Texas Intellectual Property Law Journal

Intellectual Property Law Section of the State Bar of Texas
The University of Texas School of Law

Vol. 26, No. 1, Pages 1 to 132, 2018

TEXAS INTELLECTUAL PROPERTY LAW JOURNAL

The University of Texas School of Law

Volume 26 | 2018 | Number 1

PATENT DAMAGES SYMPOSIUM

Prepared at the University of Texas School of Law (U.S. ISSN #1068-1000)

TEXAS INTELLECTUAL PROPERTY LAW JOURNAL

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Volume 26 | 2018 | Number 1

THE JOURNAL

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Foreword:

Channeling Patent Damages

John M. Golden[†]

The assessment of monetary relief in patent-infringement lawsuits presents many of the most pressing issues in patent law today.[1] These issues appear along multiple fronts: problems of valuation and the specification of relevant factors in compensatory damages, questions of when to award enhanced damages or attorney fees, and overarching institutional challenges of providing proper guidance to relevant decisionmakers while also according them an appropriate amount of discretion. In part, these different fronts reflect the different channels that the United States Patent Act establishes for monetary relief: (1) compensatory damages,[2] (2) discretionary enhancement of damages "up to three times the amount found or assessed,"[3] (3) "reasonable attorney fees,"[4] and (4) special design-patent remedies of disgorgement of the infringer's "total profit" or statutory damages of $250.[5] Within each of these channels, courts are generally to follow the guidance provided by the Act or prior judicial decisions. But both the Act and judicial precedent leave significant room for play. This room for play provides opportunities for experimentation and learning, but can also contribute to unpredictability and even error.

A gift to the University of Texas School of Law from the Intel Corporation supported exploration of the room for play in patent damages in a series of two conferences in 2016 and 2017. With funds from the gift, the law school provided

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† Professor, The 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 Sedona Conference, *The Sedona Conference Commentary on Patent Damages & Remedies*, 15 SEDONA CONF. J. 53, 55 (2014) ("[P]atent damages law remains one of the most complex, unpredictable, and rapidly evolving areas of the law.").

2 35 U.S.C. § 284 ("Upon finding for the claimant the court shall award the claimant damages adequate to compensate for the infringement . . . .").

3 *Id.* § 284.

4 *Id.* § 285.

5 *Id.* § 289.

authors of conference papers with honoraria. The gift from Intel was specifically to support conferences on patent damages, but the law school otherwise had full discretion in developing the conference agenda and selecting speakers. Authors prepared conference papers for publication in either *The Review of Litigation* or the *Texas Intellectual Property Law Journal*.

This Foreword introduces the twelve articles associated with the second conference on patent damages ("PatDam2"), which the law school hosted on February 17 and 18, 2017. The content of the twelve articles spans the channels for patent damages listed above. Some articles explore when and how substantially compensatory damages, and especially reasonable royalty damages, should be awarded.[6] Other articles consider the potential punitive purposes of monetary relief, such as enhanced damages.[7] An article by this Foreword's author examines the phenomenon of decisionmaking discretion across different statutory channels.[8] The remainder of this Foreword describes these articles in more detail.

In *Tax Solutions to Patent Damages*,[9] Jennifer Blouin and Melissa Wasserman argue that in assessing reasonable royalties, courts can make greater use of tax-related transfer prices that allocate patent-related income across multinational enterprises.[10] Blouin and Wasserman acknowledge the contention "that the tax minimization incentives associated with moving intellectual property from the United States to a 'tax haven' jurisdiction remove almost the entire economic reality of transfer prices."[11] Nonetheless, they suggest that significant limits on the dubiousness of such prices result from potential tax penalties and the general requirement that transfer prices represent plausible valuations for an arm's-length transaction between a willing seller and a willing, unrelated buyer.[12] Further, the arm's-length standard for the nature of such valuations is on its face a good match for the hypothetical negotiation standard commonly invoked for reasonable royalty damages.[13] In situations in which opposing parties to a patent suit would otherwise submit estimates for reasonable royalties that differ by a factor of 100 or more,[14] one might well imagine that even transfer prices that merit skepticism can sometimes indicate useful upper or lower bounds for reasonable royalty estimates.[15]

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6 *See infra* text accompanying notes 9–54.

7 *See infra* text accompanying notes 55–88.

8 *See infra* text accompanying notes 89–95.

9 Jennifer L. Blouin & Melissa F. Wasserman, *Tax Solutions to Patent Damages*, 26 TEX. INTELL. PROP. L.J. 1 (2018).

10 *Id.* at 4 (contending that, generally speaking, transfer prices "reflect the economic value of the patent, at least within some bargaining range").

11 *Id.*

12 *Id.*

13 *Id.* ("The standard for determining a reasonable royalty under patent law and tax law's requirement for valid transfer price are uncannily similar.").

14 *See* John M. Golden, *Reasonable Certainty in Contract and Patent Damages*, 30 HARV. J.L. & TECH., Special Symposium, at 257, 265 (2017) (noting that experts can "generate assessments for reasonable royalties that differ by more than a factor of ten and sometimes even more than a factor of hundred").

15 Blouin & Wasserman, *supra* note 9, at 25 (concluding that "transfer pricing should certainly provide some guidance as to the appropriate bounds (or relative range) to the value of firms' intangibles").

Three additional articles on compensatory damages primarily consider how to make better use of forms of evidence already in common use. In *The Patent Damages Gap: An Economist's Review of U.S. Patent Damages Apportionment Rules*,[16] Anne Layne-Farrar argues that current U.S. law tends to improperly bind courts to a binary choice between two potential base values from which reasonable royalty damages are to be derived: (1) the entire value of a product or process accused of infringement; or (2) the value of the so-called "smallest salable patent-practicing unit" (SSPPU), which a district court has defined as " 'the smallest salable infringing unit with close relation to the claimed invention.' "[17] Under the entire market value rule (EMVR), a court may use the entire value of the product or process as a base for deriving the reasonable royalty when "the patent-related feature is the basis for consumer demand."[18] Otherwise, the Federal Circuit has indicated that, to the extent a court calculates the reasonable royalty as a fraction of a base value,[19] the court is to use the SSPPU value as the base.[20] Layne-Farrar argues that this dichotomy is problematic because, just as use of the entire market value as a royalty base can lead to excessively inflated awards, use of the SSPPU value as the base can lead to "artificially deflat[ed]" awards because the value of a patented technology can greatly exceed an infringing SSPPU's market price.[21] To help avoid having fact-finders anchor on overly high or low base numbers for a reasonable royalty calculation, Layne-Farrar suggests that, in situations where the EMVR conditions are not met but where an SSPPU base also seems inadequate, the damages calculus could begin with "the end product price as the royalty base, on a per unit basis."[22]

In *Breaking the* Georgia-Pacific *Habit: A Practical Proposal to Bring Simplicity and Structure to Reasonable Royalty Damages Determinations*,[23] William Lee, Douglas Melamed, and Arthur Gajarsa also address concerns with reasonable royalty damages but take a notably different tack from Layne-Farrar. They concentrate on calling for courts to end frequent reliance on a laundry list of fifteen so-called *Georgia-Pacific* factors[24] whose use the Federal Circuit has repeatedly endorsed.[25] Lee, Melamed, and Gajarsa argue that the *Georgia-Pacific*

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[16] Anne Layne-Farrar, *The Patent Damages Gap: An Economist's Review of U.S. Patent Damages Apportionment Rules*, 26 TEX. INTELL. PROP. L.J. 31 (2018).

[17] *Id.* at 35 (quoting Cornell Univ. v. Hewlett-Packard Co., 609 F. Supp. 2d 279, 288 (N.D.N.Y. 2009)).

[18] Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301, 1336 (Fed. Cir. 2009) (internal quotation marks omitted).

[19] *See* Layne-Farrar, *supra* note 16, at 47 (noting that "the courts have allowed some non-SSPPU, non-EMVR methodologies").

[20] LaserDynamics, Inc. v. Quanta Computer, Inc., 694 F.3d 51, 67 (Fed. Cir. 2012) (describing the entire market value rule as "a narrow exception to [the] general rule" that "royalties be based not on the entire product, but on the 'smallest salable patent-practicing unit' ").

[21] Layne-Farrar, *supra* note 16, at 41.

[22] *Id.* at 49.

[23] William F. Lee, A. Douglas Melamed & Arthur J. Gajarsa, *Breaking the* Georgia-Pacific *Habit: A Practical Proposal to Bring Simplicity and Structure to Reasonable Royalty Damages Determinations*, 26 TEX. INTELL. PROP. L.J. 51 (2018).

[24] *Id.* at 52 ("The time has come to break the *Georgia-Pacific* habit.").

[25] *See* DONALD S. CHISUM, CHISUM ON PATENTS § 20.07[2] ("Use of the *Georgia-Pacific* factors has been approved by numerous Federal Circuit decisions.").

factors do not properly instruct juries to assess reasonable royalties at amounts to which parties "would have agreed had they negotiated at arm's length for patent clearance before the infringer had committed to using the patented technology."[26] The authors contend that, as a result, reasonable royalty awards are likely to be inflated by " 'lock-in' costs" that do not reflect the pertinent value of the patented technology but instead spring from difficulties in switching to an alternative after committing to an initial technological approach.[27] Lee, Melamed, and Gajarsa point out various concerns with the content or wording of individual *Georgia-Pacific* factors, and they proffer guidelines and examples for jury instructions to better ensure focus "on determining the incremental value" of the relevant patented invention.[28]

In *Beyond Circularity: Licensing for Innovation*,[29] Oskar Liivak focuses more narrowly on the use of pre-existing licenses in assessing reasonable royalty damages.[30] In particular, Liivak addresses arguments that, because private parties agree on licensing rates that reflect their expectations of the damages courts will award for infringement, use of such licenses in determining court awards creates a circularity problem that threatens either to excessively inflate or to excessively deflate patent value.[31] Liivak suggests that circularity fears might not be as fatal as feared by arguing, first, that courts have recognized and grappled with such concerns since at least the nineteenth century[32] and, second, that certain licenses are relatively or wholly untainted by circularity because they primarily serve to enable the transfer of technology or technological knowhow itself, rather than a mere transfer of legal rights whose import is subject to *ex post* clarification by the courts.[33] Liivak leaves for further work the substantially empirical questions of how extensive such untainted licensing is and in which technology sectors reliance on such licensing is most promising.

A next set of three articles considers a more radical change to compensatory damages for patent infringement—namely, adoption of a much more cost-based approach that focuses on technology-related expenses of the patentee, rather than the patentee's lost profits, the patentee's lost licensing opportunities, or benefits derived by an infringer. In *Cost-Plus Patent Damages*,[34] Michael Abramowicz points out that, in principle, greater reliance on "cost-plus damages" that compensate for risk as well as out-of-pocket expense could have the social benefit of "reducing unnecessary compensation for inventions" by more strictly focusing on giving just enough return to induce patentable invention but no more.[35] But

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[26] Lee, Melamed & Gajarsa, *supra* note 23, at 53.
[27] *Id.* at 54.
[28] *Id.* at 64.
[29] Oskar Liivak, *Beyond Circularity: Licensing for Innovation*, 26 TEX. INTELL. PROP. L.J. 113 (2018).
[30] *Id.* at 114.
[31] *Id.* at 115–20.
[32] *Id.* at 124 (discussing *Rude v. Westcott*, 130 U.S. 152 (1889)).
[33] *See id.* at 129 (describing a licensing situation in which the licensee does not "particularly care about the validity of the patent" and is instead "paying for" the relevant technology).
[34] Michael Abramowicz, *Cost-Plus Patent Damages*, 26 TEX. INTELL. PROP. L.J. (forthcoming 2018).
[35] *Id.*

Abramowicz also observes that calculating a cost-plus damages award would be difficult, and, because of phenomena such as hindsight bias, court decisions could be "systematically biased" toward unduly low awards.[36] Moreover, there is a countervailing possibility of systematic overcompensation to the extent that innovators "goldplate" patent-related investments in anticipation of reimbursement.[37] Abramowicz notes that the problem of goldplating can be checked by the ability of patent-knowledgeable users to choose not to use a patented invention, rather than pay a cost-plus-based price.[38] Nonetheless, inadvertent infringers could dilute or effectively eliminate this check because of their inability to make the relevant price-based choice.[39] After studying potential advantages and disadvantages of a cost-plus damages regime through a series of stylized simulations,[40] Abramowicz concludes that potential problems caution against jumping abruptly to an entirely cost-plus damages patent regime,[41] but that potential benefits support exploring this policy option, perhaps by first "allowing cost-plus damages to be a small factor" in patent damages assessment.[42]

In *Adjusting Patent Damages for Nonpatent Incentives*,[43] Lisa Larrimore Ouellette enriches proposals for cost-based patent damages by suggesting that courts might decrease damages in light of nonpatent incentives, such as government grants or tax relief, that effectively reduce private costs of innovation.[44] Ouellette acknowledges concerns with administrability[45] and the proper distribution of burdens among infringers,[46] but she points to a countervailing concern—namely, that failure to account for nonpatent incentives can promote overcompensation of patentees relative to what is necessary to induce desired innovation.[47] Ouellette notes that there are potential alternative or supplementary approaches to accounting for nonpatent incentives: these include (1) restricting patentability for innovation spurred by "significant nonpatent incentives," (2) conditioning the award of nonpatent incentives on the limitation of patent rights, and (3) "a requirement to repay nonpatent rewards out of patent revenue."[48] Ouellette contends that the Patent Act's provisions for reasonable royalty damages and for reasonable

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36 *Id.*

37 *Id.*

38 *Id.* (noting that users "can simply decide not to use the patented invention").

39 *Id.* (noting that inadvertent infringers can "experience *negative* utility" from "pay[ing] damages in excess of the valuation of the products" under a cost-plus damages regime).

40 *Id.* (using simulations to explore private and social welfare effects of different legal regimes).

41 *Id.* ("We cannot get to this patent system without at least some much more modest experimentation with cost-plus damages.").

42 *Id.*

43 Lisa Larrimore Ouellette, *Adjusting Patent Damages for Nonpatent Incentives*, 26 TEX. INTELL. PROP. L.J. (forthcoming 2018).

44 *Id.* at __ (proposing that courts "reduc[e] patent damages to account for the nonpatent rewards that an invention has received, including the *ex ante* reduction of risk").

45 *Id.* (reporting doubts that cost-based damages "are practically feasible for courts to implement").

46 *Id.* (noting concern that payment for patented technology "should ideally be shared across all users . . . and not just the first party to be sued").

47 *Id.* ("[A]llowing a firm to claim these nonpatent rewards in addition to full patent rents might lead to returns far in excess of what was needed to efficiently incentivize development.").

48 *Id.*

compensation for infringement by the United States provide opportunities for implementing nonpatent-incentive adjustments under existing law.[49]

In *Distinguishing Damages Paid from Compensation Received: A Thought Experiment*,[50] Peter Lee completes the trilogy of articles focusing on cost-based approaches by exploring the possibility of combining cost-based damages with a decoupling of two functions of patent damages: (1) directly rewarding patent holders and (2) deterring infringement.[51] Courts could effect this decoupling by making awards to patentees that are capped at some amount of patentee costs plus reasonable profit and thus could be less than payments required of adjudged infringers.[52] Lee adds an important qualification, however: "if calculating and apportioning inducement costs becomes more trouble than it's worth, a court c[ould] always simply allocate the full measure of make[-]whole, price-based damages to the patentee."[53] Lee further suggests that, when infringers' court-ordered payments exceed patentees' court-ordered awards, the resulting surplus could be used to fund further "research and development, thus advancing the overarching aims of the patent system."[54]

Additional proposals for altering current approaches to patent remedies come from Ronen Avraham and Mark Janis. In *Statutory Damages as a Remedy for Design Patent Infringement*,[55] Janis surveys existing provisions for damages for the infringement of patents for ornamental designs[56] and considers the possibility of a more robust role for statutory damages.[57] In *Samsung Electronics Co. v. Apple Inc.*,[58] the United States Supreme Court indicated that the "total profits" recoverable for design-patent infringement could be limited to the profits derived from "an article of manufacture" that constitutes only a portion of an infringing product.[59] Janis suggests that, at least "in the short term," a "simple or predictable test" for the nature of the relevant article of manufacture is likely to be elusive and that design patent owners will therefore consider alternative remedies.[60] In his view, however,

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[49] *Id.* (discussing scholarship on the potential use of cost in determining damages under existing law); *id.* (noting that, "in the § 1498 context, courts have already considered nonpatent incentives in patent damages calculations" (emphasis omitted)).

[50] Peter Lee, *Distinguishing Damages Paid from Compensation Received: A Thought Experiment*, 26 TEX. INTELL. PROP. L.J. (forthcoming 2018).

[51] *Id.* (proposing to "separat[e] the amount of compensation that patentees receive from the amount of damages that infringers pay").

[52] *Id.* (describing the proposal for decoupling). To avoid overcompensating a patentee relative to the inducement measure while also maintaining deterrence of infringement, Lee suggests retaining traditional measures for the standard damages to be paid by an infringer while at the same time awarding to a patentee only the fraction of the standard damages that the patentee has shown to be necessary to cover "inducement costs based on [] actual and projected expenditures as well as opportunity costs of capital" associated with relevant innovation efforts. *Id.* at __.

[53] *Id.*

[54] *Id.*

[55] Mark D. Janis, *Statutory Damages as a Remedy for Design Patent Infringement*, 36 REV. LITIG. (forthcoming 2018).

[56] *Id.* (discussing remedies for design-patent infringement).

[57] *Id.* (considering how a more meaningful statutory remedies regime might be structured).

[58] 137 S. Ct. 429 (2016).

[59] *Id.* at 434.

[60] Janis, *supra* note 55.

the current statutory damages provision for design patents "is a virtual dead letter" because of its restriction of awards to $250.[61] Janis further contends that, for patented designs, lost-profit damages will often be especially difficult to prove because of the likely existence of substantial non-infringing alternatives.[62] Finally, Janis casts doubt on the notion that reasonably royalty damages "would be a good fit for design patent infringement," in part because "[a]necdotal evidence suggests that, unlike many areas of utility patenting, there is no active licensing market for design patents."[63] Janis thus entertains the possibility of amending the Patent Act to allow for much more substantial statutory damages for design patent infringement,[64] albeit perhaps only in cases of "design patent counterfeiting"[65] and with appropriate safe harbors for retailers or other "innocent infringers."[66]

In *Should Courts Award Pain and Suffering Damages in Patent Infringement Cases?*,[67] Ronen Avraham considers an arguably more radical proposal: permitting monetary relief for so-called non-economic harms inflicted by patent infringement such as the pain and suffering of an individual inventor.[68] Avraham argues that, "from an economic perspective . . . , non-economic harm should be compensated in order to incentivize would-be infringers to internalize the full social harm of their conduct."[69] Avraham compares the pain and suffering that infringement inflicts on individual inventors to the emotional distress for which certain victims of breach of contract or property rights violations have been able to obtain recoveries.[70] In considering potential avenues for implementation of his proposal under existing law, Avraham explores the extent to which pain and suffering damages may be awarded as enhanced damages as opposed to standard compensatory damages.[71] Avraham contends that, even if restricted to situations involving individual inventors, the proposal to allow non-economic damages could be significant because solo inventors still bring about 5% of patent-infringement suits.[72]

Other authors focus even more substantially on deterrence or punishment of infringers as opposed to compensation of patentees. In *Punitive Patent Liability: A Comparative Examination*,[73] Dan Burk considers the extent to which damages

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61 *Id.*

62 *Id.* ("[A] design patent owner's efforts to defend against functionality by showing the existence of non-infringing alternative designs for carrying out the same function may well undermine its efforts to establish entitlement to lost profits.").

63 *Id.*

64 *See id.* (concluding that, with "suitable safeguards for retailers and consumers," a revised regime of statutory damages could provide "a viable remedy for design patent infringement").

65 *Id.*

66 *Id.*

67 Ronen Avraham, *Should Courts Award Pain and Suffering Damages in Patent Infringement Cases?*, 26 TEX. INTELL. PROP. L.J. (forthcoming 2018).

68 *Id.* ("I argue that there is room for cognizable non-economic harm in patent-infringement cases . . . .").

69 *Id.*

70 *Id.* (comparing harm to solo inventors to the distress from "defective construction of [a] dream home" and from "wrongful denial of [insurance] coverage").

71 *See id.* (discussing the Patent Act's provision for enhanced damages).

72 *Id.* ("[A] large portion (5%) of cases are still brought by solo inventors . . . .").

73 Dan L. Burk, *Punitive Patent Liability: A Comparative Examination*, 36 REV. LITIG. (forthcoming 2018).

remedies can substitute for injunctions as deterrents to "opportunistic or strategic patent infringement"[74] while also maintaining protection against strategic behavior by patentees.[75] Burk specifically examines the policy calculus for patent remedies in relation to "the global series of disputes surrounding 'standard essential patents' (SEPs) in handheld telecommunications devices, a set of disputes sometimes dubbed the 'smartphone wars.' "[76] SEPs can create or reinforce technological bottlenecks, giving their owners great leverage over market participants.[77] To facilitate navigation of these bottlenecks, standard setting organizations commonly have owners of SEPs commit to licensing their technology on " 'fair, reasonable and nondiscriminatory' (FRAND) terms to all adopters."[78] But when licensing breaks down, courts confront questions of how to enforce SEPs. Burk suggests that, for patents subject to FRAND commitments, courts might helpfully follow the law of restitution in providing "a spectrum of penalties, largely tied to the degree of scienter attached to the act of unjust enrichment," and culminating in "full disgorgement of the wrongdoer's profit."[79] Burk adds that German courts have all the doctrinal tools needed for this approach and that such action would comport with "remedial flexibilities within the [European Union] Intellectual Property Rights Enforcement Directive."[80]

In *Punishing the Malicious Pirate in Patent Law*,[81] Karen Sandrik examines a recent opinion of the United States Supreme Court on enhanced damages and argues that the Court's exclusive emphasis on "deliberate wrongdoing" as the basis for enhancement[82] deviates from a history in which deterrence and compensation also featured as justifications.[83] Sandrik notes that the Supreme Court's apparent focus on infringement as a form of private wrong contrasts with recent scholarship characterizing patent law as a form of public-purpose-oriented market regulation.[84] In light of the facial private-rights orientation of the Court's opinion, Sandrik considers how traditional areas of private law have balanced concerns with general welfare and individual rights.[85] Specifically, she observes that the tort of bad-faith breach of contract arose from concern that insurers might reject "reasonable settlement offers" in hopes that a claimant might lack the motivation or resources to

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74 *Id.*

75 *See id.* (suggesting existence of "a path to deter strategic behavior by potential licensees, while setting remedial defaults that deter the more serious problem of strategic behavior by [standard essential patent] holders").

76 *Id.*

77 *Id.* (describing the importance of standards for interoperability, resulting network effects, and the phenomenon of "lock in," which can give a "standard owner enormous market leverage").

78 *Id.*

79 *Id.*

80 *Id.*

81 Karen Sandrik, *Punishing the Malicious Pirate in Patent Law*, 36 REV. LITIG. (forthcoming 2018).

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

83 Sandrik, *supra* note 81 ("[M]any of those early cases understood enhanced damages as serving a deterring and/or compensating role.").

84 *Id.* ("Patent law scholars have argued that tort law, or more generally, private law remedies, are a poor fit in light of patent doctrine and/or patent policy.").

85 *Id.* (exploring "the tort action of bad-faith breach of contract" as a potentially "useful analog to enhanced damages in patent law after *Halo*").

challenge the insurer's behavior.[86] Sandrik analogizes this concern with insurer behavior to concern that a user of patented technology will knowingly neglect to obtain a license and engage in infringing use because the user believes that the patent holder will likely fail to detect infringement or decline to undertake the costs of suing for patent infringement.[87] Sandrik concludes that, although the analogy is imperfect, judicial experience with the tort of bad-faith breach of contract suggests how courts might develop a wrongfulness-based approach to enhanced damages that is workable and at least incidentally serves—or avoids disserving—patent law's public aims.[88]

Finally, in *Discretion in Patent Damages*,[89] the author of this Foreword, John Golden, examines institutional allocations of discretion in awarding patent damages and observes that recent Supreme Court decisions have enforced a strong delegation to district courts of discretionary power over monetary relief.[90] On the other hand, the Court has not yet rejected efforts by the U.S. Court of Appeals for the Federal Circuit "to limit trial court discretion in awarding reasonable royalty damages."[91] Golden suggests that this apparent toleration of discretion-limiting actions might reflect the incremental or case-by-case approach that the Federal Circuit has taken in relation to reasonable royalty damages.[92] Golden suggests that the Supreme Court appears to have embraced a view under which trial judges are to have substantial "authoritative discretion" over patent remedies,[93] but appellate courts still have important roles to play in ensuring a reasonable degree of uniformity in approaches to damages assessment, partly through providing guidance in the nature of informing "principles and illustrative markers."[94] In Golden's view, this general approach to allocating institutional responsibilities can be an effective way to respond to problems of individuality, contingency, and uncertainty regarding the content of optimal legal doctrine or practice.[95]

The twelve symposium articles on patent damages thus advance debate across multiple fronts and do so through a variety of distinct approaches. The articles' pluralism in targets and methods seems a healthy way to engage fundamental

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[86] *Id.* ("Originally this action arose in response to third-party liability insurers that rejected reasonable settlement offers within the policy limits.").

[87] *Cf. id.* (contending that the imposition of "a mandatory minimum of treble damages" in the Patent Act of 1793 suggested Congress' belief that court awards would otherwise be under-compensatory for a prevailing patentee or "that detection and enforcement of patent infringement would be difficult").

[88] *Id.* (suggesting that the Supreme Court's opinion in *Halo* need not "open the floodgates of enhanced damages claims and embolden nonpracticing entities").

[89] John M. Golden, *Discretion in Patent Damages*, 36 REV. LITIG. (forthcoming 2018).

[90] *Id.* ("[T]he Supreme Court has recently obliterated legal rules developed by the Federal Circuit that significantly limited trial court discretion.").

[91] *Id.*

[92] *Id.* (noting the Supreme Court's apparent support for "evolutionary restrictions on trial-level discretion").

[93] *Id.*

[94] *Id.*

[95] *Id.* (noting "concerns of uncertainty, contingency, and context specificity" in relation to patent damages, and observing that "opportunities for trial-level experimentation can enable better and ultimately best practices to emerge").

problems in assessing monetary relief for patent infringement.[96] With luck, these efforts can help law and legal practice advance to a point at which the awarding of patent damages is no longer said "to involve more the talents of a conjurer than those of a judge."[97]

[96] *Cf.* John M. Golden, Robert P. Merges & Pamela Samuelson, *The Path of IP Studies: Growth, Diversification, and Hope*, 92 TEX. L. REV. 1757, 1766–67 (2014) (discussing benefits of "methodological diversity").

[97] ResQNet.com, Inc. v. Lansa, Inc., 594 F.3d 860, 869 (Fed. Cir. 2010) (internal quotation marks omitted).

Tax Solutions to Patent Damages

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The calculation of patent damages lies at the epicenter of patent policy, yet it remains one of the most contentious issues in all of intellectual property law. The dominant legal framework equates a reasonable royalty, the most prevalent patent damage award, to a hypothetical negotiation between the parties at the time infringement began. Commentators and courts generally agree that existing comparable patent licenses, which represent arm's-length transaction between two unrelated private parties that places a monetary value on the patent, are highly probative in determining a reasonable royalty. The lack of publicly available licensing data, however, limits the ability of courts to identity appropriate comparable

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licenses. In this paper, we argue that there is a large untapped trove of information on existing patent licensing agreements, many of which are likely more probative to reasonable royalty calculation than currently existing licensing data offered by patent damage experts. This novel source of data is tax-related "transfer prices."

I. Introduction

The calculation of patent damages lies at the epicenter of patent policy, yet it remains one of the most contentious issues in all of intellectual property law.[1] Scholars debate whether the damage rules result in systematic overcompensation of patentees.[2] The press routinely reports eye-popping, ten-figure damage awards.[3] After a decade of trying to pass major patent reform, Congress succeeded only after the divisive patent damages provisions were expunged from the bill.[4]

The Patent Act provides that "[u]pon finding for the claimant the court shall award the claimant damages adequate to compensate for the infringement, but in no event less than a reasonable royalty."[5] There is general agreement that part of the discontent with patent damages stems from this "reasonable royalty" calculation, which is the most prevalent patent damage award.[6] The dominant legal framework equates the reasonable royalty to that of a hypothetical negotiation between the parties at the time infringement began, wherein courts are instructed to consider fifteen *Georgia-Pacific* factors in reconstructing this negotiation.[7] This laundry list of fac-

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1 The SEDONA CONFERENCE WORKING GRP., COMMENTARY ON PATENT DAMAGES AND REMEDIES 23 (2014), https://thesedonaconference.org/download-pub/3827; U.S. FED. TRADE COMM'N, THE EVOLVING IP MARKETPLACE: ALIGNING PATENT NOTICE AND REMEDIES WITH COMPETITION (2011); NAT'L RESEARCH COUNCIL, NAT'L ACADS. OF SCI., A PATENT SYSTEM FOR THE 21ST CENTURY (STEPHEN A. MERRILL, RICHARD C. LEVIN & MARK B. MYERS EDS., 2004); U.S. FED. TRADE COMM'N, TO PROMOTE INNOVATION: THE PROPER BALANCE OF COMPETITION AND PATENT LAW AND POLICY (2003).

2 *See, e.g.*, Thomas F. Cotter, *Patent Holdup, Patent Remedies, and Antitrust Responses*, 34 J. CORP. L. 1151, 1152–53 (2009); Einer Elhauge, *Do Patent Holdup and Royalty Stacking Lead to Systematically Excessive Royalties?*, 4. J. COMPETITION L. & ECON. 535, 535–36 (2008); John Golden, *"Patent Trolls" and Patent Remedies*, 85 TEX. L. REV. 2111, 2112 (2007); Mark A. Lemley & Carl Shaprio, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 1994 (2007).

3 *See, e.g.*, Jonathan D. Rockoff, *Gilead Sciences Ordered to Pay $2.5 Billion in Damages to Merck & Co.*, WALL ST. J. (Dec. 15, 2016, 6:10 PM), http://www.wsj.com/articles/gilead-sciences-ordered-to-pay-2-5-billion-in-damages-to-merck-co-1481843183 (reporting the original verdict in Idenix Pharm. LLC v. Gilead Scis., Inc., No. CV 13-1987-LPS, 2016 WL 6802481 (D. Del. 2016)); Sinead Carew, *Microsoft Hit with $1.52 Billion Patent Damage Verdict*, VC NEWS NETWORK (Feb. 22, 2007, 7:07 PM), http://www.reuters.com/article/idUSWEN465120070223 (reporting original jury verdict in Lucent Techs., Inc. v. Gateway, Inc., 580 F. Supp. 2d 1016, 1028 (S.D. Cal. 2008), *rev'd* 580 F.3d 1301, 1308 (Fed. Cir. 2009)).

4 America Invents Act, Public Law 112-29 (2011).

5 35 U.S.C. § 284 (2015).

6 PRICEWATERHOUSECOOPERS, 2014 PATENT LITIGATION STUDY: AS CASE VOLUME LEAPS, DAMAGES CONTINUE GENERAL DECLINE, 9 (2014), *available at* https://www.pwc.com/us/en/forensic-services/publications/assets/2014-patent-litigation-study.pdf.

7 Georgia-Pac. Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116 (S.D.N.Y. 197), *mod. and aff'd*, 446 F.2d 295 (2d Cir. 1971), *cert. denied*, 404 U.S. 870 (1971).

tors has been subject to intense criticism for failing, among other things, to provide the courts with sufficient guidance in determining patent damages.[8]

One way courts have responded to the subjectivity in determining reasonable royalties is to place more weight on the one objective, measurable *Georgia-Pacific* factor—existing comparable patent licenses. An existing patent license represents an arm's-length transaction between two unrelated private parties that places a monetary value on the patent. The use of existing comparable licenses may enable courts to utilize private valuations to gauge patent damages. For these reasons, comparable licenses might well constitute the best available evidence for reconstructing a hypothetical royalty negotiation. In fact, despite the controversy surrounding patent damages, there is general agreement that existing comparable patent licenses are highly probative in determining a reasonable royalty.[9]

While existing comparable patent licenses are arguably the preferred approach of courts and commentators, the lack of publicly available licensing data limits the ability of courts to identify appropriate comparable licenses. In this paper, we argue that there is a large untapped trove of information on existing patent licensing agreements, many of which are likely more probative to reasonable royalty calculation than currently existing licensing data offered by patent damage experts. This novel source of data is tax-related "transfer prices."

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[8] *See, e.g.*, Daralyn J. Durie & Mark A. Lemley, *A Structured Approach to Calculating Reasonable Royalties*, 14 LEWIS & CLARK L. REV. 627, 632 (2010) (stating that "[w]ith at least fifteen factors, a complex interaction between them, and little limit on expert testimony on damages, there is likely to be evidence somewhere in the case that could be construed to support virtually any number the jury might settle on"). Relatedly, the nebulous nature of the factors, along with the lack of guidance on how to weigh the factors, limits the ability of a court to review whether a jury's award is supported by substantial evidence. Christopher B. Seaman, *Reconsidering the* Georgia-Pacific *Standard for Reasonable Royalty Patent Damages*, 2010 BYU L. Rev. 1661, 1688 (2010).

[9] *See, e.g.*, Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301, 1323–39 (Fed. Cir. 2009); Apple, Inc. v. Samsung Elecs. Co., No. 12-CV-00630-LHK, 2014 WL 6687122 (N.D. Cal. Nov. 25, 2014) (setting ongoing royalty payments); Apple, Inc. v. Samsung Elecs. Co., No. 11-CV-01846-LHK, 2014 WL 549324 (N.D. Cal. Feb. 7, 2014) (denying Apple's request for additur following a second trial on damages); In re Innovatio IP Ventures, LLC Patent Litig., No. 11 C 9308, 2013 WL 5593609 (N.D. Ill. Oct. 3, 2013); Apple, Inc. v. Motorola, Inc., 869 F. Supp. 2d 901 (N.D. Ill. 2012) (Posner, J.), *aff'd in part, rev'd in part, vacated in part*, 757 F.3d 1286 (Fed. Cir. 2014); Stephen J. Conroy et al., *The Case for Admitting Settlement License Agreements in a Reasonable Royalty Analysis*, 46 LES NOUVELLES 291 (2011); Merritt J. Hasbrouck, *Protecting the Gates of Reasonable Royalty: A Damages Framework for Patent Infringement Cases*, 11 J. MARSHALL REV. INTELL. PROP. L. 192, 215 (2011); John C. Jarosz & Michael J. Chapman, *The Hypothetical Negotiation and Reasonable Royalty Damages: The Tail Wagging the Dog*, 16 STAN. TECH. L. REV. 769 (2013); 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, 205 (2012); David O. Taylor, *Using Reasonable Royalties to Value Patented Technology*, 49 GA. L. REV. 79 (2014); Jaimeson Fedell, Note, *A Step in the Right Direction: Patent Damages and the Elimination of the Entire Market Value Rule*, 98 MINN. L. REV. 1143, 1146–50 (2014). *But see*, William F. Lee & A. Douglas Melamed, *Breaking the Vicious Cycle of Patent Damages*, 101 CORNELL L. REV. 385 (2016); Erik Hovenkamp & Jonathan Masur, *How Patent Damages Skew Licensing Markets*, 36 REV. LITIG. 379 (2017).

As part of their multinational operations, corporations routinely transfer rights to use their patents to their subsidiaries located in different jurisdictions.[10] The amount paid by one related company to another for the economic rights to the patent is the patent's transfer price. Because the sourcing of income and expenses affects the amount of taxable income reportable in a jurisdiction, countries are often at odds regarding the appropriate value to be placed on the use of intellectual property developed in one jurisdiction but used by a business in another. Multinationals that are attempting to minimize their taxes have strong incentives to shift earnings to low-tax jurisdictions. Hence, countries have developed an extensive and detailed set of rules and regulations guiding transfer pricing. Laws require, among other things, that transfer prices reflect an arm's-length transaction between unrelated parties, that multinationals hire appraisers to prepare rigorous documentation justifying their transfer prices, and that multinationals attest to the prices' accuracy under severe penalties.[11] Moreover, the Internal Revenue Service ("I.R.S.") has the ability to reject any transfer price that they contend does not fall within an arm's-length transaction between the unrelated parties. Given the similarity between the arm's-length tax standard and the *Georgia-Pacific* factor of existing "comparable patent licenses," we contend that the tax-related transfer prices, at least within certain circumstances, are highly relevant data in determining the reasonable royalty patent damage award.

The relationship between tax-related transfer pricing and patent litigation has largely gone unnoticed, with one notable exception.[12] Andrew Blair-Stanek has previously argued that the tax minimization incentives associated with moving intellectual property from the United States (U.S.) to a "tax-haven" jurisdiction removes almost the entire economic reality of transfer prices.[13] Hence, by requiring courts to rely on transfer prices in setting damages, he contends that the courts can mitigate multinational corporations' tax avoidance. Our analysis differs from Blair-Stanek in two critical ways. First, while we agree that tax incentives certainly influence transfer prices, we do not believe that tax incentives render transfer prices completely meaningless. That is, we contend that transfer prices reflect the economic value of the patent, at least within some bargaining range. Second, our analysis differs from Blair-Stanek in that we consider transfer pricing on a global scale—i.e., not just moving intellectual property out of the U.S. and into a lower-tax jurisdiction. In doing so, we argue that, depending upon the tax rate of the jurisdiction, royalty payments/license fees within the multinational corporation can be simultaneously upwardly and downwardly influenced by tax incentives. As a result, we contend that

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[10] Often, the transfer is effectuated through a licensing agreement.

[11] *See infra* Part II.

[12] There is a nascent literature at the intersection of intellectual property law and tax law. *See, e.g.*, Jeffrey A. Maine & Xuan-Thao Nguyen, *The Unequal Tax Treatment of Intellectual Property*, 130 TAX NOTES 931 (2011); Xuan-Thao Nguyen & Jeffrey A. Maine, *Equity and Efficiency in Intellectual Property Taxation*, 76 BROOK. L. REV. 1 (2010).

[13] Andrew Blair-Stanek, *Intellectual Property Law Solutions to Tax Avoidance*, 62 UCLA L. REV. 2 (2015).

tax-related transfer prices may be used to provide both an upper and lower bound to the multinational corporation's valuation of its patents.[14]

This Article proceeds in four parts. Part II details patent law damages, highlighting the growing dominance of existing patent licenses in the calculation of patent damages, and noting that the dearth of comparable existing licenses limits the effectiveness of this approach. Part III introduces transfer prices and the host of U.S. regulations that ensure transfer prices reflect an arm's-length value. By taking a global perspective, Part IV examines when transfer prices are likely to represent the upper or lower bounds of a bargaining range based upon tax structures. Finally, Part V explores when transfer prices are the most informative to calculating reasonable royalty damage awards in patent cases and how transfer prices are devoid of some of the distortions that plague existing patent licenses between unrelated parties.

II. Patent Damages

Patents help to nudge society towards the optimal level of innovation by giving inventors a mechanism to recoup their research and development expenses.[15] Patents have value because they enable the owner to recoup these expenses—i.e., increase their profits—either by excluding others from the market in which they sell products or by receiving royalties by licensing the patent.

Once a patent is found to be valid and infringed, its owner is entitled to infringement damages. The governing statute provides for "damages adequate to compensate for the infringement, but in no event less than a reasonable royalty."[16] Courts have interpreted this language to conclude that patent damages come in two primary measures: lost profits and reasonable royalties. Lost profits provide the patentee with a damage award of the profits the patentee would have made but for the infringing sales.[17] Thus, only patentees that participate in a market in competition with the infringer, such as by selling its own product that practices the patent, will be eligible for lost profits damage awards.[18]

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14 *Id.*

15 *See* WILLIAM D. NORDHAUS, INVENTION, GROWTH, AND WELFARE: A THEORETICAL TREATMENT OF TECHNOLOGICAL CHANGE 76 (1969) (explaining the need for finding the optimal patent length, because the longer a patent lasts, the greater the social cost of that patent due to inefficiencies caused by monopoly of information).

16 35 U.S.C. § 284 (2015).

17 Mars, Inc. v. Coin Acceptors, Inc., 527 F.3d 1359, 1366 (Fed. Cir. 2008) ("[P]atentees tend to try to fit their damages cases into the 'lost profits' framework, or else fall back on the statutory grant of a reasonable royalty.").

18 BIC Leisure Prods., Inc. v. Windsurfing Int'l, Inc., 1 F.3d 1214, 1219 (Fed. Cir. 1993) (reversing the award of lost profits because the patentee and infringer did not compete in the same market). The classic example of lost profits is diverted sales—that is, profits the patentee would have made from sales it lost to the infringing product. *See, e.g.*, Micro Chem., Inc. v. Lextron, Inc., 318 F.3d 1119, 1124 (Fed. Cir. 2003); State Indus., Inc. v. Mor-Flo Indus., Inc., 883 F.2d 1573, 1578 (Fed. Cir. 1989). Lost profits may also arise from price erosion, where competition from the infringer results in the patentee lowering its prices and hence earning lower profits on the goods it sells. Lam,

Proving lost profits, however, is not an easy endeavor.[19] The prevailing patentee must prove (1) the extent of demand for the patented product, (2) the absence of non-infringing substitutes for that product, (3) the patentee's ability to meet the additional demand by expanding manufacturing capacity, and (4) the extent of profits the patentee would have made.[20] Case law also requires an inquiry into how the patentee would divide sales with other companies in the market selling non-infringing or licensed goods.[21] The difficulties associated with proving lost profits are partly responsible for why lost profits have been declining as a basis for recovery for patent infringement. In recent years, lost profits have constituted less than 37% of all patent damage awards.[22]

In contrast, reasonable royalties, which serve as the floor to patent damages, have become the dominant damage award determination. Today, over 80% of all patent damage awards are reasonable royalties.[23] Reasonable royalties are awarded by the courts in two different scenarios. First, when a patentee who manufactured the patent product fails to meet the standards of proof associated with proving lost profits.[24] Second, when the patentee does not sell the patented invention herself and may, or may not, license the patent in question to others who sell the patented invention.[25] The principal legal framework in patent law for the reasonable royalty damage sets the royalty to the amount that would be agreed upon in a hypothetical negotiation between the parties at the time infringement began.[26] This hypothetical

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Inc. v. Johns-Manville Corp., 718 F.2d 1056, 1065 (Fed. Cir. 1983); JOHN M. SKENYON, CHRISTOPHER S. MARCHESE & JOHN LAND, PATENT DAMAGES LAW AND PRACTICES § 2.4 (2009).

19 Historically, patentees have preferred an award of lost profits to a reasonable royalty, as the former better tracks the monopoly value of the patent than the latter. Mark A. Lemley, *Distinguishing Lost Profits from Reasonable Royalties*, 51 WM. & MARY L. REV. 655, 660 61 (2009). However, more recently some patentees are able to pursue greater recovery by seeking reasonable royalty damages instead of lost profits. *See, e.g.*, Monsanto Co. v. McFarling, 488 F.3d 973, 978–81 (Fed. Cir. 2007) (affirming a jury award of reasonable royalty damages of $40 per bag of soybean seed, which was more than six times greater than the plaintiff's lost profits).

20 *See, e.g.*, Panduit Corp. v. Stahlin Bros. Fibre Works, 575 F.2d 1152, 1156 (6th Cir. 1978). The United State Court of Appeals for the Federal Circuit has adopted this framework as its primary, but not exclusive, method to analyze lost profits. Gyromat Corp. v. Champion Spark Plug Co., 735 F.2d 549 (Fed. Cir. 1984).

21 *See* Mor-Flo Indus., 83 F.2d at 1578 (applying the market share rule to determine the amount of sales the patentee would have made but for the infringing activity).

22 PRICEWATERHOUSECOOPERS, *supra* note 8, at 9. The rise of non-practicing entities has also likely played an important role in lost profits becoming a declining basis for recovery for patent infringement. *Id.*

23 Seaman, *supra* note 8, at 1688.

24 35 U.S.C. § 284 (2015).

25 Poly-America, L.P. v. GSE Lining Tech., Inc., 383 F.3d 1301, 1311 (Fed. Cir. 2004) (holding that reasonable royalties are the only damages for a patent owner that sells a device whose sales are negatively affected by the sale of the infringing product).

26 The Federal Circuit has blessed several other approaches, including an "analytical method" that begins with calculating the defendant's profit from utilizing an infringing product and subtracts "the infringer's usual or acceptable net profit from its anticipated net profit realized from sales of infringing devices." Lucent Techs., Inc. v. Gateway, Inc. 580 F.3d 1301, 1324 (Fed. Cir. 2009) (quoting TWM Mfg. Co. v. Dura Corp., 789 F.2d 895, 899 (Fed. Cir. 1986)); *see* Taylor, *supra*

negotiation standard assumes both that the parties are willing to negotiate and that it was known to a certainty that the patent was valid and infringed at the time of the negotiation.[27]

Courts often rely upon a list of fifteen factors, known as the *Georgia-Pacific* factors, to help in determining a reasonable royalty rate.[28] These factors pose many

note 11, at 118. Nevertheless, the hypothetical negotiation remains the dominant framework.

