THE REVIEW OF LITIGATION

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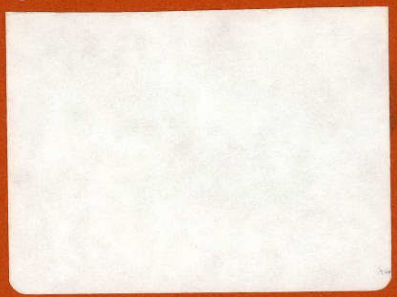

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The University of Texas School of Law
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THE REVIEW OF LITIGATION

2016 VOLUME 36 2017

FOREWORD

Patent Damages: Working with Limits

John M. Golden*

Since the start of the twenty-first century, the United States patent system has been under intense scrutiny.[1] Prominent representatives of whole industry sectors, including business leaders in information and communications technology, have clamored that the system is in many ways impeding innovation, rather than promoting it.[2] The resulting drumbeat for reform has yielded steady results but also much turbulence. The Supreme Court has repeatedly overturned holdings or policies of the Court of Appeals for the Federal Circuit or the Patent and Trademark Office (PTO).[3] Congress has rewritten substantial portions of the Patent Act and has added whole new forms of administrative proceedings.[4] The Federal Circuit

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* Professor, University of Texas School of Law. The writing of this foreword and the articles for the symposium were supported by honoraria from the University of Texas School of Law. These honoraria were made possible by a gift to the law school from Intel Corporation to support conferences on patent damages.

1. *See* John M. Golden, *Proliferating Patents and Patent Law's "Cost Disease"*, 51 HOUS. L. REV. 455, 457 (2013) ("Since at least 1999, the exact words 'The patent system is in crisis' have appeared so often in academic literature that they might be considered a meme.").

2. *See* John M. Golden, *Principles for Patent Remedies*, 88 TEX. L. REV. 505, 507 (2010) ("Perhaps most saliently, information-technology incumbents such as Microsoft Corporation and Intel Corporation have pushed strongly for rules to limit the reasonable-royalty damages available to nonincumbent patent holders . . . .").

3. *See, e.g.*, Halo Elecs., Inc. v. Pulse Elecs., Inc., 136 S. Ct. 1923, 1935 (2016) (rejecting test for enhancement of patent damages adopted by the Federal Circuit); Ass'n for Molecular Pathology v. Myriad Genetics, Inc., 133 S. Ct. 2107, 2118 (2013) (holding merely isolated DNA ineligible for patent protection despite longstanding PTO issuance of patents on such subject matter); eBay Inc. v. MercExchange, L.L.C., 547 U.S. 388, 393-94 (2006) (rejecting the Federal Circuit's "general rule . . . that a permanent injunction will issue once infringement and validity have been adjudged" (internal quotation marks omitted)).

4. Recent Legislation, *Patent Law—Patentable Subject Matter—Leahy-Smith America Invents Act Revises U.S. Patent Law Regime*, 125 HARV. L. REV. 1290, 1290 (2012) (noting that the 2011 Leahy-Smith America Invents Act (AIA) newly instituted "a first-inventor-to-file priority standard, opportunities to challenge patents through administrative proceedings, and new budgetary flexibility for the PTO"); David W. Trilling, Recent Development, *Recognizing a Need for Reform:*

itself has revisited and rethought various aspects of precedent or accepted practice.[5]

Debates over patent damages, especially damages according to a reasonable royalty measure, have frequently lain at the center of this storm.[6] As indicated by the symposium articles described below, such damages debates broach fundamental questions about the patent system's aims, the proper extent of the system's reach, and the best means for improving system performance. On a practical level, patent damages debates demand attention to sometimes fine points of procedure and call for imaginative ways of improving adjudication.

In many ways, the fierceness and persistence of debates relating to patent damages is predictable. Relevant points of tension reflect the often uncomfortably restrictive limits against which the patent system naturally strains. These limits include (1) limits to theoretical agreement on substantive goals and implementing methodologies; (2) limits to the information available to apply theory correctly even if theoretical agreement is assumed; (3) limits to the abilities of courts and other decision-makers to assess liability or monetary awards properly based on whatever facts and theories apply; and (4) limits on the territorial and subject-matter reach of patent law that can lead to questionable gaps in coverage or discontinuities in results.

To advance conversations about how to proceed in the face of such limits, the University of Texas School of Law hosted a

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The Leahy-Smith America Invents Act of 2011, 2012 U. ILL. J.L. TECH. & POL'Y 239, 241 (describing the AIA as "mark[ing] the beginning of a new era for patent law").

5. *See, e.g.*, Williamson v. Citrix Online, LLC, 792 F.3d 1339, 1349 (Fed. Cir. 2015) (en banc in relevant part) (overruling precedent "establish[ing] a heightened bar to overcoming the presumption that a [patent claim] limitation expressed in functional language without using the word 'means' is not subject to § 112, para. 6" of the Patent Act); Uniloc USA, Inc. v. Microsoft Corp., 632 F.3d 1292, 1315 (Fed. Cir. 2011) (holding evidence based on a long used "25 percent rule of thumb" for the presumptive starting point over a royalty rate to be inadmissible for purposes of proving a reasonable royalty); Knorr-Bremse Systeme Fuer Nutzfahrzuege GmbH v. Dana Corp., 383 F.3d 1337, 1344–46 (Fed. Cir. 2004) (en banc) (overruling precedent holding that refusal to produce an opinion of counsel or "failure to obtain an exculpatory opinion of counsel" on issues relating to potential patent infringement justify "an adverse inference" about what such an opinion says or would have said), *overruled in irrelevant part by* In re *Seagate*, 497 F.3d 1360 (Fed. Cir. 2007), *overruled in irrelevant part by* Halo Elecs., Inc. v. Pulse Elecs., Inc., 136 S. Ct. 1923 (2016).

6. Golden, *supra* note 2, at 507 (noting the role of "information-technology incumbents" in advocating limitations on reasonable royalty damages).

conference on patent damages ("PatDam1") in June of 2016.[7] A gift to the School of Law from Intel Corporation supported the conference as well as the offering of honoraria to authors of conference papers. At the same time, control over agenda and speakers for the conference was left wholly within the law school's discretion. The conference featured three separate panels of trial judges, damages experts, and in-house counsel. The conference also featured sessions for the discussion of draft papers to be published as articles in three separate issues of *The Review of Litigation* and the *Texas Intellectual Property Law Journal*. The journal issue in which this Foreword appears presents four of those articles.

The twelve articles prepared in association with PatDam1 address a variety of issues related to patent damages via a mix of scholarly approaches. Through a series of one-paragraph descriptions, this Foreword highlights aspects of the individual papers. The Foreword concludes with a brief discussion of common threads.

In *Patent Damages Heuristics*,[8] Thomas Cotter argues for addressing the limited fact-finding and decision-making capacities of courts by having them make more conscious and thoughtful use of heuristics—i.e., "shortcuts or 'rules of thumb' for reducing the time and effort needed to reach a solution or decision."[9] Cotter starts with the proposition that policymakers should use a "proposed heuristic when the sum of the administrative and error costs associated with its use is lower than the sum of the administrative and error costs resulting from" any competing alternative.[10] Cotter then discusses how to weigh error costs versus administrability savings in selecting appropriate heuristics.[11] He also develops a taxonomy for different types of heuristics in assessing patent damages, including heuristics for determining patentee eligibility for a particular form of damages, for providing a more readily calculated proxy for the amount of damages to which a patentee is theoretically entitled, and for informing more granular aspects of calculational methodology.[12] Finally, Cotter discusses the role of heuristics of various forms in

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7. Using funds donated by the Intel Corporation, the University of Texas School of Law also hosted a second conference on patent damages ("PatDam2") in February of 2017.

8. Thomas F. Cotter, *Patent Damages Heuristics*, 25 TEX. INTELL. PROP. L.J. (forthcoming 2017).

9. *Id.*

10. *Id.*

11. *Id.*

12. *Id.*

past and present case law and suggests paths by which courts can improve their use, including through deployment of better heuristics for employing evidence of royalty rates from allegedly comparable licenses.[13]

In *Gatekeeping Trends in Reasonable Royalty Cases*,[14] Andrew Amerson chronicles recent doctrinal developments in the case law on reasonable royalties[15] and provides a descriptive empirical study of *Daubert* motions challenging proffered expert testimony on patent damages.[16] Invoking concerns with predictability, efficiency, and effective judicial gatekeeping, Amerson suggests the desirability of simplifying the assessment of reasonable royalties, whether through use of one or more heuristics or through courts' commitment to a "baseball arbitration" approach in which the court will invariably use one or another of the parties' proposed reasonable royalty figures, rather than some value of the court's devising.[17] A hope is that a baseball arbitration approach would moderate party positions by encouraging parties to compete to present more reasonable figures than their opponents, rather than to compete to anchor the court's decision-making on a very high or low value from which a compromise might be derived.[18]

In *How Patent Damages Skew Licensing Markets*,[19] Erik Hovenkamp and Jonathan Masur focus specifically on the problem of using allegedly comparable licenses for purposes of assessing reasonable royalty damages.[20] They argue that reliance on past licenses to set reasonable royalty damages has problematic effects that include distortion of private incentives in licensing and the promotion of secrecy and obfuscation in contract design.[21] Specifically, courts' use of such patent licenses can generate deadweight loss by encouraging patentees to maintain uniformly

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13. *Id.*

14. Drew Amerson, *Gatekeeping Trends in Reasonable Royalty Cases*, 25 TEX. INTELL. PROP. L.J. 1.

15. *Id.*

16. *Id.* In *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993), the Supreme Court held that, although "'general acceptance'" of scientific evidence is not required, *id.* at 588–89, "the trial judge must ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable." *Id.* at 589.

17. *Id.*

18. *See id* at 4.

19. Erik Hovenkamp & Jonathan Masur, *How Patent Damages Skew Licensing Markets*, 36 REV. LITIG. 379 (Symposium 2017).

20. *Id.* at 380.

21. *Id.* at 381–82.

high royalty rates in light of possible reference to those rates in later litigation.[22] Hovenkamp and Masur propose that, except perhaps in the context of patents subject to a prior commitment to reasonable and nondiscriminatory licensing, courts should uniformly approach the determination of patent damages as if there were no prior analogous licenses.[23] Hovenkamp and Masur contend that, as long as the results of courts' ad hoc calculations are randomly distributed without systematic bias, there will then be better ex ante incentives for both patent holders and members of society at large.[24]

Colleen Chien and Eric Schulman provide a different take on the use of past patent licenses in *Patent Semi-Comparables*.[25] They argue that the courts' emphasis on using "truly 'comparable licenses'" to determine a reasonable royalty can wrongly lead to neglect or outright rejection of evidence of a patented invention's value that can be gleaned from "'semi-comparable' licenses" that differ substantially from the sort of bare license of a single patented invention that courts commonly envision as the model for a reasonable royalty.[26] To put their recommendation in context, Chien and Schulman describe three main categories of circumstances in which patent purchases or licenses can arise: *ex ante* transactions prior to the development or adoption of a new technology, *ex post* transactions to avoid or end litigation, and freedom-to-operate transactions commonly associated with acquiring, licensing, or cross-licensing large patent portfolios.[27] In situations in which damages or an "ongoing royalty" rate[28] are difficult to estimate, Chien and Schulman suggest that courts might revisit the desirability of appropriately tailored injunctions as a means to provide proportionate protection of patent rights.[29]

In the *Final Report of the Berkeley Center for Law & Technology Patent Damages Workshop*,[30] Stuart Graham, Peter

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22. *Id.* at 382.

23. *Id.*, Part V.

24. *Id.*

25. Colleen Chien & Eric Schulman, *Patent Semi-Comparables*, 25 TEX. INTELL. PROP. L.J. (forthcoming 2017).

26. *Id.*

27. *Id.*

28. Paice LLC v. Toyota Motor Corp., 504 F.3d 1293, 1314 (Fed. Cir. 2007) ("Under some circumstances, awarding an ongoing royalty for patent infringement in lieu of an injunction may be appropriate.").

29. Chien, *supra* note 25.

30. Stuart Graham, Peter Menell, Tim Simcoe & Carl Shapiro, *Preliminary Report of the Berkeley Center for Law & Technology Patent Damages Workshop*, 25 TEX. INTELL. PROP. L.J. 113 (2017).

Menell, Carl Shapiro, and Tim Simcoe report on a roundtable-style workshop that the Berkeley Center for Law & Technology, with support from Intel Corporation, hosted on March 3, 2016.[31] Graham, Menell, Shapiro, and Simcoe summarize points of agreement and disagreement that emerged during the discussions. For example, they report consensus on the points "that the patent holder is entitled to a royalty based on the value contributed by the patented invention"[32] and that past licenses are often a problematic way to determine this value.[33] Graham, Menell, Shapiro, and Simcoe suggest a number of potential ways to improve courts' handling of damages claims, including the development of a technical guide for judges on patent valuation; greater use of independent, court-appointed experts; a code of conduct for expert witnesses that could help establish greater independence even for party experts; early exchanges of damages contentions, acceleration of the schedule for damages-related discovery; and earlier consideration of *Daubert* challenges to damages experts.[34]

In *Rationalizing FRAND Royalties: Can Interpleader Save the Internet of Things?*,[35] Jason Bartlett and Jorge Contreras propose another procedural mechanism that courts might use, that of interpleader.[36] This procedural device "affords a party who fears being exposed to the vexation of defending multiple claims to a limited fund or property . . . a procedure to settle the controversy and satisfy the obligation in a single proceeding."[37] Bartlett and Contreras contend that courts can helpfully use interpleader to bring together all owners of standard-essential patents (SEPs) in one proceeding in which the portion of an overall royalty attributable to each owner's set of SEPs might be determined.[38] Bartlett and Contreras suggest that such use of interpleader could help prevent "royalty stacking" problems in which separately determined royalty rates for subsets of SEPs result in an aggregate royalty rate that is

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31. *Id.*
32. *Id.* at 124.
33. *Id.* at 125.
34. *Id.* at 128.
35. Jason R. Bartlett & Jorge L. Contreras, *Rationalizing FRAND Royalties: Can Interpleader Save the Internet of Things?,* 36 REV. LITIG. 285 (Symposium 2017).
36. *Id.* at 310.
37. 7 CHARLES ALAN WRIGHT ET AL., FEDERAL PRACTICE AND PROCEDURE §1704 (2016).
38. Bartlett & Contreras, *supra* note 35, at 310.

unreasonably large overall.[39] Bartlett and Contreras also suggest that interpleader will help lead to less inconsistency between, and more justification for, the relative sizes of rewards achieved by different owners of SEPs associated with the same standard.[40]

In *A Restitution Perspective on Reasonable Royalties*,[41] Karen Sandrik and John Golden, the author of this foreword, look to the law of restitution for instruction on how courts might better approach assessment of reasonable royalty damages. Golden and Sandrik note how the role of reasonable royalty damages as a residual remedy in patent law compares to the role that restitution remedies play in areas of law like contract, in which monetary relief based on a restitution measure may result when there is a failure of proof with respect to expectation damages.[42] Golden and Sandrik describe how, in order to promote appropriate private bargaining and to deter bad behavior, the Restatement (Third) of Restitution and Unjust Enrichment lays out both a multilayered set of measures for monetary relief and corresponding tiers of relative fault or responsibility.[43] Golden and Sandrik suggest that, even without straightforward translation of restitution's measures and tiers, patent law might follow restitution in adopting an approach to reasonable royalty damages that incorporates greater sensitivity to relative fault and better advances patent system goals through (1) more context-sensitive allocation of burdens of proof and production, (2) at least partial attention to questions of innovation cost and social value, and (3) deployment of different potential damages measures.[44]

In *Innovation Factors for Reasonable Royalties*,[45] Ted Sichelman highlights both the potential utility of patent-related costs in reasonable royalty determinations[46] and, more generally, the possible desirability of a more reliance-oriented damages regime.[47] Sichelman comes to his proposal on use of cost information from a different direction than that taken by Golden and Sandrik: Sichelman works primarily upward from patent law's aim "to promote

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39. *See id.* at 316-17.

40. *Id.* at 320.

41. John M. Golden & Karen E. Sandrik, *A Restitution Perspective on Reasonable Royalties*, 36 REV. LITIG. 335 (Symposium 2017).

42. *Id.* at 336.

43. *Id.* at Part II.

44. *Id.* at 377.

45. Ted Sichelman, *Innovation Factors for Reasonable Royalties*, 25 TEX. INTELL. PROP. L.J. (forthcoming 2017).

46. *Id.*

47. *Id.*

innovation,"[48] rather than laterally from inquiry into what the law of patent damages might learn from another legal area.[49] Sichelman also does more than merely suggest that cost might be a factor in the damages calculus or perhaps an occasional measure of damages itself. Sichelman contends that courts should jettison perhaps the most widely accepted part of the prevailing *Georgia-Pacific* "test"[50] for reasonable royalty damages[51]—namely, the notion that reasonable royalty damages should equal a royalty to which a willing licensor and willing licensee would have agreed in a hypothetical negotiation occurring before infringement started.[52] Sichelman argues that courts should instead look more to ensuring "a sufficient return" on the costs of research, development, and commercialization, including the opportunity costs of such investments.[53] Sichelman also emphasizes the relevance of technological value in awarding reasonable royalty damages, noting that such value or relative lack thereof can be indicated by whether "there would have been viable noninfringing alternatives [to the patented technology] for a substantially lower cost."[54]

In *Enhanced Damages for Patent Infringement: A Normative Approach*,[55] Keith Hylton investigates the question of what standard for supra-compensatory patent damages is best designed to advance social welfare.[56] Under the Patent Act, district courts have discretion to enhance damages "up to three times the amount [of compensatory

48. *Id.*

49. *See supra* text accompanying notes 41–44.

50. A district court opinion in Georgia-Pacific Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970), *modified in irrelevant part*, 446 F.2d 295 (2d Cir. 1971), is often characterized as laying out a "test" for the value of reasonable royalty damages, *see, e.g.*, Daralyn J. Durie & Mark A. Lemley, *A Structured Approach to Calculating Reasonable Royalties*, 14 LEWIS & CLARK L. REV. 627, 628 (2010) (criticizing "the non-exclusive, fifteen-factor 'Georgia-Pacific' test now taken as the gold standard for calculating reasonable royalty damages"), although the case technically only lists a non-exclusive set of fifteen potentially relevant factors, *id.* at 629.

51. Sichelman, *supra* note 45, Part I; *see also* David O. Taylor, *Using Reasonable Royalties to Value Patented Technology*, 49 GA. L. REV. 79, 122 (2014) ("It is important to recognize that the last of the fifteen Georgia-Pacific factors, the hypothetical negotiation construct, has, to a large degree, superseded the remainder of the factors in terms of importance.").

52. Sichelman, *supra* note 45.

53. *Id.*

54. *Id.*

55. Keith N. Hylton, *Enhanced Damages for Patent Infringement: A Normative Approach*, 36 REV. LITIG. 417 (Symposium 2017).

56. *Id.* at 417–18.

damages] found or assessed."[57] To analyze when courts should enhance damages, Hylton combines bottom-up analysis from the patent system's interest in promoting innovation with lateral analysis of what patent law might learn from tort. Hylton observes that social interests in generating and preserving innovation incentives for would-be patent holders should be weighed against social benefits from unauthorized use of an invention.[58] Hylton concludes that, in determining whether to enhance patent damages, courts should consider analogs of many of the factors used to determine whether to enhance damages in tort law—for example, the level of reprehensibility of the wrongdoer's conduct,[59] the likelihood that infringing activity will be detected and subjected to patent enforcement,[60] and the magnitude of social harm inflicted by infringement.[61]

In *Buying Monopoly: Antitrust Limits on Damages for Externally Acquired Patents*,[62] Erik Hovenkamp and Herbert Hovenkamp look to antitrust law not so much for instruction on how patent law might be doctrinally structured as for guidance on the extent to which patent acquisition and enforcement problematically suppress competition.[63] In particular, Hovenkamp and Hovenkamp look to antitrust law in proposing the denial of patent damages if (1) the patent in question was "externally acquired"—i.e., did not result from the patent holder's own research and development efforts—and (2) "the acquisition [of that patent] serves materially to expand or perpetuate the [patent holder's] dominant position in the relevant technology market."[64] Hovenkamp and Hovenkamp distinguish externally acquired patents from patents resulting from internal research efforts on grounds that "[d]eveloping valid patents internally and enforcing them is unilateral conduct" that the Patent Act authorizes and antitrust laws may not prohibit.[65] They acknowledge the general desirability of alienability of patent rights[66] but note broad agreement among economists that "relatively

57. 35 U.S.C. § 284.
58. Hylton, *supra* note 55, at 429.
59. *Id.* at 432–33.
60. *Id.* at 435.
61. *Id.* at 437–38.
62. Erik Hovenkamp & Herbert Hovenkamp, *Buying Monopoly: Antitrust Limits on Damages for Externally Acquired Patents*, 25 TEX. INTELL. PROP. L.J. 37 (2017).
63. *Id.* at 39.
64. *Id.* at 40.
65. *Id.* at 50.
66. *Id.* at 39.

competitive markets are more conducive to innovation than monopolized markets."[67] Hovenkamp and Hovenkamp observe that courts have previously fashioned rules that limit patents' effective enforceability[68] and argue that limiting patent damages could be a more efficient means to advance competition than standard mechanisms for antitrust enforcement.[69]

In *Allocating Patent Litigation Risk Across the Supply Chain*,[70] Michael Meurer considers situations in which multiple parties—for example, product manufacturers and their customers—are liable for a single course of patent infringement.[71] For such situations, Meurer investigates how damages or risk of damages might be best allocated among parties via indemnification, insurance, and court proceedings.[72] Most particularly, Meurer investigates the extent to which indemnification agreements, including agreements that cap a party's liability, affect the parties' bargaining positions with respect to a relevant patent owner.[73] Meurer observes that caps on liability can create conflicts between the interests of contracting parties when they bargain with a patent owner.[74] On the other hand, liability caps can also generate benefits by potentially making at least one of the parties a harder bargainer.[75] Meurer suggests that these hard-bargaining benefits might be especially useful when "patent notice works poorly and patent clearance is difficult."[76]

In *Patent Damages Without Borders*,[77] Sapna Kumar questions current case law that restricts the availability of monetary relief for U.S. patent infringement when relevant profit-making occurs abroad.[78] She contends that such case law misapplies the general presumption against extraterritorial reach for U.S. law.[79] Kumar discusses the justifications for this presumption[80] and its

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67. *Id.* at 42.
68. *Id.* at 67.
69. *Id.* at 46.
70. Michael J. Meurer, *Allocating Patent Litigation Risk Across the Supply Chain*, 25 TEX. INTELL. PROP. L.J. (forthcoming 2017).
71. *Id.*
72. *Id.*
73. *Id.*
74. *Id.*
75. *Id.*
76. *Id.*
77. Sapna Kumar, *Patent Damages Without Borders*, 25 TEX. INTELL. PROP. L.J. 71 (2017).
78. *Id.* at 77–78.
79. *Id.* at 76.
80. *Id.*

historical application to not only U.S. patent law but also trademark and copyright law.[81] Kumar concludes that, with respect to extraterritorial damages, U.S. patent law is out of step with other areas of law.[82] In her view, U.S. courts should be able to award extraterritorial damages for domestic patent infringement,[83] but they should do so only after appropriately weighing concerns of comity against the U.S. "interest in making victims of domestic patent infringement whole."[84] Further, courts should not award extraterritorial damages when their connection to domestic infringement is "too speculative or tenuous."[85]

These twelve symposium articles cover disparate ground but feature common themes. Authors such as Amerson, Cotter, and Kumar explore how decision-making might be simplified or made more evenhanded and coherent. Amerson, coauthors Bartlett and Contreras, and coauthors Graham, Menell, Shapiro, and Simcoe discuss procedural innovations that might improve aggregate and even individual results. Chien, Sichelman, and coauthors Golden and Sandrik investigate additional factors or evidence that courts might use in assessing reasonable royalties. Meurer and coauthors Hovenkamp and Masur study interactions between court-awarded damages and contractual mechanisms of private ordering. Finally, Hylton, Kumar, coauthors Hovenkamp and Hovenkamp, and coauthors Golden and Sandrik show how other areas of law—tort, copyright, trademark, antitrust, and restitution—can provide direction and insight for the law of patent damages. In short, despite taking widely different approaches to frequently distinct endpoints, the symposium articles feature repeated use of certain tactics to achieve better understanding of how the awarding of patent damages functions and might be improved.

Of course, there are further potential tactics that are missing from this limited set of articles. Just as the patent system must work with limits inevitable in any human-made and human-implemented system of law, so too is the academic enterprise bounded by the limited capacities of its practitioners and the circumstances in which they appear. Thus, this symposium's articles will not bring an end to patent damages debates. Nonetheless, these embodied applications of the legal thinker's toolkit deepen those debates and point out ways to move forward. The symposium articles offer a richly rewarding read.

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81. *Id.* at 94–97.
82. *Id.* at 109.
83. *Id.*
84. *Id.* at 110.
85. *Id.* at 111.

Rationalizing FRAND Royalties: Can Interpleader Save the Internet of Things?

Jason R. Bartlett* & Jorge L. Contreras†

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* Partner, Mauriel Kapouytian Woods LLP, San Francisco, CA.

† Professor, University of Utah S.J. Quinney College of Law, Salt Lake City, UT, and Senior Policy Fellow, Program on Information Justice and Intellectual Property, American University Washington College of Law, Washington, DC. The preparation of this article was supported, in part, by an honorarium from the University of Texas at Austin out of a fund resulting from a gift to the University of Texas School of Law by Intel Corporation. This article has benefited from presentation and feedback at the 2016 Patent Damages Conference held at the University of Texas and from thoughtful comments, discussion, and suggestions by Jeffrey Dean, Ben Edwards, Paul Gugliuzza, Cathy Hwang, Arti Rai, Chris Seaman and Norman Siebrasse.

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Interpleader possesses on first acquaintance an attractiveness which is not exceeded by any other remedy known to the law.
Professor Zechariah Chafee, Jr. (1921)[1]

I. STANDARDS, PATENTS AND REASONABLE ROYALTIES

Technical interoperability standards such as Wi-Fi,[2] Bluetooth, HTTP, and LTE enable products manufactured by different vendors to interact reliably and in a manner that is largely invisible to the consumer. The existence of such standards, and the widespread product interoperability that they enable, can reduce product development and manufacturing costs, increase consumer utility and produce significant market efficiencies known as "network effects."[3]

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1. Zechariah Chafee, Jr., *Modernizing Interpleader*, 30 YALE L.J. 814, 814 (1921).

2. Wi-Fi is the trade name given to the 802.11 series of wireless networking standards developed by the IEEE Standards Association. In this article we use the terms Wi-Fi and 802.11 interchangeably.

3. *See* CARL SHAPIRO & HAL R. VARIAN, INFORMATION RULES: A STRATEGIC GUIDE TO THE NETWORK ECONOMY 45–46 (1999); U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, ANTITRUST ENFORCEMENT AND INTELLECTUAL PROPERTY RIGHTS: PROMOTING INNOVATION AND COMPETITION 33 (2007) [hereinafter ANTITRUST & IPR REPORT] (defining "network effects").

Most of the technical standards currently deployed in products around the world were developed by market participants collaborating within voluntary associations known as standards-development organizations (SDOs).[4] Because of the significant market and consumer benefits that technical standards can confer, this degree of cooperation among competitors has long been viewed favorably by antitrust and competition law agencies, who might ordinarily be wary of such large-scale coordination efforts.[5] The importance of technical interoperability standards continues to grow in today's interconnected global economy. Efforts are under way to develop the next generation of mobile broadband communications standards known as "5G",[6] as well as standards that will link a bewildering array of devices in vehicles, buildings and the environment known as the "Internet of Things."[7]

A. Patents and Standards

It is well-documented that hundreds, if not thousands, of patents cover many important interoperability standards. Table 1 below shows estimated patent coverage of several widely-adopted standards:

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4. SDOs include a broad range of organizations, from large, international bodies (e.g., the European Telecommunications Standards Institute (ETSI) (mobile telecommunications), the IEEE Standards Association (electronics and networking), and the Internet Engineering Task Force (IETF) (Internet)), to smaller groups often referred to as "consortia" that focus on one or a handful of related standards (e.g. the DVD 6C Forum and Bluetooth Special Interest Group). *See generally* Brad Biddle et al., *The Expanding Role and Importance of Standards in the Information and Communications Technology Industry*, 52 JURIMETRICS 177 (2012) (describing the standards-development 'ecosystem'); AM. BAR ASS'N, STANDARDS DEVELOPMENT PATENT POLICY MANUAL ix–xi (Jorge L. Contreras ed., 2007) [hereinafter ABA Patent Policy Manual] (describing organizations involved in standard-setting).

5. *See, e.g.*, ANTITRUST & IPR REPORT, *supra* note 3, at 33 (discussing large–scale coordinated efforts of law agencies).

6. Balazs Bertenyi, *3GPP System Standards Heading into the 5G Era*, 3GPP, http://www.3gpp.org/news-events/3gpp-news/1614-sa_5g (last visited Jan. 16, 2017).

7. *See* Pelle Högnelid & Thomas Kalling, *Internet of Things and Business Models – Empirical Illustrations of How the Business Model Concept Helps Us to Understand Strategic Implications of Internet of Things Investments*, Proceedings of the 9th International Conference on Standardization and Innovation in Information Technology (IEEE-SIIT), Oct. 6–8, 2015, at 13 (discussing the emergence of the "Internet of Things").

Table 1

Standard	SDO	Patent Coverage Estimates[8]
MPEG-2	MPEG	800 patent families[9]
3G WCDMA	ETSI	1,000 patent families[10]
3G UMTS	ETSI/3GPP	43,658 patent disclosures[11]
4G LTE	ETSI	61,831 patent disclosures[12] 1,000 patent families[13]
802.11 (Wi-Fi)	IEEE	3,000 patents[14]

Both the overall number of SEPs and the number of different firms holding SEPs has steadily increased over the years.[15] In a 2015

8. Different studies have used different measures to assess the number of patents covering particular standards. Some studies count the number of patents disclosed in individual SDO participants' written declarations to an SDO. *See* Justus Baron & Tim Pohlmann, *Mapping Standards to Patents Using Databases of Declared Standard-Essential Patents and Systems of Technological Classification* 9–10 (Regulation & Econ. Growth, Working Paper, 2015), http://www.law.northwestern.edu/research-faculty/searlecenter/innovationeconomics/documents/Baron_Pohlmann_Mapping_Standards.pdf. It is possible that multiple declarations may list the same patents, as multiple co-owners of individual patents may each file declarations, patent owners may file new declarations as a standard evolves or as patent applications mature into issued patents, or different features of a standardized technology are covered by the same patent(s). Other studies are based on industry analysis of the number of patent families believed to be essential to particular standards. *See* KNUT BLIND ET AL., STUDY ON THE INTERPLAY BETWEEN STANDARDS AND INTELLECTUAL PROPERTY RIGHTS (IPRS), FINAL REPORT 62 (2011), http://www.iplytics.com/download/docs/studies/ipr_study_final_report_en.pdf. A patent "family" is generally a group of patents around the world that relate to the same invention and often trace their lineage to a single original patent application. *Id.* at 133–34, n. 42. Thus, there can be dozens of individual patents within a single patent family.

9. BLIND ET AL., *supra* note 8, at 62.

10. *Id.*

11. Baron & Pohlmann, *supra* note 8, at 20, Table 5.

12. *Id.*

13. BLIND ET AL., *supra* note 8, at 62.

14. *In re* Innovatio IP Ventures, LLC, No. 1:11CV-09308, 2013 U.S. Dist. LEXIS 144061, at *85 (N.D. Ill. Oct. 3, 2013).

15. Rudi Bekkers & Joel West, *The Limits to IPR Standardization Policies as Evidenced by Strategic Patenting in UMTS, 33* TELECOM. POL. 80–97 (2009) (finding an eightfold increase in the number of disclosed essential patents for UMTS (1,227) over GSM (140), as well as a threefold increase in the number of patent holders (23 to 72)).

survey, Baron and Pohlmann identified SEP disclosures made by more than 2,000 different firms and organizations.[16] An earlier 2011 study identified 292 holders of patents relevant to the telecommunications-focused standards.[17] Court records in the *Microsoft v. Motorola* case indicate that there are ninety-two holders of SEPs covering the Wi-Fi standard alone.[18]

When the total number of standards embodied in a complex technology product is multiplied by the number of patents covering each standard, large numbers invariably result. For example, in 2011, RPX, a defensive patent aggregator, estimated that roughly 250,000 different patents cover an average smartphone.[19] It is likely that the numbers of patents and patent holders in standardized product markets will continue to grow as the complexity of technology products increases and pressure toward increasing convergence and interconnectedness fuels technology product markets.

The nascent Internet of Things draws into sharp focus this trend and the potential barriers that may be imposed on technical innovation and competition by large numbers of overlapping patents. As Fiona Scott Morton and Carl Shapiro have observed,

> [T]he 'Internet of Things' is a new and growing area where royalty stacking and patent hold-up appear to be very real dangers. Devices of all sorts, from thermostats to railroad cars to refrigerators, are being given mobile connectivity using standards developed by SSOs. The price of those chips, and whether they cost $5 or $0.50 or $0.005, will determine the nature of new applications and the rate of adoption. Failure to prevent patent hold-up relating to tomorrow's information technology and communications standards

16. Baron & Pohlmann, *supra* note 8, at 13.

17. BLIND ET AL., *supra* note 8.

18. Microsoft Corp. v. Motorola, Inc., Case. No. C10-1823JLR, 2013 U.S. Dist. LEXIS 60233, at *213 (W.D. Wash., Apr. 25, 2013), *aff'd*, 795 F.3d 1024 (9th Cir. 2015).

19. RPX Corp., Registration Statement at p. 55 (Form S-1) (Jan. 21, 2011) ("Based on our research, we believe there are more than 250,000 active patents relevant to today's smartphones, a significant increase compared to our estimate of approximately 70,000 patents that were active and relevant to mobile phones in 2000. This growth can be attributed to the expanded set of features and functionality incorporated in today's smartphones, including touchscreens, internet access, streaming video, media playback, application store readiness and other web-based services, and WiFi connectivity options.").

is likely to cause significant social welfare loss in the years ahead.[20]

B. SDOs and FRAND Commitments

In order to address concerns about potential leverage exerted by holders of patents covering widely-adopted standards (so-called patent "hold-up"), many SDOs have adopted policies requiring their participants to license essential patents on terms that are royalty-free or which bear "fair, reasonable and non-discriminatory" (FRAND) royalties.[21] All SDOs accredited by the American National Standards Institute (ANSI) must require such commitments,[22] as do many other SDOs worldwide.[23]

Despite the widespread usage of FRAND commitments, there is little consensus regarding the precise meaning of such commitments, particularly with regard to the level of royalties that would be considered "fair" and "reasonable." No SDO of which we are aware defines precisely what these terms mean,[24] and many SDOs

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20. Fiona Scott Morton & Carl Shapiro, *Patent Assertions: Are We Any Closer to Aligning Reward to Contribution?*, 32 (NBER Working Paper No. 21678, 2015).

21. Following customary practice, we use the terms FRAND and RAND (reasonable and nondiscriminatory) interchangeably. *See* U.S. Dep't of Justice & U.S. Patent & Trademark Office, Policy Statement on Remedies for Standards-Essential Patents Subject to Voluntary F/RAND Commitments 1 n.2 (2013) [hereinafter DOJ/PTO Policy Statement], http://www.justice.gov/atr/public/guidelines/290994.pdf (discussing RAND and FRAND licensing commitments).

22. ANSI Essential Requirements: Due Process Requirements for American National Standards § 3.1.1, at 10–11 (Am. Nat'l Standards Inst. 2015).

23. *See* Rudi Bekkers & Andrew Updegrove, *A Study of IPR Policies and Practices of a Representative Group of Standards Setting Organizations Worldwide*, THE NAT'L ACAD. OF SCI., ENGINEERING, MED. 89 tbl.13 (2012), http://sites.nationalacademies.org/xpedio/groups/pgasite/documents/webpage/pga_072197.pdf (of ten major SDOs studied, eight explicitly specify FRAND licensing as an option in their IPR policies); Brad Biddle, Andrew White, & Sean Woods, *How Many Standards in a Laptop? (And Other Empirical Questions)*, 2010 Int'l Telecomm. Union Sec. Telecomm. Standardization, Kaleidoscope Acad. Conf. Proc. at 3 & fig. 2 (75 percent of the laptop computer standards studied were subject to a RAND commitment and 22 percent were royalty-free); Mark A. Lemley, *Intellectual Property Rights and Standard-Setting Organizations*, 90 CALIF. L. REV. 1889, 1906 (2002) (of 36 SDO policies studied, 29 required, and 3 encouraged, FRAND licensing).

24. Notwithstanding this general reticence, at least one SDO (IEEE-SA) has recently attempted to introduce clarifications to its FRAND licensing commitments, but even these fall short of defining any numerical rate or range for royalties. *See* Michael A. Lindsay & Konstantinos Karachalios, *Updating a Patent Policy: The*

affirmatively disclaim any role in establishing, interpreting, or adjudicating the reasonableness of FRAND royalty rates.[25] In fact, some SDOs expressly prohibit the discussion of royalties and other licensing terms at SDO-sponsored activities.[26] Though some commentators have argued that SDOs can and should play a greater role in defining the nature and scope of FRAND commitments,[27] concerns arising from antitrust law, complexity, efficiency and cost have, in general, thwarted most attempts by SDOs to provide such guidance.[28]

Given this lack of guidance from SDOs, parties have increasingly sought to resolve disputes regarding FRAND royalty rates through litigation.[29] Accordingly, a growing number of courts

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IEEE Experience, CPI ANTITRUST CHRONICLE, Mar. 2015 (describing IEEE's 2015 policy amendments).

25. *See, e.g.*, IEEE Standards Assn., IEEE-SA Standards Board Bylaws § 6.2 (2016), http://standards.ieee.org/develop/policies/bylaws/sb_bylaws.pdf ("The IEEE is not responsible for . . . [d]etermining whether any licensing terms or conditions provided in connection with submission of a Letter of Assurance, if any, or in any licensing agreements are reasonable or non-discriminatory."); Scott Bradner, Intellectual Property Rights in IETF Technology, Request for Comments 3979, § 4.1 (2005), http://datatracker.ietf.org/doc/rfc3979/?include_text=1 ("[IETF] will not make any explicit determination that the assurance of reasonable and non-discriminatory terms or any other terms for the use of an Implementing Technology has been fulfilled in practice.").

26. *See, e.g.*, IEEE Standards Assn., IEEE-SA Standards Board Operations Manual § 5.3.10.2 (2015), http://standards.ieee.org/develop/policies/opman/sb_om.pdf ("No discussions or other communications regarding the following topics shall occur during IEEE-SA working group standards-development meetings or other duly authorized IEEE-SA standards-development technical activities: . . . [t]he essentiality, interpretation, or validity of patent claims; [s]pecific patent license terms or other intellectual property rights. . . .").

27. *See, e.g.*, Stanley M. Besen, *Why Royalties for Standard Essential Patents Should Not Be Set by the Courts*, 15 CHI-KENT J. INTELL. PROP. 1 (2016) (arguing that SDOs, rather than courts, are best-equipped to make FRAND royalty determinations); Jorge L. Contreras, *Fixing FRAND: A Pseudo-Pool Approach to Standards-Based Patent Licensing*, 79 ANTITRUST L.J. 47, 51–52 (2013).

28. *See* Contreras, *Fixing FRAND*, *supra* note 27, at 51–52 (discussing reasons for prohibitions); Mark A. Lemley, *Property, Intellectual Property, and Free Riding*, 83 Tex. L. Rev. 1031, 1965 (2005) (observing that such restrictions are generally intended to shield SDOs from antitrust liability for collusive price fixing by their participants).

29. The stakes in such litigation are sometimes high. For example, in *Microsoft v. Motorola*, the patent holder's original demand for royalties subject to a (F)RAND commitment could have resulted in annual royalty payments of approximately $4 billion. Instead, the court awarded Motorola royalties that amounted, in the aggregate, to approximately $1.8 million per year. 2013 U.S. Dist. LEXIS 60233. Steven Musil, *Court Sides with Microsoft over Motorola Patents Used in Xbox*,

have been called upon to adjudicate the level of royalties that comply with a SEP holder's FRAND licensing commitments. While such obligations originate in SDO policies and voluntary commitments made by SDO participants, courts seeking to interpret these obligations have looked largely to the federal law of patent damages to determine what "reasonable" royalties ought to be.[30]

C. *Reasonable Royalties, Incremental Value and Apportionment*

Section 284 of the Patent Act provides that, upon a finding of infringement, "the court shall award the claimant damages adequate to compensate for the infringement, but in no event less than a *reasonable royalty* for the use the infringer made of the invention . . . ."[31] One of the key tenets of reasonable royalty damages is that "the ultimate reasonable royalty award must be based on the incremental value that the patented invention adds to the end product."[32] This "incremental value" framework can be traced at least back to the Supreme Court's 1915 decision in *Dowagiac Mfg. Co. v. Minn. Moline Plow Co.*[33] Today, the incremental value measure is one of fifteen factors incorporated into the *Georgia-Pacific* "hypothetical negotiation" framework for calculating patent damages.[34] The

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CNET (Apr. 25, 2013), https://www.cnet.com/news/court-sides-with-microsoft-over-motorola-patents-used-in-xbox/.

30. *See* Jorge L. Contreras & Richard J. Gilbert, *A Unified Framework for RAND and other Reasonable Royalties*, 30 BERKELEY TECH. L.J. 1451, 1465-67 (2015) (Despite the private origins of FRAND royalty commitments, courts have largely (and correctly) decided to calculate FRAND royalty levels using patent law reasonable royalty damages methodologies.).

31. Act of July 19, 1952, Pub. L. No. 82-593, 66 Stat. 812, codified at 35 U.S.C. § 284 (2012) (emphasis added). Damages for "lost profits" are also available under 35 U.S.C. § 284, but these are beyond the scope of this article.

