

# USING REASONABLE ROYALTIES TO VALUE PATENTED TECHNOLOGY

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## I. INTRODUCTION

In the last several years, commentators have expressed serious concerns with the state of the law governing awards of reasonable royalties as damages in patent infringement cases. These concerns range from uncertainty related to the underlying rationale and methodology for calculating reasonable royalties,<sup>1</sup> misplaced use of reasonable royalties to punish infringers,<sup>2</sup> excessive awards,<sup>3</sup> and the creation of incentives for abusive negotiation and litigation tactics.<sup>4</sup>

Given these concerns, the proper assessment of royalties has been a recent, frequent topic for debate among economists and legal scholars. Economists have challenged basic premises of the law governing reasonable royalties and injunctions based on various economic theories and insights.<sup>5</sup> Similarly, legal scholars

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<sup>1</sup> See, e.g., Daralyn J. Durie & Mark A. Lemley, *A Structured Approach to Calculating Reasonable Royalties*, 14 LEWIS & CLARK L. REV. 627, 644 (2010) (“Reasonable royalty damage awards are a mess. Damage awards, rationales, and percentages are widely disparate, reflecting an uncertain legal environment and very little oversight of jury fact-finding.”).

<sup>2</sup> See, e.g., Brian J. Love, *The Misuse of Reasonable Royalty Damages as a Patent Infringement Deterrent*, 74 MO. L. REV. 909, 910–11 (2009) (“This Article documents the striking fact that courts have time and again awarded reasonable royalty damages for patent infringement that rise well above any objectively ‘reasonable’ level for the apparent purpose of punishing defendants for their infringing conduct.”).

<sup>3</sup> See, e.g., Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 2035 (2007) (employing an economic model for analyzing patent holdup and royalty stacking to support their “strong[ ] belie[f] that the threat of holdup gives excessive reward to patent holders”).

<sup>4</sup> See, e.g., Amy L. Landers, *Let the Games Begin: Incentives to Innovation in the New Economy of Intellectual Property Law*, 46 SANTA CLARA L. REV. 307, 307 (2006) (“[C]ourts have failed to define standards to align damages with the patentee’s harm. As a result, the damages awarded for patent infringement far exceed the amount that the patent is worth. These circumstances create incentives for patentees to ‘game’ the patent system by seeking large damages and settlement jackpots from those accused of infringement.”).

<sup>5</sup> See, e.g., Elizabeth M. Bailey et al., *Making Sense of “Apportionment” in Patent Damages*, 12 COLUM. SCI. & TECH. L. REV. 255, 259 (2011) (analyzing apportionment as the proper solution to problematic damage awards and suggesting that “the reasonable royalty award (in dollars) should reflect the incremental value (in dollars) of the patented technology to the defendant as compared to the next best alternative”); Michael J. Chapman, *Using Settlement Licenses in Reasonable Royalty Determinations*, 49 IDEA 313, 336 (2009) (arguing that settlement licenses should be considered in reasonable royalty determinations); Einer Elhauge, *Do Patent Holdup and Royalty Stacking Lead to Systematically Excessive Royalties?*, 4 J. COMPETITION L. & ECON. 535, 537–45 (2008) (employing economic analysis to critique the Lemley-Shapiro economic model for analyzing patent holdup and royalty stacking); John C. Jarosz & Michael J. Chapman, *The*

have reassessed the governing law and, in particular, traditional methodologies for calculating reasonable royalties.<sup>6</sup>

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*Hypothetical Negotiation and Reasonable Royalty Damages: The Tail Wagging the Dog*, 16 STAN. TECH. L. REV. 769, 829 (2013) (proposing an alternative framework for calculating damages that focuses on “the contributions of the patent, licensing comparables, and design-around costs”); Mark A. Lemley & Carl Shapiro, Reply, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 2163, 2163–64 (2007) (defending their economic model); 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, 23 (2009) (contending that the better approach to the reasonable royalties analysis involves calculating “the difference between the net profits the infringer earned from sales of the infringing product and net profits it could have earned using the next best non-infringing substitute”); Carl Shapiro, *Injunctions, Hold-Up, and Patent Royalties*, 12 AM. L. & ECON. REV. 280, 308 (2010) (describing an economic model identifying basic elements of the hold-up component of negotiated royalties); J. Gregory Sidak, *Holdup, Royalty Stacking, and the Presumption of Injunctive Relief for Patent Infringement: A Reply to Lemley and Shapiro*, 92 MINN. L. REV. 714, 747–48 (2008) (critiquing the Lemley-Shapiro model of patent holdup and royalty stacking); Hal J. Singer & Kyle Smith, *What Does an Economist Have to Say About the Calculation of Reasonable Royalties?*, 14 INTELL. PROP. L. BULL. 7, 21 (2009) (analyzing various economic models used for calculating royalties and finding that none of them “give definitive guidance on estimating reasonable royalties”).

<sup>6</sup> See, e.g., Thomas F. Cotter, *Four Principles for Calculating Reasonable Royalties in Patent Infringement Litigation*, 27 SANTA CLARA COMPUTER & HIGH TECH. L.J. 725, 727 (2011) [hereinafter Cotter, *Four Principles*] (reassessing the traditional methodologies for determining reasonable royalties and proposing four principles that courts should consider in awarding reasonable royalties); Thomas F. Cotter, *Patent Holdup, Patent Remedies, and Antitrust Responses*, 34 J. CORP. L. 1151, 1152–54 (2009) [hereinafter Cotter, *Patent Holdup*] (summarizing critiques of patent holdup analyses and explaining the relationship between patent law and antitrust law); Durie & Lemley, *supra* note 1, at 629–33 (critiquing the *Georgia-Pacific* test for calculating reasonable royalty damages); John M. Golden, Commentary, *“Patent Trolls” and Patent Remedies*, 85 TEX. L. REV. 2111, 2160 (2007) [hereinafter Golden, *“Patent Trolls”*] (questioning “the wisdom of an approach to permanent injunctions that categorically discriminates against noncompeting patent holders”); John M. Golden, *Principles for Patent Remedies*, 88 TEX. L. REV. 505, 591–92 (2010) [hereinafter Golden, *Principles for Patent Remedies*] (offering fundamental principles to evaluate and improve patent remedies); Landers, *supra* note 4, at 328–31 (providing an overview of approaches to measuring royalties); Amy L. Landers, *Patent Claim Apportionment, Patentee Injury, and Sequential Invention*, 19 GEO. MASON L. REV. 471, 489–90 (2012) (concluding that apportionment is the proper approach for compensating patent holders); Mark A. Lemley, *Distinguishing Lost Profits from Reasonable Royalties*, 51 WM. & MARY L. REV. 655, 656 (2009) (discussing the difference between reasonable royalties and lost profits and concluding that a clear delineation between the two would prevent overcompensation); Love, *supra* note 2, at 916–23 (disagreeing with the use of inflated reasonable royalty awards as a means of deterring patent infringement); Christopher B. Seaman, *Reconsidering the Georgia-Pacific Standard for Reasonable Royalty Patent Damages*, 2010 BYU L. REV. 1661, 1666–67 (finding the *Georgia-Pacific* standard for determining reasonable royalties problematic and proposing an approach based on the infringer’s expected costs of adopting a non-infringing substitute).

At the same time, all three branches of the federal government have studied ways to improve the law governing reasonable royalties. Courts have confronted and resolved a few targeted challenges to particular methodologies for calculating reasonable royalties.<sup>7</sup> Congress has considered more sweeping change in the form of legislative proposals that would affect either the substantive test or the procedural rules governing the determination of reasonable royalties.<sup>8</sup> President Obama expanded a program designed to bring academic experts to the Patent and Trademark Office (USPTO) to conduct research,<sup>9</sup> and the USPTO subsequently called for proposals addressing “the successes, failures, and avenues for improvement of the current

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<sup>7</sup> See, e.g., *Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1315 (Fed. Cir. 2011) (“This court now holds as a matter of Federal Circuit law that the 25 percent rule of thumb is a fundamentally flawed tool for determining a baseline royalty rate in a hypothetical negotiation.”); *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1339 (Fed. Cir. 2009) (rejecting calls by legal scholars to eliminate use of the entire market value rule in reasonable royalty calculations).

<sup>8</sup> Prior to passage of the Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011), Congress considered amending, but ultimately did not amend, the relevant statutory section to codify a particular substantive approach to determining reasonable royalties that would have emphasized apportionment. For one analysis of the then-pending legislation, see generally Erick S. Lee, *Historical Perspectives on Reasonable Royalty Patent Damages and Current Congressional Efforts for Reform*, 13 UCLA J.L. & TECH. 1 (2009). More recently, the House of Representatives passed legislation introduced by Bob Goodlatte that focuses on procedure. See Press Release, U.S. House of Representatives Judiciary Comm., House Passes Innovation Act to Make Reforms to our Patent System (Dec. 5, 2013), available at <http://judiciary.house.gov/index.cfm/2013/12/house-passes-innovation-act-to-make-reforms-to-our-patent-system>. The legislation would have compelled the Judicial Conference of the United States to “develop rules and procedures . . . to address the asymmetries in discovery burdens and costs” in patent cases. Innovation Act, H.R. 3309, 113th Cong. § 6(a)(1) (2013). One of the proposed reforms would have set a default rule seeking to limit early discovery regarding damages issues in most cases to documents “sufficient to show profit attributable to the claimed invention of the patent or patents at issue.” *Id.* § 6(a)(3)(A)(i)(V). The Chairman of the Senate Judiciary Committee, however, ultimately removed the bill from the committee’s agenda. See Press Release, Comment of Senator Patrick Leahy (D-Vt.), Chairman, Senate Judiciary Comm., On Patent Legislation (May 21, 2014), available at <http://www.leahy.senate.gov/press/comment-of-senator-patrick-leahy-d-vt-chairman-senate-judiciary-committee-on-patent-legislation>.