[27] Georgia-Pac. Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116 (S.D.N.Y. 197), *mod. and aff'd*, 446 F.2d 295 (2d Cir. 1971), *cert. denied*, 404 U.S. 870 (1971). As the Federal Circuit has explained: "The hypothetical negotiation tries, as best as possible, to recreate the *ex ante* licensing negotiation scenario and to describe the resulting agreement. In other words, if infringement had not occurred, willing parties would have executed a license agreement specifying a certain royalty payment scheme." Lucent Techs., Inc., v. Gateway, Inc. 580 F.3d 1301, 1324 (Fed. Cir. 2009).

[28] The factors are:

1. Royalties patentee receives for licensing the patent in suit, proving or tending to prove an established royalty.
2. The rates paid by the licensee for the use of other patents comparable to the patent in suit.
3. The nature and scope of license, as exclusive or non-exclusive; or as restricted or non-restricted in terms of territory or with respect to whom the manufactured product may be sold.
4. The licensor's established policy and marketing program to maintain patent monopoly by not licensing others to use the invention or by granting licenses under special conditions designed to preserve that monopoly.
5. The commercial relationship between licensor and licensee, such as, whether they are competitors in the same territory in the same line of business; or whether they are inventor and promoter.
6. The effect of selling the patented specialty in promoting sales of other products of the licensee; the existing value of the invention to the licensor as a generator of sales of his non-patented items; and the extent of such derivative or convoyed sales.
7. The duration of patent and term of license.
8. The established profitability of the products made under the patent; its commercial success; and its current popularity.
9. The utility and advantages of patent property over the old modes and devices, if any, that had been used for working out similar results.
10. The nature of the patented invention; the character of the commercial embodiment of it as owned and produced by the licensor; and the benefit of those who have used the invention.
11. The extent to which the infringer has made use of the invention and the value of such use.
12. The portion of profit or the selling price that may be customarily in the particular business or in comparable businesses to allow for the use of the invention or analogous inventions.
13. The portion of realizable profit attributable to the invention as distinguished from non-patented elements, significant features / improvements added by the infringer, the manufacturing process or business risks.
14. Opinion testimony of qualified experts.
15. The amount that a licensor (such as the patentee) and a licensee (such as the infringer) would have agreed upon (at the time the infringement began) if both had been reasonably and voluntarily trying to reach an agreement; that is, the amount which a prudent licensee-who desired, as a business proposition, to obtain a license to manufacture and sell a particular article embodying the patented invention—would have been willing to pay as a royalty and yet be able to make a reasonable profit and which amount would have been acceptable by a prudent patentee who was willing to grant a license.

Georgia-Pac., 318 F. Supp. at 1119–20; Unisplay, S.A. v. Am. Elec. Sign Co., Inc., 69 F.3d 512, 517 n.7 (Fed. Cir. 1995).

relevant questions—such as the royalty rates people have been willing to pay for the invention in question or similar inventions in the industry—and, overall, represent a broad spectrum of considerations relating to the patent holder's and infringer's potential gains from the patented technology. The use of the *Georgia-Pacific* factors in calculating reasonable royalties, however, has been subject to intense criticism.[29]

Perhaps the most salient are concerns that *Georgia-Pacific* gives courts and juries no meaningful guidance as to how the fifteen factors should be weighted or compared.[30] Observers contend that the long list of *Georgia-Pacific* factors can overload the trier of fact with factors that may be "irrelevant, overlapping, or even contradictory."[31] Relatedly, others contend that the long list of *Georgia-Pacific* factors are sufficiently vague as to provide decision-makers almost limitless discretion in making a damage award determination.[32] The result has been to leave courts largely at the mercy of the parties' damages experts, which routinely differ by several orders of magnitude in their valuations. Given the wide disparity in the valuations proffered by the parties, the courts are in desperate need of additional evidence to help narrow the range of a reasonable royalty patent damage award.

From a theoretical perspective, how should the courts attempt to reconstruct the hypothetical negotiation? An application of economic theory suggests that the trier of fact should be determining the lower and upper bounds of the bargaining range.[33] The lower bound of the bargaining range is the minimum amount the licen-

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Although the *Georgia-Pacific* factors still dominate the legal landscape, several recent Federal Circuit cases have indicated a decline in the primacy of these factors in calculating reasonable royalties. *See, e.g.*, ResQNet.com, Inc. v. Lansa, Inc., 594 F.3d 860, 869 (Fed. Cir. 2010) (reaffirming the hypothetical *ex ante* negotiation as the legal standard for reasonable royalty determination but criticizing *Georgia-Pacific*'s list of evidentiary factors for calculating the royalty as "prioritized and often overlapping"); *Id.* (quoting Riles v. Shell Expl. & Prod. Co., 298 F.3d 1302, 1312 (Fed. Cir. 2002) (reaffirming that the *Georgia-Pacific* approach is not the exclusive means for calculating reasonable royalties)); Energy Transp. Grp., Inc. v. William Demant Holding A/S, 697 F.3d 1342, 1357 (Fed. Cir. 2012) ("Once again, this court does not endorse *Georgia-Pacific* as setting forth a test for royalty calculations, but only as a list of admissible factors informing a reliable economic analysis.").

29 *See, e.g.*, Lee & Melamed, *supra* note 9; Jorge L. Contreras & Richard J. Gilbert, *A Unified Framework for RAND and Other Reasonable Royalties*, 30 BERKELEY L. TECH. 1451, 1479–82 (2015); Taylor, *supra* note 9; Jarosz & Chapman, *supra* note 9, at 823; Seaman, *supra* note 8, at 1704; Durie & Lemley, *supra* note 8, at 628–31; Mark Schankerman & Suzanne Scotchmer, *Damages and Injunctions in Protecting Intellectual Property*, 32 RAND J. ECON. 199 (2001).

30 J. Gregory Sidak, *Bargaining Power and Patent Damages*, 19 STAN. TECH L. REV. 1, 3 (2015).

31 *See, e.g.*, Durie & Lemley, *supra* note 8, at 631; John W. Schlicher, *Patent Damages, the Patent Reform Act and Better Alternatives for the Courts and Congress*, 91 J. PAT. & TRADEMARK OFF. SOC'Y 19, 22 (2009); Seaman, *supra* note 8, at 1704.

32 *See, e.g.*, Durie & Lemley, *supra* note 8, at 632 (stating that "[w]ith at least fifteen factors, a complex interaction between them, and little limit on expert testimony on damages, there is likely to be evidence somewhere in the case that could be construed to support virtually any number the jury might settle on."). Relatedly, the nebulous nature of the factors along with the lack of guidance on how to weigh the factors limits the ability of a court to review whether a jury's award is supported by substantial evidence. Seaman, *supra* note 8, at 1688.

33 In other words, the hypothetical voluntary transaction necessarily makes both parties better off– a

sor is willing to accept,[34] which is a function of its opportunity cost of licensing the patent to the would-be infringer at the time of the hypothetical negotiation.[35] The upper bound of the bargaining range is the maximum amount the licensee is willing to pay, which should equal the added incremental benefit the licensee would expect to receive by licensing the patent-in-suit rather than using the next-best non-infringing substitute.[36] The ultimate outcome of the hypothetical negotiation—that is, where within the bargaining range the reasonable royalty is for a particular case—should depend in part upon the relative bargaining power of the licensor and

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negotiated royalty must fall between the upper and lower bounds of the bargaining range. Importantly, the value of technology covered by the licensor's patent must be separated from the technology's other features that the patent in question does not cover. It is possible to deduce the value of the patented feature to a product by observing the profits of the licensee is certain scenarios. For instance, if the would-be licensee sells both the patented technology and next-best non-infringing substitute, then one could calculate the difference in expected profits between the two to determine the incremental value of the patented technology to the infringing product.

The finder of fact must account for the existence of available and acceptable non-infringing substitutes at the time of the hypothetical negotiation. *See, e.g.*, Mars, Inc. v. Coin Acceptors, Inc., 527 F.3d 1359, 1372–73 (Fed. Cir. 2008). If a non-infringing alternative was not on the market at the time of the hypothetical negotiation, then it is assumed not to have existed. Siemens Med. Sols. USA, Inc. v. Saint-Gobain Ceramics & Plastics, 637 F.3d 1269, 1288 (Fed. Cir. 2011); *see also* Eschsler v. Macke Int'l Trade, Inc., 486 F.3d 1286, 1298 (Fed. Cir. 2007); Micro Chem., Inc. v. Lextron, Inc., 318 F.3d 1119, 1122–23 (Fed. Cir. 2003); Grain Processing Corp. v. Am. Maize-Products Co., 185 F.3d 1341, 1351–54 (Fed. Cir. 1999). This assumption can be overcome by the infringer by showing that a non-infringing alternative could have been readily commercialized. In contrast, the mere possibility of design around is not enough to establish availability. *Mars*, 527 F.3d at 1372–73.

[34] One piece of empirical evidence that is probative of the costs associated with licensing a patent is comparable licenses that the licensor has executed for the patent in question. Not every comparable license will provide the lower bound of the bargaining range—i.e., illuminate the licensor's minimum wiliness to accept. To determine the lower bound of the bargaining range, one must identify a license where the licensor had little to no bargaining power or chose not to exercise her bargaining power.

[35] The patent holder is not willing to accept a royalty that is lower than her opportunity cost of licensing the patent. Opportunity costs associated with licensing a patent include profits the patent holder could have earned if she had not issued the license in question. These profits may arise from lost sales—that is, sales the patent holder would have made in the absence of issuing the license. These profits may also arise from alternative licensing schemes that the patent holder forwent because the license in question was issued.

[36] In a real-life negotiation, an agreement below the lower bound of the bargaining range will never come to fruition, as the patent holder would have never agreed to license the patent below the minimum value she is willing to accept. Similarly, an agreement above the upper bound of the bargaining range will not materialize because the licensee will not pay a royalty above her maximum willingness to pay. While the stated goal of the reasonable royalty inquiry is to replicate the negotiation that might otherwise have occurred, it is important to recognize that the hypothetical negotiation differs from real-life negotiation in several important ways. Perhaps most significantly is that parties *did not* agree beforehand. The hypothetical negotiation construct presupposes this condition when no such constraint holds in the real world. Thus, one of the inherent difficulties in determining a reasonable royalty is how the trier of fact should proceed when it is clear that the maximum amount the licensee is willing to pay is more than the minimum amount the licensor is willing to accept.

licensee in the negotiation.[37] From a practical perspective, determining the bargaining range of the hypothetical negotiation and the relative bargaining power of the parties is likely as subjective and indeterminate as the application of the full list of *Georgia-Pacific* factors. Thus, not too surprisingly, courts have shied away from determining the bargaining range of the hypothetical negotiation.

One way courts have responded to the subjectivity in determining reasonable royalties is by placing more weight on the one objective, measurable *Georgia-Pacific* factor—comparable existing license agreements, such as those covering the use of the claimed invention to similar technology.[38] An existing comparable license represents an arm's-length transaction between two parties that place a monetary value on the patent. Thus, existing comparable licenses may provide the best, measurable evidence in delineating the hypothetical negotiation. The use of comparable license agreements in determining reasonable royalty rates is a longstanding and well-accepted practice in U.S. patent litigation.[39] For instance, the Federal Circuit has stated that comparable licenses "clearly reflect the economic value of the patent

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[37] The Federal Circuit has acknowledged the import of bargaining power in determining a reasonable royalty. Deere & Co. v. Int'l Harvester Co., 710 F.2d 1551, 1559 (Fed. Cir. 1983) ("[t]aking into account . . . the respective bargaining positions of the parties engaged in the theorized licensing negotiations . . . [is] an eminently reasonable approach to the willing seller-willing buyer analysis."); *see also* Fujifilm Corp. v. Benun, 605 F.3d 1366, 1372 (Fed. Cir. 2010) (noting that the patent holder "would have enjoyed a strong bargaining position" in the hypothetical negotiation); Total Containment, Inc. v. Environ Prods., Inc., 106 F.3d 427 (1997). The two parties will strike a bargain closer to the lower bound of the bargaining range the licensor's minimum willingness to accept—when the licensee has relatively greater bargaining power. In contrast, the two parties will reach an agreement closer to the upper bound of the bargaining range—the licensee's maximum willingness to pay—when the licensor has relatively greater bargaining power. The relative bargaining power of a party will depend upon the party's need to reach an agreement—that is, how much each party will gain from a successful agreement. The benefits that accrue to each party in a successful negotiation should be measured with respect to the next-best alternative. The strength of the party's alternatives will affect the strength of its bargaining power. For instance, a licensor that has received many offers to license the patent in question has strong alternatives to any given license negotiation. Similarly, a licensee that has a non-infringing alternative that is almost as good as the patented technology also has a strong alternative. The stronger the alternative, the stronger the party's bargaining power. Ultimately determining the bargaining power of parties is a fact-intensive question and will vary from case to case. *But see*, John Golden, *"Patent Trolls" and Patent Remedies*, 85 Tex. L. Rev. 2111, 2142 (noting that the Federal Circuit has also expressed concern with such an approach and noting that it would be inappropriate to "distinguish the respect due the patent rights of impecunious individual inventors from that due the patent rights of well-funded, well-lawyered, large manufacturing corporations" (citing Fromson v. W. Litho Plate & Supply Co., 853 F.2d 1568 (Fed. Cir. 1988)).

[38] Stuart Graham, Peter Menell, Carl Shapiro & Tim Simcoe, *Final Report of the Berkeley Center for Law & Technology Patent Damages Workshop*, 25 TEX. INTELL. PROP. L.J. (forthcoming 2017) ("In practice, U.S. courts usually determine reasonable royalties based on 'comparable' patent licenses with suitable adjustments made to these comparable licenses to determine reasonable royalties for the patents-in-suit. Indeed, some might say that no other method of determining reasonable royalties has found favor with the Federal Circuit.").

[39] *See* Jonathan S. Masur, *The Use and Misuse of Patent Licenses*, 110 NW. L. REV. 115, 120 nn.21, 22 (citing cases and literature).

technology in the marketplace,"[40] and it is appropriate to rely upon them when "there [is] a basis in fact to associate the royalty rates used in prior licenses to the . . . negotiation at issue in the case."[41] Courts, scholars, and commentators all nearly unanimously bless the use of comparable existing licenses to calculate patent damages.[42]

The difficulty with this preferred approach lies in finding a comparable existing license. Many patents that are litigated are not licensed, so comparable licenses involving the patent-in-suit do not exist. Moreover, because most licenses are confidential, even licenses involving similar patents or technology are typically not available to the trier of fact.[43] This Article contends that there is a large untapped trove of existing patent licensing agreements, many of which are likely more probative to reasonable royalty calculation than currently existing licensing data offered by patent damage experts. This untapped evidence is tax-related patent transfer prices.

III. Transfer Prices and the Tax Regime

This section introduces tax-related transfer prices, describes the various regulations that seek to ensure transfer prices reflect the arm's-length standard, and argues that transfer prices reasonably reflect the value of the patent—at least to the multinational corporation who owns it.

A. What are Tax-Related Transfer Prices?

Today, corporations' operations routinely span geographic borders. As a result, multiple jurisdictions assert a right to tax the income of the multinational business. Transfer-pricing rules guide the allocation of income and costs among the affiliates or "subsidiaries" of the multinational company, and thus the profits reported in each jurisdiction.[44] More specifically, transfer-pricing regimes provides rules for pricing

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[40] LaserDynamics, Inc. v. Quanta Computs., Inc., 694 F.3d 51, 79 (Fed. Cir. 2012).

[41] Uniloc USA, Inc. v. Microsoft Corp., 632 F.3d 1292, 1317 (Fed. Cir. 2011).

[42] *See, e.g.*, Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301, 1323–39 (Fed. Cir. 2009); Apple, Inc. v. Samsung Elecs. Co., No. 12-CV-00630-LHK, 2014 WL 6687122 (N.D. Cal. Nov. 25, 2014) (setting ongoing royalty payments); Apple, Inc. v. Samsung Elecs. Co., No. 11-CV-01846-LHK, 2014 WL 549324 (N.D. Cal. Feb. 7, 2014) (denying Apple's request for additur following a second trial on damages); *In re* Innovatio IP Ventures, LLC Patent Litig., No. 11 C 9308, 2013 WL 5593609 (N.D. Ill. Oct. 3, 2013); Apple, Inc. v. Motorola, Inc., 869 F. Supp. 2d 901 (N.D. Ill. 2012) (Posner, J.), *aff'd in part, rev'd in part, vacated in part*, 757 F.3d 1286 (Fed. Cir. 2014); Conroy et al., *supra* note 9; Hasbrouck, *supra* note 9, at 215; Jarosz & Chapman, *supra* note 9; Keele, supra note 11, at 205; Taylor, *supra* note 9; Fedell, *supra* note 9, at 1146–50. *But see*, Masur, *supra* note 39, at 123–145.

[43] Those "comparable" licenses that are disclosed in litigation are typically limited to only those agreements put forth by the litigating parties. Some commentators posit that the parties' may be able to create a special category of "comparables" to use in litigation that provide a skewed valuation of the patent.

[44] Transfer pricing does not alter the aggregate pre-tax profits of the organization.

transactions between enterprises under common ownership or control,[45] the hallmark of which requires prices to be set at an arm's length standard.

For instance, a multinational corporation (MNC) may transfer economic ownership of a patent to a subsidiary that is located in a jurisdiction different from that of the parent corporation. The amount of money a subsidiary pays to the parent corporation for the economic rights to use the patent is its "transfer price." Because transfer prices are set at an arm's-length standard, the price the MNC charges its subsidiary for the economic right to use the patent should be set at the amount the MNC would charge a third, unrelated party. Given that sixty percent of world trade occurs inside multinational companies, transfer pricing has become ubiquitous.[46]

Because most foreign jurisdictions have corporate statutory tax rates below the U.S. rate, U.S. MNCs, on average, can increase their reported after-tax profits—i.e., lower their overall tax burden—by shifting more profits into low-tax jurisdictions and more expenses into high-tax jurisdictions.[47] As a result, U.S. transfer pricing rules are critical in preventing the erosion of the U.S. tax base through the artificial shifting of taxable income out of the U.S. and into foreign jurisdictions through related-party transactions. The statutory authority for these rules in the U.S. is found in § 482 of the Internal Revenue Code (I.R.C.). It states:

> In any case of two or more organizations, trades, or businesses . . . owned or controlled directly or indirectly by the same interests, the Secretary may distribute, apportion, or allocate gross income, deductions, credits, or allowances between or among such organizations, trades, or businesses, if he determines that such distribution, apportionment, or allocation is necessary in order to prevent evasion of taxes or clearly to reflect the income of any of such organizations, trades, or businesses. In the case of any transfer (or license) of intangible property . . . , the income with respect to such transfer or license shall be commensurate with the income attributable to the intangible.

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[45] See the JOINT COMMITTEE ON TAXATION, PRESENT LAW AND BACKGROUND RELATED TO POSSIBLE INCOME SHIFTING AND TRANSFER PRICING, JCX-37-10, July 20, 2010.

[46] Robert Guy Matthews & Jeanne Whalen, *Glaxo to Settle Tax Dispute with IRS Over U.S. Unit for $3.4 Billion*, WALL St. J. (Sept. 12, 2006), https://www.wsj.com/articles/SB115798715531459461.

[47] The U.S. taxes its MNCs on a worldwide basis, meaning that it taxes all profits regardless of the jurisdiction in which they are sourced. The U.S. does not double tax MNCs' foreign source income as it grants a credit against the MNCs' U.S. tax obligation for any foreign taxes paid in the source country. From a theoretical perspective, a worldwide tax system should make an MNC indifferent to tax rates in foreign jurisdictions. Under the principle of capital export neutrality, if a MNC faces that same tax rate on all of its income regardless of where it is earned, then it will invest in the jurisdictions that offer the highest pre-tax rate of return on investment. If a MNC faces the same tax rate on all of its income regardless of where it is earning, then it should have no tax incentive to use transfer pricing to shift income into low-tax jurisdictions. Unfortunately, the U.S.'s worldwide system is a not a "pure" residence-based system as any incremental U.S. tax payment is delayed until the earnings are remitted or repatriated into the U.S. Hence, U.S. MNCs face a strong incentive to reduce their global tax burdens by reporting more income in low-tax countries. *See* Jennifer Blouin, *Taxation of Multinational Corporations*, 6 FOUND. & TRENDS ACCT. 1 (2011).

As noted above, the baseline by which a "distribution, apportionment, or allocation" is determined to be reasonable is the arm's-length standard.[48] Thus, transfer prices should reflect the open market value—that is, the value the corporation would have received if it had transferred the item to an unrelated party.

B. Tax-Related Transfer Prices Reflect the Value of the Patent

In the mid-1990s, the United States began to undertake comprehensive reform of its transfer pricing regulations in response to growing concern that multinational corporations were abusing transfer-pricing rules to avoid paying U.S. taxes.[49] Reform efforts to protect the U.S. tax base have continued over the past two decades, with additional expansion or amendment of transfer pricing legislation that seeks to prevent the erosion of the U.S. tax base. The result is that the U.S. now has the most aggressive and detailed transfer pricing regime in the world. This subpart describes the regulations in place to ensure transfer prices reflect an arm's-length value, with a special emphasis on intangible property, such as patents.

1. Acceptable Methods for Calculating Transfer Prices

The I.R.S. and Treasury have promulgated numerous regulations that provide substantial guidance on the various acceptable methods for calculating transfer prices, which curb the discretion of taxpayers in determining transfer prices within an arm's-length standard.[50] These regulations outline three primary methods of assigning values to intellectual property: (1) the Comparable Uncontrolled Transaction (CUT) method, which assigns value based on comparable uncontrolled transactions;[51] (2) the Comparable Profits Method (CPM), which assigns value based on an estimate of the income or cost savings attributable to the specific intangible rights transferred;[52] and (3) the Residual Profit Split Method (RPSM), which assigns value based upon the residual profit not attributable to other identifiable transactions.[53]

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48 Treas. Reg. 1.482-1(b) (2017).

49 PRICEWATERHOUSECOOPERS, INTERNATIONAL TRANSFER PRICING 2015/16, 1056, *available at* http://www.pwc.com/gx/en/international-transfer-pricing/assets/itp-2015-2016-final.pdf.

50 In 1988, the IRS and Treasury jointly issued a Notice titled "A Study on Intercompany Pricing Under Section 482 of the Code." I.R.S. Notice 88-123, 1988-2 C.B. 458; *see* Treas. Reg. 1.482-4(a) (1994).

51 The CUT method is used to value intangibles when there is a transfer of an "exact" comparable that is transferred in a similar transaction as the uncontrolled comparable. *See* Treas. Reg. 1.482 (1994). Clearly, this methodology is the most direct and reliable measure of the arm's-length result for a related-party transaction. Prior to the Tax Reform Act of 1986, the taxpayer effectively had a safe-harbor option by relying on a comparable uncontrolled transaction. Post-1986, however, the taxpayer now has to substantiate that even its comparable transactions meet a "commensurate with income standard." *See infra* text accompanying notes 58-60.

52 *See* Treas. Reg. 1.482-5 (1994). The CPM benchmarks to the operating profit of uncontrolled taxpayers involved in similar activities and industries as the taxpayer. For example, where a U.S. parent company licenses an intangible to a foreign manufacturing subsidiary, the royalty payable by the subsidiary to the parent is evaluated under this method by comparing the operating profit of the subsidiary to the operating profits of comparable uncontrolled manufacturers. If the subsidiary's profit level differs meaningfully from the profit levels of the uncontrolled manufacturers, the royal-

The I.R.S. has also promulgated the Best Method Rule, which directs a taxpayer to use the method that results in the most reliable value.[54] If a taxpayer relies upon either the CUT or CPM methods, additional regulations strictly outline whether a transaction will be deemed comparable.[55] The result is that these three methods in-

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ty rate paid by the subsidiary is adjusted as necessary to bring the profit level within an acceptable range of those levels. In effect, this method limits the extent to which income from the intangible can be retained by the licensee to the amount that an uncontrolled licensee would be permitted to retain; the remainder of that income is required to be paid to the licensor through the royalty.

53 Treas. Reg. 1.482-6(c)(2)(ii)(B) also provides for a Comparable Profit Split Method. However, the provisions of this method have a significant overlap with those of the CPM, and CPSM is used is only very limited circumstances. RPSM assigns the intangible value based on the residual profits after taking into consideration some standard rate of return on the business's routine activities. This issue was particularly salient to the Medtronic case. Medtronic, Inc. v. Comm'n, T.C. Memo 2016-112 (2016). In *Medtronic*, the taxpayer argued that the IRS's proposed increase to the license payment to be made between the taxpayer's Puerto Rican subsidiary (low-tax) and U.S. parent was too high because it failed to allocate any value to the inherently complex manufacturing intangible developed by the Puerto Rican subsidiary. The Court agreed and rejected the IRS's proposed adjustment. This method relies exclusively on external market data to allocate profits. The related-parties then allocate the profits between the U.S. and foreign parties based on the allocation of profits between uncontrolled taxpayers with similar transactions in a similar business.

54 Treas. Reg. 1.482-1(c)) (1994) (stating that:

> [t]he arm's-length result of a controlled transaction must be determined under the method that, under the facts and circumstances, provides the most reliable measure of an arm's-length result. Thus, there is no strict priority of methods, and no method will invariably be considered to be more reliable than others. An arm's-length result may be determined under any method without establishing the inapplicability of another method, but if another method subsequently is shown to produce a more reliable measure of an arm's-length result, such other method must be used. Similarly, if two or more applications of a single method provide inconsistent results, the arm's-length result must be determined under the application that, under the facts and circumstances, provides the most reliable measure of an arm's-length result.

See Treas. Reg. 1.482-8 for examples of how to apply the best method rule.

55 Treas. Reg. 1.482-1(d) (1994). The comparability of another transaction is evaluated on the following five factors: 1) functions performed; 2) contractual terms; 3) risks undertaken; 4) economic conditions; and 5) property or services transferred. In addition to the five basic comparability factors, Treas. Reg. 1.482-4(c)(2)(iii)(B)(2) also elaborates on additional factors that would aid in the determination of whether a particular transaction is comparable:

> (i) The terms of the transfer, including the exploitation rights granted in the intangible, the exclusive or nonexclusive character of any rights granted, any restrictions on use, or any limitations on the geographic area in which the rights may be exploited, (ii) The stage of development of the intangible (including, where appropriate, necessary governmental approvals, authorizations, or licenses) in the market in which the intangible is to be used; (iii) Rights to receive updates, revisions, or modifications of the intangible; (iv) The uniqueness of the property and the period for which it remains unique, including the degree and duration of protection afforded to the property under the laws of the relevant countries; (v) The duration of the license, contract, or other agreement, and any termination or renegotiation rights; (vi) Any economic and product liability risks to be assumed by the transferee; (vii) The existence and extent of any collateral transactions or ongoing business relationships between the transferee and transferor; and (viii) The func-

volve significant investment on behalf of the taxpayer in both the identification of any comparable transactions and the estimation of the future benefit potentially generated by the intangible.

Intangibles, such as patents, are subject to an additional valuation requirement known as the commensurate with income standard. The primary objective of this provision is to ensure that the IRS has the right to audit the reliability of the assumptions used in setting the transfer price for an intangible asset, which can be notoriously difficult to value.[56] Regulations implementing this standard enable the I.R.S. to adjust retroactively the transfer price of intangibles paid in earlier tax years once the profits generated by the intangibles are observed.[57] Thus, if the economic rights of a patent are transferred from a parent to a subsidiary for a period of more than one year, the IRS will determine if the transfer price is commensurate with the income attributable to the patent, not only on the day of the transfer, but also five years following the transfer. If, upon examination, the original value of the patent is within 80% to 120% of the redetermined value five years out, the original valuation stands. If, however, the redetermined value does not fall within this range, the tax-

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tions to be performed by the transferor and transferee, including any ancillary or subsidiary services.

Treasury guidance also provides for two classes of comparable transactions. Treas. Reg. 1.482-1(e)(2)(ii)(A) provides that a comparable meet the following three conditions: 1) the information concerning the controlled transaction and the uncontrolled comparable is sufficiently complete that it is likely that all material differences between the two have been identified; 2) each material difference between the controlled and uncontrolled transaction have a definite and reasonable ascertainable effect on price or profit; and 3) an adjustment is made to the comparable uncontrolled results to eliminate the effect of each material difference. It is rare that a comparable should meet all three conditions. Hence, if there are no uncontrolled comparable transactions under Treas. Reg. 1.482-1(e)(2)(ii)(A), then Treas. Reg. 1.482-1(e)(2)(ii)(B) provides that the arm's-length range should be adjusted to select all uncontrolled comparables that achieve a similar "next best" level of comparability and reliability. Then the taxpayer selects the value from these "Class B" comparables using an interquartile range from the 25th to the 75th of the Class B comparables.

56 Treas. Reg. 1.482-4(f)(2)(i) (1994).

57 Treas. Reg. 1.482-4(f)(2) (1994). If a taxpayer is not required to make a commensurate with income adjustment for five years, then the transfer price is deemed to be arm's-length and the IRS will make no additional adjustments. In other words, the commensurate with income standard provides the IRS with the opportunity to move away from a strict interpretation of the arm's-length standard when there was no comparable good with which to compare the internal transaction. Treasury believes that the commensurate with income provision is consistent with the arm's-length standard. Treasury Notice 88-123, 1988-2 C.B. 458 states that "[l]ooking at the income related to the intangible and splitting it according to relative economic contributions is consistent with what unrelated parties do. The general goal of the commensurate-with-income standard is, therefore, to ensure that each party earns the income or return from the intangible that an unrelated party would earn in an arm's-length transfer of the intangible." Of course, there are those who argue that it is not. *See, e.g.*, Reuven S. Avi-Yonah, *The Rise and Fall of Arm's Length: A Study in the Evolution of U.S. International Taxation*, 15 VA. TAX REV. 89, 131 (1995). However, given the U.S.'s treaty network, it is unlikely that the commensurate with income standard violates the arm's-length standard, as that would be problematic from U.S. trading partners' perspectives.

payer is liable for the redetermination, interest, and penalties, which accrue if there was substantial understatement or substantial overstatement.[58]

2. *Other Limitations on Taxpayer Discretion and I.R.S. Enforcement of Transfer Pricing Regulations*

Taxpayers are also subject to a slew of information reporting and record-keeping requirements.[59] For instance, taxpayers are subject to significant contemporaneous documentation requirements that must provide, among other things, substantiation of the selection of the transfer method chosen and that the value assigned to the transfer price reflects a third party, unrelated transaction. The I.R.S. has the ability to levy hefty penalties—in addition to taxes owed—if taxpayers fail to comply with the rules.[60] Moreover, the burden of proof lies with the taxpayer, not the

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[58] *See* Treas. Reg. 1.482-4(f)(2) (1994).

Susan Morse argues that much of the regulations discussed in this subsection are bypassed by allowing cost sharing agreements. Susan Morse, *Seeking Comparable Transactions in Patent and Tax* 37 REV. LITIG. BRIEF (forthcoming 2017). Cost sharing agreements (CSAs) are means by which related parties within an MNC can share the costs of developing future intangibles. Under a CSA, each party pays the cost of all of an intangible's development in proportion to the reasonability anticipated benefits it would receive from the exploitation of the intangible. However, buy-in payments are required to be made for the transfer of any asset, tangible or intangible, that is reasonably anticipated to contribute to the development of the shared intangibles. Yet importantly, these buy-in payments for existing intangibles are subject to all of the transfer pricing regulations described above.

The benefit of a CSA is that the parties using the newly developed intangibles pay for the intangibles based on their costs of development rather than the value of the developed intangible. In the case of a CSA between a U.S. party and a foreign entity located in a low-tax jurisdiction, so long as the cost of developing the intangible is lower than the future profits generated by the intangible, then MNC will reduce its global tax burden. To this extent, we agree with Susan Morse. Yet, there are drawbacks to CSAs. First, the subsidiary and the parent are owners of the developed intangibles. The intangibles no longer belong solely to the U.S. party. Second, the CSA requires continued payments by the foreign affiliate even if the profits of the foreign affiliate are lower than anticipated. Although the IRS has the ability to use the commensurate with income standard to alter transfers, the taxpayer does not have the ability to make retroactive adjustments. Third, the 2011 Treasury Regulations required that, in order for an MNC to garner CSA-related tax benefits, the foreign party to the CSA must have valuable assets to contribute to the CSA. If the foreign party is merely a "cash-box" entity (i.e., an entity that owns mostly cash and investments) then the appropriate buy-in payment should be equivalent to its best realistic alternative to participating in the CSA, which is typically a licensing agreement with its related U.S. party. In this case, there is little economic difference between entering into a CSA and simply arranging a license agreement as the buy-in payment is the net present value of the anticipated royalty payments.

[59] 26 U.S.C. §§ 482, 6038A, 6038C, and 6503(k) (2017); ERNST & YOUNG, WORLDWIDE TRANSFER PRICING REFERENCE GUIDE 2015-16, *available at* http://www.ey.com/Publication/vwLUAssets/EY-Worldwide-transfer-pricing-reference-guide-2015-16/$FILE/EY_Worldwide_ Transfer_Pricing_Reference_Guide_2015-16.pdf.

[60] 26 U.S.C. § 6662 (2017) and Treas. Reg. § 1.6662-6 (1996) impose the accuracy-related penalty for substantial valuation misstatement to related party transactions that fail the arm's-length standard for pricing property and services. There are two components to the penalty regime–the transactional penalty and the net adjustment penalty. The transactional penalty imposes a 20% substantial valuation misstatement penalty when a reported transfer price is 200% or more (or 50% or less) than the arm's-length price. A 40% gross valuation misstatement penalty is assessed when the re-

I.R.S., to demonstrate that their reported transfer price meets the arm's-length standard.

Finally, the I.R.S. is taking an aggressive, adversarial role in reviewing and adjusting transfer prices. Transfer pricing enforcement falls primarily with the I.R.S.'s Large and Mid-Size Business Division (LMSB), wherein international transfer pricing specialists and a host of economists work to review and adjust transfer prices reported by corporations.[61] The I.R.S. has recently poured additional resources into transfer price enforcement by creating a national team of transfer pricing experts, expanding economist staffing in the area, and establishing a transfer pricing council.[62] The I.R.S.'s commitment to enforcing transfer prices is also apparent by how frequently the IRS reviews and adjusts transfer prices submitted by taxpayers. For instance, in 2015, the I.R.S. audited over 64% of corporations with assets over $20 billion.[63] During these audits, transfer pricing represents 46% of the tax positions (other example of tax positions would be research and experimentation credits, inventory measurement, the domestic manufacturing deduction, etc.) reviewed for these large businesses and 71% of the proposed adjustments.[64] These audits alone resulted in over $2.84 billion in adjustments with respect to transfer pricing.[65]

To better understand how transfer-pricing rules operate in practice, consider the dispute between Glaxo Smith Kline and the I.R.S., which resulted in the largest settlement in the history of the I.R.S.[66] The Glaxo dispute centered on an alleged underpayment of U.S. tax on U.S. sales of the anti-ulcer blockbluster, Zantac. More specifically, the dispute was over the correct transfer price Glaxo U.S. paid to Glaxo U.K. for the use of the U.K. domiciled Zantac patent. Glaxo research and development for Zantac was based in the U.K and resulted in the Zantac patent held in the U.K.[67] Glaxo maintained that its research and development program—i.e., the U.K.

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ported transfer price is 400% or more (or 25% less) than the arm's-length price. In addition to the transactional penalty, the net adjustment penalty imposes a 20% non-deductible substantial valuation misstatement penalty when the net § 482 adjustment for a tax year exceeds the lesser of $5 million or 10% of the taxpayer's gross receipts. A 40% gross valuation misstatement penalty applies when the net § 482 adjustment exceeds the lesser of $20 million or 20% of the taxpayer's gross receipts. Taxpayers can avoid these penalties only if they can show that they had reasonable basis for their transfer prices supported by extensive contemporaneous documentation justifying the computation. *See* Treas. Reg. §§ 1.6662-6, 1.6662-4 (1996). Regulations result in the net adjustment penalty being far more difficult to avoid.

61 Gregory Ossi & Mike Shepherd, *The IRS's Renewed Emphasis on Transfer Pricing*, 38 J. CORP. TAX'N 3, 3 (2010).

62 *Id.* at 4-5; *see also* Kelly Phillips Erb, *IRS Brings 'A Team' to Crush Transfer Pricing Abuse*, FORBES (Mar. 27, 2012), https://www.forbes.com/sites/kellyphillipserb/2012/03/27/irs-brings-a-team-to-crush-transfer-pricing-abuse/#1f8799186945.

63 INTERNAL REVENUE SERV., 2015 DATA BOOK, at 23 (2016).

64 TREASURY INSPECTOR GENERAL FOR TAX ADMINISTRATION, REF. NO. 2016-30-090, BARRIERS EXIST TO PROPERLY EVALUATING TRANSFER PRICING ISSUES, at 18 (2016).

65 *Id.*

66 David S. Hilzenrath, *Glaxo to Pay IRS $3.4 Billion*, WASH. POST (Sept. 12, 2006), http://www.washingtonpost.com/wp-dyn/content/article/2006/09/11/AR2006091100429_pf.html.

67 Jim Ulmer, Jack Ethridge & Treba Marsh, *Transfer Pricing in a Global Economy*, 9 J. OF BUS.

domiciled Zantac patent—was the primary driver of the drug sales in the U.S.[68] Glaxo also argued that its U.S. domiciled Tagamet patent was a CUT—comparable uncontrolled transaction—for its U.K. domiciled Zantac patent. Tagamet, like Zantac, is a selective inhibitor of gastric acid secretion, although Zantac is more efficacious and had fewer side effects.[69] As a result, Glaxo U.S. paid high licensing fees for use of the Zantac patent to Glaxo U.K. The high licensing fees had the effect of shifting income out of the U.S. and into the U.K., reducing U.S. taxes.[70] The I.R.S. disagreed with Glaxo and argued that Tagamet had heavily benefited from being the first drug of its class to market, a characteristic that Zantac did not share with Tagamet. As a result, the I.R.S. concluded that it was Glaxo's aggressive marketing in

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CASE STUD. 359, 363 (2013).

[68] *Id.* Several commentators have argued that the government is not well equipped to challenge taxpayer's transfer prices and that when the government does challenge a taxpayer's position in court, its likelihood of winning the case in court is low. *See* Susan Morse, *Seeking Comparable Transactions in Patent and Tax*, 37 REV. LITIG. BRIEF (forthcoming 2017). Admittedly, the IRS, like many other administrative agencies, is likely underfunded. Nevertheless, it is important to note that IRS has placed greater emphasis on the enforcement of transfer prices in the past decade. Moreover, we are cautious to draw any conclusions about the universe of tax filings from a select, few cases that are litigated to judgment. Given that the IRS has the ability to levy a 40% fine if successful in litigation, it is not too surprising that the cases that are litigated are much more likely to be cases in which the IRS is taking an untenable position. That is, this asymmetric fine inevitably influences the type of cases taxpayers are willing to litigate.

Moreover, when the IRS loses in transfer pricing litigation, it's often because the Court determined that it failed to uphold the arm's-length standard. For example, consider several recent cases that focus on the role of equity compensation in establishing intangible development costs under a cost sharing arrangement. In both *Altera* and *Xilinx*, the IRS lost because the Court determined that the IRS's proposed adjustments would never have been considered when establishing an arm's-length royalty negotiation. *See* Altera v. Comm'n, 145 T.C. 91, 123 (2015); Xilinx, Inc. v. Comm'n, 125 T.C. 37, 54 (2005). *Veritas* and *Amazon* were also lost by the IRS because the IRS proposed "arbitrary and capricious" adjustments that violated § 482's arm's-length standard. In both of these cases, the IRS attempted to assert that the value of the intangibles party to buy-in payments had an unlimited life rather than a finite period as typically is the case in certain technologies. *See* Veritas Software Corp., 133 T.C. 297, 327 (2009); Amazon.com, Inc. v. Comm'n, 148 T.C. No. 8 (2017). These cases are all based on pre-2011 Treasury Regulations. In the 2011 Regulations, the IRS now stipulates that the value of intellectual property transferred related to a CSA will include the life of any intellectual property to which the transferred intellectual property contributed. Said another way, the buy-in payment will have to include the value created by the newly developed intellectual property. Finally, in *Medtronic*, the taxpayer prevailed because it was able to show that the value of the patent-related intangibles should not include the value of the manufacturing intangibles. Each of these cases highlights the adversarial role between the taxpayer and the tax authority. *See* Medtronic Inc. v. Comm'n, TC. Memo No. 2016-112, 143 (2016). Given the difficulty in valuing unique intangibles, the fact that the taxpayer often prevails seems to highlight the notion that company-generated, internally-documented transfer prices are capturing arm's-length economic values of intellectual property as required by tax law.

[69] Mahendra R. Gujarathi, *GlaxoSmithKlin PLc.: International Transfer Pricing and Taxation*, 22 ISSUES IN ACCOUNTING EDUCATION 749, 750 (2007). However, when Zantac launched, few market analysists thought that Zantac's sales would ever overtake those of Tagamet, which historically had been the leading treatment of choice for ulcers and heartburn.

[70] Jim Ulmer, Jack Ethridge & Treba Marsh, *Transfer Pricing in a Global Economy*, 9 J. OF BUS. CASE STUD. 359, 363 (2013).

the U.S.—not the U.K. domiciled Zantac patent—which had generated the sales and value of Zantac.[71] In other words, the I.R.S.'s position was that Glaxo's outbound royalty payment for the Zantac patent failed to be commensurate with income. Ultimately, the I.R.S. prevailed and recovered $3.4 billion in back taxes from Glaxo.[72]

IV. Taking a Global Perspective on Transfer Pricing

The above discussion focuses solely on the U.S.'s transfer pricing regime. Given that the majority of countries have statutory tax rates below the U.S.'s, U.S. tax law focuses on stemming the stripping of earnings from the U.S. by setting artificially low transfer prices of outbound transfers of intangibles. However, multinational corporations almost always include foreign subsidiaries. Foreign countries are also concerned about the erosion of their tax base. This section outlines the Organization for Economic Co-operation and Development (OECD) countries' transfer pricing regulations, which largely mimic those of the U.S. In particular, it argues that the competing adversarial roles between the taxpayer and multiple tax authorities in establishing transfer prices can set both lower and upper bounds in reasonable royalty calculations for patent damages.

A. The OECD Countries' Transfer Pricing Regulations

The OECD provides "best practices" for tax administrations of its member nations through the *OECD Model Tax Convention on Income and on Capital* (OECD Model Tax Convention), which forms the basis for the network of bilateral income tax treaties between OECD and non-OECD countries.[73]

The OECD Model Tax Convention delves extensively into transfer pricing. Like the U.S., the basic premise of the OECD's guidance is that transfers between related parties should be measured at an arm's-length standard. Article 9 of the OECD Model Tax Convention states:

> [Where] conditions are made or imposed between the two [associated] enterprises in their commercial or financial relations which differ from those which would be made between independent enterprises, then any profits which would, but for those conditions, have ac-

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[71] *Id.*

[72] *Id.* at 359. There are a couple aspects of this settlement that are noticeable. First, the IRS's understanding of the pharmaceutical industry was nuanced enough to realize that the first drug of its class to market enjoys an exclusivity that later comers do not. Second, the IRS recognized that much of the U.S. sales revenue stemmed from the U.S. marketing endeavor—not the U.K.-based science. This led to the creation of marketing intangibles owned by the U.S. business, exploited in the U.S. and, therefore, subject to taxation in the U.S. Overall, this case illustrated that the IRS was willing to invest in understanding the commercial and financial relations between the different arms of the Glaxo business.

[73] The OECD Model Tax Convention includes principles incorporated in the Model United Nations Double Taxation Convention. See OECD, MODEL TAX CONVENTION ON INCOME AND ON CAPITAL (2014). Since multiple countries may assert a right to tax the income of one multinational corporation, the OECD guidelines also help reduce conflicts among jurisdictions that could result in the double-taxation of income.

> crued to one of the enterprises, but, by reason of those conditions, have not so accrued, may be included in the profits of that enterprise and taxed accordingly.[74]

Similar to U.S. regulations, the OECD includes guidance regarding the identification of comparable transactions (e.g., the U.S. has the Best Method Rule and the OECD has the "most appropriate method" standard). In terms of specific measurement methodologies, the OECD also mimics the U.S. For example, CUT is analogous to the OECD's comparable uncontrolled price method, CPM is similar to the OECD's transactional net margin method, and RPSM is similar to the OECD's profit split method.[75]

B. Tax Incentives and Transfer Prices as Lower and Upper Bounds of the Reasonable Royalty Calculation

How do tax incentives affect transfer prices? Under the assumption that a MNC is seeking to minimize its tax burden, a MNC has the incentive to maximize the profits reported in a low-tax jurisdiction and minimize the profits reported in a high-tax jurisdiction. If the MNC's subsidiary that owns the patent is in a high-tax jurisdiction and the MNC's subsidiary that licenses the patent is in a low-tax jurisdiction, the result will be a transfer of money from a low-tax to a high-tax jurisdiction. In this scenario, the MNC seeking to minimize its tax burden has the incentive to set the licensing value on the lower bound of the bargaining range. By valuing the royalty at the lowest amount the corporation can justify—and that the tax authority will accept as within the arm's-length range—the multinational corporation will maximize its profits in a low-tax jurisdiction and minimize the global taxes it must pay. Because all of the U.S.'s major trading partners have statutory corporate tax rates below that of the U.S., almost every transfer of economic ownership of a patent from the MNC's U.S. operations to a foreign subsidiary will likely be downwardly biased or represent this lower range of arm's-length transactions.