32. Ericsson, Inc. v. D-Link Systems, Inc., 773 F.3d 1201, 1226 (Fed. Cir. 2014).

33. Dowagiac Mfg. Co. v. Minn. Moline Plow Co., 235 U.S. 641, 648 (1915).

34. Georgia-Pacific Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970), *modified and aff'd*, 446 F.2d 295 (2d Cir. 1971) (Factor 13 instructs the jury to consider "[t]he portion of the realizable profit that should be credited to the invention as distinguished from non-patented elements, the manufacturing process, business risks, or significant features or improvements added by the infringer[.]"); *see generally* Contreras & Gilbert, *A Unified Framework*, *supra* note 30, at 1479 (providing a discussion of the use of the *Georgia-Pacific* analysis in standards-essential patent cases); Christopher B. Seaman, *Reconsidering the* Georgia-Pacific *Standard for Reasonable Royalty Patent Damages*, 2010 BYU L. REV. 1661, 1697–99 (2010) (critical of the *Georgia-Pacific* framework).

incremental value approach requires a court to determine what portion of the overall product value the patented feature contributes, in view of all the other features of the product.[35] This analysis is often referred to as "apportionment."[36]

D. The Bottom-Up Approach—A Recipe for Inconsistency

A bottom-up approach to royalty calculation assesses the incremental value of individual patents in different suits without reference to the other patents covering the same standard or product. For example, consider a hypothetical product with fifty principal features,[37] forty of which are patented. Suppose that there are 1000 patents covering patented features, and that twenty-five of these patents cover Feature A, which is characterized by conformance to an SDO-developed interoperability standard bearing a FRAND licensing commitment. Firm X holds five patents covering Feature A, and Firm Y wishes to manufacture and sell the hypothetical product.

In the first instance, Firms X and Y should negotiate regarding the necessary license for X's patents. However, if that negotiation fails, despite the good faith efforts of the parties, then X may bring an infringement action against Y, or Y may bring an action against X for breach of its FRAND commitment.[38] In either case, a court may be required to determine the reasonable royalty that Y should pay to X for the use of X's patents.

To determine this "reasonable royalty," the court must determine the incremental value that X's patented technology contributes to the overall product's value. Following the reasoning employed in *Microsoft v. Motorola*, this analysis involves a determination of both the importance of X's patented technology to the standard (Feature A), and the overall importance of Feature A to

35. *Ericsson*, 773 F.3d at 1226.

36. *Id.*

37. For purposes of this analysis, we consider product "features" to include not only technological capabilities such as 802.11a/b/g/n/ab connectivity, a sensitive touch-screen, and a 10-MP camera, but also aesthetic design features, customer support, and firm reputation.

38. Such an action may be brought under a variety of theories including contract, estoppel, antitrust and others. *See* Jorge L. Contreras, *A Market Reliance Theory for FRAND Commitments and Other Patent Pledges*, 2015 UTAH L. REV 479, 498–538 (2015) (discussing different theories for enforcement of FRAND commitments).

the product.[39] Suppose that Feature A is found to be exceptionally important and thus contributes 5% to the overall value of the product (which has fifty principal features), and that X's patented technology is found to contribute 25% of the value of Feature A. The incremental value of X's patents is thus 1.25% of the total value of the product, and X may be entitled to a royalty equal to 1.25% of the product price.

But now suppose that, concurrently with this action, Y is unable to reach terms with Firm Z, which holds a different patent covering Feature A. A different court, perhaps in a different jurisdiction, must undertake the same analysis with respect to Feature A and Z's patents. The first court determined the value of X's five patents covering Feature A, and in doing so it must have, explicitly or implicitly, determined the value of the other twenty patents covering Feature A, including Z's patents. Will the first and second courts ascribe the same value to Z's patents? Absent some coordination between the finders of fact, it is almost certainly the case that their respective values for Z's patents will differ.[40] And what about W's three patents covering Feature A, the value of which should also impact the relative incremental value of both X's and Z's patents, but is not the subject of either judicial proceeding? Will either court make a specific determination of the value of W's patents? Again, this is doubtful and, even if done, it is likely that the determinations will differ.

Why do these discrepancies matter? Because, ultimately, when the "incremental" value of all 1000 patents covering the features of the product is combined with the value of the unpatented features, the total should equal 100%, no more and no less. Yet when the "value" of every element is calculated separately, and some are not explicitly calculated at all, it is likely that this total will be widely divergent from 100%. If the total is lower, then some patent holders are likely to be undercompensated for their contributions, and if the total is higher,

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39. Microsoft Corp. v. Motorola, Inc., Case. No. C10-1823JLR, 2013 U.S. Dist. LEXIS 60233, at *52 (W.D. Wash., Apr. 25, 2013), *aff'd*, 795 F.3d 1024 (9th Cir. 2015) (using a modified version of the *Georgia-Pacific* analysis to take into account the royalty rates charged by private firms and patent pools for patents essential to the same standards, to assess the importance of Motorola's patents to the standards in question and the importance of the standards to the infringing products, and to account for the total number of patents being asserted in comparison to the total number of patents covering each standard).

40. There is no reason to believe that different courts, with different parties before them, will admit evidence from unrelated proceedings regarding the valuation of different patents not before them. Likewise, the different parties will likely insist on their own experts and analysis, making it even less likely that consistent results will be reached.

then Y is over-paying to manufacture the product. Both over- and under-payment in this context yield inefficiencies that will result in either under-investment in R&D by technology contributors, under-investment in product manufacture or increases in consumer prices above their efficient level.

These inefficiencies arise from the serial, "bottom-up" nature of the reasonable royalty calculation. That is, the royalty due to every patent holder is determined individually without reference to the other patents covering the same standard or product. Even if such a royalty might meet some test of reasonableness when considered in isolation, it is likely to be unreasonable when combined with other independently-calculated royalties applied to the same product. In the next Part, we take a closer look at the weaknesses of the bottom-up FRAND royalty calculation approach and, in Part III, offer a "top-down" alternative based on the statutory interpleader mechanism.

II. WEAKNESSES OF BOTTOM-UP APPROACHES TO FRAND ROYALTY CALCULATION

Despite its growing acceptance as the preferred methodology for calculating FRAND royalties, the bottom-up approach described in Part I.D suffers from significant weaknesses that make its results both unreliable and potentially unfair at multiple levels. Bottom-up royalty determinations, by their nature, consider only the patent(s) being adjudicated, with little or no weight given to other patents covering the same standard or product. The result can be a situation in which different courts determine very different aggregate royalty levels for the same standard.[41]

The degree to which bottom-up royalty determinations can diverge among courts is illustrated dramatically by the different FRAND royalty rates judicially established for the Wi-Fi standard. There are at least five published U.S. decisions adjudicating royalty rates for SEPs covering the standard, the results of which are summarized in Table 2 below:

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41. Paul Gugliuzza identifies a similar need for consistency among court determinations with respect to patent validity and claim interpretation, i.e., that "the claims of a particular patent should be construed similarly from one case to another and that courts should not reach inconsistent validity findings regarding the same patent." Paul R. Gugliuzza, *Patent Law Federalism*, 2014 Wisc. L. Rev. 11, 21 (2014). He refers to this principle as "adjudicative uniformity" and notes that it has been emphasized by both the Court of Appeals for the Federal Circuit and the Supreme Court. *Id.* at 26, 51.

Table 2
U.S. Litigated FRAND Royalty Determinations for 802.11 (Wi-Fi) Standard-Essential Patents

Case	Court (year)[42]	Royalty
Microsoft v. Motorola[43]	W.D. Wash. (2013)	$0.035 per unit
In re Innovatio[44]	N.D. Ill. (2013)	$0.0956 per unit
Ericsson v. D-Link[45]	E.D. Tex. (2013)	$0.15 per unit
Realtek v. LSI[46]	N.D. Cal. (2014)	0.12% of net sales
CSIRO v. Cisco[47]	E.D. Tex. (2014)	Up to $1.90 per unit

The inconsistencies raised by the independent determination in these cases not only of individual patent valuations, but of the overall royalty allotted to the standard are manifest. For example, if the maximum reasonable aggregate Wi-Fi royalty is $1.80 per chip (as the Northern District of Illinois found in *Innovatio*)[48] then these judgments alone exceed the maximum. Suppose that each of these royalty rates were applied to a hypothetical Wi-Fi router that retails for $50.00. The aggregate royalty based on these outcomes would be as much as $2.2406 (nearly 4.5% of the product sale price) for the thirty-five adjudicated patents alone.[49] This suggests that the aggregate royalty for all 3000 essential Wi-Fi patents,[50] if they were asserted, would be orders of magnitude greater than that.[51] The underlying causes of some of these issues are discussed in greater detail below.

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42. Cited decisions are to the federal district court decision in which the royalty was determined. Subsequent proceedings and appeals are not listed.

43. *Microsoft*, 2013 U.S. Dist. LEXIS 60233, at *297–98.

44. No. 1:11CV-09308, 2013 U.S. Dist. LEXIS 144061, at *183 (N.D. Ill. Oct. 3, 2013)..

45. Ericsson Inc. v. D-Link Sys., 6:10-CV-473, 2013 U.S. Dist. LEXIS 110585 at *72 (E.D. Tex. Aug. 6, 2013), aff'd in part, vacated in part, rev'd in part by Ericsson Inc. v. D-Link Sys., 773 F.3d 1201 (Fed. Cir. 2014).

46. Jury Verdict Form, Realtek Semiconductor Corp. v. LSI Corp. & Agere Sys., LLC, No. 12-CV-3451, Dkt. No. 324 (N.D. Cal. Feb. 26, 2014).

47. CSIRO v. Cisco Sys., No. 6:11-cv-343, 2014 U.S. Dist. LEXIS 107612, at *51 (E.D. Tex. July 23, 2014).

48. 2013 U.S. Dist. LEXIS 144061 at *182.

49. $0.06 (0.12% * $50.00) (*Realtek*) + $0.035 (*Microsoft*) + $0.0956 (*Innovatio*) + $0.15 (*Ericsson*) + $1.90 (*CSIRO*) = $2.2406.

50. *In re* Innovatio, 2013 U.S. Dist. LEXIS 144061 at *179.

51. While some of these judgments were vacated on appeal, that does not diminish the risk that they represent to manufacturers of Wi-Fi compliant products.

A. Royalty Stacking

As suggested above, to the extent that multiple owners of patents covering a single standard or product charge royalties to a manufacturer, the cumulative effect of those royalty demands can be considerable. This phenomenon is often called royalty "stacking." As the U.S. Court of Appeals for the Federal Circuit has observed,

> [r]oyalty stacking can arise when a standard implicates numerous patents, perhaps hundreds, if not thousands. If companies are forced to pay royalties to all [patent] holders, the royalties will 'stack' on top of each other and may become excessive in the aggregate."[52]

The potential for royalty stacking in products covered by multiple patented standards has resulted in attempts to estimate the overall royalty burden on particular products. For example, one 2013 study estimated that the size of the aggregate royalty stack for a hypothetical $400 smart phone was $120 (excluding the value of cross-licenses and other non-monetary compensation), or 30% of the overall product price.[53] Moreover, in the context of litigation, Bill Lee and Doug Melamed observe that

> When thousands of patents or other inputs are involved in the same device, judges and juries consistently and systematically overemphasize the value of the single

52. *Ericsson*, 2013 U.S. Dist. LEXIS 110585, at *1201, 1209.

53. Ann Armstrong, Joseph J. Mueller, & Timothy D. Syrett, The Smartphone Royalty Stack: Surveying Royalty Demands for the Components Within Modern Smartphones (Working Paper, May 29, 2014), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2443848. Keith Mallinson challenges this result, estimating an aggregate smart phone royalty burden of approximately 5%, based on estimated industry-wide annual U.S. smart phone SEP licensing revenue of $19 billion. Keith Mallinson, *Smartphone Revolution: Technology Patenting and Licensing Fosters Innovation, Market Entry, and Exceptional Growth*, IEEE CONSUMER ELECTRONICS MAGAZINE, Apr. 2015, at 60–66. Anne Layne-Farrar also disputes the analysis by Armstrong, Mueller and Syrett on several counts. Anne Layne-Farrar, *Patent Holdup and Royalty Stacking Theory and Evidence: Where Do We Stand After 15 Years of History?*, OECD (Submitted for 122nd Meeting of the OECD Competition Committee, Dec. 17–18, 2014), http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DAF/COMP/WD%282014%2984&doclanguage=en.

> patent (or patents) at issue as compared to all the other inputs.[54]

If royalties on the patents covering a standard become excessive through stacking, then the standard may not be widely implemented and consumers will be harmed. What's more, the incentive of parties holding few or no essential patents to continue to develop the standard may decrease. In such situations, the stacking of standards-essential patents may impede rather than encourage innovation.

Courts differ in their approaches to royalty stacking. As noted in Part I.D above, a court determining the incremental value of a patent for purposes of determining a reasonable royalty *should* consider the value of all other patents covering the same standard or product. The district court in *Microsoft v. Motorola* acknowledges this, stating:

> Motorola's royalty request for its 802.11 SEP portfolio raises significant stacking concerns. There are at least 92 entities that own 802.11 [standard-essential patents]. If each of these 92 entities sought royalties similar to Motorola's request of 1.15 % to 1.73 % of the end-product price, the aggregate royalty to implement the 802.11 Standard, which is only one feature of the Xbox product, would exceed the total product price.[55]

Likewise, in *In re Innovatio IP Ventures, LLC*,[56] the court was required to calculate the "reasonable" royalty for patents covering different aspects of the 802.11 Wi-Fi standard. In doing so, it expressly recognized that it must "evaluate a proposed RAND rate in the light of the total royalties an implementer would have to pay to practice the standard" and "consider whether the overall royalty of all standard-essential patents would prohibit widespread adoption of the standard."[57] Accordingly, the existence of royalty stacking as to the Wi-Fi standard played a significant role in the court's fixing the upper limit on the applicable royalty at the manufacturer's existing profit margin.[58]

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54. William F. Lee & A. Douglas Melamed, *Breaking the Vicious Cycle of Patent Damages*, 101 CORNELL L. REV. 385, 427 (2014).

55. *Microsoft*, 2013 U.S. Dist. LEXIS 60233, at *213.

56. 2013 U.S. Dist. LEXIS 144061 (N.D. Ill. Oct. 3, 2013).

57. *Id.* at 69–70.

58. *Id.* at 166–67.

In *Ericsson v. D-Link*, the Federal Circuit reaffirmed both the potential for royalty stacking and the need to apportion royalties to a SEP holder based on the value that its patented technology bears to the overall product.[59] However, it also upheld the district court's refusal to instruct the jury on royalty stacking when the defendant "failed to provide any evidence of actual royalty stacking."[60] It explained that "[t]he mere fact that thousands of patents are declared to be essential to a standard does not mean that a standard-compliant company will necessarily have to pay a royalty to each SEP holder."[61] This reasoning is counterintuitive. The "mere" fact that thousands of patents are essential to a particular standard is, in actuality, very relevant to the reasonableness of the royalty levied on the standard. That is to say, as discussed above, a reasonable royalty is based on the *incremental value* of the patented technology to the overall product.[62] Thus, relevant factors in determining the incremental value of a particular patented technology *must* include the quantity of additional patented technologies included in the same product.[63] As Jorge Contreras and Richard Gilbert have argued,

> In an industry characterized by multiple patents that cover component technologies of a product that

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59. Ericsson, Inc. v. D-Link Systems, Inc., 773 F.3d 1201, 1232–35 (Fed. Cir. 2014).

60. *Id.* at 1234.

61. *Id.*

62. *Id.* at 1232, 1235.

63. As Contreras has previously argued with respect to the *Ericsson* decision:

> What is less relevant is whether the accused infringer is then paying royalties to other patent holders, and in what amounts. The answer to this question depends on a host of factors, including . . . the *timing* of different infringement suits. Thus . . . when the first of fifty patent holders enforces its patent against the infringer, it may be paying no other royalties. When the second patent holder sues, the infringer may be paying royalties to the first patent holder. And when the third sues, the infringer may be paying royalties to the two prior patent holders. And so forth. Does this mean that in the first suit, the infringer can introduce no evidence of stacking while in the second suit, it can introduce evidence of the amounts paid to the first patent holder, and so on? Such a result makes little sense and, if anything, will encourage a "race to the courthouse" by patent holders wishing to capture the maximum royalty before the infringer is burdened by other royalty obligations.

Jorge L. Contreras, *Standards, Royalty Stacking and Collective Action*, 3 CPI ANTITRUST CHRON. 6 (2015).

> implements many technologies, the incremental value of a particular patented component technology to the overall product value is likely to be lower if many other patented technologies also compete for a share of the overall product value. As a result, it is reasonable to introduce evidence regarding the number of patents and other patented technologies in the overall product when assessing the incremental value of a particular patented technology. Conversely, withholding evidence regarding the total field of patents covering a particular product or standard may lead a fact finder to overestimate the incremental value of the patent at issue, as knowing that a particular patent is only one of a thousand covering a product is likely to result in a different assessment of the patent's worth than believing it is the sole patent germane to the product.[64]

It is thus possible that the Federal Circuit's reasoning regarding the royalty stacking instruction in *Ericsson* can be attributed to deficiencies in the defendant's evidentiary record, rather than a general rejection of the basic concept that the quantity of other patented technologies in the same standard is relevant to the apportionment analysis that is always required to determine a reasonable royalty.

B. Evidentiary Deficits

One of the biggest challenges courts face when seeking to assess royalty rates in SEP cases is a lack of accurate information regarding the relevant technology and patents.[65] This Section discusses some of the ways in which the evidence considered by courts in making such determinations is insufficient, at best, and misleading, at worst.

1. Over-Declaration of SEPs

Despite SDO rules that require patents to be declared only if they are (or are likely to be) "essential" to the implementation of a standard, there is typically no independent verification of a declared

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64. Contreras & Gilbert, *A Unified Framework*, *supra* note 30, at 1490–91.

65. *See* Besen, *supra* note 27, at 42 (describing challenges faced by courts assessing reasonable royalty rates).

patent's essentiality.[66] The designation of a patent as a SEP is thus entirely in the discretion of the patent holder, subject only to a contravening determination in litigation.[67] Given that patent holders could face serious liability for *failing* to disclose essential patents to an SDO (including claims of anticompetitive behavior, fraud, and deceptive conduct),[68] they have a strong incentive to disclose all patents that have even a remote possibility of being relevant to a standard. These incentives have resulted in significant over-declaration of patents to SDOs, as shown in recent studies finding variably that 28%, 29% and 50% of patent families declared "essential" to ETSI's 2G, 3G and 4G wireless telecommunications standards, respectively, were actually essential to implementation of those standards.[69]

While the factors leading to over-declaration can be understood, it must also be recognized that over-declaration distorts the overall picture of patent coverage of particular standards. Thus, a standard covered by 1000 patents may look very different, from a royalty standpoint, than a standard covered by 250 patents. Moreover, the actual technical value contributed by those patent holders who have over-disclosed most aggressively may be greatly overstated and reduced or eliminated entirely if essentiality were assessed more carefully. Yet the serial, bottom-up approach to royalty calculation allows the essentiality of patents to be tested only when they are asserted in litigation, patent holder by patent holder.[70]

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66. SDOs do not make essentiality determinations, at least in part due to resource constraints and concerns over efficiency and member relations. This situation is different than in patent pools, in which significant ex ante investments are made to verify the "essentiality" of all patents proposed to be included in the pool. *See generally* Contreras, *Fixing FRAND*, *supra* note 28, at 76–77.

67. *See, e.g.*, *id.* at 60–62.

68. *See, e.g.*, Qualcomm Inc. v. Broadcom Corp., 548 F.3d 1004, 1008 (Fed. Cir. 2008) ("silence in the face of a duty to disclose patents in a standard-setting organization"); Rambus, Inc., 2006-2 Trade Cases P 75364, 2006 WL 2330117, at *53 (F.T.C, Aug. 2, 2006), *rev'd*, 522 F.3d 456 (D.C. Cir. 2008) (liability for alleged concealment of patents in face of disclosure duty); *Dell Computer Corp.*, 121 F.T.C. 616 (1996) (consent decree settling alleged failure to disclose patent to standards body).

69. *Review of Patents Declared as Essential to LTE and SAE (4G Wireless Standards) Through June 30, 2009*, FAIRFIELD RESOURCES INT'L (2010), http://www.frlicense.com/LTE%20Final%20Report.pdf; *Analysis of Patents Declared as Essential to GSM as of June 6, 2007*, FAIRFIELD RESOURCES INT'L 7 (2008), http://frlicense.com/GSM_FINAL.pdf; *Review of Patents Declared as Essential to WDCMA Through December, 2008*, FAIRFIELD RESOURCES INT'L 1 (2009), http://www.frlicense.com/wcdma1.pdf.

70. *In re Innovatio*, 2013 U.S. Dist. LEXIS 144061, at *83 (finding all 19 asserted patents to be essential after cursory analysis).

2. Blanket Disclosure and Unknown SEPs

A related but different problem arises in SDOs that do not require the identification of specific "essential patents," but instead permit firms to issue so-called "blanket disclosures" indicating that they *may* hold standards-essential patents, but without identifying particular patents.[71] In these SDOs, the total number of patents is entirely unknown and left to conjecture or, to the extent they exist, external studies.[72]

An example of the significant hurdles courts face when attempting to value patents covering standards without disclosure obligations appears in *Microsoft v. Motorola*. In that case, the court assessed the value of Motorola's patents covering ITU's H.264 audiovisual compression standard. In its analysis, the court considered only the eighty-nine other H.264 SEPs that were expressly identified in letters of assurance submitted to the SDO, despite the court's finding, based on expert testimony, that there more than 2,400 patents are essential to the H.264 standard and that many of the "core innovations" in this standard were patent-free contributions.[73]

3. Evidentiary Burden on the Defendant

In the damages phase of a typical patent infringement case, including a case involving SEPs, the patentee has the burden of proving its damages. In doing so, it must establish the level of royalties to which it is entitled based on the apportionment methodologies discussed in Part I.C, above. In support of its case, as explained in

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71. According to Bekkers and Updegrove, of eight SDOs studied, four permit blanket disclosures. Bekkers & Updegrove, *A Study of IPR Policies*, *supra* note 23, at 61. However, two of those (IETF and W3C) only permit such blanket disclosures if the patent holder commits to license its SEPs on a royalty-free basis. The other two (ITU and IEEE) permit blanket disclosures so long as a FRAND commitment is made. *Id.*

72. For example, in *Innovatio* the court relied on a study by PA Consulting Group that estimated the number of essential patents covering the Wi-Fi standard by searching patent databases for "keywords related to the 802.11 standard" and conducting a "technical analysis" of a "portion" of the search results. *In re Innovatio*, 2013 U.S. Dist. LEXIS 144061, at *83. The report expressly disclaimed having performed "a complete legal analysis" and said that its conclusion was only that the patents counted are "*potentially* essential." *Id.*

73. Microsoft Corp. v. Motorola, Inc., No. C10-1823JLR, 2013 U.S. Dist. LEXIS 60233, at *26 ("[M]any of the core innovations of the H.264 Standard were made by Telenor Group, which did not obtain patents on the technology that it contributed and made its contributions available to all implementers of the standard without patent licensing restrictions[.]").

Microsoft v. Motorola, the SEP holder must demonstrate both the value of its patented technology to the relevant standard and the value of the standard to the overall product in which it is implemented.[74] It is natural that the SEP holder will seek to put forward its best case. It will demonstrate the value of its patented technology by introducing evidence not only of its technical merit and superiority to alternative technologies, but also of the time, effort and ingenuity that went into its development. In this setting, every patented technology can be made to appear revolutionary.

But what of the many other patented and unpatented technologies that are included in technical standards? The value of the patentee's technology should be evaluated not in isolation, but in comparison to these other technological contributions. Yet, in a typical patent infringement action, the developers and owners of these other technologies are nowhere to be found. Rather, the burden is on the accused infringer to represent the hundreds or thousands of other patented and unpatented contributions to the standard to demonstrate the comparative value of the asserted SEPs. Mounting this type of defense is not only time-consuming and resource intensive, but may require expertise and background (e.g., engineers who participated in the relevant SDO) that are not known or available to the defendant. What's more, putting on evidence regarding the large body of unasserted technology in a typical patent infringement case would likely try the patience of both the judge and the jury, if sufficient time for such a presentation were even available.[75]

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74. *See* note 41, *supra*, and accompanying text (discussing methodology used in *Microsoft* case).

75. *See* Seaman, *supra* note 34, at 1697–98 (citations and internal quotations omitted):

> As a practical matter, at trial, juries hear extensive evidence from the patent holder regarding the critical importance of the patented invention but often receive little or no information regarding all the other things that contribute to the success of the accused product, such as other inventions and the contributions of defendants' own technology and marketing efforts. Indeed, it would be virtually impossible to explain the importance of all the other, noninfringing components and features contained in complex products like computer operating systems or smartphones—such a presentation likely would take weeks or months of highly technical testimony, which few judges would allow (and few jurors would want to endure). As a result, juries often come away from a trial with an inflated sense of the relative value of [the patented] invention and consequently award a disproportionately high royalty.

In *Microsoft v. Motorola*, Microsoft, one of the world's largest and wealthiest corporations, was able to introduce expert evidence refuting the SEP holder's portrayed importance of its technical contributions to the standard.[76] However, Microsoft is the rare defendant in such cases, and many manufacturers of standards-compliant products and components are unlikely to have the resources, knowledge, and expertise to represent the universe of other technologies contained in a complex technical standard.

C. *Ad Hoc Analytical Methodologies: Ranking Patents*

Several district courts have sought to value FRAND-encumbered patents, each using different analytical methodologies. In each case, the court sought to compare each asserted patent family to a hypothetical "average" patent essential to the standard. For instance, the *Microsoft* court's findings of fact devoted over forty pages to a qualitative assessment of Motorola's H.264 patents.[77] The court tried to determine whether each patent "provides" one or more "core innovative function[s]" of the standard.[78] It concluded that some patents would not have been highly valued in a hypothetical royalty negotiation because they cover "intuitive . . . minimal technical advancements" in view of the prior art.[79] Yet after undertaking this laborious exercise, the court's qualitative analysis appears not to have factored directly in its ultimate FRAND rate calculation. The court merely relied on its overall conclusion that the patents as a whole were no more valuable than average as a reason to rely on existing patent pool rates to set FRAND royalties.

In contrast, the court in *Innovatio* found, just as in the fictitious Lake Wobegone,[80] that all of the asserted patents were of *above-average* value.[81] As a result, the court had to decide how much extra

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76. *See, e.g., Microsoft*, 2013 U.S. Dist. LEXIS 60233, at *96–97 (finding that Motorola's '980 patent "provides minimal technical advancements" based, in part, on testimony of Microsoft expert).

77. *Id.*

78. *Id.* at *114–15.

79. *Id.* at *96–97.

80. *A Prairie Home Companion* (Garrison Keillor/American Public Media 1974-2016) ("Lake Wobegon, where all the women are strong, all the men are good looking, and all the children are above average.").

81. *In re Innovatio*, ECF No. 975 at 85. Notably, the court's analysis involved some bootstrapping. It found the patents at issue were of above-average value in significant part because the court had evaluated them and found them to be essential. This aspect of the *Innovatio* analysis is arguably inconsistent with the typical

royalty the asserted patents deserved. In doing so, it used a single fifteen-year-old study based on 1970s-era data that attempted to calculate a value distribution for "all electronic patents."[82] The study was unrelated to Wi-Fi or standards-essential patents. Moreover, the study actually concluded that value distributions vary substantially over time and among industries.[83] Nevertheless, the *Innovatio* court used the study to justify apportioning 84% of the value of the standard to "top ten percent" Wi-Fi patents.

Less is known about the methodologies used in the *Ericsson* and *Realtek* cases, as royalty calculations there were performed by juries operating under judicial instructions. One can assume that the methodologies used in these cases were far from consistent.[84] The jury in *Realtek*, for example, was instructed to select a FRAND royalty taking into account the importance of the two patents-in-suit to the standard as determined by: "comparing the technical contribution of the two LSI patents to the technical contributions of other patents essential to the standard," and then considering the contribution of the standard as a whole to the market value of Realtek's products utilizing the standard.[85] It is unclear how the jury could have meaningfully compared the patents-in-suit to the contributions of all of the "other patents" essential to the standard, given that no definitive list of such patents exists.

D. Advisory Opinions

The district court in Apple's FRAND contract enforcement suit against Motorola dismissed the suit on the eve of trial.[86] It expressed two major concerns. First, it was concerned by Apple's refusal to commit to pay whatever FRAND rate the court might set. It

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hypothetical royalty negotiation construct in which patents are always presumed to be valid and infringed.

82. *See* J. Gregory Sidak, *The Meaning of FRAND, Part I: Royalties*, 9 J. COMPETITION LAW & ECON. 931, 1019 (2013) (discussing *Innovatio* analysis).

83. Mark Schankerman, *How Valuable is Patent Protection? Estimates by Technology Field*, 29 RAND J. ECON. 77 (1998); *see also In re Innovatio*, 2013 U.S. Dist. LEXIS 144061, at *181 (citing and discussing Schankerman study).

84. *See* Jorge L. Contreras and Michael A. Eixenberger, *Model Jury Instructions for Reasonable Royalty Patent Damages*, 57 JURIMETRICS J. 1 (2017) (discussing variability among jury instructions in patent damages cases).

85. *See* David Long, *Jury Returns RAND-Royalty Rate of 0.19 Percent of WiFi Chip Sale Price (Realtek v. LSI)*, ESSENTIAL PATENT BLOG (Feb. 27, 2014), http://www.essentialpatentblog.com/2014/02/jury-returns-rand-royalty-rate-of-0-19-percent-of-wifi-chip-sale-price-realtek-v-lsi/ (reporting jury instructions).

86. Apple Inc. v. Motorola Mobility, Inc., 11-cv-178-bbc, 2012 U.S. Dist. LEXIS 168986, *11–12 (W.D. Wis. Nov. 28, 2012).

found that "Apple had failed to show that its requested declaration would serve any purpose other than providing Apple a ceiling on the potential license rate that it could use for negotiating purposes."[87] Second, the court was concerned that none of the other provisions of the proposed license agreement that Apple was seeking to enforce had been negotiated yet. It reasoned that even if the court picked a royalty, "litigation likely would be necessary to resolve the parties' licensing and infringement disputes."[88] The court in *Ericsson* similarly found that in the absence of an agreement to take a license at the court-adjudicated rate, any decision the court might render on the FRAND royalty rate would be an improper "advisory opinion."[89]

A similar outcome occurred in *InterDigital v. Nokia*.[90] There the court dismissed counterclaims asking it to "find that InterDigital has not offered a FRAND rate to Nokia and for the Court to determine what FRAND license terms would be."[91] The court dismissed the counterclaims as non-justiciable in part because Nokia had not submitted any sworn affidavit stating that it "would sign a license" consistent with the court's declaration.[92]

These decisions indicate that busy trial courts have little patience with litigants who are likely to view their FRAND rate determinations as advisory only. We must therefore assume that courts will continue to limit FRAND rate-setting cases to circumstances in which their orders can end the parties' disputes. Below we suggest a structure that would put the dispute in a posture more amenable to final resolution than did these cases.

E. A Better Way: Top-Down Determination of Aggregate Royalties

The bottom-up royalty approach described above results in serial royalty determinations by patent and patent holder, yielding aggregate royalty burdens that expand in an uncoordinated and inconsistent manner. A superior alternative is a top-down approach in which an aggregate royalty for all patents essential to a particular standard is determined and then allocated among the holders of such

87. *Id.* at *5–6.

88. *Id.* at *8.

89. Ericsson Inc. v. D-Link Sys., 6:10-CV-473, 2013 U.S. Dist. LEXIS 110585 at *75 (E.D. Tex. Aug. 6, 2013).

90. InterDigital v. Nokia, No. 13-CV-00009 RGA, ECF No. 230 at *6 (D. Del. May. 28, 2014).

91. *Id.*

92. *Id.*

patents according to some rational apportionment methodology. Such top-down determinations avoid issues concerning excessive royalty charges due to individualized determinations, and also benefit from the involvement of all relevant patent holders in determining both the aggregate royalty amount and apportionment methodology.

Top-down royalty determinations have traditionally been utilized by patent pools and other collective rights organizations. There, participating firms collectively agree on the price to be charged for their pooled assets, as well as the formula pursuant to which the proceeds from licensing these assets will be divided amongst them.[93] Agreements regarding aggregate patent royalties have also been made in less structured settings involving industry standards developed outside of patent pools.[94]

In addition, a handful of courts around the world have begun to consider top-down approaches to assessing royalty determinations for standardized products. The U.S. District Court for the Northern District of Illinois took a step in this direction in *Innovatio*, when it held that the aggregate per-product royalty attributable to the Wi-Fi standard should be $1.80, and then apportioned a portion of this aggregate to the plaintiff.[95] As noted by the trial judge, a "Top Down approach best approximates the RAND rate that the parties to a hypothetical *ex ante* negotiation most likely would have agreed upon . . . ."[96]

Likewise, in *Samsung v. Apple Japan*[97], the Japanese Intellectual Property High Court affirmed the Tokyo High Court's

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93. *See, e.g.*, Richard J. Gilbert, *Antitrust for Patent Pools: A Century of Policy Evolution*, 2004 STAN. TECH. L. REV. 3 (2004); Michael Mattioli, *Communities of Innovation*, 106 NW. U. L. REV. 103 (2012).

94. *See* Jorge L. Contreras, *Patent Pledges*, 47 ARIZ. ST. L.J. 543, 559–61 and Table 4 (2015) (describing maximum royalty commitments made with respect to wireless telecommunications standards). For recent proposals relating to the establishment of aggregate royalty caps for particular standards, see Contreras, *Fixing FRAND*, *supra* note 28, at 78–80 (proposing standard-based aggregate royalty agreements) and Pierre Régibeau, Raphaël De Coninck and Hans Zenger, Transparency, Predictability, and Efficiency of SSO-based Standardization and SEP Licensing: A Report for the European Commission 84-85 (2016).

95. *See In re Innovatio*, 2013 U.S. Dist. LEXIS 144061, at *83. *But see* Part II.B.3, *supra*, critiquing the court's apportionment analysis.

96. Innovatio, 2013 U.S. Dist. LEXIS at *163. *See also* Thomas F. Cotter, *Patent Damages Heuristics*, 25 TEX. INTELL. PROP. L.J., ms pp. 43–44 (forthcoming 2017) (discussing *Innovatio* top-down analysis), Chryssoula Pentheroudakis and Justus A. Baron, *Licensing Terms of Standard Essential Patents: A Comprehensive Analysis of Cases*. JRC Science for Policy Report EUR 28302 at 95-96 (2017) (analyzing Innovatio and other top-down approaches).

97. Apple Japan Godo Kaisha v. Samsung Electronics Co., IP High Court of Japan (May 16, 2014).

determination that the aggregate royalty burden for the 3G UMTS standard should not exceed 5%. It reached this conclusion based, among other things, on prevailing industry support for a 5% royalty cap for the standard.[98] It then allocated a portion of this royalty to Samsung's asserted UMTS-essential patent.

There are numerous ways that aggregate royalty rates can be determined and apportioned among rights holders, and there is a large economics and finance literature in this area.[99] Methodologies may differ as between the determination of aggregate royalties for a particular standard, and the contributions to the standard of individual patented technologies. For example, market surveys and associated conjoint analysis may be useful in gauging the value that a standard such as Wi-Fi, USB or Bluetooth contributes to a product such as a smart phone or a laptop computer.[100] However, determining the contribution to a complex standard of a particular patented technology, which may have little visibility to the user, would likely require different methods. Individual patents and groups of patents have been valued using methods such as citation count,[101] cost recovery,[102] real

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98. *See* Miyuki Hanai, *Judgment of IP High Court on Apple v. Samsung*, AIPPI E-NEWS (Dec. 2014), https://www.aippi.org/enews/2014/edition39/Miyuki_Hanai.html.

99. *See, e.g.*, Cotter, *Heuristics*, *supra* note 96, at *44–47 (analyzing various methodologies adopted in recent SEP cases); David O. Taylor, *Using Reasonable Royalties to Value Patented Technology*, 49 GEO. L. REV. 79, 131–39 (2014); Patrick H. Sullivan, *Standardising IP Valuations: Whether, What and* How, INTELL. ASSET MANAGEMENT, Mar–Apr. 2009, at 31, 31, http://www.iam-media.com/Magazine/Issue/34/Cover-story/Standardising-IP-valuations-whether-what-and-how (noting that over 50 different methods for valuing IP are currently in use); Robert Pitkethly, *The Valuation of Patents: A Review of Patent Valuation Methods with Consideration of Option Based Methods and the Potential for Further Research*, (Judge Inst., Working Paper No. 21/97, 1997), http://users.ox.ac.uk/~mast0140/EJWP0599.pdf. For a general and now classic discussion of the theory behind the allocation of resources among interested parties, see H. PEYTON YOUNG, EQUITY IN THEORY AND PRACTICE (1994).

100. *See, e.g.*, J. Gregory Sidak & Jeremy O. Skog, *Using Conjoint Analysis to Apportion Patent Damages*, 25 FED. CIR. BAR J. 581 (2016); Patricia Dyck, *Beyond Confusion—Survey Evidence of Consumer Demand and the Entire Market Value Rule*, 4 HASTINGS SCI. & TECH. L.J. 209, 237 (2012); Christopher K. Larus & Bryan J. Mechell, *Using Consumer Surveys to Prove Patent Infringement Damages at Trial*, 18 INTELL. PROP. STRATEGIST, Dec. 2011, at 3.

101. Alan Cox, *Using Citation Analysis to Value Patents*, FINANCIER WORLDWIDE (Jan. 2016), http://www.financierworldwide.com/using-citation-analysis-to-value-patents/#.V3mfcFfDT-Q.

102. Ted Sichelman, *Purging Patent Law of "Private Law" Remedies*, 92 TEX. L. REV. 517, 541, 567 (2014); Symposium, *Patent Value Apportionment Rules for Complex, Multi-Patent Products*, 27 SANTA CLARA COMP. & HIGH TECH. L.J. 763,

option value,[103] substitute costs,[104] footprint methodology,[105] discounted cash flow,[106] and comparable license analysis.[107] In some cases, when multiple patents cover a single standard or product, parties may divide aggregate revenues amongst themselves pro rata, based on nothing more than a simple patent "head count" (sometimes referred to as numerical proportionality),[108] or according to a negotiated apportionment formula.

It is beyond the scope of this article to recommend a particular methodology for determining aggregate royalty rates and for allocating royalties among patent holders. It is likely that the circumstances surrounding the development of different standards, the participants in the relevant SDO, the number of patents involved, and the norms and practices in the relevant industry will each play a role in the selection of an appropriate valuation methodology. Suffice it to say that we believe that any of a number of recognized top-down methodologies for determining aggregate royalty rates and apportionment among patent holders, if performed rigorously with access to relevant information, would yield more accurate, fair and reasonable aggregate and individual royalty rates for FRAND-encumbered SEPs than the bottom-up approaches discussed above.

781–83 (2011) [hereinafter *Apportionment Rules*]; Lemley, *Property, Intellectual Property, and Free Riding*, *supra* note 28, at 1059.

103. *See* J. Gregory Sidak, *Holdup, Royalty Stacking, and the Presumption of Injunctive Relief for Patent Infringement: A Reply to Lemley and Shapiro*, 92 MINN. L. REV. 714, 736-43 (2008).

104. *See* Seaman, *supra* note 34, at 1672–73.

105. Aaron Fahrenkrog, *A New 'Footprint' Paradigm for Reasonable Royalty Damages*, LAW360 (March 11, 2015), http://www.law360.com/articles/627190/a-new-footprint-paradigm-for-reasonable-royalty-damages.

106. *Apportionment Rules*, *supra* note 102, at 784.

107. *See* Jonathan S. Masur, *The Use and Abuse of Patent Licenses*, 110 NW. U. L. REV. 115 (2015); *see also Apportionment Rules*, *supra* note 102, at 783.

108. *See* Menno Treffers, *The Royalty Rate for a Subset of Standard Essential Patents—What is Reasonable?*, IPWATCHDOG (May 22, 2016), http://www.ipwatchdog.com/2016/05/22/royalty-rate-standard-essential-patents/id=69045/; *But see Apportionment Rules*, *supra* note 102, at 779–80 (critiquing this methodology) and Koren Wong-Ervin and Anne Layne-Farrar, *Methodologies for Calculating FRAND Royalties – Part 1*, Law360, Oct. 8, 2014 (criticizing headcount methodology and asserting that "patents are not created equal").

III. USING INTERPLEADER TO IMPLEMENT A TOP-DOWN APPROACH TO FRAND ROYALTY DETERMINATIONS

For over six hundred years, the common law has provided a party under a single obligation a mechanism to protect itself from "multiple vexation" by "adverse claimants" to the obligation: interpleader.[109] The modern embodiment of that form of action in the United States is set forth in the federal interpleader statutes.[110] These statutes give district courts original jurisdiction over civil actions in the nature of interpleader filed by anyone who is under "any obligation written or unwritten to the amount of $500 or more," if "[t]wo or more adverse claimants, of diverse citizenship . . . are claiming or may claim to be entitled to . . . benefits arising by . . . virtue of any such obligation" and the plaintiff deposits a "bond payable to the clerk of the court in such amount . . . as the court or judge may deem proper."[111] The action is proper even if the conflicting claims do not have a "common origin" and are not "identical" but are "adverse to and independent of one another."[112]

Though it has not yet been employed in the context of standards-essential patents, federal statutory interpleader offers an attractive procedural mechanism for gathering all holders of FRAND-encumbered SEPs that are essential to a particular technology standard into a single action, and then determining (a) the aggregate royalty payable with respect to the SEPs covering that standard, and (b) the allocation of that aggregate royalty among individual SEP holders.

In this Part, we discuss the history of and procedural requirements for the interpleader action, and then discuss why interpleader is an ideal procedural mechanism for determining FRAND royalties in a top-down manner.

A. History of Statutory Interpleader

Though modern practitioners may view it as obscure, interpleader has a long, rich heritage. The earliest interpleader-like proceedings date from England in the early 1300's and relate primarily to custodial rights over orphans.[113] That is, if a child lost his or her

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109. Chafee, *Modernizing Interpleader*, *supra* note 1; DOBBS LAW OF REMEDIES, Vol. 1 at 236 *et seq.* (2nd ed., West 1993).

110. 28 U.S.C. §§ 1335, 1397, 2361 (2005).

111. *Id.* § 1335.