<sup>9</sup> See Press Release, The White House, Office of the Press Sec’y, Fact Sheet: White House Task Force on High-Tech Patent Issues (June 4, 2013), available at <http://www.whitehouse.gov/the-press-office/2013/06/04/fact-sheet-white-house-task-force-high-tech-patent-issues> (announcing expansion of the Edison Scholars Program “to develop—and make available to the public—more robust data and research on the issues bearing on abusive litigation”).

approaches for calculating damages” in patent cases.<sup>10</sup> At the same time, the President’s Council of Economic Advisers, National Economic Council, and Office of Science and Technology Policy released a joint report concluding that “the best approach to resolving today’s patent troll problem is . . . to reduce the extent to which legal rules allow patent owners to capture a disproportionate share of returns to investment.”<sup>11</sup> In addition, the Federal Trade Commission (FTC) issued a report rethinking practically every facet of the law governing damages in patent cases,<sup>12</sup> conducted a joint workshop on patent assertion entities with the Antitrust Division of the Department of Justice that considered the economics of patent licensing,<sup>13</sup> and announced that it will conduct a formal study of patent assertion entities and their licensing activities.<sup>14</sup>

Despite all of this concern, debate, and study, the federal government, to date, has not implemented any major reform of the law governing reasonable royalties.<sup>15</sup> States, however, have taken

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<sup>10</sup> Call for Proposals, U.S. Patent and Trademark Office, Thomas Alva Edison Visiting Scholars Program Expansion (on file with author) (seeking proposals from “scholars in intellectual property, innovation, economics, and related fields” for research topics, and listing as an example “the successes, failures, and avenues for improvement of the current approaches for calculating damages in IP litigation—e.g., the *Georgia-Pacific* framework—and how . . . these approaches [are] related to issues of royalty stacking and hold-up”).

<sup>11</sup> PRESIDENT’S COUNCIL OF ECON. ADVISORS ET AL., EXEC. OFFICE OF THE PRESIDENT, PATENT ASSERTION AND U.S. INNOVATION 13 (2013), available at [http://www.whitehouse.gov/sites/default/files/docs/patent\\_report.pdf](http://www.whitehouse.gov/sites/default/files/docs/patent_report.pdf).

<sup>12</sup> See FED. TRADE COMM’N, THE EVOLVING IP MARKETPLACE: ALIGNING PATENT NOTICE AND REMEDIES WITH COMPETITION 177–212 (2011), available at <http://www.ftc.gov/os/2011/03/110307patentreport.pdf> (evaluating proposed reforms to the law governing reasonable royalties).

<sup>13</sup> Press Release, Dep’t of Justice, Federal Trade Commission to Hold Workshop on Patent Assertion Entity Activities (Nov. 19, 2012), available at [http://www.justice.gov/atr/public/press\\_releases/2012/288932.htm](http://www.justice.gov/atr/public/press_releases/2012/288932.htm).

<sup>14</sup> Press Release, Fed. Trade Comm’n, FTC Seeks to Examine Patent Assertion Entities and Their Impact on Innovation, Competition (Sept. 27, 2013), available at <http://www.ftc.gov/opa/2013/09/paestudy.shtm>.

<sup>15</sup> As of this writing, the only reform directly linked to the law governing the assessment of reasonable royalties has been the Federal Circuit’s jettison of the 25% rule of thumb previously used by some damages experts testifying in patent infringement cases. See *Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1318 (Fed. Cir. 2011). The Leahy-Smith America Invents Act did not include any reform directly related to reasonable royalties. See generally Pub. L. No. 112-29, 125 Stat. 284 (2011). And while President Obama recently announced a handful of executive actions “to help bring about greater transparency to the patent system and level the playing field for innovators,” none implement reform

unprecedented action. Vermont's attorney general, for example, sued a patent owner for engaging in unfair and deceptive trade practices.<sup>16</sup> Among other things, the attorney general alleged that statements in letters sent to accused infringers would likely lead the recipients to believe that prior licensing agreements between the patent owner and third parties established that an identified price for a license was fair when, in reality, the average licensing fee was less.<sup>17</sup> Vermont subsequently amended its consumer protection statute, making it an express violation of the statute to make a bad faith assertion of patent infringement.<sup>18</sup> Notably, according to the amended statute, bad faith may be supported by evidence that a patent owner "offers to license [its] patent for an amount that is not based on a reasonable estimate of the value of the license."<sup>19</sup> Thus, efforts to ensure that accused infringers pay patent owners fair and reasonable compensation for use of patented technology has not abated but only intensified in the virtual absence of direct federal action on point.

If the relevant decisionmakers in governments decide to address concerns associated with determinations of royalties for

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specifically directed to the assessment of reasonable royalties. Press Release, The White House, Office of the Press Sec'y, *supra* note 9.

<sup>16</sup> See generally Consumer Protection Complaint, Vermont v. MPHJ Tech. Invs., LLC, No. 282-5-13 Wncv (Vt. Sup. Ct. May 8, 2013).

<sup>17</sup> *Id.* at 9–10. Other states' attorneys general have taken similar steps. See, e.g., Press Release, Office of the Minn. Att'y Gen., Attorney General Lori Swanson Announces First-in-the-Nation Order to Stop Delaware Company from "Patent Trolling" in Minnesota (Aug. 20, 2013), available at [http://www.law.berkeley.edu/files/Panel\\_17b\\_Documents.pdf](http://www.law.berkeley.edu/files/Panel_17b_Documents.pdf) (requiring MPHJ Technology Investments to cease patent trolling in the state); News Release, Office of the Neb. Att'y Gen., Attorney General Bruning Investigating "Patent Trolls" (July 18, 2013), available at [http://www.ago.ne.gov/resources/dyn/files/1069520z2e735d6e/\\_fn/071813+Bruning+Patent+Troll+Release+.pdf](http://www.ago.ne.gov/resources/dyn/files/1069520z2e735d6e/_fn/071813+Bruning+Patent+Troll+Release+.pdf) (announcing investigation into patent enforcement efforts by a Texas law firm). But see *Activision TV, Inc. v. Pinnacle BanCorp, Inc.*, 976 F. Supp. 2d 1157, 1169 (D. Neb. 2013) (granting a preliminary injunction against Nebraska's attorney general and two of his employees to prevent them from enforcing a cease and desist order to "prevent or impede the [patent owner's law] firm from representing [the patent owner] in connection with licensing and litigation of U.S. patents").

<sup>18</sup> See H. 299, 2013 Gen. Assemb., 72d Sess. (Vt. 2013) (codified as amended at VT. STAT. ANN. tit. 9, §§ 4195–4199) (amending the state's consumer protection law to "facilitate the efficient and prompt resolution of patent infringement claims, protect Vermont businesses from abusive and bad faith assertions of patent infringement, and build Vermont's economy, while at the same time respecting federal law and being careful to not interfere with legitimate patent enforcement actions" by targeting "bad faith assertion[s] of patent infringement").

<sup>19</sup> *Id.* § 4197(b)(5).

patent infringement directly,<sup>20</sup> there are two primary avenues for reform. The first focuses on reasonable royalties themselves, that is, royalties determined by courts. The second focuses on negotiated royalties—royalties agreed upon by parties. While the first avenue for reform would seek to ensure that *courts* efficiently and accurately award reasonable royalties, the second avenue for reform would seek to ensure that *parties* efficiently and accurately negotiate royalties.

In this Article, I focus on the first avenue for reform—the effort to ensure that courts efficiently and accurately award reasonable royalties—by identifying and exploring two basic paradigms for calculating reasonable royalties: valuing patent rights and valuing patented technology. The traditional paradigm, valuing patent rights, reflects a tort law make-whole conception of compensatory damages.<sup>21</sup> Applying it, courts award patent owners the value of their lost royalties—the royalties they would have obtained from infringers had the infringers licensed rather than infringed the patent owners’ patents.<sup>22</sup> As I will show, however, these lost royalties reflect both the value of use of patented technology and

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<sup>20</sup> There are many indirect ways to address concerns regarding the assessment of royalties for patent infringement. For example, the potential for excessive royalties may be reduced by improving the quality of issued patents, reducing the cost of patent infringement litigation, improving notice to potential infringers, and staying injunctions in appropriate circumstances. Some of these reforms have already taken place, see, e.g., Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (establishing new post grant review proceedings to improve patent quality and creating a new statutory section restricting joinder of accused infringers to reduce the cost of patent litigation), and the relevant decisionmakers have considered these types of reforms to combat problems specifically related to patent trolls, see Press Release, U.S. House of Representatives Judiciary Comm., *supra* note 8 (“This bipartisan bill take steps to combat the ever increasing problem of abusive patent litigation.”).

<sup>21</sup> See, e.g., *Rite-Hite Corp. v. Kelley Co.*, 56 F.3d 1538, 1546–47 (Fed. Cir. 1995) (en banc) (adopting a tort law make-whole conception of compensatory damages for patent infringement, which allowed for compensation based on sales of a device not covered by the patent-in-suit); see also Ted Sichelman, *Purging Patent Law of “Private Law” Remedies*, 92 TEX. L. REV. 517, 519 (2014) (“[P]atent remedies mirror traditional tort law remedies by attempting to restore the patentee to the *status quo ante*—namely, the state of the world in which there is no infringement of the patent.”).