In contrast, if the MNC's subsidiary that owns the patent is in a low-tax jurisdiction and the MNC's subsidiary that licenses the patent is in a high-tax jurisdiction, the license payment will result in profits moving into the low-tax jurisdiction and out of the high-tax jurisdiction. In this scenario, the MNC seeking to minimize

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[74] *Id.* at art. 9.

[75] What the OECD guidelines lack is a commensurate with income standard that allows for periodic adjustments to transfer prices based on profits. This leads to potential conflicts between jurisdictions (U.S. and non-U.S.) if both agreed with the *ex ante* transfer prices but then the U.S. disputes that agreed upon transfer pricing *ex post*. Hence, the use of periodic adjustments could clearly be deemed inconsistent with OECD guidelines. Yet, the OECD is clear that it grants tax authorities the right to audit the accuracy of the assumptions on which transfer prices are based, and to make adjustments if the assumptions underlying the transfer prices are inappropriate.

It appears that the OECD is considering formalizing a commensurate with income standard in its transfer pricing guidelines. The OECD Base Erosion Profit Shifting Action Item 8 "Hard to Value Intangibles" implies that *ex post* outcomes should be compared to *ex ante* profit projections to evaluate the reasonableness of the transfer prices suggesting that making periodic adjustments to transfer prices by tax authorities is an acceptable practice.

its tax burden has the incentive to set the licensing value that is at the upper bound of the arm's-length transaction range. By valuing the royalty at the highest amount the corporation can justify—and that the jurisdiction's tax authority will accept as within the arm's-length range—the MNC will select the largest reasonable transfer price payment from a high-tax to a low-tax jurisdiction and hence minimize its tax burden.

Thus, depending upon the underlying tax incentives, the transfer prices reported to and accepted by the tax authorities may help to delineate the upper or lower boundary of the reasonable royalty patent damage award. Notably, because statutory tax rates are widely known, the tax incentives should always be apparent. Moreover, because many patents will likely have transfer pricing that represent a license from a high-tax to a low-tax jurisdiction and vice versa, it is likely that the court may be able to use different transfer prices associated with one patent to delineate both the upper and lower boundaries of the reasonable royalty.

The remainder of this subpart discusses two examples drawn from the Joint Committee on Taxation's Report on "Present Law and Background Related to Possible Income Shifting and Transfer Pricing" to illustrate patent-related income flows and demonstrate, in a more concrete manner, when transfer prices may represent the upper or lower bounds of the value of the patent.[76]

1. Joint Committee Taxation Report Examples

Figure 1 is a simplified pictorial representation of Case Study Foxtrot, drawn from the Joint Committee on Taxation's Report. Foxtrot is a U.S. MNC that manufactures goods overseas using a contract manufacturer, Foxtrot Hong Kong. Foxtrot Netherlands licenses the U.S. patent from Foxtrot U.S. and then Foxtrot Hong Kong makes goods to Foxtrot Netherlands' specifications.[77] Foxtrot Netherlands sells finished goods either directly to non-U.S. customers or to Foxtrot U.S. (who then sells to U.S.-based customers). The number 1 shows the payment that Foxtrot Bermuda makes to the U.S. parent for the use of the U.S.-based patent. The U.S. has a higher corporate statutory tax rate than Bermuda. As a result, it behooves Foxtrot U.S. to value the patent at the lower bound of the arm's length transaction—i.e., minimize the license fee—when it licenses the patent to Foxtrot Bermuda as the license fee creates U.S.-sourced taxable income.

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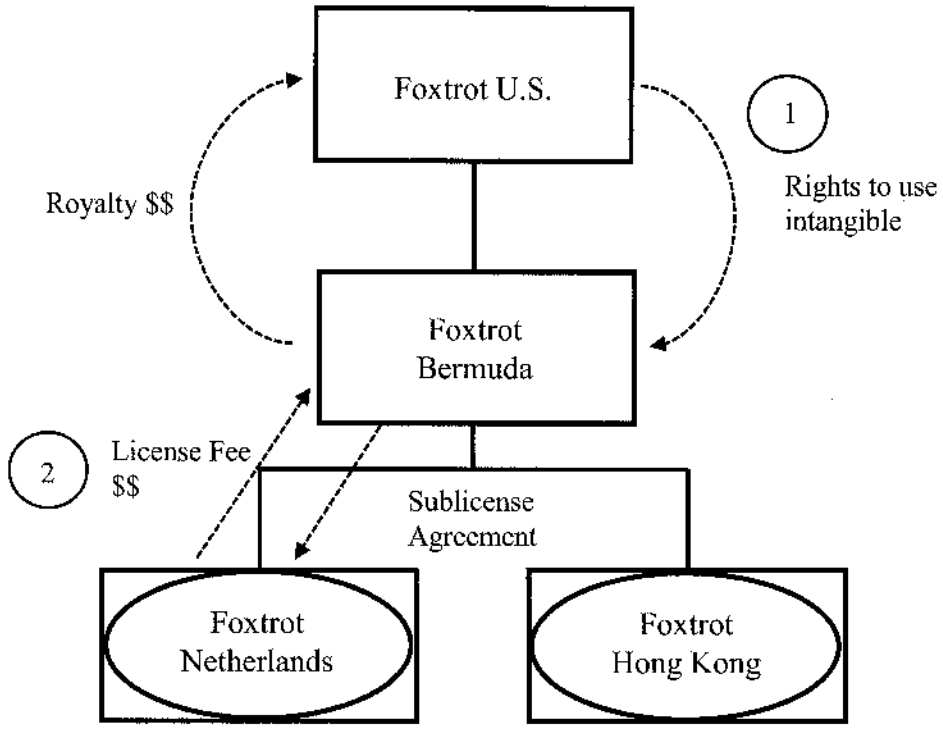
[76] In Section III of the JCT's report, there are six case studies based on the tax structures of six large, multinational manufacturers. JOINT COMMITTEE ON TAXATION, JCX-37-10, PRESENT LAW AND BACKGROUND RELATED TO POSSIBLE INCOME SHIFTING AND TRANSFER PRICING, at 51 (2010).

[77] Both Foxtrot Netherlands and Foxtrot Hong Kong are disregarded entities for purposes of any U.S. tax filings. This means that Foxtrot Netherlands' and Foxtrot Hong Kong's economic activity are combined with Foxtrot Bermuda before reporting to the IRS. These disregarded entities facilitate the reduction of Foxtrot's Subpart F income. A U.S. MNC's Subpart F income is immediately taxable in the U.S.—i.e., it does not qualify for the deferral of any potential repatriation taxes. Subpart F income is a component of the U.S.'s controlled-foreign-corporation or CFC anti-abuse regime.

Figure 1



Number 2, however, shows that Foxtrot Netherlands has a sublicense agreement with Foxtrot Bermuda so that it may use the patent in the manufacturing process. The Dutch have a higher corporate statutory tax rate than Bermuda. As a result, it benefits Foxtrot Netherlands to value the patent at the upper bound of the arm's-length transaction range—i.e., maximize its license fee—to Foxtrot Bermuda as doing so will reduce Foxtrot's current Dutch tax obligation.[78] That is, each dollar of royalty paid by Foxtrot Netherlands to Foxtrot Bermuda reduces Foxtrot's current tax obligation by the applicable Dutch statutory tax rate. Furthermore, the transfer price set between the Netherlands and Bermuda will have been evaluated by the Dutch tax authorities under applicable Dutch transfer pricing guidelines.[79] So, the payment made by Foxtrot Bermuda to the U.S. parent should represent the lower bound of the value of the patent, and the payment made between Foxtrot Netherlands and Foxtrot Bermuda should represent an upper bound.[80]

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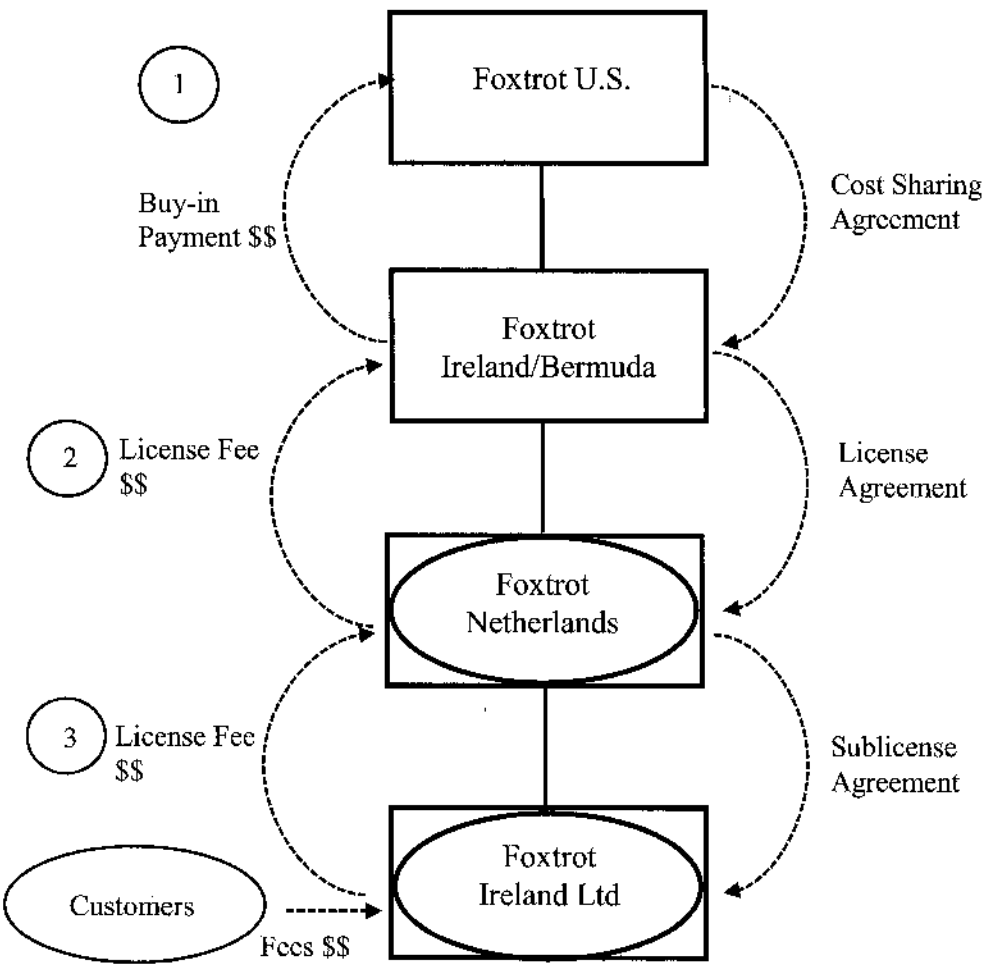
[78] Foxtrot Netherlands has a sizeable income as it is reporting the majority of Foxtrot's foreign sales.

[79] PRICEWATERHOUSECOOPERS, INTERNATIONAL TRANSFER PRICING 2015/16, 620, *available at* http://www.pwc.com/gx/en/international-transfer-pricing/assets/itp-2015-2016-final.pdf.

[80] Importantly, cost-sharing agreements do not render transfer pricing ineffective. As this example

In Figure 2, we assumed that, instead of being primarily a manufacturer, Foxtrot is a patent-intensive firm. The structure below represents the Double-Irish transaction commonly used by U. S. MNCs to reduce their foreign tax obligations.[81] Similar to the structure in Figure 1, the U.S. parent transfers the patent offshore. In this case, Foxtrot U.S. establishes a cost-sharing agreement with Foxtrot Ireland/Bermuda (a quasi-Irish corporation) whereby Foxtrot Ireland/Bermuda makes pay-

Figure 2



illustrates, even in the presence of a cost-sharing agreement between the U.S. operations and the foreign entity, there will likely still be intra-firm license agreements between the MNC's foreign entities that provide for upper and lower bounds of the value of the intangibles.

[81] This example is based on Google's structure.

ments to purchase an outright interest in the U.S. patent, which will then be jointly developed by the U.S. parent and the foreign subsidiary (see Number 1).[82]

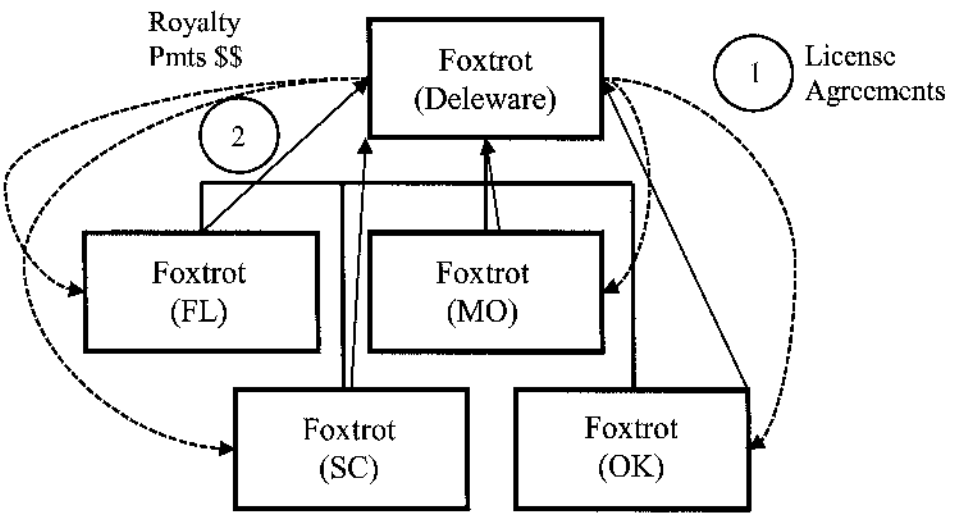
Foxtrot Ireland/Bermuda then provides a sublicense of the intangible to a Dutch holding company (Number 2). The Dutch holding company, Foxtrot Netherlands, then sublicenses the patent to Foxtrot Ireland Ltd. (Number 3). Foxtrot Ireland Ltd. has significant employees and operations in Ireland. This entity collects all non-U.S.-based Foxtrot revenue from customers. Foxtrot Ireland Limited then negotiates a transfer price for the use of the sublicense with the Irish tax authorities. This royalty payment serves to reduce the Ireland Limited's taxable income. Foxtrot Netherlands receives a sizable royalty payment from Foxtrot Ireland Limited. The Dutch entity then makes a sizeable license payment to Foxtrot Ireland/Bermuda. The net effect is that Foxtrot Netherlands has little current corporate tax. This royalty payment does not create any significant tax, as Bermuda does not tax royalty income. As with Figure 1, Number 1 (the transfer from Foxtrot Ireland to Foxtrot U.S.) represents a lower bound on the value of the intangible. On the other hand, the payments between Foxtrot Ireland/Bermuda, Foxtrot Netherlands, and Foxtrot Ireland Ltd. are all likely to be biased upwards therefore representing estimates of the upper bound.

2. State and Local Taxation Transfer Pricing Regulations

Finally, even within the domestic-only organizations/supply chains, there are many opportunities to observe tax-related transfer prices, particularly if a corporation has an incentive to source income (expenses) in low (high) tax states. Figure 3 illustrates the use of a Delaware intangible holding company structure. In this setting, the domestic parent, Foxtrot U.S., places its intangibles in a Delaware holding company, then its subsidiaries in other states make payments to the Delaware entity for the use of its intangibles. As Delaware does not tax income from intangibles, payments made by an affiliate in another state to the Delaware parent company saves the corporation the states' taxes on the royalty payment.

[82] Foxtrot Ireland/Bermuda is a quasi-Irish entity meaning that it is a registered Irish company. But since the company has all of its assets and business in Bermuda, Ireland does not assert its right to tax the income.

Figure 3



The above discussion illustrates that the tax authorities and taxpayers often have an adversarial relationship in the establishment of transfer pricing. The majority of the discussion focuses on the I.R.S.'s combatting artificially low outbound transfer prices (i.e., the transfers or license of U.S. based/created intangibles into foreign jurisdiction). However, taxpayers may also have an incentive to value the patent at the upper bounds of arm's-length transactions (e.g., the Glaxo case). Because the U.S. is considered a high-tax jurisdiction, it is natural to presume that values found on U.S. tax returns have a tendency to be too low. While this is true, one can argue that there is a significant amount of time and effort required by a U.S. MNC to support the appropriateness of its transfer pricing. Furthermore, U.S. MNCs have transfers of intangibles between non-U.S. jurisdictions. These transfers may be biased upward to take advantage of low-tax incentives. Many of these royalty payments/license fees are subject to scrutiny under OECD transfer pricing guidelines suggesting that they face a level of scrutiny similar to U.S.-based transfer prices. Given the commensurate with income standard and existing penalties regimes, transfer pricing should certainly provide some guidance as to the appropriate bounds (or relative range) to the value of firms' intangibles. Nevertheless, given the staggering sums of money at issue, it is inevitable that corporations will seek to set their transfer prices within their discretion to minimize their tax liability. Although our current system is far from perfect, we reject the notion that the tax incentives effectively strip away all value and render transfer prices meaningless. Given that dueling patent experts often diverge by several orders of magnitude on a reasonable royalty damage award, transfer pricing could provide valuable evidence to help the trier of fact narrow the range of a reasonable royalty patent damage determination.

V. The Situations in which Tax-Related Transfer Prices are the Most Informative to Patent Damages

Although the underlying legal standards for defining the reasonable royalty in the tax and patent context are nearly identical—that is, both require a hypothetical arm's-length negotiation between willing, uncontrolled parties—a number of factors may render transfer prices more or less informative to the reasonable royalty calculation in patent damages. This section commences by delineating circumstances that alter the saliency of transfer prices in determining patent damage awards and concludes by arguing that transfer prices are devoid of some of the distortions that plague prior pre-existing patent licenses between unrelated parties.

To begin, the patent's transfer price will be most informative to the calculation of a reasonable royalty damage award when the timeframes for the hypothetical negotiations overlap.[83] Under patent law, the hypothetical negotiation occurs at the time the defendant started infringing the patent. The initial transfer of patent offshore typically occurs early in the technology's existence.[84] Thus, the patent will likely be subject to an intra-corporation transfer before patent infringement begins. There is a concern, however, that the patent will be transferred so early in the technology's lifespan that the royalty calculated for the tax purposes will drastically undervalue the patent. If the patent is transferred to a subsidiary immediately upon its issuance it is possible that the incremental value the patent provides to the underlying technology will be uncertain, as the value of the technology itself will largely be unknown. Importantly, our proposal does not advocate utilizing the initial transfer price of the patent. Instead, we posit utilizing the royalty the licensee subsidiary pays the licensor subsidiary. Unlike the initial transfer price, tax law requires the royalty rate to be updated to reflect changes in the value of the underlying technology, and hence the patent in question.[85] Thus, even if the initial transfer price is arbitrarily low, the updating of the licensing stream provides some confidence that increases in the valuation of the technology will be reflected over time.

Second, the tax-related transfer price might need to be adjusted to reflect the nature of the parties in the patent infringement litigation. For instance, patent law typically assumes the royalty rate is higher when it involves licensing a patent to a direct competitor rather than to another unrelated party, because the opportunity

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[83] Integra Lifesciences I, Ltd. v. Merck KGaA, 331 F.3d 860, 870–72 (Fed. Cir. 2003) (holding that a prior license consummated at a significantly different time "may have no bearing on the value of the hypothetical . . . license").

[84] Lee A. Sheppard, *Reflections on the Death of Transfer Pricing*, 120 TAX NOTES 1112, 1112 (2008) ("Good ideas are identified early and transferred early.").

[85] Under the commensurate with income standard, transfer prices must be within 80% and 120% of an *ex post* valuation of the intangible. Furthermore, if the intangible is "exploited" using a cost-sharing arrangement, regulations required that the taxpayer rely on an "investor model," effectively placing a cap on the profit that the arrangement can generate for the licensee. To the extent that the licensee earns more than 1.5 times its investment, an adjustment is made to allocate more income back to the licensor (typically a U.S.-based entity). *See* Treas. Reg. 1.482-7(i)(6) (2001).

costs to the patentee are likely larger with the former than the latter.[86] U.S. tax law defines the "arm's-length" price as the price that the corporation would have charged if it had instead been dealing with an unrelated party (rather than its own subsidiary) under the same circumstances.[87] The arm's-length pricing in tax context captures the appropriate market premium associated with the value of the patent, regardless of the specific nature of the relationship between the hypothetical licensee and licensor. To the extent transfer prices do not explicitly account for the opportunity costs associated with licensing technology to a direct competitor, existing patent law doctrine suggests an upward adjustment may be necessary.

Third, the more similar the technology associated with the intra-corporation patent transfer and the patent litigation in question, the more informative the transfer price will be to the calculation of the patent damage award. That is, the transfer price represents an arm's-length transaction wherein the parent company licenses the patent to a subsidiary for use in making some product. If a patented technology's value varies upon the product in which it is incorporated, the licensor may price discriminate—i.e., charge greater licensing rates when the patent provides more value to the product.[88] Take for example, a patent on technology that meaningfully elongates the battery charge for computer devices.[89] The value of the patent technology will likely be larger for a laptop computer than a desktop computer.[90] As a result, a manufacturer of the former may be willing to pay more to license the technology than a manufacturer of the latter. To the extent that the value of a patented technology varies upon its use, it may be necessary to adjust the transfer price if the products subject to the intra-corporation transfer are significantly different than the one at issue in the patent litigation.

Finally, we note that tax-related transfer prices are devoid of some of the distortions that plague prior patent licensing prices between unrelated parties. Commentators have long noted the possibility of a feedback loop existing between prior patent licenses and patent litigation damage awards.[91] Because many patent licenses

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86 *See* Minks v. Polaris Indus., Inc., 546 F.3d 1364, 1373 (2008) (holding that the reasonable royalty determined by the district court may need to be adjusted upwards to account for the parties being competitors); Mars, Inc. v. Coin Acceptors, Inc., 527 F.3d 1359, 1373–74 (Fed. Cir. 2008) (noting that the reasonable royalty for licensing to a competitor is larger than the standard arm's-length rate).

87 26 C.F.R. § 1.482-1(b)(1).

88 Anne Layne-Farrar, The Patent Damages Gap: An Economist's Review of U.S. Statutory Patent Damages Apportionment Rules, 26 TEX. INTELL. PROP. L.J. (forthcoming 2017) (manuscript at 13) (*available at* https://ssrn.com/abstract=2911289) (noting that technology that elongates battery life would provide more value to a laptop than a desktop computer).

89 *Id.*

90 *Id.*

91 Roger D. Blair & Thomas F. Cotter, INTELLECTUAL PROPERTY: ECONOMIC AND LEGAL DIMENSIONS OF RIGHTS AND REMEDIES 230 (2005); Lemley & Shapiro, *supra* note 2, at 2021–22; Taylor, *supra* note 9, at 106–07; Lee & Melamed, *supra* note 9, at 418; Masur, *supra* note 39, at 133–38; Hovenkamp & Masur, *supra* note 9. *But see*, Oskar Liivak, *Beyond Circularity: Licensing for Innovation*, 26 TEX. INTELL. PROP. L.J. (forthcoming 2017) (arguing that not all patent licenses are

are negotiated in the shadow of existing or threatened patent litigation, there is a concern that distortions associated with the prior existing patent licenses may be introduced to the reasonable damages calculation. For instance, while the hypothetical negotiation for calculating a reasonable royalty for patent damages assumes the patent is valid and infringed, real-life licensing rates are invariably negotiated in the presence of uncertainty about patent validity and infringement.[92] As a result, commentators often suggest that actual royalty rates found in "comparable" prior licenses between unrelated parties should be adjusted upwards to counteract this uncertainty when being utilized as benchmarks for patent damages.[93] The same adjustment would not be necessary for tax-related transfer prices, as tax law assumes the patent is valid and must be licensed—i.e., infringed.[94] That is, because tax-related transfer prices are not negotiated in the shadow of litigation, there is no danger that any uncertainty associated with success at trial would downward bias their values.

Enforceability concerns, however, are not the only confounding feedback factor that is present in prior patent licenses but absent in tax-related transfer prices. Scholars have also noted that real-life negotiations of licenses often occur after the licensee has already begun practicing the licensed patent.[95] To the extent the infringer is locked into the patented technology, it is likely to agree to a rate much higher than if it were free to change technology.[96] Thus, a prior patent license may not accurately track the incremental value of the patent to the product but instead be inflated upwards.[97] The concern that prior existing license agreements may reflect lock-in costs is also absent in tax-related transfer prices. The transfer of patents by related entities simply does not involve the dynamic associated with hold-up costs.

VI. Conclusion

This Article argues that tax-related transfer prices could be useful evidence in calculating reasonable royalty patent damages. Although transfer prices are undoubtedly influenced by the tax system, given that corporate statutory tax rates are widely known, the tax incentives should always be apparent. Knowing whether a reported transfer price should represent a lower or upper bound of a reasonable royalty calculation will enable the trier of fact to utilize transfer prices to help narrow the range of an acceptable reasonable royalty patent damage award. Importantly, our proposal will not solve every reasonable royalty calculation. That is, only a pa-

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subject to this feedback loop and that these licenses "produce market-based evidence that can be used rather directly to compute patent damages").

92 Durie & Lemley, *supra* note 8, at 641–43.

93 *Id.*

94 That is, appraisers hired by multinational corporations to calculate the royalty rate associated with the transfer of patents to a subsidiary do not discount the licensing price to affect uncertainty in patent validity and infringement.

95 Lee & Melamed, *supra* note 9, at 418; Lemley & Shapiro, *supra* note 2, at 2016.

96 Lee & Melamed, *supra* note 9.

97 Lemley & Shapiro, *supra* note 2.

tentee that manufactures products and has transferred the economic right of the patent to a subsidiary will have reported tax-related transfer prices. Nevertheless, given the ubiquity of intra-company trading, it is likely that a significant number of litigated patents will meet this criterion.

The Patent Damages Gap: An Economist's Review of U.S. Statutory Patent Damages Apportionment Rules

Anne Layne-Farrar†

I. Introduction

As an economist, I must admit that I find the current state of the law regarding damages for patent infringement—most particularly that relating to apportionment—frustrating at best and woefully incomplete at worst. Namely, damages case law for utility patent infringement provides two very different, but insufficient, guidance frameworks for calculating damages: the Entire Market Value Rule (EMVR) versus the Smallest Salable Patent Practicing Unit (SSPPU) principle.

Apportionment is required for utility patent damages in litigation as a means of restricting damages to the footprint of the asserted technology and avoiding value from non-patented (or, as is often the case, "other-patented") features. This requirement dates back to the early 1880s, with the *Garretson v. Clark* decision.[1] While that 1884 ruling was issued under a different damages regime (as explained below),[2] it remains applicable today. Specifically, the Supreme Court wrote in *Garretson* that:

> The patentee . . . must in every case give evidence tending to separate or apportion the defendant's profits and the patentee's damages between the patented feature and the unpat-

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1 Garretson v. Clark, 111 U.S. 120, 121 (1884).

2 Disgorgement was the common rule in 1880s. Some authors argue that the reasonable royalties framework in place today works in a quasi-disgorgement fashion. *See* John Golden & Karen Sandrik, *A Restitution Perspective on Reasonable Royalties*, 36 REV. LITIG. 335 (2017).

> ented features, and such evidence must be reliable and tangible, and not conjectural or speculative; or he must show, by equally reliable and satisfactory evidence, that the profits and damages are to be calculated on the whole machine, for the reason that the entire value of the whole machine, as a marketable article, is properly and legally attributable to the patented feature.[3]

Thus, the 1884 *Garretson* decision laid down the foundation for today's battle between damages based on the "entire value of the whole machine" (now known as the Entire Market Value Rule, or EMVR) and the Smallest Salable Patent Practicing Unit (SSPPU) principle.[4] Note that the language of *Garretson* provides for two mutually exclusive but exhaustive options in calculating damages—the end-product value or an apportionment of that value—and does not call for pulling individual components out of end products.[5] Nevertheless, the apportionment rule in *Garretson* set the stage for the SSPPU approach that emerged in case law over a century later. As I argue in this paper, the modern pair of EMVR and SSPPU options is far narrower than the approaches afforded by *Garretson*. I present the economic case for expanding the allowable damages frameworks beyond EMVR or SSPPU, to return to an apportionment regime more in line with *Garretson*.

In this paper, I explain the gap in reasonable damages calculations that I perceive the courts' EMVR/SSPPU dichotomy has created. I first survey utility patent damages under the EMVR approach in Section II. Then in Section III, I review the case law developing the SSPPU approach. Section IV compares and contrasts these two approaches. I find that utility patent damages case law is incomplete in that EMVR and SSPPU do not exhaust all reasonable valuation scenarios in litigation, and instead leave uncovered a class of highly likely infringement scenarios that do not fit either the EMVR or SSPPU confines. In Section V, I close out my analysis with a proposal for how we might seal the problematic gap in damages case law and issue a plea for the courts to step into the breach, providing guidance on how to apply reasonable and balanced apportionment principles in the circumstances that warrant damages between SSPPU and EMVR.

II. EMVR: Protecting Juries

The Federal Circuit has confirmed that the EMVR logic first expressed in *Garretson* (a case concerning mop heads) remains particularly relevant for damages today, when infringement suits can implicate products with far more non-patented features than those that were sold in the 1880s.[6] It is important to understand that in the 1880s, patent damages did not include a "reasonable royalties" option as is available today. The reasonable royalties provision we are familiar with did not ap-

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[3] *Garretson*, 111 U.S. at 121 (quoting Garretson v. Clark, 1878 U.S. App. LEXIS 2023 *1, *14 (C.C.N.D.N.Y. July 15, 1878)).

[4] *See generally* 1-20 CHISUM ON PATENTS § 20.07(2)(g)(ii) (2017).

[5] *See generally* 23 CHISUM ON PATENTS SCG-6213: Existing Licenses; Prevailing Industry Rates (2017).

[6] *See* Ericsson, Inc. v. D-Link Sys., 773 F.3d 1201, 1232 (Fed. Cir. 2014).

pear until 1915, and was not codified in U.S. code until 1922.[7] Instead, in the 1880s, damages were limited to actual damages, such as lost profits or an established royalty payment.[8] Thus, if patent holders were unable to prove that they had lost any profits and had no established royalty (having chosen not to license their patent), then disgorgement of the defendant's profits attributable to the patented technology was an allowable and common remedy in the 1880s, albeit one that was plagued with its own apportionment difficulties.[9]

In its 1995 *Rite-Hite* decision, the Federal Circuit reviewed the early case law prior to Congress passing the 1946 revision to the Patent Act,[10] which removed infringer profit disgorgement for utility patents and replaced it with a narrower view of patent damages.[11] The Federal Circuit found that in pre-1946 rulings, "[w]hile patentees who commercialized the invention of the patent in suit might recover some amount of profits, the entire amount of profits would not be awarded where the invention was not of an entirely new device but amounted only to an improvement, unless the invention was the basis for demand for the entire device."[12] The last portion of this quote, "the basis for demand," has since formed a central guiding principle for allowing reliance on the EMVR. In short, the patent holder must show that its asserted technology drives demand for the product as a whole or else the entire market value of that product cannot be used as the base for damages calculations.

The Federal Circuit has explained the rationale behind its EMVR interpretation as being rooted in the potential for cognitive biases among jurors.[13] For example, in its 2011 *Uniloc* decision, the court noted that "[t]he disclosure that a company has made $19 billion dollars in revenue from an infringing product cannot help but skew the damages horizon for the jury, regardless of the contribution of the patented component to this revenue."[14] In other words, having seen a large number for total accused product revenues, a jury might "anchor" on that number when assessing the damages estimates presented by the two parties, even when the case evidence clearly establishes that the patents read on only a small part of the accused product.[15]

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7 Caprice Roberts, *The Case For Restitution And Unjust Enrichment Remedies In Patent Law*, 14 LEWIS & CLARK L. REV. 653, 660 (2010) [hereinafter Roberts (2010)]; *see also* Michael Risch, *(Un)Reasonable Royalties* 14, (Vanderbilt University, Working Paper No. 2016-1036, 2016) (available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2884387).

8 Rude v. Westcott, 130 U.S. 152 (1889) (explaining that only established royalty payments were acceptable: "In order to make the price received by a patentee from sales of licenses a measure of damages against infringers, the sales must be common—that is, of frequent occurrence—so as to establish such a market price for the article that it may be assumed to express, with reference to all similar articles, their salable value at the place designated.").

9 *See* Roberts (2010), *supra* note 7, at 656–61.

10 Rite-Hite Corp. v. Kelley Co., Inc., 56 F.3d 1538, 1565–66 (1995).

11 *See* Risch, *supra* note 7, at 19.

12 *Rite-Hite*, 56 F.3d at 1565.

13 *See* Uniloc USA, Inc. v. Microsoft Corp., 632 F.3d 1292, 1320 (Fed. Cir. 2011).

14 *Id.*

15 *Id.* at 1321.

Expanding on this logic in its 2012 *LaserDynamics* opinion, the Federal Circuit wrote:

> Admission of such overall revenues, which have no demonstrated correlation to the value of the patented feature alone, only serve to make a patentee's proffered damages amount appear modest by comparison, and to artificially inflate the jury's damages calculation beyond that which is "adequate to compensate for the infringement."[16]

The Federal Circuit's 2014 *Ericsson v. D-Link* ruling established a two-prong explanation of EMVR: 1) the "substantive legal rule" that dictates patent damages "must be based on the incremental value that the patented invention adds to the end products" and 2) an "evidentiary principle" meant to aid juries in assessing reasonable royalty damages in litigation.[17] Then, in its 2015 *CSIRO v. Cisco* decision, the court expanded its explanation:

> First, "[w]here small elements of multi-component products are accused of infringement, calculating a royalty on the entire product carries a considerable risk that the patentee will be improperly compensated for noninfringing components of that product." Second is the "important evidentiary principle" that "care must be taken to avoid misleading the jury by placing undue emphasis on the value of the entire product."[18]

As the quote above illustrates, a key feature of modern debates on apportionment is the "multi-component product." By their very nature, such products are unlikely to have a single feature that forms the one and only basis of demand, or is the sole driver of customer purchases. Hence, in the context of multi-component products, a successful argument for taking the EMVR approach is likely to be rare at best, which brings us to the case law's current alternative to EMVR: the SSPPU.

III. SSPPU: Protecting Infringers?

The SSPPU framework was first espoused in 2009 by Judge Rader in *Cornell University v. Hewlett-Packard Company*.[19] That case involved a computer component: "the claimed invention is a small part of the IRB [instruction recorder buffer], which is a part of a processor, which is part of a CPU module, which is part of a 'brick,' which is itself only part of the larger server."[20] During pre-trial proceedings, Judge Rader warned Cornell not to claim damages beyond the reach of its asserted invention.[21] Nevertheless, at trial Cornell's damages expert attempted to testify on damages based on Hewlett-Packard's (HP's) server and workstation revenues, but without presenting any evidence that would link consumer demand for servers and

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[16] LaserDynamics Inc. v. Quanta Computs., 694 F.3d 51, 68 (Fed. Cir. 2012) (citing Uniloc USA, Inc. v. Microsoft Corp., 632 F.3d 1292, 1319–20 (Fed. Cir. 2011)).

[17] Ericsson, Inc. v. D-Link Sys., 773 F.3d 1201, 1226 (Fed. Cir. 2014). For a discussion of the Federal Circuit's ruling in this case, see The Essential Patent blog at http://www.essentialpatentblog.com/2014/12/federal-circuit-gives-guidance-on-litigating-rand-obligation-ericsson-v-d-link/.

[18] Commonwealth Sci. and Indus. Research Org. v. Cisco Systems, Inc., 809 F.3d 1295, 1302 (2015) (quoting LaserDynamics Inc. v. Quanta Computs., 694 F.3d 51, 67 (Fed. Cir. 2012)).

[19] Cornell Univ. v. Hewlett-Packard Co., 609 F. Supp. 2d 279, 282 (N.D.N.Y. 2009).

[20] *Id.* at 283.

[21] *Id.*

workstations to the asserted patents.[22] The Judge interrupted the trial to prevent this testimony, but gave Cornell a chance to return the following day with a damages estimate more closely tied to the patented technology.[23] Cornell's damages expert chose to base his round-two damages estimate on HP's CPU "brick" revenues.[24] As clearly articulated in his Judgment as a Matter of Law ruling, Judge Rader found this approach equally problematic:

> Notably, Cornell chose this hypothetical royalty base in favor of another alternative more clearly relevant to the value of the patented invention – the revenue Hewlett-Packard would have earned had it sold each infringing processor as just that, a processor, without any additional non-infringing components. Instead of linking its base amount to the processors (of which the infringing IRB is an important component), Cornell simply stepped one rung down the Hewlett-Packard revenue ladder from servers and workstations to the next most expensive processor incorporating product without offering any evidence to show a connection between consumer demand for that product and the patented invention.[25]

Observing that at least some pricing data was available for the component in which the asserted patents were a meaningful and contributing part, Judge Rader argued that "[t]he logical and readily available alternative was the smallest salable infringing unit with close relation to the claimed invention – namely the processor itself."[26] Thus, the principle of the smallest salable patent practicing unit (SSPPU) was born.

Judge Rader's expressed frustration with Cornell's damages calculations is understandable. He had repeatedly ruled that Cornell had failed to establish that the asserted technology drove demand for anything beyond a processor, and as such, was not eligible for the EMVR approach as applied to HP's servers, workstations, CPUs, or "bricks."[27] Yet Cornell continued to argue (without producing any new evidence that its patented technology was important for the sale of HP's end products) that it was owed damages on the entire server product and continued to calculate damages based on relatively large elements of the server system that included numerous non-infringing features without presenting any rational apportionment of those sales to narrow the product revenues to the relevant asserted features.[28] However sensible the introduction of the SSPPU concept may have been in the *Cornell* case, though, that concept has subsequently led to significant mischief in other cases, with different fact patterns.

As the SSPPU principle gained in popularity, courts began to treat it with primacy, as if damages calculations must always use an SSPPU royalty base, unless the available evidence established that the EMVR was appropriate. For example, in

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22 *Id.*
23 *Id.* at 283–84.
24 *Id.* at 284.
25 Cornell Univ. v. Hewlett-Packard Co., 609 F. Supp. 2d 279, 285 (N.D.N.Y. 2009).
26 *Id.* at 288.
27 *Id.* at 283–84.
28 *Id.*

the *In re Innovatio* case,[29] Judge Holderman concluded "that Innovatio's patent portfolio [of 23 standard essential patents, or SEPs] is of moderate to moderate-high importance to the 802.11 [Wi-Fi] standard."[30] Despite this finding, Judge Holderman reported that he felt compelled to follow the SSPPU approach because he found that the patent holder had failed to introduce sufficient evidence in support of an EMVR revenue base:

> Beyond the court's resolution of the parties' dispute about the application of the "smallest salable patent-practicing unit" test to Innovatio's asserted claims here, Innovatio's application of its approach did not credibly apportion the value of the end-products down to the patented features. In light of that failure of proof, the court has no choice based on the record but to calculate a royalty based on the Wi-Fi chip.[31]

Thus, Judge Holderman set the royalty base for damages as "a small silicon device about the size of a dime that is inserted during manufacturing into an electronics device, such as a laptop computer or wireless access point, to provide the device with 802.11 wireless functionality."[32] The chips were found to have an average price, over the relevant time period, of $3.99 per unit, which was then further reduced to reflect the chipmaker's established profit margin.[33] In the end, the royalty base employed in the *Innovatio* case was below $2.00 per unit.[34] This is in contrast to the average price of Wi-Fi access points (around $60 per unit) or Wi-Fi enabled laptops (around $785 per unit), which Innovatio argued should form the royalty base (with apportionment they argued reflected the footprint of the asserted patents).[35] Clearly, when the numbers differ by magnitudes of this size, decisions on which royalty base to allow are likely have a profound effect on the resulting damages calculations.[36]

IV. The Patent Damages Disconnect

One of my primary concerns with the SSPPU approach as the de facto royalty base when the EMVR criteria (at least as currently defined) cannot be met, is that it is often at odds with the statutory requirement for damages calculations that damages should be "in no event less than a reasonable royalty for the *use* made of the in-

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[29] *In re* Innovatio IP Ventures, LLC Patent Litig., 2013 WL 5593609, at *1 (N.D. Ill. Oct. 3, 2013).

[30] *Id.* at *36.

[31] *Id.* at *14.

[32] *Id.* at *12.

[33] *Id.* at *40–41.

[34] *Id.* at *43.

[35] *See In re* Innovatio IP Ventures, LLC Patent Litig., 2013 WL 5593609, at *12 (N.D. Ill. Oct. 3, 2013). The average price per chip is reported in the opinion; the average prices of the end products are backed out from other data reported in the opinion.

[36] It is of course true that a $1 royalty can be reached either by applying a 1% royalty rate on a $100 end product or by applying a 10% royalty rate on a $10 component. In my experience, however, such close matching of rates and bases is difficult to achieve in practice, where each element of a royalty calculation needs to be supported with documents or other evidence. The most likely outcome in a jury trial is for the court to reduce the allowable base while holding the rate constant or adjusting it upward only modestly, such that calculated damages are meaningfully affected by the reduction of the royalty base.

vention by the infringer."[37] As further evidence of its importance in damages calculations, the use a specific infringer makes of the asserted patented technology is woven throughout the fifteen *Georgia Pacific* factors commonly referenced in patent infringement litigation.[38] Thus far, however, the choice of SSPPU is largely an exercise of where the patented technology physically resides, without serious consideration of its value footprint. For example, the SEP portfolio in the *Innovatio* case included patents on wireless adapters for "controlling high level communication protocols" and a "radio frequency data communication system" involving numerous pieces of base station equipment.[39] Nonetheless, since the functionality of these SEPs was technically implemented in so-called Wi-Fi chips, that component was chosen for the royalty base.[40]

I am not the first to recognize a potential disconnect between the SSPPU standard and the value-of-use calculation. Judge Davis provided a nice analogy highlighting this problem:

> It is simply illogical to attempt to value the contributions of the [CSIRO patent] based on wireless chip prices that were artificially deflated because of pervasive infringement. Basing a royalty solely on chip price is like valuing a copyrighted book based only on the costs of the binding, paper, and ink needed to actually produce the physical product. While such a calculation captures the cost of the physical product, it provides no indication of its actual value.[41]

That the choice of an SSPPU may be divorced from the value the asserted patented technology brings to users leads directly to a problem with treating the damages framework as an either/or choice between EMVR and SSPPU. That dichotomy creates an incomplete set of economic options for damages experts. On the one hand, when the patented technology drives or forms the basis for demand, the case law establishes that revenues from the end product are the correct royalty base, with appropriate apportionment applied to reflect non-infringing features.[42] On the other hand, when the patented technology does not form the basis of demand for the product as a whole, and instead contributes to a relatively small portion of the accused product, then revenues associated with the smallest salable component within the end product that infringes the patented technology should be the royalty base.[43] But there is a third possibility not captured by either of these damages estimation frameworks: the patented technology is not the sole driver of demand, but is important enough to affect features and functionality—and hence user value—beyond

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37 35 U.S.C. § 284 (2017) (emphasis added).

38 Georgia-Pac. Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1119–20 (S.D.N.Y. 1970) (explicitly relating Factor 11 to the value conveyed by the infringer's use and applying aspects of the value-in-use concept in factors 6, 8, 9, 10, and 13).

39 *In re* Innovatio IP Ventures, LLC Patent Litig., 2013 WL 5593609, at *13 (N.D. Ill. Oct. 3, 2013).

40 *Id.* at *14.

41 Commonwealth Sci. and Indus. Research Org. v. Cisco Systems, Inc., 2014 WL 3805817, at *11 (E.D. Tex. 2014).

42 LaserDynamics Inc. v. Quanta Computs., 694 F.3d 51, 67–68 (Fed. Cir. 2012).

43 *Id.*

its smallest salable component implementation.

To see the gap in the coverage of the SSPU and EMVR frameworks more clearly, we return to the language in the Federal Circuit's *LaserDynamics* decision, where the court observed that:

> We reaffirm that in any case involving multi-component products, patentees may not calculate damages based on sales of the entire product, as opposed to the smallest salable patent-practicing unit, without showing that the demand for the entire product is attributable to the patented feature . . . . Admission of such overall revenues, which have no demonstrated correlation to the value of the patented feature alone, only serve to make a patentee's proffered damages amount appear modest by comparison, and to artificially inflate the jury's damages calculation beyond that which is "adequate to compensate for the infringement."[44]

The first sentence of the above quote matches the language discussed above in the context of the EMVR case law: "demand for the entire product" must be "attributable to the patented features." But the latter sentence of the quote uses different language that is not equivalent to the "basis of demand" point. Specifically, the court argues that when overall revenues "have no demonstrated correlation to the value of the patented features" then reference to overall product revenues can "artificially inflate" a jury's view of damages.[45] I agree, but "correlation" is a very different metric than "the basis of demand." Patented technology may not be the sole driver of customer demand, but may nonetheless affect the end product beyond its physical implementation in a component, such that there can be a "demonstrated correlation" between the value of the patented features and overall revenues.