112. *Id.*

113. Ralph v. Rogers, *Historical Origins of Interpleader*, 51 YALE L.J. 924, 825 (1941).

parents and fell into the custody of one who did not have a custodial claim, what was the temporary custodian to do when others appeared with competing claims over the child? And what result would follow if competing claimants, in separate proceedings, each won custody of the child? The custodian could not, after all, split the baby. To avoid these difficulties, courts were authorized to order the adverse claimants to "interplead" so that all competing claims could be resolved in a single proceeding.[114]

From at least the 1400s, a bailee of a thing or instrument of value (*e.g.* a deed) could resolve competing claims to it through interpleader.[115] The underlying theory, as the English Court of Common Pleas expressed it in the 1424 case of *Cromwel v. Moris*, is that adverse claimants should be compelled to interplead:

> for otherwise the defendant would be in great mischief for if he were to answer to one and to the other severally, then if it were found against the defendant and for the plaintiff in each case, each of them would have judgment to recover the writing, and so he would be twice charged for the same thing which would be contrary to reason . . . ."[116]

Interpleader relief was available both when the adverse claimants had sued the bailee ("compulsory interpleader"), and when the bailee was merely concerned that they might bring suit ("interpleader by way of garnishment").[117] In the latter case, service upon absent claimants and potential claimants was effected by the sheriff delivering a "writ of *scire facias*" (meaning to "make known").[118] If a claimant warned by *scire facias* failed to appear to interplead, a default judgment could be entered against him.[119]

In the early twentieth century, interpleader had become an important but limited form of action in the United States. It was

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114. *Id.* at 926.

115. *Id.* at 946. The common fact pattern was this: A contracts with B to perform some service. To secure his performance, A deposits an instrument of value, such as a deed to property, with third party C. If B performs but A does not pay, C is to convey the deed to B. If B fails to perform, C is to return the deed to A. If A and B dispute whether B performed and C does not know who is right, C deposits the instrument in court and is discharged of his responsibility.

116. *Id.*

117. *Id.* at 934.

118. *Id.* at 936.

119. *Id.* at 937. Federal Rule 81(b) abolishes the writ of *scire facias* but states that the "same relief" is still available "by appropriate action" or motion.

available in federal courts under their general equity powers and under a series of Interpleader Acts enacted beginning in 1917.[120] Interpleader relief was perhaps most commonly used to resolve adverse claims to insurance proceeds and bank accounts.[121] The Interpleader Acts were available only to specific classes of stakeholders such as insurance companies and fraternal benefit societies.[122] Judicially-created doctrines further limited the availability of interpleader. These included requirements that all claimants claim the "same thing, debt or duty," that the adverse claims be "derived form a common source," and that the stake holder have no "independent liability" to the claimants and stand "perfectly indifferent between them."[123]

In 1921, Harvard Law Professor Zechariah Chafee published an influential article in the *Yale Law Journal* entitled "Modernizing Interpleader."[124] Professor Chafee argued that these restrictions had come to "hem in" the "admirable remedy" of interpleader and were neither necessary nor consistent with the historical origins of the doctrine.[125] He argued that the only true requirements of interpleader are "reasonable apprehension of double vexation, absence of collusion [between the stakeholder and any claimant], and deposit of the *res* in court."[126]

Fifteen years later, Professor Chafee's liberal view of interpleader was implemented in the Federal Interpleader Act of 1936 (the "1936 Act"). The 1936 Act allowed "any person, firm, [or] corporation" to bring an action in interpleader.[127] It extended interpleader subject-matter to "any obligation written or unwritten to the amount of $500 or more." It also provided that the claims need not have a common origin, or be identical so long as they are "adverse to and independent of one another."[128]

The Interpleader Act was further amended and simplified in 1948, putting it in essentially the same form as we find it today.[129] The 1948 amendments made clear that interpleader applies whenever two

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120. Zechariah Chafee, Jr., *Interpleader in the United States Courts*, 41 YALE L.J. 1134 (1931).

121. *Id.* at 1134, 1139.

122. *Id.* at 1161.

123. Chafee, *Modernizing Interpleader*, *supra* note 1, at 822 (quoting POMEROY, EQUITY JURISPRUDENCE § 1322 (4th ed. 1919).

124. *Id.*

125. *Id.* at 814.

126. *Id.* at 821.

127. Zechariah Chafee, Jr., *The Federal Interpleader Act of 1936: I*, 45 YALE L.J. 963, 968 n.26 (1936) [hereinafter Chafee, *FIA of 1936*].

128. *Id.*

129. 28 U.S.C. § 1335 (2005).

or more adverse claimants are claiming "or may claim" to be entitled to any one or more of the benefits arising by virtue of the obligation.[130] These statutes were expressly intended to implement interpleader broadly and the Supreme Court has said they should be "liberally construed."[131] Only a "minimal threshold level of substantiality" is required to demonstrate that adverse potential claims exist.[132]

The 1948 Act also liberalized the deposit requirement. Traditionally, interpleader required that the *res* in dispute be deposited with the clerk of the court to facilitate immediate distribution to the prevailing claimant or claimants upon entry of judgment. When interpleader jurisdiction was expanded to cover "any obligation," drafters recognized that it would not always be practical, or even possible, for the stakeholder to deposit the disputed *res*.[133] Accordingly, the Act provided that in lieu of actual deposit, the stakeholder may submit a "bond payable to the clerk of the court in such amount and with such surety as the court or judge may deem proper . . . ."[134] While the deposit requirement is expressed as a condition of jurisdiction, in modern practice it is sometimes ignored when the stakeholder pleads its willingness to deposit a bond.[135]

B. Applying Interpleader to FRAND Royalty Determinations

Interpleader, as it is currently adopted in the federal interpleader statutes, has unique procedural features that make it attractive for litigating apportionment of an aggregate FRAND royalty. These include:

- **Low bar for case-in-controversy:** jurisdiction extends to any entity which claims or "may claim" a share of the obligation

130. *Id.* § 1335(a)(1).

131. *State Farm Fire & Casualty Co. v. Tashire*, 386 U.S. 523, 533 (1967).

132. *Michelman v. Lincoln Nat'l Life Ins. Co.*, 685 F.3d 887, 895 (9th Cir. 2012) (holding interpleader proper when the potential adverse claimant was reasonably believed to have a "colorable" claim to insurance proceeds; insurance company need not assess the merits of the potential claim).

133. *See* Chafee, *FIA of 1936*, *supra* note 127, at 977.

134. 28 U.S.C. 1335(a)(1).

135. *See* Cathy Hwang and Benjamin P. Edwards, *The Value of Uncertainty*, 110 NW. U. L. REV. COLLOQUY 19 (2015), http://scholarlycommons.law.northwestern.edu/nulr_online/228 (noting absence of practice of depositing *res* or bond in litigation among "sophisticated financial parties" involving "securitized financial instruments").

provided only that such claims have a "minimal level of substantiality";

- **Minimal diversity:** federal diversity jurisdiction exists whenever at least two claimants are diverse and the presence of non-diverse claimants does not destroy it;
- **Ease of service:** nationwide service of process is authorized;
- **Breadth of consolidation:** the court has statutory power to enjoin all claimants from "instituting or prosecuting any proceeding" in the United States affecting the obligation; and
- **Finality:** once the obligation has been apportioned, the court may make the injunction permanent and discharge the interpleader plaintiff from further liability.

These unique features make interpleader a powerful procedural mechanism for obtaining jurisdiction over a large and diverse group of claimants and resolving their claims to a particular obligation in a single consolidated proceeding. This mechanism addresses the shortcomings of piecemeal litigation that FRAND cases embody today and allows the efficient and speedy resolution of factually-intensive questions that might otherwise require the expenditure of significant public and private resources in multiple duplicative actions.

There are two primary requirements for applying interpleader to disputes over FRAND royalties. First, it must be established that the aggregate patent royalty applicable to a standard may be viewed as a single payment "obligation" of the interpleader petitioner (i.e., the manufacturer of a standardized product or component). Second, the amount in controversy must be paid out of a single fund that is subject to two or more adverse claims.

1. Single Obligation

Outside the standards context, every patent represents a discrete, independent potential claim for royalties. If each royalty claim is discrete and independent, then the manufacturer of a product that infringes multiple patents is not "multiply vexed" by such claims even if they relate to the same product. A smartphone manufacturer may choose to implement different patented technologies to provide, for instance, a more advanced camera, longer-lived battery, or tougher screen. Each such choice is independent of the others. If the manufacturer implements all three, the patent holders' royalty claims may "compete" in an economic sense for a share of the manufacturer's

product revenue, but they are not in a legal sense seeking to recover royalties for the "same" technology.

Standards essential patents, however, present a special case. Once a manufacturer decides to implement a particular standard in its product, it must take the entire standard, with all associated patents. Apart from any "optional" features, the product manufacturer cannot choose which patented features of the standard to include or exclude.[136] The mandatory features of the standard and their associated patents, even if there are thousands of them, constitute a single aggregate that the manufacturer must take to manufacture a standardized product.

SEP holders bound by FRAND commitments cannot charge unlimited royalties on standardized technologies. There is broad consensus among courts, agencies and commentators that FRAND commitments require royalty rates on individual SEPs to be set in such a manner that the *aggregate* royalty on the standard as a whole is reasonable and consistent with widespread implementation of the standard.[137] Even the Federal Circuit, which has expressed some skepticism about the uniqueness of SEPs, acknowledges that SEP royalties can become "excessive in the aggregate" and that this should be taken into account when setting individual patent royalties.[138] As noted above, some courts have gone further to set a theoretical maximum royalty rate for the standard as a whole.[139] In *Innovatio*, for instance, the aggregate royalty was set at $1.80 per unit, and

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136. Many standards include both mandatory and optional features. Mandatory features must be included in the product in order for it to be deemed compliant with the standard and thereby to be entitled to licenses from holders of SEPs. *See* ABA Patent Policy Manual, *supra* note 4, at 16–18. For the sake of simplicity, we will refer throughout this article to mandatory portions only.

137. *See* Symposium, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 2015–16, 2026-28 (2007) (raising examples that insinuate the costs of royalty stacking might be worse than data suggests); Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard-Setting*, 1 INNOVATION POLICY AND THE ECONOMY 119, 121-23 (2001); Microsoft Corp. v. Motorola, Inc., Case. No. C10-1823JLR, 2013 U.S. Dist. LEXIS 60233, at *42 (W.D. Wash., Apr. 25, 2013), *aff'd*, 795 F.3d 1024 (9th Cir. 2015); Letter from The Hon. Renata B. Hesse, Acting Assistant Att'y Gen, U.S. Dep't of Justice to Michael A. Lindsay, Esq. (Feb. 2, 2015), https://www.justice.gov/atr/response-institute-electrical-and-electronics-engineers-incorporated ("[A]ppropriately apportioning the value of all essential patent claims in an IEEE standard addresses royalty stacking, which may hamper implementation of a standard.").

138. Ericsson, Inc. v. D-Link Systems, Inc., 773 F.3d 1201, 1209 (Fed. Cir. 2014).

139. *Id.*; *see also supra* notes 95–98 and accompanying text (discussing *Innovatio* and Japanese *Apple v. Samsung* cases)).

Innovatio's portion of that aggregate was set at $0.0956.[140] Thus, for every standard, there is a single royalty pie to be divided among SEP holders. Parties may vehemently dispute the size of the pie and their shares of it, but there seems to be no dispute that a single pie exists. Hence, the reasonable aggregate royalty represents a single obligation to which all SEP owners are claimants. Moreover, all SEP owners have signed on to a contract to take no more than a FRAND share of that aggregate. That contract can also be seen as a single obligation supporting interpleader jurisdiction.

2. Adverse Claims

The case for applying interpleader to FRAND royalty disputes also depends on establishing the potential for overlapping, adverse claims to the relevant funds. This bar is not a high one. As discussed above, interpleader jurisdiction extends to any situation with the potential for adverse claims to have a "minimal threshold level of substantiality."[141] Only a good faith fear of adverse claims is required, regardless of the actual merits of the claims or the stakeholder's subjective belief.[142]

In standards litigation, the potential for individual claims to exceed a reasonable aggregate royalty, or royalty stacking, has been widely acknowledged.[143] If royalties can stack, then the royalties one patent holder charges necessarily impact the royalties that other patent owners can charge. Every slice taken leaves less pie for the others. The example of the royalty rates assessed in the five Wi-Fi suits summarized in Table 2 exemplifies this problem. Even for the thirty-five patents asserted in those suits, the aggregate royalty, based on the five courts' calculations, would exceed some of their maximum aggregate royalties for the standard. And this does not even consider the remainder of the 3,000 patents covering the standard.

Stacking concerns aside, the "apportionment" analysis also illustrates why competing claims to royalties on the same standard are adverse to one another and in need of consolidated resolution.[144] The

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140. *In re* Innovatio IP Ventures, LLC, 2013 U.S. Dist. LEXIS 144061, *183 (N.D. Ill. Sept. 27, 2013).

141. 7 CHARLES ALAN WRIGHT & ARTHUR R. MILLER, FEDERAL PRACTICE AND PROCEDURE § 1704 (3d ed. 2008).

142. MOORE'S FEDERAL PRACTICE—CIVIL 22.02 (3d ed., 1997).

143. *See supra* Section II.A.

144. Such consolidation is consistent with similar techniques in other areas of the law. For example, under federal bankruptcy law, multiple creditors are placed together in a single action in order to resolve all claims to the debtor's estate in a

apportionment analysis that courts must perform in every SEP case is a valuation of a certain set of patents *relative to* all of the other patents covering the standard.[145] When a trier of fact concludes that a given set of patents contributed important technologies to the standard and are therefore entitled to a greater-than-average share of royalties,[146] that decision is adverse to the claims of every other SEP owner whose share of the overall pie is thereby reduced.

The *Innovatio* case presents a particularly clear example of this effect. As discussed above, the Court adopted a valuation methodology the court employed proceeded from the assumption that 84% of the royalties should be awarded to the top 10% most valuable patents.[147] The court determined that the patents-in-suit were among the "top 10%" and therefore awarded the patent holder a higher royalty than would have been attributed patents in the bottom 90%. Can there be any doubt that the decision to rank Innovatio's 19 patents among the top 10% was "adverse" to the interests of the owners of all the other patents that cover the standard?[148]

Ranking patents based on their importance to a standard also presents risks to the infringing manufacturer. If different finders of fact in different proceedings each rank different patents in the "top 10%," then a manufacturer is faced with the threat of paying more than 100% of the reasonable aggregate royalty. Again, this results from the inherent flaws in performing royalty calculations for SEPs in a bottom-up manner.

The *Realtek* and *CSIRO* cases offer a telling example of how this could happen. In *Realtek*, the patent owner claimed its patented technology minimized performance degradation due to "multipath signal transmission" in the Wi-Fi standard.[149] In setting the royalty,

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consolidated fashion. *See generally* Mary Elisabeth Kors, *Altered Egos: Deciphering Substantive Consolidation*, 59 U. PITT. L. REV. 381 (1998).

145. *See supra* Part I.C (discussing apportionment analysis for patent damages).

146. *See supra* notes 80–83 and accompanying text (discussing flaws in patent ranking analysis).

147. *See* Sidak, *The Meaning of FRAND, Part I: Royalties*, *supra* note 82, at 1019 (explaining the analysis was based on a fifteen-year-old study attempting to calculate a value distribution for "all electronic patents").

148. This decision is not adverse to the other owners in the sense that they are bound by it as a matter of collateral estoppel, but that is not what "adverse" means in the interpleader context. Indeed, it is *precisely because* the absent claimant would not be bound that Interpleader is necessary and appropriate. Interpleader protects the stake holder from inconsistent judgments that may arise when each claim is separately litigated.

149. *See* Eric Schweibenz, *LSI Files New 337 Complaint Regarding Certain Audiovisual Components*, ITC BLOG (Mar. 12, 2012), http://www.itcblog.com/lsi-

the jury in the Northern District of California was instructed to "compare[] the technical contribution" of the patent "to the technical contributions of other patents essential to the standard."[150] Five months later, in the Eastern District of Texas, the *CSIRO* case was decided. The court there awarded considerably higher royalties than were awarded in *Realtek* for a single patent that the court found "solve[d] challenges to indoor wireless networking known as the 'multipath' problem" in wireless communications.[151] When the jury in *Realtek* was considering the contribution of LSI's patented Wi-Fi multipath technology to the standard, did it have in mind *CSIRO*'s Wi-Fi multipath technology? It almost certainly did not. These determinations were conducted independently without reference to one another. And given that patentees are represented in each of these cases by able counsel who will assert the importance of their client's technical contribution, it would not be surprising for many more patented technologies to be found to be the "most important" contributors to solving the multipath problem in the Wi-Fi standard.[152]

Finally, while it is clear in the standards context that potential adverse claimants may exist, their identity is often unknown. As discussed above, some SDOs allow blanket FRAND commitments to be made, in which patent holders declare that they hold SEPs, but are not required to identify them.[153] Other SDOs require identification of specific patents and patent applications that cover the standard, but over-disclosure is common.[154] Thus, there may be no definitive list of patents that are actually essential to a standard. Another issue that has emerged recently in the area of SEP litigation is the frequent transfer of SEPs to patent assertion entities.[155] These entities are often created for the purpose of "disaggregating" a portfolio, thereby multiplying

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files-new-337-complaint-regarding-certain-audiovisual-components (summarizing LSI ITC complaint asserting '985 patent, which LSI characterized as relating to "digital modulation and demodulation methods and/or systems that provide increased data rates while minimizing performance degradation due to such factors as multipath signal transmission and noise interference").

150. *See* Long, *supra* note 85.

151. CSIRO v. Cisco, No. 6:11-cv-343, 2014 U.S. Dist. LEXIS 107612 at *4 (E.D. Tex. July 23, 2014).

152. *See supra* Part II.B.3 (discussing plaintiff's presentation of favorable evidence and lack of contravening evidence from other SEP holders).

153. *Id.*

154. *See* sources cited *supra* note 69.

155. Jorge L. Contreras, *When a Stranger Calls—Standards Outsiders and Unencumbered Patents*, 12 J. COMP. L. & ECON. 507, 528 (2016) (finding that 77% of U.S. SEP assertions between 2000 and 2015 were brought by non-practicing entities).

opportunities for royalty-extraction.[156] Even when the list of declared essential patents is known, such transfers can impede potential licensees' ability to discover who owns the patents in each portfolio, and to whom royalties may be owed.

For all of these reasons, there is currently no reliable method by which a product manufacturer can determine all potential SEP royalty claimants. An important advantage of interpleader is that it has the potential to bring all claimants and potential claimants out of the shadows and into a single proceeding.

3. Leveling the Playing Field

The problem for implementers is not that SEP royalties are high *per se*, but that they are unpredictable and inconsistently apportioned. Ad hoc SEP assertions create a substantial risk that certain implementers will bear higher royalty burdens than their competitors for any number of reasons ranging from historical accident to poor bargaining strategy. Sometimes early licensees are favored over later licensees when licensors offer more favorable terms to the first licensees to acquiesce to their royalty demands. Sometimes later market entrants are able to structure their businesses to minimize royalty exposure. Some licensees benefit from the protection of foreign antitrust regimes and some do not. Some licensees are amenable to suit in fora where jurors have historically awarded high royalty rates to patent owners, and some are not. Some licensees have substantial existing investments in patent-implementing products and some do not. All of these are potentially factors in bilateral license negotiations (implicitly, at least) yet there appears to be no valid economic rationale for them. Any impact they may have on pricing are artifacts of the widely varied and often inconsistent legal regimes that touch SEPs.

Interpleader-based royalty determinations may also more efficiently reward investments in standards development made by large standard implementers. Currently, it is risky for SEP owners to assert their patents when they are also large producers of standardized products, as their own products may be vulnerable to a counter-suit by an accused infringer. As a result, the lion's share of SEP royalties tends to flow to SEP owners that enjoy a lower risk of counter-suit by

156. Mark A. Lemley & A. Douglas Melamed, *Missing the Forest for the Trolls*, 113 COLUMBIA L. REV. 2117, 2121 (2013) (arguing that many of the problems associated with so-called "trolls" are in fact "problems that stem from the disaggregation of complementary patents [patents that cover technologies used together in the same products] into too many different hands").

nature of their business structure. An argument could be made that standardization substantially eliminates the incentive for large manufacturers to invest in standards development. Any innovations that are made part of the standard are made available to all competitors and therefore cannot be used to differentiate their products. Any patents they obtain can be expected to generate below-average royalties because they are in a relatively weak bargaining position compared to SEP owners that primarily or exclusively derive their revenue from patent licensing. In an interpleader context, by contrast, it is reasonable to expect that royalties will be allocated based only on the intrinsic value of the patented technologies. Whether the SEP owner is also a standard implementer should not be a factor in apportioning royalties.

4. Privity

Before the Interpleader Act of 1936 was enacted, courts generally required that all the adverse claims in interpleader actions be "dependent, or be derived from a common source."[157] The 1936 Act eliminated this "privity" requirement, stating that an action for interpleader could be maintained even though "claimants do not have a common origin, or are not identical, but are adverse to and independent of one another."[158] Nevertheless, given the historical origins of the interpleader action, courts may perceive interpleader actions to be more appropriate in cases when the adverse claimants have some meaningful relationship that pertains to the claim in dispute. There are good reasons to assert that such privity arises from the way SDOs work.

FRAND licensing obligations apply only to those SEPs that are subject to FRAND commitments. Patent owners make FRAND commitments as a *quid pro quo* for participating in the standardization process and having their patented technologies considered for inclusion in the standard. Technical proposals are vetted by committees and plenary sessions are held in which the participants' representatives cast the votes that determine which technology will be included in the standard.[159] Indeed, representatives sometimes engage in "horse trading" with other participants to get their preferred

157. Chafee, *Modernizing Interpleader*, *supra* note 1, at 822.

158. Chafee, *FIA of 1936*, *supra* note 127, at 968.

159. *See, e.g.*, IEEE Standards Board Bylaws, IEEE STANDARDS ASSOCIATION, http://standards.ieee.org/develop/policies/bylaws/sect1-3.html#1 (last visited Jan. 16, 2017).

technologies into the standard.[160] In these ways, SDO participants create a unitary body of technology that incorporates only those patents the participants have selected together through the voting processes of their bylaws. The presence of a patented technology in a standard is therefore not attributable to any individual patentee alone, but to all the standards body participants who jointly approved the patentee's technology for inclusion in the standard. Given all of that, it seems particularly equitable that SDO participants should be required to come together again in court to litigate their entitlement to royalties arising from the standardization process.[161]

Thus, equity also supports placing the burden of litigating royalty apportionment upon the parties having the incentive and superior knowledge to litigate the issue: the SEP holders themselves. The mechanics of the process we envision is described in the next Part.

C. Interpleader Mechanics

1. Initiating Suit

The interpleader statute confers original jurisdiction over actions filed by any person, firm or corporation that is under "any obligation written or unwritten" in excess of the jurisdictional amount if there are two or more claimants of diverse citizenship and the plaintiff has posted bond. Once a product manufacturer has begun to implement a standard without a license under all relevant FRAND-encumbered SEPs, the manufacturer has an "obligation" to pay royalties to all SEP holders. An interpleader action could be brought by the manufacturer to quiet these competing claims to its obligation to pay a fixed aggregate royalty for implementing the standard. In practice, however, it is more likely that such a suit would be brought in response to a patent holder's suit for infringement in which royalties are sought. Such an action may be brought "in the judicial district in which one or more of the claimants reside."[162]

The interpleader action also offers a component supplier that is not directly threatened by an infringement suit the ability to adjudicate all competing royalty claims with respect to its standard-

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160. Maurits Dolmans, *Standards for Standards*, 26 FORDHAM INTL. L.J. 163, 178 (2002).

161. Of course, some FRAND-encumbered patents are sold or transferred to entities that did not participate in the standardization process. Contreras, *When a Stranger Calls*, *supra* note 155. Even in that case, however, the transferees stand in the stead of the transferors and are equitably subject to all of the same obligations.

162. 28 U.S.C. § 1397 (1948).

implementing component for the benefit of its customers. This possibility is increasingly relevant when standards are used in complex, multi-function products such as smartphones that include many feature-rich components. A SEP holder will often bring suit not against the manufacturer of the chip or component that actually implements a standardized technology, but against the manufacturer of a larger product that utilizes that chip or component or, in cases such as *Innovatio*, against owners of retail businesses (coffee shops, motels) that use such products in their operations.[163] In each of these cases, the component manufacturer undoubtedly has an interest in determining the aggregate FRAND royalty burdening its standards-compliant component. However, if the SEP holder does not sue the component manufacturer directly,[164] then the component manufacturer has little opportunity to intervene in the suit and present what is probably the most relevant evidence regarding the operation and development of its standard-compliant component. The interpleader action offers a component manufacturer the opportunity to initiate an original action to interplead the royalty rather than merely seek to intervene in such a suit after the fact.

2. Depositing a Bond

Interpleader actions generally begin with the initiation of the action by the petitioner, who describes the disputed property and the competing claimants, and a determination of whether interpleader is proper. This stage of the controversy pits the petitioner, on one side, against the multiple claimants, on the other. But once the interpleader action is deemed proper, the controversy shifts to a dispute among the claimants over the proper allocation of the resource (in this case, the pool of royalties attributable to the standard). The petitioner can, at this stage, retire from the action if it so wishes. Before doing so, however, it must deposit the disputed funds or property in dispute with

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163. The SEP holder's goal in bringing suit at the highest level possible in the production chain is, of course, to maximize its royalties. That is, while a reasonable royalty on a $20 Wi-Fi chip might be $0.25, a reasonable royalty on a $200 router might be $2.50. *See* Jorge L. Contreras, *A Brief History of FRAND: Analyzing Current Debates in Standard Setting and Antitrust through a Historical Lens*, 80 ANTITRUST L.J. 39, 74–75 (2015).

164. A SEP holder would often prefer not to sue a component manufacturer because once the component manufacturer pays the SEP holder a royalty, the SEP is "exhausted" and royalties cannot be charged to more lucrative downstream customers such as integrated product manufacturers or service businesses. *See* Contreras, FRAND History, *supra* note 163, at 74–75; Lee & Melamed, *Breaking the Vicious Cycle*, *supra* note 54, at 427 n.201.

the court. Today, when specific properties are not at issue, this deposit is often accomplished through the posting of a bond.

The interpleader bond can be any amount that the "court or judge may deem proper."[165] In a SEP case, the "proper" amount would be related to the likely aggregate royalties owed on the standard. Accordingly, this phase presents an opportunity for the court to begin to evaluate the importance of the standard to the product and the importance of patented technologies to the standard.[166] The interpleading product manufacturer would presumably be liable to pay a royalty for all acts of infringement subject to the six-year statute of limitations and any other limits, and the bond should be set accordingly.

3. Serving Process and Preliminary Injunction

Once jurisdiction is established (and the bond is deposited), the next step is to bring all claimants and potential claimants before the court. Statutory interpleader authorizes a district court in an interpleader action to issue process nationwide.[167] In addition, the court may enter an order restraining claimants from "instituting or prosecuting any proceeding in any State or United States court affecting the property, instrument or obligation involved in the interpleader action until further order of the court."[168] Like the ancient writs of *scire facias*, the process and order is to be "addressed to and

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165. 28 U.S.C. § 1335 (2016).

166. *See supra* note 39 and accompanying text (discussing FRAND royalty calculation methodology in *Microsoft v. Motorola*).

167. 28 U.S.C.A. § 2361 (West 2016). Because all claimants may not be subject to personal jurisdiction in the state in which an interpleader action is brought, the courts have historically characterized interpleader as an action *in rem* or quasi-*in rem*, and have avoided potential due process jurisdictional concerns by recognizing jurisdiction based on the presence of the *res* in the relevant jurisdiction. *See generally* Chafee, *Modernizing Interpleader*, *supra* note 1.

168. 28 U.S.C.A. § 2361. It is likely that the injunction would extend to International Trade Commission proceedings in addition to district court proceedings. The injunction language of the statute quoted above is broad, covering any proceeding "affecting the ... obligation involved." Even outside the interpleader contexts, there is already precedent for such an injunction. In *Realtek v. LSI*, the district court enjoined LSI from enforcing any exclusion order it might obtain in the ITC pending its determination of the FRAND royalty rate. *Realtek Semiconductor Corp. v. LSI Corp.*, 946 F. Supp. 2d 998, 1010 (N.D. Cal. 2013). The district court went even further in *Microsoft v. Motorola*, enjoining Motorola from enforcing an injunction issued by a German court. The anti-suit injunction was affirmed on appeal. 696 F.3d 872, 889 (9th Cir. 2012).

served by the United States marshals for the respective districts where the claimants reside or may be found."[169]

An interpleader plaintiff could serve all parties that "claim or may claim" a share of the interpleaded royalty. This would include any SEP holder that has contacted the product manufacturer seeking royalties with respect to the standard. It would also include every other entity that participated in the standardization process and submitted FRAND declarations, or which has initiated litigation or made demands against others regarding royalties on the same standard. In the likely event that some patents subject to the FRAND obligation have been assigned to entities that did not participate in the standardization process, the identity of such assignees could be discovered through interrogatories directed to the original patent owners. The assignees could be served subsequently.

The court's jurisdiction would reach every claimant or potential claimant. Even in an extreme case where a foreign entity that has no other U.S. contacts holds U.S. patents, jurisdiction would still lie in the Eastern District of Virginia.[170] Of course, jurisdiction of the U.S. courts does not extend to disputes over royalties associated with foreign counterpart patents and the interpleader statute does not confer the power to enjoin foreign proceedings.[171]

Moreover, interpleader jurisdiction does *not* require evidence of an actual or imminent case or controversy involving each individual defendant as does a declaratory judgment action.[172] Once an implementer has been sued or received a demand for royalties by at least one SEP owner, it is reasonable to assert that other SEP owners

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169. 28 U.S.C.A. § 2361.

170. 35 U.S.C. § 293 (West 2016) (conferring jurisdiction upon the Eastern District of Virginia over any non-resident patentee that has not otherwise designated an agent for service of process in "any action respecting the patent or rights thereunder" to be conducted in the same manner as if it had personal jurisdiction over the patentee). Due process would still require such non-resident patentees to have sufficient contacts with the United States as a whole. But in most cases there would be ample contacts to satisfy due process requirements. At a minimum, the defendant must have acquired a U.S. patent that someone (maybe the owner, maybe its predecessor in interest) declared essential to an industry standard practiced in the U.S. Moreover, the owner must be reserving its right to charge royalties of a party practicing the patent. If the owner did not want to charge royalties, it could allow itself to be enjoined from enforcing against the interpleader plaintiff and be excused from the suit with no effort.

171. While a U.S. interpleader action would, of necessity, have effect only in the United States, it is likely that the royalty allocation determined in such a proceeding would have at least strong persuasive effect in other jurisdictions, and might encourage parties to settle their SEP royalty claims on a global basis.

172. 28 U.S.C.A. § 2201 (West 2016).

may claim that they are entitled to a share of the royalties on the same standard. Interpleader jurisdiction is sufficiently broad to reach all claimants *and potential* claimants. This facilitates obtaining interpleader jurisdiction over particular patent holders who have not affirmatively asserted their SEPs against a product manufacturer. In the interpleader action it would likely be reasonable to assert that any patentee that participated in the standardization process and declared patents, submitted a FRAND declaration, or subsequently acquired SEPs from such a patentee has a claim or potential claim for royalties on the standard that exceeds the threshold level of minimal substantiality. Thus *all* standard-related patent claims against the product manufacturer pertaining to the interpleaded royalties would be consolidated before a single court in a single action.

4. Litigating Apportionment

Once the court is satisfied that as many claimants and potential claimants as can be found have been served, the case would move to the royalty apportionment phase. In this phase, the SEP holder claimants would be the primary litigants.

a. Presenting the Best Evidence

As discussed above in Section II.E, there are many ways to conduct a top-down apportionment analysis. We do not advocate a particular method here. We note, however, that the process we are suggesting would give litigants access to certain kinds of valuable evidence that simply do not exist in a typical patent infringement case. Instead of reliance on third-party studies to count "likely" essential patents, the number of patents at issue would be known. Instead of speculation about royalty "stacking" that might arise from future patent assertions, the number of parties claiming royalties would also be known. Instead of reliance solely on expert testimony to tease out the value of the patents in suit relative to all the other (unidentified) patents in the standard, the other patents in the standard would be identified and their owners present in court to defend their value. As participants in the standardization process (or their successors in interest) and owners of the patents incorporated in the relevant standard, the claimants would be in the best position to advocate the value of their patented technical contributions.

A standard can be seen as a collection of solutions to a set of technical problems. Rather than evaluate the entire standard on an individual, patent-by-patent basis, it is likely that a court would

identify clusters of patents that relate to similar problems. For instance, the CSIRO and LSI patents discussed above[173] might belong to a cluster of patents relating to technologies for solving the "multipath" problem in Wi-Fi networks. A court attempting to apportion Wi-Fi royalties might weigh the importance and difficulty of solving the multipath problem against the other problems that the Wi-Fi standard required to be solved. Then, the court could hear evidence relevant to which multipath-related patents (if any) represented substantial technological advancements as opposed to incremental improvements or arbitrary choices of implementation. The share of royalties allocated for multipath technologies could be allocated accordingly.

Alternatively, one could look at standards as a collection of contributions by standards participants. Rather than go too deep into the weeds of each constituent technology, a court might focus more holistically on the apparent value of the contributions made by each SDO participant. It could evaluate evidence regarding the quantity and quality of the technical submissions of each standards participant. It could then assess the extent to which those technical submissions related to patented or unpatented technologies. From this, it could derive a measure of the relative quantity and quality of patented technology contributed by each participant to the standard as a whole, and allocate royalties accordingly.

b. Adjudicatory Authority: Judge, Jury or Special Master

The determination of patent damages in federal court today is typically a question of fact tried to a jury.[174] But the action in interpleader descends from a court's traditional exercise of equity jurisdiction, and actions in equity are typically decided by a judge rather than a jury.[175] Given the complexity of the subject matter and the well-known vagaries of jury awards in patent cases,[176] we suspect

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173. *See supra* notes 150–151 and accompanying text.

174. *See, e.g.*, Mark A. Lemley, *Why Do Juries Decide If Patents Are Valid?*, 99 VA. L. REV. 1673, 1719 (2013) ("[J]ury trials have become the norm in patent cases on ultimate questions of validity as well as infringement and damages issues.").

175. *See* DAN B. DOBBS, LAW OF REMEDIES: DAMAGES, EQUITY, RESTITUTION, VOL. 1, 57 (1993) ("The non-jury trial remains today one of the three or four most outstanding characteristics of an 'equity' trial.").

176. *See, e.g.*, Seaman, *supra* note 34, at 1705 ("The competency of juries to decide complex, lengthy cases has long been questioned, particularly for difficult scientific and economic issues."); Jennifer F. Miller, *Should Juries Hear Complex*

that many litigants, both SEP holders and infringers, would prefer a bench determination of both the aggregate royalty and the apportionment of royalties among competing claimants to a jury trial. This intuition is borne out by several recent cases involving FRAND royalty determinations in which the parties voluntarily waived their right to a jury trial in favor of a bench trial.[177]

In the context of an interpleader action, we can also envision that during the apportionment phase, the parties might consent to litigate before a special master or panel of special masters. Special master appointment is available pursuant to Federal Rule of Civil Procedure 53[178] even as to issues that would traditionally be tried to a jury when the parties consent. The special master approach would allow for a more flexible procedure and the appointment of technically trained masters. Indeed, in the context of a special master proceeding, the apportionment process could draw even more heavily upon valuation techniques commonly employed in patent pools. It seems that all parties would have a strong incentive to consent for the reasons discussed above. Rule 53 also allows the court to appoint a special master to try non-jury issues without the parties' consent if necessary to "resolve a difficult computation of damages."[179]

c. The Petitioner's Incentive to Remain Involved

As noted above, although the product manufacturer is the initiator of the interpleader proceeding, it is not legally required to participate in the apportionment phase. Rather, this phase may involve only the adverse claimant SEP holders. Nevertheless, we see many reasons that a product manufacturer initiating an interpleader action might prefer to remain involved in this phase. For example, the product manufacturer could introduce evidence supporting arguments that:

Patent Cases?, 2004 DUKE L. & TECH. REV. at ¶1 (2004) ("many legal scholars and practitioners have begun to speculate as to whether juries are competent to hear patent infringement cases"); Kimberly A. Moore, *Juries, Patent Cases, & a Lack of Transparency*, 39 HOUS. L. REV. 779, 780–82 (2002).

177. *See* Contreras, *Brief History of FRAND*, *supra* note 163, at 80–84 (discussing parties' stipulation to bench trials in *Microsoft v. Motorola*, *Apple v. Motorola* and *Innovatio*). *But see id.* (noting other cases in which jury trials were used to determine FRAND royalties including *Ericsson v. D-Link* and *LSI v. Realtek*).

178. Fed. R. Civ. Proc. 53.

179. Fed. R. Civ. Proc. 53(a)(B)(ii).

- The aggregate royalty should be different from the amount established in the first phase;
- Some of the aggregate royalty should be apportioned to unpatented technologies or technologies claimed in expired patents, thus lowering overall payment to be made to claimants;[180]
- Some of the aggregate royalty should be allocated to the product manufacturer's own patents;[181] and
- Some of the aggregate royalty should be allocated to patents to which product manufacturer already holds a license.[182]

Thus the aggregate royalty established in the first phase would be preliminary and subject to substantial reexamination in the apportionment phase. For jurisdictional purposes, the interpleader plaintiff may be ordered to deposit a bond sufficient to cover the largest amount that the district court judges to be reasonably in controversy.[183] After jurisdiction is established, however, the district court can consider any arguments that plaintiff may present that it is entitled to a share of the amount in controversy or that the true amount in controversy is lower.[184]

5. Judgment, Permanent Injunction, Finality

Once the apportionment phase is complete, the court can enter judgment and the clerk may immediately distribute the proceeds of the bond to claimants in accordance with the adjudicated apportionment. The court may also "discharge the plaintiff from further liability, make

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180. See *supra* note 75 and accompanying discussion.

181. One of the four elements of the original bill of interpleader required that the petitioner have no interest in the disputed subject matter. *See* Chafee, *Modernizing Interpleader*, *supra* note 1, at 804–42 (criticizing rule). While this requirement was eliminated from the Federal Interpleader Act, it remains in the procedural codes of many states. COUND, FRIEDENTHAL, MILLER & SEXTON, CIVIL PROCEDURE 585 (4th ed. 1985).

182. Many industries in which technical standards are prevalent are characterized by cross license agreements among major market players. *See, e.g.*, Peter C. Grindley & David J. Teece, *Managing Intellectual Capital: Licensing and Cross-Licensing in Semiconductors and Electronics*, 39 CAL. MGMT. REV. 9, 9–10, 24–25 (1997). In addition, some patents essential to a particular version of a standard may have been licensed to a manufacturer as part of a license to an earlier version of the standard.

183. WRIGHT & MILLER § 1716.

184. Zechariah Chafee, *Broadening the Second Stage of Interpleader*, 56 HARV. L. REV. 541 (1943).

the injunction permanent, and make all appropriate orders to enforce its judgment."[185] Thus, the parties served in the case could be permanently enjoined from further asserting their patents against the interpleader plaintiff with respect to the interpleaded royalties.

The resulting judgment would be *res judicata* as to all royalties due for past sales of the infringing product at issue in the suit. It therefore would avoid the concern that some courts have expressed that adjudicating a FRAND royalty is merely an "advisory opinion" that the parties can use as further leverage in licensing negotiations.[186] A concrete, discrete set of legal claims would be fully and finally resolved as a result of the action.

The resulting judgment would also have broader legal and practical effects. Under ordinary principles of *collateral estoppel*, claimants should be precluded from re-litigating the aggregate royalty due on products that are the same as or similar to the products at issue in the initial suit. The aggregate royalty payable on a Wi-Fi router, for example, might differ from the aggregate royalty on a Wi-Fi-enabled refrigerator. There is no apparent reason why the aggregate royalty should vary significantly from router to router, however.

Moreover, it seems likely that in many cases SEP owners would be precluded from re-litigating apportionment of the aggregate royalty, even for different types of products. That is, even if the aggregate reasonable royalty might be different for routers versus refrigerators, the *relative* contributions of each SEP owner's patented technologies to the standard should be consistent in many cases. SEP owners would have had a full and fair opportunity to litigate the relative value of their patented contributions to the standard in the first interpleaded case. Presumably, each one would have had more than adequate incentive to claim the largest share of standards royalties that they could get in the first suit. There seems to be no reason why those SEP owners should be entitled to re-litigate their royalty share in a subsequent suit.

Litigating the aggregate royalty on a product-class by product-class basis, while still more efficient than the current system of individual bilateral suits, is not ideal. As a result, the natural tendency may be for suppliers of the "smallest saleable patent practicing unit" (SSPPU) implementing the standard[187] to take the initiative to acquire licenses through interpleader suits. This may enable component

185. 28 U.S.C.A. §2361 (West 2016).

186. *See* Part II.D, *supra*.

187. The SSPPU doctrine originated in Cornell Univ. v. Hewlett-Packard Co., 698 F.Supp.2d 279 (N.D.N.Y. 2009).

suppliers to efficiently acquire broad, exhaustive standards patent rights that they could pass on to their customers.

Other product manufacturers who are not parties to the interpleader suit would not be bound by collateral estoppel.[188] It is possible that a product maker who is displeased with the distribution of royalties awarded under the first suit could seek to re-litigate it. As a practical matter, however, that seems unlikely. First, the product manufacturers that have the greatest incentive to re-litigate apportionment are those that are also SEP holders. If they hold SEPs, then presumably they would have been party to the first suit as claimants and therefore bound by collateral estoppel. Second, the apportionments made in the first suit could be admissible evidence in the second suit. If so, that would exert a strong influence over the trier of fact. It could therefore serve as an influential bellwether case similar to those that are used to drive settlement of multiparty product liability cases and other mass torts.[189]

In sum, it is conceivable that a single interpleader proceeding could have the practical effect of eliminating substantially all litigation over patents essential to practicing a given standard.

D. Other Considerations

1. Statutory Interpleader versus Joinder Mechanisms under the FRCP

The Federal Rules of Civil Procedure provide several alternative means of haling multiple SEP owners into a common court. Permissive joinder under Rule 20 is available when the right to relief is asserted against multiple defendants jointly, severally, or in the alternative with respect to or arising out of the same transaction, occurrence, or series of transactions or occurrences and there are common questions of law or fact.[190] Compulsory joinder is available

188. Conceivably, the plaintiff could bring an interpleader class action on behalf of itself and similarly situated manufacturers. That approach might lead to even more finality. One obstacle is that, unlike an ordinary plaintiff who seeks to *recover* money, an interpleader plaintiff is trying to *pay* money. The normal economic incentives for class actions therefore do not apply. The authors are grateful to Paul Gugliuzza for this insight.