<sup>22</sup> See, e.g., *Trans-World Mfg. Corp. v. Al Nyman & Sons, Inc.*, 750 F.2d 1552, 1568 (Fed. Cir. 1984) (“A reasonable royalty is the amount that ‘a person, desiring to manufacture[, use, or] sell a patented article, as a business proposition, would be willing to pay as a royalty and yet be able to make[, use, or] sell the patented article, in the market, at a reasonable profit.’” (quoting *Goodyear Tire & Rubber Co. v. Overman Cushion Tire Co.*, 95 F.2d 978, 984 (6th Cir. 1938))).



the value of the patent owners' rights to seek and obtain judicial remedies for patent infringement, such as injunctive relief, enhanced damages, and attorneys' fees.<sup>23</sup> By contrast, the alternative paradigm, valuing patented technology, reflects only the value of the use of patented technology.<sup>24</sup>

To understand the difference between valuing patent rights and valuing patented technology, consider the following stylized example. Suppose a patent owner has a very strong case against an infringer, a case so strong that it is a virtual certainty that the court will award a judgment, including not only the patent owner's lost profits but also an award of treble damages<sup>25</sup> and attorneys' fees for willful infringement.<sup>26</sup> Suppose further that it is a virtual certainty that the court will award \$4 million (\$1 million in lost profits on sales of 1 million devices at \$1 of marginal profit per device, trebled, plus \$1 million in attorneys' fees). Next, suppose that it is a virtual certainty that the court will award an injunction, and that the injunction will enable the patent owner to increase its profits over the term of the patent in an amount of \$6 million (on sales of 6 million additional devices at \$1 of marginal profit per device).<sup>27</sup> In these circumstances, the value to the patent owner<sup>28</sup> of its patent rights against this particular

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<sup>23</sup> See *infra* Part II.A.

<sup>24</sup> I use the terminology, "valuing patented technology," to distinguish this form of valuation from what I call the "valuation of patent rights." Technically, however, when I say "valuing patented technology," I refer to valuing *use of* patented technology. By statute, a reasonable royalty is tied to the particular use of the patented technology by the infringer. See 35 U.S.C. § 284 (2012) (allowing for "a reasonable royalty for the use made of the invention by the infringer" (emphasis added)). A reasonable royalty does not represent the present value of every future use of patented technology, but only the particular use made by a particular infringer.

<sup>25</sup> See *id.* (providing that a "court may increase the damages up to three times the amount found or assessed").

<sup>26</sup> See *id.* § 285 (providing for "reasonable attorney fees").

<sup>27</sup> Technically, this amount should be the present value of the actual profit spread out over the entire remaining term of the patent.

<sup>28</sup> From the perspective of the infringer, the value of the patent owner's patent rights will be different. For example, the infringer's past and future profitability associated with use of the patented technology may be different than the patent owner's profitability; the infringer would incur its own attorneys' fees negotiating and litigating any dispute between the parties; and the prospect of an injunction may cause the infringer switching costs to change from the infringing technology to a non-infringing technology. The difference in the value of the patent rights to the patent owner and the infringer is a form of arbitrage, at least a portion of which the patent owner may be able to capture by settling the dispute

infringer, ignoring other potential value,<sup>29</sup> is \$10 million (\$4 million plus \$6 million). But the value of the patent owner's use of the patented technology—the patent owner's lost and future profit attributable to the patented invention—is only \$7 million (\$1 million plus \$6 million). The \$3 million difference represents the value of the ability to obtain a judgment trebling the patent owner's damages and recovering the patent owner's attorneys' fees—in other words, the value of certain legal rights against this infringer.

While it is easy to see the difference between the value of patent rights and the value of patented technology in this stylized example, the difference may not be as easy to recognize in other more realistic and complex situations. If this patent owner and infringer settled their litigation for \$10 million, for example, it is impossible to know how much of the \$10 million represents the value of use of the patented technology without knowing all of the details of the basis for this settlement. This is problematic. And knowing only some of the details may be even more problematic. For example, if one knows only the settlement amount (\$10 million) and the number of infringing sales (1 million), one may come to the incorrect conclusion that the value of use of the patented technology would be \$10 per infringing sale (\$10 million divided by 1 million). Moreover, real situations do include more complexities. As an example, in real situations there is not certainty as to liability, and parties base their settlements on the *expected* value of future judgments, with discounts based on risk associated with the ability of the patent owner to prove that the infringer is liable for infringement of a patent claim that is not invalid or unenforceable.<sup>30</sup> Significantly, the extent of these

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between the parties. For simplicity, I ignore the ability of the patent owner to capitalize on this arbitrage in my example.

<sup>29</sup> There are no doubt other sources of value to the patent owner. For example, as described in the preceding footnote, the patent owner may be able to capitalize on arbitrage created by increased value of the patent rights to the infringer. *See supra* note 28. As another example, publicity associated with any judgment may cause other actual and potential infringers not to infringe, a valuable result from the perspective of the patent owner.

<sup>30</sup> *See* JOHN W. SCHLICHER, SETTLEMENT OF PATENT LITIGATION AND DISPUTES: IMPROVING DECISIONS AND AGREEMENTS TO SETTLE AND LICENSE 15–16 (Am. Bar Ass'n ed., 2011) (asserting that the uncertainty involved in patent litigation requires parties to

discounts reflects the value of the patent rights, not the value of the patented technology.

With this distinction between valuing patent rights and valuing patented technology in mind, the alternative paradigm this Article explores is the latter: the idea that reasonable royalties assessed in patent infringement litigation should reflect only the value of use of the patented technology. Indeed, this alternative paradigm—that reasonable royalties should reflect the value of patented *technology* rather than patent *rights*—in several ways explains the course of the common law governing the method for calculating reasonable royalties. It also comports with the three public policies identified by courts as guiding the award of reasonable royalties: preventing injustice by avoiding undercompensation of patent owners;<sup>31</sup> eliminating incentives to infringe and litigate;<sup>32</sup> and providing optimal incentives to invent.<sup>33</sup> Moreover, valuing patented technology as opposed to patent rights has significant benefits. It eliminates circularity in the determination of reasonable royalties and its associated problems of undercompensation and overcompensation of patent owners; increases guidance, and therefore accuracy, by decisionmakers; reduces uncertainty and unpredictability; bounds expert testimony and improves substantive review of reasonable royalty determinations; and may reduce the cost of these determinations.

As I will show, courts developed the remedy of reasonable royalties to correct what they sensed as injustice associated with *undercompensation* of patent owners.<sup>34</sup> This undercompensation occurred due to methods of valuation that focused on the value of patent rights rather than the value of patented technologies. In particular, courts developed the remedy of reasonable royalties to replace nominal damages, which merely recognized a violation of

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“decide whether to settle by comparing the value or cost of settlement to the expected value or expected cost of litigation to judgment”).

<sup>31</sup> See *U.S. Frumentum Co. v. Lauhoff*, 216 F. 610, 617 (6th Cir. 1914) (reasoning that an award of nominal damages may be “repellent to the sense of justice”).

<sup>32</sup> See *Panduit Corp. v. Stahlin Bros. Fibre Works, Inc.*, 575 F.2d 1152, 1158–59 (6th Cir. 1978) (highlighting the risk that a potential licensee might simply use the invention, aware of possible litigation, if a prospective damages award merely equals a foregone royalty).

<sup>33</sup> See *infra* notes 150–52 and accompanying text.

<sup>34</sup> See *infra* Part IV.A.

the patent owner's proven right to exclude.<sup>35</sup> Nominal damages—by definition—altogether ignored the value of the patented technology. Courts also used the remedy of reasonable royalties to replace negotiated royalties when those negotiated royalties reflected large discounts based on the perceived inability of patent owners to enforce their rights because of potential invalidity.<sup>36</sup> Thus, with both nominal damages and discounted negotiated royalties, courts believed the monetary awards insufficiently compensated the patent owners, and their adjustments of these awards moved reasonable royalties in the direction of the true value of the patented technology and away from the value of the patent owner's legal rights.

More recently, however, scholars' analyses of the relationship between reasonable royalties and negotiated royalties have focused on the possibility of *overcompensation* of patent owners.<sup>37</sup> As I will show, these scholars have highlighted different methods of calculating royalties that similarly ignore the value of the patented technology and instead focus on the value of the rights associated with patent ownership. For example, they highlight the possibility that negotiated royalties will reflect "patent holdup" and "royalty stacking" based on the ability of patent holders to extract value from sunk costs and complementary technologies by threatening accused infringers with injunctions.<sup>38</sup> To the extent that reasonable royalties reflect these negotiated royalties and do not correct for patent holdup and royalty stacking, then these scholars believe reasonable royalties likewise overcompensate patent owners.

The overarching point is that these concerns with undercompensation and overcompensation fade when the focus remains on the value of patented technology, rather than on the value of patent rights. Thus, in this Article, I consider several reforms that would tie the law governing reasonable royalty determinations even closer to the value of patented technology. These potential reforms include: elimination of the hypothetical negotiation construct that predominates reasonable royalty

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<sup>35</sup> See *infra* Part III.A.

<sup>36</sup> See *infra* Part III.B.

<sup>37</sup> See *infra* Part V.B.2.

<sup>38</sup> See *infra* Part V.B.2.

determinations; the use of additional assumptions within the existing hypothetical negotiation construct; and, more generally, the need to adjust negotiated royalties that often form the basis for reasonable royalty calculations.<sup>39</sup> I also highlight several open questions related to full adoption of the fundamental paradigm of valuing patented technology.

The Article proceeds in six parts. Part II explains the conceptual framework of valuing patented technology rather than valuing patent rights. Part III studies the historical development of awards of reasonable royalties, and how the law has already moved toward valuing patented technology and away from valuing patent rights. Part IV considers the public policies guiding awards of reasonable royalties in patent infringement cases and, specifically, how valuing patented technology furthers these public policies. Part V analyzes the reforms that would be necessary to adopt fully the paradigm of valuing patented technology. Part VI explores how this paradigm may eliminate or at least mitigate problems plaguing the current state of the law. Part VII responds to some potential objections to valuing patented technology rather than valuing patent rights.

## II. VALUING PATENT RIGHTS VERSUS VALUING PATENTED TECHNOLOGY: CONCEPTUAL FRAMEWORK

Patent law has been moving toward using reasonable royalties to value patented technology rather than patent rights, but it has not quite arrived at this destination. Before exploring this progression, it is helpful to clarify what is meant by valuing patent rights versus valuing patented technology.