If we place damages frameworks on a spectrum ranking the magnitude of patented contributions to the value of their end products, where EMVR lies at the far right (the patented technology is the key reason for the end-product value) and SSPPU at the far left (the patented technology is just one of many reasons for end-product value), this third option would occupy the middle of the spectrum.[46] For this middle group, the relevant question then becomes how much "correlation" can be "demonstrated," with SSPPU becoming less suitable as a damages approach as demonstrable correlation between the patented technology and end-product value increases. The figure below presents three paradigms of demonstrated correlation. The top line fits an SSPPU approach reasonably well, but the bottom two do not, with the third line showing a meaningful disconnect between the SSPPU physical implementation and the value contributed by the use of the patented technology to the overall product.

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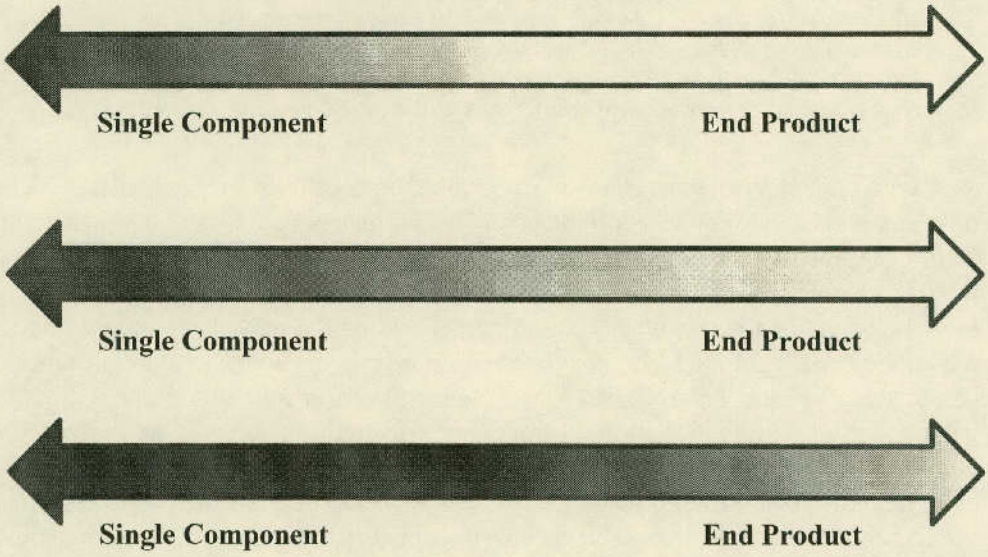
[44] *Id.*

[45] *Id.*

[46] That is, product value that "results as a natural, direct, uninterrupted consequence" from use of the patented technology, "without which the [value] would not have [been realized]" should be included in the selection of a damages approach and should counsel for moving beyond SSPPU when that value exceeds the limits of the smallest salable unit. This is an economic analog to the legal concept of proximate cause; *see* West's Encyclopedia of American Law (2nd ed., 2008), *available at* http://legal-dictionary.thefreedictionary.com/proximate+cause (defining "proximate cause").



Judge Davis's printing analogy further illuminates how the value of intellectual property can extend beyond the costs of its physical implementation.[47] Suppose a printer will publish two books, each 100-page-long hardcopies: one is a textbook by a well-respected legal scholar, such as Herbert Hovenkamp; the other a case analysis written by an unknown first-year law student. The cost of the paper, ink, and printing will be the same for the two books, but the value to users of the IP embedded in each book is likely to be vastly different. The Hovenkamp textbook will likely have far higher value than the law student case analysis, with the former enjoying greater distribution and a longer shelf life. Thus, even though both works are physically implemented in the same format, and have identical production costs, the value of the works to users will be very different. The same can be true for other forms of IP with respect to their physical implementations.

Some examples may clarify the various points that are likely to exist along the spectrum of damages between the endpoints of EMVR and SSPPU. First, think about certain pivotal radio frequency (RF) technology within a smartphone: RF functionality is physically implemented on a semiconductor chip within a smartphone, but technically unrelated features within that phone can have enhanced value because of innovations in radio-enabled connectivity, and radio-enabled connectivity can enjoy enhanced value resulting from the presence of those features. As Teece and Sherry (2016) explain:

> [A]dding a camera to a cellphone increases the range of ways that the owner can make use of the cellphone; the owner can now take photos and share them with others over cellular connections in a way that the owner of a camera-less cellphone cannot. This increases the

[47] Commonwealth Sci. and Indus. Research Org. v. Cisco Systems, Inc., 2014 WL 3805817, at *11 (E.D. Tex. 2014).

> value to the owner of having cellular connectivity. Similarly, the ability to share photos with others over a cellular network enhances the value of the camera functionality, as compared to the value of a stand-alone camera without cellular connectivity that is not capable of such sharing. In other words, even though the two features are technologically unrelated, adding the camera functionality enhances the value of cellular connectivity, and vice versa.[48]

Putnam and Williams (2016) corroborate the prevalence of system-level technologies within the mobile telecom sector, which makes that sector ill-suited to an SSPPU approach.[49] These authors conducted a case study of patents declared as potentially essential for the 3G WCDMA standard, identifying the "practicing unit" most relevant for the patented technology defined as the aspect of the product in which the benefits of the technology were most clearly apparent. In many instances, components, product features, and user equipment were specifically described in the patent claims, along with how the technology affected functionality for those components, features, and equipment. Among the practicing unit options of baseband chip, network, or user equipment, the authors find that none of the 362 patents reviewed could be limited to baseband chip functionality alone.

As another example, Petit (2016) presents a case study on the Wireless Avionics Intra-Communications (WAIC) standard.[50] This standard is "primarily about safety-related applications: release of oxygen masks, trigger of oxygen flow, emergency lighting, cabin pressure, etc."[51] The WAIC standard is implemented via the installation of RF equipment (antennae, transmitters, and receivers) on commercial airplanes.[52] This RF equipment represents identifiable, salable components of the much larger end product—the plane.[53] While oxygen mask operations and other safety features improved through the use of the WAIC standard are important, these elements are not the sole basis for demand of a plane.[54] Thus, damages calculations for infringement cases involving WAIC-related patents fall squarely within the current SSPPU regime, with the RF component prices as the relevant royalty base, to which further apportionment would be applied to reflect the particular footprint of the patents in suit.[55]

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[48] David J. Teece & Edward F. Sherry, *On the 'Smallest Saleable Patent Practicing Unit': An Economic and Public Policy Analysis* 17 (Tusher Center, Univ. of Cali. at Berkeley Working Paper, January 2016), http://innovation-archives.berkeley.edu/businessinnovation/documents/Tusher-Center-Working-Paper-11.pdf.

[49] Jonathan Putnam & Tim Williams, *The Smallest Salable Patent-Practicing Unit (SSPPU): Theory and Evidence* 35–45 (Sept. 6, 2016) (unpublished manuscript), https://papers.ssrn.com/abstract=2835617.

[50] *See generally* Nicolas Petit, *The Smallest Saleable Patent Practicing Unit ("SSPPU") Experiment, General Purpose Technologies, and the Coase Theorem* (Feb. 20, 2016) (unpublished manuscript), https://papers.ssrn.com/abstract=2734245.

[51] *Id.* at 2.

[52] *Id.* at 3.

[53] *Id.*

[54] *Id.*

[55] *Id.*

Petit, however, calculates that adopting the WAIC standard can lead to significant operational cost savings for commercial airlines.[56] In particular, "a standard Airbus A-380 embarks approximately 5700 kilograms of electrical wires. With wireless technology, approximately 30% of the entire aircraft electrical wire (i.e., 1710 kilograms) can be stripped."[57] In turn, that reduction in weight translates into both jet fuel cost savings (the most significant operational cost that airlines face) and reduced CO_2 emissions.[58] Taking the fuel cost savings for a standard Airbus A-380, Petit estimates a cost savings of $3.02 million per plane, far in excess of the $1,000 price of a typical RF transmitter.[59] Even if the key patent holders in the aggregate only sought half of the cost savings realized by users as compensation for their patented technology, the necessary royalty rate would need to be 1510 times the SSPPU price—a figure an accused infringer would surely decry as "unreasonable."[60] Indeed, should the aggregate royalty for WAIC technology reach even a fraction of 1500% of RF transmitter revenues, it is likely that the patents would be held up as the poster children for "royalty stacking" abuse.[61]

The WAIC example highlights yet another important point for damages apportionment and the appropriate choice of a royalty base: a jury's cognitive biases can run in either direction.[62] Just as the Federal Circuit in *LaserDynamics* rightly worried about the disclosure of total revenues "artificially inflat[ing] the jury's damages calculation" when the patented technology contributes to no more than a small component of the overall product, we also need to worry about an SSPPU revenue (and even more so, an SSPPU profit margin) figure artificially deflating a jury's damages calculations when the patented technology is not the sole driver of demand but nonetheless contributes more value to its users than is captured in the component in which it is physically or technically implemented. Presenting a jury with the $1,000 RF transmitter price tag as the royalty base would likely artificially deflate the jury's damages calculations in a WAIC patent infringement case, when the value contributed by the patents to users will measure some portion of $3.02 million.

Yet another example drawn from discussions with David Long further emphasizes the importance of basing valuation on a technology's use, rather than its physical location in some component. Consider an innovative wireless technology that reduces the power requirements for mobile devices, increasing the time a device holds a charge by 30%. As is common for information and communications technology (ICT) inventions, this battery improvement technology is physically imple-

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56 Petit, *supra* note 50, at 3.
57 *Id.* at 2.
58 *Id.*
59 *Id.* at 3.
60 *Id.*
61 *Id.*
62 *See* Anne Layne-Farrar, *The Practicalities and Pitfalls of The Smallest Saleable Patent Practicing Unit Doctrine: A Review of Teece and Sherry*, 51.4 LES NOUVELLES 234, 235 (2016) (reviewing Teece & Sherry, *supra* note 48).

mented in a semiconductor chip. Suppose that the same chip can be deployed to provide wireless capabilities in a mobile phone, a tablet, a laptop, or a desktop computer. The last device is kept plugged into the wall socket whereas the other three devices are mobile and hence only plugged in when a new charge is needed.

This patented power-saving invention will be more valuable to a mobile user than to a desktop user: longer battery life is one (though not the only) key feature on which consumers choose mobile devices. Thus, using the patented technology would either increase a mobile device maker's quantity of sales, enable it to increase its retail prices, or both. By contrast, desktop computer users will find less value in patented technology that provides power savings, as desktop computers must be plugged in to function. While the patented technology may improve the desktop's energy consumption, users are unlikely to consider this a key feature, and hence is unlikely to translate into meaningfully higher market shares or revenues for the desktop maker. With this fact pattern, is the chip a reasonable SSPPU for the patented technology? Does the answer depend on whether the chip is used in a mobile device or a desktop? If a particular manufacturer used the same chips in both mobile devices and desktops, how should damages for that multi-product manufacturer be calculated?

The disconnect between the physical implementation of the patented technology and the value of the technology's use is particularly problematic if the component in which the technology is implemented reflects a component market that has rarely taken patent licenses at the component level of the production chain. Industry practice in many ICT sectors is to license all IP at the end-production level: thus, some component makers will not have patent licenses, will not have paid for the user value of the IP physically implemented in their components, and thus will have component pricing structures that do not reflect the value of using the technically implemented IP. Judge Davis referred to this problem in his *CSIRO* ruling, noting that the wireless chip prices relevant in his case "were artificially deflated because of pervasive infringement."[63]

To alter such a market structure *ex post*, taking a component maker's prices or profit margins as the royalty base without considering whether that component maker has ever paid for the use of the technology implemented in its components, ignores important market dynamics. Consider a hypothetical Product X, an end product with three key features (A, B, and C) that together drive demand. Under industry norms, most manufacturers of Product X currently pay all IP royalties to the patent holders. Suppose the product incorporates two smaller components, a battery and a chip, both purchased from third-party suppliers and hence with observable prices. Figure 1 illustrates this product, broken down into its components, reflecting the status quo costs a manufacturer of Product X faces (the bill of materials for the components and the license fees covering features A, B, and C).

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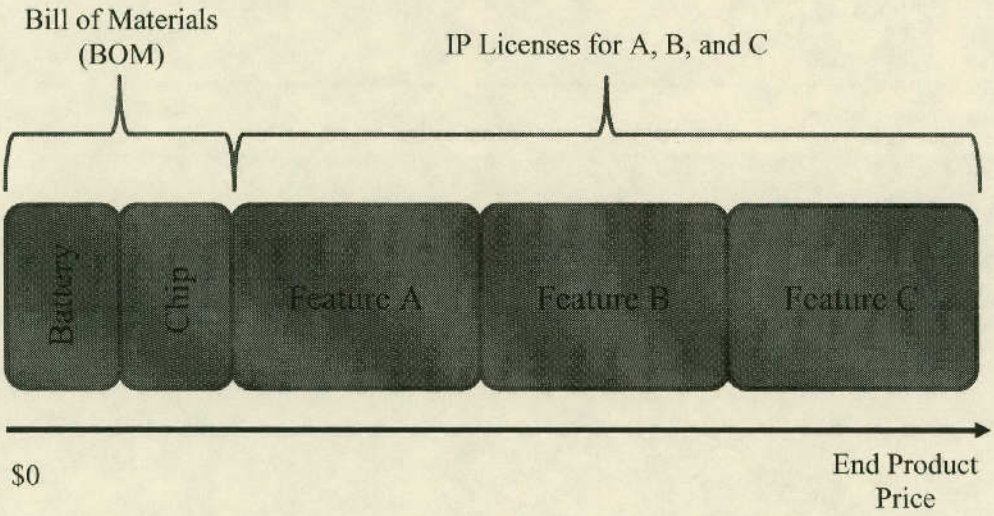
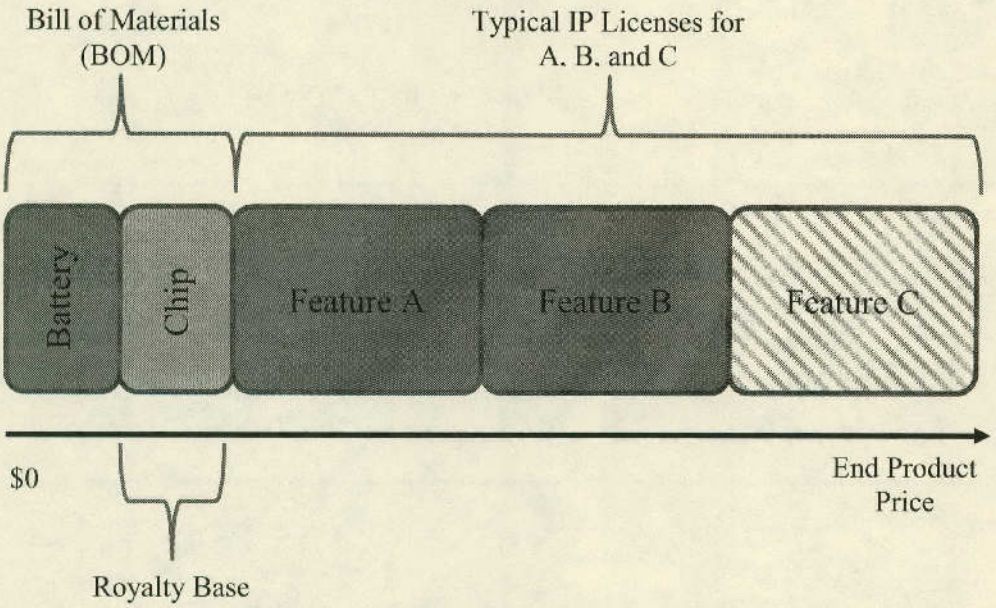
[63] Commonwealth Sci. and Indus. Research Org. v. Cisco Systems, Inc., 809 F.3d 1295, 1299 (Fed. Cir. 2015).

Figure 1: Licensing under industry norm



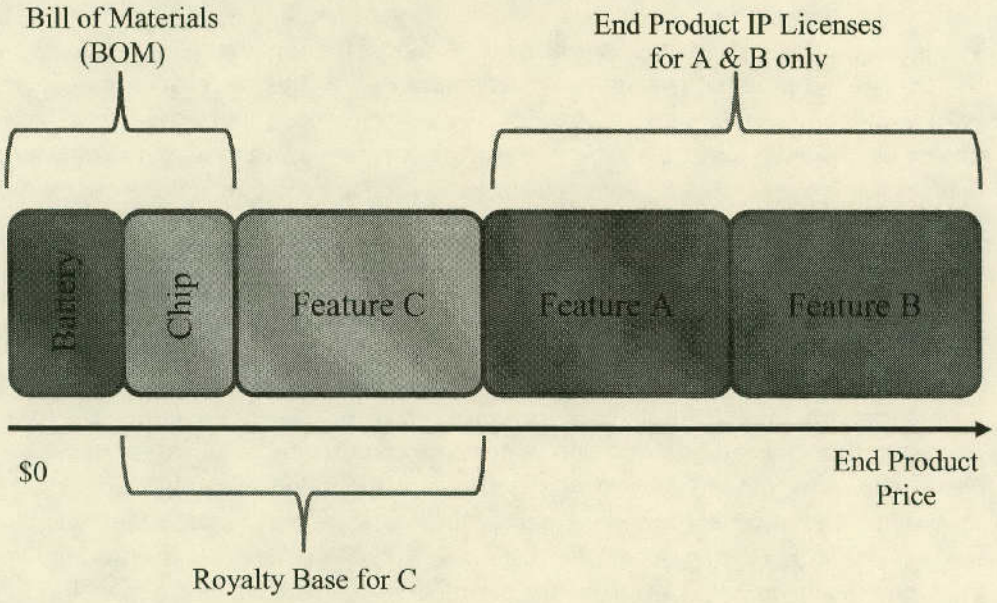
Suppose that the patents asserted in litigation read on feature C, but are physically implemented in the chip. Feature C, alone, does not drive demand, so EMVR cannot be used to determine damages. The chip also implements feature sets A and B, so under an SSPPU approach, the defendant will argue that the chip implements far more than feature set C and thus requires further apportionment. Assuming that each of the three features are of equal value to users of Product X (and hence to its seller), the defendant will argue for taking around 33% of the chip price (or even more likely, 33% of the chip's profit margin) as the royalty base, reflecting the "cost" of the patented technology implemented on the chip to the maker of Product X. The basis for this argument is that 1) the chip "captures" all of the patented technology because this is where the asserted patents are technically implemented; 2) the "value" of the IP on the chip must be some fraction of the chipmaker's profits, which reflect all of the chipmaker's costs of producing the chip, so the chipmaker's profit margin is the relevant damages base; and 3) the chip's price is set by the market and cannot be raised without substantial loss of sales and/or profits, so the chip's profits must cap the royalty. While highly stylized, this is a realistic example of SSPPU arguments in my experience. Figure 2 below represents this scenario graphically, with the solid green box for the chip highlighted out of the rest of the product components representing the royalty base for damages and the green shaded box for feature C illustrating the value contributed to the product from the asserted patents.

Figure 2: Licensing under narrow SSPPU approach



SSPPU arguments under this set of circumstances offer an incomplete view of the market, how the market values the use of the asserted patented technology, and what the relevant royalty base should be for setting reasonable damages for the asserted patented technology. First, under industry norms, end-product makers are currently paying both the price of the chip *and* the license fee for patents enabling feature C that are implemented on that chip. As a result, the apportioned chip profits do not reflect the full value of the asserted patented technology to users of the end product or its seller. Second, the argument that the price of the chip cannot be increased due to market pressures ignores the fact that the value of using the IP was separate from the price of the chip to begin with. If Product X manufacturers were willing to pay for both the chip and the IP license under the industry norm of end-product makers licensing all IP, then the chip's price should increase to reflect the value of using the IP if that chip now captures the full value of using the IP. This approach merely shifts payments across production levels, and as such does not increase aggregate payments for the asserted technology at the overall product level. Figure 3 below illustrates this point, with both the chip and feature C combined to form the royalty base for damages, shifting the cost of using feature C from an end-user license regime to a component license regime.

Figure 3: SSPPU Licensing reflecting value, not location, of IP



While modifying the SSPPU cost base to include the full value of using the patented technology enabling feature C might seem the most straightforward way to fill in the damages gap, allowing for EMVR and SSPPU to define the full set of damages framework options, I am skeptical that this would work in practice (at least without some serious transition pains for all of the companies involved). The problem with this sort of adjustment to SSPPU is that it too runs the risk of taxing juries' evaluation skills during the industry shift to the new licensing regime and therefore is likely to fall afoul of anchoring problems analogous to those that drove the creation of the SSPPU in the first place. In order to achieve an SSPPU with value-of-use based damages when the value footprint of the patented technology exceeds its physical implementation footprint, the royalty rate would need to exceed the current price of the component until the industry adjusted to the new paradigm. With chips, the current market structure for many ICT industries would need to be adjusted to include the value of using IP to the end product, where it historically has been paid, shifting it down to the component level, where heretofore it has generally not been paid. Component prices would then increase to reflect the value of using the IP implemented within the component, shifting costs from end-product makers down to component makers. Through patent exhaustion and pass-through rights, component makers would then indemnify their customers to justify their newly higher prices, meaning end-product prices would be unaffected (except by any transaction costs that affect rights pass through).

The Product X hypothetical is simply a generic illustration of the more specific WAIC example from above, where an SSPPU approach reflecting the value of us-

ing the patented technology would require a royalty rate over 1500 times the price of the component in which the technology is implemented. Nevertheless, before component prices adjust to such a new industry order, I suspect that juries will struggle with the SSPPU-plus approach just as much, if not more, than they did with $19 billion end-product revenue for a component of a processor. That is, juries seeing a royalty base that starts with a low-priced component and a royalty rate 10 times 100% are likely to be biased in the other direction, toward awarding damages that are too low to compensate the patent holder for the value its patents contribute to the product.

Understanding why a chip maker that has not paid for the use of IP embedded on its chips before could indeed handle an initial 150,000% royalty rate (in a dynamic sense, before the industry adjusted) requires a fairly sophisticated understanding of path dependency and market pricing, as well as an understanding of how market pricing would realign over time with chip makers taking on costs from and providing indemnity to producers further downstream.[64] As Figure 3 makes clear, increasing the royalty base to incorporate the value of using the patented technology would reflect a rejiggering of where costs are incurred within the production chain, but would not impact the final product price or the license fee that the holder of Patent C received for the use of its patented technology. It would require component makers to raise prices to reflect the value of using the IP embedded within the component and to begin offering indemnity to their customers. Against this nuanced, though economically sound argument, we would likely have defendants making simple, fairness-based responses during patent infringement litigation: how can it be reasonable to charge many multiples of the total profit the licensee earns from sale of the component?[65] In other words, the pain associated with the necessary market changes to move IP licensing from the end-product level to the component level make it highly unlikely that the move will ever occur.

Given the above issues, I conclude that the currently allowed damages approaches for utility patent infringement are incomplete. Patent holders with asserted technology whose value exceeds the baseline valuation of "one feature out of many" that fits the SSPPU principle, but which also falls short of the "sole basis of demand for the end product" as required by the EMVR, face an exceedingly difficult task in presenting "reliable and tangible" evidence on apportionment and in calculating damages that still enables compensation that is "in no event less than a reasonable royalty" and that thereby reflects the value of using the patented technology within the infringing product.[66]

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[64] For such an understanding, see, for example, Anne Layne-Farrar, Gerard Llobet & Jorge Padilla, *Patent Licensing in Vertically Disaggregated Industries: The Royalty Allocation Neutrality Principle*, 95 COMM. & STRATEGIES 61, 65–67 (2014).

[65] Moreover, in jurisdictions with "excessive pricing" laws, like the European Union, defendants are likely to raise antitrust arguments as well. Given the global nature of many patent portfolios, this concern is a real one even for U.S.-based patent holders.

[66] 35 U.S.C. § 284 (2017).

V. How to Fill the Gap

The choice between EMVR and SSPPU is not quite as stark as presented above: the courts have allowed some non-SSPPU, non-EMVR damages methodologies. However, these options appear insufficient to unequivocally fill the gap identified here. For instance, in *CSIRO v. Cisco*, the Federal Circuit held that taking a cents- or dollars-per-unit royalty approach does not fall under either EMVR or SSPPU, which both require a revenue base as opposed to a units base for damages calculations.[67] The fee-per-unit option could work in cases like the WAIC example above, where cost savings stemming from the patented technology are relatively easy to estimate on a per-unit basis. But this approach is unlikely to be workable in other instances, such as for the RF smartphone example given above, where the additional value for technically unrelated features is not a simple cost reduction. In many instances, it is quite difficult to translate technology value into per-unit cost savings or per-unit price increases that can be cleanly isolated and attributed to specific asserted patented technology.

A second option that avoids the EMVR/SSPPU split relies on comparable licenses covering the same patents. Recognizing that industry practice in many sectors of the economy, particularly for multi-component ICT products, sets royalty rates as a fraction of average selling prices for the end product, the Federal Circuit explained in its *CSIRO* ruling that:

> The rule Cisco advances—which would require all damages models to begin with the smallest salable patent-practicing unit—is untenable. . . . [A]dopting Cisco's position would necessitate exclusion of comparable license valuations that—at least in some cases—may be the most effective method of estimating the asserted patent's value. Such a holding "would often make it impossible for a patentee to resort to license-based evidence."[68]

"License-based evidence" is typically one of the best indicators of an asserted patent's value, because arm's-length licenses tend to reflect the fair market value of using the patented technology within products and services.[69] When the case record contains sufficiently comparable licenses that value the asserted patents, but do so without resort to an SSPPU estimation exercise, the damages expert can rely on

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[67] Commonwealth Sci. and Indus. Research Org. v. Cisco Systems, Inc., 809 F.3d 1295, 1303 n.1 (Fed. Cir. 2015) ("The choice of royalty base—which is often the focus of the apportionment analysis—is irrelevant to the district court's analysis. The particular rates relied on by the district court were contemplated as cents per end unit sold by Cisco, but they could equally have represented cents per wireless chip without affecting the damages calculation.").

[68] *Id.* at 1307.

[69] While secrecy is certainly a common issue, in my experience patent holders do not avoid license deals on the "bottom segment" for fear of setting precedents, particularly when they can rely on arguments that such deals are not comparable for other licensees. *But see* Erik Hovenkamp & Jonathan Masur, *How Patent Damages Skew Licensing Markets*, 36 REV. LITIG. 379, 381 (2017) (stating that patent holders are discouraged "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.").

those licenses as establishing a reasonable royalty. These comparable licenses might entail running royalties (percentages of revenues, percentages of selling prices, or per-unit amounts), lump sums, or some combination thereof. But sufficiently comparable licenses will not always be available, especially for newer products or newly licensed patent portfolios, and thus this alternative is also insufficient for filling the damages gap.

As a third alternative to the EMVR/SSPPU dichotomy, damages can take the form of a lump-sum payment. This also avoids the need for an explicit revenue base multiplied by a royalty rate, and thus avoids the need for an SSPPU. That being said, in my experience, willing parties often arrive at lump-sum license payments through negotiations over the basic math of a revenue base times a royalty rate. In other words, in arm's-length bargaining the parties frequently forecast revenues for the covered products over the life of the license, apply some mutually acceptable royalty rate to that amount, and then factor in appropriate discounts (for example, to reflect the fact that the patent holder is receiving the entire license payment upfront rather than over time) to arrive at the ultimate lump-sum amount to be paid by the licensee. Recall from the quote above that *Garretson* requires evidence that is "reliable and tangible, and not conjectural or speculative," so damages experts must explain how they reach their lump-sum amounts. As a result, this third option will likely be limited to either truly comparable license agreements establishing an appropriate lump sum that could translate without adjustment to the current litigation or cases with clean evidence of cost savings or price increases (e.g., like the WAIC example). Thus, this option is also limited and insufficient for overcoming the patent damages gap.

We therefore need to add a new option to the current choices of EMVR, SSPPU, per-unit royalties, comparable licenses, and lump-sum payments. As discussed above in relation to Figure 3, one solution might be to expand the SSPPU approach to allow for royalty rates in excess of 100% of the chosen component royalty base. This would trigger price increases for components that had not before paid for IP licenses, with a shift of patent licensing from the end-product level to the component level over time. However, as a matter of economics, it is not clear that moving to such an SSPPU-plus world would be more efficient or bestow greater societal welfare than the current regime where many arm's-length, multi-component ICT licenses are set on the basis of end products.[70] This approach would require significant changes to industry practices, and thus would incur considerable transition costs. Moreover, firms in these industries have voluntarily chosen to handle patent licensing at the end-product level, where market prices are easy to observe and much harder to game than many component prices would be. It therefore seems far

[70] *See* Gerard Llobet & Jorge Padilla, *The Optimal Scope of the Royalty Base in Patent Licensing*, 59 J.L. & ECON. 45 (2016) (presenting theoretical analysis establishing that royalty percentages applied to EMVR or "ad valorem" royalties are generally welfare enhancing and preferable to SSPPU prices).

easier (and less disruptive to otherwise uninvolved industry members) to simply add a new utility patent damages approach that covers the middle ground cases where the value of using the asserted patent exceeds the price or profit of the component in which it is physically located but does not rise to the level of being the sole driver of demand for the entire end product.

I do not believe that introducing such an additional damages option would require much effort from the courts or the litigating parties. In fact, I think some incremental changes to the current regime could be all that is required. To see this, return to the hypothetical Product X example. Again, consider that the asserted patents cover feature C and the technologies are physically implemented in the chips. Consumers choose Product X suppliers on the basis of all three features, A, B, and C. In addition, assume that the chip makers are not licensed to use the asserted patent. The situation falls short of the current requirements for EMVR, since feature C is not the sole basis of demand, but clearly exceeds the confines of the current applications of SSPPU since the value of feature C to the end product exceeds the price that the Product X maker pays for the chip implementing feature C. If the chip were used as the royalty base, it would run the risk of biasing the jury towards a too-low damages figure not reflective of the value footprint of using the asserted technology.

In this situation, the damages expert could rely on the end-product price as the royalty base, on a per-unit basis so as not to unfairly bias the jury with aggregate revenue figures. To this royalty base, the damages expert could either apply an appropriate apportionment percentage (say 33%, reflecting that feature C is one of three features in the product driving consumer demand) in conjunction with an established end-product royalty rate, or she could devise a smaller royalty rate that appropriately reflects the value of using the patented technology within the product (and no more) to apply directly to the product price (that is, the rate itself would incorporate apportionment). In recognition of the issues driving the EMVR rule, the jury could be shown either the apportioned revenue base only (33% of end-product revenues in our hypothetical) or the per-unit product price but not any aggregate revenues, which could solve both the upward and downward bias problems.

This additional damages approach proposal is consistent with recent case law on injunctions for patent infringement. In particular, in its late 2015 review of the irreparable harm prong of injunction evaluations under *eBay*[71] for the *Apple v. Samsung* case,[72] the Federal Circuit "issued an Order that withdrew their original opinion and issued a revised opinion that focuses on the patented feature being 'one of several [features] that cause consumers to make their purchasing decision,' rather than the patented feature having to be 'the exclusive or significant driver of customer demand' as prior decisions had intimated."[73] A similar softening of the sole driv-

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[71] eBay Inc. v. MercExchange, L.L.C., 547 U.S. 388, 395–96 (2006).

[72] Apple Inc. v. Samsung Electronics Co., Ltd., 786 F.3d 983, 1005 (Fed. Cir. 2015).

[73] David Long, *Federal Circuit revised injunction decision to emphasize patented feature being one*

er of demand requirement for EMVR could be allowed for patent damages, as one means of filling in the current gap that appears when asserted patents add more value to an end product than is captured in the price or profits of the physical component housing the patented technology.

The above proposal also appears to be consistent with the spirit of *Garretson*: the patent holder would present "evidence tending to separate or apportion the defendant's profits and the patentee's damages between the patented feature and the unpatented features."[74] That is, using the end product as the royalty base, but applying a reasonable apportionment factor and limiting what is shown to the jury could close the patent damages gap in a sensible fashion, balancing the needs of both patent holders and licensees and balancing the risks of both downward and upward biases for juries.

The goal in relation to the litigation rules framing utility patent damages should be the creation of rubrics that ensure compensation for patent holders that is not "less than a reasonable royalty" and that reflects the value of using the asserted patented technologies within the accused infringing products, without risking overcompensation that could harm product manufacturers or follow-on inventors hoping to move those products forward. The case law currently in place does not reach that goal. While I believe the proposals above are worth considering, even those who disagree with the proposals made here should be open to finding other means of filling out the damages approaches to avoid leaving entire categories of cases without a reasonable damages framework.

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of several that drive purchasing decision (Apple v. Samsung), ESSENTIAL PATENT BLOG (Dec. 23, 2015), http://www.essentialpatentblog.com/2015/12/federal-circuit-revised-injunction-decision-to-emphasize-patented-feature-being-one-of-several-that-drive-purchasing-decision-apple-v-samsung.

[74] Garretson v. Clark, 111 U.S. 120, 121 (1884).

Breaking the *Georgia-Pacific* Habit: A Practical Proposal to Bring Simplicity and Structure to Reasonable Royalty Damages Determinations

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I. Introduction

In the mid-1990s, the Federal Circuit endorsed the fifteen *Georgia-Pacific* factors as an appropriate and helpful framework for determining reasonable royalty damages in patent cases. Courts subsequently have applied the *Georgia-Pacific* factors as the commonly accepted default framework for reasonable royalty damages, and courts often instruct juries to use the fifteen *Georgia-Pacific* factors as the test for determining reasonable royalty damages.

The time has come to break the *Georgia-Pacific* habit. Notwithstanding their widespread use, the *Georgia-Pacific* factors have become outdated and impractical. Indeed, the *Georgia-Pacific* factors are not, and were never intended to be, a generally applicable framework for determining reasonable royalty damages. In recent years, the Federal Circuit has cautioned that the *Georgia-Pacific* factors are not a "talisman" for reasonable royalty determinations and has held that it is reversible error to instruct juries on *Georgia-Pacific* factors that are irrelevant or inconsistent with the evidence of record. There is evidence that the *Georgia-Pacific* factors not only complicate the damages analysis but also lead to damages awards that systematically overcompensate patent holders. These problems have led to an increased focus on whether the long list of *Georgia-Pacific* factors is in fact helpful to juries, as well as new proposals to provide a simpler and more coherent framework.

This article provides a proposal to bring simplicity and structure to reasonable royalty determinations through a new framework for damages jury instructions. Courts should replace their reliance on the *Georgia-Pacific* factors with a more concise and coherent set of principles that will facilitate damages awards based on the true market value of the patent at the time of the hypothetical negotiation.

II. Patent Damages Policy Objectives

The notion that providing inventors with certain exclusive rights to their inventions will encourage the development and dissemination of valuable innovations is the bedrock of patent law. This purpose is stated explicitly in the U.S. Constitution, which empowers Congress "[t]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."[1]

As two of us discussed in *Breaking the Vicious Cycle of Patent Damages*, "[t]here is little dispute that providing inadequate patent protection to inventors would leave them without optimal incentives to invent."[2] However, "[t]here is also little dispute that the ultimate goal of fostering innovation would be undermined by providing too great a degree of protection to patents and, in particular, that excessive damages for patent infringement would reduce the overall incentive for firms to develop commercial products and to innovate by building on earlier inventions."[3] Thus, an accurate assessment of damages for patent infringement is essential to foster innovation and further the purposes of the patent laws.[4]

An accurate assessment of damages would award the patent holder the market value of a license to use the patented technology. That is the amount on which a willing licensor and a willing licensee would have agreed in a market transaction in which both had the option of walking away from the deal and pursuing their best alternative instead. It is the amount to which they would have agreed had they negotiated at arm's length for patent clearance before the infringer had committed to using the patented technology.[5] That amount will in no event be greater than the in-

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1 U.S. CONST. art. I, § 8, cl. 8.

2 William F. Lee & A. Douglas Melamed, *Breaking the Vicious Cycle of Patent Damages*, 101 CORNELL L. REV. 385, 391 (2016) [hereinafter *Breaking the Vicious Cycle*]; *see also, e.g.*, FED. TRADE COMM'N, THE EVOLVING IP MARKETPLACE: ALIGNING PATENT NOTICE AND REMEDIES WITH COMPETITION 40 (2011) ("[A] patent enables [the owner] to capture returns from R&D investment by preventing others from appropriating the invention and driving down prices through infringing competition."); WILLIAM M. LANDES & RICHARD A. POSNER, THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW 13 (Harvard Univ. Press, 2003) ("[A] firm is less likely to expend resources on developing a new product if competing firms that have not borne the expense of development can duplicate the product and produce it at the same marginal cost as the innovator; competition will drive price down to marginal cost and the sunk costs of invention will not be recouped.").

3 *Breaking the Vicious Cycle*, *supra* note 2, at 391; *see also, e.g.*, Thomas F. Cotter, *An Economic Analysis of Enhanced Damages and Attorney's Fees for Willful Patent Infringement*, 14 FED. CIRC. B.J. 291, 313–14 (2004) ("[S]upracompensatory awards could . . . induce firms to . . . avoid marketing innovative products, or (in the antitrust context) from agreeing to unconventional, but socially desirable, methods for joint production and distribution of goods." (footnotes omitted)); Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 1993 (2007) (excessive royalties "act as a tax on new products incorporating the patented technology, thereby impeding rather than promoting innovation").

4 *Breaking the Vicious Cycle*, *supra* note 2, at 391–92.

5 *Id.* at 392–393.

cremental value of the patented technology for the intended use compared to the value of the best alternative available at the time.[6]

The *Georgia-Pacific* factors do not direct courts or juries to make that assessment. One of the most significant problems with the *Georgia-Pacific* factors is that they do not adequately preclude consideration of the alleged infringer's "lock-in" costs—such as the investments already made in the allegedly infringing product and the cost to switch to a non-infringing alternative—and thus often lead the factfinder to overestimate the value of the patented technology when determining damages awards.[7] To better approximate the true economic value of a patent, and avoid inflating the value of the patent based on lock-in costs, a factfinder should focus on how the parties would value a license to the patent *ex ante*, i.e., *before* the alleged infringer invested in, or a standard setting organization committed to, the allegedly infringing technology.[8] In this hypothetical *ex ante* negotiation, implementers would get preclearance before infringing and before committing to use the patented technology.[9]

Courts, however, have allowed *ex post* considerations, such as lock-in costs and subsequent changes in circumstances, to pollute the hypothetical *ex ante* negotiation.[10] These *ex post* considerations sometimes result in an apparent value for the patented technology that is less than its market value, but more often tend to inflate the value of the patent for a would-be infringer.[11] For example, while seemingly

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6 *Id.* at 392.

7 *Id.* at 393, 409–10 ("[I]n the interval between the ex ante hypothetical negotiation date and the ex post actual negotiation date . . . , the infringer will usually have made substantial asset-specific investments tied to the infringing technology . . . . We use the term 'lock-in costs' to refer to how much more it would cost the infringer to switch to an alternative technology ex post than it would have cost to switch ex ante."); SCA Hygiene Prods. Aktiebolag v. First Quality Baby Prods. LLC, 137 S. Ct. 954, 972 (Breyer, J., dissenting) ("[T]here is a 'lock-in' problem that is likely to be more serious where patents are at issue. Once a business chooses to rely on a particular technology, it can become expensive to switch, even if it would have been cheap to do so earlier. As a result, a patentee has considerable incentive to delay suit until the costs of switching—and accordingly the settlement value of a claim—are high." (citing *Breaking the Vicious Cycle*, *supra* note 2, at 409–10)).

8 *Breaking the Vicious Cycle*, *supra* note 2, at 392 ("There is a virtual consensus among scholars that the optimum reasonable royalty remedy—in light of both incentives needed to invent and those needed to develop commercial products and to innovate further upon earlier inventions—is one that most closely restores the parties to the position they would have been in had they been able to negotiate a patent license before infringement (i.e., ex ante).").

9 *See id.* at 392–93.

10 *Id.* at 413 ("The 'book of wisdom' doctrine provides that a royalty rate may be determined based in part upon events after the hypothetical negotiation date."); *see also* Fromson v. W. Litho Plate & Supply Co., 853 F.2d 1568, 1575–76 (Fed. Cir. 1988) (discussing the book of wisdom doctrine), *overruled in part on other grounds by* Knorr-Bremse Systeme Fuer Nutzfahrzeuge GmbH v. Dana Corp., 383 F.3d 1337, 1343 (Fed. Cir. 2004). *See generally* John C. Jarosz & Michael J. Chapman, *The Hypothetical Negotiation and Reasonable Royalty Damages: The Tail Wagging the Dog*, 16 STAN. TECH. L. REV. 769, 801–03 (2013) (discussing the application of the book of wisdom doctrine to permit consideration of *ex post* facts in setting a reasonable royalty).

11 *Breaking the Vicious Cycle*, *supra* note 2, at 412 ("The use of ex post considerations allows the

"comparable" licenses can be highly probative evidence, they are often the product of *ex post* bargaining—bargaining *after* the potential licensor has invested in the relevant technology—and therefore may reflect *ex post* considerations, such as lock-in costs or premiums to account for uncertainty related to potential litigation outcomes, thereby inflating the royalties agreed to in the license.[12] Using these licenses to calculate a reasonable royalty can thus lead to a rate different from what the parties would have agreed upon in *ex ante* bargaining and thus different from the market value of the patented technology.[13] Other *Georgia-Pacific* factors also ask juries to weigh the total *ex post* value of the patent in the infringing product, instead of the incremental benefit compared to the alleged infringer's best *ex ante* alternative.[14] This too results in an inflated royalty rate that fails to capture the value of the patent accurately.[15]

As discussed in *Breaking the Vicious Cycle*, allowing such *ex post* considerations to factor into the hypothetical *ex ante* negotiation systematically overcompensates the patent holder.[16] To accurately assess patent damages, patent damage law must be refined to prevent *ex post* considerations from factoring into the hypothetical *ex ante* negotiation.[17]

We intend in this article to discuss how to implement the principles described in *Breaking the Vicious Cycle* in the real-world context of jury instructions in district court litigation.

III. The *Georgia-Pacific* Factors No Longer Provide Adequate Guidance for Reasonable Royalty Damages Determinations

In this section, we review the history of the *Georgia-Pacific* factors and explain why this antiquated yet widespread method for damages calculations leads to inconsistent and inaccurate jury verdicts.

A. Courts' Use of the *Georgia-Pacific* Factors as the Commonly Accepted Default Framework for Reasonable Royalty Damages

In *Rite-Hite Corp. v. Kelley Co.*, the Federal Circuit endorsed the *Georgia-Pacific* factors as providing a "wide range of factors relevant to [the] hypothetical negotiation."[18] Until recently, the Federal Circuit repeatedly endorsed the *Georgia-*

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patent holder to extract a premium—above the ex ante value of the invention—based on factors like lock-in costs."); *see also* Lemley & Shapiro, *supra* note 3, at 2009.

12 *Breaking the Vicious Cycle*, *supra* note 2, at 418–19.

13 *Id.*

14 *Id.* at 420–22.

15 *Id.* at 421–22.

16 *Id.* at 411–38.

17 *Id.* at 465–66.

18 Rite-Hite Corp. v. Kelley Co., 56 F.3d 1538, 1555 (Fed. Cir. 1995) (citing Georgia-Pac. Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1119 (S.D.N.Y.1970)); *see also* Unisplay, S.A. v. Am. Elec. Sign Co., 69 F.3d 512, 517 n.7 (Fed. Cir. 1995) (stating that "[a] comprehensive list of relevant factors in determining a reasonable royalty is set out in [*Georgia-Pacific*]").