189. *See* Rothstein & Borden, *Managing Multidistrict Litigation in Products Liability Cases*, Federal Judicial Center Judicial Panel on Multidistrict Litigation, FEDERAL JUDICIAL CENTER 44–46 (2011), http://www2.fjc.gov/sites/default/files/2012/MDLGdePL.pdf (describing role of bellwether cases in multidistrict litigation).

190. Fed. R. Civ. P. 20.

under Rule 19 for any party whose presence is necessary to accord complete relief among the existing parties.[191] Even an interpleader procedure similar to the statutory interpleader mechanism described in this article is available under Rule 22.[192] In certain cases, these rules might be sufficient to join all of the necessary parties to the same suit.

In many cases involving SEPs, however, none of these procedural rules is likely to offer complete relief. It is unlikely that under ordinary jurisdictional rules all of the necessary SEP holders will be amenable to suit in a single jurisdiction. Thus, service of process presents a problem. Even if process were available in a single jurisdiction, it is likely that at least two SEP owners will be non-diverse, thus destroying diversity jurisdiction. Statutory interpleader solves both of these problems by allowing nationwide service of process and requiring only minimal diversity.

Moreover, the consolidation of claims in a single proceeding is largely at the discretion of the trial court. In some cases, courts may prefer to limit the number of patents at issue for case management reasons. For example, in *Huawei v. T-Mobile*, the court severed Nokia's counterclaims asserting SEPs against Huawei "to reduce the complexity of the cases," even though severing those counterclaims would "require eight jury trials to resolve a single controversy between these two parties over essential patents."[193] Such broad discretion to omit patents is not granted to the court presiding over an interpleader proceeding.

In *Innovatio*, the court employed Multi-District Litigation procedures to manage suits that had been brought against a large number of diverse defendants.[194] MDL enables the court to consolidate pre-trial proceedings, but does not provide authority to consolidate suits for trial without the consent of the parties. Thus, MDL ultimately fails to provide for consolidated resolution of competing claims to standard-related royalties. Moreover, MDL procedures are inadequate to resolve all potential claims. Theoretically, an implementer might simultaneously sue all SEP owners who contacted it to demand excessive royalties. The implementer might then attempt to consolidate these separate suits

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191. Fed. R. Civ. P. 19; *Prima Tek II, L.L.C. v. A-Roo Co.*, 222 F.3d 1372, 1377 (Fed. Cir. 2000).

192. Fed. R. Civ. P. 22(a)(1) ("Persons with claims that may expose a plaintiff to double or multiple liability may be joined as defendants and required to interplead.").

193. Huawei Techs. Co. Ltd. v. T-Mobile US Inc., Order, Case No. 2:16-cv-52-JRG-RSP, slip op. at 2 (E.D. Tex. Jul. 10, 2016).

194. *Innovatio*, 921 F. Supp. 2d at 906 (noting MDL consolidation).

using MDL procedures. There would be no basis, however, to assert jurisdiction over SEP owners who had yet to contact the implementer to demand royalties. Interpleader jurisdiction is unique in that it confers jurisdiction over all claimants and *potential* claimants.

2. Waking the Sleeping Dogs

Interpleader offers a procedural mechanism to join all holders of SEPs relating to a standard in a single action. But of course, not all SEP holders today actively assert their SEPs, either in litigation or through licensing demands. There are many reasons that such "sleeping dog" SEP holders might elect not to seek royalties with respect to their SEPs, including a business model directed primarily to "defensive" use of patents, unwillingness or inability to spend the sums required to mount substantial patent licensing and litigation programs, and questions regarding the validity, enforceability or value of SEPs.[195] Thus, while these sleeping dog SEP holders might never have sought royalties with respect to their SEPs, waking them through interpleader could prompt their action when none would otherwise have been taken. As such, a product manufacturer could face a higher aggregate royalty burden after undergoing an interpleader action than it would have by simply facing the most aggressive individual SEP holders one by one.

While this risk certainly exists, our goal is not merely to minimize the FRAND royalty burden on product manufacturers. Rather, we offer a systemic solution to the problem of inconsistent bottom-up FRAND royalty determinations. In some cases, involving all relevant SEP holders in the royalty determination could result in a higher royalty payment for product manufacturers. However, we believe that this outcome is not likely given, among other things, the prevalence of SEP acquisition and assertion by non-practicing entities in recent years. There is no reason to believe that SEPs covering widely implemented standards will lie unasserted and unmonetized forever.[196] This suggests that forcing a resolution of the royalties due with respect to such SEPs through interpleader will simply be

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195. *See* Contreras, *Fixing FRAND*, *supra* note 28, at 62 (discussing motivations of sleeping dog SEP holders); *see also* Jorge L. Contreras, *FRAND Market Failure: IPXI's Standards-Essential Patent License Exchange*, 15(2) CHI.-KENT J. INTELL. PROP. 419, 435 and n.61 (2016) (discussing dubious involvement of non-asserting SEP holders in plan to monetize Wi-Fi patents).

196. *See* Contreras, *When a Stranger Calls*, *supra* note 155 (observing that many former "sleeping dogs" have transferred SEPs to patent assertion entities for the purpose of asserting and monetizing such patents).

accelerating a determination that is bound to occur, rather than precipitating a determination (and concomitant payment obligation) that never would have occurred absent the interpleader action.

Finally, we note that the impact of waking the sleeping dogs is likely to be less for component suppliers than it may be for end-product manufacturers. As discussed above, it seems most likely that component suppliers would be the ones to take advantage of interpleader. For them, the opportunity to pass on to their customers the equivalent of a fully exhaustive license to all SEPs could be an attractive selling point supporting higher prices. Moreover, the prices of the components they supply are generally much lower than the prices of end-user products into which they are incorporated. Accordingly, they have a smaller royalty base, a larger percentage of the value of which is attributable to the standard. The risk of incurring an unreasonable outlier royalty award is therefore arguably lower than it may be in the case of suits involving more complex end-user products. Suppose the reasonable aggregate royalty were expected to be in the range of five to fifty percent. The aggregate royalty assessed on a twenty-dollar component would be therefore in the range of one to ten dollars. On a $600 smartphone, however, the same range of royalty rates yields an aggregate royalty from thirty to three hundred dollars. Assessed on a $2,000 laptop, the same range of royalty rates yields an aggregate royalty of between one hundred and one thousand dollars. For most standards, it is difficult to envision a court assessing an aggregate royalty on a component that is so high as to be less favorable to the implementer than even a handful of smaller royalty rates applied at the end-user product level.

VI. CONCLUSION

The bottom-up nature of reasonable royalty calculations in disputes involving standards-essential patents subject to FRAND commitments has yielded inconsistent and incongruous results in which patent holders can be over-compensated or under-compensated. While individual royalty determinations in these proceedings may seem to adhere to judicial and contractual requirements regarding "reasonableness", there is no reason to believe that the aggregate royalty rates established through these uncoordinated, serial processes will be reasonable in terms of the overall value that the patented technology contributes to the standard or the product.

To address this problem, we propose that the mechanism of statutory interpleader be used to join the holders of all patents essential

to a particular technology standard into a single proceeding in which an aggregate "reasonable" royalty may be determined and then apportioned among the holders of individual standards-essential patents. This approach will both enhance fairness of royalty determinations and reduce the costs inherent in multiple independent proceedings. Finding such a solution is particularly critical today, as technology convergence continues to impact standardization in key areas such as next-generation wireless communication and the Internet of Things.

A Restitution Perspective on Reasonable Royalties

John M. Golden* & Karen E. Sandrik†

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† Assistant Professor, Willamette University College of Law.

I. INTRODUCTION

Patent law commonly confronts problems of uncertainty and technical difficulty. Some of these questions, such as those centered on the definition and implementation of patentability standards of subject-matter eligibility, enablement, and nonobviousness, are relatively unique to patents. But recent debates over patent-infringement remedies reflect fundamental issues with respect to the enforcement and valuation of rights—or of injury from the violation of those rights—that courts have encountered in a wide variety of contexts. Consequently, remedies debates offer substantial opportunities for patent law to draw instruction from other legal fields.

Questions about how to assess reasonable royalties for patent infringement offer particularly fruitful opportunities for cross-pollination.[1] The law of restitution is an especially good candidate for comparative study. Decades ago, U.S. patent law shed a traditional disgorgement remedy commonly associated with restitution. Although we are not looking to the law of restitution to argue for this remedy's revival, we are looking to see what the legal architecture of restitution's approach to monetary relief suggests about ways to improve reasonable royalty analysis within U.S. patent law's current remedies structure.

There is reason to hope that restitution law might have much to teach. Most prominently, there is the practical fact that, despite patent law's formal elimination of a disgorgement remedy, its retained reasonable royalty remedy has long operated in a quasi-disgorgement fashion by posing the question of what percentage of an infringer's revenue a patentee should receive. Because the restitution law itself does not generally demand full disgorgement of a wrongdoer's profits, the partial-disgorgement character of many reasonable royalty awards directly overlaps with the nature of relief that restitution often affords.

As one would expect from this overlap in practical content, restitution law has substantial experience in addressing issues that also appear in the assessment of reasonable royalties. These issues include problems of reasonably apportioning value among multiple contributions to an overall activity or outcome, assigning burdens of production and proof with respect to valuation and apportionment, and assuring consistency of remedies with statutory law or other expressions of public policy. In contrast with the often relatively

1. *See, e.g.*, John M. Golden, *Reasonable Certainty in Contract and Patent Damages*, 30 HARV. J.L. & TECH. (forthcoming) ("Contract law's reasonable certainty requirement provides helpful instruction for how courts can regulate proof of reasonable royalty damages in patent cases.").

blunderbuss approach of patent law, the law of restitution has responded to such problems in at least three context-sensitive ways: (1) by developing an array of alternative measures for monetary relief, (2) by tying deployment of these measures to similarly reticulated classifications of parties' relative responsibility, and (3) by showing sensitivity to practicalities of proof and background policy concerns. This Article suggests that, in relation to reasonable royalties, patent law can learn much from the law of restitution's comparatively precise yet flexible approach.

Part I provides an introduction to patent remedies and, more specifically, to reasonable royalty damages as an option within patent law's standard remedial suite. Part II provides a primer on the law of restitution and then discusses the vision of intellectual property remedies specifically embraced by the Restatement (Third) of Restitution and Unjust Enrichment. Part II concludes by examining in detail the law of restitution's multi-tiered approach to monetary relief. Part III considers how aspects of this reticulated approach might translate to the award of reasonable royalties in patent law. The crucial point is that, in accordance with restitution's example, patent law might take greater account of cost, social value, and relative responsibility or fault in assessing reasonable royalties. Such lessons can enhance patent law's capacity to advance its public purposes by better enabling it to reward meritorious innovators, to discourage bad-faith infringement, and to limit undue chilling of socially desirable follow-on work.

II. REASONABLE ROYALTIES IN PATENT LAW

In little over a decade, the law of patent-infringement remedies has changed from a relatively neglected backwater into a maelstrom of controversy frequently at the center of efforts at patent reform.[2] In recent years, concern with reasonable royalty damages has been at the forefront of such debates. This Part explains the role of reasonable royalties within the overall scheme of patent remedies, discusses the historical elimination of U.S. patent law's traditional disgorgement remedy, and limns key aspects of current struggles in the law of reasonable royalties.

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2. *See* John M. Golden, *Principles for Patent Remedies*, 88 TEX. L. REV. 505, 506 (2010) ("Once a joint domain of inertia and arcana, questions of patent remedies now generate heated public debate.").

A. Reasonable Royalties in the Suite of Patent Remedies

The fundamental remedies in U.S. patent law are (1) injunctions "to prevent the violation of" patent rights[3] and (2) damages "adequate to compensate for [any] infringement."[4] Section 283 of the Patent Act empowers courts to grant such injunctions "in accordance with the principles of equity," and Section 284 of the Act mandates that courts award damages "in no event less than a reasonable royalty for the use made of the invention by the infringer."[5] Courts have inferred a capacity to grant another form of relief when they deny a permanent injunction but feel that a risk of ongoing infringement justifies forward-looking monetary relief.[6] Avoiding calling this forward-looking relief a compulsory license, courts have dubbed it an "ongoing royalty,"[7] thereby signaling a substantial tie between its assessment and the calculus for a reasonable royalty for past infringement, although the exact relation between the two remains a work in progress.[8]

There are additional remedies available under the Act, either as a direct result of the Act's express terms or as a result of judicial interpretation. Significantly for concerns of justice, equity, and the public interest, Section 284 also provides for enhanced damages by stating that a "court may increase the damages up to three times the amount [of damages otherwise] found or assessed."[9] The statute does not elaborate on when such damages should be awarded, but courts have commonly associated the availability of such punitive relief with a finding that infringement was willful and thus in some sense

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3. 35 U.S.C. § 283 (2012).

4. *Id.* § 284.

5. *Id.*

6. Thomas F. Cotter & John M. Golden, *Empirical Studies Relating to Patents—Remedies*, *in* RESEARCH HANDBOOK ON THE ECONOMICS OF INTELLECTUAL PROPERTY LAW (Peter Menell, David Schwartz & Ben Depoorter eds.) (forthcoming) ("The Federal Circuit has recognized that, in lieu of a permanent injunction, a trial court may award an 'ongoing royalty' for continuing infringement . . . .").

7. *See, e.g.*, Paice LLC v. Toyota Motor Corp., 504 F.3d 1293, 1314 (Fed. Cir. 2007) ("Under some circumstances, awarding an ongoing royalty for patent infringement in lieu of an injunction may be appropriate.").

8. *See* Peter Lee, *The Accession Insight and Patent Infringement Damages*, 110 MICH. L. REV. 175, 232 (2011) ("As a practical matter, courts are likely to turn to the familiar practice of calculating reasonable royalties for past infringement when determining ongoing royalties."); William F. Lee & A. Douglas Melamed, *Breaking the Vicious Cycle of Patent Damages*, 101 CORNELL L. REV. 385, 390 tab.1 (2016) (generally recommending ongoing royalties at the "same rate as past damages").

9. 35 U.S.C. § 284 (2012).

especially wrongful.[10] Likewise, the Act provides for the possibility of a court awarding "reasonable attorney fees to the prevailing party,"[11] but the Act restricts this possibility to "exceptional cases"[12] and thereby keeps at center stage awards of injunctions, damages, and ongoing royalties as alternatives to injunctions.

Hence, in the current patent regime, reasonable royalty damages have a vital role as a floor for one of the two most central forms of remedies under the Patent Act. Moreover, the importance of this role has been both highlighted and augmented by recent developments, two of which merit immediate attention.

First, the 2006 decision of the U.S. Supreme Court in *eBay Inc. v. MercExchange, L.L.C.*[13] effectively restricted the previously presumptive availability of permanent injunctions to patent holders who prove a defendant's liability for infringement.[14] In turn, new limits on injunctive relief have given monetary relief greater relative weight within patent law's remedial scheme. If injunctive relief is unavailable, monetary remedies become essentially all that a court can offer a patent owner to enforce formal legal patent rights. Hashing out the value of these rights in court, as embodied in an award of lost profits, a reasonable royalty, or an ongoing royalty, then becomes much more crucial to the effective functioning of the patent regime.

A second development has focused attention on reasonable royalty damages specifically, as opposed to monetary remedies generally. This development reflects changes in technology markets and, in particular, a much greater emphasis on the monetization of patent rights, rather than their less directly monetized use as tools to deter potential competitors or as bargaining chips for purposes of cross-licensing or patent-infringement-suit deterrence.[15] Monetization has been embraced both by traditional product or service companies that have built patent portfolios reaching beyond core business needs

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10. *See In re* Seagate Tech., LLC, 497 F.3d 1360, 1368 (Fed. Cir. 2007) (en banc) (citing precedent associating enhanced damages with "willful or bad faith infringement").

11. 35 U.S.C. § 285 (2012).

12. *Id.*

13. 547 U.S. 388 (2006).

14. *See* Mark P. Gergen, John M. Golden & Henry E. Smith, *The Supreme Court's Accidental Revolution? The Test for Permanent Injunctions*, 112 COLUM. L. REV. 203, 204, 212–18 (2012) (discussing *eBay*'s responsiveness to concerns that permanent injunctions for patent infringement had become too readily available and its calling into question prior presumptions in favor of injunctive relief).

15. *Cf.* John M. Golden, *Patent Privateers: Private Enforcement's Historical Survivors*, 26 HARV. J.L. & TECH. 545, 598 (2013) (discussing "a past tradition of relative restraint in patent rights' enforcement and acquisition").

and also by more specialized forms of so-called "patent aggregators" or "patent assertion entities" whose core—and commonly sole—business is that of acquiring and licensing or otherwise enforcing patent rights.[16] For patent assertion entities and, more generally, monetizers enforcing patents far outside the scope of any more traditional business activities, there is generally no substantial option of damages based on lost profits separate from licensing fees not paid by the infringer. Moreover, in the wake of *eBay*, such patent holders' prospects for obtaining an injunction are frequently bleak.[17] Thus the single fundamental remedy, essentially the only likely remedy of any substantial import, for these patentees is often that of reasonable royalty damages. In light of the increased prominence of such monetizing patent holders in the U.S. patent landscape, reasonable royalty damages have become more important than ever to how the patent regime operates.

B. Rise of the Reasonable Royalty Remedy

The rise of reasonable royalty damages to its current starring role in the patent system's operation might be understood to constitute an upending of the traditional hierarchy of patent remedies. Until *eBay*, damages remedies for patent infringement were commonly secondary to injunctive relief both in importance to individual litigants and in the timing of activity relating to them within patent litigation. This was perhaps particularly true of reasonable royalty damages, for which there were relatively few reported decisions by the courts.[18]

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16. *See, e.g.*, Robin Feldman, *Intellectual Property Wrongs*, 18 STAN. J.L. BUS. & FIN. 250, 266 (2013) (observing that "[s]ome operating companies have entered the patent monetization game by either creating subsidiaries to manage their intellectual property portfolios or transferring their intellectual property to third parties"); Amy L. Landers, *Liquid Patents*, 84 DENV. U.L. REV. 199, 202 (2006) ("Recognizing that the patent right can be monetized into licensing fees and damages in an action for patent infringement, some entities have undertaken formalized programs to gather or acquire critical patents in particular fields.").

17. *See* Cotter & Golden, *supra* note 6 (observing that empirical studies have indicated "that a patent owner's status as a patent assertion entity was substantially associated with denial of injunctive relief"); Karen E. Sandrik, *Reframing Patent Remedies*, 67 U. MIAMI L. REV. 95, 97 (2012) ("Case law in the last five years has established a near categorical rule that [nonpracticing entities] cannot obtain injunctive relief.").

18. Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 2030 (2007) (reporting the gathering of "a surprisingly small number of cases—only fifty-eight"—through the "collect[ion of] all the cases reported in Westlaw from 1982 through mid-2005 that actually awarded reasonable royalties to patentees").

With the threat of an injunction in prospect, patent holders and accused infringers could frequently look forward to working out any funds to be exchanged as part of the process of negotiating a license to forestall or defuse either the threat or the court-issued reality of injunctive relief. The ability to bifurcate trials into liability and remedies phases[19] and to take an appeal before damages were assessed[20] could further put off court proceedings—and even preparations for court proceedings—specifically relating to the assessment of monetary relief. As indicated in section I.A, *eBay* has made court-awarded damages or their prospect more central to patent litigation by lowering the likelihood of injunctive relief and, for substantial numbers of cases, removing the prospect of injunctive relief all but entirely.[21] Thus, part of the rise of reasonable royalties into prominence is a very recent story about renewed emphasis on monetary relief in general.

A longer story about the rise of reasonable royalty damages involves their emergence from essential nonexistence to an alternative measure of damages that could enable substantial compensation when other measures of damages were insufficiently proven or otherwise unavailable. Through the late nineteenth century, the dominant measures of patent-infringement damages in actions at law were royalties based on a pre-established royalty rate, lost profits from "lost sales or diminished revenues" as a result of competition from an infringer, or nominal damages,[22] the last of which were of an amount technically within a jury's discretion but generally required to be fundamentally inconsequential, as with the apparently conventional nominal damages award of six cents.[23] In equity, a patent holder

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19. *Cf.* Ronald J. Schutz & Jonathan D. Goins, *Case Management Issues in Patent Litigation*, 5 SEDONA CONF. J. 1, 9 (2004) ("In most cases, damages should be severed f[ro]m other issues to simplify the task of the fact finder.").

20. 28 U.S.C. § 1292(c)(2) (2012) (providing for "an appeal from a judgment in a civil action for patent infringement which would otherwise be appealable to the United States Court of Appeals for the Federal Circuit and is final except for an accounting"); *see also* V. Ajay Singh, Note, *Interlocutory Appeals in Patent Cases Under 28 U.S.C. § 1292(c)(2): Are They Still Justified and Are They Implemented Correctly?*, 55 DUKE L.J. 179, 184 (2005) (observing that 28 U.S.C. § 1292(c)(2) enables an interlocutory appeal after "the patent has been found to be valid and infringed and . . . all that remains is to determine the amount of damages to be awarded").

21. *See supra* note 6 and accompanying text.

22. 7 DONALD S. CHISUM, CHISUM ON PATENTS § 20.02[2] (2016).

23. *See id.* ("A number of decisions awarded only nominal damages (e.g., six cents) where a patent owner could prove neither an established royalty nor lost profits through reduced sales or prices."); 3 WILLIAM C. ROBINSON, THE LAW OF PATENTS FOR USEFUL INVENTIONS § 1052, at 320 n.3 (1890) (citing a case to support the proposition "[t]hat six cents are nominal damages").

generally did not have access to these measures of monetary remedies available at law, but instead had recourse to the remedy of disgorgement of an infringer's relevant profits—that is, the portion of those profits properly attributable to the infringement.[24]

But various courts found the above-described set of patent damages measures to be inadequate. Restriction to these measures could lead to what were perceived to be insufficient rewards, perhaps no more than nominal damages even though substantial commercial harm had occurred. Such outcomes could result because demands for proving such measures as lost profits or an established royalty rate were strict[25] and because disgorgement of infringer profits had its own problems of proof and was only available if equity jurisdiction were separately established.[26] Consequently, some courts experimented with allowing the award of damages based on "general evidence" "to get at a fair measure of damages."[27] Such general evidence could include evidence of "the utility and advantage of the invention over the old modes or devices" and evidence of "the extent of the use [of the invention] by the infringer."[28] The U.S. Supreme Court ultimately asserted that, through such evidence, a jury could determine "the loss

24. *See* 7 CHISUM, *supra* note 22, § 20.02[3] (observing that the U.S. Supreme Court established early on that the patent owner could only recover profits "attributable to the patented invention").

25. *See* Sheldon v. Metro-Goldwyn Pictures Corp., 106 F.2d 45, 49 (2d Cir. 1939) (L. Hand, J.) (observing that "most patentees used to be wrecked" by a demand that the patentee show what portion of an infringer's profits were attributable to the infringement); 7 CHISUM, *supra* note 22, § 20.02[2] (chronicling the emergence of reasonable royalty damages in U.S. case law); Daniel Harris Brean, *Ending Unreasonable Royalties: Why Nominal Damages Are Adequate to Compensate Patent Assertion Entities for Infringement*, 39 VT. L. REV. 867, 889 (2015) ("Reasonable royalty damages arose in the common law as a way to award some damages to patentees who could not sufficiently prove their damages or the infringer's profits, rather than give such patentees only nominal damages upon proof of infringement."); Oskar Liivak, *When Nominal Is Reasonable: Damages for the Unpracticed Patent*, 56 B.C. L. REV. 1031, 1046–47 (2015) (observing that courts looked for ways to alleviate the harshness of pre-existing restrictions on damages); Note, *Recovery in Patent Infringement Suits*, 60 COLUM. L. REV. 840, 848 (1960) ("[T]he inequity of depriving a patent owner of compensation for the misappropriation of his exclusive rights was remedied by the judicial development of an award based on a reasonable royalty.").

26. *See* 7 CHISUM, *supra* note 22, § 20.02[1][e] (discussing a holding of the U.S. Supreme Court "that a patent owner could not file a suit in equity after expiration of the patent to collect the defendant's profits earned prior to expiration").

27. Suffolk Co. v. Hayden, 70 U.S. 315, 320 (1865).

28. *Id.*

to the patentee or owner, by the piracy, instead of the purchase of the use of the invention."[29]

Thus, reasonable royalty damages first arose as a form of residual remedy that could enable more than nominal monetary relief—and some greater approximation of at least minimal justice—when other, presumably preferable measures of damages, failed.[30] In this sense, reasonable royalty damages served as a sort of stopgap, permitting both some "fudging" of otherwise applicable strictures for providing monetary relief and at the same time giving judges power to correct potentially errant factfinders (e.g., a trial judge or jury) through reliance on the ultimately legal nature of an assessment of reasonableness.[31] Judge Learned Hand described this originally residual role of reasonable royalty damages as follows:

> The whole notion of a reasonable royalty is a device in aid of justice, by which that which is really incalculable shall be approximated, rather than that the patentee, who has suffered an indubitable wrong, shall be dismissed with empty hands.[32]

Now, what Hand characterized as "a device in aid of justice" is likely to be not a merely residual backstop but instead the only measure of substantial relief effectively available in a large class of cases in which patent assertion entities or other nonpracticing patent holders allege patent infringement.[33] This shift of reasonable royalty damages to the foreground of patent law practice has predictably

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29. *Id.*

30. Golden, *supra* note 1; *see also* Panduit Corp. v. Stahlin Bros. Fibre Works, Inc., 575 F.2d 1152, 1159 (6th Cir. 1978) (describing "the 'reasonable royalty' device" as "[c]reated in an effort to 'compensate' when profits are not provable"). Whether, problems of proof aside, the only available reasonable royalty is sometimes a merely nominal one is a currently debated question. Brean, *supra* note 25, at 923 (concluding that courts should award no more than nominal damages "[w]here actual harm cannot be shown"); Liivak, *supra* note 25, at 1034 (contending "that a nominal reasonable royalty is proper where the patentee has not undertaken any efforts to commercialize the invention and the patent is asserted against an independent inventor"); Nathaniel C. Love, Note, *Nominal Reasonable Royalties for Patent Infringement*, 75 U. CHI. L. REV. 1749, 1772 (2008) ("When noninfringing alternatives are available, zero (or nominal) reasonable royalty awards in patent infringement suits are supported by the patent statutes and by Federal Circuit jurisprudence.").

31. *Cf.* 7 CHISUM, *supra* note 22, § 20.02[4] (discussing the elimination of the disgorgement remedy and the role of reasonable royalties).

32. Cincinnati Car Co. v. N.Y. Rapid Transit Corp., 66 F.2d 592, 595 (2d Cir. 1933).

33. *See supra* note 6 and accompanying text.

placed greater pressure on courts to rationalize and limit their application, a phenomenon described in section I.D below.

C. *Fall of Patent Law's Disgorgement Remedy*

Before outlining present concerns with the understanding and implementation of reasonable royalty damages, it is important to highlight one further part of the history of their rise—namely, the demise in the United States of the traditional remedy of disgorgement of an infringer's relevant profits. Almost necessarily, elimination of this restitution remedy made the availability of reasonable royalties more vital to patent law's overall remedial scheme. Likewise, this historical development sheds light, albeit a somewhat ambiguous light, on the extent to which restitution principles might and should productively inform the modern deployment of reasonable royalty damages.

The elimination of the disgorgement remedy in U.S. patent law traces back to a 1946 statute amending the U.S. patent law by specifying that, in a patent-infringement suit, a prevailing patent holder "shall be entitled to recover general damages which shall be due compensation for making, using, or selling the invention, not less than a reasonable royalty therefor."[34] This statutory language notably omitted any explicit reference to a monetary remedy based on the infringer's profits. A House committee report arguably shed some light on this omission by indicating that the new statutory language's eschewing of prior statutory reference to accounting for profits did "not preclude the recovery of profits as an element of general damages."[35] Instead, according to the report, the new statutory language "empower[ed] equity courts to assess general damages irrespective of profits" and thus to avoid the delay and expense of technical processes of assessing infringer profits and then engaging in "apportionment"—attributing a fraction of those profits to the infringement.[36] A Senate committee report adopted in full the House committee's characterization of this amendment.[37]

Courts split on whether the 1946 amendment abrogated the traditional remedy of disgorgement of an infringer's profits.[38] In 1964, a plurality opinion of four U.S. Supreme Court justices effectively

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34. Act of August 1, 1946, Pub. L. No. 587, 60 Stat. 778, 778 (1946).
35. H.R. Rep. No. 79-1587, at 1-2 (1946).
36. *Id.* at 2.
37. S. Rep. No. 79-1503, at 2 (1946) (adopting the House committee report "as the report of the Senate Committee on Patents").
38. 7 CHISUM, *supra* note 22, § 20.02[4][c].

resolved the controversy by (1) emphasizing a distinction between the recovery of "profits" and the recovery of "damages," and (2) concluding that "[t]he purpose of the [1946] change was precisely to eliminate the recovery of profits as such and allow recovery of damages only."[39] Lower courts subsequently fell into line,[40] and a majority of the Supreme Court ultimately embraced the 1964 plurality's view in a 1983 opinion.[41]

One might imagine an argument that the elimination from U.S. patent law of the classic restitution remedy of disgorgement suggests that the law of restitution is now essentially forbidden ground in thinking about how best to apply the present Patent Act. But the current exclusion of a straightforward disgorgement remedy seems more properly viewed as having more limited significance. As interpreted, the 1946 amendment by Congress requires that those advocating restoration of a pure disgorgement remedy call for congressional action.[42] But the 1946 amendment does not prohibit courts from drawing instruction for reasonable royalty assessments from the handling of similar concerns in the law of restitution. Indeed, courts have explicitly recognized that the magnitude of an infringer's profits can inform a court's assessment of the proper size of a damages award, including a reasonable royalty award.[43] Permitting infringer's profits to inform reasonable royalty awards naturally enables those

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39. Aro Mfg. Co. v. Convertible Top Replacement Co., 377 U.S. 476, 505 (1964).

40. 7 CHISUM, *supra* note 22, § 20.02[4][c]; Caprice L. Roberts, *The Case for Restitution and Unjust Enrichment Remedies in Patent Law*, 14 LEWIS & CLARK L. REV. 563, 665 (2010) (observing that "subsequent courts" treated the plurality's "determination regarding the elimination of the profit remedy as authoritative").

41. Gen. Motors Corp. v. Devex Corp., 461 U.S. 648, 654 (1983) ("In 1946 Congress excluded consideration of the infringer's gain by eliminating the recovery of his profits.").

42. *See* Roberts, *supra* note 40, at 685 (contending that "Congress should reform the Patent Act to reauthorize a restitutionary disgorgement remedy"); *cf.* Kimble v. Marvel Ent., LLC, 135 S. Ct. 2401, 2409 (2015) (stating that "*stare decisis* carries enhanced force when a decision . . . interprets a statute").

43. *See, e.g.*, Kori Corp. v. Wilco Marsh Buggies & Draglines, Inc., 761 F.2d 649, 655 (Fed. Cir. 1985) ("[U]nder proper circumstances, an infringer's profits may be considered in establishing a patent holder's general damages."); Georgia-Pacific Corp. v. U.S. Plywood Corp., 243 F. Supp. 500, 530 (S.D.N.Y. 1965) (observing that "the profits made by an infringer are frequently taken into account in the fixing of a reasonable royalty"); 7 CHISUM, *supra* note 22, § 20.02[4][c] (discussing cases); F. Scott Kieff & Anne Layne-Farrar, *Incentive Effects from Difference Approaches to Holdup Mitigation Surrounding Patent Remedies and Standard-Setting Organizations*, 9 J. COMPETITION L. & ECON. 1091, 1110 (2014) (describing as a "long-accepted principl[e]" the notion that "infringer's profits may be at least relevant to a damages calculation").

awards to implement a form of partial disgorgement.[44] Among the fifteen *Georgia-Pacific* factors commonly cited as potential bases for a court's assessment of reasonable royalty damages,[45] at least two point to consideration of an infringer's profits by directing courts to take into account "[t]he established profitability of the product made under the patent" and "any evidence probative of the value of [the infringer's] use" of the invention.[46] In short, an award of reasonable royalty damages can amount to a form of "disgorgement-lite," giving the patentee a substantial fraction of the infringer's relevant profits and entangling reasonable royalty determinations in questions of apportionment and technical computation that previously bedeviled court determinations on disgorgement.

D. Apportionment and Other Reasonable Royalty Challenges

The relation between reasonable royalty awards and infringer profits or revenues unsurprisingly has fed controversy over reasonable royalties that has become akin to that over pre-1946 disgorgement awards. In assessing an infringer's relevant revenues or profits, in determining what portion of those revenues or profits properly forms a royalty base for a reasonable royalty, and in applying a royalty rate to this base,[47] courts predictably experience many of the same problems of uncertainty, complexity, and management of expert testimony that previously plagued the disgorgement remedy's apportionment calculus.[48] Complaints of excessive complication and

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44. Roger D. Blair & Thomas F. Cotter, *An Economic Analysis of Damages Rules in Intellectual Property Law*, 39 WM. & MARY L. REV. 1585, 1650 (1998) ("The good news is that the formal prohibition on restitutionary awards may have little impact on courts' actual behavior.").

45. 7 CHISUM, *supra* note 22, § 20.07[2] ("Use of the *Georgia-Pacific* factors has been approved by numerous Federal Circuit decisions, and by district courts."); JANICE MUELLER, PATENT LAW 639 (4th ed. 2013) ("In determining the contours of the hypothetical negotiation [to determine a reasonable royalty], district courts have traditionally considered evidence . . . on an extensive list of factors as set forth in the leading case of *Georgia-Pacific Corp. v. United States Plywood Corp.*").

46. Georgia-Pacific Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970), *modified in irrelevant part*, 446 F.2d 295 (2d Cir. 1971).

47. *Cf.* Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301, 1338 (Fed. Cir. 2009) (discussing issues relating to the choice of a proper royalty base and royalty rate).

48. *See* H.R. Rep. No. 79-1587, *supra* note 35, at 2 (describing the frequent use of special masters to aid in apportionment as leading to proceedings that "are conducted in accordance with highly technical rules and are always expensive, are often protracted for decades and in many cases result in a complete failure of

potentially disproportionate awards, previously raised in relation to patent law's traditional disgorgement remedy, now arise in relation to reasonable royalty awards. The dramatic rise in the use of juries in patent cases, a phenomenon of the last third of the twentieth century,[49] has arguably exacerbated these concerns. Courts have sought to respond. In the past decade, the U.S. Court of Appeals for the Federal Circuit has issued a raft of opinions tightening standards for proving reasonable royalty damages, thereby outlining grounds for district judges to overturn apparently excessive or otherwise unsupported jury awards and, even before this, to exclude expert testimony that the judges find not to properly implement a proper computational methodology.[50] Yet dissatisfaction with the state of legal doctrine and practice on reasonable royalties continues, with some worrying that further shifts in doctrine might make substantial reasonable royalty damages too difficult to obtain, with others contending that existing shifts have not gone far enough.[51]

III. RESTITUTION PRINCIPLES FOR LIABILITY AND REMEDIES

In addressing questions of how to properly assess reasonable royalty damages, the law of restitution is well suited for comparative study. The law of restitution and its associated commentary embodies a wealth of doctrinal engineering, practical experience, and theory on which patent law might draw. With an eye towards understanding the restitutionary perspective and deriving lessons from it, this Part examines the law of restitution in three movements. Section II.A presents a short primer that introduces the terminology of restitution and unjust enrichment and explains how we define those terms for purposes of this Article. Section II.B introduces relevant sections of

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justice"); 7 CHISUM, *supra* note 22, § 20.07[3] ("Computation of the defendant's profits under the actual advantage concept required resolution of numerous intricate problems both theoretical and pragmatic.").

49. Mark A. Lemley, *Why Do Juries Decide If Patents Are Valid?*, 99 VA. L. REV. 1673, 1705 fig.1 (2013) (showing a dramatic rise in the percentage of patent trials involving a jury from the 1970s on).

50. *See, e.g.*, Golden, *supra* note 15, at 605 & n.406 (discussing how "[t]he Supreme Court and the Federal Circuit have together limited the availability or value of patent-infringement remedies in a series of cases").

51. *Compare* Richard A. Epstein, *Common Ground: How Intellectual Property Unites Creators and Innovators*, 22 GEO. MASON L. REV. 805, 822 (2015) ("[O]ne risk of the current legislative maneuver is that it seeks first to soften injunctive relief, and second to dilute damage awards so that breach and infringement become profitable strategies."), *with* Lee & Melamed, *supra* note 8, at 388 ("Flaws in current doctrine create a reinforcing cycle that perpetuates inflated patent damages . . . .").

the Restatement (Third) of Restitution and Unjust Enrichment ("Third Restatement"),[52] most notably Section 42, entitled "Interference with Intellectual Property and Similar Rights." Section II.C then provides a roadmap for the Third Restatement's reticulated approach to monetary relief for restitutionary wrongs.

A. Restitution Primer

Unlike traditional damages remedies that are tied to a plaintiff's loss, restitutionary remedies are tied to the potential gains of the defendant.[53] Yet the law of restitution is much more complex than simply instructing a court to issue a gain-based remedy.[54] It is an area of law that, among other things, seeks to shape ex ante behavior to avoid injustices and to tailor its remedies accordingly.[55] While the objective of preventing injustice is clear, the law of restitution is, at times, frustratingly opaque. Part of the uncertainty is due to the varying use and understanding of foundational terms, such as "restitution" and "unjust enrichment."[56] To lay the groundwork for

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52. RESTATEMENT (THIRD) OF RESTITUTION AND UNJUST ENRICHMENT (AM. LAW INST. 2011) (hereinafter THIRD RESTATEMENT).

53. Many scholars have made this distinction. *See, e.g.*, Doug Rendleman, *Measurement of Restitution: Coordinating Restitution with Compensatory Damages and Punitive Damages*, 68 WASH. & LEE L. REV. 973, 975-76 (2011) ("The court will base the plaintiff's recovery of compensatory damages on her loss. . . . [Conversely,] [t]he court's baseline guide to restitution is the defendant's gain, not the plaintiff's loss."); *see also* PETER BIRKS, UNJUST ENRICHMENT 3 (2d ed. 2005) [hereinafter "BIRKS II"] ("The law of restitution is the law of gain-based recovery, just as the law of compensation is the law of loss-based recovery.").

54. *See* DAN B. DOBBS, LAW OF REMEDIES, DAMAGES, EQUITY, RESTITUTION 366 (2d ed. 1993) ("Restitution is a simple word but a difficult subject, partly because restitutionary ideas appear in many guises."). Not only perhaps is it complex, but "[s]ignificant uncertainty shrouds the modern law of restitution." Andrew Kull, *Rationalizing Restitution*, 83 CAL. L. REV. 1191, 1191 (1995).

55. Comments throughout the Third Restatement illustrate how the law of restitution and unjust enrichment seeks to shape ex ante behavior through appropriate selection of the measure of restitution. *See, e.g.*, THIRD RESTATEMENT, *supra* note 52, at § 49 rep. cmt. a (explaining the "the measure of restitution is determined with reference to the tortiousness of the defendant's conduct or the negligence or other fault of one or both of the parties in creating the situation giving rise to restitution") (internal citations omitted); *id.* § 51 cmt. e ("The object of the disgorgement remedy—to remove the possibility of profit from conscious wrongdoing—is one of the cornerstones of the law of restitution and unjust enrichment."); *id* § 51 cmt. f (explaining that gain on embezzling funds should be disgorged if "there would be an incentive to embezzlement if the defendant were permitted to retain the profits").

56. Many scholars have noted this particular uncertainty and the problems it has caused (and continues to cause). *See, e.g.*, Kull, *supra* note 54, at 1191-92 ("The

comparison of patent and restitution law, this section explains how we understand "restitution" and other related terms used in this Article. As a preliminary matter, we note that, at various times, the Article uses the terms "law of restitution," "restitution law," or even just "restitution" as a convenient shorthand for what the Third Restatement characterizes as the "law of restitution and unjust enrichment."[57] In contrast, this first primer section considers the meanings of "restitution" and "unjust enrichment" separately.

Problems start with the term "restitution" itself. Scholars have noted that "restitution" is "an unfortunate word,"[58] one that is "singularly ill-chosen" insofar that it does not accurately describe the body of law it covers.[59] The term "restitution" was adopted by Reporters Warren Seavey and Austin Scott in the Restatement of Restitution: Quasi Contracts and Constructive Trusts ("First Restatement"), published in 1937.[60] The First Restatement was the first large-scale synthesis of what previously appeared to be disparate principles and rules about what we in the U.S. now call restitution or unjust enrichment. Since the First Restatement, the word "restitution"

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linguistic confusion that bedevils the law of restitution—necessitating laborious definitions before anyone can understand what you are talking about—affords an early indication that the common name of this neglected body of law was singularly ill-chosen."); *see also* Stephen G.A. Pitel, *Characterisation of Unjust Enrichment in the Conflict of Laws*, *in* UNDERSTANDING UNJUST ENRICHMENT 344 (Jason W. Neyers et al. eds., 2004) (titling a section of his paper "Unjust Enrichment and Restitution—Terminology Problems"); Rendleman, *supra* note 53, at 977 (explaining a "major source of confusion is that the meanings of the words change between the vernacular language and the technical vocabulary of remedies").

57. Indeed, the title of the Third Restatement is "Restatement of the Law: Restitution and Unjust Enrichment." The treatment of these two terms as synonymous is consistent throughout the Third Restatement, yet not all scholars agree with this treatment. *See, e.g.*, ANDREW BURROWS, THE LAW OF RESTITUTION 9 (3rd ed. 2011) ("It has become widely recognised in recent years that there is a fundamental distinction in the law of restitution between restitution of an unjust enrichment and restitution for wrongs."); Pitel, *supra* note 56, at 344 ("The law of unjust enrichment and the law of restitution are not the same, although for many years leading academics claimed that they were.").

58. *See* WARD FARNSWORTH, RESTITUTION: CIVIL LIABILITY FOR UNJUST ENRICHMENT vii, 12 (2014) (stating that the term "restitution" [s]ometimes [] does not describe what is happening very aptly at all" and that "[t]he word is also unfortunate because it can refer to one of two (or three) things").

59. Kull, *supra* note 54, at 1191-1192 (explaining "[t]he linguistic confusion that bedevils the law of restitution—necessitating laborious definitions before anyone can understand what you are talking about—affords an early indication that the common name of this neglected body of law was singularly ill-chosen").