### A. VALUING PATENT RIGHTS

The quintessential patent right is commonly thought to be the right to exclude.<sup>40</sup> The Patent Act itself provides that “[e]very patent shall contain . . . a grant to the patentee . . . of the right to exclude others from making, using, offering for sale, or selling the

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<sup>39</sup> See generally Part V.B (discussing these reforms).

<sup>40</sup> See, e.g., Thomas Cheng, *Putting Innovation Incentives Back in the Patent-Antitrust Interface*, 11 NW. J. TECH. & INTELL. PROP. 385, 416 (2013) (“The quintessential patent right is the right to exclude.”).

invention throughout the United States or importing the invention into the United States . . . .”<sup>41</sup> This right to exclude is a negative right, not a positive right.<sup>42</sup> A patent does not give its owner any right to use the patented invention.<sup>43</sup> Rather, it gives its owner a right to exclude others’ use of the patented invention.<sup>44</sup> Without qualification, this seems to indicate that a patent grants an inviolable right to exclude.

But a patent, in a very real sense, gives its owner the right to *seek* to exclude others from using the patented invention. An assertion of patent infringement is subject to numerous defenses allowing alleged infringers to challenge whether the patent owner may exclude use of the invention. These defenses include statutory<sup>45</sup> as well as non-statutory defenses.<sup>46</sup> Furthermore, even if a patent owner proves its patent infringement claim is not subject to any defense, a court may decline to impose an injunction prohibiting use of the invention based on equitable considerations.<sup>47</sup>

Patent rights, furthermore, extend beyond the right to seek to exclude others from using the patented invention; patent owners may also obtain monetary remedies for patent infringement. These monetary remedies include damages<sup>48</sup> and attorneys’ fees.<sup>49</sup>

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<sup>41</sup> 35 U.S.C. § 154(a)(1) (2012). This statutory section goes on to explain that “if the invention is a process” the patent also includes a right to exclude similar conduct. *Id.*

<sup>42</sup> *See, e.g.*, CRAIG A. NARD, *THE LAW OF PATENTS* 1 (3d ed. 2013) (“A patent gives its owner the *right to exclude*; a patent does not provide a positive right to make, use, or sell the invention.”).

<sup>43</sup> *Id.*

<sup>44</sup> *Id.*

<sup>45</sup> 35 U.S.C. § 282(b) (2012) (listing defenses).

<sup>46</sup> There are numerous examples of non-statutory equitable defenses to assertions of patent infringement. *See, e.g.*, *Radio Sys. Corp. v. Lalor*, 709 F.3d 1124, 1132 (Fed. Cir. 2013) (recognizing an equitable estoppel defense); *Therasense, Inc. v. Becton, Dickinson & Co.*, 649 F.3d 1276, 1288 (Fed. Cir. 2011) (en banc) (recognizing the inequitable conduct defense).

<sup>47</sup> 35 U.S.C. § 283 (2012) (“The several courts having jurisdiction of cases under this title may grant injunctions in accordance with the principles of equity to prevent the violation of any right secured by patent, on such terms as the court deems reasonable.”); *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 391–92 (2006) (describing a four-part equitable test to determine whether a patent owner should obtain an injunction against an infringer).

<sup>48</sup> 35 U.S.C. § 284 (2012) (“Upon 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 for the use made of the invention by the infringer, together with interest and costs as fixed by the court. When the damages are not found by a jury, the court shall

Importantly, these monetary remedies also are not inviolable. They depend on successfully overcoming the same defenses, plus others, including a time limitation on damages<sup>50</sup> and a notice requirement.<sup>51</sup> Thus, it is more accurate to conceive of a patent as giving its owner rights to seek remedies for use of patented technology, where potential remedies include both monetary and injunctive relief.<sup>52</sup>

Significantly, the rights to seek monetary and injunctive relief effectively give a patent owner the ability to impose negotiation and litigation costs on potential infringers. If a potential infringer will not voluntarily stop using a patent owner's patented technology or pay for past use of the patented technology, the patent owner may sue the potential infringer in federal court.<sup>53</sup> The negotiations and litigation will disrupt the potential infringer's business activities. So too will they disrupt the patent owner's business activities; the patent owner itself will also have opportunity costs associated with exercising its patent rights. And for both parties, the costs associated with patent infringement litigation—both direct and indirect costs—may be substantial.<sup>54</sup>

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assess them. In either event the court may increase the damages up to three times the amount found or assessed.”).

<sup>49</sup> *Id.* § 285 (“The court in exceptional cases may award reasonable attorney fees to the prevailing party.”).

<sup>50</sup> *Id.* § 286 (“Except as otherwise provided by law, no recovery shall be had for any infringement committed more than six years prior to the filing of the complaint or counterclaim for infringement in the action.”).

<sup>51</sup> *Id.* § 287(a) (“In the event of failure so to mark, no damages shall be recovered by the patentee in any action for infringement, except on proof that the infringer was notified of the infringement and continued to infringe thereafter, in which event damages may be recovered only for infringement occurring after such notice.”).

<sup>52</sup> This conception of patent rights is not dependent on certainty regarding validity of the patent; these rights exist upon the issuance of the patent and do not depend upon certainty that the patent will not be later declared invalid. See Alan C. Marco & Saurabh Vishnubhakat, *Certain Patents*, 16 YALE J.L. & TECH. 103, 104–05 (2013) (“[T]he right to exclude is more precisely a right to sue with some probability of success.”); Mark A. Lemley & Carl Shapiro, *Probabilistic Patents*, 19 J. ECON. PERSP. 75, 75 (2005) (“[E]conomists have increasingly recognized that a patent does not confer upon its owner the right to exclude but rather a right to *try* to exclude by asserting the patent in court . . .” (citation omitted)).

<sup>53</sup> 35 U.S.C. § 281 (2012) (“A patentee shall have remedy by civil action for infringement of his patent.”).

<sup>54</sup> See AM. INTELL. PROP. L. ASS'N, REPORT OF THE ECONOMIC SURVEY 2013, at 34–36 (2013) (reporting results of survey regarding direct litigation costs and listing a median cost of \$2 million for all patent infringement lawsuits with between \$1 million and \$10 million at risk).

Based on this understanding of patent rights, the value of these rights is the amount of money a patent owner can obtain based upon the difference between a world where its patent rights do not exist and a world where its patent rights do exist. It is the ability of a patent owner to take advantage of (a) the existence of potential remedies for patent infringement, including both injunctive and monetary relief, and (b) the ability to impose negotiation and litigation costs on potential infringers when seeking to obtain those remedies. The patent owner may take advantage of the existence of these potential remedies and the ability to impose costs on potential infringers either by agreeing to license the patented technology or by obtaining and enforcing a judgment granting injunctive relief, monetary relief, or both against an infringer.

The value of patent rights thus depends upon many factors, several of which incorporate a substantial degree of uncertainty. The value of patent rights depends on the validity of the patent.<sup>55</sup> It depends on the patent's vulnerability to equitable defenses.<sup>56</sup> It depends on the ability to prove infringement, that is, use of the patented technology. In other words, it depends on the probability of liability.<sup>57</sup> This probability is largely dependent upon the scope of the patent's claims given the effect of this scope on the ability to prove infringement and withstand challenges to validity.<sup>58</sup> Indeed, the broader the patent claims, the easier it is for the patent owner to prove infringement, but also for an alleged infringer to prove invalidity using prior art. Likewise, the narrower the patent

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<sup>55</sup> See 35 U.S.C. § 102 (2012) (novelty and statutory bars); § 103 (obviousness); § 112 (written description, enablement, definiteness); § 282(b) (defenses).

<sup>56</sup> See, e.g., *Radio Sys. Corp. v. Lalor*, 709 F.3d 1124, 1132 (Fed. Cir. 2013) (finding equitable estoppel applicable); *Therasense, Inc. v. Becton, Dickinson & Co.*, 649 F.3d 1276, 1288 (Fed. Cir. 2011) (en banc) (recognizing the inequitable conduct defense).

<sup>57</sup> In a recent study of stock market reactions to court decisions in patent cases, Alan Marco and Saurabh Vishnubhakat found that "resolution of uncertainty about validity or infringement is worth as much on average as is the initial patent right, indicating the presence of significant legal uncertainty." Marco & Vishnubhakat, *supra* note 52, at 104. As they explain, "uncertainty over whether title can be enforced undermines the market value of the property right." *Id.* at 106.

<sup>58</sup> Uncertainty related to scope derives from the imperfection of language as a means to define legal rights. Various legal doctrines, however, seek to limit that uncertainty, including the definiteness requirement, 35 U.S.C. § 112(b) (2012), and the process of claim construction, see *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–19 (Fed. Cir. 2005) (en banc) (setting out claim construction principles).



claims, the harder it is for the patent owner to prove infringement, but also for an alleged infringer to prove invalidity using prior art. Moreover, the value of patent rights also depends on the probability of obtaining a final judgment for injunctive and monetary relief, even if liability is a certainty.<sup>59</sup> And it depends on the probability of enforcement of this final judgment.<sup>60</sup> Beyond these probabilities (for liability, relief, and enforceability), the value of patent rights depends on the cost of negotiation and litigation over allegations of patent infringement. If the patent owner has the ability to impose more costs on potential infringers, for example, the patent owner may be able to extract value from potential infringers given the patent's existence. The value also depends on the level of risk aversion of the patent owner and potential infringers. The more risk averse a potential infringer is, the more value the patent owner may be able to extract from the potential infringer. Importantly, the value of patent rights also depends on the value of the corresponding patented technology. I turn to this last concept—the value of the patented technology—next. But, before doing so, it is important to note that the impact of the value of the patented technology on the value of patent rights turns upon the *expected* value of the patented technology, i.e., predictions—correct or incorrect—of the value of future use of the patented technology.