Pacific factors as an acceptable framework for reasonable royalty determinations, emphasizing that consideration of the fifteen factors helps to "tie the reasonable royalty calculation to the facts of the hypothetical negotiation at issue."[19] Relying on the Federal Circuit's endorsement, district courts commonly cite to the *Georgia-Pacific* factors as an acceptable framework for determining reasonable royalty damages.[20]

But, in practice, courts apply the framework inconsistently. For example, some courts include only a subset of the *Georgia-Pacific* factors in their jury instructions,[21] while others incorporate all fifteen factors.[22] Some courts will even list more

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[19] LaserDynamics, Inc. v. Quanta Comp., Inc., 694 F.3d 51, 60 n.2 (Fed. Cir. 2012) ("'This court has sanctioned the use of the *Georgia-Pacific* factors to frame the reasonable royalty inquiry. Those factors properly tie the reasonable royalty calculation to the facts of the hypothetical negotiation at issue.'" (quoting Uniloc USA, Inc. v. Microsoft Corp., 632 F.3d 1292, 1317 (Fed. Cir. 2011))); i4i Ltd. P'ship v. Microsoft Corp., 598 F.3d 831, 854 (Fed. Cir. 2010), *aff'd*, 564 U.S. 91 (2011) ("We have consistently upheld experts' use of a hypothetical negotiation and *Georgia-Pacific* factors for estimating a reasonable royalty."); Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301, 1335 (Fed. Cir. 2009) ("[T]he flexible analysis of all applicable *Georgia-Pacific* factors provides a useful and legally-required framework for assessing the damages award in this case."); Parental Guide of Tex., Inc. v. Thomson, Inc., 446 F.3d 1265, 1270 (Fed. Cir. 2006) ("[A]s both parties recognize, a 'reasonable royalty' rate under section 284 is calculated with reference to the long list of factors outlined in *Georgia-Pacific* . . . ."); Dow Chem. Co. v. Mee Indus., Inc., 341 F.3d 1370, 1382 (Fed. Cir. 2003) ("[T]he district court should consider the so-called *Georgia-Pacific* factors in detail, and award such reasonable royalties as the record evidence will support." (internal citation omitted)).

[20] *See, e.g.*, Emblaze Ltd. v. Apple Inc., 52 F. Supp. 3d 949, 955 (N.D. Cal. 2014) ("The *Georgia-Pacific* factors are used in the 'hypothetical negotiation' approach to determining a reasonable royalty."); Magnetar Techs. Corp. v. Six Flags Theme Parks Inc., No. 07-cv-127, 2014 WL 530241, at *2 (D. Del. Feb. 7, 2014) ("The *Georgia-Pacific* factors are widely accepted to calculate a reasonable royalty rate and have been affirmed by the Federal Circuit."); Rembrandt Soc. Media, LP v. Facebook, Inc., 22 F. Supp. 3d 585, 592 n.15 (E.D. Va. 2013) ("The fifteen *Georgia-Pacific* factors, which have been adopted by the Federal Circuit, are used by patentees to raise and lower the royalty rate, thereby allowing a patentee to arrive at the final figure that represents the amount a willing licensee would pay to license the patent at issue."); Microsoft Corp. v. Motorola, Inc., No. 10-cv-1823, 2013 WL 2111217, at *15 (W.D. Wash. Apr. 25, 2013) ("Courts have long experience in conducting hypothetical bilateral negotiations to frame the reasonable royalty inquiry in patent infringement cases under the *Georgia-Pacific* framework."); Pulse Med. Instruments, Inc. v. Drug Impairment Detection Servs., LLC, 858 F. Supp. 2d 505, 510 (D. Md. 2012) ("[C]ourts in this circuit as well as others have consistently looked to experts to apply the *Georgia-Pacific* factors" in determining patent damages); Carnegie Mellon Univ. v. Marvell Tech. Grp., Ltd., No. 09-cv-290, 2012 WL 6562221, at *12 (W.D. Pa. Dec. 15, 2012) ("The Federal Circuit has routinely upheld an expert's use of the *Georgia-Pacific* factors as an appropriate method for assessing damages in patent cases.").

[21] *See* X-tra Light Mfg., Inc. v. Acuity Brands, Inc., No. 04-cv-1413, 2007 WL 835360 (S.D. Tex. Feb. 16, 2007) (at Instruction No. 17, listing eleven factors that closely track eleven of the *Georgia-Pacific* factors); ADC Telecomm., Inc. v. Switch-craft, Inc., No. 04-cv-1590, 2007 WL 420277 (D. Minn. Jan. 19, 2007) (at Instruction No. 28, same); Minemyer v. R-Boc Reps., No. 07-cv-1763, 2012 WL 1418472 (N.D. Ill. Feb. 16, 2012) (at Instruction No. 67, same); Forgent Networks, Inc. v. Echostar Tech. Corp., No. 6:06-cv-208, 2007 WL 1836442 (E.D. Tex. May 21, 2007) (at Instruction No. 7.2, listing fourteen factors that paraphrase most of the *Georgia-Pacific* factors); Koito Mfg. Co., Ltd. v. Turn-Key-Tech. LLC, 2003 WL 22297154 (S.D. Cal. April 25, 2003) (listing twelve of the *Georgia-Pacific* factors).

factors in addition to the *Georgia-Pacific* factors.[23] In many jury instructions, the jury is tasked with balancing many different factors, generally without any guidance on the relative importance of the factors or how to balance them.[24]

Courts' continued reliance on the *Georgia-Pacific* factors is grounded more in habit and precedent than in careful analysis. Indeed, notwithstanding their widespread use and acceptance, the Federal Circuit has never performed a detailed evaluation of the merits of each *Georgia-Pacific* factor or identified which factors should be most important to a reasonable royalty determination. Likewise, although use of the *Georgia-Pacific* factors is not required by Federal Circuit precedent, district courts commonly adopt the *Georgia-Pacific* factors with little or no discussion, often simply noting that the factors have been approved by the Federal Circuit.[25]

As discussed below, there are many good reasons to break the *Georgia-Pacific* habit and develop a more coherent set of reasonable royalty instructions.

B. The *Georgia-Pacific* Factors Are Out of Date

The *Georgia-Pacific* factors were first set forth in 1970—nearly fifty years ago. It goes without saying that, since that time, we have experienced a technological revolution, with an explosion of growth in ever more complex technologies and technology products. For example, Intel invented the first microprocessor in 1971, the year after *Georgia-Pacific* was decided. Intel's first microprocessor had 2,300 transistors.[26] Intel now makes processors that have billions of transistors and deliver 3,500 times the performance at 1/60,000th the cost. To put those figures in perspec-

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[22] *See, e.g.*, Dig. Reg. of Tex., LLC v. Adobe Sys., Inc., No. 12-cv-1971, 2014 WL 7795674 (N.D. Cal. Sept. 4, 2014) (listing all fifteen *Georgia-Pacific* factors in the jury instructions); Cardsoft, Inc. v. Verifone Sys., Inc., No. 2:08-cv-98, 2012 WL 3176523 (E.D. Tex. June 8, 2012) (same).

[23] *See* Omega Pats., LLC v. Fortin Auto Radio, Inc., No. 6:05-cv-1113-Orl-22DAB, 2007 WL 843344 (M.D. Fla. Feb. 12, 2007) (at Instruction No. A-34, listing all fifteen *Georgia-Pacific* factors, as well as "16. Any other economic factor that a normally prudent person would, under similar circumstances, take into consideration in negotiating the hypothetical license").

[24] *See, e.g.*, *Dig. Reg. of Tex.*, 2014 WL 7795674 (providing no indication of how to balance the factors); Apple, Inc. v. Samsung Elec. Co., No. 11-CV-01846-LHK, 2012 WL 3568795 (N.D. Cal. Aug. 21, 2012) (same); *see also* Jorge L. Contreras & Michael A. Eixenberger, *Model Jury Instructions for Reasonable Royalty Patent Damages*, 57 JURIMETRICS J. 1, 8 (2016) (noting that "the *Georgia-Pacific* framework does not give courts or juries meaningful guidance concerning how the fifteen factors should be weighted or compared").

[25] *See, e.g.*, *Emblaze Ltd.*, 52 F. Supp. 3d at 955 ("The *Georgia-Pacific* factors are used in the 'hypothetical negotiation' approach to determining a reasonable royalty."); *Magnetar Techs.*, 2014 WL 530241, at *2 ("The *Georgia-Pacific* factors are widely accepted to calculate a reasonable royalty rate and have been affirmed by the Federal Circuit."); *Rembrandt Soc. Media*, 22 F. Supp. 3d at 592 n.15 ("The fifteen *Georgia-Pacific* factors, which have been adopted by the Federal Circuit, are used by patentees to raise and lower the royalty rate, thereby allowing a patentee to arrive at the final figure that represents the amount a willing licensee would pay to license the patent at issue."); *Pulse Med. Instruments*, 858 F. Supp. 2d at 510 ("[C]ourts in this circuit as well as others have consistently looked to experts to apply the *Georgia-Pacific* factors.").

[26] *See The Story of the Intel 4004*, INTEL, https://www.intel.com/content/www/us/en/history/museum-story-of-intel-4004.html (last visited October 1, 2017).

tive: if a smartphone were built using its 1971 technology, the phone's microprocessor alone would be the size of a parking space; if housing prices fell at the same rate as the price of transistors in Intel microprocessors, you could purchase a home for the price of a piece of candy.[27]

Moreover, courts' continued reliance on the *Georgia-Pacific* factors conflicts with the fresh thinking that the Federal Circuit and district courts have brought to bear in patent damages cases in recent years. In the last ten years, the Federal Circuit has issued a series of important damages decisions that have made significant progress toward achieving fair and accurate patent damages awards.[28] Indeed, the Federal Circuit (along with several district courts) has cautioned that the *Georgia-Pacific* factors are not—and were not intended to be—a generally applicable test.[29]

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[27] *See Celebrating 50 Years of Moore's Law: Whatever Has Been Done, Can Be Outdone*, INTEL, http://download.intel.com/newsroom/kits/ml50/pdfs/moores-law-50-years-infographic-entire.pdf (last visited Jan 5, 2017).

[28] *See, e.g.*, Ericsson, Inc. v. D-Link Sys. Inc., 773 F.3d 1201, 1235 (Fed. Cir. 2014) ("We further hold that district courts must make clear to the jury that any royalty award must be based on the incremental value of the invention . . . ."); Virnetx, Inc. v. Cisco Sys., Inc., 767 F.3d 1308, 1327 (Fed. Cir. 2014) ("[T]he requirement that a patentee identify damages associated with the smallest salable patent-practicing unit is simply a step toward meeting the requirement of apportionment. Where the smallest salable unit is, in fact, a multi-component product containing several non-infringing features with no relation to the patented feature . . . the patentee must do more to estimate what portion of the value of that product is attributable to the patented technology."); LaserDynamics, Inc. v. Quanta Comput., Inc., 694 F.3d 51, 77 (Fed. Cir. 2012) (explaining that "[t]he propriety of using prior settlement agreements to prove the amount of a reasonable royalty is questionable" because settlement agreements "are tainted by the coercive environment of patent litigation [and] are unsuitable to prove a reasonable royalty . . . , the premise of which assumes a voluntary agreement will be reached between a willing licensor and willing licensee, with validity and infringement of the patent not being disputed"); Uniloc USA, Inc. v. Microsoft Corp., 632 F.3d 1292, 1317 (Fed. Cir. 2011) ("[T]here must be a basis in fact to associate the royalty rates used in prior licenses to the particular hypothetical negotiation at issue in the case."); ResQNet.com, Inc. v. Lansa, Inc., 594 F.3d 860, 870 (Fed. Cir. 2010) (expert's reliance on licenses as evidence of a reasonable royalty was improper where "none of these licenses even mentioned the patents in suit or showed any other discernible link to the claimed technology"); Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301, 1329 (Fed. Cir. 2009) ("[A] lump-sum damages award [based on a reasonable royalty] cannot stand solely on evidence which amounts to little more than a recitation of royalty numbers, one of which is arguably in the ballpark of the jury's award, particularly when it is doubtful that the technology of those license agreements is in any way similar to the technology being litigated here.").

[29] *See Ericsson, Inc.*, 773 F.3d at 1230 ("[W]e have never described the *Georgia-Pacific* factors as a talisman for royalty rate calculations . . . ."); Energy Transp. Grp., Inc. v. William Demant Holding A/S, 697 F.3d 1342, 1357 (Fed. Cir. 2012) ("Once again, this court does not endorse *Georgia-Pacific* as setting forth a test for royalty calculations, but only as a list of admissible factors informing a reliable economic analysis."); Whitserve, LLC v. Comp. Packages, Inc., 694 F.3d 10, 31 (Fed. Cir. 2012) ("We do not require that witnesses use any or all of the *Georgia-Pacific* factors when testifying about damages in patent cases."); Asetek Danmark A/S v. CMI USA, Inc., No. 13-cv-00457, 2015 WL 5568360, at *8 n.9 (N.D. Cal. Sept. 22, 2015) ("Not all *Georgia-Pacific* factors are relevant to any particular hypothetical negotiation."), *aff'd in relevant part*, 852 F.3d 1352 (Fed. Cir. 2017); Linear Grp. Servs., LLC v. Attica Automation, Inc., No. 13-cv-10108, 2014 WL 4206871, at *4 n.1 (E.D. Mich. Aug. 25, 2014) ("There are fifteen *Georgia-Pacific* factors. Not all may be applicable in a given case."); Cequent Trailer Prods., Inc. v. Intradin (Shanghai) Mach.

Despite these technological and legal developments, the *Georgia-Pacific* factors are still the default framework, and courts still instruct juries using the same fifteen factors that have been used for decades. The time is ripe to reconsider and improve how courts apply the *Georgia-Pacific* factors and, particularly, how they instruct juries regarding patent damages.

C. Conceptual Problems with the *Georgia-Pacific* Factors

Basing reasonable royalty determinations on the *Georgia-Pacific* factors presents several conceptual difficulties for a factfinder to navigate, and leads to inconsistent and inflated damages awards.

First, the *Georgia-Pacific* factors do not provide a coherent framework. Instead, they are a laundry list of "unprioritized and overlapping" factors and do not provide sufficient guidance to the jury regarding how to apply or balance the factors or determine their relative weight.[30] Indeed, the *Georgia-Pacific* court itself recognized the difficulty of applying the factors, noting that there is "no formula by which these factors can be rated precisely in the order of their relative importance or by which their economic significance can be automatically transduced into their pecuniary equivalent."[31] This lack of guidance makes it no easy task for a juror to synthesize, harmonize, and balance the factors to arrive at a reasonable royalty.[32]

Co., No. 1:05-cv-2566, 2007 WL 438140, at *26 (N.D. Ohio Feb. 7, 2007) ("In this case, a number of the *Georgia-Pacific* factors do not apply to the instant facts."); Avocent Huntsville Corp. v. ClearCube Tech., Inc., No. 03-cv-2875, 2006 WL 2109503, at *37 (N.D. Ala. July 28, 2006) ("The fifteen *Georgia-Pacific* factors are not exclusive, however; other factors also may be relevant."); Procter & Gamble Co. v. Paragon Trade Brands, Inc., 989 F. Supp. 547, 607 (D. Del. 1997) ("In performing a hypothetical negotiation analysis, it is important to recognize that some of the *Georgia-Pacific* factors may be of minimal or no relevance to a particular case and other factors may have to be molded by the Court to fit the facts of the case at hand."); Wright v. United States, 53 Fed. Cl. 466, 475 (2002) ("While the *Georgia-Pacific* factors are often probative of a reasonable royalty rate, the court is neither constrained by them nor required to consider each one where they are inapposite or inconclusive." (internal quotation omitted)). For example, many factors are inappropriate in cases involving Standard Essential Patents ("SEPs"). *See Ericsson, Inc.*, 773 F.3d at 1230 ("In a case involving RAND-encumbered patents, many of the *Georgia-Pacific* factors simply are not relevant; many are even contrary to RAND principles.").

30 *See, e.g.*, *ResQNet.com*, 594 F.3d at 869 (explaining that the *Georgia-Pacific* factors are "unprioritized and often overlapping"); Marine Polymer Techs., Inc. v. HemCon, Inc., No. 06-cv-100-JD, 2010 WL 3070201, at *3 (D.N.H. Aug. 3, 2010) ("The *Georgia-Pacific* factors, however, are not prioritized, often overlap in the context of a particular case, and do not all apply in every case.").

31 Georgia-Pac. Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1120 21 (S.D.N.Y.1970), *modified sub nom.* Georgia-Pac. Corp. v. U.S. Plywood-Champion Papers, Inc., 446 F.2d 295 (2d Cir. 1971).

32 Contreras & Eixenberger, *supra* note 24, at 8 ("From a practical standpoint, the *Georgia-Pacific* framework does not give courts or juries meaningful guidance concerning how the fifteen factors should be weighted or compared."); Daralyn J. Durie & Mark A. Lemley, *A Structured Approach to Calculating Reasonable Royalties*, 14 LEWIS & CLARK L. REV. 627, 628 (2010) ("[T]he fifteen-factor test . . . overloads the jury with factors to consider that may be irrelevant, overlapping, or even contradictory."); Christopher B. Seaman, *Reconsidering the* Georgia-Pacific *Standard for Reasonable Royalty Patent Damages*, 2010 BYU L. REV. 1661, 1703–04 (2010) (discussing how "the *Georgia-Pacific* test provides juries with inadequate instruction on how to determine a rea-

Second, multiple *Georgia-Pacific* factors (Factors 6, 8, 10 and 11) are inconsistent with the apportionment principles (Factor 13) that have now become critical components of damages determinations, particularly with respect to computer and software related patents. To begin with, Factor 6 invites the jury to consider the sales of "non-patented items."[33] Factor 6 conflicts with—or at least undermines—the Federal Circuit's recent emphasis on damages apportionment, which requires damages to be specifically based on the value of the *patented features*.[34] Yet not only is Factor 6 still commonly included in damages instructions, it is listed before Factor 13, which embodies the apportionment principle.[35] Similarly, Factor 8 instructs the jury to consider the commercial success of the accused product, without also asking the jury to consider whether and to what extent the success of the accused product is related to non-patented features or other circumstances.[36] Likewise, Factors 10 and 11 instruct the jury to consider the benefits and the extent of use of "the invention" as a whole without cautioning the jury to exclude the benefits of any conventional elements of the invention or benefits that could be obtained using non-infringing alternatives.[37]

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sonable royalty").

[33] Factor 6 calls for consideration of "[t]he effect of selling the patented specialty in promoting sales of other products of the licensee; that existing value of the invention to the licensor as a generator of sales of his non-patented items; and the extent of such derivative or convoyed sales." *Georgia-Pac.*, 318 F. Supp. at 1120.

[34] *See* Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301, 1337 (Fed. Cir. 2009) ("The patentee . . . must in every case give evidence tending to separate or apportion the defendant's profits and the patentee's damages between the patented feature and the unpatented features."); *see also* Samsung Elecs. Co. v. Apple Inc., 137 S. Ct. 429, 434–36 (2016) (holding that the damages remedy for design patent infringement in a multi-component product may be based either on the product sold to a consumer or a component of that product, depending on the facts of the case); VirnetX, Inc. v. Cisco Sys., Inc., 767 F.3d 1308, 1327 (Fed. Cir. 2014) ("[T]he requirement that a patentee identify damages associated with the smallest salable patent-practicing unit is simply a step toward meeting the requirement of apportionment. Where the smallest salable unit is, in fact, a multi-component product containing several non-infringing features with no relation to the patented feature . . . the patentee must do more to estimate what portion of the value of that product is attributable to the patented technology."); LaserDynamics, Inc. v. Quanta Comput., Inc., 694 F.3d 51, 67 (Fed. Cir. 2012) ("[I]t is generally required that royalties be based not on the entire product, but instead on the smallest salable patent-practicing unit.").

[35] Factor 13 calls for consideration of "[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." *Georgia-Pac.*, 318 F. Supp. at 1120.

[36] Factor 8 calls for consideration of "[t]he established profitability of the product made under the patent; its commercial success; and its current popularity." Georgia-Pac. Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1120 (S.D.N.Y.1970), *modified sub nom.* Georgia-Pac. Corp. v. U.S. Plywood-Champion Papers, Inc., 446 F.2d 295 (2d Cir. 1971)

[37] Factor 10 calls for consideration of "[t]he nature of the patented invention; the character of the commercial embodiment of it as owned and produced by the licensor; and the benefits to those who have used the invention." *Id.* Factor 11 calls for consideration of "[t]he extent to which the infringer has made use of the invention; and any evidence probative of the value of that use." *Id.*

Third, and related to the second point, use of the *Georgia-Pacific* factors leads to systematic overcompensation because they encourage the jury to include *ex post* considerations.[38] As discussed in *Breaking the Vicious Cycle*, Factors 1 and 2, which concern comparable licenses, encourage the jury to consider licenses that are entered into after the infringer is locked in to the patented technology, and that are thus likely to include an inflated royalty because of (among other things) switching costs and concerns about litigation risks including the risk of an injunction.[39]

The use of *ex post* information encompassed in other factors—particularly in Factors 6, 8, 10, and 11—tends to overcompensate patent holders in part because the commercial prospects of the products using the patented technology often seem assured at the time of trial, when the parties valuing the technology *ex ante* would in fact have been uncertain about its success and would have determined the value based on a range of possible outcomes.[40] Consideration of such *ex post* information presents two related problems. First, it increases the risk of "hindsight bias," whereby people naturally tend to overestimate the likelihood of a known outcome.[41] In the patent litigation context, consideration of *ex post* information may distort the jury's assessment of the infringing product's *ex ante* importance or value.[42] Second, it increases the risk of "outcome bias," whereby "evidence of outcome is given too much weight."[43] In the patent litigation context, outcome bias means that the jury might not be able to give appropriate weight to an *ex post* event and account for its often limited relevance, i.e., only as a potential indicator of what the parties' *ex ante* expectations would have been.[44] As stated in *Breaking the Vicious Cycle*, "[t]o avoid or at least minimize these problems, these factors must be interpreted in light of the best alternative available at the time of the hypothetical ex ante negotia-

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38 *See, e.g.*, Commonwealth Sci. & Indus. Research Org. v. Cisco Sys., Inc., 809 F.3d 1295, 1305 (Fed. Cir. 2015), *cert. denied*, 136 S. Ct. 2530 (2016) (finding that the district court's analysis of the *Georgia-Pacific* factors overcompensated the patent holder because it "increased the royalty award" based on the patent being included in the 802.11 WiFi standard); Lemley & Shapiro, *supra* note 3, at 2020 (explaining that "royalty rates awarded in court under *Georgia-Pacific* properly should systematically exceed the rates that parties would negotiate out of court"); *see also id.* at 2032–33 ("The average royalty rate granted in all reasonable-royalty cases is 13.13% of the price of the infringing product. This number will strike many patent lawyers as surprisingly high; very few patent licenses negotiated without litigation (or even in settlement of it) result in royalty rates anywhere near that high."); H.R. REP. NO. 110-314, at 26 (2008) (noting that "the Committee [on the Judiciary] was presented with numerous studies showing that current litigation practices often produce a royalty award substantially in excess of a reasonable royalty").

39 *Breaking the Vicious Cycle*, *supra* note 2, at 418–20.

40 *Id.* at 420–22.

41 *See* Bernard Chao et al., *Why Courts Fail to Protect Privacy: Race, Age, Bias, and Technology*, 106 CAL. L. REV. (forthcoming 2018) (manuscript at 25–26) (on file with authors) (discussing hindsight bias and studies on the same).

42 *See id.* at 26 ("[W]hen people know of a particular outcome, they tend to overestimate the likelihood of that outcome.").

43 *Id.* at 26–27.

44 *See id.* at 27–29 (describing studies that demonstrate outcome bias in several contexts).

tion."[45] See Appendix B for a chart that summarizes the relevance of each *Georgia-Pacific* factor to the *ex ante* analysis.

Use of *ex post* commercial information will not always overcompensate patent holders. If the actual commercial success of a product embodying the technology turns out to be much less than had been expected *ex ante*, a royalty determined with *ex post* information might be less than one determined on the basis of only *ex ante* information. This is especially likely if the parties would have agreed to a fixed fee royalty *ex ante*[46] and if the effect of lock-in factors like those reflected in *ex post* license agreements on the determination of a royalty with *ex post* information is insubstantial.

This possibility does not, however, mean that use of *ex post* information in royalty determinations is prudent. First, use of *ex post* royalties will generally lead to excessive royalties. Some *ex post* information, such as that reflecting lock-in and litigation risk, systematically tends to overstate royalties. Second, while *ex post* commercial information is not inherently biased in one direction or another, patent holders will naturally assert more patents against commercially successful products than against commercial failures because their anticipated recoveries are larger against successful products. Use of *ex post* information will exaggerate the extent to which royalties owed on successful products are excessive and will thus as a general matter imply excessive royalties when patents are asserted. Third, use of *ex post* information would allocate the total royalty cost inequitably among technology users, requiring successful users to pay more than market value and vice versa. Using only *ex ante* information not only will ameliorate this inequity but also, ironically, will increase the rewards to asserting patents against relatively unsuccessful products, and will therefore increase the likelihood that patent holders will be fully compensated and will recover royalties from all infringers.[47]

Fourth, since the jury is not instructed to document its findings on each factor or how it weighed the factors, use of the *Georgia-Pacific* framework results in unpredictable, black box determinations that are difficult to review.[48] The difficulty of

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[45] *Breaking the Vicious Cycle*, *supra* note 2, at 421.

[46] If the parties would have agreed to a percentage royalty *ex ante*—if, in other words, the parties would have agreed to share the commercial risk—there is no reason to think that a royalty rate determined on the basis of *ex ante* information would be less than that determined with *ex post* information about the commercial success of the infringing product, except to the extent that it would have included a discount for uncertainty. That will usually also be the case if a per-unit royalty would have been agreed to *ex ante*.

[47] The arguments for using *ex post* information seem to rest largely on concerns that patent holders will be undercompensated in aggregate if royalties are determined only on the basis of *ex ante* information because patents will not be asserted against unsuccessful infringers and those infringers will be able to free-ride on the patented invention. As noted in the text, however, there should be fewer free-riders if only *ex ante* information is used. Moreover, patent holders can often avoid free-riding and any resulting under-compensation by licensing at the component level, and thus covering both successful and unsuccessful products, rather than at the end product level.

[48] *See Lucent Techs, Inc. v. Gateway, Inc.*, 509 F. Supp. 2d 912, 940 (S.D. Cal. 2007) ("[A]bsent a

reviewing reasonable royalty determinations is reflected by the fact that the overwhelming majority of courts affirm juries' reasonable royalty determinations.[49]

Fifth, various studies have found that jurors have trouble comprehending pattern jury instructions, and can benefit from instructions that limit the legal vernacular and use simpler language more tailored to the facts of the case.[50] Ambiguity in juror instructions or in the legal standard itself "may allow jurors to subvert justice by relying on their biases, prejudices, and whims."[51] Moreover, research suggests that jurors may be biased toward the "anchor" on which he or she is focused, which in patent cases will generally be the patent(s)-in-suit and the patent holder's often inflated damages demand.[52] Compounding the potential for bias is the fact that jurors will inevitably hear a great deal about the benefits of the patents-in-suit but much less about the value of other essential components of the infringing product, and might therefore overvalue the patent's value and contribution to the infringing product.[53] These tendencies highlight the need for a simple and coherent set of instructions that—unlike the fifteen *Georgia-Pacific* factors—can focus the jury on how to evaluate the asserted patent's true *ex ante* market value.

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view into the 'black-box' of the jury's decision making process, the Court cannot say that the jury's verdict was inconsistent or without the support of sufficient evidence."); Durie & Lemley, *supra* note 32, at 632–33; Seaman, *supra* note 32, at 1708–10 (discussing the ways in which "jury instructions that recite the potpourri of *Georgia-Pacific* factors tend to make effective post-trial review of reasonable royalty awards more difficult").

49 *See* Durie & Lemley, *supra* note 32, at 634 (finding that the Federal Circuit affirmance rate for reasonable royalty determinations was 77% and that district courts almost never grant JMOL motions regarding reasonable royalties).

50 *E.g.*, Edith Greene & Brian Bornstein, *Precious Little Guidance: Jury Instructions on Damage Awards*, 6 PSYCHOL. PUB. POL'Y & L. 743, 748 (2000) ("[J]urors have considerable difficulty understanding pattern instructions adopted from statutory language but that they have more success comprehending, explaining, and using instructions that have been rewritten and simplified using various principles of psycholinguistics."); Walter W. Steele, Jr. & Elizabeth G. Thornburg, *Jury Instructions: A Persistent Failure to Communicate*, 67 N.C. L. REV. 77, 78 (1988); Robert P. Charrow & Veda R. Charrow, *Making Legal Language Understandable: A Psycholinguistic Study of Jury Instructions*, 79 COLUM. L. REV. 1306, 1316 (1979); *see also* Joshua P. Davis, Shannon Wheatman & Cristen Stephansky, *Writing Better Jury Instructions: Antitrust as an Example*, University of San Francisco Law Research Paper 2016-12 at 22 (Jan. 24, 2017), *available at* http://awards.concurrences.com/IMG/pdf/ssrn-id2759634.pdf.

51 Greene & Bornstein, *supra* note 50, at 747.

52 *Breaking the Vicious Cycle*, *supra* note 2, at 427–28.

53 *See* Seaman, *supra* note 32, at 1697–98 ("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 . . . . 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." (quoting DAN L. BURK & MARK A. LEMLEY, THE PATENT CRISIS AND HOW COURTS CAN SOLVE IT 29–30 (Univ. of Chicago Press, 2009)); Mark A. Lemley & A. Douglas Melamed, *Missing the Forest for the Trolls*, 113 COLUM. L. REV. 2117, 2143 (2013).

IV. General Principles to Improve Reasonable Royalty Damages Instructions

Given the conceptual difficulties and *ex post* considerations inherent in the *Georgia-Pacific* factors, jury instructions that track the *Georgia-Pacific* framework do not properly focus the jury on determining the incremental value of the patent at issue. In this section, we propose guidelines for how both the form and the substance of the jury instructions can be improved and simplified. These guidelines are intended to inform instructions that will help factfinders determine more consistent and accurate reasonable royalty rates.

A. The Form of the Instructions

The instructions should be simple and should clearly identify the relevant considerations in a cohesive framework. The instructions should also be flexible enough to be applied in different cases and to accommodate additional instructions tailored to the facts of each case.[54]

B. The Substance of the Instructions

The instructions should incorporate the following principles:

First, the instructions should focus the jury on the ultimate issue of determining the market value of the patent before the alleged infringement.[55] In particular, the instructions should exclude *ex post* considerations such as lock-in costs, and should permit the jury to consider *ex post* information such as the actual commercial success of the product only to the extent that such information sheds light on what the parties would have expected and agreed upon *ex ante*, and only if consideration of such information would not on balance be prejudicial or confusing.[56]

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[54] *See* Ericsson, Inc. v. D–Link Sys., Inc., 773 F.3d 1201, 1232 (Fed. Cir. 2014) ("Although we recognize the desire for bright line rules and the need for district courts to start somewhere, courts must consider the facts of record when instructing the jury and should avoid rote reference to any particular damages formula.").

[55] *See* Jorge L. Contreras & Richard J. Gilbert, *A Unified Framework for RAND and Other Reasonable Royalties*, 30 BERKELEY TECH. L.J. 1451, 1459–60 (2015) ("[T]he point at which royalties should be computed is the time at which the infringer is able to choose between alternative infringing and non-infringing implementations, rather than at the time of infringement.").

[56] In their article, Norman V. Siebrasse and Tomas F. Cotter propose a hybrid approach, which the authors call the "contingent ex ante" framework. *See* Norman V. Siebrasse & Tomas F. Cotter, *A New Framework for Determining Reasonable Royalties in Patent Litigation*, 68 FLA L. REV. 929, 936 (2016). Siebrasse and Cotter argue that this framework, in which the court attempts to "reconstruct[] the ex ante bargain the parties would have struck with the benefit of ex post information" is superior to the both the pure *ex ante* and pure *ex post* approaches. *Id.* Siebrasse and Cotter suggest that a contingent *ex ante* framework will reduce the incidence of windfalls in those instances in which a purely *ex ante* approach would result in a lower royalty than that to which the parties would have agreed if they had known about the commercial success of the infringing product.

While there is some appeal to this approach, we think on balance it is inferior to the purely *ex ante* approach. First, the hybrid approach would ask the jury not just to imagine a but-for world that did not exist—the *ex ante* bargain, but to imagine one that could never have existed—an *ex ante* bargain with *ex post* information. Second, the jury would naturally give great weight to the *ex*

Second, the instructions should make clear that the market value of a patent is based on, and cannot be greater than, the incremental value of the patented technology over available alternatives.[57] For this valuation, the idea of an *ex ante* negotiation should be used only as a device to focus the jury on determining the amount to which the parties (considering their commercial relationship) would have agreed at a time before the alleged infringer was locked-in to the claimed technology and was, in theory, free to walk away from the deal.

Third, the instructions should clearly exclude the value contributed by factors other than the claimed invention that would not be reflected in the market value of the patented technology. These factors encompass not only technical components and features that are not part of the claimed invention but also the value added by any other factor, such as the accused infringer's manufacturing process, product marketing, or brand recognition.

Fourth, the instructions should highlight the importance of an established licensing royalty for the asserted patents, and should also explain that other sufficiently comparable agreements may also help to inform the jury's ultimate determination of reasonable royalty damages. But the instructions should also instruct

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post information, which will appear more real to the jury; and critically important information, such as the relative value of alternatives to the patented technology, which is not embodied in observable *ex post* events will undoubtedly be given short shrift. Third, by focusing on such *ex post* events as the commercial success of the infringing product, the hybrid approach will exacerbate the significance of the unavoidable tendency of juries to exaggerate the share of the value of the infringing product that is properly attributable to the patented technology. *See Breaking the Vicious Cycle*, *supra* note 2, at 42–28.

Finally, the concern of Siebrasse and Cotter about windfall seems largely misplaced. For one thing, the windfall concern is unlikely to be significant where the result of an *ex ante* bargain is a percentage royalty, because the actual royalty would in that case reflect the extent of commercial success; that is largely true also of a per-unit royalty. Moreover, while an implementer that enters into an *ex ante* license at a fixed fee royalty will benefit if the infringing product enjoys unanticipated commercial success, that benefit is not a windfall. The *ex ante* bargain reflects what the parties would have agreed to in the real world, including the agreed-upon allocation of market risk. And any benefit to an implementer whose infringing product is unexpectedly successful will be offset by harm to implementers (and benefit to patent holders) when the infringing product turns out to be less successful than anticipated. The hybrid approach is thus not likely to increase returns to patent holders compared to those anticipated *ex ante*, and thus their incentives to innovate; but by putting more risk on implementers, the hybrid approach might inhibit their commercialization of patented technology and their investment in follow-on invention based on that technology.

[57] *See* Contreras & Gilbert, *supra* note 55, at 1457 ("[A] patent['s] . . . incremental contribution relative to the next-best alternative . . . is the appropriate metric to evaluate a reasonable royalty."); Seaman, *supra* note 32, at 1661 (proposing that "a reasonable royalty for patent infringement should not exceed the accused infringer's expected costs of adopting an acceptable noninfringing substitute" because "a rational actor will not pay more for a particular good or service when a lower-cost replacement is available"); Thomas F. Cotter, *Four Principles for Calculating Reasonable Royalties in Patent Infringement Litigation*, 27 SANTA CLARA COMPUT. & HIGH TECH. L.J. 725, 743 (2011) (noting that while there are practical difficulties in determining the value of a next-best alternative, "logic suggests that a patent's expected contribution to profitability or cost reduction in relation to the next-best alternative—its expected *economic utility* to the user, if you will—should be a key determinant of the user's reservation price for the use of the invention").

jurors to consider whether any of the licenses were negotiated after the infringer was committed to using the subject technology, and thus might reflect a price inflated by *ex post* factors like lock-in costs or litigation risks.[58]

Finally, the instructions should emphasize the commercial context in which the parties would have conducted the hypothetical negotiation.[59]

V. Evaluation of Recent Alternatives to the *Georgia-Pacific* Factors

Acknowledging that a verbatim recitation of the fifteen *Georgia-Pacific* factors fails to instruct a jury adequately on how to determine a reasonable royalty rate, various bar associations, courts, and working groups have drafted model jury instructions for patent cases.[60] While most are an improvement upon the all-too-common verbatim recitation of the *Georgia-Pacific* factors, we do not believe that these models sufficiently provide judges and juries with a simple, flexible set of instructions that will help the jury determine a truly accurate and fair reasonable royalty rate. The most prominent alternative model patent jury instructions—those of the National Jury Instruction Project, the Northern District of California, the Federal Circuit Bar Association, and the American Intellectual Property Law Association ("AIPLA")—are discussed below.

National Jury Instruction Project's Model Patent Jury Instructions.[61] The form and substance of the National Jury Instruction Project's model instructions suffer from many of the same deficiencies as the *Georgia-Pacific* framework. Indeed, these instructions still ask a jury to weigh multiple complex factors and call for consideration of *ex post* information that will tend to inflate the damages award.

First, the model instructions list ten factors with no guidance on how these factors should be weighted or applied.[62] Similar to the *Georgia-Pacific* framework, jurors likely will not understand how to balance these factors or determine their relative weight.

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58 The trial court should also exercise its gatekeeper role to keep from the jury license agreements that are so infected by *ex post* considerations or other non-comparable factors that their introduction into evidence would be more prejudicial than helpful. *See Breaking the Vicious Cycle*, *supra* note 2, at 420 & n.157.

59 Adjustments may be necessary to reflect differences in context. Particularly for SEPs, the date of the hypothetical negotiation should be the date just before the patent became essential to the relevant standard, rather than the date of first infringement. *See id.* at 430–32; Apple, Inc. v. Motorola, Inc., 869 F. Supp. 2d 901, 913 (N.D. Ill. 2012) ("[O]nce a patent becomes essential to a standard, the patentee's bargaining power surges because a prospective licensee has no alternative to licensing the patent; he is at the patentee's mercy.").

60 *See* Contreras & Eixenberger, *supra* note 24, at 4–6 (summarizing the various efforts and their developments).

61 *See* NAT'L JURY INSTRUCTION PROJECT, MODEL PATENT JURY INSTRUCTIONS §§ 6.5–6.6 (2009), *available at* http://www.nationaljuryinstructions.org/documents/NationalPatentJuryInstructions.pdf.

62 *Id.* at § 6.6.

Second, the jury is instructed to assume that the hypothetical negotiation took place "just before the time when the infringing sales first began."[63] But setting the date of the negotiation based on the date of the first infringing sale—rather than just before the alleged infringer elected to use the allegedly infringing technology—results in the hypothetical negotiation that includes lock-in costs because the alleged infringer will have already invested considerable resources to acquire needed complements, build the product and get it to market.

Compounding this problem is the fact that several of the factors themselves, like the *Georgia-Pacific* factors, incorporate considerations that post-date the first sale:

- The first four factors appropriately focus on licensing evidence, including licenses to the patent, comparable licenses, the licensing history of the parties, and licensing practices in the relevant industry.[64] However, these factors do not expressly instruct jurors to consider whether the licenses were negotiated after the subject technology had already been incorporated into the accused product. In such situations, the price of the license may be inflated by *ex post* considerations like lock-in costs and the licensee's concerns about litigation. Additionally, the instructions do not explain what the jury should consider to be a "comparable" license agreement.
- The seventh factor tells the jury to consider "[t]he significance of the patented technology in promoting sales of the alleged infringer's products and earning it profit."[65] This instruction is not limited to the parties' expectations at the time of the hypothetical negotiation but instead invites the jury to consider the invention's effect on *ex post* sales of non-patented items. This instruction allows pollution of the damages award by *ex post* events, conflicts with apportionment principles, and tends to inflate the damages award.
- The eighth factor calls for consideration of "[a]lternatives to the patented technology and advantages provided by the patented technology relative to the alternatives,"[66] without instructing that the jury should consider the best alternative available at the time of the hypothetical negotiation. Additionally, and as we noted in *Breaking the Vicious Cycle*, the availability of alternatives should not be treated merely as one factor "to be considered on equal footing with the others."[67] Instead, juries should be instructed that alternatives provide a fundamental constraint on the reasonable royalty. "Properly understood . . . the alterna-

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63 *Id.*
64 *Id.*
65 *Id.*
66 *Id.*
67 *Breaking the Vicious Cycle*, *supra* note 2, at 422.

tives put a ceiling on the amount a willing licensee would pay *ex ante*, because it would not pay more than the patent is worth compared to the alternative of not taking a license."[68]

- Finally, the ninth factor asks the jury to consider "[t]he portion of the alleged infringer's profit that should be credited to the invention as distinguished from non-patented features, improvements or contributions."[69] This factor calls for consideration of actual profits, rather than just expected profits. To properly assess the incremental value of the patented technology, this factor should be limited to the excess profit from using the patented technology beyond what would have been obtained using the next-best alternative available on the hypothetical negotiation date.[70] And it should be limited to expectations about profits, not actual *ex post* experience that would not have influenced the *ex ante* bargain.

Northern District of California's Model Patent Jury Instructions.[71] The Northern District of California's model instructions improve upon the *Georgia-Pacific* framework in several ways.[72] First, rather than a verbatim listing of factors, they discuss in a simpler and more cohesive manner the principles that the jury should apply.[73] Second, they give helpful practical instructions on how to calculate a reasonable royalty.[74] Third, they offer a separate instruction for Standard Essential Patent ("SEP") cases on apportionment and the licensee's obligation to license the patent on reasonable and nondiscriminatory terms.[75]

However, the instructions lack many key components. First, the jury is instructed to assume that the hypothetical negotiation took place "at the time when the infringing activity first began."[76] This is an improvement over setting the date at the time of first sale, but setting the date at the time the infringement first began (rather than just before the alleged infringer elected to use the allegedly infringing technology) still results in the hypothetical negotiation including lock-in costs. At the time infringement first began, the alleged infringer will have already invested to build the product with the allegedly infringing technology.

Second, while the jury is instructed that the royalty "must reflect the value attributable to the infringing features of the product, and no more,"[77] the jury is not

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68 *Id.*

69 NAT'L JURY INSTRUCTION PROJECT, *supra* note 61, at § 6.6.

70 *Breaking the Vicious Cycle*, *supra* note 2, at 422.

71 *See* N.D. CAL., MODEL PATENT JURY INSTRUCTIONS §§ 5.6–5.9 (2015), *available at* https://web.archive.org/web/20161208163256/http://cand.uscourts.gov/juryinstructions.

72 *See* Contreras & Eixenberger, *supra* note 24, at 12.

73 *See* N.D. CAL., MODEL PATENT JURY INSTRUCTIONS, *supra* note 71, at § 5.7.

74 *See id.*

75 *See id.* at § 5.9.

76 *Id.* at § 5.7.

77 *Id.*

told to award a royalty rate based only on the incremental value of the invention over alternatives available to the alleged infringer at the time of the hypothetical negotiation. Without this explanation, the damages award may not reflect the true market value of the patented technology.

Third, while the instructions encourage the jury to consider comparable licenses,[78] they fail to explain that jurors should consider whether *ex post* factors such as lock-in costs might have inflated the price of those licenses. They also do not explain what the jury should consider to be a "comparable" license agreement.

Fourth, the instructions do not prompt the jury to consider commercial considerations that could show a patent holder's willingness or reluctance to license the patent-in-suit, including whether the parties are competitors or whether the patent holder had a policy not to license the patent. As we explain below, this evidence could shed light on the parties' relative bargaining positions and an appropriate damages award.[79]

Federal Circuit Bar Association's Model Patent Jury Instructions.[80] The Federal Circuit Bar Association's model instructions are also an improvement over the verbatim listing of the *Georgia-Pacific* factors.[81] First, these instructions set the hypothetical negotiation date "at a time prior to when the infringement first began."[82] Second, the jury is instructed that "[e]vidence of things that happened after the infringement first began can be considered in evaluating the reasonable royalty only to the extent that the evidence aids in assessing what royalty would have resulted from a hypothetical negotiation."[83] Third, the instructions include just three simple factors.[84] Fourth, an additional instruction covers apportioning in cases concerning SEPs.[85]

Nevertheless, these instructions are still lacking in certain respects. First, while the instructions include just three simple factors for the jury to consider, the factors are imprecise, and the instructions do not give the jury sufficient guidance on how to apply them. The instructions state only that the jury should consider "[t]he value that the claimed invention contributes to the accused product" and the "[t]he value that factors other than the claimed invention contribute to the accused product."[86]

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78 *Id.*

79 *See infra* notes 117–121 and accompanying text.

80 *See* FED. CIR. BAR ASS'N, MODEL PATENT JURY INSTRUCTIONS §§ 6.5–6.8 (2016), *available at* http://fedcirbar.org/Resources/Other-Materials/Model-Patent-Jury-Instructions.

81 *See* Contreras & Eixenberger, *supra* note 24, at 9–12 (discussing development and merits of the model instructions).

82 FED. CIR. BAR ASS'N, MODEL PATENT JURY INSTRUCTIONS, *supra* note 80, at § 6.6.

83 *Id.*

84 *See id.* at § 6.7; *see also* Contreras & Eixenberger, *supra* note 24, at 10 (noting that the three factors "are clearly derived from, but do not strictly follow, the *Georgia-Pacific* factors").

85 FED. CIR. BAR ASS'N, MODEL PATENT JURY INSTRUCTIONS, *supra* note 80, at § 6.7.

86 *Id.*

The jury will struggle to make those value determinations without a more robust explanation.

Second, although the instructions set the hypothetical negotiation date before the first infringement,[87] they give the jury no understanding of how long before that first infringement to set that date. Indeed, the instruction is broad enough to capture one minute before the alleged infringer first infringed. In those situations, the hypothetical negotiation will still include lock-in costs. The jury should be instructed expressly that hypothetical negotiation occurs just before the alleged infringer elected to use the allegedly infringing technology.

Third, the instructions ask the jury to consider "comparable license agreements,"[88] but they do not give the jury any guidance to determine what agreements are "comparable."