60. RESTATEMENT OF THE LAW OF RESTITUTION (AM. LAW INST. 1937) (hereinafter FIRST RESTATEMENT).

has been used to describe a number of different concepts that arguably fall within a larger body of law than the word naturally suggests.[61]

The basic, non-legal definition of restitution is "the act of restoring to the rightful owner that which is lost or has been taken away."[62] This much is well accepted as within the proper meaning of "restitution"; that is, that restitution includes the remedy of giving back a specific entitlement such as a mistaken payment or a specific piece of property.[63] Yet the term "restitution" is often used beyond this meaning.

Important for our purposes here, as an infringer does not necessarily give back a specific piece of property to a patentee, restitution has been more broadly understood to include the remedy of removing a benefit conferred upon a defendant at the claimant's expense.[64] The removal of the benefit is commonly achieved by measuring the value of the defendant's enrichment, and then ordering the defendant to transfer that determined value to the claimant.[65] The underlying cause of action in such a situation is commonly characterized as one for "unjust enrichment."[66]

A further potential source of confusion is the fact that, for many—indeed, probably for most—lawyers and judges in the United States, the word "restitution" can refer to both a remedy *and* the actual cause of action itself or to either separately.[67] This is likely due to a U.S. tendency to view unjust enrichment as "the heart of liability

61. *See* FARNSWORTH, *supra* note 58, at 12 (explaining restitution can mean a legal claim, a type of remedy, and compensation for criminal victims).

62. WEBSTER'S NEW UNIVERSAL UNABRIDGED DICTIONARY 1544 (2d ed. 1972); *see also* DOUGLAS LAYCOCK, MODERN AMERICAN REMEDIES, CASES AND MATERIALS 622 (4th ed. 2010) ("Literally, 'restitution' is just a synonym for restoration: Nonlegal dictionaries define it as restoration of property to its true owner, and despite the modern association with unjust enrichment, judges sometimes think of restitution as a way of making plaintiff whole or restoring a previous status quo.").

63. *See* Kull, *supra* note 54, at 1194 (explaining it is accepted that restitution includes "the act of restoration").

64. *See, e.g.*, PETER BIRKS, AN INTRODUCTION TO THE LAW OF RESTITUTION 9 (1989); G. VIRGO, THE PRINCIPLES OF THE LAW OF RESTITUTION 3 (1999).

65. *See* THIRD RESTATEMENT, *supra* note 52, at § 49(3).

66. BURROWS, *supra* note 57, at 9.

67. *See* LAYCOCK, *supra* note 62, at 622 ("'Restitution' may mean either the cause of action or the remedy."); FARNSWORTH, *supra* note 58, at VIII ("[R]estitution is not just a remedy, though it is sometimes misunderstood that way. It is a type of legal claim—a cause in action, and an important one.").

restitution"[68] or the "'unitary principle' which 'underlies the rules of' restitution."[69]

Similar to restitution, the definition of "unjust enrichment" has been, and remains, a source of much doctrinal and theoretical conversation.[70] For our purposes here, we will define unjust enrichment as the non-consensual benefit that one has received at the expense of another and that the receiving party lacks an adequate legal basis for retaining.[71] Under this definition, unjust enrichment includes both benefits received directly by virtue of a transfer of a discrete thing or set of things, as well as benefits received or obtained indirectly by a transfer or act of appropriation, as through the use of patented technology in violation of another's patent rights. This broad definition of unjust enrichment is important for purposes of this Article because it is indirect forms of enrichment that tend to generate remedial complications most analogous to those encountered in assessing reasonable royalty damages for patent infringement. Yet it should be acknowledged that including indirect gains within the compass of "unjust enrichment" is a conceptual and terminological step that is not without debate.[72]

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68. Kull, *supra* note 54, at 1196 (arguing that "restitution be defined exclusively in terms of its core idea, the law of unjust enrichment"). Similarly, Farnsworth explains that his book on restitution "is about restitution in its core sense: the common-law action that a plaintiff brings to recover a defendant's unjust enrichment." FARNSWORTH, *supra* note 58, at VIII. Scholars around the globe have also argued that restitution and unjust enrichment are synonyms. *See* Pitel, *supra* note 57, at 344 (identifying this long-held position in restitution scholarship). And, most recently in the U.S., criminal law has "appropriated" the term to refer to payments made by criminals to victims. *See supra* note 58, at VII.

69. HANOCH DAGAN, THE LAW AND ETHICS OF RESTITUTION 12-13 (2004) (hereinafter DAGAN, RESTITUTION) (explaining Reporters Warren Seavey and Austin Scott referred to unjust enrichment in this way).

70. *See, e.g.*, Ernest J. Weinrib, *The Structure of Unjustness*, 92 B.U. L. REV. 1067, 1067 (2012) (exploring possible answers to the question "What renders an enrichment unjust?" through a corrective justice lens); Mitchell McInnes, *The Reason to Reverse: Unjust Factors and Juristic Reasons*, 92 B.U. L. REV. 1049, 1052 (2012) (exploring the nature of what makes an enrichment unjust); Pitel, *supra* note 56, at 344 (finding "[t]he law of unjust enrichment and the law of restitution are not the same, although for many years leading academics claimed that they were" and taking issue with Birks' equation of unjust enrichment and restitution).

71. *See* Douglas Laycock, *Restoring Restitution to the Canon*, 110 MICH. L. REV. 929, 932 (2012) [hereinafter, Laycock, *Restoring Restitution*] (further explaining the definition of unjust enrichment).

72. For example, David Stevens and Jason Neyers argue that allowing for anything other than the giving back of money or a particular piece of property results in a punitive measure of recovery from the defendant. David Stevens & Jason W. Neyers, *What's Wrong with Restitution*, 37 ALTA. L. REV. 221, 234 (1999) (narrowing the scope of the definition by arguing that "[u]njust enrichment is,

The last term we want to define is one that is often used when discussing the remedy for an unjust enrichment: "disgorgement." Although, as stated above, the measure of restitution is often tied to the enrichment received, in the situations in which enrichment results from the beneficiary's own wrongful conduct, this may change, and a disgorgement measure of restitution may apply. Instead of corresponding just to the benefit conferred, the disgorgement remedy involves the measurement and removal of all the defendant's profit that is appropriate given the higher level of the defendant's culpability. Due to this higher level of culpability, disgorgement seeks to ensure that the wrong committed is "valueless" to the person who committed that wrong.[73] Disgorgement is used interchangeably in the U.S. with "accounting for profits" and tends to impose a higher burden of proof on claimants than an award for purely compensatory relief.

As these definitions suggest, U.S. law has tended to characterize the law of restitution as a sort of complement to tort law. According to this account of complementary sets of law, the law of restitution focuses on liabilities and remedies for gains received at another's expense, and tort law focuses quite distinctly on *loss* inflicted.[74] Viewing patent infringement as a form (or variant) of tort, one might then find more understandable the Patent Act's emphasis on compensating for infringement and its omission of a remedy of disgorgement.

More significantly for purposes of this Article, however, we can see similarities and differences in how the law of restitution and patent law seek to shape ex ante behavior. The differences can, in turn, be instructive regarding how patent law might be improved—at least in those circumstances where restitution's distinctive approach appears to have been successful. Just as restitution and tort commonly operate as complements that share, broadly speaking, common goals of promoting socially desirable behavior and discouraging socially undesirable behavior, the law of restitution and patent law share common goals in a wide set of circumstances. For example, both the

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simply, the non-consensual transfer and retention of value" and explaining this "definition [] is implicit in much of the English language writing on the subject"). As restitutionary damages do not seek to punish the enriched party, this is a serious charge. This is just one of the many examples where scholars outside the U.S. disagree with the relatively broad definition of unjust enrichment commonly accepted within the U.S.

73. *See* FARNSWORTH, *supra* note 58, at 114 (explaining that "disgorgement" or "accounting of profits" is "meant to make the defendant's act valueless to him").

74. *See id.* at viii (drawing this complementary relationship between tort and restitution).

law of restitution and patent law encourage parties to enter contractual agreements for "use value"—in patent terms, a license agreement.[75] Moreover, both try to use their respective remedies to deter particularly blameworthy behavior such as the type of behavior that is most often labeled as conscious wrongdoing or willful infringement.

Interestingly, however, restitution and patent law pursue the objective of measuring use value and deterring socially undesirable behavior in markedly different ways. Unlike patent law, and intellectual property law generally, the measure of recovery in restitution law often depends on the blameworthiness of the defendant's particular behavior. Section II.C discusses this point in detail. Before exploring the various layers of blameworthiness and measures of benefits received, it makes sense, however, to consider how, according to the Third Restatement, one brings a claim that seeks restitution due to an unjust enrichment and also how the Third Restatement itself treats problems of intellectual liability infringement.

B. The Third Restatement on Restitution and Remedies for Intellectual Property Infringement

Although there were two tentative drafts of a second Restatement on restitution, such a second Restatement was never completed.[76] Published in 2011, the Restatement (Third) is thus the first true successor to the First Restatement. The Third Restatement has generally been well received.[77] Many scholars, both in the U.S.

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75. *See id.* at 10 (explaining "that the law of restitution, like the law of tort, often can be understood as pressuring parties to make contracts when they can, rather than imposing costs and benefits on each other and then calling for judicial valuation of them afterward").

76. Two tentative drafts were put together in the 1980s, but they never went beyond this tentative draft stage. *See* LAYCOCK, *supra* note 62, at 622.

77. Multiple symposia, taking place before and after the publication of the Third Restatement, show the level of scholarly interest, importance, and acceptance of the Third Restatement. *See, e.g.*, Symposium, *A Conference On Restitution and Unjust Enrichment*, 92 B.U. L. REV. 763 (2012); Symposium, *Restitution Rollout: The Restatement (Third) of Restitution & Unjust Enrichment*, 68 WASH & LEE L. REV. (2011); Symposium, *The Restitution Roundtable*, 65 WASH. & LEE L. REV. (2008); Symposium, *Restitution and Unjust Enrichment*, 79 TEX. L. REV. 1763 (2001). While these symposia generally reflect a high regard for the Third Restatement, scholars have also made constructive arguments reflecting disagreement with particular positions and provisions within the Restatement. *See, e.g.*, Mark P. Gergen, *Causation in Disgorgement*, 92 B.U. L. REV. 827, 829 (2012) (arguing the Restatement "is on the wrong track" in deciding to combine issues of fact and non-factual policy and fairness considerations).

and abroad, have praised Reporter Andrew Kull and the Third Restatement, stating, for example, that the Third Restatement "brings clarity and light"[78] to the law of restitution. Additionally, aspects of the Third Restatement have already, and repeatedly, been adopted by courts that look to specific provisions or illustrations for guidance when encountering underdeveloped or unclear law.[79]

Significantly for our purposes, the Third Restatement takes a strong position on the relevance and applicability of restitution law to intellectual property law. Indeed, the Third Restatement itself suggests the utility of comparing restitution law and the law of patent remedies. The Third Restatement explicitly takes the position that intellectual property remedies, including the patent law remedies of lost profits and reasonable royalties, are restitutionary in nature. Consistent with this view, the Third Restatement has a section specifically dedicated to intellectual property, Section 42. Section 42 builds upon the first section of the Third Restatement, a conventional starting place for modern claims of unjust enrichment and an equally appropriate beginning point for our analysis.

1. Restitution Foundations in the Third Restatement

Despite the decades between the Restatements, Section 1 of the Third Restatement is nearly identical to Section 1 of the First Restatement.[80] Providing the foundation for the subsequent sections, Section 1 explains that "[a] person who is *unjustly enriched* at the *expense* of another is subject to *liability in restitution*."[81] This section

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78. Laycock, *Restoring Restitution*, *supra* note 71, at 929 (further instructing readers that the Third Restatement "should be on every litigator's bookshelf, and a broad set of transactional lawyers and legal academics would also do well to become familiar with it"); *see also* BURROWS, *supra* note 57, at 9 (explaining that the Third Restatement is a "monumental achievement, for which we have to thank Professor Kull and his advisers, [and it] deserves wide-ranging recognition").

79. *See, e.g.*, Birchwood Land Co., Inc. v. Krizan, 115 A.3d 1009, 1012 (Vt. 2015) (explaining that on multiple occasions since the publication of the Third Restatement, Vermont has adopted provisions of the Third Restatement when Vermont law is underdeveloped); In re APA Assessment Fee Litigation, 766 F.3d 39, 46–47 (D.C. Cir. 2014) (looking to the Third Restatement provisions and illustrations to help determine when a claim for unjust enrichment is appropriate in the "'contractual context' when the contract does not 'regulate the parties' obligations'").

80. *See* FIRST RESTATEMENT, *supra* note 60, at § 1 ("A person who has been unjustly enriched at the expense of another is required to make restitution to the other.").

81. THIRD RESTATEMENT, *supra* note 52, at § 1 (emphasis added).

has four distinct yet interdependent components: (1) liability in restitution, (2) enrichment, (3) expense, and (4) injustice.

The language "liability in restitution" is significant because it affirms that restitution provides an independent basis for substantive liability.[82] The use of the term "restitution" is used broadly to describe both the cause of action and the remedy, just as it was in the First Restatement.[83] As noted above, such a flexible and broad understanding of restitution, and its further extension to encompass not only the literal restitution of transferred enrichment, but also more general forms of wrongful gain that might also be characterized as constituting "unjust enrichment," has generated concern and controversy.[84] One consequence of defining "restitution" in this way is that, as a practical matter, there is necessarily an "inherent flexibility" within the unifying concept of "unjust enrichment."[85] As a result, reference to a plea of unjust enrichment leaves unclear the boundaries of the nature and scope of the liability in restitution.[86]

Moreover, the Third Restatement leaves unanswered how unjust enrichment should be understood as a theoretical matter. It explains that there is no bright-line rule or mechanical definition that can be applied to unjust enrichment to reliably delineate the nature or scope of liability in restitution.[87] In this sense, the Third Restatement, as with the concept of restitution itself, joins the camp of those who define unjust enrichment broadly.[88] That said, the other three highlighted aspects of Section 1 provide practical boundaries to the scope of restitution.

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82. *See id.* §1, cmt. a ("The identification of unjust enrichment as an independent basis of liability in common-law legal systems . . . was the central achievement of the 1937 Restatement of Restitution. That conception of the subject is carried forward here.").

83. *See id.* (further explaining how the Third Restatement uses "restitution" in keeping with the First Restatement).

84. *Id.*; *see also id.* §1, cmt. c (explaining the confusion surrounding legal restitution).

85. *See id.* § 1, cmt. a (outlining generally how the word "restitution" plays different legal roles).

86. *See id.*; *see also* Weinrib, *supra* note 70, at 1067 (explaining "the reference to 'unjust' (or 'unjustified') enrichment provides little indication of the source of one's liability").

87. *See* Hill v. Cross Country Settlements, LLC, 936 A.2d 343, 351 (Md. 2007) ("Unjust enrichment is a claim . . . that may not be reduced neatly to a golden rule.").

88. This observation is not original to us. *See, e.g.*, Mitchell McInnes, *The Reason to Reverse: Unjust Factors and Juristic Reasons*, 92 B.U. L. REV. 1049, 1052 (2012) (noting that the Third Restatement defines unjust enrichment as a cause of action and a remedy).

The first of these three predicate components is indicated by the word "enriched," a term that is often used interchangeably with the notion of receiving or otherwise obtaining a "benefit."[89] Enrichment refers to the requirement that the recipient's wealth be increased in some significant way, a way that a comment in the Third Restatement describes as "measurable."[90] In the patent context, enrichment corresponds to a situation in which the defendant has received some sort of measurable benefit due to her infringement of the plaintiff's patented technology. If the defendant did not gain a benefit from the use or other infringement of plaintiff's patented technology, even if the defendant's actions did result in injury to the plaintiff, there would be no liability in restitution.[91] Again, restitution is focused on a defendant's gains. If there is no gain, there is no restitutionary remedy.

The second limiting component is that the enrichment gained must also have been received at the "expense" of the plaintiff. Oftentimes, the expense of the plaintiff corresponds relatively precisely and automatically to the gain of the defendant. But under the Third Restatement, the concept of expense reaches more broadly. Most simply, an expense is a violation of plaintiff's "legally protected rights."[92] Consequently, while Section 1 establishes that the enrichment must be at the expense of the plaintiff, a plaintiff asserting a claim in restitution generally does not need to show that it suffered actual loss.[93] Rather, the plaintiff needs only to prove that the defendant gained a measurable benefit through a violation of plaintiff's rights, regardless of whether actual harm to the plaintiff's "real world" interests resulted. This means that under the Third Restatement's approach, the "enriched" and "expense" components for an unjust enrichment would ordinarily be satisfied in the patent context if a defendant has derived some benefit from the infringement of a valid patent belonging to the plaintiff.

The third and last limiting component to the broad definition of "liability in restitution, as used in Section 1, is that the enrichment

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89. *See, e.g.*, HANOCH DAGAN, UNJUST ENRICHMENT 1 (1997) (explaining the components of an unjust enrichment claim and characterizing the first as "a benefit (or enrichment)").

90. *See* THIRD RESTATEMENT, *supra* note 52, at § 1, cmt. d ("Restitution is concerned with the receipt of benefits that yield a measurable increase in the recipient's wealth.").

91. *See id.* §3, cmt. b ("Cases in which a legal wrong results in injury to the claimant but no benefit to others are not part of the law of restitution.").

92. *Id.* § 1, cmt. a.

93. *Id.* §1, cmt. a (explaining "'at the expense of another'" can also mean "'in violation of the other's legally protected rights,' without the need to show that the claimant has suffered a loss.").

received at the expense of the plaintiff must be "unjust."[94] The Third Restatement, in its use of "unjust" generally throughout the Restatement and specifically in this section, adopts a broad definition that captures both indirect and direct enrichment.[95] The potential inclusion of indirect enrichment, such as a "reduction in necessary expenditures or a reduced obligation to a third party,"[96] is important for purposes of thinking about what lessons restitution law holds for the determination of reasonable royalty damages in patent law. In many cases, an infringer will obtain indirect benefits from the use of patented technology. For example, while an infringer may receive direct enrichment in the form of actual use of the technology, an infringer may also obtain indirect enrichment by reducing its time for further innovation.

Section 1 is not the only portion of the Third Restatement's opening chapter on "General Principles" that merits attention. Section 4 of the Third Restatement states a principle that is intimately related to Section 1's concepts of enrichment, expense, and injustice—namely, the principle that "[a] person is not permitted to profit by his own wrong."[97] In combination with Section 1, this language from Section 4 makes clear that the law of restitution is at its core the law of nonconsensual transfers that cannot be permitted to stand.

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94. *Id.* § 1.

95. *Id.* §1, cmt. d. The Third Restatement also explains that "unjust" is a term that encompasses within its understanding of injustice what some would distinguish as separate concepts of "unjustified" and "unjust" enrichment. *See id.* at cmt. b. "Unjustified enrichment is enrichment that lacks an adequate legal basis; it results from a transaction that the law treats as ineffective to work a conclusive alteration in ownership rights." *Id.* "Unjust enrichment," on the other hand, might be defined distinctly as enrichment under circumstances such that the benefit gained cannot in good conscience be retained. *See id.* The distinction between unjustified and unjust enrichment might be important when comparing the concept and scope of unjust enrichment in different jurisdictions, including, for example, American law with Canadian law: the Third Restatement itself suggests that the effective "coextensive[ness]" of unjust and unjustified enrichment that it asserts might be a peculiar feature of "American law." *Id.* The distinction is much discussed in recent restitution literature. *Compare* DAGAN, RESTITUTION, *supra* note 69, at 18–25 (criticizing the use of "unjustified" and arguing it is a "positivist trap") *with* Laycock, *Restoring Restitution*, *supra* note 71, at 932 (explaining the move to prefer 'unjustified enrichment' in the Third Restatement makes it clear that something is not unjust because of some "free-floating moral inquiry, but a matter of legal rules").

96. THIRD RESTATEMENT, *supra* note 52, at § 1, cmt. d.

97. *Id.* at § 4.

2. The Third Restatement and Intellectual Property

Section 42 of the Third Restatement carries forward the principles of Sections 1 and 4 to its subject matter, "Interference with Intellectual Property and Similar Rights." This section is contained within Chapter 5, which covers a variety of forms of "Restitution for Wrongs."[98] Section 42 states:

> A person who obtains a benefit by misappropriation or infringement of another's legally protected rights in any idea, expression, information, image, or designation is liable in restitution to the holder of such rights.[99]

Some of this language looks familiar from Section 1, including the terms "benefit" and "liable in restitution." These terms should be construed as having the same meaning as they did in Section 1. The Third Restatement does not define or give much context to some of the other terms in Section 42, notably "misappropriation" and "infringement." This is intentional.[100] The Third Restatement explains that Section 42 addresses "the recovery of profits or use value[,] following unauthorized interference with recognized forms of intellectual property (including patents . . .)."[101] The determination of whether there has been an unauthorized interference with patents is viewed as governed by federal statute and not the Third Restatement.[102]

The Comments for Section 42 illustrate several other aspects that are relevant to our Article. For example, the drafters of the Third Restatement considered whether Section 42 should be considered applicable to patents or similar federal rights given the possibility of

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98. *See id.* ch. 5, §§ 40–46.

99. *Id.* § 42.

100. *See id.* § 3, cmt. d (giving §42 as an example where "[t]he law of restitution and unjust enrichment requires the surrender of benefits wrongfully obtained, but it does not tell us whether the defendant's conduct is wrongful in a particular case").

101. *Id.* § 42, cmt. a.

102. *See id.* § 42, cmt. a. That is not to say the Third Restatement does not also acknowledge that, generally speaking, it plays second fiddle to how statutes define and regulate intellectual property. *See id.* ("To the extent of any inconsistency [between statutes and the Third Restatement], the rule of § 42—like every rule within this Restatement—yields to the provisions of statute law.").

total preemption by the Patent Act or other federal statutes.[103] The drafters concluded that despite such federal statutes, Section 42 applies and effectively characterized patent law's lost-profits and reasonable royalty measures of monetary relief as restitutionary. Comment a of Section 42 reasons that the section "authorize[s] remedies that are restitutionary in nature—notably the recovery of an infringer's profits, or of 'damages' measured by the cost of a license."[104] This comment illustrates the strong position that the Third Restatement takes on intellectual property—specifically, that various intellectual property statutes at least partly codify the rule expressed in Section 42.

The Comments also explain that judges who believe the relevant intellectual property statute, such as Section 284 of the Patent Act, has incorporated the principles of restitution and unjust enrichment should look to the Third Restatement "for guidance on the content of those principles."[105] In an opinion in *Apple, Inc. v. Motorola, Inc.*,[106] Judge Posner of the U.S. Court of Appeals for the Seventh Circuit, sitting by designation for the Northern District of Illinois, did just that.

Judge Posner's opinion states that "often a royalty is actually a form of restitution."[107] Judge Posner pulled directly from the Comments of Section 42 in support of invoking restitutionary principles in assessing reasonable royalty damages: he quoted both the observation that an award of "'the market value of an unauthorized use'" is "'more accurately described as a species of restitution'" and the conclusion that "'[u]nlike the accounting for the infringer's profits, restitution measured by use value survives in the current Patent Act.'"[108] In an earlier instance of drawing on restitution principles in assessing intellectual property remedies, a much-cited opinion by Judge Learned Hand looked to the First Restatement's treatment of "a

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103. *See id.* ("Indeed, statute law so far defines both rights and remedies that it might reasonably be suggested that restitution in the standard infringement scenarios be excluded . . . from the scope of this Restatement.").

104. *Id.*

105. *Id.* § 42 cmt. a.

106. Apple, Inc. v. Motorola, Inc., 869 F. Supp. 2d 901 (N.D. Ill. 2012).

107. *Id.* at 910 (explaining this "form of restitution" as "a way of transferring to the patentee the infringer's profit, or, what amounts to the same thing, the infringer's cost savings from practicing the patented invention without authorization").

108. *Id.* at 916.

constructive trustee" in considering what portion of copyright infringers' profits should be recoverable by the plaintiffs.[109]

Although jurists other than Judge Posner do not appear to have so clearly embraced Section 42's equation of restitution and reasonable royalty damages, such an embrace is not necessary for restitutionary principles to offer guidance on how to assess the recoverable portion of value obtained from nonconsensual use—a category of value into which reasonable royalty damages comfortably fall. The following part looks at specific mechanics of Section 42 and other applicable sections to demonstrate how the Third Restatement can provide guidance to courts confronted with a claim for reasonable royalty damages.

3. Assigning Remedies for Infringement

Section 42 is not a standalone provision. One must turn to other sections of the Third Restatement to understand how to remedy an interference with intellectual property.[110] Section 42 establishes that a patent holder subjected to infringement has a restitution claim, and, correspondingly, that the infringer is subject to liability in restitution to the patent holder.[111] Yet beyond these basics, there is little detail in Section 42. Among other things, Section 42 does not contain language concerning the potential measure or calculation of recovery, although the Comments do discuss the "use value" terminology quoted by Judge Posner.[112] Section 42 also does not give much context regarding the "person" liable in restitution.

Chapter 7 of the Third Restatement, the Third Restatement's "Remedies" chapter, fills in these gaps with an organized network of doctrines regulating the award of monetary relief. There are two variables within restitution law that provide opportunity for deeper

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109. Sheldon v. Metro-Goldwyn Pictures Corp., 106 F.2d 45, 51 (2d Cir. 1939).

110. A previous draft of §42 seemed to suggest a standalone provision, one that did not require a reader to refer to later parts of the Third Restatement. It had the measure of recovery built into the rule, as well as the identification of the three types of infringer, although the language was different and might have involved some distinctions that were ultimately rejected. *See* RESTATEMENT (THIRD) OF RESTITUTION AND UNJUST ENRICHMENT, (AM. LAW INST., Tentative Draft No. 4, April 18, 2005).

111. *See supra* pp. 353–54 and accompanying notes.

112. *See* THIRD RESTATEMENT, *supra* note 52, at § 42, cmt. a ("Section 42 describes the restitution claim that underlies the recovery of profits or *use value* following unauthorized interference with recognized forms of intellectual property . . . ." (emphasis added)).

reflection on how patent law might address some questions about how to assess reasonable royalties for patent infringement: (1) possible ways of measuring the defendant's gains and (2) classification of the defendant's behavior in ways that may impact the measurement of gains.

These two variables interact together to enable restitution law to respond in a flexible yet predictably regulated manner to a variety of scenarios. Perhaps the simplest are members of a set of scenarios in which no analysis of the value of an unjustly acquired gain is required, and, concomitantly, no analysis of blameworthiness is required because restitution straightforwardly calls for return of a specific and uniquely determined monetary amount. The classic example here is the return of a mistaken payment.

In more complex cases, such as ones in which the unjustly enriched party has made independent contributions to the value of benefits obtained, a court may have to engage in detailed consideration of one or both of the variables of value and blameworthiness. For such cases, the Restatement tends first to consider the variable of blameworthiness and then uses this variable's value to help determine the proper measure of gains that the plaintiff has a right to recover.[113] The Third Restatement explains that the first step in the blameworthiness inquiry is to identify the basic type of "person" that has been unjustly enriched. The Third Restatement identifies four basic types: the innocent recipient, the faultless wrongdoer, the unwitting or unconscious but responsible wrongdoer, and the conscious wrongdoer.[114] Further, as indicated in section II.C below, the Third Restatement breaks down at least some of these types into relevant subtypes.[115] Similarly, the Third Restatement provides a taxonomy of measures of monetary relief, and the blameworthiness classification determines what subset of these measures may apply in

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113. *See id.* ch. 7, topic 1, p. 175 (explaining that, if a court needs to "choose between two or more possible measures of value," this "choice is guided primarily by the extent to which the defendant is at fault in obtaining the benefit"); *see also id.* § 49, cmt. a (stating the choice between the possible measures of value "turn[s] chiefly on the innocence or blameworthiness of the defendant").

114. *See id.* § 52 (listing the types of defendants and their respective "Responsibility for Enrichment"); *see also id.* § 52, cmts. a & b (outlining the various types of possible defendants and referring readers to particular sections based upon the type of defendant, including, for example, § 50 for the innocent infringer and § 51 for the conscious infringer).

115. *See id* § 52 (1) (identifying further subtypes of defendants based upon the defendant's "negligence," "misrepresentation," "breach or repudiation of a contract," "unreasonable failure to avoid or rectify the unjust enrichment," or "bad faith or reprehensible conduct").

a particular case. Section II.C discusses the nature of and interaction between these parallel taxonomies in more detail.

C. Restitution's Reticulated Approach to Monetary Relief

Section II.B's discussion of the Third Restatement and its account of restitutionary principles already suggests ways in which approaches to monetary relief under the law of restitution might inform the awarding of reasonable royalty damages for patent infringement. This section provides more specific bases for comparison and reform by examining in greater detail the law of restitution's highly reticulated approach to monetary relief. This approach offers a menu of alternative measures of monetary relief that, in turn, interacts significantly with the classification of levels of fault or responsibility on the parts of both the victim and the recipient of unjust enrichment. Moreover, the layering of allowances for context sensitivity does not end there. In addition to regulating the measure of monetary relief in ways that reflect context-sensitive assessments of relative fault as well as attention to the purposes of overarching legal regimes, the law of restitution shows similar context sensitivity in regulating the assignment and intensity of burdens of proof and production. The resulting amalgam of layers of ordered context sensitivity enables the law of restitution to achieve a combination of relative coherence, substantially clear ex ante incentives, and significant flexibility to which crafters of patent law's reasonable royalty damages might do well to aspire—a possibility that this Article explores in Part III.

This Section explains the law of restitution's reticulated approach to monetary relief in three movements. First, it identifies alternative measures of monetary relief that the law of restitution makes available. Second, it considers how the law of restitution defines levels of relative fault or responsibility for unjust enrichment and the significance that restitution law assigns to such fault or responsibility, in particular with respect to applicable measures of unjust enrichment. Third, it discusses how the law of restitution shows sensitivity to the underlying purposes of relevant legal regimes and to the limitations of evidence, including expert testimony, that parties can assemble to support particular values for monetary relief.

1. Alternative Measures of Unjust Enrichment

The Third Restatement provides a helpful catalog of different potential measures for monetary relief. At least by one count, the

number of such potential measures totals eight.[116] The first two measures apply in the alternative in a case of "[e]nrichment from a money payment":

> (1) the "amount of the payment" or
> (2) "the resulting increase in the defendant's net assets, whichever is less,"[117]

where the Third Restatement uses the term "defendant" to refer to the recipient of unjust enrichment and the term "claimant" to refer to a party seeking relief from the unjust enrichment of another.[118] Because of the limited application of these first two measures of recovery to cases of mistaken payment, we will not discuss them further.

The Third Restatement's next four measures are more to the point. They specify remedies for an "[e]nrichment from the receipt of nonreturnable benefits," such as the benefits received from patent infringement. They include:

> (3) "the value of the benefit in advancing the purposes of the defendant";
> (4) "the cost to the claimant of conferring the benefit";
> (5) "the market value of the benefit"; or
> (6) "a price the defendant has expressed a willingness to pay, if the defendant's assent may be treated as valid on the question of price."[119]

The final two measures are in some ways less truly individual measures than sets or categories of measures that have their own more detailed articulation:

> (7) "the amount of the profit wrongfully obtained," a measure applying "[w]hen restitution is intended to strip the defendant of a wrongful gain";120 and
> (8) measures of unjust enrichment including "[s]upplemental enrichment in the form of interest or use value, proceeds, and consequential gains."[121]

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116. *See id.* § 49 (listing "Measures of Enrichment").
117. *Id.* § 49(2).
118. *See id.* § 49(1) ("A claimant entitled to restitution may obtain a judgment for money in the amount of the defendant's unjust enrichment.").
119. *Id.* § 49(3).
120. *Id.* § 49(4).
121. *Id.* § 49(5).

The fifth measure, the "market value" measure, is generally the most pertinent in relation to efforts to assess reasonable royalty damages for patent infringement. As discussed below, this measure ordinarily applies to the unwitting or unconscious infringer—for example, in the patent context, an infringer that was not aware of relevant patent rights prior to the lawsuit.[122] The Third Restatement explains that, "where appropriate," the reasonable cost of a license may be used to identify this market value, thereby connecting this measure tightly to the notion of a reasonable royalty.[123] Because the measure is an objective one of market value, the recovery under this measure might be higher than the actual value or use value[124] to the defendant.[125]

In turn, the seventh measure of monetary relief, "the amount of profit wrongfully obtained," might be more than both the market value and the provable loss to the plaintiff. This measure is characteristically associated with the conscious wrongdoer—a party that acts with either the knowledge of the wrong or "despite a known risk that the conduct in question violates the rights of the claimant."[126] This type of person, the conscious wrongdoer, will be further discussed in the next subparts. In short, such wrongdoers are generally viewed as most culpable and are typically liable for their "net profit attributable to the underlying wrong"[127]—the disgorgement measure of relief that many people associate primarily and, incorrectly, even solely with restitution law. The aim of this measure of relief is to take from the defendant all of the profit received through the defendant's wrongdoing.[128] The Third Restatement is careful to define what "profit" means in this context: profit must be identifiable, it must be

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122. *Id.* § 51(2).

123. *Id.*

124. The term "use value" includes the possibility of a supplemental enrichment that may be "in the form of interest, rent, or other measure of use value." *Id.* § 53(1). The potential relevance and availability of measures of supplemental enrichment comes after, if ever, liability in restitution generally is established. *Id.* § 53, reporter's note cmt. a.

125. *Id.* § 51, cmt. c.

126. *Id.* § 51(3).

127. *Id.* § 51(4).

128. *Id.* ("The object of restitution in such cases is to eliminate profit from wrongdoing while avoiding, so far as possible, the imposition of a penalty."); *see also* S.E.C. v. Huffman, 996 F.2d 800, 802 (5th Cir. 1993) ("Despite some casual references in our caselaw to the contrary . . . disgorgement is not precisely restitution. Disgorgement wrests ill-gotten gains from the hands of a wrongdoer."); Gergen, *supra* note 77, at 829 (criticizing the often-repeated statement in the Third Restatement that "disgorgement is meant to deter but not to punish, as if these were distinct goals[, for] [d]eterrence is one purpose of punishment.") (citations omitted).

measurable, but it may include "any form of use value, proceeds, or consequential gains."[129]

The above discussion begins to suggest how the law of restitution uses different measures of monetary relief to achieve a fair amount of ordered context sensitivity. But a fuller understanding of such context-sensitive deployment requires greater understanding of restitution's graded scale for the relative fault of the unjust-enrichment claimant and defendant. This scale is the subject of the next subsection, which will describe the Third Restatement's different classifications of fault or responsibility and then explain how these interact with deployment of the measures of enrichment listed above.

2. Definition and Significance of Fault or Responsibility

The Third Restatement emphasizes that, although its various proffered measures for unjust enrichment can "yield different amounts," they do not necessarily do so.[130] According to the Third Restatement, when the measures lead to different output totals, "the choice between them is dictated by general principles of unjust enrichment, turning chiefly on the innocence or blameworthiness of the defendant."[131] Hence, to understand how the measures apply, one needs to understand the Restatement's classification of levels of fault or responsibility for the enriched party. From least at fault or least responsible to most at fault or most responsible, the basic classification includes at least six categories of recipients of unjust enrichment.

Under the Restatement's scheme, there are three significant forms of "innocent recipient," a person who is "legally blameless"[132] in that she "commits no misconduct in the transaction concerned" and "bears no responsibility for the unjust enrichment."[133] These variants of innocent recipients are as follows:

(1) an innocent recipient who did not request relevant benefits;[134]

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129. THIRD RESTATEMENT, *supra* note 52, § 51(5)(a). Section 53, in turn, defines "proceeds" and "consequential gains." Most interesting in light of the nature of patented technology, consequential gains "are profits realized through the defendant's subsequent dealings with such an asset . . . ." *Id.* § 53 (3).

130. *Id.* § 49 cmt. a.

131. *Id.*

132. *Id.* § 50 cmt. a.

133. *Id.* § 50(1).

134. *Id.* § 50(1)–(3).

(2) an innocent recipient who requested relevant benefits but did so under circumstances "depriv[ing the request] of significance" such as those of "fraud or incapacity";[135] and
(3) an innocent recipient who requested relevant benefits in the absence of such invalidating circumstances.[136]

A common scenario in which there is an innocent recipient is one in which the recipient benefits from a mistaken payment or a mistaken service. Importantly, patent infringers generally cannot qualify as innocent recipients under the Third Restatement's taxonomy. Instead, they are at best faultless wrongdoers under a regime of strict liability.[137] Nevertheless, the category of innocent recipient is instructive for our purposes, not because it maps directly onto a relevant category of infringers in patent law, but instead because it helps exemplify restitution law's use of tiers of fault or responsibility and because it helps illuminate the sort of "floor" on remedies that might correspond to the lowest available level of fault or responsibility.

Understandably, the Third Restatement is protective of innocent recipients, generally using only relatively restrictive measures of the degree to which they have been unjustly enriched.[138] Although the Third Restatement states that "[a]n innocent recipient may be liable in an appropriate case for [direct results of the relevant transaction such as] use value or proceeds," the Restatement generally forbids innocent-recipient liability "for consequential gains,"[139] which are "profits realized through the defendant's subsequent dealings with [a relevant] asset, or through the defendant's interference with the claimant's rights."[140] For "unrequested benefits," the innocent recipient's unjust enrichment "is measured by the standard that yields the smallest liability,"[141] and the resulting liability "may not leave the recipient worse off (apart from the costs of litigation) than if the

135. *Id.* § 50 cmt. e.
136. *Id.* § 50(1)–(2), (4).
137. *See infra* text accompanying notes 146–150.
138. THIRD RESTATEMENT, *supra* note 52, § 50 cmt. f ("The liability in restitution of a person who qualifies as an innocent recipient is determined by rules that are notably solicitous of the defendant.").
139. *Id.* § 50(5); *see also id.* § 53(3).
140. *Id.* § 53(2).
141. *Id.* § 50(2)(a).

transaction giving rise to the liability had not occurred."[142] For "requested benefits," the innocent recipient's unjust enrichment is typically given by "their reasonable value to the recipient. . . . normally the lesser of market value and a price the recipient has expressed a willingness to pay."[143] In circumstances where the significance of the recipient's request is significantly undermined, "a more restrictive standard" for measuring unjust enrichment may apply,[144] such as the applicable standard for unrequested benefits.[145]

The Third Restatement provides three further categories of fault or responsibility levels for recipients who have obtained benefits through "misconduct," which is defined broadly to encompass both "culpable" or nonculpable behavior that constitutes "actionable interference by the defendant with the claimant's legally protected interests for which the defendant is liable" in restitution.[146] These levels correspond to the following categories of recipients of unjust enrichment:

> (4) a recipient who has engaged in misconduct "without fault" such as a non-negligent and otherwise non-culpable tortfeasor who is liable under a regime of strict liability;[147]
> (5) a "responsible" recipient "who is not a conscious wrongdoer" but has significantly contributed to the unjust enrichment through "(a) negligence; (b) misrepresentation, whether tortious or not; (c) breach or repudiation of a contract with the claimant, whether enforceable or not; (d) unreasonable failure, despite notice and opportunity, to avoid or rectify the unjust enrichment in question; or (e) bad faith or reprehensible conduct";[148] and
> (6) a "defaulting fiduciary" or "conscious wrongdoer" "who acts (a) with knowledge of the underlying wrong to the claimant, or (b) despite a known risk

142. *Id.* § 50(3).
143. *Id.* § 50(2)(b).
144. *Id.* § 50(2)(c).
145. *Id.* § 50 cmt. e ("[I]f the incapacitated party cannot be presumed to derive the usual advantage from the benefits in question—the basis of any market price—enrichment may be measured as if the benefits were unrequested.").
146. *Id.* § 51(1).
147. *Id.* § 51 cmt. a.
148. *Id.* § 52(1).

> that the conduct in question violates the rights of the claimant."[149]

The defaulting fiduciary can be considered a special subcategory that is largely tangential to the purpose of making analogies to patent infringement and thus will be generally omitted from the discussion below.

As might be expected by analogy with treatment of the different categories of innocent recipients, the categories of recipients who have committed some form of misconduct correspond to different levels of stringency with respect to the relevant measures for unjust enrichment. For purposes of restitution law, faultless misconduct, such as that committed by "innocent converters, unconscious trespassers, and unwitting infringers," leads to liability "in restitution for the market value of the rights they have 'taken,'" a measure that, under some circumstances, "exceeds any value actually realized by the defendant" but that, under other circumstances, "is substantially less than realized value because it excludes "consequential gains" and "proceeds not constituting unjust enrichment."[150] In contrast, responsible recipients are often subject to measurements of liability that are "more protective of the claimant" and, in the worst cases, such as situations involving bad faith, can be equivalent to those for conscious wrongdoers.[151] A conscious wrongdoer is commonly subject to a remedy of disgorgement of "the net profit attributable to the underlying wrong,"[152] including "proceeds and consequential gains that are not unduly remote."[153] According to the Third Restatement, "[t]he object of restitution in such cases is to eliminate profit from wrongdoing while avoiding, so far as possible, the imposition of a penalty."[154]

With respect to measures for unjust enrichment, the Third Restatement's treatment of relative fault or responsibility extends beyond consideration of the enriched party's fault or responsibility in isolation. The restitution claimant's fault or responsibility can also play a role in determining the appropriate measure, as when the

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149. *Id.* § 51(3).

150. *Id.* § 51 cmt. c.

151. *Id.*; *see also id.* § 52(2) ("A defendant who is responsible for enrichment as described in subsection (1) may be subject to a greater liability in restitution than an innocent recipient of the same benefits, in order that the defendant rather than the claimant bear the costs of the transaction . . . ."); *id.* § 52(2)(a)-(c) (providing three specific examples).

152. *Id.* § 51(4).

153. *Id.* § 53(3).