#### B. VALUING PATENTED TECHNOLOGY

Patented technology is the technology described in a patent's claims. That is, the claims define the scope of the patented invention.<sup>61</sup> The value of patented technology, in turn, is the amount of money that a user of patented technology can save or

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<sup>59</sup> Liability does not guarantee any judicial order for a remedy other than reasonable royalties. Thus, for example, it does not guarantee any judicial order for lost profits, enhanced damages, or injunctive relief.

<sup>60</sup> Judicial orders for equitable or monetary remedies do not guarantee compliance with or enforcement of these orders. Infringers may still infringe even if there is a judicial order prohibiting it. Infringers may not pay monetary awards even if there is a judicial order requiring it. And patent owners may not seek or obtain enforcement in instances of non-compliance. An example is when an infringer is judgment-proof.

<sup>61</sup> *Computer Docking Station Corp. v. Dell, Inc.*, 519 F.3d 1366, 1373 (Fed. Cir. 2008) (“The words of the claims define the scope of the patented invention.” (citing *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996))).

otherwise obtain based upon the difference between a world where the patented technology is used and a world where the patented technology is not used.

As with the value of patent rights, there is uncertainty associated with the value of patented technology. Uncertainty related to the scope of patent claims still exists because the claims define what constitutes the patented technology.<sup>62</sup> Other uncertainties relate to measurements or predictions of differences between the world where the technology is used and the world where it is not used. For instance, experts in a particular industry may disagree over the extent to which a patented technology reduces cost or allows its user to increase price above its costs in the relevant market, for example based on product differentiation. Thus, one may distinguish between expected and actual value of patented technology. But notably, these uncertainties do not include those related to liability (invalidity, vulnerability to equitable defenses, and infringement), relief, or enforceability associated with patent rights.<sup>63</sup> Nor, under this conception, is the value of patented technology affected by the cost of negotiation and litigation over patent rights, or levels of risk aversion with respect to litigation.

Now consider the significance of these conceptions of the value of patent rights and the value of patented technology in the context of reasonable royalties. A reasonable royalty in a technology-focused analysis would reflect only the value of the patented technology. A reasonable royalty in a rights-focused analysis, by contrast, would also reflect the value the patent owner and the accused infringer place on the remedies a court might provide in a dispute over patent infringement, as well as associated negotiation costs, litigation costs, and risk aversion, as I have described. Thus, one can conceive of a range of reasonable royalty calculations lying along a spectrum. All approaches consider the value of the patented technology as compared with the next best alternative technology, but at one end of the

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<sup>62</sup> *Id.*

<sup>63</sup> See Marco & Vishnubhakat, *supra* note 52, at 104 (“If a patent is ruled valid, nothing about the decision affects the value of the underlying technology; the change in value may reasonably be attributed to changes in beliefs about the uncertainty regarding the property right.”).

spectrum the calculation also takes into account the probability of liability, relief, and enforcement as well as negotiation and litigation costs, while at the other end of the spectrum, the calculation ignores all of these factors. Intermediate positions tip more or less towards one end or the other as they take some, but not all, of these factors into account. In this Article, I will consider which of the two ends of the spectrum the law governing reasonable royalties reflects—a technology-focused analysis or a rights-focused analysis—and how the law would change were it to focus only on the value of the patented technology.

### III. HISTORICAL PROGRESSION FROM VALUING PATENT RIGHTS TO VALUING PATENTED TECHNOLOGY

As a matter of history, the law governing monetary remedies in patent cases has moved, at least in some respects, in the direction of valuing patented technology. But it has not yet fully abandoned valuing patent rights. Furthermore, courts have not expressly or intentionally moved the law in the direction of valuing patented technology; they, for example, have not clearly explained the distinction between valuing patent rights and valuing patented technology. But language in opinions by the Federal Circuit and the Supreme Court come close to distinguishing these concepts.

#### A. COURTS' RESPONSE TO PROBLEMS WITH NOMINAL DAMAGES

Courts developed the remedy of reasonable royalties in patent infringement cases in the late 1800s and early 1900s to avoid injustices associated with awarding nominal damages and established royalties.<sup>64</sup> In both respects, courts moved the law

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<sup>64</sup> See Lee, *supra* note 8, at 3–20 (collecting early cases applying the reasonable royalty remedy). An established royalty exists when a patent owner consistently licenses others to engage in conduct comparable to an infringer's conduct at a uniform royalty; it indicates the terms upon which the patent owner would have licensed the infringer's use of the patented technology. See *Rude v. Westcott*, 130 U.S. 152, 165 (1889) (“[W]here 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. . . . In order that a royalty may be accepted as a measure of damages against an infringer, who is a stranger to the license establishing it, it must be paid or secured before the infringement complained of; 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

governing monetary remedies in patent cases in the direction of valuing patented technology rather than patent rights. Consider, first, courts' response to perceived injustices associated with nominal damages.

Traditionally, when litigants prove liability but cannot prove actual damages, courts award nominal damages. Indeed, the Supreme Court often awarded nominal damages in patent cases in the late nineteenth century.<sup>65</sup> It did so for various reasons related to the inability to prove actual damages: inability to prove either lost profits given the lack of any advantage in using the patented invention or lost royalties in the form of an established royalty;<sup>66</sup> inability to apportion any lost profits;<sup>67</sup> inability to prove infringers' profits;<sup>68</sup> inability to apportion any infringers' profits;<sup>69</sup> and insufficient evidence to allow a jury to assess actual damages.<sup>70</sup>

Around the same time, however, in other patent cases the Supreme Court avoided awarding nominal damages. The Court did so by allowing juries to refer to "general evidence" of the patent owners' damages in the form of "the utility and advantage of the invention over the old modes or devices that had been used for working out similar results"<sup>71</sup> and by reference to "the profit made by the defendant and that lost by the plaintiff."<sup>72</sup> In turn, lower courts began replacing nominal damages with "reasonable royalties" based on this type of evidence.<sup>73</sup>

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invention; and it must be uniform at the places where the licenses are issued."); *Monsanto Co. v. McFarling*, 488 F.3d 973, 978–79 (Fed. Cir. 2007) (describing similar requirements to find established royalties). Consistent with the phrase "lost profits," established royalties therefore might be called "lost royalties."

<sup>65</sup> See, e.g., *Black v. Thorne*, 111 U.S. 122, 124 (1884) (holding that "damages must necessarily be nominal" if the patent holder does not prove either (1) that "use of the patented invention . . . add[ed] to the gains of the infringer . . . or impair[ed] the just rewards of the inventor," or (2) that a "license fee ha[d] been generally paid").

<sup>66</sup> *Id.*

<sup>67</sup> See, e.g., *Dobson v. Dornan*, 118 U.S. 10, 17–18 (1886); *Blake v. Robertson*, 94 U.S. 728, 733–34 (1876).

<sup>68</sup> See, e.g., *Rude*, 130 U.S. at 167.

<sup>69</sup> See, e.g., *Keystone Mfg. Co. v. Adams*, 151 U.S. 139, 147 (1894).

<sup>70</sup> See, e.g., *Rude*, 130 U.S. at 167; *New York v. Ransom*, 64 U.S. 487, 488 (1859).

<sup>71</sup> *Suffolk Co. v. Hayden*, 70 U.S. 315, 320 (1865).

<sup>72</sup> *Philp v. Nock*, 84 U.S. 460, 462 (1873).

<sup>73</sup> See, e.g., *Hunt Bros. Fruit-Packing Co. v. Cassiday*, 64 F. 585, 587 (9th Cir. 1894) (finding reasonable royalties as an adequate measure of damages in the absence of proof of

The Supreme Court later seemed to hold that only nominal damages should be awarded in the absence of evidence of lost profits or established royalties.<sup>74</sup> As a result, lower courts split on the issue of whether reasonable royalties could be awarded in the absence of specific evidence of lost profits or established royalties.<sup>75</sup> In 1915, however, the Supreme Court, in *Dowagiac Manufacturing Co. v. Minnesota Moline Plow Co.*, ultimately clarified that reasonable royalties may be awarded in the absence of specific evidence of lost profits or established royalties.<sup>76</sup>

In *Dowagiac*, the lower courts had awarded nominal damages.<sup>77</sup> The Supreme Court agreed with the lower courts that the patent owner had not proven entitlement to lost profits or an established royalty.<sup>78</sup> But the Court disagreed with the lower courts' conclusion that, as a result, the patent owner should recover only nominal damages.<sup>79</sup> The Court reasoned that “[a]s the exclusive right conferred by the patent was property, and the infringement was a tortious taking of a part of that property, the normal measure of damages was the value of what was taken.”<sup>80</sup> In terms of how to measure the value of what was taken in the absence of lost profits or an established royalty, the Court held that the patent owner could seek to “prov[e] what would have been a

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lost sales); *McKeever v. United States*, 14 Ct. Cl. 396, 425 (1878) (concluding that a reasonable royalty is an appropriate measure of damages).

<sup>74</sup> *Coupe v. Royer*, 155 U.S. 565, 583 (1895) (“Upon this state of facts, the evidence disclosing the existence of no license fee, no impairment of the plaintiffs’ market, in short, no damages of any kind, we think the court should have instructed the jury, if they found for the plaintiffs at all, to find nominal damages only.”).

<sup>75</sup> Compare *City of Boston v. Allen*, 91 F. 248, 252–53 (1st Cir. 1898) (limiting award to nominal damages based on *Coupe*, and asserting that *Coupe* may have limited *Suffolk*), *City of Seattle v. McNamara*, 81 F. 863, 864–65 (9th Cir. 1897) (same), and *Houston, E. & W.T. Ry. Co. v. Stern*, 74 F. 636, 639–40 (5th Cir. 1896) (same), with *U.S. Frumentum Co. v. Lauhoff*, 216 F. 610, 624–25 (6th Cir. 1914) (awarding reasonable royalty despite *Coupe*), *McCune v. Baltimore & Ohio R.R. Co.*, 154 F. 63, 65 (3d Cir. 1907) (same), and *Cassidy v. Hunt*, 75 F. 1012, 1016–17 (C.C.N.D. Cal. 1896) (same).