Finally, the instructions fail to instruct juries (1) to consider whether *ex post* factors such as lock-in costs might have inflated the price of comparable licenses, (2) to consider only the incremental value of the patented technology over non-infringing alternatives available to the alleged infringer at the time of the hypothetical negotiation, or (3) to account for commercial considerations that could show a party's willingness or reluctance to license the patent-in-suit. Failing to instruct on these issues will likely result in a less reliable and accurate award relative to the model instructions proposed by the National Jury Instruction Project and Northern District of California.

AIPLA's Model Patent Jury Instructions.[89] The AIPLA model instructions are also an improvement in many respects. First, the instructions are tailored to the facts of the case and apply simple language that the jury will more readily understand.[90] Second, the instructions give guidance on how to assess whether license agreements are "comparable."[91] Third, the instructions appropriately state that "[t]he reasonable royalty award must be based on the incremental value that the patented invention adds to the end product" and that "measuring this value requires a determination of the value added by the patented features" to "the infringing features of the product, and no more."[92]

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87 *Id.* at § 6.6.

88 *Id.* at § 6.7.

89 AIPLA, MODEL PATENT JURY INSTRUCTIONS §§ 11.13–11.25 (2016), *available at* https://www.aipla.org/committees/committee_pages/Patent-Litigation/Committee%20Documents/Forms/AllItems.aspx?RootFolder=%2fcommittees%2fcommittee_pages%2fPatent-Litigation%2fCommittee%20Documents%2fModel%20Jury%20Instructions&FolderCTID=0x0120002F8CB41CE81E514CA7508DB4ED795056.

90 *See generally id.*

91 *Id.* § 11.23.

92 *Id.* § 11.13.

Nevertheless, the instructions do not give the jury enough guidance on how to determine the "incremental value" added by the invention. First, the instructions tell the jury to consider the fifteen *Georgia-Pacific* factors as well as a sixteenth "catchall" factor that calls for consideration of any "economic factor" that a "normally prudent business person" would consider under similar circumstances.[93] But the jury still is not told how to balance or apply these many factors.

Second, the instructions set the date of the hypothetical negotiation "just before the infringement began."[94] As discussed above, this time period will usually include lock-in costs because the alleged infringer will already have invested to build the allegedly infringing product. Compounding this problem is the fact that—as discussed above—many of the *Georgia-Pacific* factors incorporate considerations that post-date first infringement.

Third, while the jury is instructed that the royalty "must be based on the incremental value that the patented invention adds to the end product,"[95] the jury is not told that the "incremental value" reflects the value of the invention over available non-infringing alternatives.

VI. A New Practical Approach to Reasonable Royalty Instructions

In this section, we propose a new, more practical approach to jury instructions regarding reasonable royalty damages. The guiding principle is for the jury to fashion a remedy that reflects the actual market value of the patented technology at the time prior to when the defendant invested in the allegedly infringing technology. As such, the instructions should consistently focus the jury on restoring the parties to the position they would have been in if they had willingly negotiated a license *ex ante*. In addition, we propose a simplified list of four factors for the jury to consider in determining reasonable royalty. We further propose that the instructions should be tailored to each case with guidance regarding the relevant disputed facts and the parties' proposed methodologies for calculating the damages award. We believe that this approach will facilitate more accurate damages awards that are more easily reviewable by both district courts and the Federal Circuit. A set of model instructions is included in Appendix A.

A. Instructions Regarding Reasonable Royalties Generally

The instructions should begin by introducing the concept of reasonable royalty damages and making clear that what is intended is a determination of the market value of the patented technology. The jury should be instructed that the market value is that to which the parties would have agreed in a negotiation occurring before lock-in and when the parties were free to decline a license in favor of whatever alternatives were available. Patent lawyers and judges are familiar with the term "hy-

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93 *Id.* § 11.15.
94 *Id.* § 11.14.
95 AIPLA, MODEL PATENT JURY INSTRUCTIONS, *supra* note 89, at § 11.13.

pothetical negotiation"; but, as others have noted, that term might confuse the jury as to what they are being asked to do and might suggest that they are being called upon literally to construct the negotiation itself.[96] The instructions should focus the jury more directly on the task of determining the patent's *ex ante* market value and that, when the jury refers to negotiations, it should use the term "pre-investment negotiation" instead of the less precise, unmoored term "hypothetical negotiation."

The first step in the reasonable royalty analysis is to determine the appropriate date for the parties' pre-investment negotiation. To appropriately assess a patented invention's true market value, the negotiation date should be a date on which the accused infringer is deciding between using the patented technology versus any alternatives to the patented technology. A reasonable royalty should therefore be defined for the jury as follows:

> A reasonable royalty is the payment that the patent holder and the accused infringer would have agreed to immediately *before* the accused infringer invested in using the allegedly infringing technology.[97]

Setting the valuation or negotiation date immediately before the decision to use the technology is preferable to using the date of first infringement because only the earlier date excludes lock-in costs from the analysis. Excluding lock-in costs is important because they are not representative of the true economic value of the claimed invention and including them in the determination overcompensates the patent holder.

Cases involving SEPs present somewhat different considerations. For these cases, juries should generally be instructed that the patent should be valued just before the technology purportedly covered by the patent was incorporated into the standard.[98] The later date on which the individual implementer chose to use the patented technology is *not* the correct date because the implementer did not have the option at that time of choosing an alternative technology.[99] We thus recommend calling the negotiation in SEP cases the "pre-standard negotiation."

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[96] *See, e.g.*, Contreras & Eixenberger, *supra* note 24, at 7–8; Jarosz & Chapman, *supra* note 10, at 783; Seaman, *supra* note 32, at 1677–81.

[97] *See Breaking the Vicious Cycle*, *supra* note 2, at 426 ("The hypothetical negotiation date should be set at just prior to the time that the infringer became committed to using the infringing technology, which in most cases will be the lock-in date . . . . [T]his provides the optimal framework for assessing the incremental benefit conferred by the claimed technology as compared to available alternatives.").

[98] Joseph Farrell et al., *Standard Setting, Patents, and Hold-Up*, 74 ANTITRUST L.J. 603, 637 n.134 (2007); Mark A. Lemley & Carl Shapiro, *A Simple Approach to Setting Reasonable Royalties for Standard-Essential Patents*, 28 BERKLEY TECH. L.J. 1135, 1147–48 (2013); Contreras & Gilbert, *supra* note 55, at 1491–93; FTC, THE EVOLVING IP MARKETPLACE: ALIGNING PATENT NOTICE AND REMEDIES WITH COMPETITION 23 (Mar. 2011) ("Courts should cap the royalty at the incremental value of the patented technology over alternatives available at the time the standard was chosen.").

[99] *See Breaking the Vicious Cycle*, *supra* note 2, at 431–32 ("The FRAND commitment means that the patent holder no longer has a right, presumed in the paradigmatic story, to refuse to license its patent; by the same token, the infringer is entitled to use the patented technology and does not need to obtain the consent of a recalcitrant or mercenary patent holder in order to do so.").

This adjustment is necessary because, as we noted in *Breaking the Vicious Cycle*, lock-in often long precedes infringement of standardized technology and standardized technology is thus especially vulnerable to *ex post* contamination.[100] Once a standard is adopted, the costs associated with modifying the standard to design around SEPs are substantial, and the individual infringer no longer has the option of using alternatives to the standardized technology. Unlike non-SEP cases, the lock-in here is not a result of the infringer's product development and implementation costs. It is rather the result of the substantial group coordination and decision-making costs that the standard setting organization ("SSO") and its members have incurred to develop and adopt the standard, and that would have to be incurred again to change or replace it. These costs often include not only the costs of achieving consensus among a large and heterogeneous group but also costs incurred for hundreds or more complementary technologies and parts that would have to be changed to switch to an alternative to the patents-in-suit. Instructing juries that the negotiation took place immediately prior to the patent's incorporation into the standard will ensure that the reasonably royalty rate is not artificially inflated by these lock-in costs.[101]

After explaining the valuation date, juries should be instructed on what they should assume about the negotiation. Specifically, the jury should be instructed to assume that both parties believed the patent was valid and would be infringed, and that both parties were willing to enter an agreement and would have acted reasonably in their negotiations. The jury should further be instructed to choose a royalty that would have resulted from the negotiation, and not simply a royalty either party would have preferred.

In some situations, as explained in *Breaking the Vicious Cycle*, the patent holder would not willingly have licensed the patents to the infringer *ex ante* but rather would have preferred to retain exclusive or nearly exclusive control over the patented technology. That situation is most likely to arise in cases involving direct competitors or cases in which, as in the pharmaceutical industry, there are only one or a few patents embodied in a commercial product. Although the jury must determine a reasonable royalty and therefore cannot conclude that the parties would not have agreed on a value for the patents, competitive and other commercial considerations are often highly relevant to determining the relative bargaining power of the parties and thus the amount of the royalty and should not be ignored by juries. In Factor Four, below, we discuss how jury instructions should address this situation.

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[100] *Id.* at 429.

[101] Nevertheless, and as we also noted in *Breaking the Vicious Cycle*, it might be appropriate in some circumstances to assess different reasonable royalties based on different hypothetical negotiation dates for early movers (who may have assumed greater exposure implementing the infringing technology before the standard was adopted) and late adopters (who may have delayed implementation until the standard was adopted). *See id.* at 426 n.200.

B. Four Factors for Determining Reasonable Royalty Damages

The jury should be instructed regarding the considerations that are relevant to the reasonable royalty determination. Instead of the lengthy and unwieldy list of fifteen *Georgia-Pacific* factors, we propose just four. This streamlined set of factors will facilitate more accurate, predictable, reviewable, and consistent damages awards. As discussed below, the first factor instructs the jury to determine damages based on the value of the claimed invention over alternatives available at the time—i.e., based on the added value of the invention. The second factor acts as a backstop to the first factor, cautioning the jury against determining damages based on factors or components unrelated to the claimed invention—i.e., to exclude value added by other factors or components. The third factor instructs the jury that comparable license agreements might in appropriate circumstances serve as an important guide to determining what the parties would have agreed to in a hypothetical negotiation. The fourth factor instructs the jury to consider the economic relationship of the parties (e.g., whether the patentee would generally prefer exclusive use of its invention or to license its invention broadly).

1. *Factor One: The Incremental Value Contributed by the Invention*

The jury should be instructed that the patent holder is entitled to recover damages only for the ***incremental value*** that the claimed invention contributes to the accused product, determined by comparing the allegedly infringing technology to the alleged infringer's best *ex ante* alternative.[102]

Juries should therefore consider the effect of commercially acceptable alternatives to the claimed invention that do not infringe the patent holder's patents and that were available at the time of the parties' negotiation. An accused infringer would not agree to pay a royalty larger than the incremental value of the claimed invention over this commercially acceptable non-infringing alternative. For example, if the patent is directed to an improved windshield wiper for a car, the incremental value would be determined based on the benefits of the patented windshield wiper over other commercially available windshield wipers.[103]

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[102] *See, e.g.*, Ericsson, Inc. v. D-Link Sys., Inc., 773 F.3d 1201, 1235 (Fed. Cir. 2014) ("We further hold that district courts must make clear to the jury that any royalty award must be based on the incremental value of the invention."); *see also* AstraZeneca AB v. Apotex Corp., 782 F.3d 1324, 1334–35 (Fed. Cir. 2015) ("When an infringer can easily design around a patent and replace its infringing goods with non-infringing goods, the hypothetical royalty rate for the product is typically low . . . . By the same reasoning, if avoiding the patent would be difficult, expensive and time-consuming, the amount the infringer would be willing to pay for a license is likely to be greater.").

[103] The best alternatives should be determined by taking into account both cost to the infringer and the value to the infringer of the available alternatives. If the infringer would have to incur a cost to use the best alternative, perhaps because it is covered by a third party's patents, the maximum amount the infringer would pay for the invention at issue in the hypothetical negotiation would be equal to the sum of the cost of the best alternative and the incremental value of the invention at issue over that alternative.

Further, when determining the incremental value contributed by the claimed invention, juries should be instructed to disregard "switching costs." "Switching costs" are the costs that the accused infringer would incur to switch from practicing the claimed invention to an alternative method or product. These costs may include, for example, the cost of redesigning products, retooling factories, and eliminating inventory.[104]

2. *Factor Two: The Value Contributed by Factors Other Than the Claimed Invention*

The reasonable royalty may not be based on value added to the accused product by any factor other than the claimed invention. For example, juries should be instructed to exclude value added by the accused infringer's manufacturing process, product marketing, or brand recognition.[105] The jury should also exclude value added by components, features, or technologies that are not part of the claimed invention, including technologies embodied in other patents that are owned by the accused infringer or others. For example, if the patent is directed to an improved windshield wiper for a car, the jury should exclude from the damages calculation the value added by the car's branding and its many other components, such as the steering wheel, engine, or transmission.[106]

Some have criticized this principle on the ground that it does not enable to patent holder to share in the synergies created by the combination of the patented technology and the other product components. This criticism is mistaken. The starting point to understanding the mistake is to appreciate that the reasonable royalty determination calls for a determination of the market value of the patented technol-

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[104] *See Breaking the Vicious Cycle*, *supra* note 2, at 410 n.106.

[105] On the other hand, if, for example, the patented invention allows the manufacturer to use a simpler manufacturing process, then that benefit may be considered value attributable to the patented invention for purposes of determining damages.

[106] *See, e.g.*, VirnetX, Inc. v. Cisco Sys., Inc., 767 F.3d 1308, 1326 (Fed. Cir. 2014) ("[W]hen claims are drawn to an individual component of a multi-component product, it is the exception, not the rule, that damages may be based upon the value of the multi-component product."); Uniloc USA, Inc. v. Microsoft Corp., 632 F.3d 1292, 1318–19 (Fed. Cir. 2011) (explaining that a patentee may not use all of the revenues that a defendant has made from selling accused products unless the patented feature is "the basis for customer demand" for the accused products); Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301, 1337 (Fed. Cir. 2009) ("The patentee . . . must in every case give evidence tending to separate or apportion the defendant's profits and the patentee's damages between the patented feature and the unpatented features."); Georgia-Pac. Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1120 (S.D.N.Y.1970) (explaining that damages awards should be based on "[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* Garretson v. Clark, 111 U.S. 120, 121 (1884) ("The patentee . . . must in every case give evidence tending to separate or apportion the defendant's profits and the patentee's damages between the patented feature and the unpatented features . . . or he must show . . . that the profits and damages are to be calculated on the whole machine, for the reason that the entire value of the whole machine, as a marketable article, is properly and legally attributable to the patented feature.").

ogy—of the royalty to which the parties would have agreed *for the intended use*. A patented technology that makes a unique and significant contribution to a very valuable product will, all other things equal, add more value to the finished product than one that contributes to a product that has little value; and the market value of the patented technology will reflect that incremental value. In that sense, the patent holder is able to appropriate a portion of the synergies created by combining the products' components. But if there are unpatented alternatives that could make an equally significant contribution to the product, the market value of the patented technology will be modest, even if the product is very valuable. (Tiffany& Co. does not pay more than the local gas station for printer paper.)

This point can be expressed with a bit more precision. The patented technology competes with alternatives for use in the product. If it is the best of the alternatives, its use will create surplus value compared to the alternatives. All other things equal, the more valuable the product, the larger the surplus. The infringer and the patent holder, in effect, bargain over how to split the surplus—how, in other words, to share the synergies created by the combination of the patented technology and the other components in the product. The outcome of the bargain depends, among other things, on their relative bargaining power and on the expense and risk of bringing the relevant product to market.[107] But the patent holder in no case should receive more than its share of the synergies created by the combination of components in the infringing product. Any greater share would give the patent holder more than it would have received had the parties in fact agreed on a royalty at the outset.

In furtherance of the objective of not including value contributed by other components, the Federal Circuit has held that, where the claimed invention covers just one feature or technology in the accused product, damages generally must be based on, at most, the "smallest saleable patent-practicing unit" of the product.[108] The "smallest salable patent-practicing unit" is the smallest part or component within the accused device that is offered for sale and that substantially embodies the claimed invention.[109] Even when considering the smallest saleable unit, however, damages awards should not include the value of features or technologies within the smallest saleable unit that are unrelated to the claimed invention. The value of the smallest saleable unit should thus be apportioned to isolate the value contributed by the claimed invention.[110] For example, consider again a patent directed to an im-

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[107] *See Breaking the Vicious Cycle*, *supra* note 2, at 392 n.10.

[108] *See, e.g.*, *LaserDynamics, Inc. v. Quanta Comp., Inc.*, 694 F.3d 51, 67 (Fed. Cir. 2012) (explaining that the royalty base for patent damages must be based on at most the "smallest saleable patent-practicing unit").

[109] *See id.*

[110] In a recent article, Anne Layne-Farrar criticizes the use of the smallest saleable unit on the ground that it does not appropriately tie damages to the value the accused infringer receives from using the patented technology. Anne Layne-Farrar, *The Patent Damages Gap: An Economist's Review of U.S. Statutory Patent Damages Apportionment Rules*, 26 TEX. INTELL. PROP. L.J. (forthcoming 2017) (manuscript at 7) (on file with authors). She argues that the price of the component embodying the patented technology might be suppressed because the infringer did not pay for the technol-

proved windshield wiper for a car: if the allegedly infringing car maker purchased the windshield wiper from a third party, then the windshield wiper likely would be the smallest saleable unit. But the jury would still be required to separate out the value of the patented windshield improvement from the value of other aspects of the wiper, such as a special material that is not part of the claimed invention but that is used to make the wiper.[111]

3. *Factor Three: Comparable Agreements*

The jury should be instructed to consider prior agreements by the patent holder to license the patent(s)-in-suit or other agreements if they were negotiated in circumstances, and concerned subjects, sufficiently comparable to those that would be involved in the parties' negotiation regarding the patent(s)-in-suit.[112]

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ogy,and proposes doing away with the smallest saleable unit requirement where the patented technology is worth more than the price of the smallest saleable unit, even if the patented technology is not the basis for customer demand of the end product and thus does not satisfy the entire market value rule. *Id.* at 18–19. In those cases, she proposes that a patentee may rely on the end product price of the entire product as the royalty base and apportion out any percentage of the price that is not impacted by the patented technology. *Id.* at 19.

Prof. Layne-Farrar's proposal is problematic and unnecessary. First, patent damages lawyers will always present patent damages to the jury in reference to some "anchor," which will usually be the infringing device or product. The smallest saleable unit requirement is intended to establish the "anchor" that is closest to the patented technology and is thus least likely to lead the jury astray, toward overvaluing the patented technology by taking other components into account. Moreover, Layne-Farrar does not shed any light on how to determine whether the value of the patent exceeds the price of the smallest saleable unit, except by reference to the prejudicial price of the end product, nor does she explain how to determine the portion of the price of the end product that is properly attributable to the patent. *See id.* at 14–17. Second, Prof. Layne-Farrar's proposal fails to recognize the real-world dynamic of a trial before a jury. Inevitably, the focus of the trial is the claimed patented invention, and much less time and attention can be and is devoted to other technologies, patented inventions, and other components incorporated into a larger product. This real-world dynamic requires an anchoring point or concept to guide the factfinder. Even if Layne-Farrar were correct that the smallest saleable unit anchor would in some instances be too low, her proposal would in almost every case result in an anchor even further from the correct value. Third, Layne-Farrar's concern applies only to a small subset of instances in which the smallest saleable unit is actually sold: those where the value of the patented technology is very large in relation to the price of the component and the infringer nevertheless did not set the price expecting that it would eventually have to pay for the technology. Fourth, while in extreme cases infringement can result in suppressed product prices, that can be a problem no matter what the size of the anchor. And, in any event, a jury may consider in its damages valuation any evidence that a component's market price is misleadingly low, so there is no need to use the higher end-product price as the anchor.

[111] *See, e.g.*, *VirnetX*, 767 F.3d at 1327 ("[T]he requirement that a patentee identify damages associated with the smallest salable patent-practicing unit is simply a step toward meeting the requirement of apportionment. Where the smallest salable unit is, in fact, a multi-component product containing several non-infringing features with no relation to the patented feature . . . the patentee must do more to estimate what portion of the value of that product is attributable to the patented technology.").

[112] *See, e.g.*, *Lucent*, 580 F.3d at 1325; *Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1325 (Fed. Cir. 2014) ("[U]sing sufficiently comparable licenses are a generally reliable method of estimating the value of a patent."); Contreras & Eixenberger, *supra* note 24, at 11.

Actual licenses for the patent(s)-in-suit from around the time that the accused infringer first elected to use the allegedly infringing technology can be highly probative as to what constitutes a reasonable royalty because such licenses reflect the economic value of the patent(s)-in-suit in the marketplace at the relevant time.[113]

To use licenses to other patents as evidence of reasonable royalty damages, the party offering the licenses has the burden to show that the licenses are both technologically and economically comparable to the license that the parties would have agreed to in their negotiation. The jury should be instructed that, to make this showing, the party offering the license must compare the technology, scope, context, and value of that license with the technology, scope, context, and value of a pre-investment license to the patent-in-suit. The licenses do not need to be identical, only comparable. But showing only a loose or vague comparability between the technological or economic aspects of the licenses fails to meet this burden.[114]

When assessing economic comparability, the jury should be cautioned that the royalty stated in the agreement will not necessarily reflect the true market price of the licensed patent if there is evidence that the agreement was part of a broader relationship between the parties. For example, if as part of the agreement the patent holder provided other types of consideration in addition to the patent license itself, such as a cross license to other patents, the stated royalty might exaggerate the real consideration paid for the patent itself.[115]

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[113] *See, e.g.*, *LaserDynamics*, 694 F.3d at 81 (finding that agreements licensing the patent-in-suit were not too old to be probative because the value of the patented technology was apparent at the time they were entered into); *see also Breaking the Vicious Cycle*, *supra* note 2, at 417–20 (discussing how "the 'comparable' licenses to be considered are often the product of ex post bargaining and therefore reflect ex post considerations such as lock-in costs, as well as premiums to account for uncertainty related to potential litigation outcomes").

[114] *See, e.g.*, *VirnetX*, 767 F.3d at 1330 ("When relying on licenses to prove a reasonable royalty, alleging a loose or vague comparability between different technologies or licenses does not suffice."); *Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1317 (Fed. Cir. 2011) ("[T]here must be a basis in fact to associate the royalty rates used in prior licenses to the particular hypothetical negotiation at issue in the case."); *ResQNet.com, Inc. v. Lansa, Inc.*, 594 F.3d 860, 870 (Fed. Cir. 2010) (expert's reliance on licenses as evidence of a reasonable royalty improper where "none of these licenses even mentioned the patents in suit or showed any other discernible link to the claimed technology"); *Lucent*, 580 F.3d at 1329 ("[A] lump-sum damages award [based on a reasonable royalty] cannot stand solely on evidence which amounts to little more than a recitation of royalty numbers, one of which is arguably in the ballpark of the jury's award, particularly when it is doubtful that the technology of those license agreements is in any way similar to the technology being litigated here."); *Finjan, Inc. v. Secure Comput. Corp.*, 626 F.3d 1197, 1211–12 (Fed. Cir. 2010) ("We have recently reiterated that use of past patent licenses [to determine damages awards] must account for differences in the technologies and economic circumstances of the contracting parties.").

[115] As we discussed in *Breaking the Vicious Cycle*,

> [I]t is often difficult to ascertain the actual terms of the entire agreement between the parties and to determine the royalties paid for the patents-in-suit. Patent holders, knowing that their licenses will influence royalty awards in future litigation, have an incentive to structure their agreements in ways that exaggerate the apparent cost of the licenses to the licensees. For example, they can provide various

If the allegedly comparable license was negotiated at a time after the licensee had invested in the technology (such as by building a factory), the jury should be instructed that the stated royalty rate might have been inflated by the licensee's lock-in costs. As a general matter, when licenses are negotiated *ex post*, rather than *ex ante*, their value fails to capture the true market value of the patent at the time of the *ex ante* hypothetical negotiation date. By the time of the *ex post* actual negotiation date, the licensee might have already begun practicing the licensed patent, and thus might have entered the *ex post* negotiation already locked into the patented technology and concerned about litigation risk. This differs from a pre-investment bargain because lock-in will likely encourage the licensee to pay a substantially higher royalty rate *ex post* than the true market value of the patent at the *ex ante* negotiation date.[116]

Litigation settlement agreements, for example, necessarily are affected by *ex post* considerations, since they are negotiated after the alleged infringement began and are shaped by circumstances of the litigation that are unrelated to the actual economic value of the patent. These litigation-induced settlement agreements should be excluded; if they are admitted, juries should be instructed that such agreements are generally disfavored because they tend to overstate the value of the patents.[117]

When the patent holder can prove that the royalty stated in the license included a discount because of uncertainty as to whether the patents(s)-in-suit were valid and infringed, the court should also instruct the jury to exclude that discount in the reasonable royalty determination.

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types of consideration in addition to the patent license itself and allocate a disproportionate share of the total amount paid by the licensee for the package to the patent license.

Breaking the Vicious Cycle, *supra* note 2, at 418; *see also* Carl Shapiro, *Injunctions, Hold-Up, and Patent Royalties*, 12 AM. L. & ECON. REV. 280, 300–01 (2010).

[116] *See Breaking the Vicious Cycle*, *supra* note 2, at 418–19 (noting that many licenses are negotiated after the licensee has already begun practicing the licensed patent and at a time when the licensee is locked into the technology and concerned about litigation); Jonathan S. Masur, *The Use and Misuse of Patent Licenses*, 110 NW. U. L. REV. 115, 120–21 (2015).

[117] *See, e.g.*, *LaserDynamics*, 694 F.3d at 77 (explaining that "[t]he propriety of using prior settlement agreements to prove the amount of a reasonable royalty is questionable" because settlement agreements "are tainted by the coercive environment of patent litigation [and] are unsuitable to prove a reasonable royalty . . . , the premise of which assumes a voluntary agreement will be reached between a willing licensor and willing licensee, with validity and infringement of the patent not being disputed"); *see also Rude v. Westcott*, 130 U.S. 152, 164 (1889) ("[A] payment of any sum in settlement of a claim for an alleged infringement cannot be taken as a standard to measure the value of the improvements patented, in determining the damages sustained by the owners of the patent in other cases of infringement.").

4. *Factor Four: Commercial Considerations Showing Either Desire or Reluctance to License*

The parties might not in fact have been willing to negotiate a license *ex ante*. However, it is necessary to assume that the parties would have agreed to an *ex ante* license in order to determine a reasonable royalty. Making that assumption does not require us to ignore the reality that some licensors might be more eager to license than others. A licensor's relative willingness to license can, in certain cases, be relevant to assessing the reasonable royalty.[118]

To see how this relative unwillingness might affect the reasonable royalty, we should first consider the patent holder that would have wanted to license its patents to the infringer *ex ante*. In that situation, the parties would have agreed to a royalty that would have reflected the relative bargaining power of the parties, up to a maximum equal to the incremental value of the patented technology compared to the infringer's best alternative. In effect, the parties would bargain over how to divide the incremental value of the patented technology.[119]

In other situations, commercial considerations might demonstrate that a party would be "unwilling" or reluctant to license. For example, if a patent holder had an established policy and marketing program not to license the patent or had a policy to license only under special conditions designed to preserve its patent exclusivity, a jury could find that that party would be reluctant to license. In that situation, the jury can find that the parties to the hypothetical bargain would have agreed upon a higher royalty rate, up to a maximum equal to the incremental value of the patented technology compared to the infringer's best alternative. A patent holder that would not have been willing to license its patent to the infringer *ex ante* may be entitled to damages equal to that maximum.[120]

Note, however, that a party should not be considered an unwilling or reluctant licensor if it was willing *ex ante* to license the patents but would not have entered a license *ex ante* for strategic reasons, in the expectation that it could strike a better deal at a later time. "In other words, a patent holder cannot avoid being deemed a willing licensor . . . if it intended all along to license the infringer but wanted to wait until the infringer was locked-in in order to negotiate at that time a higher royalty."[121]

Certain other commercial considerations might show that a party would have been especially "willing" to license. For example, if the commercial relationship between the patent holder and the accused infringer would have been an inventor-promoter relationship (rather than a competitive relationship), the evidence might

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[118] *See Breaking the Vicious Cycle*, *supra* note 2, at 445 n.280 (discussing when a licensor should be considered an *ex ante* "willing" licensor rather than an "unwilling" licensor).

[119] *See id.* at 392.

[120] *Id.* at 440–41 n.265.

[121] *Id.* at 445 n.280.

enable the jury to find that one party or the other would have had a stronger desire to license the patent. If that party were the patent holder, the infringer might have been able to negotiate for a lower royalty rate, i.e., for a larger share of the incremental value provided by the patented technology. That might be the case for a patent holder that was bound by a commitment made to an SSO to license the patent on [Fair,] Reasonable, and Non-Discriminatory ("[F]RAND") terms, and thereafter was unable to enhance its bargaining position by threatening not to license the patent.[122]

C. Damages Instructions in [F]RAND Cases

SEP cases require determination of a "reasonable" royalty, just as non-SEP cases do. As with non-SEP cases, the "reasonable" royalty should be no greater than the incremental value of the claimed invention over the next best alternative.[123]

The damages framework we propose is thus conceptually applicable to SEP cases, including those involving [F]RAND royalties; but the criteria need to be adjusted to account for certain differences:

The date of hypothetical negotiation: As discussed above, juries should generally be instructed that the hypothetical negotiation date must be just before the patented technology was incorporated into the standard, *not* the date on which the individual implementer chose to use the patented technology.[124] We also recommend calling it the "pre-standard negotiation."

Factor One: When a patent is essential to a standard and subject to a [F]RAND commitment, the parties in a pre-standard negotiation would agree to a reasonable royalty based on the contribution of the patented technology to the capabilities in the standard, and the contributions of those capabilities in the standard to the accused infringer's products. Accordingly, the jury should be instructed to ensure that any reasonable royalty award reflects only the additional amount the alleged infringer would pay for the right to implement the standard including the patented technology rather than a standard that included the best alternative available at the time of the hypothetical negotiation.[125]

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[122] *Ericsson, Inc. v. D-Link Sys. Inc.*, 773 F.3d 1201, 1230–31 (Fed. Cir. 2014) (holding that the patent holder's licensing policy and the commercial relationship between the patent holder and the accused infringer are not appropriate considerations for determining RAND royalties); *see also Georgia-Pac.*, 318 F. Supp. at 1120.

[123] Jorge L. Contreras and Richard J. Gilbert present a thorough discussion of the similarities between SEP and non-SEP cases, and persuasively argue that a unified framework is needed to assess reasonable royalties in both types of cases. *See generally* Contreras & Gilbert, *supra* note 55. The authors particularly note that the patent's "incremental contribution relative to the next-best alternative . . . is the appropriate metric to evaluate a reasonable royalty" for both SEPs and non-SEPs because both require apportionment and present concerns over hold-up. *Id.* at 1457; *see also Breaking the Vicious Cycle*, *supra* note 2, at 447 n.288.

[124] *See supra* notes 97–100 and accompanying text.

[125] *See, e.g.*, *Ericsson*, 773 F.3d at 1235 ("[D]istrict courts must make clear to the jury that any royalty award must be based on the incremental value of the invention, not the value of the standard as a

Factor Two: Although the royalty should reflect the contribution of the patented technology to the standard, the jury should be instructed that the royalty should not include value contributed by other patents or technologies incorporated into the standard or the accused product or any other factor such as the accused infringer's product marketing or brand recognition.[126] As explained above, this approach will enable the patent holder to obtain the market value of the patented technology, including a portion of the synergies created by the combination of components in the standard.[127]

Factor Three: Instead of asking the jury to consider comparable licenses from around the time that the accused infringer first elected to use the allegedly infringing technology, the court should instruct the jury to consider licenses from around the time the patent became essential to the standard.

Factor Four: When the patents are subject to a [F]RAND commitment, the patent holder must be considered a willing licensor that cannot discriminate against any particular party. Thus, instead of instructing the jury to consider commercial considerations that might have affected the patent holder's incentives to license the patent, in cases involving [F]RAND-encumbered patents, the court should instruct the jury to consider the patentee's obligation to license the patent-in-suit on reasonable and non-discriminatory terms. The instructions should include the language from the letter of assurance and or the SSO policy as appropriate. The instructions should also note that the jury must take into account the [F]RAND commitment in determining a reasonably royalty.[128]

D. The Jury Should Be Instructed Regarding Different Types of Royalties

Because the outcome of a negotiation may take various forms, the jury should be instructed that there are different types of potential reasonable royalty damages.

1. Lump Sum Royalties vs. Running Royalties

Depending on the circumstances of the case and the evidence presented, the jury should be instructed on the difference between lump sum and running royalties,

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whole or any increased value the patented feature gains from its inclusion in the standard.").

[126] *See, e.g., Microsoft Corp. v. Motorola, Inc.*, No. 10-cv-1823, 2013 WL 2111217, at *12 (W.D. Wash. Apr. 25, 2013) ("[A] RAND commitment should be interpreted to limit a patent holder to a reasonable royalty on the economic value of its patented technology itself, apart from the value associated with incorporation of the patented technology into the standard."); *id.* at *18 ("[A] reasonable royalty would not take into account the value to the licensee created by the existence of the standard itself, but would instead consider the contribution of the patent to the technical capabilities of the standard and also the contribution of those relevant technological capabilities to the implementer and the implementer's products.").

[127] *See supra* notes 104–110 and accompanying text.

[128] *See, e.g., Ericsson, Inc. v. D-Link Sys. Inc.*, 773 F.3d 1201, 1230–31 (Fed. Cir. 2014) ("'[T]he commercial relationship between the licensor and licensee' is irrelevant because Ericsson must offer licenses at a *non-discriminatory* rate.").

and that they must choose which structure is most appropriate based on the evidence presented.

The jury should be instructed that a one-time lump sum payment is a single payment that the accused infringer would have paid for a license covering all sales of the licensed product. Depending on the circumstances, the evidence might indicate that the parties would prefer a lump sum royalty over a running royalty. A lump sum royalty has the advantages of providing more certainty as to the cost of the license and avoiding monitoring and compliance issues.

On the other hand, a running royalty is a type of royalty where the accused infringer would have paid the patent-holder either a percentage of the sales price or a specific dollar amount every time the accused infringer sold a product incorporating the patented technology. The jury should be instructed that determination of the running royalty requires identification of the appropriate royalty base (e.g., where applicable, the smallest saleable unit or entire market value) and the appropriate royalty rate.

2. *Post-Verdict Reasonable Royalties*

No enhancement of the reasonable royalty should be awarded for post-verdict infringement.[129] The hypothetical negotiation already assumes that both parties considered the patent to be valid and infringed. Also, (except perhaps in very unusual cases) the *ex ante* bargain would not be limited to the period prior to verdict, so determination of the royalty agreed to in that bargain would encompass the rate to which the parties would have agreed for the post-verdict period.[130]

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[129] The parties might, of course, agree to change the post-verdict royalty if, for example, the court-determined royalty is too high and deters sales of the infringing product that might benefit both the patent holder and the infringer. Because renegotiation resulting in a higher royalty would be likely only in the most extreme cases (presumably involving repeat players and/or multifaceted commercial relationships), it has been suggested that post-verdict royalties might have a pro-infringer bias. *See* Vincenzo Denicolò et al., *Revisiting Injunctive Relief: Interpreting eBay in High-Tech Industries with Non-Practicing Patent Holders*, 4 J. COMPETITION L. & ECON. 571, 579 (2008). This possibility does not, however, justify enhancing post-verdict royalties. In the first place, downward adjustment of royalties is likely only in the very unusual case in which the court sets a running royalty that is large enough in relation to the total cost of the infringing product to materially impact the price and sales volume of the product. It is hard to see how efficiency overall would be served by imposing excessive costs on technology users as a general matter in anticipation of an occasional market correction. Moreover, any post-verdict negotiation is itself likely in almost all cases to result in an excessive royalty because it will partially reflect lock-in costs.

[130] In the rare case in which it is determined that the *ex ante* license would have been for a more limited period, the jury should be instructed to determine a royalty for subsequent years using the criteria described above, but on the assumption that that royalty would have been determined by a negotiation at or shortly prior to the expiration of the *ex ante* license agreement.

E. The Jury Should Be Instructed on the Manner of Performing the Damages Calculation

In addition to jury instructions that provide simple *qualitative* factors for damages determinations, the jury should also be given simple *quantitative* methods for calculating a specific damages number.

The goal is not to force the jury to use any particular damages calculation methodology, but rather to provide the jury with guidance and options that clarify their choices and simplify their task. For example:

The parties might agree on the form of the calculation but disagree only on the inputs to the calculation. In such cases, the parties can provide the formula to the jury, and explain that the jury's task is to determine the inputs to the calculation and then complete the calculation.

The jury might also be asked to choose between the parties' competing damages calculation methodologies, which can be recited in the instructions as competing options for calculating the damages number.[131]

Alternatively, the jury can be invited to set forth its own damages calculation methodology based on its own evaluation of the evidence and damages methodologies presented by the parties.

The court should include the damages calculation methodologies on which the jury is instructed as options on the verdict form. The verdict form should require the jury to show its work—i.e., to identify the specific method of calculation and the inputs to the calculation based on the evidence presented. This will facilitate appellate review and eliminate the "black box" nature of many damages determinations.

F. The Jury Should Be Instructed How the Damages Determination Relates to the Particular Facts of the Case

A verbatim recitation of the factors discussed above (or worse, the full list of the *Georgia-Pacific* factors) might be too abstract for juries to apply accurately to the evidence presented at trial. As noted above, studies have indicated that jurors' comprehension of instructions can be improved by reducing legal vernacular in favor of simplicity and clarity.[132]

Accordingly, to ensure that juries understand the instructions well enough to appropriately determine reasonable royalty rates, judges should go beyond merely reciting factors or legal standards and instead clearly customize the instructions to fit the facts of the case.

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[131] It would be the court's responsibility, as gatekeeper, to keep from the jury any methodologies that are not reasonably calculated to answer the correct legal question, i.e., the royalty the parties would have agreed to in the hypothetical *ex ante* negotiation in light of the best alternative available at that time and exclusive of any *ex post* considerations, such as lock-in costs or litigation risks.

[132] *See* Greene & Bornstein, *supra* note 50, at 748; *see also* Steele & Thornburg, *supra* note 50, at 90–91.

For example, with respect to non-infringing alternatives, a generic instruction—i.e., "consider whether the accused infringer had a commercially acceptable non-infringing alternative to the claimed invention available at the time of the hypothetical negotiation"—is less helpful than a specific instruction tied to the facts of the case. The court should tell the jury what a non-infringing alternative is, what the defendant alleges is a non-infringing alternative, and how that affects the royalty calculation:

> In this case, [the accused infringer] contends that [non-infringing alternative] was an alternative that was available to [the accused infringer] at the time of the [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"] and that did not infringe the [asserted patent], i.e., it was a "non-infringing alternative." If you find that [alleged non-infringing alternative] was a non-infringing alternative to the claimed invention, then [the accused infringer] would not have agreed to pay a royalty larger than the incremental value of the claimed invention over this commercially acceptable non-infringing alternative, and any royalty you award must be based on this incremental value over the cost of the alternative.

Making these adjustments to customize the instructions will go a long way toward ensuring that the jury both understands the instructions and applies them appropriately.

VII. Conclusion

The fifteen *Georgia-Pacific* factors are no longer an appropriate framework for instructing juries on reasonable royalty damages. They are out of date both technologically and doctrinally. Simply put, the factors are unwieldy, confusing, and tend to systematically inflate damages awards above the true market value of the patented technology. The time has come for a change.

We have proposed a new, more practical framework to simplify reasonable royalty jury instructions. The goal is to facilitate more accurate, predictable, reviewable, and consistent damages awards. The following are key takeaways that should be incorporated into the reasonable royalty instruction:

First, unlike the all-too-familiar verbatim recitation of the fifteen *Georgia-Pacific* factors, jury instructions should be simple, practical, and tailored to the facts of the case. The jury should be asked to consider fewer factors and should be given a more robust and clear explanation of the importance of the factors, how they relate to the facts of the case, how they affect a reasonable royalty award, and how to calculate the reasonable royalty award. This will improve the ability of the jury to understand the reasonable royalty instructions and apply them appropriately.

Second, jury instructions should consistently focus the jury on determining the *ex ante* incremental value of the patented technology over the alleged infringer's best alternative. This is not adequately accomplished by the *Georgia-Pacific* factors, which call for the jury to consider numerous *ex post* considerations and which treat the availability of a non-infringing alternative as just one factor among fifteen. Adopting a framework that excludes such *ex post* considerations from the assess-

ment of a reasonable royalty—and placing proper focus on the relevance of a non-infringing alternative—will help to avoid inappropriately awarding the patent holder damages based on the value of extraneous factors, such as the alleged infringer's lock-in costs or concerns about litigation risk.

Third, jury instructions should clearly instruct jurors on apportionment principles and the value contributed by factors other than the claimed invention. In particular, the jury should be instructed expressly to consider the value added by other patented technologies embodied in the accused product as well as factors such as the accused infringer's manufacturing process, product marketing, or brand recognition. This will help diminish the jury's natural tendency to overvalue the patent-in-suit compared to other essential components of the infringing product, and will help avoid inappropriately awarding the patent holder damages based on the value of non-patented technology.

Finally, jury instructions should focus the jury on the probative value of prior license agreements and commercial evidence that would indicate the licensor's relative willingness *ex ante* to enter an agreement with the alleged infringer. This type of evidence is often highly relevant to what the parties would have determined to be the real-world, fair-market value of the patented invention. But the jury also should be instructed to consider whether and how *ex post* factors such as lock-in costs might have affected the price of those licenses or the parties' willingness to negotiate.

APPENDIX A

Model Jury Instructions for

Reasonable Royalty Patent Damages

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I. Introduction

I will now instruct you on damages. If you find that {the accused infringer} has infringed one or more valid claims of the patent-in-suit, you must determine the amount of money damages to which {the patent holder} is entitled. If you find that {the accused infringer} has not infringed any valid claim of the patent-in-suit, then {the patent holder} is not entitled to any damages. By instructing you on damages, I do not suggest that one or the other party should prevail. These instructions are merely provided to guide you on the calculations of damages in the event you find infringement of a valid patent claim and thus must address damages in your deliberation.

{The patent holder} must prove each element of its damages claim, including the amount of damages, by a "preponderance of the evidence." This means that {the patent holder} must persuade you, by the evidence, that something is more likely to be true than not true.

If so proven by {the patent holder}, the amount of damages must be adequate to compensate {the patent holder} for {the accused infringer}'s infringement. In other words, any damages award should put the {the patent holder} in approximately the same financial position it would have been in had the infringement not occurred.

While {the patent holder} is not required to prove the amount of its damages with mathematical precision, it must prove the amount of damages with reasonable certainty. You may not award damages that are speculative, damages that are only possible, or damages that are based on guesswork.

Damages also are not meant to punish an infringer but only to compensate a patent holder. Therefore, you may not add anything to the amount of damages to penalize an accused infringer or to set an example.

[*Add if the patent holder is under a [F]RAND obligation*: Because {the patent holder} committed to license the patent(s)-in-suit on [Fair,] Reasonable and Non-Discriminatory ("[F]RAND") terms, you must ensure that any damages award is consistent with and does not exceed the amount permitted under {the patent holder}'s [F]RAND obligations.]

Authorities

35 U.S.C.A. § 284 (West 2016); NAT'L JURY INSTRUCTION PROJECT, MODEL PATENT JURY INSTRUCTIONS, Final Instruction No. 6.1-6.2 (2009); FED. CIR. BAR ASS'N, MODEL PATENT JURY INSTRUCTIONS, Instruction No. 6.1 (2016); Final Jury Instructions, Ericsson Inc., v. D-Link Corp., No. 6:10-cv-473 (E.D. Tex. June 12, 2013), Dkt. No. 504 at 22; Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301, 1324 (Fed. Cir. 2009) ("The burden of proving damages falls on the patentee."); Aro Mfg. Co. v. Convertible Top Replacement Co., 377 U.S. 476, 507 (1964) ("[The] question (is) primarily: had the infringer not infringed, what would Patent

Holder-Licensee have made?" (internal quotation marks omitted)); Riles v. Shell Exploration & Prod. Co., 298 F.3d 1302, 1312 (Fed. Cir. 2002) ("Compensatory damages, by definition, make the patentee whole, as opposed to punishing the infringer."); Ericsson, Inc. v. D-Link Sys., Inc., 773 F.3d 1201, 1231 (Fed. Cir. 2014) ("Trial courts should also consider the patentee's actual RAND commitment in crafting the jury instruction.").

II. REASONABLE ROYALTIES - GENERALLY

[*If the patent holder seeks lost profits*: If you find that {the patent holder} has established that {the accused infringer} infringed its patent but has not proved its claim for lost profits, or has proved its claim for lost profits for only a portion of the infringing sales, then you must award {the patent holder} a reasonable royalty for all infringing sales for which it has not been awarded lost profits damages.]

[*If the patent holder seeks only a reasonable royalty*: If you find that {the patent holder} has established that {the accused infringer} infringed its patent, {the patent holder} is entitled to a reasonable royalty to compensate it for that infringement.]