154. *Id.* § 51(4).

claimant has engaged in some form of relevant behavior such as fraud, another form of legal violation, or a failure to perform as agreed in association with the relevant transaction.[155]

3. Sensitivity to Law's Purpose and Evidentiary Burdens

Assessments of relative fault or responsibility can affect not only the measure for unjust enrichment but also the standards for satisfying burdens of proof or production with respect to specific enrichment amounts. Such standards can be particularly crucial in situations in which courts look to disgorge profits because courts do not then "impose a general forfeiture" of all that is gained "from a tainted transaction" but instead seek to engage in the commonly difficult and uncertainty-plagued task of identifying, and limiting relief to, "the amount of the gain that is attributable to the underlying wrong."[156]

Here, the Third Restatement rejects the "traditional formula . . . that the claimant has the burden of proving revenues and the defendant has the burden of proving deductions."[157] Instead, the Restatement champions what it describes as "a more modern and generally useful rule that the claimant has the burden of producing evidence from which the court may make at least a reasonable approximation of the defendant's unjust enrichment," after which production "the defendant is then free . . . to introduce evidence tending to show that the true extent of unjust enrichment is something less."[158] The Restatement's burden of production "is ordinarily met as soon as the claimant presents a coherent theory of recovery in unjust enrichment"—for example, by "show[ing] a causal connection between defendant's wrongdoing and a measurable increase in the defendant's net assets."[159] This approach is presented as consistent with "the equitable disposition that resolves uncertainty in favor of the claimant against the conscious wrongdoer," thereby assigning to the conscious wrongdoer "the risk of uncertainty arising from the wrong."[160]

More generally, the Third Restatement repeats a point separately made by Dan Dobbs in his treatise on the law of remedies—

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155. *Id.* § 50 cmt. e.
156. *Id.* § 51 cmt. i.
157. *Id.*
158. *Id.*
159. *Id.*
160. *Id.*

namely, that "restitution should be measured to reflect the substantive law purpose that calls for restitution in the first place."[161] Dobbs lists among potentially relevant possibilities (1) respect for "the defendant's autonomy and right of choice," including a desire not to have the relevant benefit that might make monetary relief minimal or even altogether inappropriate; (2) respect for "the joint autonomy of the parties as expressed [in a] contract," such as a contract rejecting "a restitutionary remedy" for purposes of agreed risk allocation; (3) "statutory policy"; and (4) disfavor for "conscious wrongdoing or the violation of especially prized standards such as the standards of honesty imposed upon fiduciaries."[162] Dobbs notes that the policy behind the Statute of Frauds might counsel limiting the scope of a remedy in restitution to effectuate the purposes of the statute by not permitting a party to obtain the equivalent of full expectation damages through restitution when the statute bars obtaining them through contract.[163]

IV. CROSS-POLLINATION POSSIBILITIES FOR REASONABLE ROYALTIES

The law of restitution offers potential instruction for how courts might manage the assessment of reasonable royalties for patent infringement. In particular, patent law can learn from restitution's deployment of a reticulated set of measures for monetary relief and a corresponding set of classifications for parties' relative fault or responsibility. Patent law can also learn from restitution's sensitivity to practical difficulties of proof and questions about whether the remedy awarded will serve the relevant law's underlying purpose. In general, these lessons suggest that, without dramatic increase in the complexity of the judicial task, courts can make reasonable royalty determinations significantly more responsive to findings of legal responsibility, practicalities of proof, and patent law's stated constitutional purpose "[t]o promote the Progress of Science and useful Arts."[164] In this way, courts might subtly but substantially shift assessments of reasonable royalties toward greater reliance on findings of legal responsibility and understandings of statutory

161. 1 DAN B. DOBBS, LAW OF REMEDIES § 4.5(1), at 629 (2d ed. 1993); *see also* THIRD RESTATEMENT, *supra* note 52, at § 49 cmt. a (quoting Dobbs); *id.* § 49 rep. note a (same).

162. DOBBS, *supra* note 161, § 4.5(1), at 630.

163. *Id.*

164. U.S. CONST. art. I, § 8, cl. 8.

purpose that lie more centrally within the Article III courts' realms of competence than the economic analyses of patent value that have dominated recent controversies. This shift offers promise in helping to improve patent law's performance both in deterring socially undesirable conduct and in encouraging socially desirable conduct in accordance with patent law's fundamental aims.

A. Additional Economic Measures or Factors

The law of restitution's attention to policy concerns and allowance for alternative measures of monetary relief suggest that at least two potential measures of an invention's economic value might sensibly play more prominent roles in the assessment of reasonable royalty remedies. A first measure is the cost of the relevant processes of invention and innovation undertaken by the original inventor or patent holder. A cost measure is straightforwardly suggested by the Third Restatement's presentation of cost to the claimant as one of the potential measures for monetary relief in restitution.[165] By promising reimbursement where a patent holder might otherwise walk away empty-handed, a cost measure also appears facially consistent with the language of the Patent Act, which specifies that damages are to provide adequate compensation[166] as well as the general purpose of patent law to promote innovation for the purposes of benefiting society as a whole.[167] More specifically, a cost measure that seeks to provide a patentee with an appropriate return for reasonable costs associated with innovation, comports with a commonly stated guideline for tailoring patent law to its social-welfare-promoting purpose—namely, the instruction that patent law should provide a reward that is just large enough to cover the pertinent costs, including opportunity costs, associated with innovation so that the socially optimal level of these activities are stimulated at the least expense to society as a whole.[168]

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165. *See supra* text accompanying note 119.

166. 35 U.S.C. § 284 (2012).

167. *See* Golden, *supra* note 2, at 509 (for purposes of exposition and analysis, "assum[ing] a utilitarian goal that is standard in modern accounts: the patent system should act to promote the development, disclosure, and use of new technologies, ideally in a way that maximizes social welfare[.]").

168. *See* David O. Taylor, *Using Reasonable Royalties to Value Patented Technology*, 49 GA. L. REV. 79, 117 (2014) ("[L]egal scholars have made the case that reasonable royalties should provide just enough incentive for prospective patent owners to invent, but no more."); *cf.* Ted Sichelman, *Innovation Factors for Reasonable Royalties*, 25 TEX. INTELL. PROP. L.J. (forthcoming 2017) (proposing use of "evidence of R&D commercialization, and opportunity costs . . . to set a range of 'reasonable royalties'").

Of course, there would be substantial problems with adopting cost or cost-plus-reasonable-reward as the measure for reasonable royalties in the main run of patent cases. Cost measurement can raise difficult accounting questions and could encourage manipulation of accounts simply for the purpose of making patent protection more effective. Further, a broadly applicable cost measure could encourage profligate investment in innovation or divert innovative effort from activities that offer great innovation bang per invested buck to activities that are expensive but less socially productive. Requiring that relevant costs be objectively reasonable and not only actually incurred should help prevent the worst potential distortions of private behavior in this regard. But concerns would justifiably remain.

Nonetheless, evidence on reasonable costs of innovation seems to merit at least some attention in reasonable royalty analysis. As at least a sporadic factor in such analysis, reasonable costs of innovation could provide a useful, commonsense check on outlandishly large or small assessments of patent value proffered by parties' expert witnesses. Further, a cost measure for damages might be used in some circumstances as a backup or alternative to another measure—for example, by providing that a patentee should in limited circumstances recover the lesser of (1) the reasonable cost of pertinent innovative activity and (2) a fraction, in accordance with industry norms and excluding any "hold-up costs" reflective of sunk investments, of the lowest plausible cost of implementing a technological alternative to the patented invention of essentially equivalent functionality (a "design-around"). The relevant limited circumstances could be ones in which a patentee cannot otherwise provide adequate evidence to support a reasonable royalty award or in which a patentee's application for relief is substantially unsympathetic for reasons such as those discussed in section III.B below.

Despite limitations chronicled above, cost-based measures for compensation are commonly used by governments and private parties in contracting with suppliers of innovation.[169] Thus, their omission from the laundry list of *Georgia-Pacific* factors in assessing reasonable royalties is surprising. The law of restitution suggests that cost can be included as an alternative measure or factor in assessing monetary relief without undermining the administrability or deterrence potential of the more general legal scheme. Patent damages law can likewise incorporate at least somewhat greater attention to relevant and reasonable costs of innovative activity.

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169. *See* Golden, *supra* note 2, at 539 (noting "[g]overnment experiences with cost overruns in the procurement of military technology").

Other potential factors in reasonable royalty assessment are the overall social value of the invention and the technical significance of the inventor's achievement. Neither of these factors seems very apt as a measure of monetary relief itself. Assessment of overall social value or technical significance is likely difficult to do with the precision necessary to justify a specific monetary award. On the other hand, like cost, these factors relate to the underlying purpose of patent law to promote substantial inventions and innovations, and they might helpfully inform the assignment and calibration of burdens of proof or production in ways that align with how the law of restitution deploys concerns with fault or responsibility to set burdens or to break deadlocks generated by uncertainty or evidentiary "ties."

Worries that patents threaten to unduly "tax" or block later innovation might commonly reflect suspicion that, from a social standpoint, many patents involve only trivial inventions at best. At the remedies stage of a patent case, courts need not be helpless to address this concern. Judges and juries might be expected to be reasonably competent at assessing whether an invention is of only trivial or, instead, exceptionally high social value or technical significance. In this respect, judges and juries might draw useful instruction from the sort of external evidence of nonobviousness already used in assessing patent validity, including factors such as scientific acclaim or relevant failure of others.[170] An assessment that substantial evidence supports a conclusion that a patented invention is of especially high or low social significance could lead to the application of more indulgent or demanding requirements, respectively, for proof of a reasonable royalty. Even if limited to such extreme cases, such adjustments to the demands for proof of damages could significantly add to confidence that patent law will fulfill its promise for innovators who contribute the most social value while not overly clogging paths to further innovation with heavy taxes for adoption of the most incremental and marginal of prior patentable advances.

B. A More Reticulated Approach to Fault or Responsibility

Reasonable royalty assessment might also follow the law of restitution in taking account of parties' relative fault or responsibility in ways that go beyond the current blunderbuss approach of permitting enhanced damages or attorney fee shifting in situations involving

170. Apple Inc. v. Samsung Elecs. Co., 816 F.3d 788, 804-05 (Fed. Cir. 2016) (discussing evidence supporting a finding of nonobviousness).

willful infringement or other exceptional circumstances, but otherwise leaving concerns with fault or responsibility substantially outside of the patent damages calculus.[171] The law of restitution's different gradations of fault or responsibility suggest that the law of reasonable royalties might consider using different measures of relief or different evidentiary rules, standards, or presumptions in situations involving, for example, (1) independent inventors who, despite reasonable diligence, were unaware of the relevant patent or alternative embodiments thereof; (2) infringers who, because of the nature of claiming or continuation practice or because of arguable surprises in claim construction or application of the doctrine of equivalents, did not receive practically achievable and customary notice of their potential infringement in advance; (3) infringers for whom no especially mitigating or aggravating circumstances apply; (4) probabilistically conscious infringers who were properly on notice of a substantial risk of infringement; and (5) conscious infringers who might satisfy legal standards for willful infringement. Reticulation of measures, burdens, and presumptions with respect to reasonable royalties to take account of such gradations of fault or responsibility might enable patent law to better deter socially undesirable infringing activity and to better promote socially desirable innovation by patent-obtaining inventors and their followers alike.

Reticulation might operate on both ends of the scale of relative fault. For example, a conscious infringer might face not only potential enhancement of damages as a result of willful infringement, but also be required to make a prima facie showing that it would be unreasonable to assess damages using an "entire market" approach, rather than placing the burden for justifying this approach on the patentee. Conversely, greater evidentiary burdens might confront a patentee who has, in some sense, helped bring about infringement, for example, by sitting quietly on rights after notice of potentially infringing activity or by providing poor notice of patent scope through atypically opaque patent drafting that, although not generating clear and convincing evidence of invalidity, nonetheless flirts with the borders of claim indefiniteness or inadequate written description. Effectively extremizing the results of litigation in this way would make the threat of having to pay substantial damages, perhaps even enhanced damages, more substantial for conscious infringers whom,

171. *See* Amanda Frye, *"Inextricably Commingled": A Restitution Perspective in Patent Remedies*, 26 HARV. J.L. & TECH. 669, 686 (2013) ("The patent field could import a restitutionary focus on the culpability of the wrongdoer to create a sliding scale of infringement.").

because of the conscious nature of their infringement, properly designed law might best be able to deter.[172] Likewise, such extremized results in cases of notably poor patent notice should encourage patentees to do more to fulfill the patent system's promise as a means of securing effective public disclosure.[173]

As an alternative to focusing on extremes in poor patentee or infringer behavior, one could imagine a true ladder of measures of relief or evidentiary burdens corresponding to distinct levels of relative fault as between a patentee and adjudged infringer. But for simplicity in this initial pass at what the law of restitution might teach the law on reasonable royalties, we presently sketch only how one might design a system focused on deterring the extremes.

The proposal to extend consideration of relative fault to regulation of how reasonable royalty damages are assessed might be viewed as an extension of patent law's currently much more minimally multi-tiered approach to dealing with levels of blame. Courts may already award reasonable attorney fees to prevailing parties in exceptional circumstances[174] and may already enhance damages awarded to the patentee[175] when merited by "egregious infringement behavior."[176] Making at least some degrees of relative fault relevant for more mainline remedies such as reasonable royalty awards should make more effective the patent system's efforts to encourage comparatively poor behavior by both patentees and potential infringers.

Of course, one might worry that making the reasonable royalty calculus sensitive to relative fault could be too effective in the sense that it either spurs over-reliance by lawyers or excessively chills behavior that rational policymakers would not want to discourage. This concern might be cause for proceeding cautiously, such as by focusing initial tweaks on extremes of behavior as discussed above. If one proceeds in this way, there should be little initial danger of artificially creating demand for attorney opinion letters in the manner

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172. *Cf.* Anup Malani & Jonathan S. Masur, *Raising the Stakes in Patent Cases*, 101 GEO. L.J. 637, 641 (2013) (arguing for "enhanced rewards and penalties" in patent litigation to better "compensate holders of valid, valuable patents" and "reduce or eliminate invalid patent owners' opportunities to earn positive returns at trial").

173. Bonito Boats, Inc. v. Thunder Craft Boats, Inc., 489 U.S. 141, 150–51 (1989) ("The federal patent system thus embodies a carefully crafted bargain for encouraging the creation and disclosure of new, useful, and nonobvious advances in technology and design . . ..").

174. 35 U.S.C. § 285 (2012).

175. *Id.* § 284.

176. Halo Elecs., Inc. v. Pulse Elecs., Inc., 136 S. Ct. 1923, 1932 (2016).

of a previously abandoned Federal Circuit approach, which had indicated that courts could draw an adverse inference with respect to willfulness from an adjudged infringer's failure to produce evidence of an earlier opinion of counsel that was contrary to the court's ultimate conclusions on validity and infringement.[177] There is no proposal here for an adverse inference from a failure to produce an attorney opinion letter, and confinement of our most detailed proposal to extremes of relative fault should lead to chilling effects or pressure to consult an attorney being substantially, if not wholly, confined to situations in which parties should be on notice of the likelihood of their engaging in what might later be perceived as relative misbehavior. In short, consistent with restitution's approach to monetary remedies, there seem practicable ways of incorporating sensitivity to relative fault into the assessment of reasonable royalties—and of doing so in ways that will encourage best practices and discourage worst practices with respect to both patentee and infringer behavior.

V. CONCLUSION

The law of restitution illustrates how, in addressing questions of difficult-to-quantify monetary relief, courts can develop a context-sensitive yet coherent approach that responds to underlying public policy, has available an array of different measures of relief, and deploys both these measures and burdens of proof or production in ways that distinguish between levels of relative responsibility or fault. In awarding reasonable royalties in patent law, courts might similarly consider an inventor's costs and an invention's social value in addition to an infringer's revenues, profits, or other benefits from use of the invention. Moreover, there is much the law of reasonable royalties can do to incorporate concerns of relative responsibility or fault in a way that is more finely tuned to set proper incentives than the current approach to enhanced damages for willful infringement. In short, without having to embrace restitution as a fundamental theory for

177. *See* Knorr-Bremse Systeme Fuer Nutzfahrzuege GmbH v. Dana Corp., 383 F.3d 1337, 1344–46 (Fed. Cir. 2004) (en banc) (holding that refusal to produce an opinion of counsel and "failure to obtain an exculpatory opinion of counsel" do not provide bases for "an adverse inference" about what such an opinion says or would have said), *overruled in irrelevant part by* In re Seagate, 497 F.3d 1360 (Fed. Cir. 2007), *overruled in irrelevant part by* Halo Elecs., Inc. v. Pulse Elecs., Inc., 136 S. Ct. 1923 (2016); *cf.* 35 U.S.C. § 298 (2012) ("The failure of an infringer to obtain the advice of counsel with respect to any allegedly infringed patent, or the failure of the infringer to present such advice to the court or jury, may not be used to prove that the accused infringer willfully infringed . . . .").

patent remedies, patent law can learn much from the law of restitution's multilayered set of doctrines for regulating the award of monetary relief.

How Patent Damages Skew Licensing Markets*

Erik Hovenkamp† & Jonathan Masur††

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I. INTRODUCTION

As a first principle, the role of patent damages is to compensate patentees for past or future infringement. But this simplistic characterization provides little guidance for constructing effective remedial *standards*. The truth is that patent remedies are far less consequential within the courtroom than outside of it. Private dealings vastly outnumber litigated disputes,[1] but they all occur in the proverbial "shadow of litigation." Incentives to invent are similarly colored by expectations about the remedies that support patent enforcement. And these expectations are formed by observing the calculus with which the courts compute damages. Thus, as a policy issue, what matters most is not the number of dollars awarded in a

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† Ph.D. candidate, economics, Northwestern University; Law and Science Fellow, Northwestern University Pritzker School of Law. Hovenkamp's work was supported by the Ewing Marion Kauffman Foundation.

†† John P. Wilson Professor of Law and David and Celia Hilliard Research Scholar, University of Chicago. Masur's work was supported by the David and Celia Hilliard Fund.

1. *See, e.g.*, Mark A. Lemley & Carl Shapiro, *Probabilistic Patents*, J. ECON. PERSPECTIVES, Spring 2005, at 75, 75 (noting that less than 1.5% of patents are ever litigated, and only .1% ever reach trial).

particular case, but rather the legal standard used to choose that amount. Such standards have a substantial impact on the private exchange of patent rights and should therefore be viewed as an important policy lever for encouraging the efficient dissemination and commercialization of patented technologies.

This article addresses a particularly problematic standard for computing patent damages—which we call "licensing-based damages." Under this standard, damages are based on the monetary terms of prior licensing agreements involving the litigated patent. We are particularly interested in damages awards based on prior agreements in which the present plaintiff licensed the now-disputed patent. The licensing-based damages standard is perhaps best known as the first of the fifteen *Georgia-Pacific* factors,[2] which provide guidance for computing patent damages consisting in a "reasonable royalty."[3] However, its use dates back as far as the late nineteenth century.[4]

Today, licensing-based damages are commonly used in disputes involving patents that have been licensed in the past.[5] The courts tend to view this standard as not only convenient, but also accurate. For instance, the Federal Circuit has remarked that, "[w]here an established royalty rate for the patented invention is shown to exist, that rate will usually be adopted as the best measure of reasonable and entire compensation."[6] In the courts' view, the royalty rate from a prior agreement is a strong indicator of what the defendant in suit would have paid for the same rights. Indeed, it is thought to "remove[] the need to guess at the terms to which the parties would hypothetically

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2. Georgia-Pacific Corp. v. United States Plywood Corp., 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970), *mod. and aff'd*, 446 F.2d 295 (2d Cir. 1971) (listing "[t]he royalties received by [the plaintiff] for the licensing of the patent in suit, proving or tending to prove an established royalty" as the first of fifteen factors for computing reasonable royalties).

3. 35 U.S.C. § 284 (2011) ("[T]he court shall award the claimant damages adequate to compensate for the infringement, but in no event less than a reasonable royalty."). The most common interpretation of the reasonable royalty is that it equals what the parties would have agreed to in a counterfactual arm's length licensing negotiation. *E.g.*, Mark Lemley, *Distinguishing Lost Profits from Reasonable Royalties,* 51 WM. & MARY L. REV. 655, 661 (2009).

4. *See, e.g.*, Clark v. Wooster, 119 U.S. 322, 326 (1886) ("It is a general rule in patent causes that established license fees are the best measure of damages that can be used.").

5. *See* Jonathan S. Masur, *The Use and Misuse of Patent Damages*, 110 NW. U. L. REV. 115, 120 (2015) ("Courts have relied upon existing licenses in calculating damages for decades, and the practice has grown even more prominent in recent years.").

6. Tektronix, Inc. v. United States, 552 F.2d 343, 347 (Ct. Cl. 1977).

agree."[7] The implication is that the defendant would have paid the same amount as the prior licensee, notwithstanding that the litigants reached no such agreement on their own.

The problem with licensing-based damages is that they tether patentees to the terms of their prior dealings, and this distorts both litigation outcomes and licensing behavior in a number of harmful ways. Perhaps the most serious problem is that it undermines efficient patent licensing and hence prevents patented inventions from being efficiently disseminated and commercialized.[8] When a patentee licenses its patent, this standard forces it to hedge against the possible future consequences of the present agreement on its future dealings and disputes. This discourages patent holders from licensing at anything less than a high royalty rate—even if additional mutually beneficial agreements could be reached at lower rates—due to the fear that anything less would weaken its patent by limiting its future recovery.

This is in stark contrast to the way agreements are normally formed. Ideally, both parties to a deal would view their transaction as an isolated event that will not bind them in future dealings or disputes with third parties. This is the logic that underpins the privity of contract doctrine. But the licensing-based damages rule makes this impossible. For example, suppose a patentee would like to license to some "fringe competitors," which present only a nominal commercial threat, but not to its primary rival. Licensing is virtually always welfare-enhancing, so this outcome would be efficient. But the licensing-based damages standard may prevent it from happening and may instead lead the patentee to refuse to license to *anyone*. Indeed, an agreement with a fringe competitor would create a false inference that the patentee would have willingly licensed to its primary rival at the same rate. This may be an unacceptable risk, leading the patent holder to rationally (albeit reluctantly) refuse to license with anyone.

The patentee is concerned not only with adversely impacting its future litigation prospects, but also with the fees it can earn in future licensing. If the patent holder were to license at a modest royalty rate, the resulting limitation on future recovery provides a bargaining chip with which future licensees may secure lower fees than they would otherwise pay. Thus, because patent holders are concerned with keeping their patents as strong as possible, they will be reluctant to

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7. Monsanto Co. v. McFarling, 488 F.3d 973, 979 (Fed. Cir. 2007).

8. For the related proposition that this damages standard is unlikely to provide an accurate measure of harm, see Masur, *supra* note 5, at 120 ("[T]here is doubt as to whether existing licenses can provide reliable evidence of reasonable royalty damages.").

strike any licensing deals that might undermine the perceived value of their patents.

One inherent problem with the licensing-based damages standard is that it reflects a trivialized view of patent rights as commercial objects. It treats them like commodities, such as grain or lumber, that are always sold to everyone at a common price. But in fact there are many variables that would tend to create a disparity in the licensing terms reached in different agreements. Section II provides a comprehensive list of such factors. For example, many patented inventions can be applied in a number of different ways or within different kinds of products, which vary in their commercial value. Alternatively, the royalty rate in a licensing agreement may reflect factors that have nothing to do with patent value. For example, a high royalty rate may be used essentially as a financing device, allowing a pre-revenue licensee to avoid paying a large lump sum and instead pay as she goes.

Due to the many variables that influence the terms of licensing agreements, price discrimination—charging different royalty rates to different licensees—becomes an essential condition for efficiency in patent licensing markets. If patent holders feel obligated to stick to a fixed price for all licensees, then they may forgo many mutually beneficial deals that could only be reached on more modest terms. That is to say, rigid pricing will produce deadweight loss, which is a well-understood problem in economics. Thus, ideally patent holders would feel free to price discriminate—to charge low royalties to low-value licensees and high royalties to high-value licensees. Furthermore, unlike many consumer products, the value of a patent license is usually high in relation to the relevant transaction costs, making it generally feasible for a patentee to price discriminate through ad hoc negotiations with different licensees. But the licensing-based damages standard discourages them from doing this. It induces them to strike only the most lucrative licensing deals and thereby keep the royalty rate high, even if additional valuable deals could be reached at lower rates.

The problems with licensing-based damages extend beyond the disincentive they create for price discrimination. If licenses can reduce the amount of damages a patent owner will receive at trial—and thus reduce the amount of future licenses as well—patent owners have incentives to conceal or obscure the licensing deals they have struck. They might couple licenses with other goods such as trademarks or trade secrets that the licensee does not really want or need in an attempt to render the licenses less useful to courts as guides to damages. Or they might simply attempt to conceal the license using

confidentiality agreements and prevent it from ever reaching the public. These tactics, whichever form they take, will likely increase transaction costs, make settlements less likely, and obscure information that could function as a public good. Courts' misuse of licensing-based damages can thus do violence to the IP-licensing ecosystem.

In light of the foregoing conclusions, we propose that the licensing-based damages standard be abandoned and that courts instead award damages ad hoc, on the basis of the value of the technology to the infringer.[9] This does not mean that comparable licenses should not have any influence on the parties. On the contrary, assessments of comparable licenses are quite helpful in private licensing negotiations, and they should be considered in this context. What we suggest, by contrast, is that the courts should not rely on the terms of a prior licensing deal as a measure of the plaintiff's damages. That standard treats any licensing agreement as an implicit commitment by the patentee to accept the stipulated royalty rate as the measure of damages in all future disputes, and this systematically distorts private behavior in licensing markets.

In principle, there may be some situations in which the licensing-based damages standard is appropriate, or at least less harmful. This may be so if the patentee has widely licensed the infringed patent on nondiscriminatory terms.[10] However, as we will show, the standard is still likely to produce an inapt measure of damages in this situation, at least if there was pre-judgment uncertainty as to whether the plaintiff would prevail in court. The prior royalty rate, while stable over time, reflected uncertainty as to whether the plaintiff would win. If the court applies this royalty rate as-is, it implicitly discounts the patentee's recovery to reflect that uncertainty, notwithstanding that it has just eliminated all uncertainty by holding the patent valid and infringed. We show that this will lead to systematic under-compensation over time, assuming that ad hoc damages (expectations of which determine the terms in the first agreement) are accurate in expected value.

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9. *See* David O. Taylor, *Using Reasonable Royalties to Value Patented Technology*, 49 GA. L. REV. 79 (2014) (advocating this type of approach).

10. In particular, this may be so if the patent is very widely licensed at a common rate. For example, some patentees make a commitment to license their patents on reasonable and nondiscriminatory (RAND) terms. These commitments are often applied to patents that are essential to an adopted technology standard, in which case they will be licensed by most or all firms who products read on the standard. *See infra* note 20.

The arguments in the prior paragraph also explain why it is not enough to demand that courts be more careful to ensure that the relied-upon agreements are sufficiently "comparable." Even if the commercial circumstances are largely equivalent, the fact that the prior agreements were reached under uncertainty suggests that they are generally an inaccurate measure of damages. More generally, damages should not be based on economic data that have been distorted by the parties' expectations about what damages will be. Doing so creates a circularity problem that biases damages downward and undermines efficiency in licensing markets.

Econometrics has a term for the bias created by this kind of circularity problem: endogeneity.[11] In effect, endogeneity means that that the modeler—or, in our case, the courts—is relying on a mistaken conception of how some causal relationship actually works. When the courts apply the licensing-based damages standard, the endogeneity problem is the following: the court believes that economic factors alone are shaping licensing terms, and that only these terms are in turn shaping future damages awards. The court thus presumes that economic factors alone are shaping its damages awards. But in fact the licensing-based damages standard has a causal effect on future licensing terms, and this effect is not related to any economic factors relevant to the agreement in question. This, by extension, means that licensing terms are not actually a good measure of damages because they are distorted by the courts' remedial standards. An ironic corollary is that licensing terms are actually less reliable as a proxy for harm than they would be if the licensing-based damages standard did not exist. If courts persist in using this inaccurate measure, patent owners will respond by reducing the number of licenses they grant.

This Article proceeds in four additional Parts. In Part II, we describe the operation of a healthy patent licensing market. In Part III, we explain how courts' use of licensing-based damages can lead to artificial reductions in the damages awarded at trial, and thus to artificial reductions in future licensing revenue as well. In Part IV, which is the heart of the paper, we describe the effects of these distortions on the licensing market. We explain that patent owners will be less inclined to price discriminate, that they will attempt to bundle patent licenses with unnecessary other goods in order to render licenses less transparent, and that in many cases they will simply hide

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11. Kevin D. Hoover, *Causality in Economics and Econometrics*, THE NEW PALGRAVE DICTIONARY OF ECONOMICS ONLINE (Steven N. Durlauf and Lawrence E. Blume eds., 2d Ed. 2008), http://www.dictionaryofeconomics.com/article?id=pde2008_C000569 (providing an overview of endogeneity and causality in economic analysis).

licenses behind confidentiality agreements. Part V concludes with some tentative policy recommendations.

II. PATENT LICENSING MARKETS

For every patent, there is a potential licensing market in which the patent holder may sell the rights to make, use, or sell technologies covered by the patent. As with any other market, we would like a licensing market to operate efficiently, meaning that no possible mutually beneficial transactions are foregone.[12] In addition to benefitting both licensing parties, these transactions create a positive externality in the form of enhanced consumer welfare in the licensee's product market. Indeed, a licensee desires a license precisely because it will allow it to offer a new, improved, or less expensive product to its consumers. This in turn permits it to capture additional profits while also improving consumer welfare. And of course a patentee benefits from mutually beneficial licensing by definition, so a healthy licensing market only strengthens the incentive to invent. Thus, by encouraging both the development and the dissemination of new inventions, an efficient licensing market allows society to have its cake and eat it too.

Although the principal ambition of the patent system is to promote innovation, it clearly has a secondary interest in encouraging the dissemination and commercialization of patented inventions through efficient patent licensing. Because all patent licensing occurs in the shadow of litigation, patent remedies play a prominent role in shaping licensing behavior. Most patentees will never actually receive a remedy (because most patents are never litigated),[13] but beliefs about patent remedies influence virtually all patent licensing. Thus, expectations about damages do a great deal of work, and these expectations are formed principally by the general rules that courts use to calculate damages.[14] For a licensing market to achieve efficiency, these rules must shape incentives in such a way that patent holders are not discouraged from licensing.

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12. Mutually beneficial licensing is possible when a potential licensee values the use of the patented invention more than the patent holder values the exclusion of the licensee's use.

13. Lemley & Shapiro, *Probabilistic Patents*, *supra* note 1, at 75.

14. The only circumstance in which expectations about damages are irrelevant is when there are no damages to award for past conduct and both parties believe with 100% certainty that the court will grant an injunction if the patent owner prevails at trial. Not surprisingly, we suspect that this circumstance arises only very rarely, if ever, in situations where licensing might be mutually beneficial.

Many patents could be licensed on mutually beneficial terms to at least *some* prospective user.[15] This is particularly likely when technologies are complex and can be applied in a number of different kinds of products. For example, mutually beneficial licensing is always possible if the patented technology can be usefully applied by firms that do not compete with the patent holder. The extreme case, which is now quite common, arises when the patent holder is a non-practicing entity that sells no products and thus does not compete with anyone.[16]

Even if a prospective user is a competitor, however, licensing may benefit the competitor more than it hurts the patent holder. In such a case, the parties can still reach a mutually beneficial deal, notwithstanding that it provides a boost to the patentee's rival. For example, if the parties' products are sufficiently differentiated, then competition will not be too fierce, in which case the patentee may not face serious injury by selling a license. Another obvious explanation is the availability of non-infringing alternative technologies. If a rival licensee has a viable alternative option, then licensing may be in the patentee's best interest, even if its first choice would be to exclude the licensee from the market altogether. After all, the alternative technology might impact competition in substantially the same way, but it would not entitle the patentee to collect licensing fees.[17] As this analysis demonstrates, mutually beneficial licensing is legitimately impossible only if (1) all possible licensing applications would substantially increase the degree of competition faced by the patent holder, and (2) prospective licensees do not have reasonably viable alternatives to the patented technology.[18]

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15. Here, and throughout this paper, we focus on patents with legitimate commercial value. However, there are many patents that do not have commercial value, in which case there are no prospective users willing to pay for a license. *See, e.g.*, THOMAS F. COTTER, COMPARATIVE PATENT REMEDIES 46 (2013) ("Many patents have little or no commercial value. . . .").

16. A non-practicing entity is a firm that owns and enforces patents, but does not actually manufacture any products that rely on them. *E.g.*, Mark A. Lemley & A. Douglass Melamed, *Missing the Forest for the Trolls*, 113 COLUM. L. REV. 2117, 2118 (2013).

17. A similar possibility arises if the prospective licensee has a reasonably strong argument that the patent is invalid, in which case the alternative to licensing might be litigation resulting in the patent's invalidation. Here too licensing to a rival may be preferable to the alternative.

18. This is most likely to occur in situations where the patented technology essentially constitutes the final product all by itself, such as a patented pharmaceutical compound.

At the time a patent is granted, the patent holder is the only party with the right to use the patented invention. To the extent that mutually beneficial licensing is possible, this initial allocation of patent rights is inefficient. Ronald Coase famously pointed out the significance of the initial allocation of property rights in markets where, for one reason or another, the relevant parties may not be able to transact efficiently.[19] He noted that

> the initial delimitation of legal rights does have an effect on the efficiency with which the economic system operates. One arrangement of rights may bring about a greater value of production than any other. But unless this is the arrangement of rights established by the legal system, the costs of reaching the same result by altering and combing rights through the market may be so great that this optimal arrangement of rights . . . may never be achieved.[20]

Coase focused on transaction costs as the principal threat to market efficiency. But more generally the threat could be anything that gets in the way of efficient trade, such as a legal rule that discourages efficient patent licensing. And the courts may create such an incentive when they tether patentees to the terms of their prior dealings with nonparty licensees—a result that injures patentees, prospective licensees, and consumers.

A. Anatomy of an Efficient Licensing Market

In order to determine how standards for computing damages are likely to impact licensing markets, the first question to ask is how a well-functioning licensing market would operate in a typical case. For example, what factors determine the license fees in a particular case? How consistent are the terms and scope of different transactions for the same licensing rights? This section addresses these issues and demonstrates that, for a number of reasons, patent licensing markets tend to be more complex and irregular than conventional product markets.

Some markets, such as the market for toasters, are quite simple. They involve very little variability among the terms or scope of different transactions. All buyers of a particular model will receive exactly the same toaster, and they will all use it for the same purpose:

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19. Ronald H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1, 16 (1960).
20. *Id.*

making toast. Further, because transaction costs are high in relation to transaction value, the manufacturer will set a fixed price, and all buyers will pay exactly that amount. Thus, if the price of the toaster is fixed at $10, then we can safely presume this is the same amount that any counterfactual buyer would have been made to pay for it.

For other kinds of products, such as home remodeling, the market is much less consistent, with comparatively little similarity among different transactions. A typical contractor may remodel a hundred homes, but he is probably not asked to do exactly the same thing in any two cases. Thus not all customers are receiving the same thing. Similarly, because some remodels are more elaborate or difficult than others, the price level will vary from one transaction to the next. A home renovator will not charge a fixed amount to all customers but will instead negotiate a custom agreement with each customer. As such, it is largely impossible to identify an "established price" in the market for home renovations.

When courts rely on licensing-based damages, they implicitly treat patent licenses like toasters; they presume that the price paid by one licensee is a strong predictor of what any other licensee would pay for the same rights. But the truth is that patent rights are much more complex, and in fact they tend to act more like home renovations.[21] There are many important variables, discussed in detail below, that will tend to affect the terms of trade with different prospective licensees. If the patent holder simply charged a fixed price to everyone, many potential licensees would simply refuse to license. This is the case even if the parties could reach a mutually beneficial agreement at a lower price. Furthermore, much like a home renovation, the value of a licensing transaction is usually high in relation to transaction costs, enabling patent holders to bargain individually with licensees.[22] Thus, within patent licensing markets,

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21. A prominent exception is a licensing market for a standards-essential patent: a patent whose claimed technology must be used by any product that comports with a particular technological standard. Such patents are very widely-licensed, and frequently the patent holders pledge that they will be licensed on "reasonable and nondiscriminatory" (RAND) terms, which will involve setting a common royalty rate for all licensees. *See, e.g.*, Scott J. Miller, *Standard Setting, Patents, and Access Lock-In: RAND Licensing and the Theory of the Firm*, 40 IND. L. REV. 351, 353 (2007). In these cases, the licensing market looks more like a conventional product market.

22. Another reason bargaining would tend to be feasible here is that a licensor may be able to determine how much value the licensee derives from the relevant patent rights by simply considering the licensing application and how it will affect the licensee's product. By contrast, if the relevant product is a toaster, there is a

price discrimination—the practice of charging different prices to different customers[23]—is generally a necessary and feasible way of achieving market efficiency.[24] Yet by treating patent rights like commodities, the courts inadvertently discourage price discrimination and, by extension, the efficient licensing of patented inventions.

Intuitively, if there is a diverse set of prospective licensees, then it is unlikely that linear pricing—charging the same price to everyone—will achieve market efficiency. In such a case, the patent holder will have to charge different prices to different buyers. In the extreme case the patent holder would engage in "first degree" or "perfect" price discrimination, meaning that it charges each potential licensee a price that is exactly equal to its willingness to pay for a license, which would reach an efficient result by eliminating deadweight loss.[25] However, it is not actually necessary that the patent holder gets all of the trade surplus in every transaction; as a matter of efficiency, it is just as well (and certainly more equitable) for the patent holder to bargain individually with all prospective licensees, in each case choosing a price that leaves both parties better off.[26] In what follows we refer to this more general variety of price discrimination as *discriminatory bargaining*.

The differential welfare effects of linear pricing and discriminatory bargaining are easily seen in the juxtaposed graphs in Figure 1, found on the following page. Here the top and bottom graphs correspond to linear pricing and discriminatory bargaining,

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significant asymmetric information problem because the seller cannot generally predict the value a buyer places on the toaster.

23. More accurately, price discrimination means a disparity in prices charged to different customers that is not explained by a corresponding disparity in the costs of supplying these different buyers. However, for our purposes it is sufficient simply to consider all situations that might induce a patent holder to charge different fees to different licensees. That is, in what follows, "price discrimination" refers to any situation in which a patent holder receives different fees from different licensees of the same patent. Note that, unless a firm always prices at marginal cost, price discrimination is always necessary to achieve economic efficiency. However, due to high transaction costs, perfect price discrimination is almost never feasible.

24. The concept of price discrimination was first introduced by economist Arthur Pigou. *See* ARTHUR C. PIGOU, THE ECONOMICS OF WELFARE 275–89 (1920). For a modern overview of price discrimination and its effects, see Hal R. Varian, *Price Discrimination,* HANDBOOK OF INDUSTRIAL ORGANIZATION 597 (Richard Schmalensee & Robert D. Willig eds., 1989).

25. *See, e.g.*, Daniel J. Gifford and Robert T. Kurdle, *The Law and Economics of Price Discrimination in Modern Economies: Time for Reconciliation?* 43 U.C. DAVIS L. REV. 1235, 1241 (2010) (noting that first degree price discrimination eliminates deadweight loss).

26. That is, all mutually beneficial deals are executed, but we make no assumption about how the parties split the licensing surplus in any given transaction.

respectively. The x-axis can be interpreted as the set of prospective licensees, arranged in decreasing order of their willingness to pay (WTP) for a license. The dotted line in each graph gives the prices charged to these licensees. A licensee will pay for a license only if its willingness to pay exceeds the price it is charged. Linear pricing generates deadweight loss, which captures the forgone value of efficient deals that were not executed, because not all buyers have a WTP that exceeds the constant price level.

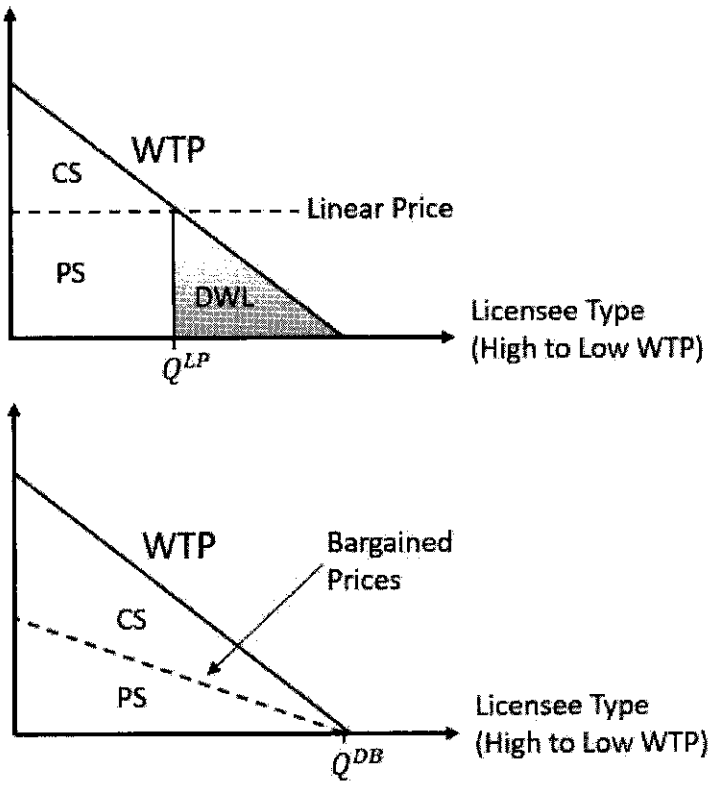

FIGURE 1:
Linear Pricing (Top) Vs. Discriminatory Bargaining (Bottom)

By contrast, under discriminatory bargaining, the price is lower for a licensee with a lower WTP, reflecting that bargaining allows the patent holder to tailor each license fee to the specific needs and preferences of the corresponding licensee. The patent holder is able to transact with all prospective licensees, which achieves market efficiency.[27] In each graph, market welfare (of the patent holder and

27. More accurately, the patent holder licenses to every prospective licensee with whom mutually beneficial licensing is possible. As noted below, if a

its licensees) is given by the sum of the unshaded regions, CS (consumer surplus, which captures the welfare of licensees), and PS (producer surplus, which captures the welfare of the patent holder). As the graphs reflect, market welfare is higher under discriminatory bargaining. There is no deadweight loss in this case because no efficient transactions are forgone. Accordingly, $Q^{DB} > Q^{LP}$, where the numbers Q^{DB} and Q^{LP} give the quantities of licenses sold under discriminatory bargaining and linear pricing, respectively.

The problem with linear pricing is that it cuts off the bottom segment of the market. The only efficient linear price would be zero. But the patent holder, which maximizes its own licensing receipts, would never set such a generous price. This would give it a profit of zero. Rather, just like an oligopolist in a conventional product market, the patent holder charges an inefficiently high price to everyone. Thus price discrimination is preferable for both licensees and the patent holder.

There are a number of reasons why a typical patent holder would like to discriminate in the terms of different licensing transactions. First, different licensees may not be willing to pay the same amount. This is not only a function of the licensee's characteristics. It can also be a result of changes in the number of alternative technologies that are available, or of the circumstances under which a licensing agreement is reached. Furthermore, a patent holder may have its own motivations for charging different amounts to different users. In what follows, we illustrate some of the most important variables that will tend to affect the terms of trade, variables that are largely ignored when a court focuses myopically on prior licensing terms.