<sup>76</sup> See 235 U.S. 641, 650 (1915) (rejecting an interpretation of *Coupe* as prohibiting awards of reasonable royalties because, in *Coupe*, “although the plaintiff was entitled to prove what would have been a reasonable royalty, and thereby show a proper basis for an assessment of damages, no proof upon that subject was presented”).

<sup>77</sup> *Id.* at 643.

<sup>78</sup> *Id.* at 647–48.

<sup>79</sup> *Id.* at 650–51.

<sup>80</sup> *Id.* at 648.

reasonable royalty, considering the nature of the invention, its utility and advantages, and the extent of the use involved.”<sup>81</sup>

By avoiding awards of nominal damages, courts moved away from undercompensation associated with mere recognition of violations of legal rights. That is, awards of nominal damages simply recognize the existence of a legal right and its violation; they do not attempt to provide compensation based on any exogenous guideline other than liability, such as to compensate for actual or assumed harm.<sup>82</sup> For example, awards of nominal damages do not relate in any way to the value of the underlying patented technology.

When courts dispensed with awarding nominal damages and instead began awarding reasonable royalties, they adopted a guideline for awarding additional compensation consistent with judges’ sense of justice.<sup>83</sup> And the guideline that courts adopted focused on the value of patent rights based on the tort law principle of making the patent owner whole. In particular, courts sought to identify what royalty the patent owner and infringer would have agreed upon had the infringer licensed the patent from the patent owner instead of infringing.<sup>84</sup> This analysis would

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<sup>81</sup> *Id.* The Court agreed with the Ninth Circuit’s description of the relevant inquiry: “In the absence of [an established] royalty, and in the absence of proof of lost sales or injury by competition, the only measure of damages was such sum as, under all the circumstances, would have been a reasonable royalty for the defendant to have paid.” *Id.* at 649 (quoting *Hunt Bros. Fruit-Packing Co. v. Cassidy*, 64 F. 585, 587 (9th Cir. 1894)).

<sup>82</sup> 22 AM. JUR. 2D *Damages* § 8 (2013).

<sup>83</sup> *See, e.g., U.S. Frumentum Co. v. Lauhoff*, 216 F. 610, 617–18 (6th Cir. 1914) (“To send the successful plaintiff away after years of litigation and with only nominal damages is repellent to the sense of justice.”).

<sup>84</sup> *See, e.g., McKeever v. United States*, 14 Ct. Cl. 396, 425 (1878) (employing this hypothetical agreement analysis). Ted Sichelman has described this “premise of promoting the *status quo ante*”—the idea that a patent owner should be returned to the status it held prior to infringement by, for example, awarding it the royalty it would have received had the infringer paid to license the patented technology rather than engage in unlicensed use—“as a fundamental tenet of patent law remedies” that “should be jettisoned.” Sichelman, *supra* note 21, at 554. He would jettison it, in part, because “the level of damages that promotes optimal innovation incentives . . . may often be less, and sometimes more, than the profits or royalties that would have been earned in the marketplace but for the infringement.” *Id.* But, in Sichelman’s view, today reasonable royalties *may not* be used to provide optimal incentives to invent, but instead must reflect tort law make-whole principles, given the statutory codification of reasonable royalties. *Id.* at 560 (“Because the current patent-remedies scheme contemplates making the patentee whole in the event of infringement, attempts to deviate from that baseline . . . would contravene legislative authority.”).

necessarily include an assessment of the value of the patented technology, but the focus would be on the ability of the patent owner to extract from the infringer any value based on the existence of the patent rights had the two parties negotiated in advance of infringement.<sup>85</sup> Given that any such negotiation would include discounts based on the likelihood of liability, relief, and enforceability, and increases based on the value of injunctive relief and, at least potentially, the costs to negotiate and litigate, the determination of reasonable royalties would reflect the value of the patent owner's patent rights. But awards reflecting the value of patent rights provided more justice compared to awards of nominal damages. And, again, the value of patent rights at least includes as one factor the value of the underlying patented technology. Thus, the movement from nominal damages to reasonable royalties represented a first step toward valuing patented technology.

#### B. COURTS' RESPONSE TO PROBLEMS WITH ESTABLISHED ROYALTIES

Courts also began to use reasonable royalties to avoid awards of established royalties in cases where there was widespread belief in the invalidity of the licensed patent. Courts did so in a series of cases involving a patent owned by Consolidated Rubber Tire Company.

In 1915, Judge Learned Hand authored one of the seminal opinions on point, just months after the Supreme Court's decision in *Dowagiac* "settl[ed] the mooted question as to whether a reasonable royalty may be allowed."<sup>86</sup> The patent-in-suit had been declared invalid by the Sixth Circuit in 1902, not invalid by the Seventh Circuit in 1907, and finally not invalid by the Supreme Court in 1911.<sup>87</sup> When the patent owner later asked for an award

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<sup>85</sup> See, e.g., *McKeever*, 14 Ct. Cl. at 425 (finding the value of the patent rights to be what the infringers reasonably would pay and the plaintiff would accept if the parties had negotiated prior to infringement).

<sup>86</sup> *Consol. Rubber Tire Co. v. Diamond Rubber Co. of N.Y.*, 226 F. 455, 459 (S.D.N.Y. 1915), *aff'd*, 232 F. 475 (2d Cir. 1916).

<sup>87</sup> See *id.* at 463–64 (describing the trial history of the patent). One opinion explains that seventeen courts passed on the validity of the patent at issue. *B.F. Goodrich Co. v. Consol. Rubber Tire Co.*, 251 F. 617, 618 (7th Cir. 1918). The cases predated (and no doubt highlight a benefit of) the Supreme Court's recognition of non-mutual defensive collateral estoppel in patent cases; now a final, unappealable judgment of invalidity in one lawsuit

of damages for the patent's infringement, Judge Hand rejected the idea of limiting the patent owner to a royalty established after the Sixth Circuit declared the patent invalid and prior to the Supreme Court's resolution of the patent's validity in 1911:

[T]he decision invalidating the patent on May 6, 1902[] ma[de] impossible any true established royalty thereafter. All the subsequent period until the patent was finally declared valid in April, 1911, seems to me irrelevant to any just estimate of the patentee's damages. Even if, crippled as the patent was by the adverse ruling, an apparent established royalty during that period had been shown, I should not regard it as a true established royalty, because that phrase should not be used of the value of a patent monopoly which is suspected with good reason of being no patent at all . . . . [W]e must seek a reasonable royalty . . . .<sup>88</sup>

Thus, Judge Hand rejected as unjust an award of a royalty established during a time when there was a common suspicion that the patent was invalid. And instead of awarding an established royalty, Judge Hand resorted to awarding a reasonable royalty.<sup>89</sup>

Judge Hand's decision to reject royalties established during the time period when a patent was thought to be invalid pushed the law governing reasonable royalties in the direction of valuing only patented technology. Indeed, one might read his decision rejecting a royalty established during a time period when a patent was thought to be invalid as laying the groundwork for this conception of reasonable royalties. In effect, he distinguished between

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benefits all potential infringers. See *Blonder-Tongue Labs., Inc. v. Univ. of Ill. Found.*, 402 U.S. 313, 350 (1971) (holding that non-mutual defensive collateral estoppel may be raised as defense to a patent infringement claim).

<sup>88</sup> *Consol. Rubber Tire Co.*, 226 F. at 458.

<sup>89</sup> *Id.* Judge Arthur Sanborn, finding the same reasonable royalty in a separate lawsuit involving the same patent, described "widespread infringement following" the 1902 decision that "compelled plaintiffs to lower royalties." *Consol. Rubber Tire Co. v. B.F. Goodrich Co.*, 237 F. 893, 893-94 (N.D. Ill. 1916), *modified and aff'd*, 251 F. 617, 624 (7th Cir. 1918) (adding an award of interest on damages). Another opinion indicates that the amount of money paid to license the patent dropped from twenty cents to two cents after a court found the patent invalid. *B.F. Goodrich Co.*, 251 F. at 620.



established royalties and reasonable royalties based on the difference between valuing patent *rights* (which by its nature depends on the validity of the underlying patent) and valuation focusing exclusively on the value of the patented *technology* (which does not depend on the validity of the underlying patent). And he rejected valuation based on patent rights. In particular, he rejected the concept of discounting the monetary award based on assessments of the likelihood of liability. While discounting occurred in the market because of a common belief that the patent was likely invalid and that, therefore, a court likely would not provide any remedy, there is no indication of changing views in the market regarding the value of the underlying patented technology. In short, Judge Hand's rejection of the established royalty effectively adopted the value of the underlying patented technology as the appropriate focus of a reasonable royalty calculation.<sup>90</sup>

In an unbroken line of succession, later courts have followed Judge Hand's reasoning by awarding reasonable royalties rather than diminished royalties established during periods of "disrepute" and "open defiance" of patents—but they have also extended his reasoning to set a requirement that any assessment of a reasonable royalty be based upon an assumption that the patent at issue was valid and would be respected.<sup>91</sup> Indeed, the so-called

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<sup>90</sup> Conceptually, one might argue that Judge Hand's rejection of the royalty set by the market reflected a concern with valuing the actual patent right (the later-determined, *valid* right), rather than a false understanding of that right (the false belief that the patent was invalid). But, as I have described it, the concept of valuing patent rights is closely tied to measuring the probability of liability, relief, and enforceability. See *supra* notes 57–60 and accompanying text. Moreover, Judge Hand made no reference to rewarding the patent owner for the ability to impose negotiation or litigation costs on the infringer. Regardless, the underlying point remains: by eliminating discounting due to the possibility of invalidity, Judge Hand removed from the analysis the value of the ability to convince a court to grant a remedy for infringement. He therefore tied the reasonable royalty calculation more tightly to the value of the patented technology than to other exogenous factors.