A royalty is a payment made to a patent holder in exchange for the right to use the claimed invention. A reasonable royalty is the amount that {the patent holder} and {the accused infringer} would have agreed to immediately before [*non-SEP cases*: {the accused infringer} invested in using the allegedly infringing technology] [*SEP cases*: the technology allegedly covered by the patent was incorporated into the standard]. As a short-hand, I will refer to this agreement as the result of a [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"]. Although this [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"] never took place, your job is to make a judgment about what the outcome would have been had it taken place.

[*In cases where the court sets the date of the negotiation*: In this case, the [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"] would have taken place on ___.] {*In cases where the parties contest the date of the negotiation*: In this case, you must decide the date of the [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"]. {The patent holder} contends that the negotiation would have taken place on ___, and {the accused infringer} contends that the negotiation would have taken place on___.]

In considering the [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"], you should focus on what {the patent holder} and {the accused infringer} would have known and expected immediately before [*non-SEP cases*: {the accused infringer} invested in using the allegedly infringing technology] [*SEP cases*: the technology allegedly covered by the patent was incorporated into the standard].

[*Add in cases in which ex post evidence has been admitted*: Evidence of things that happened after the date of the [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"] can be considered in evaluating the reasonable royalty only to the extent that such evidence aids in assessing what the parties would have thought or expected on the earlier date of the [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"] itself, and thus what royalty would have been agreed to by willing parties on that date.]

In determining the reasonably royalty that would have resulted from the [*non-*

SEP cases: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"], you must assume that the parties believed the patent was valid and would be infringed, that the parties were willing to enter into an agreement, and that the parties would have acted reasonably in their negotiations.

In determining the reasonable royalty, you must apply the following three principles:

1. The reasonable royalty may not exceed the incremental value that the claimed invention contributes to [*SEP cases*: {the relevant standard} and to] {the accused product} compared to the best available alternative to the claimed invention.

2. The reasonable royalty may not include the value that factors other than the claimed invention contribute to [non-SEP cases: {the accused product}] [SEP cases {the standard}, including the overall value of the standard itself].

3. Comparable license agreements, such as those covering the use of the claimed invention or similar technology, often indicate the market value of the claimed invention.

In determining the reasonable royalty, you should also consider [*Cases with no RAND obligation*: the commercial relationship between {the patent holder} and {the accused infringer}, including their relative bargaining power; *Cases with a RAND obligation*: {The patent holder}'s obligation to license the patent-in-suit on Reasonable and Non-Discriminatory ("RAND") terms.]

You may also consider any other factors which in your mind would have increased or decreased the royalty that the parties would have negotiated at the time of the [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"].

Authorities

35 U.S.C.A. § 284 (West 2014); Apple Inc. v. Motorola, Inc., 757 F.3d 1286, 1325-26 (Fed. Cir. 2014), *overruled on other grounds by* Williamson v. Citrix Online, *LLC*, 792 F.3d 1339, 1349 (Fed. Cir. 2015); Ericsson, Inc. v. D-Link Sys., Inc., 773 F.3d 1201, 1226, 1231 (Fed. Cir. 2014); VirnetX, Inc. v. Cisco Sys., Inc., 767 F.3d 1308, 1326 (Fed. Cir. 2014); LaserDynamics, Inc. v. Quanta Comp., Inc., 694 F.3d 51, 79 (Fed. Cir. 2012); Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301, 1324, 1340 (Fed. Cir. 2009); Syntrix Biosys., Inc. v. Illumina, Inc., No. 3:10-cv-05870 (W.D. Wash. Mar. 18, 2013), Dkt. 287 at 41; Apple, Inc. v. Motorola, Inc., 869 F. Supp. 2d 901, 913 (N.D. Ill. 2012) ("The proper method of computing a FRAND royalty starts with what the cost to the licensee would have been of obtaining, just before the patented invention was declared essential to compliance with the industry standard, a license for the function performed by the patent. That cost would be a measure of the value of the patent qua patent. But once a patent be-

comes essential to a standard, the patentee's bargaining power surges because a prospective licensee has no alternative to licensing the patent; he is at the patentee's mercy."), *aff'd in part, rev'd in part and remanded*, 757 F.3d 1286 (Fed. Cir. 2014); Georgia-Pac. Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970); *see also* Commonwealth Sci. & Indus. Research Org. v. Cisco Sys. Inc., 809 F.3d 1295, 1305 (Fed. Cir. 2015) ("[R]easonable royalties for SEPs generally—and not only those subject to a RAND commitment—must not include any value flowing to the patent from the standard's adoption."); FED. CIR. BAR ASS'N, MODEL PATENT JURY INSTRUCTIONS, Instruction Nos. 6.6, 6.7 (2016).

III. FACTOR ONE - THE INCREMENTAL VALUE CONTRIBUTED BY THE CLAIMED INVENTION

{The patent holder} is entitled to recover damages in an amount not greater than the cost to the {the accused infringer} of its best alternative to the claimed invention at the time of the [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"], plus the value of any additional benefit that the claimed invention contributes to [*SEP cases*: {the relevant standard} and to] {the accused product} over {the accused infringer's} best alternative.

Determining the incremental value of the claimed invention requires a baseline for comparison. During a negotiation the potential licensee would consider the availability and cost of alternatives to the claimed invention. You should consider whether {the accused infringer} had available at the time of the [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"] a commercially acceptable alternative to the claimed invention that did not infringe {the patent holder's} patent(s). [*Add if the accused infringer contends that there was a non-infringing alternative available*: In this case, {the accused infringer} contends that {non-infringing alternative} was a commercially acceptable alternative that was available to {the accused infringer} at the time of the [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"] and that did not infringe the {asserted patent(s)}, i.e., it was a "non-infringing alternative." If you find that {non-infringing alternative} was a non-infringing alternative to the claimed invention, then {the accused infringer} would not have agreed to pay a royalty larger than the additional value of the claimed invention over this non-infringing alternative, and any royalty you award must be based on this incremental value over the cost of the alternative.

Further, when determining the incremental value contributed by the claimed invention, you may not include "switching costs." "Switching costs" are the costs that {the accused infringer} would incur to switch from practicing the claimed invention to an alternative method or product. These costs may include, for example, the cost of redesigning products, retooling factories, and eliminating inventory. These costs are not relevant to the reasonable royalty that the parties would have negotiated because the negotiation would have taken place at a time just before [*non-SEP cases*: {the accused infringer} elected to use the allegedly infringing technology] [*SEP cases*: the technology allegedly covered by the patent was incorporated into the standard], when the infringer would have had no switching costs.

[*There is a separate instruction for cases involving an allegedly essential patent subject to a [F]RAND commitment below (Instruction IX). For cases involving an allegedly essential patent not subject to a [F]RAND commitment, add the following*: In this case, [*if agreed*: the parties agree that the patent(s)-in-suit is essential to practicing {the relevant standard}; thus] [*if disputed*: {the patent holder} contends that the patent-in-suit is essential to practicing {the relevant standard}, while {the accused infringer} contends that it is not essential. If you find that the patent(s)-in-

suit is essential to practicing the standard, then] in determining a reasonable royalty, you should consider whether and how much more {the accused infringer} would have paid for the right to implement the standard using the patented technology rather than the best alternative available at the time of the [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"].

Authorities

Garretson v. Clark, 111 U.S. 120, 121 (1884) ("The patentee . . . must in every case give evidence tending to separate or apportion the defendant's profits and the patentee's damages between the patented feature and the unpatented features . . . or he must show . . . that the profits and damages are to be calculated on the whole machine, for the reason that the entire value of the whole machine, as a marketable article, is properly and legally attributable to the patented feature."); *id.* ("[T]he patentee must show in what particulars his improvement has added to the usefulness of the machine or contrivance."); Minco, Inc. v. Combustion Eng'g, Inc., 95 F.3d 1109, 1120 (Fed. Cir. 1996) (upholding the district court's award of a reasonable royalty based, in part, on finding that "the market contained no non-infringing alternatives"); *In re* Innovatio IP Ventures, LLC Patent Litig., No. 11-cv-9308, 2013 WL 5593609, at *9 (N.D. Ill. Oct. 3, 2013) ("The court's RAND rate therefore must, to the extent possible, reflect only the value of the underlying technology and not the hold-up value of standardization."); Ericsson, Inc. v. D-Link Sys., Inc., 773 F.3d 1201, 1235 (Fed. Cir. 2014) ("We further hold that district courts must make clear to the jury that any royalty award must be based on the incremental value of the invention, not the value of the standard as a whole or any increased value the patented feature gains from its inclusion in the standard."); Microsoft Corp. v. Motorola, Inc., No. 10-cv-1823, 2013 WL 2111217, at *18 (W.D. Wash. Apr. 25, 2013) ("[A] reasonable royalty would not take into account the value to the licensee created by the existence of the standard itself, but would instead consider the contribution of the patent to the technical capabilities of the standard and also the contribution of those relevant technological capabilities to the implementer and the implementer's products."); Commonwealth Sci. & Indus. Research Org. v. Cisco Sys. Inc., 809 F.3d 1295, 1304-05 (Fed. Cir. 2015) (finding error where district court failed to apportion based on the incremental value of the patent-in-suit separate from the value accruing from the patent's inclusion in a standard); AstraZeneca AB v. Apotex Corp., 782 F.3d 1324, 1338 (Fed. Cir. 2015) ("When a patent covers the infringing product as a whole, and the claims recite both conventional elements and unconventional elements, the court must determine how to account for the relative value of the patentee's invention in comparison to the value of the conventional elements recited in the claim, standing alone."); *id.* at 1334-35 ("When an infringer can easily design around a patent and replace its infringing goods with non-infringing goods, the hypothetical royalty rate for the product is typically low . . . . By the same reasoning, if avoiding the patent would be difficult, expensive and time-consuming, the amount the infringer would be willing to pay for a license is likely to be greater.").

IV. FACTOR TWO - THE VALUE CONTRIBUTED BY FACTORS OTHER THAN THE CLAIMED INVENTION

The reasonable royalty should be based solely on the incremental value of the patented invention when used in the accused product(s), compared to the value of the next best alternative when used in that product. The reasonable royalty therefore should not include value added to {the accused product(s)} by factors other than the claimed invention. For example, you must exclude value added by other factors, such as {the accused infringer}'s [manufacturing process, product marketing, or brand recognition.] You also must exclude value added by the inclusion of components, features, or technologies that are not part of the patented invention, including technologies embodied in other patents that are owned by {the accused infringer} or others.

You must apportion whatever you determine to be the value of the infringing product so that the reasonable royalty award reflects only the incremental value that is contributed by the patent(s)-in-suit to {the accused product(s)} and not the value contributed by other components. To apportion means to divide and allocate.

Where the claimed invention covers just one feature or technology in the accused product(s), damages generally must be based on, at most, the "smallest saleable unit." That is the smallest part or component within {the accused product} that substantially embodies the claimed invention. For example, if there were a patent directed to an improved windshield wiper, the smallest saleable unit would be the windshield wiper, as opposed to the car itself or other parts of the car, like the steering wheel, the tires, or the transmission. [In this case, the smallest saleable unit is {the smallest salable unit}.] The cost of the smallest saleable unit embodying the claimed invention generally sets the upper limit on the damages base in any damages calculation.

Further, you may not award damages for the value of features or technologies added to the smallest saleable unit other than the claimed invention. Thus, you may need to further apportion the smallest saleable unit to isolate the value contributed by the claimed invention.

Authorities

Georgia-Pac. Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970) ("The 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."), *modified sub nom.* Georgia-Pac. Corp. v. U.S. Plywood Champion Papers Inc., 446 F.2d 295 (2d Cir. 1971); *In re* Innovatio IP Ventures, LLC Patent Litig., No. 11-cv-9308, 2013 WL 5593609, at *10 (N.D. Ill. Oct. 3, 2013) ("Nonetheless, the concern of royalty stacking requires that the court, to the extent possible, evaluate a proposed RAND rate in the light of the total royalties an implementer would have to pay to practice the standard."); Riles v. Shell Exploration & Prod. Co., 298 F.3d 1302,

1313 (Fed. Cir. 2002) (setting aside a jury damages award because the expert's "models did not reflect what royalty rate a hypothetical negotiation between Shell and Riles would have yielded at the time the infringement began. Instead, the models reflected [the expert's] assessment of the worth of Shell's oil rig at the time of the trial."); Commonwealth Sci. & Indus. Research Org. v. Cisco Sys. Inc., 809 F.3d 1295, 1304-05 (Fed. Cir. 2015) (finding error where district court failed to apportion based on the incremental value of the patent-in-suit separate from the value accruing from the patent's inclusion in a standard); AstraZeneca AB v. Apotex Corp., 782 F.3d 1324, 1338 (Fed. Cir. 2015) ("When a patent covers the infringing product as a whole, and the claims recite both conventional elements and unconventional elements, the court must determine how to account for the relative value of the patentee's invention in comparison to the value of the conventional elements recited in the claim, standing alone.").

V. THE ENTIRE MARKET VALUE RULE

[*This instruction should be used only in cases in which a patent holder asserts that it is entitled to a royalty based on the entire market value rule.*]

As you have heard, damages must generally be based on the incremental value of the patented technology over the best alternative available to {the accused infringer}, and must be calculated with reference to the "smallest saleable unit" when the claimed invention covers just one feature or technology in the accused product. In this case, however, {the patent holder} contends that the "entire market value rule" applies. In certain cases, this rule allows a patent owner to recover a reasonable royalty based on the value of an entire product containing multiple features and technologies, even though the asserted patent is directed to only one feature or technology within that product.

The entire market value rule applies rarely and only in specific circumstances. Specifically, if {the patent holder} proves that the claimed invention is the sole basis driving customer demand for the entire product, then you may award a reasonable royalty based on the value of the entire product [, which in this case is {the entire product}]. If {the patent holder} does not prove that the claimed invention is the sole basis driving customer demand for the entire product, then you may not award a reasonable royalty based on the value of the entire product but must instead base the royalty on the smallest saleable unit [,which in this case is {the smallest saleable unit}].

[*Note: If it is contended that the assertion that the claimed invention drives demand depends on non-novel elements of the claim (as opposed to the novel elements), consider modifying the above paragraph as follows*: Specifically, if {the patent holder} proves that the novel elements embodied in the asserted claim are the sole basis driving customer demand for the entire product, then you may award a reasonable royalty based on the value of the entire product [, which in this case is {the entire product}]. If {the patent holder} does not prove that the novel elements embodied in the asserted claim are the sole basis driving customer demand for the entire product, then you may not award a reasonable royalty based on the value of the entire product but must instead base the royalty on the smallest saleable unit, which in this case is {the smallest saleable unit}.]

Authorities

VirnetX, Inc. v. Cisco Sys., Inc., 767 F.3d 1308, 1326 (Fed. Cir. 2014) ("[W]hen claims are drawn to an individual component of a multi-component product, it is the exception, not the rule, that damages may be based upon the value of the multi-component product."); Uniloc USA, Inc. v. Microsoft Corp., 632 F.3d 1292, 1318 (Fed. Cir. 2011) ("A patentee may not use all of the revenues that a defendant has made from selling accused products unless the patented feature is 'the basis for customer demand' for the accused products."); Lucent Techs., Inc. v. Microsoft Corp., No. 07-cv-2000, 2011 WL 2728317, at *5 (S.D. Cal. July 13, 2011)

("If the patentee cannot meet this test, then the patentee must in every case give evidence tending to separate or apportion the defendant's profits and the patentee's damages between the patented features and the unpatented features.").

VI. FACTOR THREE - COMPARABLE AGREEMENTS

You may consider prior agreements by {the patent holder} to license the patent(s)-in-suit. You may also consider prior agreements by the {the patent holder}, {the accused infringer}, or third parties to license or acquire technology similar to the patent-in-suit if those agreements are technologically and economically comparable to a license that the parties would have negotiated in the [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"].

In order to use prior agreements as evidence of reasonable royalty damages, the party offering the agreement as evidence has the burden to show that the prior agreements are both technologically and economically comparable to the license that the parties would have agreed to in the [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"]. To make this showing, the party offering the agreement as evidence must compare the scope, context, and value of the prior agreement to the scope, context, and value of a license to the patent-in-suit at the time of the [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"]. The licenses do not need to be identical, only comparable. But, showing only a loose or vague comparability between different technologies or licenses fails to meet this burden.

Actual licenses for the patent(s)-in-suit from around the time that [*non-SEP cases*: {the accused infringer} first elected to use the allegedly infringing technology] [*SEP cases*: the technology allegedly covered by the patent was incorporated into the standard] can be highly probative as to what constitutes a reasonable royalty because such licenses reflect the economic value of the patent(s)-in-suit in the marketplace at the relevant time. However, the use of litigation settlement agreements as evidence in determining a reasonable royalty is disfavored because those agreements often reflect litigation considerations unrelated to the incremental value of the claimed invention compared to alternatives. Non-litigation license agreements are generally more reliable indicators of what willing parties would have agreed to in a [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"].

In deciding whether a license agreement is technologically and economically comparable, you may consider the following factors:

1. Whether the negotiating circumstances were similar—for example, whether the license agreement reflected an arms-length transaction between willing parties without the threat of litigation.
2. Whether the structure of the license was similar to the structure of the license that would have resulted from the [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"].
3. Whether the patent(s) covered by the license were similar to the patent(s) involved in the [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"].

4. Whether the product(s) covered by the license were similar to the product(s) involved in the [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"].

5. Whether other product features or technologies not covered by the patent(s)-in-suit affect the comparability of the two negotiations.

6. Whether other relationships between or consideration exchanged among the parties, even if not covered by the agreement, affected the terms of the agreement.

7. Whether the relationship between the parties to the license was similar to the relationship between {the patent holder} and {the accused infringer} at the time of the [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"].

8. Whether the agreement was negotiated at a time [*non-SEP cases*: *after* the party licensing the patented technology had first elected to use the allegedly infringing technology] [*SEP cases*: *after* the technology allegedly covered by the patent was incorporated into the standard]. Such a situation will be different from the [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"] in this case, where the parties are assumed to have negotiated a royalty immediately *before* [*non-SEP cases*: {the accused infringer} first elected to use the allegedly infringing technology] [*SEP cases*: the technology allegedly covered by the patent was incorporated into the standard]. If the agreement was entered into after that time, you must take account of the extent to which the royalty specified by the agreement might be higher than a royalty that would have been agreed to [*non-SEP cases*: before the technology was chosen] [*SEP cases*: before the technology allegedly covered by the patent was incorporated into the standard] because {the accused infringer} had already invested or committed to the technology or was concerned about the risk of litigation.

9. Whether the relevant market circumstances at the time the license was entered into differs from the relevant market circumstances at the time of the [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"].

[*To be used if licenses based on the value of an entire product with multiple components are admitted or referenced in expert testimony*: The Court has admitted into evidence [or has allowed experts to reference] license agreements where the royalty is calculated as some percentage of the value of an entire, multi-component product. You should consider these licenses only if you find that they are technologically and economically comparable to the license that the parties would have agreed to in the [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"]. You must also keep in mind that the royalty in these license

agreements may reflect more than the value of the claimed invention. You must apportion any reasonable royalty award in this case so that it reflects only the value that the claimed invention contributes to {the accused product}. The royalty award should not reflect the value contributed by any other factors, features, components, patents, and technologies.]

Authorities

Apple Inc. v. Motorola, Inc., 757 F.3d 1286, 1325 (Fed. Cir. 2014) ("[U]sing sufficiently comparable licenses is a generally reliable method of estimating the value of a patent."); Ericsson, Inc. v. D-Link Sys., Inc., 773 F.3d 1201, 1227-28 (Fed. Cir. 2014); LaserDynamics, Inc. v. Quanta Comp., Inc., 694 F.3d 51, 81 (Fed. Cir. 2012); ResQNet.com, Inc. v. Lansa, Inc., 594 F.3d 856, 870 (Fed. Cir. 2010) (expert's reliance on licenses as evidence of a reasonable royalty improper where "none of these licenses even mentioned the patents in suit or showed any other discernible link to the claimed technology."); Finjan, Inc. v. Secure Computing Corp., 626 F.3d 1197, 1211-12 (Fed. Cir. 2010) ("We have recently reiterated that use of past patent licenses under factors 1 and 2 must account for differences in the technologies and economic circumstances of the contracting parties . . . . Parr explained that Finjan did not compete with Microsoft but does compete against Secure; that Finjan received significant intangible value from Microsoft's endorsements of Finjan; and that the license involved a lump sum instead of a running royalty. These differences permitted the jury to properly discount the Microsoft license." (internal citations omitted)); Lucent Tech., Inc. v. Gateway, Inc., 580 F.3d 1301, 1329 (Fed. Cir. 2009) ("[A] lump-sum damages award [based on a reasonable royalty] cannot stand solely on evidence which amounts to little more than a recitation of royalty numbers, one of which is arguably in the ballpark of the jury's award, particularly when it is doubtful that the technology of those license agreements is in any way similar to the technology being litigated here."); Wordtech Sys., Inc. v. Integrated Networks Sols., Inc., 609 F.3d 1308, 1319-21 (Fed. Cir. 2010) (discussing running royalty and lump sum license agreements); Hanson v. Alpine Valley Ski Area, Inc., 718 F.2d 1075, 1078-79 (Fed. Cir. 1983) (finding "since the offers were made after infringement had begun and litigation was threatened or probable, their terms 'should not be considered evidence of an "established royalty,"' since '[l]license fees negotiated in the face of a threat of high litigation costs "may be strongly influenced by a desire to avoid full litigation."'" (internal citations omitted)); Commonwealth Sci. & Indus. Research Org. v. Cisco Sys. Inc., 809 F.3d 1295, 1303 (Fed. Cir. 2015) ("Where the licenses employed are sufficiently comparable, this method is typically reliable because the parties are constrained by the market's actual valuation of the patent."); Summit 6, LLC v. Samsung Elecs. Co., Ltd., 802 F.3d 1283, 1300 (Fed. Cir. 2015).

VII. FACTOR FOUR - COMMERCIAL CONSIDERATIONS

[*This instruction should not be used in cases involving [F]RAND-encumbered patents because these commercial considerations are contrary to [F]RAND principles.*]

In determining what portion of the incremental value of the patented technology compared to the best alternative would have been included in a reasonable royalty agreed to in the [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"], you may also consider whether {the patent holder} would have been relatively unwilling or relatively willing to license the patent(s)-in-suit to {the accused infringer}. As a general matter, the less willing the patent holder would have been to license the patents to the infringer, the greater is the portion of the incremental value that should be included in the royalty.

To make the determination of the willingness or unwillingness of the patent holder to license its patents, you should consider commercial considerations such as whether {the patent holder} commercially practices the asserted patent. For example, a [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"] may take into account the following factors:

1. Whether {the patent holder} had an established policy and marketing program to not license others to use the patent or to license only under special conditions designed to preserve its patent exclusivity.
2. The commercial relationship between {the patent holder} and {the accused infringer}, such as whether they were competitors in the same geographic territory, in the same line of business, or whether they are inventor and promoter.

A patent holder should be considered willing to license its patents if it would have been willing to license them at a later date, even if it would not have been willing to license them at the time of the [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"].

Authorities

Georgia-Pac. Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970); Ericsson, Inc. v. D-Link Sys., Inc., 773 F.3d 1201, 1230-31 (Fed. Cir. 2014) (holding that the patent holder's licensing policy and the commercial relationship between the patent holder and the accused infringer are not appropriate considerations for determining RAND royalties).

VIII.[ALTERNATIVE] FACTOR FOUR - THE PATENTEE'S OBLIGATION TO LICENSE THE PATENT-IN-SUIT ON [F]RAND TERMS

[*Replace the above Factor Four with this alternative instruction in cases where the patent holder is under a [F]RAND obligation.*]

In this case, {the patent holder} is under an obligation to license the patent(s)-in-suit on [Fair,] Reasonable And Non Discriminatory ("[F]RAND") terms.

[*If the patent holder undertook [F]RAND obligation*: {The patent holder} agreed to license the patent-in-suit {insert language from letter of assurance and/or SSO policy as appropriate}. Therefore, you must take into account this [F]RAND commitment in determining a reasonable royalty.]

[*If a different entity undertook [F]RAND obligation*: {Entity that encumbered patent with [F]RAND obligation} agreed to license the patent(s)-in-suit {insert language from letter of assurance or SSO policy as appropriate}. By acquiring the patent(s)-in-suit, {the patent holder} also agreed to license the patent(s)-in-suit on these terms. Therefore, you must take into account this [F]RAND commitment in determining a reasonable royalty.]

When a patent is essential to a standard and subject to a [F]RAND commitment, the parties in a pre-standard negotiation would agree to a reasonable royalty based on the contribution of the patented technology to the capabilities in the standard, and the contributions of those capabilities in the standard to the accused infringer's products. You must apportion any reasonable royalty award that you make to ensure that it reflects no more than the incremental value that is contributed by the patent(s)-in-suit to {the relevant standard}, and excludes any value contributed by other patents or technologies incorporated into the standard. In addition, the standard itself has inherent value apart from the individual technologies that make up the standard, and any reasonable royalty that you award must be apportioned so that it excludes the value attributable to the ability to practice the standard itself.

[*Add in cases where the patent holder is under a [F]RAND obligation for a patent declared essential to an IEEE standard on or after March 15, 2015*: Pursuant to the relevant IEEE [F]RAND commitment, the parties in a pre-standard negotiation would agree that a reasonable royalty excludes any value resulting from the inclusion of the patent-in-suit's technology in the IEEE standard.

Further, that IEEE [F]RAND commitment expressly states that to determine the reasonable royalty the parties would consider: (i) the contribution of the functionality of the claimed invention or inventive feature to the value of the relevant functionality of the smallest saleable product (e.g., component, sub-assembly, or end-product) that practices the claimed invention: (ii) the contribution of the claimed invention to the value of the smallest saleable product that practices the claimed invention, in light of the value contributed by all other patents essential to the IEEE standard; and (iii) existing licenses covering use of the patent-in-suit,

where such licenses were not obtained under the explicit or implicit threat of a prohibitive order (that is, an order that would prohibit making, using, or selling an allegedly infringing product), and where the circumstances and resulting licenses are otherwise sufficiently comparable to the circumstances of the contemplated license.]

Authorities

Ericsson, Inc. v. D-Link Sys., Inc., 773 F.3d 1201, 1231 (Fed. Cir. 2014) ("Trial courts should also consider the patentee's actual RAND commitment in crafting the jury instruction."); *id.* at 1235 ("We further hold that district courts must make clear to the jury that any royalty award must be based on the incremental value of the invention, not the value of the standard as a whole or any increased value the patented feature gains from its inclusion in the standard."); Microsoft Corp. v. Motorola, Inc., 10-cv-1823, 2013 WL 2111217, at *12 (W.D. Wash. Apr. 25, 2013) ("[A] RAND commitment should be interpreted to limit a patent holder to a reasonable royalty on the economic value of its patented technology itself, apart from the value associated with incorporation of the patented technology into the standard."); *id.* at *18 ("With respect to Factors 6 and 8, a reasonable royalty would not take into account the value to the licensee created by the existence of the standard itself, but would instead consider the contribution of the patent to the technical capabilities of the standard and also the contribution of those relevant technological capabilities to the implementer and the implementer's products."); *In re* Innovatio IP Ventures, LLC Patent Litig., No. 11-cv-9308, 2013 WL 5593609, at *10 (N.D. Ill. Oct. 3, 2013) ("Nonetheless, the concern of royalty stacking requires that the court, to the extent possible, evaluate a proposed RAND rate in the light of the total royalties an implementer would have to pay to practice the standard."); IEEE-SA Standards Board Bylaws (*available at* http://standards.ieee.org/develop/policies/bylaws/approved-changes.pdf).

IX. ROYALTY STACKING

[*Add in cases where there is evidence of a preexisting or anticipated royalty stack at the time of the hypothetical negotiation, whether for SEPs or otherwise.*]

[*SEP cases*: In many circumstances, a particular standard may require users to practice hundreds or even thousands of different patents. For example, the {relevant standard} at issue in this case encompasses many patents that patent holders have alleged may be essential to the standard. If companies were forced to pay royalties to all holders of [F]RAND committed patents, the royalties would stack on top of each other and could become excessive in the aggregate.

[*SEP cases*: In a "pre-standard negotiation," both {the patent holder} and {the accused infringer} would take into account the aggregate royalties required to practice {the relevant standard}. To avoid improper royalty stacking, you must consider the overall amount of royalties that {the accused infringer} would have to pay to license additional patents that are essential to practice the standard in determining the amount of royalties that {the accused infringer} would agree to pay to license the patent(s)-in-suit.]

[*non-SEP cases*: In some circumstances, at the time of the pre-investment negotiation the parties are aware of other patents that must be licensed in order to produce a product like {the accused product}. In such cases, the parties would take into account the aggregate royalties required to produce {the accused product} as a factor in determining the amount of royalties that {the accused infringer} would agree to pay to license the patent(s)-in-suit.]

Authorities

Ericsson, Inc. v. D-Link Sys., Inc., 773 F.3d 1201, 1209 (Fed. Cir. 2014); *In re* Innovatio IP Ventures, LLC Patent Litig., No. 11-cv-9308, 2013 WL 5593609, at *10 (N.D. Ill. Oct. 3, 2013) ("Nonetheless, the concern of royalty stacking requires that the court, to the extent possible, evaluate a proposed RAND rate in the light of the total royalties an implementer would have to pay to practice the standard."); Microsoft Corp. v. Motorola, Inc., 10-cv-1823, 2013 WL 2111217, at *12 (W.D. Wash. Apr. 25, 2013).

X. TYPE[S] OF REASONABLE ROYALTIES

[*To be used if the parties dispute the appropriate type of royalty. If there is no dispute, the instruction should be modified to state that the parties agree that only a lump-sum royalty or only a running-royalty is appropriate.*]

Because the outcome of a [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"] may take various forms, reasonable royalties can be calculated in several different ways. {The accused infringer} contends that parties would have agreed to what is called a "one-time lump sum payment." {The patent holder} contends that parties would have agreed to what is called a "running royalty." It is for you to determine which way is the most appropriate based on the evidence that you have heard.

A one-time lump sum payment is a single payment that {the accused infringer} and {the patent holder} would have agreed to at the time of the [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"] for a license covering all sales of the licensed product. {The accused infringer} contends that the parties would have agreed to a lump sum payment and that the appropriate lump sum payment would be an amount of ___. By contrast, {the patent holder} contends that the parties would not have agreed on a lump sum payment. {The patent holder} also disagrees with {the accused infringer's} calculation of the lump sum and contends that, if you find that the parties would have agreed on a lump sum payment, the appropriate lump sum payment is ___.

A running royalty is a type of royalty where {the accused infringer} and {the patent holder} would have agreed at the time of the [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"] for {the accused infringer} to pay {the patent-holder} {a percentage of the sales price / a dollar amount} every time {the accused infringer} sells a product incorporating the patented technology. In this case, {insert party name} contends that the parties would have agreed upon a running royalty. If you find that the parties would have agreed to a running royalty, you must calculate total damages using the appropriate running royalty rate.

To calculate running royalty damages, you must first identify the total sales revenue of the smallest saleable component of the accused product that practices the claimed invention.

Next, you must identify what portion of the total sales revenues for the smallest saleable unit is attributable to the relevant component, sub-component, or portion of the accused product that practices the claimed invention ("the apportioned base"). In this case, {insert party name} contends that the apportioned base is $___. While {insert party name} contends that a lump sum is the appropriate form of royalty, {insert party name} also disagrees with {insert party name's} calculation of the base and contends that, if you reject the lump sum payment, the apportioned base is $___.

Next, you must determine the royalty rate, expressed as {a percentage of the apportioned base}, that the parties would have agreed to in a [*non-SEP cases*: "pre-investment negotiation"; *SEP cases*: "pre-standard negotiation"] for a license to the claimed invention. In this case, {insert party name} contends that the royalty rate is ___%. Again, while {insert party name} contends that a lump sum payment is the appropriate form of royalty, {insert party name} also disagrees with {insert party name's} calculation of the royalty rate and contends that, if you find that the parties would have agreed to a running royalty, the appropriate royalty rate is ___%.

Finally, to calculate the total running royalty damages, you must multiply the value of the apportioned base by the royalty rate: Total Damages = (apportioned base) x (royalty rate).

Authorities

VirnetX, Inc. v. Cisco Sys., Inc., 767 F.3d 1308, 1330 (Fed. Cir. 2014); Lucent Tech., Inc. v. Gateway, Inc., 580 F.3d 1301, 1325-26 (Fed. Cir. 2009); Summit 6 v. Samsung Elecs. Co., Ltd., 802 F.3d 1283, 1300-01 (Fed. Cir. 2015); Carnegie Mellon Univ. v. Marvell Tech. Grp., Ltd., 807 F.3d 1283, 1304-05 (Fed. Cir. 2015); Wordtech Sys., Inc. v. Integrated Networks Sols., Inc., 609 F.3d 1308, 1319-21 (Fed. Cir. 2010).

APPENDIX B

The following chart summarizes how the *Georgia-Pacific* factors might be relevant to the *ex ante* analysis:

Georgia-Pacific Factor	Relevance to Ex Ante Analysis
Factor #1: The royalties received by the patentee for the licensing of the patent-in-suit, proving or tending to prove an established royalty.	Potentially relevant for *ex ante* facts about royalties.
Factor #2: The rates paid by the licensee for the use of other patents comparable to the patent-in-suit.	Potentially relevant for *ex ante* facts about rates.
Factor #3: The nature and scope of the license, as exclusive or non-exclusive; or as restricted or not restricted in terms of territory or with respect to whom the manufactured product may be sold.	Potentially relevant for *ex ante* facts or expectations about the nature and scope of the license.
Factor #4: The licensor's established policy and marketing program to maintain his patent monopoly by not licensing others to use the invention or by granting licenses under special conditions designed to preserve that monopoly.	Potentially relevant for *ex ante* facts about licensor's policy (e.g., determining whether the licensor is entitled to an injunction).
Factor #5: The commercial relationship between the licensor and the licensee, such as, whether they are competitors in the same territory in the same line of business; or whether they are inventor and promoter.	Potentially relevant for *ex ante* facts about the parties' commercial relationship.
Factor #6: The effect of selling the patented specialty in promoting sales of other products of the licensee; the existing value of the invention to the licensor as a generator of sales of its non-patented items; and the extent of such derivative or convoyed sales.	Potentially relevant for *ex ante* facts or expectations about whether the "patented specialty" would promote sales of other products compared to the best available alternative. Evidence of actual promotion of sales is relevant only insofar as it illuminates *ex ante* expectations.
Factor #7: The duration of the patent and the term of the license.	Relevant.

Georgia-Pacific Factor	Relevance to Ex Ante Analysis
Factor #8: The established profitability of the product made under the patent; its commercial success; and its current popularity.	Potentially relevant only insofar as it illuminates *ex ante* expectations.
Factor #9: The utility and advantages of the patented property over the old modes or devices, if any, that had been used for working out similar results.	Potentially relevant for *ex ante* facts or expectations about utility and advantages compared to the best available alternative. Evidence of actual utility and advantages is relevant only insofar as it illuminates *ex ante* expectations.
Factor #10: The nature of the patented invention; the character of the commercial embodiment of it as owned and produced by the licensor; and the benefits to those who have used the invention.	Potentially relevant for *ex ante* facts about the nature of the patented invention (for example, revolutionary or incremental), the commercial embodiment, and the benefits of using the invention compared to the best available alternative.
Factor #11: The extent to which the infringer has made use of the invention; and any evidence probative of the value of that use.	Potentially relevant only insofar as it illuminates *ex ante* expectations.
Factor #12: The portion of the profit or of the selling price that may be customary in the particular business or in comparable businesses to allow for the use of the invention or analogous inventions.	Potentially relevant for *ex ante* facts about customary profit or selling price.
Factor #13: The 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.	Potentially relevant only insofar as it illuminates *ex ante* expectations.
Factor #14: The opinion testimony of qualified experts.	Relevant for opinions based on *ex ante* facts or expectations. The court in its role as gatekeeper should keep from the jury any methodologies that are not reasonably calculated to assess the royalty the parties would have agreed to in the hypothetical *ex ante* negotiation.

Georgia-Pacific Factor	Relevance to Ex Ante Analysis
Factor #15: The amount that a licensor (such as the patentee) and a licensee (such as the infringer) would have agreed upon (at the time the infringement began) if both had been reasonably and voluntarily trying to reach an agreement; that is, the amount which a prudent licensee – who desired, as a business proposition, to obtain a license to manufacture and sell a particular article embodying the patented invention – would have been willing to pay as a royalty and yet be able to make a reasonable profit and which amount would have been acceptable by a prudent patentee who was willing to grant a license.	Relevant for *ex ante* facts or expectations. This is the material issue, which the other factors help to illuminate.

Beyond Circularity: Licensing for Innovation

Oskar Liivak[†]

Table of Contents

I. Introduction

Of late, patent damages have become a very active area of scholarship. Of course damage awards matter to litigants, but their importance goes much deeper. Tort damages are compensation for harm and as such they go directly to the core nature and function of tort systems. What counts as damage tells us a lot about a tort system and its underlying purpose.

In the modern telling of it, there are two types of patent damages: lost profits and reasonable royalties.[1] Lost profits are generally reserved for manufacturers—patent holders that are building and selling a patented product. If infringement causes any lost sales then the patentee can recover the profits lost due to the infringement.[2]

Many patent holders are not manufacturers and they are precluded from lost profits. For them, or for anyone else who cannot prove lost profits, reasonable royalties are the statutory fall back.[3] Courts are to award "in no event less than a

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† Professor of Law, Cornell Law School. I would like to thank Tom Cotter, John Golden, and David Taylor for helpful comments and discussion. The article has benefitted greatly from presentation at the Second Patent Damages Conference at the University of Texas School of Law.

1 CRAIG NARD, THE LAW OF PATENTS 787 (1st ed. 2008).

2 *See id.* at 788 (describing the legal framework for determining lost profits as set forth by Panduit Corp. v. Stahlin Bros. Fibre Works, 575 F.2d 1152, 1156 (6th Cir. 1978)).

3 *See* 35 U.S.C. § 284 (2012) ("Upon finding for the claimant the court shall award the claimant

reasonable royalty."[4] And it is these awards that have been the focus of much debate.[5] To compute a reasonable royalty, the courts have come to rely on an extensive list of factors. These factors were collected in the 1970 case of *Georgia-Pacific Corp. v. United States Plywood Corp.*[6] Of these so-called *Georgia-Pacific* factors, a number of them focus on the objective evidence of the patentee's prior negotiated licenses. The very first *Georgia-Pacific* factor looks to "the royalties received by the patentee for the licensing of the patent in suit, proving or tending to prove an established royalty."[7] Likewise, the second factor considers "the rates paid by the licensee for the use of other patents comparable to the patent in suit."[8] In setting a reasonable royalty, it seems to make perfect sense to look to the rates that the patentee had previously agreed to.[9] This objective evidence of previous licenses saves the court from having to compute a reasonable royalty itself. Such market-based evidence for damages appears prominently in many areas of law and so naturally it appears prominently in patent law too.[10]

Despite its allure, a growing chorus of scholars has fundamentally questioned the use of prior negotiated licenses for patent damages.[11] Scholars have noted that there is a troubling feedback loop between the patent damages calculated by looking to prior licenses and negotiated licenses themselves.[12] Because patent licenses are

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damages adequate to compensate for the infringement, but in no event less than a reasonable royalty for the use made of the invention by the infringer . . . .").

4 *Id.*

5 *See* U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, THE EVOLVING IP MARKETPLACE: ALIGNING PATENT NOTICE AND REMEDIES WITH COMPETITION 160 (2011) [hereinafter 2011 FTC IP MARKETPLACE REPORT], https://www.ftc.gov/sites/default/files/documents/reports/evolving-ip-marketplace-aligning-patent-notice-and-remedies-competition-report-federal-trade/110307patentreport.pdf ("Much of the controversy in the patent community concerning damage awards has focused on whether the law governing reasonable royalty damages appropriately compensates patentees."). Within this debate, there is, although, some consensus. A reasonable royalty is generally understood as the economic value of the patented technology in relation to its next best alternative. See *id.* at 186–87 ("Academics, practitioners, economists, and business representatives acknowledged the importance of the value of the patented technology over alternatives to a reasonable royalty damages analysis."). But beyond that, deep disagreement exists regarding the proper way to determine that incremental value.

6 *See* Georgia-Pac. Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970).

7 *Id.*

8 *Id.*

9 Jonathan S. Masur, *The Use and Misuse of Patent Damages*, 110 NW. U.L. REV. 115, 156 (2015) [hereinafter Masur, *Use and Misuse*] ("Courts inevitably struggle to assess reasonable royalty damages, and it is only natural that they would turn to market-based measures such as existing licenses.").

10 *See* 1 DAN B. DOBBS, LAW OF REMEDIES § 3.3(3), at 297–98 (2d ed. 1993) (providing examples of market-measured damages in tort and contract law); *see also id.* § 3.5, at 328-30 (noting that comparable sales and prior sales are potential measures for market damages).

11 *See infra* note 36.

12 *See* Mark A. Lemley & Scott Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 2021 (2007) ("While an effort by courts to mimic the market seems unexceptional, in fact reliance on private license deals involves a degree of circularity because royalty rates in those deals are themselves set as a function of what patentees could get if they went to court.").

negotiated in the shadow of threatened (if not actual, ongoing) litigation, the licenses necessarily reflect in large part the expected patent damages that would result if the patentee and the licensing target do not reach an agreement.[13] In particular, the expected damages payout depends critically on the probability of success for the patentee at trial. For patent litigation on average, this factor is much less than one.[14] In other words, negotiating to avoid the threat of patent suit will pivot about the expected payout from such a suit: the probability of success times the expected damages award.

If the patentee does ultimately file suit, if and when patent damages are actually being computed, then the patentee has already survived an invalidity attack and has proved infringement. There is no probability of failure—the patentee has won. Prior licenses that had incorporated a discount factor for expected payout should not be used as direct measures of a reasonable royalty. Where these conditions hold, incautious use of this seemingly objective data will lead to improperly set damages.[15]

In their contribution to the 2016 Conference on Patent Damages, Jonathan Masur and Erik Hovenkamp (H&M) offer some of the latest scholarship in this important area.[16] Building off points made in an earlier Masur article,[17] the duo make two main arguments. They first reemphasize and reinforce the problems stemming from the circularity implicit in using prior licenses that are negotiated in the shadow of litigation. On this point, this article agrees with them. Their work joins and reinforces the concern that such licenses are not the clean, objective evidence that they appear to be.[18] And as I will argue below, a hundred years ago the Supreme Court warned against using exactly such licenses for many of the same reasons we are concerned about them today. Yet despite that sage advice, the Federal Circuit is moving in the opposite direction and is liberalizing the use of licenses reached in settlements rather than restricting them.

Despite our agreement on that point, this article though sharply disagrees with H&M on a related matter. The pair goes beyond simply cautioning against using settlement licenses as comparables. They conclude that *all* patent licensing is inherently fraught with these problems because there is no patent licensing that

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[13] *Id.* at 2021–22.

[14] *See* Stephen H. Kalos & Jonathan D. Putnam, *On the Incomparability of 'Comparables': An Economic Interpretation of 'Infringer's Royalties'*, 9 J. PROPRIETARY RTS. 1, 3 (1997) (asserting that "the potential licensee would be willing to pay up to the 'expected value' of the license, where the expected value is the full economic value of the license discounted for the probability that the patent is invalid and/or not infringed.").

[15] "Improperly set" here means improper relative to the reasonable royalty that is based on the assumption that the patent is valid and infringed.

[16] *See generally* Erik Hovenkamp & Jonathan Masur, *How Patent Damages Skew Licensing Markets*, 36 REV. LITIG. 379 (2017).

[17] *See* Masur, *Use and Misuse*, *supra* note 9, at 120 (setting forth three problems arising from "the use of existing licenses to measure reasonable royalty damages").

[18] *See infra* note 42.

exists without the taint of these circularities.[19] They suggest we simply stop using prior negotiated licenses as evidence for calculating patent damages.[20]

Although agreeing descriptively that circularity is a problem for *most* of today's licensing, this article argues that there are (and have been) licensing programs that do not succumb to the circularity disease and that do produce market-based evidence that can be used rather directly to compute patent damages. And they should be emphasized not just because they are good sources of data for damages, but more importantly, such licensing programs are normatively important for justifying the patent system as an engine of innovation. Such licensors (along with innovators that sell manufactures) form the core connection between invention and innovation. Such licensing programs are programs of innovation and technology transfer. Technological tools are moving from their creators to their myriad users.