***(i)* Alternative licensing applications.** Different licensees may intend to apply the patented technology in different ways, which may vary in the extent to which they enhance the licensees' profits. For example, suppose the patented technology is a spray-on coating that makes steel products more resistant to rust. There are many product manufacturers that could benefit from this. At one end of the spectrum, a licensee that manufactures mufflers for cars would receive substantial utility from the invention, for rust creates holes that prevent a muffler from functioning. On the other hand, a licensee that produces sledgehammers derives much less value from the technology, implying it is not willing to pay nearly

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prospective user is a direct competitor, then there may be no licensing terms that would leave both parties better off.

as much. Rust does not impede the functionality of sledgehammers, so the benefit is merely a shinier sledgehammer. Even though these two licensees have acquired the same rights, they are paying for different kinds of product enhancements: the muffler maker is paying for improved functionality, while the sledgehammer maker is paying for an aesthetic improvement. As this illustrates, a given patent license may represent very different things to different licensees.

***(ii)* Obsolescence; increased competition in the licensing market.** In many cases, the value of a given patent license will depreciate over the patent term.[28] There are two principal reasons for this. First, the patented technology may grow obsolete over time, as it is gradually surpassed by more sophisticated or popular technologies. For example, the digital video disk (DVD) was initially a very popular technology for storing movies for in-home viewing, but it is growing obsolete over time as improved technologies like Blu-ray and digital streaming have become more widely available. A related problem is that although a technology may not grow obsolete in the sense that it becomes inferior, the licensing market may nevertheless grow more competitive over time.[29] That is, as time passes, more and more viable alternatives may enter the licensing market. And, of course, prices are lower in a more competitive market, implying that license fees will tend to fall as the field of competitors grows larger over time. This means that the precedent set by a prior agreement may overstate the value of a license later in the patent term.

***(iii)* Commercial relationship between the parties.** A licensing agreement benefits the patent holder only if it provides license fees in excess of the benefit it would get by excluding the licensee's use. And the value of such exclusion is larger when the licensee is

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28. RICHARD A. POSNER & WILLIAM M. LANDES, THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW, 311–12 (2003).

29. "Biosimilar" or "bioequivalent" pharmaceutical drugs are a good example. These drugs mimic patented drugs without infringing their patents by using different molecules or compounds to achieve substantially the same results. *See, e.g.*, Abbott Laboratories v. Sandoz, Inc., 486 F. Supp. 2d 767 (N.D. Ill. 2007) (declining to hold that a bioequivalent drug infringed a pioneer patent under the doctrine of equivalents simply because it achieved similar therapeutic results); Acorda Therapeutics, Inc. v. Apotex, 2011 WL 4074116 at *9 (D.N.J. Sept. 6, 2011) (same); Adams Respiratory Therapeutics, Inc. v. Perrigo Co., 616 F.3d 1283 (Fed. Cir. 2010) (explaining the difference between the conclusion that a drug is bioequivalent and the analysis of infringement under the doctrine of equivalents).

a competitor. Thus a patent holder will tend to charge larger license fees to firms with which it competes on some level. So, for example, if a patent holder charges a rival a $10 per-unit royalty and later sells this patent to a non-practicing entity (NPE), it does not follow that the NPE and a similar user would reach an agreement for the same $10 per unit. On the other hand, if the patent holder and licensee sell *complementary* products—e.g. a smartphone operating system and smartphone apps—then the patent holder may be willing to accept a lower license fee, all else being equal.

***(iv)* Invention around the patent.** A licensee is willing to pay less when it is more feasible to invent around the patent, or when the benefits of inventing around are larger. Thus, if one licensee is much more technologically sophisticated than another, it would tend to be willing to pay less for a license as it is better equipped to invent around the patent. Similarly, all else being equal, invention around the patent is more valuable when there is more time remaining in the patent term. The cost of inventing around the patent (a fixed cost) will be amortized over a larger number of sales. Thus, all else being equal, a licensee would tend to be willing to pay a larger royalty rate if there is less time remaining in the patent term, in which case invention around is less worthwhile.

***(v)* Financial constraints.** Patent licensing agreements often call for the licensee to pay a two-part tariff: an initial lump sum in addition to a per-unit royalty on licensed sales.[30] If a licensee is financially constrained at the time of agreement—say, because its business is not yet profitable and it does not have easy access to the capital markets—then it may be willing to pay a larger royalty in order to avoid paying a large lump sum. Thus a high royalty may simply reflect a financing deal aimed at spreading out the licensee's total obligations over time; if the deal instead involved a well-heeled licensee, the royalty rate might be much lower, even if both of these licensees happen to get the same benefits from the license. The same logic also applies in the other direction. If the patent holder is in poor financial shape at the time of the agreement, it may be willing to accept a lower royalty in exchange

30. Michael D. Rostoker, *PTC Research Report: A Survey of Corporate Licensing*, 24 J.L. & TECH. 59, 64 (1984) (analyzing data on patent licensing and noting that 46% of agreements in the dataset involve both an upfront fixed fee and a per-unit royalty).

for a larger upfront fee. Here too this has nothing to do with the value of a license.

***(vi)* Sunk cost investments.** In some cases, the patent holder has some leverage over the licensee, enabling it to extract larger fees than it could have hoped to garner in an arm's length bargain. In particular, a licensee may begin developing a technology only to discover that it is already covered by an existing patent. In such a case, the patent holder can extract the costs that have already been sunk in the technology by threatening to "hold up" the infringer[31]—an outcome it could not attain through ex ante bargaining.[32] Accordingly, license fees will tend to be artificially high to the extent that the licensee has already invested in using the patented technology.[33]

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31. *See, e.g.*, Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 2010 (2007) ("[T]he royalty negotiated in the shadow of litigation and holdup can significantly exceed the intrinsic value of the invention itself.").

32. For example, in the well-known *Blackberry Case*, the non-practicing entity NTP obtained an injunction against Research in Motion (RIM), the firm that makes Blackberry devices. The devices used an email system that was held to infringe NTP's patents. But RIM had already made considerable sunk-cost investments in this particular system, and it would be very expensive to switch over to something else on short notice. This holdup problem gave NTP leverage to extract a massive settlement worth more than $600M—about twenty times the amount that the lower court had awarded as damages. *See* NTP, Inc. v. Research in Motion, Ltd., 397 F. Supp. 2d 785 (E.D. Va. 2005). As numerous commenters have noted, this holdup problem allows the plaintiff to capture a much larger payoff than it could even have obtained in an arm's length deal. *See, e.g.*, Lemley & Shapiro, *Patent Holdup, supra* note 31, at 2010.

33. The courts already recognize an extreme case of this leverage problem. In particular, if an independent inventor goes so far as to commence infringing sales by the time licensing negotiations commence—implying licensing is achieved under threat of litigation—then a court will typically place less evidentiary weight on this agreement when calculating damages in a later case. *See, e.g.*, Hanson v. Alpine Valley Ski Area, Inc., 718 F.2d 1075, 1078–79 (Fed.Cir.1983) (noting that license fees set in settlement of an infringement action should not serve as a basis for damages, since they "may be strongly influenced by a desire to avoid full litigation") (internal quotation omitted); Masur, *supra* note 5, at 124–25 ("[C]ourts and commentators generally disfavor licenses that parties negotiated as settlements to ongoing litigation."). Paradoxically, however, some courts decline to adhere to this limitation despite acknowledging that it exists. *See, e.g.*, Intellectual Ventures I LLC v. Symantec Corp., 2016 WL 937220, at *4 (D. Del. Mar. 10, 2016) (noting that settlements are generally not a good basis for damages, but nevertheless awarding damages based on a settlement, citing the fact that the settlement involved a patent that was "sufficiently comparable" to the patent in suit).

***(vii)* Information externalities.** Because licensing terms are determined in the shadow of litigation, they will depend critically on the parties' beliefs about how litigation would turn out. Thus any new information that sheds light on this question may alter the terms of subsequent licensing. For example, if a patent holder has already successfully litigated its patent, then it will tend to charge higher fees in subsequent licensing negotiations, all else being equal. The parties update their beliefs based on what they learned from the lawsuit, and so a successful lawsuit will tend to shift expectations in favor of the patentee. Alternatively, the establishment of a new legal precedent—say, a refinement of some relevant patent eligibility rules—may shed new light on whether the patent is likely to be held valid. This too would tend to affect the licensing terms in subsequent negotiations.

***(viii)* Uncertain value of a licensing application.** Related to the last point, at the time of contracting the patent holder and its prospective licensee may be uncertain as to how much value the patented invention will provide the licensee. For example, it may be that the patented invention has not previously been applied in the way contemplated by the licensee. As such, the royalty rate in the first licensing transaction would ordinarily be lower or higher than in subsequent agreements, depending on whether the application proves to have relatively low or high value. For example, if the first application does better than expected, then subsequent licensees would ordinarily pay more for it, all else being equal.

***(ix)* Patent complementarities.** If a licensee already has the rights to one or more patents that are complementary to the one being licensed, then it derives a larger marginal benefit from the license, all else being equal. This could arise because the patented technologies are complementary in the sense that it is convenient to use them both simultaneously, or because the licensee has a patent that is blocked by the licensed patent.[34] For example, suppose the licensee has a patent on an improved version of the technology covered by the licensor's patent. The licensee would be willing to pay not for the right to use the patentee's inferior technology, but for the right to use its own superior version. All

34. Patent *A* blocks patent *B* if one cannot practice *B* without also practicing *A*. This means that a licensee who wants to use the technology covered by *B* must obtain licenses for both patents. *See* Robert P. Merges, *Of Property Rules, Coase, and Intellectual Property*, 94 COLUM. L. REV. 2655, 2659–60 (1994).

else being equal, this licensee's willingness to pay is higher than that of an alternative licensee who lacks any rights to the improvement.

As the above examples illustrate, there are many variables that shape the terms of a licensing agreement. For a licensing market to operate efficiently, patent holders must not be discouraged from price discrimination when licensing to different licensees. Of course, some (but not all) of the variables discussed above are already addressed in later *Georgia-Pacific* factors. For example, factor five highlights the relevance of the commercial relationship between the plaintiff and defendant, such as whether they sell competing or complementary products, as addressed in point *(iii)* above.[35] But the point is that these factors, along with the other variables mentioned above, tend to undermine the appropriateness of factor one as the sole or primary basis for calculating patent damages.

III. COLLATERAL EFFECTS OF PATENT LICENSING

Ideally, a single instance of patent licensing would be an isolated event that binds only the parties, and only to the extent contemplated by their agreement. In this case, licensing would not create disadvantages in future dealings or disputes arising outside the scope of the agreement. But when courts rely on prior agreements as a basis for damages, they unwittingly tether patentees to the terms of their prior agreements. This creates problematic repercussions for patent owners, which in turn can make them more reluctant to license in the first place.

A. Reduced Future Damages

In Part II we described the many reasons why the licensing price agreed to by one licensee might not accurately reflect the value of the same patent to another licensee. For a variety of reasons, patent owners might charge one licensee more or less than another, even for the same license to the same patent. Accordingly, even at first blush the amount of a prior patent license may not provide an accurate guide to patent damages in a later case. However, these types of errors will

35. *Georgia-Pacific Corp.* v. *United States Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970), *mod. and aff'd*, 446 F.2d 295 (2d Cir. 1971) (listing "[t]he commercial relationship between the licensor and licensee, such as, whether they are competitors" as the fifth factor).

be random, rather than biased. Sometimes the price of a license will be greater for the first licensee than the second; sometimes less. If patent licenses introduced only random errors, rather than biases, into courts' calculations of damages, these errors might be shrugged off as tolerable. After all, it is not as if the available alternative methods for calculating damages are unerring.

Yet these are not the only or necessarily even the most severe distortions introduced by using prior licenses as guides to patent damages at trial. The use of licenses to calculate damages also creates a downward bias on patent damages due simply to the probabilistic nature of patents.[36] When a patent owner and potential licensee negotiate a license, both parties are aware that there is some probability that the patent will be held invalid or not infringed if the parties' dispute were to go to trial. The two parties may not share the same view as to this probability, and they may not be able to estimate it with any great certainty. But it is the very rare case in which either side can be *certain* that a court will find a patent valid and infringed. In the vast majority of cases, there is some non-zero likelihood that the defendant will prevail on one ground or another.

Accordingly, the value of any license will be reduced by the probability that the patent owner will not prevail at trial. Suppose that patent owner P and potential licensee L_1 are negotiating a license to a patented technology that is part of a product L_1 is selling. Suppose further that L_1 values the technology at $10 million and that the parties believe that it is 50% likely that P's patent will be held valid and infringed at trial. P and L_1 would typically agree to a license of approximately $10 million × 50% = $5 million, which represents a discount on the full price to compensate for the uncertainty that is endemic to patent litigation.[37]

Now imagine that P files suit and prevails at trial against a second infringer, L_2, that makes a product similar to L_1's. Once P's patent has been found valid and infringed, the court must assess damages against L_2.[38] In order to do so, one of the court's principal

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36. For an extended discussion of this point, see generally Masur, *supra* note 5.

37. To be sure, this simplified model elides many factors, including the possibility that the parties would face asymmetric stakes in litigation, asymmetric costs, holdup problems, or any number of other variables. This stripped-down analysis is offered in support of a single point: that the value of any patent license will be discounted to reflect the uncertainty surrounding whether the patent will in fact be held valid and infringed. Adding further complexity and detail to the model will not alter that fact.

38. Damages are of course a jury question; our reference to "the court" is meant to include both the jury's calculation and the judge's involvement in designing jury

sources of information would be the license that P negotiated with L_1. This license is the very first *Georgia-Pacific* factor; but more than that, it represents (to the court) the market's valuation of the patented technology. Given the difficulty of accurately estimating the value of patented technology from expert reports and pricing information alone, one would expect courts to seize upon this type of market-based indicator. Indeed, this is what courts typically do. Past licenses of the same or similar technology to similarly situated licensees are considered highly reliable indicia of a patent's value, and courts commonly award damages in the range of prior licenses. Here, then, the court would likely award damages against L_2 and to P of approximately $5 million in accordance with the license that P and L_1 negotiated.

Yet a damages award of $5 million would be error. As a matter of black-letter patent law, the appropriate amount of damages is the licensing fee that the parties would have negotiated *had they agreed that the patent was valid and infringed.* That figure is $10 million—the full value of the patented technology to L_1. The $5 million license is the full value of the technology discounted by the probability that the patent will be held invalid or not infringed. A court cannot simply treat an actual license as if it were granted pursuant to a negotiation in which both parties viewed the patent as valid and infringed. It is rarely the case that both parties to a license will view infringement and validity as certainties, and indeed such cases may not even exist. The court cannot rely upon the $5 million license between P and L_1 as if it represents the underlying value of the patent, stripped of all uncertainty.

Accordingly, when courts use existing licenses to assess damages, they will inevitably undervalue the patents in suit. Every licensing amount will essentially be discounted to reflect some probability that the patent will be held invalid or not infringed.[39] If that probability is greater than zero, the licensing fee will be less than the value of the underlying patented technology. Only in the rare case when the parties agree that the patent is 100% likely to be held valid and infringed will the license provide an accurate guide to damages. Otherwise, the license will represent only some proportion of the overall value the court is attempting to determine.

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instructions, allowing (or not allowing) evidence of damages, or adjudicating motions for additur or remittitur.

39. The only important exception is when the licensee's best outside option is to design around the patented feature. Lemley & Shapiro, *Patent Holdup*, *supra* note 31, at 2003–05.

Nor can the court back out the parties' true value simply by scrutinizing the license. Even if the parties did agree upon a value for the patent and a probability of success at trial—and they likely did not—the license will not reveal this information. The license will almost certainly include only one dollar figure: the amount of the license itself. If two parties negotiate a license for $5 million, the court will have no way to determine whether the parties believed that the patented technology was worth $5 million and the patent was 100% likely to be held valid and infringed, or whether the technology was worth $10 million and the patent was 50% likely to be valid and infringed, or some other arrangement.

This opacity presents a fundamental problem for any court that seeks to use existing licenses as guides to patent damages. The court cannot determine the true value of the patent from the license, and furthermore it would be error for the court to simply use the value of the existing license as a measure of damages.

B. Distorted Fees in Future Licensing

The last section showed that licensing-based damages can lead to under-compensation by failing to account for uncertainties that shape license fees. A corollary is that this under-compensation will generally translate into reduced fees in future patent licensing. As already noted, licensing terms are shaped principally by the parties' expectations of how litigation would play out. Thus, if the parties expect damages to undercompensate, then this provides prospective licensees with a bargaining chip for securing lower license fees than the patentee would ordinarily accept.

Consider an example. There are two prospective users—L_1 and L_2—that would like to license a patent owned by a patent holder, P. For each prospective user, the value of a license is $100,000. For the sake of simplicity, assume each of their intended applications clearly reads on the patent (i.e., there is no uncertainty on the infringement question), but the patent may or may not be valid. Specifically, all parties believe that there is a 50% probability that the patent will be held valid. Suppose that P is initially approached by L_1 to strike a licensing deal. Since there is no prior licensing deal on which to base damages, they presume that damages would be assigned somewhat randomly, but with an expected value equal to the full value of a license ($100,000).[40] However, knowing that there is a 50% chance

40. This assumption is not at all essential to the argument; it just makes things simpler. Even if expected damages were different from $100K, subsequent licensing would still result in lower fees.

that the patent is invalid, they discount this amount by half, and thus agree on a fee of $50,000.

Now suppose that, after this agreement is formed, L_2 approaches P to strike a second licensing deal. The parties expect that a court would base damages on the prior agreement, providing an award of $50,000. However, as before, the parties believe that P has only a 50% chance of winning, so they discount the expected award by half, resulting in a license fee of $25,000. Thus, even though there are no material differences between the licensees, the second agreement results in lower fees. By contrast, if the courts did not adhere to the licensing-based damages standard, then nothing would change in the second agreement; the negotiated fee would be the same $50,000.

The problem is that, by basing damages on the prior license fee, the courts fail to filter out the "uncertainty discount"—the percentage by which the license fee was reduced to reflect P's uncertain litigation prospects—from the prior agreement. The damages award subsumes this uncertainty discount. But subsequent licensing negotiations also occur under uncertainty—as before, P is not certain to win in court—resulting in a second round of discounting. As a consequence, the fee reached in the second agreement carries two iterative discounts—one reflecting uncertainty in the present agreement, and one reflecting uncertainty in the first agreement. Of course, there is no good reason that the fee charged in one agreement should reflect the uncertainty faced in another. But this nonsensical result is nevertheless a rational response by the parties to licensing-based damages.

Even if there is no uncertainty about the patent holder's litigation prospects, a prior licensing agreement may come back to haunt the patent holder. This can occur when efficient licensing would involve significant price discrimination. Consider the following example. A patent holder is initially approached by a prospective licensee, Beta, who values a license at $100,000. As in the preceding example, suppose that the court's damages, if not based on any prior agreements, would equal the full licensing value ($100,000) in expected value. But in this case suppose that the patent holder is certain to win if it brings an infringement claim. Thus the patent holder can extract the full $100,000 from Beta.[41]

41. Alternatively, they could split the surplus in some way, as contemplated in the discriminatory bargaining outcomes depicted in Figure 1. But for simplicity, we assume for now that the patent holder can extract the full licensing surplus.

After this agreement is formed, another prospective user, Alpha, approaches the patent holder. Alpha attaches much more value to the patented invention—say, because it provides a larger incremental benefit when applied to Alpha's product—and is willing to pay as much as $500,000 for a license. If the parties expected damages to equal the license value—as they did in the first agreement—then the patent holder could extract a fee of $500,000. However, this is not possible if a court will award damages based on the prior agreement. In this case, the expected damages are just $100,000—one fifth of what the patent holder would have received but for the prior agreement. In fact, even if Alpha were held to have willfully infringed, treble damages would only amount to $300,000, still substantially less than what the patent holder could ordinarily obtain.[42] In either case, licensing-based damages inadvertently compel the patent holder to give Alpha a steep discount.

The same problem could cut in the opposite direction, benefitting patent holders and injuring defendants. This may be particularly pronounced in situations in which a defendant has unintentionally infringed the patent and damages are likely to be based on the terms of a prior agreement that happened to involve a relatively high royalty rate. To illustrate, imagine, in the above Alpha-Beta example, that Alpha had been the first to approach the patent holder and licensed the patent for $500,000. Now suppose that Beta later unintentionally infringed the patent. Based on the prior agreement with Alpha, a court would require Beta to pay damages of $500,000—five times more than it would otherwise pay.

To synthesize what is going on here, suppose there are two licensing agreements involving the same patent, one occurring at time $t = 1$, and the other occurring at time $t = 2$. For each t, there is a distinct licensee, L_t. Then let $V_t > 0$ denote L_t's valuation for a license, and let p_t denote the probability that the patent holder would win an infringement suit against L_t. Note that $0 \leq p_t \leq 1$, since this is a probability. Now assume that, if damages are awarded ad hoc, they will equal the defendant's license valuation (V_t) in expected value. Let F_t denote the fee charged in agreement t, which will depend on the variables just defined. In the first agreement, there is no prior deal that would influence damages. Thus, expected damages would be V_1, resulting in the fee

$$F_1 = p_1 V_1$$

42. 35 U.S.C. § 284 (2011) (stating that in cases of willful infringement, "the court may increase the damages up to three times the amount found or assessed").

This says that the fee in the first agreement is simply equal to expected damages (L_1's valuation), discounted by the patent holder's probability of winning. If courts did not rely on licenses in calculating damages, the fee in the second would be analogous—it would be p_2V_2—because the parties to this agreement would expect damages to be V_2 if the patent holder won in court. But if the prior fee F_1 would instead be the basis for damages, then the fee charged in the second agreement would be

$$F_2 = p_2F_1 = p_2 \times p_1V_1$$

Here we can see both of the problems that came up in the preceding examples. First, F_2 nonsensically reflects uncertainty from the first agreement, as captured by the fact that it includes p_1 as a factor. This discounts the fee based on uncertainty that is entirely impertinent to the agreement in question. The second problem is that F_2 reflects the valuation of the wrong licensee—it includes the term V_1 rather than V_2, even though the former is not a reliable guide to the present agreement. This could either increase or decrease the fee depending on how V_1 and V_2 compare. Overall, F_2 is lower than the proper fee (p_2V_2) when $p_1V_1 < V_2$, and it is higher when $p_1V_1 > V_2$.[43]

An implication of this analysis is that, even if there have been many prior licensing deals involving a common royalty rate, it does not follow that the court should use the established royalty as a measure of damages. The established royalty was likely discounted by the parties' uncertainty about whether the patent would be held valid and infringed. If the court were to apply the established royalty as damages, it would preserve this discount and award the infringer the same discount it might have negotiated under conditions of uncertainty. This would be a nonsensical result, for the court has just resolved that uncertainty. Preserving this uncertainty-based discount limits the plaintiff's recovery based on factors that have nothing to do with the intrinsic value of a license or the commercial injury suffered by the plaintiff. As such, there is no reason that such factors should influence the remedy.

43. One obvious caveat is that, unless the second licensee has unintentionally infringed, it will never agree to pay more than V_2. Thus, if $p_2p_1V_1 > V_2$, then F_2 would be truncated to V_2.

IV. IMPACT ON LICENSING INCENTIVES

The preceding section explained how licensing-based damages may distort damages awards and, by extension, the terms of licensing agreements. These first-order effects do not involve a direct change in the *allocation* of patent rights; they simply alter the amount of money that changes hands in the course of licensing or litigation. However, parties will anticipate these effects ex ante and adjust their conduct accordingly, and this second-order effect may indeed influence how patent rights are allocated. Thus, the more serious concern with licensing-based damages is that they tend to distort licensing behavior and thereby undermine the efficient dissemination of patent rights. This section addresses some of these adverse incentive problems.

A. Diminished Licensing

A patent is only as strong as the remedies that can be obtained to enforce it.[44] Thus, patent holders do not want to do anything that might undermine their ability to receive a strong remedy in the future. When the courts rely on licensing terms as a basis for damages, patent holders influence future remedies whenever they strike a licensing deal. As such, they have a strong incentive to make their patents appear valuable by licensing on relatively lucrative terms, ensuring future remedies will be comparatively strong. Unfortunately, this kind of posturing will tend to require that the patent holder forgo efficient licensing deals that can only be reached on more modest terms. The result is that the licensing-based damages standard diminishes the number of efficient licensing deals that are executed, thereby creating deadweight loss.

If efficient licensing would involve a significant degree of price discrimination, then licensing-based damages undermine efficiency by diminishing the patent holder's willingness to price discriminate. In such a case, there are a number of different licensees willing to pay variable amounts. But if the patent holder transacts with the low-valuation licensees, this may prevent it from collecting satisfactory fees in transactions with the high-valuation licensees. This would also undermine the damages the patent holder could obtain in future litigation. Thus, in an effort to avoid these outcomes, the patent

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44. Masur, *supra* note 5, at 127; Dov Greenbaum, *Academia to Industry Technology Transfer: An Alternative to the Bayh-Dole System for Both Developed and Developing Nations*, 19 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 311, 388 (2009) ("[W]ith no potential enforcement by the owner of the IP, potential licensees may see no incentive to ever license the patent; infringing at will.").

holder may rationally (albeit regrettably) refuse to license to prospective users who are not willing to pay a relatively large amount for a license.

A principal problem is that, at the time of licensing, a patent holder likely cannot predict how the present agreement will impact it in the future, and as such it may prefer to remain cautious and accept only a relatively high royalty rate. This derives from uncertainty about its future licensing and litigation prospects. For instance, a patent holder may be uncertain as to the various ways a patent could be usefully applied, or of which firms might be interested in licensing. (In fact, it is unlikely that a typical patent holder has perfect information about these things.) For example, at the time a patent is granted, the patent holder may suspect that there are many possible applications, but it may have so far identified only a few of them. In this case, a patent holder does not want to establish a low royalty rate early in the patent term only to learn later on that its invention has some much more valuable alternative applications. This would give the courts the mistaken impression that the patent license is not particularly valuable, allowing licensees using the more valuable application to get a steep discount. As such, a patent holder may be relatively cautious or inflexible early in the term until it has a better understanding of the patent's applications, even if it could begin striking some mutually beneficial licensing deals soon after the grant date.

Another possibility is that both the patent holder and licensees may be uncertain how valuable the licensed invention will be in practice. For example, if a new software program is added to a smartphone, it may be unclear ex ante how consumers will respond to the addition and, by extension, how it will affect sales of the smartphone. On one hand, a prospective licensee does not want to pay too much for a license, for the patented technology may not prove particularly helpful. On the other hand, the patent holder does not want to accept too low a royalty, for if it turns out that the application is quite helpful, it may be compelled to offer future licensees the same low rate. This reflects the fact that a prospective licensee is thinking only about the deal in question, but the patent holder must think about how the deal will affect its future licensing and litigation prospects. This could lead to delays in licensing or to a complete breakdown in negotiations.

More generally, licensing-based damages will tend to replicate the deadweight loss problem that results from linear pricing, which was illustrated in Figure 1. This is not because it induces a patent holder to charge identical royalties to all comers. Rather, it will tend

to induce a patent holder to choose some minimum royalty rate below which it refuses to license, and then bargain only with those firms willing to match or exceed this threshold. Because there are likely to be some mutually beneficial licensing opportunities that require a lower royalty rate, this creates deadweight loss by foreclosing some efficient transactions.

Diminished future license fees are not the only thing that may deter the patent holder from licensing at a relatively modest royalty rate. The patent holder may have a strong interest in excluding a direct competitor from using the patented technology, and it may be able to do this only if it refuses to license at anything less than a high royalty rate, or perhaps only if it declines to license *at all*. As noted in an earlier section, it may be impossible for a patent holder and a direct competitor to reach mutually beneficial licensing terms. This is not surprising. The right to exclude competitors is a principal source of patent value, and many firms do not license their patents to direct competitors. At the same time, it may nevertheless be possible to license a patent to non-competitors. The patented invention may have useful applications within non-competing products. In this case, market efficiency would involve licensing to non-rivals but not the competitor. Nonetheless, the patent holder may rationally refuse to license to *anyone*. Licensing might establish a royalty rate that it would never accept from the competitor, which would provide its rival with leverage in future litigation. That is, licensing might prevent the patent holder from obtaining an adequate remedy if the competitor went on to infringe the patent.

Licensing-based damages need not always work to a patent holder's detriment, however, notwithstanding that they result in fewer licensing transactions. If the patent holder earns significantly larger fees but strikes fewer licensing deals, the former effect may dominate the latter. This could cause overall licensing revenues to increase. This can happen if the market value of a license declines after the patent has been licensed at a relatively high rate—say, because a number of competing alternatives entered the licensing market—so that a licensee in an arm's length bargain would subsequently pay only a small fee. In this case, the patent holder's best strategy may be to rely on a "wait and sue" approach. It could sit on its rights and use its high established royalty to secure supra-competitive fees from unintentional infringers. In this case, the patent holder would not want to bargain at arm's length, even though this would likely result in more deals being consummated, because it could garner only small fees in these agreements. Rather, it would prefer to bargain only when it has

leverage—liability for damages that will be based on the high prior royalty—with which it can extract excessive fees.

B. Royalty Gamesmanship

When patent owners do agree to license their IP, they will also have incentives to obfuscate or distort the terms of those licenses. If courts will look to existing licenses to determine patent damages, then patent owners have every reason to structure those licenses such that the price appears to be as high as possible. There are a variety of strategies that patent owners might employ, and here we canvas a sampling of them.

First, the patent owner might attempt to bundle other goods along with the patent as part of the license in exchange for a higher licensing price.[45] The patent license might be drafted to include other forms of IP, such as trademarks or trade secrets relevant to the patented technology. It might include the provision of tacit knowledge, such as a promise by the patent owner to direct its scientists and engineers to help the licensee implement the patented technology.[46] Or it might be paired with a future promise of some type, such as an unstated agreement to separately cross-license some other technology owned by the licensee.

These types of maneuvers are not necessarily welfare-diminishing, though they may result in future patent infringers being forced to pay excessive damages at trial.[47] However, the process of negotiating them could increase transaction costs. And if the parties are not able to agree upon the higher price to be paid for these additional considerations, the result could be that the opportunity to license the patent is forgone entirely.

At least in theory, courts police existing licenses for this type of strategy. The Federal Circuit has instructed trial courts that they are not to use existing licenses as a measure of damages when those licenses include consideration other than merely a license to the patent

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45. Masur, *supra* note 5, at 142.

46. *See generally* Peter Lee, *Transcending the Tacit Dimension: Patents, Relationships, and Organizational Integration in Technology Transfer*, 100 CALIF. L. REV. 1503, 1516 (2012) (explaining that patent licenses can facilitate the transfer of tacit knowledge).

47. *Cf.* Keith N. Hylton & Mengxi Zhang, *Optimal Remedies for Patent Infringement* (Boston Univ. School of Law, Law and Economics Research, Paper No. 15-53, 2015) (laying out a formal model that describes the optimal amount of damages patent owners should receive).

itself.[48] In practice, it is difficult to know how successful these policing efforts really are. But even if courts are entirely successful at weeding out patent licenses that include inducements beyond the patent itself, that will only solve one problem—the problem of inflated damages verdicts. In fact, it will also *heighten* the incentives of patent owners to negotiate licenses that include more than just the right to use the patented technology. Patent owners will understand that if they can lard up the license with other considerations, courts will not rely upon the license as a guide to future damages. And because the use of existing licenses typically leads to underestimations of patent damages, patent owners will be eager to take their own existing licenses out of consideration. The result could be a proliferation of needlessly complicated licenses involving considerations that neither party values especially highly—and thus excessive transaction costs.

A second strategy that a patent owner might employ is to engineer the sequence of licenses it negotiates, with the highest-value licenses negotiated first (and before any trial occurs). For instance, low-volume licensees—parties who only plan to use the patented technology in a small number of units or over a short time period—might well be willing to pay higher per-unit prices than higher-volume users. Because the patent license will consume a lower proportion of a low-volume user's overall budget, that user might be more willing to settle quickly on a higher price rather than consuming greater resources haggling over a lower one.

There is nothing inherently problematic about strategically sequencing licensing negotiations, but again, as with the tactics detailed above, any additional complications introduced into the licensing process could derail parties from ever reaching agreement. For instance, imagine a situation in which a large-volume potential licensee wishes to negotiate a license to a valuable patent. The patent owner might prefer to delay consummating this license until after a trial concludes, or until after the patent owner has negotiated a separate license with another party for the same technology. In the meantime, the potential licensee—not wishing to be left in limbo—might adopt a different (and inferior) technology or simply drop the relevant line of

48. *See* ResQNet.com, Inc. v. Lansa, Inc., 594 F.3d 860, 873 (Fed. Cir. 2010) ("In sum, the district court erred by considering ResQNet's re-bundling licenses to significantly adjust upward the reasonable royalty without any factual findings that accounted for the technological and economic differences between those licenses and the '075 patent."); *see also* John Elmore, *The Technological Comparability of Patent License Agreements*, 46 LES NOUVELLES 115, 116 (2011) ("[C]ase law cautions that patent license agreements providing substantial non-patent benefits or multiple patents may not be comparable to a 'straight' patent license.").

business entirely. The result would be needless social costs driven entirely by the patent owner's desire to structure its licensing behavior in light of courts' misuse of licenses in assessing damages.

Third and finally, a patent owner might attempt to structure the terms of a licensing agreement to make the license appear more lucrative on a per-unit basis than it actually is. There are a variety of ways to accomplish this, but the general idea is that the license is written as if it covers fewer units or a shorter period of time than it does in fact.[49] For instance, suppose that a firm has been infringing a patent from 2012 through 2016. Imagine that the parties are willing to agree to a license of $10 million per year of infringing activity, or $40 million total. The patent owner might instead suggest that the license to be written to cover the years 2014 through 2016 only, yet for the same amount of $40 million. To a court (or a future licensee), the licensing price would appear to be $20 million per year, rather than $10 million. The parties might then arrive at an understanding (which they do not memorialize) that the patent owner will not sue the licensee for infringement from 2012 to 2014. Or the parties might simply rely upon the doctrine of laches to block suit for that period.[50]

A roughly equivalent strategy is to draft a license that intentionally understates the number of units it is meant to cover. For instance, imagine that the patent owner and putative licensee agree that the licensee intends to use the patented technology in 10 million manufactured units and is willing to pay $4 per unit, or $40 million in total. The parties might draft a license stating that the patent owner grants a license in exchange for a lump sum of $40 million. The license might then further state that the parties "anticipate that the licensee will produce 5 million units"—which implies a price of $8 per unit. This language could be drafted to be unenforceable: if the licensee produces more than 5 million units—which both parties expect will occur—that does not void the license or alter its terms. For the licensee, nothing is lost. And for the patent owner, the patented technology appears to be more valuable than it actually is.

Or, in the alternative, a licensor could include geographic or field-of-use restrictions that are meaningless to the particular licensee but make the license seem more valuable than it really is.[51] For instance, a license granted to a firm that only does business in

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49. *See* Layne S. Keele, *Res"Q"ing Patent Infringement Damages After* ResQNet*: The Dangers of Litigation Licenses as Evidence of a Reasonable Royalty*, 20 TEX. INTELL. PROP. L.J. 181, 228 (2012) (describing this type of arrangement).

50. *See* Carnegie Mellon Univ. v. Marvell Tech. Grp., Ltd., 807 F.3d 1283, 1298 (Fed. Cir. 2015) (discussing the legal standard for laches in patent cases).

51. Masur, *supra* note 5, at 142.

California could be written to state that it is "only valid in California." Or a license granted to a firm that manufactures medical devices could be written to state that it "only applies to medical devices," making it appear that a more general blanket license would be more expensive. These sorts of tactics are not merely hypothetical. There are several cases on record in which a patent defendant has alleged that a licensor has engaged in one or more of these tactics in an effort to inflate the perceived value of a patent license.[52]

Again, the primary result of these practices will likely be to inflate the prices that future licensees or infringers held liable at trial will be forced to pay. Standing by itself, that may not create tremendous social loss. But the process of negotiating such a license could involve greater transaction costs than would accrue if the parties were "playing it straight," and in some cases the result might be a foregone licensing opportunity. These are potentially significant social costs, generated by the ways in which courts use licenses to value patents.

The general theme of this section is that an arms-length market valuation of a good, such as a patent, is only as reliable as the parties negotiating it. When one party has an incentive to strategically inflate or alter the terms of that license, the license can no longer be counted upon to provide accurate estimations of a patent's value. Moreover, the fact that licenses play such a central role in calculating patent damages—and the manner in which courts employ licenses in that calculation—creates incentives for patent owners who are repeat players to manipulate licensing terms whenever possible. The ripple effects of courts' treatment of licenses are persistently negative.

C. Confidentiality in Patent Licensing

If patent licensees cannot inflate the value of the licenses they negotiate—or perhaps even if they can—they might respond by attempting to keep the licenses confidential. If information regarding the licenses cannot be disclosed, then they cannot be used against the patentee to reduce damages at trial. Patentees might thus protect licensing agreements with confidentiality provisions and non-

52. *See* Microsoft Corp. v. Motorola, Inc., 2013 WL 2111217, at *2 (W.D. Wash. 2013) (in which Motorola introduced as evidence of damages a license that it had negotiated with a smaller firm and that may have been inflated for purposes of driving up Microsoft's damages); Ericsson, Inc. v. InterDigital Commc'ns Corp., 418 F.3d 1217 (Fed. Cir. 2005) (in which Nokia accused InterDigital of artificially inflating the value of its patents to increase Nokia's required payments); Masur, *supra* note 5, at 142–43 (describing these cases).

disclosure guarantees in an effort to prevent them from being disclosed in the event that the licenses become relevant in future litigation.

In most cases, however, this strategy will not succeed. For the most part, district courts have permitted discovery of prior licenses, even licenses protected by confidentiality agreements, when the licenses appear relevant to the question of damages.[53] (Of course, our argument is that these licenses are almost never relevant to the damages calculation, but courts do not yet subscribe to that view.) In some cases, courts will issue a protective order that permits discovery of the documents but prevents the parties and their attorneys from further disclosing the information outside of the trial.[54] In some cases, courts will prohibit discovery of prior licenses when the court does not believe that the licenses are highly probative of the damages issue before the court.[55] At least one district court has also held that ongoing or unconsummated settlement and licensing negotiations involving the patents-in-suit are not discoverable.[56] Accordingly, in some circumstances patent owners might be expected to delay finalizing licensing agreements until after the conclusion of a contemporaneous trial. Nonetheless, our review of the case law leads us to conclude that existing licenses will be discoverable in the majority of cases.

Attempting to shield licenses with confidentiality agreements might be thought of as one species of the greater genus of methods that patentees might use to eliminate existing licenses as guides to damages. As we observed in the preceding section, some patent holders might seek to render licenses useless as measures of damages by bundling them with other goods. This is only a partial solution because the licensing price still represents a floor on the value of the patent. It is similarly unlikely that patent owners will be able to shield

53. *E.g.*, Wyeth v. Orgenus Pharma Inc., No. 09-3235, 2010 WL 4117157, at *4 (D.N.J. Oct. 19, 2010); Pandora Jewelry, LLC v. Bajul Imports, Inc., No. 1:10-CV-135 SNLJ, 2011 WL 976623, at *1 (E.D. Mo. Mar. 17, 2011); High Point SARL v. Spring Nextel Corp., No. 09-2269-CM-DJW, 2011 WL 3241432, at *2 (D. Kan. Jul. 29, 2011); Clear with Computers, LLC v. Bergdorf Goodman, Inc., 753 F. Supp. 2d 662, 664 (E.D. Tex. 2010).

54. *E.g.*, Cornell Research Found., Inc. v. Hewlett Packard Co., 223 F.R.D. 55, 67–68 (N.D.N.Y 2003); Sprinturf, Inc. v. Sw. Recreational Indus., Inc., 216 F.R.D. 320, 322 (E.D. Pa. 2003).

55. *E.g.*, Bayer AG v. Sony Elecs., 202 F.R.D. 404, 408–09 (D. Del. 2001); Centillion Data Sys., Inc. v. Ameritech Corp., 193 F.R.D. 550 (S.D. Ind. 1999); Fenner Invs. Ltd. v. Hewlett-Packard Co., No. 608CV273, 2010 WL 1727916, at *3 (E.D. Tex. Apr. 28, 2010) (holding that *ResQNet* does not compel the admission of evidence relating to settlement agreements in prior litigation); Software Tree, LLC v. Red Hat, Inc., No. 609CV097, 2010 WL 2788202, at *4 (E.D. Tex. Jun. 24, 2010).

56. Mondis Tech., Ltd. v. LG Elecs., Inc., 2011 WL 1714304, at *5 (E.D. Tex. May 4, 2011).

licenses using confidentiality agreements, as we explained. But it is important to note that these methods are not mutually exclusive. A patent owner could bundle a patent license with other goods, massage the license terms to make them appear more lucrative than they really are, and then attach a strict confidentiality guarantee to the agreement as well. A patentee who pursues enough of these strategies simultaneously stands a good chance of convincing a court that the license is incomparable or worth more than it might appear.

Patent owners also have incentives to keep licenses confidential from other potential licensing partners, even under circumstances where divulging a license would ordinarily be in both parties' interests. For instance, imagine that a patent owner successfully negotiates a non-exclusive license with Firm A for $10 million. It then opens negotiations with Firm B, which is similarly situated to Firm A, and seeks royalties in the same amount. If courts did not use licenses to set damages, it would be in the patent owner's interest to divulge the existence and terms of its license to Firm A in the course of negotiations with Firm B. The price of that license would provide a focal point for negotiations with Firm B and might well convince that firm to license on similar terms.[57] The information revelation would similarly be in Firm B's interests. It might reduce the costs of negotiation and provide information about the activities of Firm B's competitors. More generally, additional information cannot possibly be harmful to Firm B.

But if courts will use licenses to calculate damages, the patent owner has a strong incentive *not* to disclose its prior license to Firm B. Once Firm B observes the $10 million license between the patent owner and Firm A, it may believe that it faces only $10 million in potential liability should it lose at trial. If Firm B believes that it has a realistic chance of prevailing at trial, it will only be willing to license the patent for some fraction of $10 million. (To be precise, as we noted in the preceding part, the value of the license will be discounted by the probability that the patent will be held invalid or not infringed at trial.)[58]

On the other hand, it is possible that courts' use of licensing-based damages will actually encourage settlement in some cases. The reason is that once the patent owner has licensed the patent for the first time, the owner will become more pessimistic about the damages it will likely be awarded at trial. For instance, suppose that Firm B is unaware of Firm A's license. Imagine that the patent owner and Firm

57. *See generally* RICHARD H. MCADAMS, THE EXPRESSIVE POWERS OF LAW (2015).