<sup>91</sup> *Gen. Motors Corp. v. Blackmore*, 53 F.2d 725, 729 (6th Cir. 1931) (noting "the hypothesis that the patent was valid and would be respected" (citing *Consol. Rubber Tire Co.*, 226 F. at 455)); *Gen. Motors Corp. v. Dailey*, 93 F.2d 938, 941–42 (6th Cir. 1937) (same) (citing *Blackmore*, 53 F.2d at 725); *Fromson v. W. Litho Plate & Supply Co.*, 853 F.2d 1568, 1577 n.15 (Fed. Cir. 1988) ("[A] court should not select a diminished royalty rate a patentee may have been forced to accept by the disrepute of his patent and the open defiance of his rights." (quotation marks and citation omitted) (citing *Dailey*, 93 F.2d at 941–42)); *ResQNet.com, Inc. v. Lansa, Inc.*, 594 F.3d 860, 872 (Fed. Cir. 2010) ("[T]his court has long recognized that a reasonable royalty can be different than a given royalty when, for

“assumption of validity” used in reasonable royalty determinations can be traced to Judge Hand’s decision, and it has the effect of tying reasonable royalties more closely to the value of patented technology.<sup>92</sup>

### C. COURTS HAVE NOT CLEARLY EXPLAINED THE DISTINCTION

Despite the progression of the law toward valuing patented technology and away from valuing patent rights, courts have not clearly explained, let alone embraced, the distinction between these two conceptions of reasonable royalties. Here, I will first consider opinions from the Federal Circuit, given its unique role in describing the law governing patent law in this country based upon its exclusive jurisdiction over appeals in patent infringement cases, and then consider opinions from the Supreme Court.

1. *The Federal Circuit.* The Federal Circuit has not directly confronted the distinction between valuing patent rights and valuing only patented technology. And while it has explained the law governing reasonable royalties in a way that focuses attention on valuing patented technology, it has done so in the context of a

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example, widespread infringement artificially depressed past licenses.” (citing *Fromson*, 853 F.2d at 1577)). For additional authority, see generally *Hughes Aircraft Co. v. United States*, 86 F.3d 1566, 1573 (Fed. Cir. 1996) (stating that “the entirety of the circumstances should be considered,” including “what effect infringement has had on the value of a patent”), *vacated on other grounds*, 520 U.S. 1183, 1183 (1997); *Nickson Indus., Inc. v. Rol Mfg. Co.*, 847 F.2d 795, 798 (Fed. Cir. 1988) (“[A] higher figure may be awarded when the evidence clearly shows that widespread infringement made the established royalty artificially low.” (citation omitted)); *Trio Process. Corp. v. Goldstein’s Sons, Inc.*, 533 F.2d 126, 129 (3d Cir. 1976) (reasoning that a reasonable royalty may be higher than an artificially-depressed royalty).

<sup>92</sup> I do not mean to overstate the point. In modern times it is relatively rare for courts to award established royalties. See *Chapman*, *supra* note 5, at 323 (“[E]stablished royalties are relatively rare, because courts have established stringent and narrowly defined requirements that must be met before an observed royalty rate may be considered ‘established.’ ”); *Monsanto Co. v. McFarling*, 488 F.3d 973, 978–79 (Fed. Cir. 2007) (identifying requirements for awarding an established royalty). Instead, courts award reasonable royalties. *Chapman*, *supra* note 5, at 323–24. This shift away from established royalties and toward reasonable royalties does not necessarily reflect Judge Hand’s discomfort with awarding a heavily-discounted, established royalty, but rather the “stringent and narrowly defined requirements that must be met before an observed royalty rate may be considered ‘established.’ ” *Id.* at 323. But if a patent owner continues licensing the use of its patented technology at the same royalty after a judgment of liability, rather than increase that royalty, the royalty may be deemed established, *and* there is less basis to argue that the royalty reflects a valuation discounted based on potential non-liability.

framework that values patent rights. Consider two relatively recent cases.

In *LaserDynamics, Inc. v. Quanta Computer, Inc.*, the Federal Circuit described valuing patented technology.<sup>93</sup> The court remarked that “the hypothetical negotiation framework [for determining reasonable royalties] . . . seeks to discern the value of the patented technology to the parties in the marketplace when infringement began.”<sup>94</sup> Thus, the court effectively explained that the purpose of a reasonable royalty analysis is to determine the expected value of the patented technology. This remark, however, was followed by a more complete description of the hypothetical negotiation construct that is consistent with valuation of patent rights.<sup>95</sup> The court stated that “the basic question posed in a hypothetical negotiation is: if, on the eve of infringement, a willing licensor and licensee had entered into an agreement instead of allowing infringement of the patent to take place, what would that agreement be?”<sup>96</sup> The reality is that this agreement would reflect, at least in part, the parties’ assessment of the likelihood of liability, relief, and enforceability—the value of the patent owner’s patent rights.<sup>97</sup> The court did not discuss the difference between valuation of patent rights and valuation of only patented technology, nor did it clearly select one approach to valuation over the other. The remark concerning valuing patented technology may merely reflect the fact that valuation of patent rights necessarily includes valuation of patented technology—even though the focus is on the ability of patent owners to extract value from accused infringers based on the threat of obtaining monetary and equitable remedies and imposing negotiation and litigation costs.

Likewise, in *ResQNet.com, Inc. v. Lansa, Inc.*, the Federal Circuit stated that, “[a]t all times, the damages inquiry must concentrate on compensation for the economic harm caused by infringement of the claimed invention.”<sup>98</sup> The court went on to

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<sup>93</sup> 694 F.3d 51, 76 (Fed. Cir. 2012).

<sup>94</sup> *Id.*

<sup>95</sup> *See id.*

<sup>96</sup> *Id.*

<sup>97</sup> *See supra* Part II.A (reviewing that valuation).

<sup>98</sup> 594 F.3d 860, 869 (Fed. Cir. 2010).

explain that, as a result, “the trial court must carefully tie proof of damages to the claimed invention’s footprint in the market place.”<sup>99</sup> It criticized the district court for allowing the patent owner to “inflate the reasonable royalty analysis with conveniently selected licenses without an economic or other link to the technology in question.”<sup>100</sup> The court also instructed the district court to focus on prior license agreements “linked to the economic demand for the claimed technology.”<sup>101</sup> While this analysis highlights that a proper valuation includes an appraisal of the patented technology, it does not clearly exclude valuation of patent rights. Moreover, the court’s recognition of the hypothetical negotiation construct in the same opinion again allows for some distortion based on valuation of patent rights.<sup>102</sup> The court, however, did recognize aspects of the law seeking to correct for two such distortions: (1) distortion caused by the fact that “litigation itself can skew the results of the hypothetical negotiation”<sup>103</sup> and (2) distortion caused by the possibility that “widespread infringement artificially depressed past licenses.”<sup>104</sup> The first distortion relates to the cost of litigation, to its inherent riskiness for both patent owners and alleged infringers, and to risk aversion. The second distortion may be understood to raise a concern similar to Judge Hand’s concern with undercompensation based on incorrect predictions of non-liability: misplaced estimations of liability may produce downward pressure on negotiated royalties. Thus, while not explicitly recognizing the distinction between valuation of patent rights and valuation of patented technology, this decision frames the reasonable royalty inquiry as an economic analysis related to the value of the claimed technology.<sup>105</sup> Moreover, it recognizes specific restrictions on the hypothetical

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<sup>99</sup> *Id.*

<sup>100</sup> *Id.* at 872.

<sup>101</sup> *Id.* at 872–73.

<sup>102</sup> *Id.* at 872.

<sup>103</sup> *Id.*

<sup>104</sup> *Id.*

<sup>105</sup> *Id.* at 869, 872–73 (suggesting that the trial court on remand look to the “economic demand for the claimed technology”).

negotiation construct that seek to direct its use to valuation of patented technology only, rather than valuation of patent rights.<sup>106</sup>

2. *The Supreme Court.* The Supreme Court has come closer to distinguishing between valuation based on patent rights and valuation based only on patented technology.<sup>107</sup> Consider one of the Court's more recent opinions, and then two of the Court's older opinions.

First, consider the more recent case. In *eBay, Inc. v. MercExchange, L.L.C.*, decided in 2006, the Supreme Court remarked that "the creation of a right is distinct from the provision of remedies for violations of that right."<sup>108</sup> In the context of its decision, the Court was referring to the statutory "right to exclude" and the statutory authorization for courts to grant the remedy of injunctive relief for its violation.<sup>109</sup> Thus, in context, the statement meant that the right to exclude is distinct from the provision of injunctive relief for violation of that right; the statutory grant to a patent owner of a right to exclude does not necessarily mean that a patent owner is entitled to an injunction.<sup>110</sup> But the language the Court used more broadly distinguished between any patent right and any remedies for

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<sup>106</sup> *Id.* at 872. One might argue that isolated statements in a few Federal Circuit opinions support valuation of patent rights. See, e.g., *King Instruments Corp. v. Perego*, 65 F.3d 941, 949 (Fed. Cir. 1995) ("[T]he award of damages compensates for the violation of the patentee's right to exclude others from making, using, or selling the invention."); *Lindemann Maschinenfabrik GmbH v. Am. Hoist & Derrick Co.*, 895 F.2d 1403, 1406 (Fed. Cir. 1990) ("In patent law, the fact of infringement establishes the fact of damage because the patentee's right to exclude has been violated."). But in context these statements do not address, let alone exclude, the idea of using reasonable royalties to value patented technology rather than patent rights.

<sup>107</sup> Recent scholarship by two economists, John Jarosz and Michael Chapman, refers briefly to a question at the heart of the subject of this Article: "[W]hether and to what extent the patent holder's reasonable royalty damages should include not only compensation for the specific contribution of the patented invention, but also for the violation of the patent holder's right to exclude others from practicing the patent." Jarosz & Chapman, *supra* note 5, at 798. They highlight that the Supreme Court's *eBay* decision provides reason to believe that the Court might distinguish between valuation based on patent rights and valuation based only on patented technology. *Id.* at 799. Jarosz and Chapman ultimately conclude that "[i]t is not clear that any damages should be awarded to compensate for the patent holder's loss of the ability to exclude others from using the patented invention." *Id.*

<sup>108</sup> 547 U.S. 388, 392 (2006).