At a fundamental level, H&M have overlooked the distinction between *ex ante* versus *ex post* licensing. They focus solely on the latter while ignoring the former. In its 2011 report on the Evolving IP Marketplace, the Federal Trade Commission devotes the first two chapters to distinguishing *ex ante* from *ex post* licensing.[21] *Ex post* licensing is about licensing patent rights that is negotiated late "*after* the [licensing target] has invested in creating, developing or commercializing the technology" themselves.[22] Transferring the patented technology is not the focus of these transactions. Often the licensing target has already independently invented and commercialized the technology themselves. Independent invention is no defense in patent law's world of strict liability and the transaction is simply trying to resolve the overhanging patent liability. Such licenses are negotiated deep in the shadow of litigation and the licensing terms often bear little relevance to the incremental value of the patented technology. Lock-in costs, litigation costs, and litigation outcome uncertainty can all play outsized roles in these negotiations. As a result, such licenses are not particularly helpful as comparables for determining a reasonable royalty. As advised by H&M, and others before them, we should not use *ex post* licensing for determining a reasonable royalty. This article agrees.

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[19] *See* Hovenkamp & Masur, *supra* note 16, at 413 ("To avoid the problems created by the licensing-based damages standard, we offer a simple proposal: stop using it."); Masur, *Use and Misuse*, *supra* note 9, at 121 ("[T]here is doubt as to whether existing licenses can provide reliable evidence of reasonable royalty damages."). Hovenkamp & Masur do acknowledge limited circumstances where a prior negotiated license may avoid the problems they identify. *See* Hovenkamp & Masur, *supra* note 16, at 416 ("[O]ne 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."). But even this limited exception is qualified. They follow-up noting that those licenses will be "inapt" wherever "the established royalty was materially affected by pre-litigation uncertainty." *Id.*

[20] *Id.* at 413.

[21] *See* 2011 FTC IP MARKETPLACE REPORT, *supra* note 5, at 31, 49 (devoting the first chapter to *ex ante* licensing, and the second to *ex post* licensing).

[22] *Id.* at 8.

But not all patent licensing is trying to settle a potential or actual lawsuit. As emphasized by the FTC, *ex ante* licensing involves patent transactions between a patentee and a technology user that takes place "*before* the purchaser has obtained the technology through other means."[23] The purchaser wants to get technology that it has not yet independently invented. And the focus of the transaction is the technology transfer—moving technology from its creator to those that can implement it. That is innovation. It is one of the few uses of the patent system that can be defended in strong terms.[24] And because the focus is on the technology and not the patent rights, the bulk of the circularity problems just do not exist.[25] Furthermore, if indeed the incremental value is the desired datum for reasonable royalties, then the amount that a technological user is willing to pay above and beyond the existing alternatives is certainly very relevant for calculating a reasonable royalty. Such *ex ante* licenses are the market licenses that should form the basis for comparable-based reasonable royalties. Yet such *ex ante* licensing is just ignored by H&M.

This article presents three main reasons why they are incorrect when they argue that no licensing program can escape the circularity disease. As a first point, their conclusion runs counter to patent history. As explained below, already in 1889 the Court warned against reflexive use of some negotiated patent licenses—in modern parlance we would say that the problematic licenses are *ex post* licenses, or straight promises not to sue. Most of the circularity dynamics that worry today's damages scholars can be found in the court opinions of that era. But even as the Court made those warnings about *some* negotiated licensing it was simultaneously singing the praises of other licenses.

And to a large extent we overlook those programs today. Such programs create what are known as established royalties. Such a royalty program is not just suitable for damages calculations but the Court considers these as the "best" evidence for damages calculations.[26] The Court was aware of the dangers that some negotiated licenses pose, and it told lower courts to steer clear of them, but the Court also saw the importance and value of other licensing programs that stood apart from the problematic ones. There are licensing programs that avoid the circularity.

As a second point, all licensing cannot be suspect because (if true) that would suggest all market-based damages are suspect. The broad problems about patent licensing that H&M emphasize would condemn not just all prior licenses but it would also condemn using market data for lost profits calculations. There is a deep,

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[23] *Id.* at 7–8.

[24] *See* Oskar Liivak, *Establishing an Island of Patent Sanity*, 78 BROOK. L. REV. 1335, 1357–65 (2013).

[25] *See* 2011 FTC IP MARKETPLACE REPORT, *supra* note 5, at 145 n.28 (noting that "circularity is attenuated in an ex ante licensing negotiation by the licensee's ability to use an alternative technology and his unwillingness to pay more than the incremental value the invention adds to the infringing product, regardless of the size of any potential damage award.").

[26] Clark v. Wooster, 119 U.S. 322, 326 (1886). *See also infra.* notes 79-80 and accompanying text.

close kinship between the manufacturing business models used for lost profits and the *ex ante* licensing used for established royalties. Product manufacturers can be seen as engaged in a type of *ex ante* licensing program. A product manufacturer sells the patented product along with an implied license to use that patented product. They are selling to users who do not yet have the technology. The profits from such sales are the difference between revenue and the costs. And that profit can be seen as the price the patentee has put on the implied license to use their patented product. Sales that are lost due to infringement are the harm that lost profits damages aims to fix. And in making that calculation we rely heavily on the market prices established for those products.[27] Yet if H&M's broad arguments are correct, then we should stop using market prices for lost profits too. If they are right, then the revenue figures for lost profits are invariably infected by discounts relating to litigation uncertainty about patent validity. Nobody, including H&M, is worried about lost profits, but it seems their arguments necessarily implicate lost profits as well.

Lastly, and in a more normative and theoretical mode, if they are right and there is no reliable market price on patented technology, then significant foundations of the patent system are implicated. And that is worrisome. If they are right that no licensing program can produce reliable market values, then that removes one of the major rationales for a patent system. Technological advancement is a critical engine of economic growth.[28] That much is certain. Which institutions a society should use to foster technological growth is far less certain. The main advantage of a patent system over alternatives like grants or prizes, is that a patent system leverages private decision making. Through their own calculus people invest time and resources to create technological tools. Others that can utilize those tools use their own calculus to decide if they want to buy that technology. When these parties come together, we have technology moving from creators to users and it is an economic activity that can be justified economically on rather strong terms. Litigation plays a role but it should not be the main event.[29]

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[27] As with established royalties, the market price is not reflexively always used as the price for calculating lost revenue. If the patent holder market price was forced to be low in order to compete with infringers, then courts are willing to adjust the lost profits calculus to account for such price erosion. *See* Grain Processing Corp. v. Am. Maize-Prods. Co., 893 F. Supp. 1386, 1392 (N.D. Ind. 1995).

[28] *See* PETER S. MENELL, *Intellectual Property: General Theories*, 2 CIVIL LAW AND ECONOMICS, THE ENCYCLOPEDIA OF LAW AND ECONOMICS 134 (Boudewijn Bouckaert & Gerrit De Geest eds., 2000) ("Robert Solow demonstrated that technological advancement and increased human capital of the labor force accounted for most (between 80 and 90 percent) of the annual productivity increase in the US economy between 1909 and 1949, with increases in the capital/labor ratio accounting for the remainder . . . . It is now widely recognized that technological advancement and enhanced human capital are the principal engines of economic growth in the United States and other industrialized countries." (citation omitted)).

[29] *See* Oskar Liivak, *Private Law and the Future of Patents*, 30 HARV. J.L. & TECH. 33, 38–41 (2017).

If patent-related transactions are all "ineluctably"[30] tainted and there is no reliable market price for the value of the technology, then we lose a critically important pillar for a functioning patent system.[31] If the patent system necessarily requires the courts (rather than private parties) to habitually compute the incremental value of technological inventions, then such a system will bankrupt itself administratively.[32] Moreover, if the government is to calculate the value of technological inventions analytically in every case (as we must assume in their non-market assessment), then rather than incurring the deadweight, dynamic, and administrative costs of a patent system, why not just have a prize or grant system instead?

Relatedly, concluding that there are no licenses that focus on technology transfer sits in considerable tension with one of the main justification for patents. Kenneth Arrow famously noted the particular difficulties attending a market for technology.[33] Without some legal backing (like through a patent system), a technology seller could not easily reveal her technology to potential buyers for fear that the buyer would just take the information. And if the seller does not reveal the information, few buyers would be willing to blindly pay beforehand. This is Arrow's information paradox.[34] Arrow saw property rights (like patents) as a way out of the paradox by enabling a market in technology. Yet if *ex post* licensing is the licenses that exist, then there is no beneficial technology transfer; the licensor has usually already independently invented the technology. It is just a market to avoid being sued. The terms of such licensing agreements bear little relation to the value of the technology.

To some extent Masur himself wishes to find a way out too. Masur concludes his initial article lamenting that, "[i]t is in the nature of legal scholarship to write comedies rather than tragedies. Each legal problem should be accompanied by a clever (and preferably plausible) solution. But it does not seem that this story is meant to end well."[35] This article tries to offer a way out. Indeed, a patent system that focuses only on *ex post* transactions has all the pathologies that (H&M) identify. But a patent system need not and should not be understood that narrowly. If instead the system focuses on *ex ante* transactions with the goal of efficient exchange and dissemination of technology, then not only does the circularity disease for patent remedies fade away, but the patent system can have a solid defensible foundation.

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30 *See* Masur, *Use and Misuse*, *supra* note 9, at 115.

31 *See* Kenneth W. Dam, *The Economic Underpinnings of Patent Law*, 23 J. LEGAL STUD. 247, 247 48 (1994).

32 *See* Liivak, *supra* note 24, at 34.

33 *See* KENNETH J. ARROW, *Economic Welfare and the Allocation of Resources for Invention*, *in* THE RATE AND DIRECTION OF INVENTIVE ACTIVITY: ECONOMIC AND SOCIAL FACTORS, NATIONAL BUREAU OF ECONOMIC RESEARCH 609, 614–19 (1962).

34 *See id.*

35 Masur, *Use and Misuse*, *supra* note 9, at 156.

The following two sections further detail these arguments. The first section lays out the current scholarship, including H&M's work, in the use of prior licenses for patent damages. Much of that work questions the widespread use of prior negotiated licenses in damages calculations. That work finds that licenses negotiated in the shadow of litigation can be infected by factors that are improper for a damages calculation. This article largely agrees with those conclusions and the section further shows that these worries are also consistent with concerns already identified by the Supreme Court in the 19th century.

But H&M go beyond this, and argue that no licensing program exists that can avoid this circularity. The second and last section takes on that argument. It shows that historically the Supreme Court recognized established royalties as a licensing program that was not tainted and that the Court considered such licenses to provide the best evidence of patent damages. Such damages calculations using established royalties are analogous to the largely uncontroversial damages via lost profits. This section ends by arguing that such licensing programs of technology transfer are necessary foundations of a healthy patent system and posits that the present disagreement about damages might be driven by a very important high-level disagreement about the purpose of the patent system. The view espoused here focuses on patents as support for a market of *ex ante* exchange of *inventions*, while H&M have limited their focus on the patent system as solely an *ex post* exchange of *patent rights*.

II. License Distortions in the Shadow: Policy and History

For the past two decades there has been a growing concern over the prevalent use of prior negotiated licenses as evidence for calculating reasonable royalties.[36] The worry is that there is an inherent feedback loop built into patent damages calculations. The notion is that patent licenses are negotiated in the shadow of litigation. Licensors and licensees base their negotiation on the expected outcome of patent litigation. Licenses negotiated to avoid the overhang of threatened litigation will necessarily contain a discount reflecting the chances that the plaintiff (due to invalidity, noninfringement, or unenforceability) will never be awarded damages.

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[36] *See* Kalos & Putnam, *supra* note 14, at 2 ("[A]rm's length royalties agreed to in the course of licensing negotiations are often insufficient to compensate for infringement."); *see* ROGER D. BLAIR & THOMAS F. COTTER, INTELLECTUAL PROPERTY: ECONOMIC AND LEGAL DIMENSIONS OF RIGHTS AND REMEDIES 230 (2005) (describing double discounting of damage awards based on prior negotiated licenses); 2011 FTC IP MARKETPLACE REPORT, *supra* note 5, at 145 n.28; Thomas F. Cotter, *Patent Holdup, Patent Remedies, and Antitrust Responses*, 34 J. CORP. L. 1151, 1182–83 n.156 (2009); Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 2021 (2007) ("The first problem comes from reliance on industry licensing rates."); David O. Taylor, *Using Reasonable Royalties to Value Patented Technology*, 49 GA. L. REV. 79, 114–16 (2014); William F. Lee & A. Douglas Melamed, *Breaking the Vicious Cycle of Patent Damages*, 101 CORNELL L. REV. 385, 418–20 (2016); Masur, *Use and Misuse*, *supra* note 9, at 130 38.

But those licensing amounts are not directly relevant for measuring damages because damages are only awarded after a patent is found valid and infringed.

A. Distortion Dynamics in the Shadow

The primary worry is that basing today's patent damages on yesterday's patent licenses creates a dangerous circular loop.[37] The feedback occurs because the majority of patent licenses are negotiated in the shadow of existing or threatened patent litigation.

As with any negotiation, the ultimate agreement (or lack thereof) reflects the position each party must confront if an agreement is not reached.[38] If the licensing target refuses to take a license, the patent holder can sue. But to prevail, the patent holder has to survive invalidity and perhaps unenforceability attacks, and then must prove infringement. As a result, any negotiated license prior to (or during trial) will reflect this discount for trial uncertainty.[39] But once courts reach the point where damages need to be computed then validity and infringement have been established.[40] An obvious error is introduced if the court uses the above-described prior negotiated license as the measure of a reasonable royalty.[41]

Although these issues have been noted for some time, recent scholarship has emphasized that this does not just threaten the damages in a particular case. The recent work has focused on the potential for this dynamic to lead to systemic problems in patent damages. If the initial negotiated license occurs in the shadow of litigation and necessarily incorporates the risk and uncertainty for success at trial, then so does any later negotiation. But those later negotiations reflect the probability of success for those litigants coupled to the potential damages recovery at trial which will be computed based on the probability of success estimates of earlier licensees.[42] This downward spiral threatens to upend reasonable royalties.[43]

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37 *See* Lemley & Shapiro, *supra* note 36, at 2021 ("While an effort by courts to mimic the market seems unexceptional, in fact reliance on private license deals involves a degree of circularity because the royalty rates in those deals are themselves set as a function of what patentees could get if they went to court.").

38 *See* ROGER FISHER ET AL., GETTING TO YES: NEGOTIATING AGREEMENT WITHOUT GIVING IN (2011).

39 *See* Kalos & Putnam, *supra* note 14, at 2 ("[R]oyalties agreed to as the result of actual licensing negotiations are generally discounted for uncertainty regarding whether the patent is valid and infringe . . . ."); Taylor, *supra* note 36, at 115 ("Negotiated royalties thus include discounts based on risk borne by the patent owner associated with proving liability, relief, and enforceability, and they may also include discounts based on costs borne by the patent owner to bring infringement litigation.").

40 *Georgia-Pacific* explicitly instructs the hypothetical negotiation to take place under the assumption that the patent is valid and infringed. *See* Georgia-Pac. Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1121 (S.D.N.Y. 1970).

41 *See* Taylor, *supra* note 36, at 115 ("Use of negotiated royalties as reasonable royalties locks in these discounts, creates incentives to infringe and litigate instead of settle and license, and, moreover, creates a circularity problem.").

42 In more formal terms, the negotiated royalty for the nth licensor, NR_n, is related to previous licenses by $NR_n = \gamma_n NR_{n-1}$ where γ_n is the probability for patentee success at trial against the nth licensing target. As γ is generally less than one, this suggests that as this dynamic plays out,

Enforcement uncertainty is not the only factor argued to be causing damages feedback. Related criticisms argue that there are feedback factors that inflate (rather than progressively deflate) patent damages.[44] In 2007, Lemley and Shapiro argued that negotiated licenses can include the licensor's hold-up costs and can far exceed the incremental value of the patented technology.[45] A later licensor may have its own hold-up costs to worry about in their licensing negotiations but because damages rely on prior negotiated licenses, that later licensor must also negotiate in the shadow of previous hold-out costs as well. For today's infringement and licensing landscape, this may well be quite prevalent: "many licenses—especially those in fields with a 'develop without full preclearance' dynamic—are negotiated after the licensee has already begun practicing the licensed patent."[46]

Furthermore once these dynamics are understood by patent holders, then there is the worry that patent holders will strategically manipulate these feedback loops. As argued by Lee and Melamed, "[p]atent holders have an incentive to negotiate first with parties least able to litigate or otherwise resist and thus most likely to agree to inflated royalties, and then to use those agreements as benchmarks in later litigation and negotiations. The feedback loop is complete."[47]

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negotiated licenses and any reasonable royalties based on those licenses will monotonically decrease. Yet depending on the details of the model, this may converge to zero at different rates. For example, the courts could use the average of all previous negotiated royalties in setting the reasonable royalties or they might rely on the most recent negotiated license. The convergence to zero of this dynamic depends on these more specific assumptions. But the main point is clear. Patent damages are not stable over time even if the value of the patented technology has not changed and patent damages that are monotonically decreasing cannot be considered functioning properly.

43 *See* Taylor, *supra* note 36, at 141 ("This circularity, left unchecked, may devalue reasonable royalties given risk associated with liability, relief, and enforcement."); Masur, *Use and Misuse*, *supra* note 9, at 121 ("Judicial error with regard to the appropriate measure of damages will produce smaller royalty amounts outside of litigation, which will in turn lead to lower judicial calculations of damages, which will then beget even smaller royalty payments outside of litigation, and so forth.").

44 *See* Lee & Melamed, *supra* note 36, at 439 ("The inflated premium extracted from one firm drives a litigation outcome for the next firm. Knowing this, patent holders have an incentive to negotiate first with parties least able to litigate or otherwise resist and thus most likely to agree to inflated royalties, and then to use those agreements as benchmarks in later litigation and negotiations. The feedback loop is complete.").

45 *See* Lemley & Shapiro, *supra* note 12, at 2022 ("The consequence of this circularity is that reasonable royalties are elevated above the benchmark level, and the problems of holdup identified earlier 'infect' the court-awarded level of reasonable royalties: Since negotiated royalties reflect a premium based on holdup, so will the reasonable royalties awarded by the court. And this in turn gives patent holders more negotiating power in a self-reinforcing manner, which ultimately magnifies the effects of holdup on negotiated royalty rates.").

46 Lee & Melamed, *supra* note 36, at 418; *accord* Hovenkamp & Masur, *supra* note 16, at 381 ("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.").

47 Lee & Melamed, *supra* note 36, at 439.

B. Proposed Reforms

Having recognized the problems, scholars have proposed a number of reforms. Rightfully recognizing that an error source is the mismatch between success probability at the time of negotiation and the certainty of success when damages are being computed, some have argued for finding places where the spread between these litigation expectations is minimized.[48] And accordingly as Kalos and Putnam suggested, in 1997, that "where a license has been negotiated after litigation in which a patent has been found to be valid, the agreed-to royalty will not have been discounted for uncertainty over validity. In such cases, the use of an actual royalty rate as a reasonable royalty rate is sufficient to compensate for infringement."[49] Although it avoids the litigation discount, this proposal ignores entirely the hold-up costs.

Alternatively, if we can get a handle on the discount factors and how they distorted prior negotiations, then perhaps we could adjust those figures to correct for the distortion. David Taylor has discussed adjustments to correct negotiated royalties.[50] Coleen Chien and Eric Schulman advocate for allowing a broader evidentiary sweep for what they term 'semi-comparable' licenses.[51] They suggest looking for licenses that contain "objective measures of the incremental value of the technology" even if that means expanding the search area to licenses that we might otherwise consider not "strictly comparable."[52] And although such licenses are not likely to offer up a clean valuation, they argue that it is a starting from which "adjustments can then be made to arrive at a reasonable royalty."[53] These proposals are a step forward. They recognize the dangers with incautious use of negotiated licenses and they all offer some future directions to optimize the needed adjustments but unwinding the distortions is not trivial.[54] In light of that complexity, some scholars advocate not using a negotiated royalty for damages calculations.[55]

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48 Masur, *Use and Misuse*, *supra* note 9, at 131 ("The problem is caused in large part because the court, in reconstructing the hypothetical negotiation, must assume that the parties agreed the patent was valid and infringed.").

49 Kalos & Putnam, *supra* note 14, at 5 ("The foregoing analysis does not mean, however, that actual royalties should never be used as reasonable royalties in estimation of damages."); *accord* Masur, *Use and Misuse*, *supra* note 5, at 147 (arguing that a settlement reached when the litigation outcome becomes near certain should be a "guiding star" in valuation).

50 *See* Taylor, *supra* note 36, at 130 ("That is, negotiated royalties (so called "comparable agreements" or "comparables") need to be adjusted to reflect these corrective assumptions before they are used as reasonable royalties."); *see also* Masur, *Use and Misuse*, *supra* note 9, at 148 ("Another solution would be for the court assessing damages to apply a multiplier to an existing license.").

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

52 *Id.*

53 *Id.*

54 *See* Masur, *Use and Misue*, *supra* note 9, at 148–56.

55 *See* John Jarosz & Michael Chapman, *The Hypothetical Negotiation and Reasonable Royalty Damages: The Tail Wagging the Dog*, 16 STAN. TECH. L. REV. 769, 811–12 (2013); *see also* Taylor, *supra* note 36, at 126-32.

As H&M write, "we offer a simple proposal: . . . in most cases they should ignore licenses entirely."[56]

C. SCOTUS: Avoid Licenses Formed in the Shadow

As noted in the previous section, a number of scholars have warned about the problematic dynamics of using licenses negotiated in the shadow of litigation as measures for damages. Despite the attraction of an objective "market" valuation, some have gone so far as to recommend curtailing the practice entirely. As a policy matter, I agree. And as a doctrinal matter, this section will argue that the Supreme Court agrees too.

In 1889, the Supreme Court decided *Rude v. Westcott*.[57] The Court reviewed an award of patent damages.[58] To prove the fact and amount of harm, the patentee offered three prior licenses. The Court noted that

> it would seem that [the license] was made in part under a threat of suit, and in part as the result of an arbitration after litigation on the subject had been commenced, and to avoid future litigation. It is clear that a payment of any sum in settlement of a claim for an alleged infringement cannot be taken as a standard to measure the value of the improvements patented, in determining the damages sustained by the owners of the patent in other cases of infringement. Many considerations other than the value of the improvements patented may induce the payment in such cases. The avoidance of the risk and expense of litigation will always be a potential motive for a settlement.[59]

Rude, although appearing before the statutory appearance of reasonable royalties, still represents good law.[60] And indeed the case is regularly cited for its proposition that litigation *settlements* are not suitable evidence for calculating patent damages.[61] But *Rude* is relevant beyond just settlement of actual, initiated patent litigation.[62]

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[56] Hovenkamp & Masur, *supra* note 17, at 413.

[57] Rude v. Westcott, 130 U.S. 152 (1889).

[58] *Id.* at 162.

[59] *Id.* at 164.

[60] *See* U.S. Frumentum Co. v. Lauhoff, 216 F. 610, 618 (6th Cir. 1914)(citing to Rude v. Westcott and its exclusion of licenses relating to litigation settlement); *see also* DONALD CHISUM, CHISUM ON PATENTS *§ 20.02* ("Judge Denison's seminal opinion in U.S. Frumentum Co. v. Lauhoff (1914) gave the reasonable royalty concept a new life, a life which was subsequently christened by the Supreme Court in 1915 and by Congress in 1922."); *see also* 4 WILLIAM C. ROBINSON, THE LAW OF PATENTS FOR USEFUL INVENTIONS § 1057, at 329 n.4 (1890) ("That payments made in settlement of suits for infringement do not establish a license fee.").

[61] Panduit v. Stahlin Bros. Fibre Works, 575 F.2d 1152, 1164 n.11 (6th Cir. 1978); Bascom Global Internet Servs. v. AOL LLC, 2011 U.S. Dist. LEXIS 100609, *4 (E.D.N.Y. Sept. 8, 2011); Cornell Univ. v. Hewlett-Packard Co., 2008 U.S. Dist. LEXIS 39343, *6–7 (N.D.N.Y. May 14, 2008); Hanson v. Alpine Valley Ski Area, Inc., 718 F.2d 1075, 1078–79 (Fed. Cir. 1983) ("[S]ince the [settlement] offers were made after the infringement had begun and litigation was threatened or probable, their terms should not be considered evidence of an 'established royalty' since '[l]icense fees negotiated in the face of high litigation costs 'may be strongly influenced by a desire to avoid full litigation . . . .'").

[62] *See* Oskar Liivak, *When Nominal is Reasonable: Damages for the Unpracticed Patent*, 56 B.C. L. REV. 1031, 1050 (2015) ("[*Rude v. Westcott*] deserves much more attention than it currently receives.").

Both its explicit holding and its articulated rationales impact all *ex post* licensing.[63] Any licensing whose central purpose is money (or other consideration) in exchange for a "promise not to sue" is suspect and should not be used incautiously for damages calculations.[64]

In short, contemporary patent scholarship has reached the conclusion that most of today's patent licenses improperly include factors that should be irrelevant to patent damages. Most importantly, most of the prior negotiated licenses include factors beyond the incremental value of the patented technology, like litigation expenses and litigation success probabilities. The general consensus is that those licenses should be either ignored as evidence for reasonable royalties or should be at least carefully handled and adjusted for these erroneous factors. This article argues that a case like *Rude v. Westcott* makes clear that, for many of the same policy rationales, the Supreme Court agrees that such licenses should be avoided altogether if not handled with real care and scrutiny.

III. Out from the Shadow: Innovation via Technology Licensing

The previous section concluded that most of today's prior negotiated licenses cannot easily be used to determine patent damages. That immediately brings up a hard and sobering question. If all *ex post* licensing should be excluded, what, if any, licensing activity is left? On first blush, little seems to remain.[65] And in part, as discussed above, that descriptive fact has led many to suggest alternative routes to computing reasonable royalties.

H&M not only agree that most licensing is problematic, but they go further, arguing that *all* prior negotiated patent licenses are error prone and should not be used.[66] Masur contends flatly that "there is no egress from this circularity."[67] Patent

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[63] *Ex ante* licensing focuses on technology transfer while *ex post* licensing focuses solely on a promise not to sue. *See supra* note 17 and accompanying text. *Ex post* licenses are predominantly forced upon those that have independently invented the patent subject matter. *See* Livak, *supra* note 29, at 46.

[64] Some question the modern relevance of *Rude* arguing that the holding of the case prohibits the use of settlements as evidence for *established royalties*. And for today's reasonable royalties, that prohibition need not be followed. *See* ResQNet.com, Inc. v. Lansa, Inc., 594 F.3d 860, 869 71 (Fed. Cir. 2010); Prism Tech. v. Sprint Spectrum, 849 F.3d 1360, 1368–70 (Fed. Cir. 2017). But such a limiting view underestimates and misunderstands the case. *Rude* addresses the relevance of certain evidence for proving the fact and amount of harm from patent infringement. The Court concluded that prior licenses negotiated under threatened or actual litigation should not be used to prove the amount of damages in a case. This is still highly relevant to a reasonable royalties calculation. Whether reasonable royalties, or lost profits, or established royalties, courts are compensating for damage. If some licenses are error prone for calculating damages under established royalties then they are still error prone for damages under reasonable royalties. After all reasonable royalties are still a form of damages and are compensation for the harm of infringement.

[65] *See* Lee & Melamed, *supra* note 36, at 418 ("[V]irtually all licenses—even those that do not arise directly out of litigation—are negotiated in 'the shadow of the law' and reflect the parties' litigation expectations.").

[66] *See* Masur, *Use and Misuse*, *supra* note 9, at 115; *see also* Hovenkamp & Masur, *supra* note 16, at

transactions are all "ineluctably" tainted by the shadow of litigation.[68] He explains that

[t]he point is that patent licenses are inherently parasitic on litigation: without the threat of litigation, there would be no licensing . . . . Whether the courts realize it or not, there is no other context in which licenses might arise.[69]

As argued above in Section I, *ex post* patent licensing is indeed problematic in the way noted by H&M, previous scholars, and the Supreme Court. *Ex post* licensing necessarily incorporates a probabilistic account of expected patent damages and often can include significant lock-in costs. And indeed we should only use such evidence very carefully, if at all.

But this article strongly disagrees with their broader theoretical claim that there is no licensing outside the context of settling litigation (whether threatened or actual). First, using negotiated licenses as evidence for damages is not some new judicial creation. It has a very long history in the United States.[70] And it is not as if the courts have not been aware of the dangers of *some* licenses. As explained below, the Supreme Court has emphasized many of the same concerns as today but it did so while still praising other licensing practices. The existence of those other practices presents a puzzle for H&M. Did H&M overlook an important class of licensing or has Congress and the Supreme Court been improperly relying of them as damages since 1793?

Second, H&M's critique, if correct, applies further than they acknowledge and presumably further than they would like. Their criticisms, if taken seriously, should not only bring into question all negotiated licenses but should bring into question lost profits as well. If there is no reason to license a patent other than to settle the prospect of litigation (and thereby tainting that license), then there is no other reason to pay a premium for a patented article as well. In short, lost profits should be as tainted as all patent licensing. But that is not an argument that anyone is

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413.

67 Masur, *Use and Misuse*, *supra* note 9, at 134 n.83.

68 *Id.* at 115.

69 *Id.* at 135.

70 The Act of 1793 based damages solely on prior licensing agreements: "the infringer should forfeit and pay to the patentee a sum equal to three times the price for which the patentee has usually sold or licensed to other persons the use of said invention." Patent Act of 1793, ch. 11, 1 Stat. 318-23, § 5. That licensing-centric damages provision was replaced in 1800 with a provision that broadened the focus to "actual damage." *See* Act of Apr. 17, 1800, ch. 25, 2 Stat. 37, 38, § 3. But note that the change in 1800 did not reflect a policy change that licensing based damages were inappropriate rather it just reflected that other modes like lost profits should be put on a similar footing for proving compensable harm. *See* Seymour v. McCormick, 57 U.S. 480, 488 (1853) (explaining the statutory change as reflecting the realization that "some inventions or discoveries had their chief value in a monopoly of use by the inventor, and not in a sale of licenses, [and as a result] the value of licenses could not be made a universal rule, as a measure of damages."). *Contra* Masur, *Use and Misuse*, *supra* note 9, at 120 (suggesting courts have only recently "arrived at" the use of existing licenses and that "[c]ourts have relied upon existing licenses in calculating damages for decades").

making. Lost profits are generally considered immune (or at least correctable) from litigation uncertainty.

Lastly, and more normatively, if the patent system cannot generate reliable market valuations for patented inventions then the system has far bigger problems than this contained debate about comparable licenses used in computing reasonable royalties. If the patent system cannot function to foster efficient technology transfer and a robust market for it, then the patent system loses a central pillar justifying its existence.

A. Established Royalties: Untainted Licensing

As mentioned above, the Supreme Court's 1889 opinion warns against the incautious use of any licensing whose purpose is solely to relieve the licensee of patent litigation (whether potential or actual litigation).[71] But while offering that warning, the Court also strongly suggests that other licensing is not problematic. The Court reiterated the long standing rule that some negotiated licenses can be used as a measure of damages: "[i]t is undoubtedly true that where there has been such a number of sales by a patentee of licenses to make, use and sell his patents, as to establish a regular price for a license, that price may be taken as a measure of damages against infringers."[72]

Having warned that litigation related licenses are problematic, the Court outlines that other categories are not tainted. Such licenses should be "[l]ike sales of ordinary goods, they must be common, that is, of frequent occurrence, to establish such a market price for the article that it may be assumed to express, with reference to all similar articles, their salable value at the place designated."[73]

The Court expands on this and enumerates a set of criteria as a suitable measure of damages via an established royalty:

1. "it must be paid or secured before the infringement complained of;"
2. "it must be paid by such a number of persons as to indicate a general acquiescence in its reasonableness by those who have occasion to use the invention;"
3. "it must be uniform at the places where the licenses are issued;"[74] and
4. it must not be paid under threat of suit or in settlement of litigation.[75]

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71 Rude v. Westcott, 130 U.S. 152 (1889).

72 *Id.* at 165.

73 *Id. Contra* Hovenkamp & Masur, *supra* note 16, at 413 ("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 . . . that are always sold to everyone at a common price.").

74 *Rude*, 130 U.S. at 165.

75 *Id.* at 166.

There is no doubt that such established royalties are not often granted,[76] but their existence provides an important historical counterpoint to H&M's suggestion that no licensing programs can give accurate guidance. And as the Supreme Court is explicitly excluding licenses formed "under threat of suit," it is clear that *ex post* licensing is being ruled out as an evidentiary source for established royalties.

And it is not just an existence of proof of some obscure exception to H&M's broad pronouncement. Such licensing programs that lead to established royalties were considered excellent measures of damages. The Court has repeatedly stated that "established royalt[ies] . . . [afford] a basis for measuring . . . damages"[77] and in fact "it is a general rule in patent cases, that established license fees are the best measure of damages that can be used."[78] In modern times the Federal Circuit has similarly recognized that "[w]here an established royalty exists, it will usually be the best measure of what is a 'reasonable' royalty."[79]

At the very least, this long standing history and praise for established royalties should present an interesting puzzle for the modern debate over negotiated licenses.[80] Why have courts continued to praise established royalties? At times we might disregard old hoary cases when their reasoning is outdated, but the cases of the time demonstrate that the courts worried about many of the same litigation risk distortions that today's scholarship is highlighting. Yet those cases still embraced a specific type of licensing as a measure of damages. This article suggests that those cases were considering a style and rationale for licensing that H&M have failed to consider. In large part, this article argues that the Supreme Court was embracing *ex ante* patent licensing.

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[76] Michael J. Chapman, *Using Settlement Licenses in Reasonable Royalty Determinations*, 49 IDEA 313, 323 (2009).

[77] Dowagiac Mfg. Co. v. Minn. Moline Plow Co., 235 U.S. 641, 648 (1914); *see also* Philp v. Nock, 84 U.S. 460, 462; Birdsall v. Coolidge, 93 U.S. 64, 70 (1876); Clark v. Wooster, 119 U.S. 322, 326 (1886); Tilghman v. Proctor, 125 U.S. 136, 143 (1888).

[78] Clark v. Wooster, 119 U.S. 322, 326 (1886).

[79] Nickson Indus., Inc. v. Rol Mfg. Co., 847 F.2d 795, 798 (Fed. Cir. 1988); Hanson v. Alpine Valley Ski Area, Inc., 718 F.2d 1075, 1078 (Fed. Cir. 1983); *see also* LAWRENCE M. SUNG, PATENT INFRINGEMENT REMEDIES 281 (2003) (noting that licenses for the patent in suit have been called "one of the strongest measures of a reasonable royalty"). But even with an established royalty, the courts have recognized scenarios where the established royalty must be adjusted to properly compensate the patentee. *See, e.g.*, *Nickson Indus.*, 847 F.2d at 798 ("[A] higher figure may be awarded when the evidence clearly shows that widespread infringement made the established royalty artificially low." (citing Trio Process Corp. v. L. Goldstein's Sons, Inc., 533 F.2d 126, 129–30 (3d Cir. 1976))).

[80] Although David Taylor certainly argues that even established royalties are problematic ("Unadjusted established royalties, because they are negotiated royalties, reflect valuation of patent rights"), he still notes the puzzle of the case law that praises established royalties. Taylor, *supra* note 36, at 132 ("But there is still law indicating that established royalties, when they exist, are the "best measure" of reasonable royalties."). While I agree with Taylor's focus on the value of the patented technology rather than the value of the patent rights, I do not agree that established royalties value the rights. To see it otherwise appears inconsistent with *Rude*.

In particular, if the harmful dynamics of circularity appear wherever negotiations are tainted by either litigation risk distortions or where the defendant has sunk costs that can be leveraged, we should then look for technological negotiations that occur without these two factors. There is broad consensus that the proper measure of damages is the "incremental [*ex ante*] value of the patented [technology] over the next-best alternative."[81] Or as Lee and Melamed described it, we want "the invention's market value" without the distorting "factors such as lock-in costs and litigation risks."[82]

Such a clean transaction occurs when the patent holder licenses the technology to a *user* who is (at the time of negotiation) able to deploy the next best alternative (patented or not) as a substitute to using the patented technology. For this example, the focus is on a simple user of the technology, not someone who wants to resell it. How much would I pay for a non-exclusive license to use that technology? For concreteness, consider a cost-saving process that reduces the energy needs for production of some valuable chemical.[83] I will pay up to the amount of the costs that are saved.[84] I do not particularly care about the validity of the patent. I do not have the technology yet and that is what I am paying for. Such a negotiated license just does not seem tainted by any issues about validity. I do not care about validity—I want to cut my energy needs and I need the technology to do that. If the technology does not work, I would not pay. Now imagine that all potential users are offered a similar license.[85] Evidence from such an extensive, non-exclusive licensing program would qualify for established royalties because it provides an undistorted market price for the patented invention.[86] Here, non-exclusive licensing to end-users can

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81 *See* 2011 FTC IP MARKETPLACE REPORT, *supra* note 5, at 189.

82 Lee & Melamed, *supra* note 36, at 440–41.

83 *See* Liivak, *supra* note 24, at 1361 (exploring the economics of selling a cost-saving process to an industry that wants to utilize it).

84 Hovenkamp and Masur make a lot out the "naïve" view of patents as commodities and that such a view would foreclose the opportunity to price discriminate. Hovenkamp and Masur, *supra* note 16, at 413. This article does not agree. Established royalties do not require the same dollar figure for each license. It just needs to be "uniform." And that requirement has generally allowed flexibility so that the license can meter the royalties to match incremental value of the technology for varying users. For example in the cost saving example, a license for a cost saving process can have uniform licensing terms but it can be very tailored to the incremental value of users.

85 John Duffy has argued that courts have traditionally put a thumb on the scale to aid such commercializing patentees. *See* John F. Duffy, *Reviving the Paper Patent Doctrine*, 98 CORNELL L. REV. 1359 (2013). One un-appreciated benefit of such a doctrine is that commercializing patentees (and those that transact with them) are less worried about patent invalidity and non-infringement because the probability of finding the patent valid and infringed increases toward unity. In other words, such doctrines help further reduce circularity by reducing the litigation uncertainty discount.

86 Some might respond that this is unrealistic and that in reality potential technology users will feign disinterest but will surreptitiously use the technology anyways. If patent remedies are not properly designed then indeed this may happen. *See* Panduit Corp. v. Stahlin Bros. Fibre Works, Inc. 575 F.2d 1152, 1163 (6th Cir. 1978). But it need not happen. For such cases of bad actors that copy and pirate in the face of a patentee who is trying to actually innovate (by tech transfer), patent law should unload the full panoply of the court's power via injunctive relief and enhanced damages to

provide a fairly accurate guide for patent damages.[87] Such licensing programs are precisely those envisioned by the FTC in support of robust *ex ante* transactions.

B. Lost Profits: Implied Licensing of a Technological Commodity

Established royalties, as described in the previous section, are not the only place where patentees are engaged in licensing to end-users. Established royalties are very closely related to lost profits. Until the development of reasonable royalties, they were the two avenues for establishing patent damages. Importantly, lost profits are generally acknowledged to be less susceptible to the circular dynamics described above for negotiated licenses. But why?

After all, a manufacturer is selling a patented object for a market price, but at the same time the manufacturer is licensing as well. The license is just not explicit. Manufacturer patentees are selling their patented product for money. In the transaction they get money in exchange for the patented product and an implied license to use the patented product. The profit on any component sales that are lost due to infringement is the harm that lost profits damages aims to fix. And in making that calculation, we rely heavily on the market prices established for those products. The lost profits are quite directly akin to the harm from unlicensed use in an established royalty case. As suggested by David Taylor, established royalties could perhaps be better described as "lost royalties."[88]

If as claimed by Masur, there is "simply no reason to license a patent other than to alleviate the threat of suit,"[89] then there is not going to be a reason to pay a premium (above the marginal production costs) for a patented device. Every component sale is a negotiation and the selling price should reflect some discount for the expectation value of patent damages via lost profits. Lost profits would be as hopelessly tainted as reasonable royalties via negotiated licenses. But I do not think H&M are willing to go that far. The circularity discussions from other scholars just do not implicate lost profits either.[90]

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prevent those actions. *See id.*

87 Exclusive licensing from a patentee to someone like a regional distributor for the patented technology could also provide an unencumbered estimate of the value of the patented technology but need to be more careful. First, the negotiation for license to become the exclusive supplier of the technology does hinge on validity concerns and that raises many of the problems that plague negotiated *ex post* licenses. Second, the value of the technology requires business estimates as to end user demand for the technology. The first problem can be ameliorated perhaps by transactions that resemble warranty deeds rather than quitclaim deeds. The licensor insures the licensee against the chance of invalidity. And as to the second, that valuation is surely an estimate but it is not less an estimate than any other business venture where ultimate consumer demand needs to be guessed.

88 Taylor, *supra* note 36, at 97 n.64.

89 Masur, *Use and Misuse*, *supra* note 9, at 134.

90 There are times (just as with established royalties) when the "market" price during the period of infringement is not adopted directly as the measure of lost profits. When price erosion can be proven, then the patentee can argue that the selling price would have been greater but for the infringement. *See* Grain Processing Corp. v. Am. Maize-Prods. Co., 893 F. Supp. 1386, 1390–92 (N.D. Ind. 1995). This is quite analogous to Learned Hand's concerns in Consol. Rubber Tire Co.

And just as with the established royalties example, the easier lost profits cases have patent holders selling to end users. The end-user is not particularly motivated by patent validity, nor are they locked-in to make the purchase. The profit premium that the patent holder can reap is a market value for the incremental value of the patented tool relative to the next-best alternatives. In short, such sales figures do provide a reliable market price for the patented technology.

C. For Innovation We Need a Market in Inventions

The above shows that there are important types of patent licensing (explicit or implied) where the harmful impacts of circularity are muted. Those examples not only provide good *data*[91] for patent damages, but they exemplify (in my opinion) the basic function and nature of the patent system. By having patent damages keyed to these types of activities, the patent system instructs patent holders what we expect them to do with their patents (innovate) and more importantly what duties others have (avoid infringing and causing harm to the innovators).[92] When an inventor can support themselves financially with such a business model, I am convinced that it represents socially beneficial, economically defensible behavior that deserves strong court protection to prevent piracy and other harms.[93] Through such a system, patent law can hope to create a vibrant market in technological artifacts and, through it, society benefits as technology is created and deployed.[94] An important part of that system is in fact treating inventions like commodities.[95] That is how the technology can be widely deployed. And indeed such a patent system might strike some as "naïve and grossly over-simplified."[96] But to me, simple is not a bug. In complex systems, simple often is the only thing that might actually work.[97]

H&M do not see patent damages or the overall patent system the same way. As described in part above, they think that "[t]he prospects for finding a true market measure of patent value do not seem promising."[98] They lament that "courts will not be able to draw upon market indications of value"[99] but they cannot see any licensing activity that could take place outside the shadow of litigation. They focus

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v. Diamond Rubber Co. of N.Y., 226 F. 455, 459 (S.D.N.Y. 1915), *aff'd*, 232 F. 475 (2d Cir. 1916).

91 *See* Chien & Schulman, *supra* note 51 (focusing on seeking data sources exclusively).

92 *See* Liivak, *supra* note 29, at 51.

93 *See* Liivak, *supra* note 24, at 1376.

94 In this sense, this market narrative focuses much more on actual innovation rather than just the act of invention. *See* JOSEPH A. SCHUMPETER, THE THEORY OF ECONOMIC DEVELOPMENT 88–89 (1951) (discussing the distinction between invention and innovation). Invention is what gets you in the door to get a patent but innovation (or gearing up to innovate) is what starts to accrue damages.

95 *Id.*

96 Hovenkamp & Masur, *supra* note 16, at 413.

97 *See* Henry E. Smith, *Property as Platform: Coordinating Standards for Technological Innovation*, 9 J. COMPETITION L. & ECON. 1057, 1090 (2013).

98 Masur, *Use and Misuse*, *supra* note 9, at 156.

99 *Id.* at 157.

on the "patent licensing market." For them, "[p]atent licenses are best understood as civil settlements in anticipation of possible litigation."[100] Technology transfer is just not a central part of their story.

With each worldview, I think we are each being internally consistent. But they are different views with different foci. I am focused on the invention—the patented technology—and its efficient distribution through market exchange. Focusing on the actual technology is different than focusing on the patent rights.[101] H&M talk about the "patent rights" as the main focus. They talk about the "efficient dissemination of patent rights" and a "patent licensing market." That is quite different from a healthy invention licensing market. And though this current debate is ostensibly about a detailed discussion of computing a reasonable royalty, it is also directly connected to a much bigger debate over the purpose and function of the patent system.

IV. Conclusion

Recent scholarly work has highlighted problematic circular dynamics in the use negotiated licensing agreements for patent damages. Much of the criticism is well deserved. Most prior licensing agreements are not indicative of the value of the patented technology but are rather just attempts to settle potential or actual litigation. These are all *ex post* licenses. But the problems with ex post licenses does not mean that there are no licenses that have probative value for measuring a market value for a patented invention. *Ex ante* licensing is different in kind. Where the patentee is an innovator and is selling the technology to those that do not yet have it, those licenses produce the sought after market-based valuation of the patented invention relative to the available alternatives. Such acts not only provide more reliable data for computing patent damages but those acts are also the very ones that should be supported and encouraged as forming the backbone of a patent system that protects innovation.

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[100] *Id.* at 127.

[101] *See* Taylor, *supra* note 36, at 91–97.