58. *Supra* Part II; Masur, *supra* note 5, at 129–32.

B agree that the patent is 50% likely to be valid and infringed, and that a court would likely award $20 million if the patent owner prevailed at trial. Firm B should be willing to pay $20 million × 50% = $10 million for a license. But if the patent owner knows that the license with Firm A is likely to be divulged at trial, it will understand that its likely damages at trial might actually be $10 million (the license value) × 50% = $5 million. Firm B would be willing to license for any amount less than $10 million, which is what it (mistakenly) expects to pay at trial; however, the patent owner would be willing to license for any amount greater than $5 million, which is what it expects to receive at trial.[59] This opens up $5 million in bargaining space.[60] Under these conditions, the parties are more likely to reach agreement.

Whether courts' misuse of licensing-based damages will encourage or discourage settlement in any given case is therefore highly contextual. But the more general problem with patent licenses being made confidential is that existing, publicly known licenses represent a public good. Even if licenses are not useful in calculating damages, they are potentially very useful as guideposts for other licenses. One of the difficulties in arranging efficient patent licensing is that the terms of existing licenses are often not well known, so parties struggle to find benchmarks for the deals they wish to strike. The result is an increase in the cost of bargaining and a decrease in the number of licensing deals due to bargaining breakdowns.

The more licenses are made public, the greater the benefits to third parties. Some larger firms have attempted to assemble large licensing databases as a means of providing this type of information, but those efforts have been halting and may also be biased by the firm's own interests. As a general matter, it would be beneficial if more licenses became public as a matter of course, or even as a result of litigation. If patent owners respond to the use of licenses to calculate royalties by attempting to hide licenses, the pool of potentially valuable licensing information will diminish.

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59. *Cf.* Ben Grunwald, *The Fragile Promise of Open-File Discovery*, 49 CONN. L. REV (forthcoming 2017) (predicting that criminal cases will be plea bargained—that is, settled—more frequently if defendants gain full knowledge of the strength of the prosecution's case).

60. *See* Richard A. Posner, *An Economic Approach to Legal Procedure and Judicial Administration*, 2 J. LEGAL STUD. 399 (1973) (describing the settlement bargaining game); *see also* John P. Gould, *The Economics of Legal Conflicts*, 2 J. LEGAL STUD. 279 (1973) (same); *cf.* William M. Landes, *An Economic Analysis of the Courts*, 14 J.L. & ECON. 61, 66–69 (1971) (same).

V. CONCLUSION: PROPOSED REFORM

To avoid the problems created by the licensing-based damages standard, we offer a simple proposal: courts should be extremely careful when using existing licenses to gauge damages, and in most cases they should ignore licenses entirely. Even if the litigated patent has previously been licensed to one or more third parties, the terms of those agreements should generally be considered irrelevant or at most treated as a very weak guide when fashioning a remedy. That is, damages should be assigned through the same calculus employed in cases where there are no prior agreements to use as a baseline. This ensures that remedies are not influenced by expectations about remedies, and that licensing markets will not be distorted by concerns that today's dealings might undermine tomorrow's disputes.

Because judicial reliance on prior licensing agreements is so widespread, we anticipate that some readers will be skeptical of our proposal. At first blush, it may appear to understate the practical complexities that distinguish patent practice from patent scholarship. But any such criticism rests implicitly on one or more fallacious assumptions. The first and most significant fallacy, which we have already exposed in detail, involves the presumption that prior licensing agreements are likely to provide apt measures of damages. We have demonstrated why, for a number of reasons, this presumption is false. It rests on a naïve and grossly over-simplified conception of patent licensing transactions. It also fails to appreciate the economic complexities that distinguish them from purchases of conventional goods or services, in particular the influence of the courts on the terms of trade. Indeed, even if the relevant commercial circumstances are similar in a prior agreement, it does not follow that the royalty rate negotiated in that agreement would provide a good measure of damages in the next case. The terms of the prior agreement were likely distorted by the parties' uncertainty about litigation, and such concerns have no place shaping the successful plaintiff's recovery.

The second fallacy is often characterized as "looking under the lamppost."[61] This involves relying on a particular system or practice not because it is likely to be effective, but because it simple. We have

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61. The expression, also referred to as the "streetlight effect," comes from an old fable. A drunkard is searching for his keys underneath a lamppost. A police officer asks, "Are you sure this is where you lost your keys?" The drunkard replies, "No, but it's easier to look here." David H. Freedman, *Why Scientific Studies Are So Often Wrong: The Streetlight Effect*, DISCOVER MAG., December 10, 2010, http://discovermagazine.com/2010/jul-aug/29-why-scientific-studies-often-wrong-streetlight-effect.

demonstrated that this is precisely what courts are doing when they rely upon previously negotiated licenses. Yet although this approach might economize on judicial decision costs, it is thoroughly misguided. In any normative theory of patent damages, the objective cannot simply be to choose the standard that makes it easiest to come up with a number. Rather, the goal should be to adopt the standard that best serves patent policy interests.

The patent courts have already made it clear that a remedial standard is not appropriate solely on the ground that it is easy. For example, the Federal Circuit recently held that the 25-percent "rule of thumb" is generally not an appropriate standard for computing reasonable royalty damages.[62] Under the 25-percent rule, courts presumed that reasonable royalties should be set at 25% of the infringer's revenues, absent some indication to the contrary.[63] The standard is clearly easy to implement; it is not meaningfully different from a statutory damages rule. But many scholars—particularly economists—derided the standard for its arbitrariness and criticized the courts' apparent disinterest in considering factual issues that shed interest on the proper measure of compensation.[64] The Federal Circuit agreed, denouncing the rule of thumb as "fundamentally flawed" and generally inadmissible.[65] The same logic—that the goal of a damages standard is to promote patent policy and not simply to come up with a number—suggests that the licensing-based damages standard is not likely to be effective simply because it is practicable. And as we have shown above, the use of an improper standard can create real social costs.

The third fallacy, which is similar, is that a damages standard based on existing licenses is likely to elicit better results because it is more predictable—even if it is wrong. In other words, proponents of this fallacy might argue that a bright-line rule is superior to a standard, even if the rule has a known bias. It is of course true that calculating damages based upon the value of the underlying technology—rather than using existing licenses—will necessarily require some

62. Uniloc USA, Inc. v. Microsoft Corp., 632 F.3d 1292, 1315 (Fed. Cir. 2011) ("This court now holds as a matter of Federal Circuit law that the 25 percent rule of thumb is a fundamentally flawed tool for determining a baseline royalty rate in a hypothetical negotiation.")

63. *E.g.*, Thomas Cotter, *Four Principles for Calculating Reasonable Royalties in Patent Infringement Litigation*, 27 SANTA CLARA COMPUTER & HIGH TECH. L.J., 725, 732 (2011).

64. *Id.* at 733.

65. *Uniloc*, 632 F.3d at 1315.

speculation and involve some degree of uncertainty.[66] Under normal circumstances, this might be a disadvantage given that the goal is to encourage licensing. Typically, the greater the level of certainty over likely outcomes at trial, the greater the likelihood that the parties will be able to reach a settlement—here, a license.[67] But that is not the case for patent licenses. In this context, certainty about how courts will use licenses—that is, certainty that they will use existing licenses to calculate damages—is precisely what *deters* patent holders from licensing. The more certain an owner is that a court will use a license to calculate future damages, the greater the incentive for the patent owner to obscure the value of the license or refrain from licensing entirely, for all the reasons we detail above.

The uncertainty involved in calculating damages on the basis of the value of the underlying technology—rather than using existing licenses as a guide—is by no means a feature. However, so long as damages are not biased *on average,* patentees will believe that they are likely to receive fair compensation in expectation. Patent owners and putative infringers will have the proper incentives. If damages calculations based upon the value of the technology do turn out to be biased—that is, if they under- or over-compensate on average—then certainly courts should attempt to reform their practices. But it is undeniably better to tolerate some uncertainty in calculating damages than to rely upon a methodology that will reliably generate wrong answers.

The fourth and final fallacy, which is implicit in some potential critiques of our proposal, is that a patent damages standard that relies upon prior licenses will not undermine patent licensing so long as successful plaintiffs appear to be adequately compensated in most final judgments. This type of argument proceeds as follows: among the set of cases that are litigated to judgment, successful plaintiffs seem to get adequate compensation in most cases. Therefore, licensing markets will operate efficiently, because potential-infringers know that they will have to provide sufficient compensation if they refuse to pay an adequate price for a license.

This argument is beset by a selection bias problem. It may be that there is actually much less licensing going on than would be optimal, because patentees—wanting to keep their recovery prospects as strong as possible—are refusing to license at anything less than a high royalty rate, even though they could reach additional mutually beneficial agreements on more modest terms.

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66. *See generally* Taylor, *supra* note 9.

67. George L. Priest & Benjamin Klein, *The Selection of Disputes for Litigation,* 13 J. LEG. STUD. 1 (1984).

As we have already noted, one possible exception to our proposal is a patent that has been widely licensed on common terms to many different licensees, as with patents subject to a RAND commitment.[68] But the standard will be inapt even in these cases if the established royalty was materially affected by pre-litigation uncertainty about whether the patent would be held valid and infringed.[69] Thus, if the court uses the established royalty as the measure of damages, it allows expectations about the plaintiff's litigation prospects to influence the remedy.

Patent licensing markets are complex, and there are many variables that determine which terms are mutually beneficial in a particular licensing relationship. The optimal royalty might be higher in one exchange and lower in another. As a consequence, economic efficiency requires that patent holders vary licensing terms among different transactions so as to maximize the number of mutually beneficial deals that are reached. But this paper demonstrates that the courts unwittingly discourage this kind of efficient discrimination when they base patent damages on prior licensing agreements involving the litigated patent. This tethers patent holders to the terms of their private dealings, leaving them wary of accepting anything less than a high royalty rate, even if this means foregoing many mutually beneficial licensing opportunities that could be reached only on more modest terms. While administratively convenient in the small number of cases that are actually litigated to judgment, it creates problems in virtually all patent licensing, and thus substantially undermines the efficient commercialization of patented inventions. Eradicating the licensing-based damages standard would benefit not only patent holders, but also prospective licensees and their consumers.

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68. *See supra* note 21.

69. As noted earlier in Section III, since the parties have litigated the dispute to judgment, it is probably safe to infer that there was significant pre-judgment uncertainty. One might counter that the present dispute may have involved some uncertain elements that were not present in the prior agreement. For example, perhaps the defendant's product is different from those of nonparty licensees, and the infringement question is less obvious here. But, of course, such distinctions cast doubt on the comparability of the prior licensing deals.

Enhanced Damages for Patent Infringement: A Normative Approach

Keith N. Hylton*

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I. INTRODUCTION

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

The question immediately generated by *Octane* was whether the move toward greater discretion over fee awards would be extended

* William Fairfield Warren Distinguished Professor, Boston University; Professor of Law, Boston University School of Law, knhylton@bu.edu. I thank participants in the University of Texas School of Law Patent Damages conference, June 9–10, 2016, for helpful suggestions and comments. I thank Philip Chen and Qiuyi Wu for research assistance.

1. 134 S. Ct. 1749 (2014).

2. *Id.* at 1752 (citing Brooks Furniture Mfg., Inc. v. Dutailier Int'l, Inc., 393 F.3d 1378, 1381 (Fed. Cir. 2005)).

3. *Id.* at 1755–56.

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

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

Although the analysis here is mostly normative and draws heavily on the economic theory of penalties,[9] the aim of this paper is

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

5. *In re* Seagate Tech., LLC, 497 F.3d 1360, 1368 (Fed. Cir. 2007) (en banc).

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

7. Halo Elecs., Inc. v. Pulse Elecs., Inc., 136 S. Ct. 1923, 1935–36 (2016).

8. *Id.* at 1935.

9. *See, e.g.*, Gary S. Becker, *Crime and Punishment: An Economic Approach*, 76 J. POLIT. ECON. 169 (1968) (setting out a normative economic theory of punishment); Richard A. Posner, *An Economic Theory of the Criminal Law*, 85

to provide a set of practical guidelines courts can follow in explaining, justifying, and developing rules to structure the discretion that *Halo* has returned to them. *Halo* provides an opportunity for courts to integrate deterrence policy more closely with the rules governing the enhancement of damages for patent infringement.

II. LEGAL BACKGROUND

On the question of enhanced damages, the relevant portion of the Patent Act, Section 284, is rather sparse. It says that "[w]hen damages are not found by a jury, the court shall assess them. In either event the court may increase the damages up to three times the amount found or assessed."[10]

A quick glance at these words should leave a reader with the impression that they were intended to grant courts discretion over enhanced damages, up to the limit of trebling. In spite of the seemingly high degree of discretion granted by Section 284, the Federal Circuit erected a set of significant restrictions on the discretion of courts to enhance damages in *Seagate*, which required a threshold finding of an objectively high likelihood of infringement coupled with subjective bad faith.[11] A finding of subjective bad faith would be appropriate only where the defendant either knew or should have known of the high

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COLUM. L. REV. 1193 (1985) (setting out a positive economic theory of criminal law); Keith N. Hylton, *Theory of Penalties and the Economics of Criminal Law*, 1 REV. L. & ECON. 175 (2005) (offering a formal version of Posner's argument that also reconciles the accounts in Becker and Posner); Keith N. Hylton & Haizhen Lin, *Innovation and Optimal Punishment, with Antitrust Applications*, 10 COMP. LAW & ECON. 1 (2014) (examining relationship between punishment and innovation incentives).

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

11. *In re* Seagate Tech., LLC, 497 F.3d 1360, 1371 (Fed. Cir. 2007), *abrogated by* Halo Elecs., Inc. v. Pulse Elecs., Inc., 136 S. Ct. 1923 (2016). Only after such a finding may a court consider the traditional "totality of the circumstances" factors used to determine whether enhancement was appropriate. The Federal Circuit's standard appears to focus on the probability of infringement, viewed both objectively and subjectively. *See, e.g.*, Bard Peripheral Vascular, Inc. v. W.L. Gore & Assocs., Inc., 682 F.3d 1003, 1005 (Fed. Cir. 2012); Powell v. Home Depot U.S.A., Inc., 663 F.3d 1221, 1236 (Fed. Cir. 2011). The requirement of an objectively high likelihood implies that the facts and law should, to a reasonable person, point to a conclusion that it was far more likely than not that infringement occurred. The additional requirement of subjectively bad faith implies that the facts must indicate that it was far more likely than not that the infringing party knew that he was infringing the patent—that his own subjective prediction of the likelihood of infringement was nearly the same as the objective probability.

likelihood of infringement.[12] Only after establishing the objective and subjective components required by *Seagate* could a court consider the traditional "totality of the circumstances" factors used to determine the degree of enhancement.[13] In addition, the Federal Circuit had adopted a de novo standard of review for the objective portion of the *Seagate* test.[14]

The Supreme Court held in *Halo* that the Federal Circuit's approach reflected an erroneous interpretation of Section 284.[15] The new standard set forth in *Halo* discards the threshold test focusing on the probability of infringement and replaces it with a flexible standard that takes into account other variables.[16]

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

III. NORMATIVE QUESTION

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

The question of optimal damages has been examined in greatest depth in the torts context.[18] Analyses of optimal damages have

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12. *Seagate*, 497 F.3d at 1371.

13. Read Corp. v Portec, Inc., 970 F.2d 816, 826–27 (Fed. Cir. 1992) ("[T]he paramount determination in deciding to grant enhancement . . . is the egregiousness of the defendant's conduct based on all the facts and circumstances.").

14. *Bard*, 682 F.3d at 1005.

15. *See Halo*, 136 S. Ct. at 1933–34 (2016) (rejecting the *Seagate* test because Section 284 does not require any rigid formula to warrant enhanced damages).

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

17. Keith N. Hylton, *Punitive Damages and the Economic Theory of Penalties*, 87 GEO. L.J. 421, 424–39 (1998).

18. *See, e.g.*, Guido Calabresi and A. Douglas Melamed, *Property Rules, Liability Rules and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089, 1115-24 (1972) (discussing the economically efficient strategy in the context of pollution control); WILLIAM M. LANDES & RICHARD A. POSNER, THE ECONOMIC

been prominent in the modern law and economics literature, but the question of optimal damages has been examined less directly in writings as far back as Bentham.[19]

A. Damages Theory

The optimal damages literature has distinguished two general types of damages awards. One is *loss-internalizing* damages; the other is *gain-eliminating* damages.[20] In this part, I will review these theories of damages and suggest applications to patent infringement litigation. The torts literature on which I rely typically examines damages awards in the context of a lawsuit between a victim and an "injurer."[21] In this article, I will refer to a lawsuit between a victim and an infringer. Also, I use the term infringement in its most general sense to refer to any infringement of a legal right—whether an ordinary tort or a case of patent infringement. In spite of this general definition, I will use examples mostly from patent infringement to illustrate the arguments.

1. Loss Internalization

Under the loss internalization approach, the damages award should seek to internalize to the infringing party the total social loss generated by the infringement.[22] Thus, if the infringement has injured more than one person, and if there will be only one damages award issued for the infringement, the damages award should force the infringer to pay a sum that internalizes the losses of all of the victims.

STRUCTURE OF TORT LAW 58–62 (1987) (conducting a detailed analysis on what levels of due care should be required in order to minimize the social costs of accidents); David D. Haddock, Fred S. McChesney & Menahem Spiegel, *An Ordinary Economic Rationale for Extraordinary Legal Sanctions*, 78 CAL. L. REV. 1, 8 (1990) (discussing the standard model of tort remedies); Hylton, *supra* note 17; A. Mitchell Polinsky & Steven Shavell, *Punitive Damages: An Economic Analysis*, 111 HARV. L. REV. 869, 878–96 (1998) (noting that the proper magnitude of damages is equal to the harm the defendant has caused to avoid socially undesirable consequences).

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

20. Hylton, *Punitive Damages*, *supra* note 17, at 421.

21. *E.g.*, STEVEN SHAVELL, ECONOMIC ANALYSIS OF ACCIDENT LAW 5 (2007).

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

Internalization implies that the infringer will anticipate ex ante incurring the entire loss to society as if it were his own.

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

Consider a simple example. Suppose the cost of taking care (for the infringer) to avoid infringement is $20. If the infringer takes care, the probability of infringement occurring will be .25. If the infringer does not take care, the probability of infringement occurring will be .75. In addition, let the harm from infringement be $100. Taking care is socially desirable under these assumptions because the cost of care is less than the incremental social harm from failing to do so: $20 < (.75 - .25)($100). On the other hand, suppose the cost of taking care is $60 instead of $20. In this case, since $60 > $50, it is not socially desirable for the infringer to take care.

A damages award set at full compensation will induce the infringer to take care ex ante whenever it is socially desirable for him to do so. Thus, if the damages award is set equal to the victim's loss, an infringer for whom the cost of taking care is $20 (low-cost infringer) will take care, while an infringer for whom the cost of taking

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

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

care is $60 (high-cost infringer) will not take care. A full compensation damages award in this case fully internalizes society's losses to the infringer, and therefore generates socially desirable care on the part of the infringer.

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

Next, consider a case of covert or concealed infringement. While many instances of infringement are open and obvious, some instances may be difficult to discover. For example, the infringing technology may be buried deep within a complicated product, such as an automobile, and therefore likely to be discovered only through luck or a careful search.[26] Suppose that when the infringer injures the

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25. Indep. Wireless Tel. Co. v. Radio Corp. of America, 269 U.S. 459, 466 (1926) ("It is urged on behalf of the respondent that in equity the real party in interest, the exclusive licensee whose contract rights are being trespassed upon by the infringer, should be able without the presence of the owner of the patent to obtain an injunction and damages directly against the infringer. We recognize that there is a tendency in courts of equity to enjoin the violation of contract rights which are invaded by strangers in a direct action by the party injured, instead of compelling a roundabout resort to a remedy through the covenant, express or implied, of the other contracting party. But such a short cut, however desirable, is not possible in a case like this."); Mosaid Tech., Inc. v. Freescale Semiconductor, Inc., No. 6:11-cv-173, 2013 WL 1819769 (E.D. Tex. Apr. 29, 2013) (dismissing a patent infringement claim brought by an exclusive licensee for lack of standing); Aspex Eyewear, Inc. v. Miracle Optics, Inc., 434 F.3d 1336 (Fed. Cir. 2006); Intellectual Prop. Dev., Inc. v. TCI Cablevision of Cal., Inc., 248 F.3d 1333 (Fed. Cir. 2001).

26. *See* Intamin Ltd. v. Magnetar Techs., Corp., 483 F.3d 1328, 1338 (Fed. Cir. 2007) (patented magnetic braking system for amusement park rides could not be ascertained by a simple visual inspection); Antonious v. Spalding & Evenflo Cos., Inc., 275 F.3d 1066, 1070 (Fed. Cir. 2002) (patentee purchased and dissected a golf club head to discover potential infringement of patent directed to an improved perimeter weighting structure for metal golf club heads); Judin v. U.S., 110 F.3d 780, 782 (Fed. Cir. 1997) (difficult to determine whether accused optical communications device infringed patent without reverse-engineering the accused device); Ashraf Zahr, *Levels of "Reasonable Inquiry" In Electronics Patent Cases*, LAW360 (June 5, 2014, 10:20 AM), http://www.law360.com/articles/536202/levels-

patentee, the patentee will discover the identity of the infringer, or indeed the infringement itself, with a probability of only 20%. Again it is socially desirable for the low-cost infringer—that is, the infringer whose cost of taking is only $20—to take care. But the low-cost infringer will not take care in this case because $20 > (.75- .25)(.2)($100) = $10. Thus, if a court awards full compensation damages in a setting where some infringers may escape identification, infringers will fail to take socially desirable care.[27] To fully internalize ex ante the loss caused by the infringer, the court will have to enhance damages by multiplying the compensatory award by a factor of 5.

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

The examples considered so far involve measurable losses suffered by identifiable victims. But these assumed circumstances may not describe every real-world case of infringement. Suppose, for example, that the infringement imposes some losses that are difficult to measure.[28] Many commentators have noted that lost profits from patent infringement are often difficult to determine.[29] Alternatively, suppose the victim has suffered measurable losses that are disallowed

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of-reasonable-inquiry-in-electronics-patent-cases (finding that the some electronic devices may contain infringing software that cannot be analyzed because the source code is unavailable; some may contain indiscernible components due to their size).

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

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

29. Robert S. Frank & Denise W. DeFranco, *Patent Infringement Damages: A Brief Summary*, 10 FED. CIRCUIT B.J. 281, 281–89 (2000) (an award of lost profits requires proof of but-for causation; the patentee who cannot prove causation is entitled to a reasonable royalty award but determining such a royalty is often difficult).

by the legal system. For example, in the patent infringement context, patentees generally cannot recover foreign lost profits in the U.S.[30] Yet another example would consist of losses imposed on specific victims who cannot be identified or determined—consider, for example, the problem of orphaned works in copyright law.[31] To induce socially optimal care on the part of the infringer, these types of losses should be internalized ex ante to the infringer. But they cannot be internalized by a compensatory damages award because they are neither measurable nor legally compensable. The only substitute to precise measurement of losses that could potentially induce optimal care would be the employment of a multiplier for the inadequate damages award.

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

To better organize the conceptual categories of harm, I will follow Bentham by distinguishing categories of primary and secondary losses.[32] Primary losses are losses suffered directly by

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30. For example, foreign lost profits due to patent infringement generally are not recoverable in the U.S. *See* Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc., 711 F.3d 1348, 1371–72 (Fed. Cir. 2013) (holding that patentees are not entitled to compensatory damages for lost foreign sales that are the allegedly foreseeable result of the domestic infringement of patents); Microsoft Corp. v. AT&T Corp., 550 U.S. 437, 454–55 (2007) ("The presumption that United States law governs domestically but does not rule the world applies with particular force in patent law. The traditional understanding that our patent law operates only domestically and does not extend to foreign activities is embedded in the Patent Act itself, which provides that a patent confers exclusive rights in an invention within the United States.") (internal quotations omitted); WesternGeco LLC v. ION Geophysical Corp., 791 F.3d 1340, 1349 (Fed. Cir. 2015) (damages cannot be awarded for lost profits resulting from lost contracts for services to be performed abroad).

31. An orphaned work is a work with a valid copyright but whose owners cannot be determined. *See, e.g.*, Authors Guild, Inc. v. HathiTrust, 755 F.3d 87, 92 (2d Cir. 2014) (noting that the copyright holder of "orphan work" cannot be readily identified or located).

32. BENTHAM, *supra* note 19, at 152 ("[M]ischief may be frequently distinguished, as it were, into two shares or parcels: the one containing what may be

identifiable victims.[33] Secondary losses are losses suffered by society generally, or by unidentifiable victims.[34] Consider, as an analogous case, crime. Crime victims suffer directly from each instance of crime. However, society in general suffers too, as potential victims change their behavior in anticipation of the possibility of crime. This second set of losses, resulting from changes in behavior, fall in the category of secondary harms.

2. Gain Elimination

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

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

Why might it be desirable to deter infringement by *all* potential infringers no matter how high the gain from infringement? There are two reasons presented in the literature on optimal damages. One is that if the transaction cost of securing consent to an otherwise infringing act is low, then potential infringers should be encouraged by the law

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called the primary mischief; the other, what may be called the secondary."); Hylton, *supra* note 17, at 435–39.

33. BENTHAM, *supra* note 19, at 152.

34. *Id.*

35. Hylton, *Punitive Damages*, *supra* note 17, at 421.

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

to seek consent.[37] Applying this general prescription to the patent context, if the transaction cost of obtaining a license from the patentee is low, the potential infringer should obtain a license.[38] The transaction cost of securing a license would be low in a setting where the boundary of the patent is clear and the burden of negotiating a license small.[39] In this setting, a gain-eliminating award would induce infringers to seek a license instead of infringing. Since transaction costs are low, society would prefer all infringers to seek a license rather than incur litigation and other costs associated with non-compensable losses from infringement.

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

The other justification provided in the literature for the gain-eliminating award is to prevent infringements where the gain to the infringer is very likely to always be less than the incremental harm to society.[41] Of course, in this special case, compensatory awards that fully incorporate the social loss would also work just as well to deter infringement. But the gain-eliminating award might still be preferable here given the risk that the compensatory award may not fully

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37. Calabresi & Melamed, *supra* note 18; Hylton, *Punitive Damages*, *supra* note 17, at 1109 ("[The] costs of imposing a penalty sufficient to eliminate the offender's gain are minimal, because if the offender's gain exceeds the victim's loss, the offender can arrange a consensual transaction.").

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

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

40. *See* Hylton, *Punitive Damages*, *supra* note 17, at 452; *see also* TXO Prod. Corp. v. Alliance Res. Corp., 509 U.S. 443, 459–62 (1993) (holding that a punitive damages award that is over 526 times as large as the compensatory damages award is not "grossly excessive" after consideration of the relevant factors, including the defendant's bad faith, reprehensible conduct, and potential financial gains).

41. *See* Hylton, *Punitive Damages*, *supra* note 17, at 460–64; Brief of Keith N. Hylton as Amicus Curiae in Support of Respondents at 15–16, State Farm Mut. Auto. Ins. Co. v. Campbell, 538 U.S. 408 (2003) (No. 01-1289).

incorporate the social loss—for example, not all victims may be able to identify the infringer, or bring an action for damages, or prove their damages. It is not clear that this scenario has a broad application to patent law, given that infringement generally benefits society to some degree by increasing use or consumption of the patented technology. Still, there may be special cases where this special theory of gain elimination may be applicable. For example, in a setting where perfect price discrimination generated socially efficient consumption of the patented technology, an act of infringement should be treated as purely wasteful of social resources, and therefore should be subjected to a penalty designed to eliminate the expectation of gain to the infringer.

3. Extending Damages Theory to Intellectual Property

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

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

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

The presence of substantial and concentrated secondary costs—i.e., costs of numerous and unidentifiable victims—provides a special justification, in addition to the justifications from the torts literature canvassed earlier, for enhancing damages in the intellectual

property setting. As is true of all cases of secondary costs, the precise level would be difficult to estimate.[42] However, a general policy of doubling or trebling damages might be preferable to simply awarding full compensation damages.

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

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

B. Determinants of Optimal Damages

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

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

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

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

In deciding how generous a damages award should be, a tradeoff must be considered. On one side, increasing damages reduces the rate of infringement and therefore increases the static or "deadweight" loss from intellectual property protection. On the other side, increasing damages spurs investment in innovation, both by reducing the risk of infringement and protecting or even enhancing the financial reward from innovation. The benefit to society from encouraging innovation is determined by the social value of the patent and by the degree to which innovation is sensitive to the reward. Just as the Hand Formula from torts compares the burden of precaution to the expected loss avoided (the probability of the loss multiplied by the severity),[43] a rough cost-benefit standard for determining patent damages would compare, on the margin, the social burden of increasing damages (static cost) with the social benefit (elasticity of innovation multiplied by its social value).

This suggests that as the social benefit from patent protection increases, or as the social burden of protection falls, the damages award should increase too. The most generous award will provide maximal encouragement of innovation to the extent that it enhances society's welfare. Such an award would induce investment in innovation as long as the gain to society is at least as great. An award that protects the lost profits and also provides an enhancement up to the residual surplus to consumers generated by the patent would satisfy this objective. This formula for optimal damages would be too

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

generous in cases where the innovation was of little value to society. But for the most socially valuable innovations, this formula could generate awards greater than the trebling required by Section 284.[44]

IV. THE LEGAL STANDARD

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

A. Enhancement Factors

In general, the balancing of economic interests implied by this analysis suggests a multi-factored "reasonableness" standard for assessing damages.[45] Many if not all of the factors taken into account in the general torts setting for enhancing damages should be part of the assessment of enhanced damages in the patent infringement context. Enhanced (punitive) tort damages may be awarded after a finding that the injurer's conduct was reprehensible, wanton, malicious, or reckless.[46] In addition, courts have used several factors to determine the degree to which damages should be enhanced. The traditional factors for enhancement of tort damages were set out in *Green Oil v. Hornsby* as follows:

(1) Punitive damages should bear a reasonable relationship to the harm that is likely to occur from the defendant's

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44. Patent Act of 1952, 35 U.S.C. § 284 (2011); *see also* Keith N. Hylton and Mengxi Zhang, *Optimal Remedies for Patent Infringement*, 52 INTERNATIONAL REVIEW OF LAW AND ECONOMICS 44–57 (forthcoming 2017).

45. John M. Golden, *Reasonable Certainty in Contract and Patent Damages*, 30 HARV. J.L. & TECH., SPECIAL SYMPOSIUM, at 257–278 (2017).

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

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

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

The threshold finding of reprehensibility in tort law has generally relied on either a finding of maliciousness or recklessness.[48] Malicious conduct is intentional and evinces a desire to injure the victim.[49] Conduct is generally classified as intentional when the

47. 539 So. 2d 218, 223–24 (Ala. 1989).

48. *See* State Farm Mut. Auto. Ins. Co. v. Campbell, 538 U.S. 408, 419 (2003) (finding that the court will consider whether the tortious conduct evinced a reckless disregard of the health or safety of others and whether the harm is the result of intentional malice when determining reprehensibility); Kolstad v. American Dental Ass'n, 527 U.S. 526, 526 (1999) (noting that the "egregious conduct" requirement for punitive awards may be met by a defendant's evil motive or intent).

49. OLIVER WENDELL HOLMES, THE COMMON LAW 130 (1887) ("It has been shown, in dealing with the criminal law, that, when we call an act malicious in common speech, we mean that harm to another person was intended to come of it, and that such harm was desired for its own sake as an end in itself."); BMW of North

injurer has acted while knowing with substantial certainty that he would inflict a harm on the victim.[50] Reckless conduct is not necessarily intentional in this sense, but it indicates indifference to the interests of the potential victim or victims. In general, an injurer acts recklessly if he knows of the high probability of harm created by his conduct and if the burden of avoiding the harm is slight.[51]

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

The intentional copier of an existing technology presents a more complicated scenario because there are special cases within this category. An infringer can become an intentional copier in many ways: he can attempt in good faith to design around an existing patent, resulting in a substitute technology that he reasonably believes is non-infringing; he can attempt in good faith to design around an existing patent, resulting in a substitute technology that he believes in good faith, though not reasonably, is non-infringing; he can copy an existing technology while reasonably believing that it is not protected by a valid patent or that his copy is not infringing; he can copy an existing technology while believing in good faith, though not reasonably, that it is not protected by a valid patent or that his copy is not infringing; he can copy an existing technology while knowing full well that it is protected by a valid patent and that his copy is infringing. The strength

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Am., Inc. v. Gore, 517 U.S. 559, 589 (1996) (finding that "malice includes any wrongful act without just cause or excuse . . . with an intent to injure the . . . property of another").

50. RESTATEMENT (THIRD) OF TORTS: LIAB. FOR PHYSICAL & EMOTIONAL HARM § 1 (Am. Law Inst. 2010); KEETON, *supra* note 46, § 8, at 34.

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

52. Hylton, *Punitive Damages*, *supra* note 17, at 455–58.

of the case for enhancement varies among these categories, generally becoming stronger as one moves from the first to the last category. This is so for two reasons. First, the intention to copy with knowledge of the resulting legal violation increases as one moves from the first to the last category, which suggests that the effectiveness of a damages award in controlling incentives to infringe should increase as well. Second, as one moves closer to the last category, the effectiveness of a damages award that eliminates the prospect of gain from an intentional violation should increase.

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

Taking the severity of the social harm into account is an important step in any reasonableness analysis of damages. The Hand Formula from negligence doctrine, for example, weighs the burden of taking care against the product of the probability of harm and the severity of harm.[53] For a given probability of harm, the case for finding negligence increases as the severity of harm increases. The same should hold in the patent context. For any fixed likelihood of infringement, enhancement should be more likely as the severity of the social harm from infringement increases.

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

53. United States v. Carroll Towing Co., 159 F.2d 169, 173 (2d Cir. 1947).

infringer deliberately copies while knowing that the social harm could be great, enhancement of damages should be considered.

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

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

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

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

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

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

Admittedly, patent litigation can be time consuming and distracting for innovators.[54] The Wright brothers are said to have spent much of their careers consumed in patent litigation.[55] An excessive or obsessive approach to litigation should not be permitted to give rise to a claim for enhanced damages. However, these concerns are insufficient to justify a refusal to incorporate reasonable indirect costs into the enhancement analysis.

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

(1) whether the infringer had actual knowledge of an existing patent;
(2) whether there is a good-faith belief on the part of the infringer that the patent is invalid or not infringed;
(3) whether an infringer received a competent opinion;
(4) whether the infringer made a good-faith effort to design around the patent;
(5) whether the infringer's behavior and tactics at trial are consistent with a finding of good faith;
(6) whether there was deliberate copying;
(7) the infringer's motivation;

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54. *See, e.g.*, Daniel A. Crane, *Exit Payments in Settlement of Patent Infringement Lawsuits: Antitrust Rules and Economic Implications*, 54 FLA. L. REV. 747, 757–59 (2002) (discussing two categories of patent litigation costs: costs directly attributable to the litigation and indirect costs; "patent litigation is a very costly process" (citing Blonder-Tongue Labs., Inc. v. Univ. of Ill. Found., 402 U.S. 313, 334 (1971))).

55. *See, e.g.*, Wright Co. v. Herring-Curtiss Co., 204 F. 597 (W.D.N.Y. 1913), *aff'd*, 211 F. 654 (2d Cir. 1914) (the Wright brothers brought an infringement suit against the Herring-Curtiss Company and Glenn Curtiss on their patent for improvements for an aeroplane); Wright Co. v. Paulhan, 177 F. 261 (C.C.S.D.N.Y.) (L. Hand, J.), *rev'd*, 180 F. 112 (2d Cir. 1910)) (the Wright brothers brought a suit against Louis Paulhan for infringing their patent for a flying machine); Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 888 (1990) (noting that the Wright brothers "engaged in extensive litigation against companies that did not recognize their patent").

(8) the size and finances of the infringer;
(9) the closeness of the case;
(10) the duration of the misconduct;
(11) whether the infringer took remedial steps;
(12) whether the infringer made any attempts to conceal the infringement; and
(13) the defendant's motivation for harm.[56]

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

B. Elaboration on Intentionality and Social Harm

The law traditionally has distinguished general (intent to act) and specific (intent to harm) intent.[57] This distinction mirrors that between good faith (acting with no intent to harm) and bad faith (acting with intent to harm).[58] The law also distinguishes conduct on

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56. Jon E. Wright, *Comment, Willful Patent Infringement and Enhanced Damages—Evolution and Analysis*, 10 GEO. MASON L. REV. 97, 107–08 (2001); *see also* Read Corp., 970 F.2d 816, 827 (Fed. Cir. 1992) (Add Parenthetical).

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

58. *E.g.*, Rawlings v. Apodaca, 151 ARIZ. 149, 162 (1986) (acting intentionally with knowledge that the conduct was likely to cause unjustified, significant damage is sufficient to show bad faith); Burnsed Oil Co. v. Grynberg, 320 F. App'x 222, 230

reasonableness grounds. Thus, on intentionality alone, the most innocent actor is one who has acted in good faith and reasonably. The next step in the movement away from innocence is the actor who has acted in good faith but unreasonably. The final category is bad faith. The case for enhancement of damages increases according to this order.

Compared to the common law concept of reasonableness, it may seem initially to be unfair to permit a plaintiff to obtain a damages award of any amount against an infringer who has acted in good faith and on the basis of a reasonable belief of legality. However, the difference between patent infringement and negligence is that a finding of patent infringement incorporates a finding of social harm that is divorced from the infringer's ability to perceive the specific social harm generated by his conduct, whereas a finding of negligence assumes that the tortfeasor did foresee the specific social harm from his conduct. Still, the approach of patent law is not entirely foreign to tort law; trespass routinely holds defendants liable even though they have acted in good faith and with a reasonable belief of legality.[59]

Another consideration regarding the question of intentionality is the distinction between the meaning of willfulness in the torts and patent infringement settings. As noted earlier, *Seagate* adopted a willfulness requirement as a precondition to enhancement on the theory that this is also the general approach of tort law.[60] While it is true that a finding of willfulness or recklessness is a precondition to an award of punitive damages in tort law, recklessness in tort law is

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(5th Cir. 2009) ("Bad faith is more than bad judgment or negligence: it is a neglect or refusal to fulfill some duty or some contractual obligation, not prompted by an honest mistake as to one's rights or duties, but by some interested or sinister motive and implies the conscious doing of a wrong because of dishonest purpose or moral obliquity.") (internal quotations omitted).

59. Dougherty v. Stepp, 18 N.C. 371, 372 (1835) (per curiam) ("It is the entry that constitutes the trespass. There is no statute, nor rule of reason, that will make a wilful entry into the land of another, upon an unfounded claim of right, innocent, which one, who sat up no title to the land, could not justify or excuse."); RESTATEMENT (SECOND) OF TORTS § 164 cmt. a (Am. Law Inst. 1965) ("If the actor is and intends to be upon a particular piece of land in question, it is immaterial that he honestly and reasonably believes that he has the consent of the lawful possessor to enter, or, indeed, that he himself is its possessor.");); KEETON, *supra* note 46, § 13, at 74 ("The defendant is liable for an intentional entry although he has acted in good faith, under the mistaken belief, however reasonable, that he is committing no wrong.").

60. *In re* Seagate Tech., LLC, 497 F.3d 1360, 1370 (Fed. Cir. 2007) (en banc) (noting that willfulness is not unique to patent law and has an established meaning in civil context).

determined by a balancing test that incorporates both the probability of harm and the severity.[61] Thus, an accurate importation of the concept of willfulness from tort law into patent law would include a multiplicity of factors, as suggested here, even at the threshold stage of determining willfulness.

V. THE DAMAGES MULTIPLIER

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

Economic analysis suggests that the optimal damages amount should vary by case.[62] However, it would probably be too administratively burdensome to calculate an optimal damages multiplier based on measures of consumer welfare for every case. A schedule or range of multipliers would be less burdensome to implement. Still, even with a range, there is no reason suggested in the economics literature to believe that the range should consist only of numbers between one and three.

The question of feasibility might seem to be troubling in the absence of evidence that any other scheme other than trebling had ever been adopted. However, other schemes have been adopted. The first patent statute, the Patent Act of 1790, provided unfettered discretion to the court, providing no more guidance than "damages as shall be assessed by a jury."[63] The patent statute was amended in 1793 to provide for a mandatory minimum of treble damages.[64] In other words, the 1793 patent statute permitted courts to apply a multiplier greater than three but prohibited the application of a multiplier less than three. These examples suggest that the deterrence concern was given greater weight in the early period of American intellectual property law than today.

The Clayton Act provides another example of a mandatory multiplier. Under the Clayton Act, a federal court must apply a

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

62. *See, e.g.*, Hylton, *Punitive Damages*, *supra* note 17.

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

64. Patent Act of Feb. 21, 1793, ch.11, § 5, 1 Stat. 318, 322 (allow the patentee to recover "a sum, that shall be at least equal to three times the price, for which the patentee has usually sold or licensed to other persons, the use of [the invention]").

multiplier of three to compensatory damages for an antitrust injury.[65] Courts do not have the discretion to apply a lesser or greater multiplier.

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

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

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

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

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

should have discretion to enhance damages to reflect the correspondingly greater importance of deterrence.

Although it may be too administratively burdensome for a court to implement the third principle in full, rough shortcuts can be developed for some cases. Consider, for example, the hepatitis C drug Sovaldi, which requires a treatment regime costing $84,000.[66] The alternative is a liver transplant that costs roughly $300,000.[67] A simple, back-of-the-envelope estimate of the total consumer surplus generated by Sovaldi would multiply the number of patients receiving the drug by the difference between costs of the two treatment regimes, $216,000. Assuming a 44% profit margin on Sovaldi,[68] we can make a rough estimate of 6 for the ratio of consumer surplus to the profit from Sovaldi. Thus, the third principle suggests an optimal multiplier of 6, rather than the trebling provided by statute, if the patent for Sovaldi were to be infringed. This example suggests that it is not too difficult to adopt a variable damages multiplier based on the social value of the infringed patent.

VI. CONCLUSION

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

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

67. *Id.*

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