131</sup> For instance, one of the case's key claims is that the royalties agreed upon by Qualcomm and its licensees were calculated as a percentage of the price of end-devices.<sup>132</sup> Both the FTC and the district court saw this as evidence of monopolization by Qualcomm.<sup>133</sup> However, as various commentators have observed, this type of pricing may simply be guided by efficiency considerations.<sup>134</sup> In a nutshell, basing license fees on the price of an end-device might simply be a cost-efficient way of allocating risk between inventors and implementers.<sup>135</sup> The FTC and the district court overlooked this important counterargument.

Furthermore, the theory of the case, while necessarily couched in quite narrow legal terms, is fundamentally an indictment of Qualcomm's vertically integrated business model whereby it uses its SEP licensing business to finance massive amounts of R&D. As we discuss above, the indictment of such a model is rooted in faulty assumptions that patent holders like Qualcomm deploy excessive bargaining power derived from patents to extract supracompetitive royalties. But such a conclusion fails to properly account for the role of strong patents in facilitating Qualcomm's complex business model and innovation and commercialization strategies. This threatens to lead to suboptimal levels of investment and innovation.<sup>136</sup>

Further, the weakening of patent protection may also embolden holdout behavior by implementers. The evidence is still tentative, but survey data suggests that implementers have become increasingly reluctant to conclude license agreements with innovators.<sup>137</sup> The consequences of this shift are still unfolding, but left unchecked it could ultimately reduce the production of innovations.

Finally, the push to curtail patent protection has also filtered into the internal rules of SDOs. As explained above, IEEE moved to implement SSPPU for holders of essential technologies.<sup>138</sup> Likewise, ETSI started discussions aimed at contractually limiting the availability of injunctions for rightsholders (though these

126 STRONGER Patents Act of 2017, S.1390, 115th Cong. § 106 (2017).

127 Inventor Rights Act of 2019, H.R. 5478, 116th Cong. § 3 (2019).

128 See *Patent Legislation to Watch in 2020*, KIRKLAND & ELLIS (Jan. 1, 2020), <https://www.kirkland.com/news/in-the-news/2020/01/patent-legislation-to-watch-in-2020>.

129 Inventor Rights Act of 2019, *supra* note 127, at §§ 3-6.

130 See U.S. Dep't of Justice, U.S. Pat. & Trade Off., and Nat'l Inst. of Standards and Tech., *Policy Statement on Remedies for Standards-Essential Patents Subject to Voluntary F/RAND Commitments* 1-8 (Dec. 19, 2019) (“The agencies have heard concerns that the 2013 policy statement has been misinterpreted to suggest that a unique set of legal rules should be applied in disputes concerning patents subject to a F/RAND commitment that are essential to standards (as distinct from patents that are not essential), and that injunctions and other exclusionary remedies should not be available in actions for infringement of standards-essential patents. Such an approach would be detrimental to a carefully balanced

patent system, ultimately resulting in harm to innovation and dynamic competition.”).

131 *FTC v. Qualcomm, Inc.*, No. 19-16122 (9th Cir. Feb. 27, 2020), available at [https://www.ca9.uscourts.gov/content/view.php?pk\\_id=0000001003](https://www.ca9.uscourts.gov/content/view.php?pk_id=0000001003).

132 *Qualcomm*, 411 F. Supp. 3d at 673.

133 *Id.*

134 Auer & Morris, *supra*, note 9.

135 *Id.*

136 See, e.g., Geoffrey A. Manne, *FTC v. Qualcomm: Innovation and Competition*, TRUTH ON THE MARKET (Jan. 22, 2019), <https://truthonthemarket.com/2019/01/22/ftc-v-qualcomm-innovation-and-competition/>.

137 See Heiden & Petit, *supra* note 10, at 179.

138 See Press Release, IEEE, *supra*, note 74.

discussions do not yet appear to have led to meaningful reforms). These are bad developments from the perspective of encouraging the necessary innovations that the patent system was developed to foster and protect.

At this point it is unclear whether the decision to use the SSPPU standard or consensually limit injunctive remedies is appropriate in an *ideal* world in which private parties are free to negotiate as they will. We do not live in such an ideal world, however, and it is impossible to divorce such a decision from the current regulatory and legal overlays on the system. Private organizations should be expected to adopt these measures in the shadow of court decisions and regulatory biases that artificially favor such terms, but the optimality of such rules cannot be inferred from the fact of their adoption in such a context.

But outside the pressure imposed by cases like *Qualcomm* and *eBay*, it is dubious that such policies would necessarily be uniformly adopted by all licensing parties. Indeed, economic theory suggests that a value-added per component approach to licensing may yield inferior results.<sup>139</sup> As Greg Sidak observes:

Using the retail price of the downstream product as the royalty base enables the patent holder to capture the complementarity and network effects generated by its technology. When complementarity effects are strong, the full social value of a patent implemented in a complex product is captured in the end user's demand for the downstream product. In the case of a patented technology implemented in a smartphone, the demand for the handset approximates the value generated by the sum of all individual patented technologies when used in combination with one another. That combined value is greater than the sum of the parts, and it is at least as great as the amount that consumers willingly pay for the downstream product. Consequently, the retail price of the downstream product is an appropriate royalty base.<sup>140</sup>

Indeed, real-world voluntarily negotiated licenses tend to reflect a norm of using the entire market value for calculating an SEP's royalty base.<sup>141</sup> One need look no further, for example, than the *Qualcomm* case itself to see that viable licensing schemes not based on SSPPU are the norm—the post-licensing complaints of implementers notwithstanding.

Of course, this is not to say that all changes have gone in the direction of weaker or less certain patent protection. The Supreme Court's *Halo* decision overruled the so-called *Seagate* test for willful patent infringement, ultimately making it easier for rightsholders to obtain treble damages.<sup>142</sup> Similarly, in the UK and the EU, respectively, the *Unwired Planet* and *Huawei v. ZTE* rulings both attempted to find a middle ground between the rights of inventors and implementers.<sup>143</sup> Nevertheless, the fact remains

that there is today a strong undercurrent pushing for weaker or less certain patent protection that threatens to undermine the utility of patents in facilitating the efficient allocation of resources for innovation and its commercialization.<sup>144</sup> Policymakers should pay careful attention to the changes this trend may bring about and move swiftly to recalibrate the patent system where needed in order to better protect the property rights of inventors and yield more innovation overall.

139 See Sidak, *supra* note 80, at 995.

140 *Id.*

141 *Id.* at 996.

142 *Halo Elecs., Inc. v. Pulse Elecs., Inc.*, 579 U.S. \_\_\_ (2016).

143 *Unwired Planet Int'l Ltd. v. Huawei Technologies Co. Ltd.* [2018] EWCA (Civ) 2344 (Eng.); see Case C-170/13, *Huawei Technologies Co.*

*Ltd. v ZTE Corp.*, 2016 R.P.C. 259.

144 Barnett, *supra* note 20, at 812 (“Adverse effects will necessarily occur in every case in which weak patent coverage compels an innovator to incur commercialization costs that it would not otherwise bear under lower levels of expropriation risk. Those inflated commercialization costs impose a subtle social cost that can distort the entire supply chain running from idea to market.”).