<sup>109</sup> *Id.*

<sup>110</sup> *Id.* Quoting the Patent Act, the Court reasoned "that injunctive relief 'may' issue only 'in accordance with the principles of equality.'" *Id.* (quoting 35 U.S.C. § 283 (2012)).

violation of the right.<sup>111</sup> And so a similar distinction can be made between patent rights *generally* and the provision of *monetary* relief in the form of *reasonable royalties*: the existence of patent rights is distinct from the provision of reasonable royalties for violations of those rights. In other words, reasonable royalties need not equal the value of patent rights; they are separate concepts. And as I have discussed, reasonable royalties may reflect only the value of patented technology.<sup>112</sup> In *eBay*, however, the Court did not describe the difference between valuation of patent rights and valuation only of patented technology. In older cases—much older cases—the Court came closer to making this distinction explicit.

Now consider the two older cases, both of which predate the Supreme Court's sanctioning of awards of reasonable royalties in *Dowagiac* in 1915. The first is *Suffolk Co. v. Hayden*, decided in 1865.<sup>113</sup> The Supreme Court's opinion in the case—a seminal one on the issue of reasonable royalties (then called general damages)—may be interpreted as distinguishing between valuation of patent rights and valuation of patented technology.<sup>114</sup> The Court explained that a trial court did not err by instructing a jury to estimate actual damages by measuring the “value of improvements” identified in the patent-in-suit:

[L]ooking at the term *value*, in the connection in which it was used [in the jury instruction], it is quite clear that it had reference only to the utility and advantages, or value of the use of the improvement over the old mode of cleaning cotton; not the value of the patent itself.<sup>115</sup>

In this short explanation, the Court indicated that the correct value for a reasonable royalty analysis is the value of the patented *improvement* rather than the value of the *complete* technology described in the patent; the value of the *use of the improvement*

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<sup>111</sup> *See id.*

<sup>112</sup> *See supra* Part II.B.

<sup>113</sup> 70 U.S. 315 (1865).

<sup>114</sup> *Id.* at 319–20.

<sup>115</sup> *Id.*

rather than the value of the *improvement itself*; and the value of the *patented improvement* rather than the value of the *patent itself*.<sup>116</sup> In this last respect—the point that the relevant value is that of the patented improvement rather than that of the patent itself—the Court, on the one hand, used terminology distinguishing between valuation of patented technology and valuation of patent rights. The “value of the patent itself” is, after all, the present value of all of the rights the patent provides against all existing and potential infringers. In the context of the decision, on the other hand, the Court may have been using “patent” rather erroneously as shorthand for “patented invention.” Indeed, it may have done so in order to emphasize the distinction between the value of use of the improvement over prior technology, as compared to the value of use of the complete technology described in the patent regardless of the state of prior technology. And if this latter interpretation is correct, then the case stands only for the proposition that reasonable royalties should reflect *incremental* profit from use of patented technology.<sup>117</sup>

The second case is *Rude v. Wescott*, decided in 1889.<sup>118</sup> In its decision, the Supreme Court again focused on the value of technology and at least implicitly distinguished the valuation of patent rights.<sup>119</sup> Like the Federal Circuit’s decision in

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<sup>116</sup> *Id.*; see also *id.* at 320 (“This question of damages, under the rule given in the statute, is always attended with difficulty and embarrassment both to the court and jury. There being no established patent or license fee in the case, in order to get at a fair measure of damages, or even an approximation to it, general evidence must necessarily be resorted to. And what evidence could be more appropriate and pertinent than that of the utility and advantage of the invention over the old modes or devices that had been used for working out similar results? With a knowledge of these benefits to the persons who have used the invention, and the extent of the use by the infringer, a jury will be in possession of material and controlling facts that may enable them, in the exercise of a sound judgment, to ascertain the damages, or, in other words, the loss to the patentee or owner, by the piracy, instead of the purchase of the use of the invention.”).

<sup>117</sup> See ROGER D. BLAIR & THOMAS F. COTTER, *INTELLECTUAL PROPERTY: ECONOMIC AND LEGAL DIMENSIONS OF RIGHTS AND REMEDIES* 47–48, 215 (2005) (discussing the concept of incremental profit). Other cases highlight the same distinction made in *Suffolk*. See, e.g., *Egry Register Co. v. Standard Register Co.*, 23 F.2d 438, 440–41 (6th Cir. 1928) (“[The patent owner] cannot, by the language which his claim happens to take, transform his invention of an improvement in an existing structure into one of a complete structure, as if it were wholly new, so as to entitle him to profits upon these parts of it which are not in any fair sense his invention.”).

<sup>118</sup> 130 U.S. 152 (1889).

<sup>119</sup> *Id.* at 164.

*ResQNet.com*, the Supreme Court highlighted the distortion of litigation-induced settlement agreements on a proper damages analysis,<sup>120</sup> and in the process twice indicated that the proper damages analysis seeks to identify “the value of the improvements patented.”<sup>121</sup> First, the Court stated 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.”<sup>122</sup> Then, in explaining why this is so, the Court explained that “[m]any considerations *other than the value of the improvements patented* may induce the payment in such cases,” including “[t]he avoidance of the risk and expense of litigation.”<sup>123</sup> What the Court condemned—valuing avoidance of risk and expense of litigation—is exactly consistent with my definition of valuing patent rights.<sup>124</sup> The Court went on to indicate that appropriate evidence of damages for patent infringement would include “evidence of the *value of the invention* to the defendants,”<sup>125</sup> which is one way to value patented technology.<sup>126</sup> Despite this discussion distinguishing valuation of technology from valuation of patent rights, the Court held that the patent owner’s evidence related to the value of the technology was only conjectural, “furnish[ing] no satisfactory basis for any

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<sup>120</sup> *Id.* This analysis resembles the Federal Circuit’s analysis in *ResQNet.com*. See *supra* notes 102–06 and accompanying text.

<sup>121</sup> *Rude*, 130 U.S. at 164.

<sup>122</sup> *Id.* (emphasis added).

<sup>123</sup> *Id.* (emphasis added).

<sup>124</sup> See *supra* Part II.B (defining valuation of patent rights as “reflect[ing] the value the patent owner and the accused infringer place on the remedies a court might provide in a dispute over patent infringement, as well as associated negotiation costs, litigation costs, and risk aversion”).

<sup>125</sup> *Rude*, 130 U.S. at 167 (emphasis added) (“[N]o evidence of the value of the invention to the defendants was adduced except the conjectural estimates stated; and they furnished no satisfactory basis for any damages, much less *data* which authorized the specific finding made as to the damages for each drill used. Opinions not founded on knowledge were of no value. Conclusions from such opinions were at best mere guesses. By the decision rendered a settled rule of law was violated, that actual, not speculative, damages must be shown, and by clear and definite proof, to warrant a recovery for the infringement of a patent.”).

<sup>126</sup> See *supra* Part II.B (defining valuation of patented technology).



damages,” and therefore the Court remanded the case with instructions for the lower court to award nominal damages.<sup>127</sup>

Thus, both the Federal Circuit and the Supreme Court have issued opinions that at least implicitly distinguish the valuation of patent rights in favor of valuing patented technology, *ResQNet.com* and *Rude*. Neither court, however, has expressly articulated the distinction between valuing patent rights and valuing patented technology, let alone explored how the distinction comports with the public policies guiding the reasonable royalty analysis, how it can be used as a touchstone to guide reform of the law governing reasonable royalties, and the benefits that would accompany these reforms. I turn to these matters next.

#### IV. GUIDING PUBLIC POLICIES

While courts have not clearly expressed the distinction between valuation of patent rights and valuation of patented technology, they and modern commentators have clearly expressed the public policies guiding the award of reasonable royalties in patent cases. Beyond the basic tort law principle of putting the patent owner in the economic position it would have been in had there been no infringement,<sup>128</sup> I will show that these public policies include preventing injustice associated with undercompensation, eliminating an incentive to infringe and litigate in favor of an incentive to settle and license, and providing incentives to invent. Significantly, adoption of the principle of valuing patented technology would further each of these other public policies.<sup>129</sup>

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<sup>127</sup> *Rude*, 130 U.S. at 167. It would be another twenty-six years before the Court, in *Dowagiac*, would sanction awards of reasonable royalties to avoid nominal damages. See *supra* notes 79–81 and accompanying text.

<sup>128</sup> See, e.g., *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 377 U.S. 476, 507 (1964) (plurality opinion) (“[T]o determine the damages that may be recovered from [the infringer] here, we must ask how much [the patent owner] suffered by [the infringer’s] infringement—how much it would have made if [the infringer] had not infringed.”).

<sup>129</sup> The question of whether reasonable royalties should value patent rights or instead only patented technology is a matter of determining the appropriate paradigm. Some might view the resolution of the question as a matter of politics or economics. I begin to analyze this question by studying significant decisions in the common law governing the award of reasonable royalties and the articulated policy justifications. As I will show, these decisions in certain respects have moved the doctrine toward valuing only patented technology. I then consider an economic analysis of the doctrine, which also provides justification for adopting valuation only of patented technology. See *infra* Part IV.A–C.

## A. PREVENTING INJUSTICE ASSOCIATED WITH UNDERCOMPENSATION

As shown, judges originally developed the concept of reasonable royalties to avoid injustice.<sup>130</sup> They sought to provide more than mere nominal damages to patent owners who, despite proving infringement and lack of invalidity, were unable to prove entitlement to actual damages—either lost profits or lost royalties—or disgorgement of infringers' profits.<sup>131</sup> Similarly, these judges sought to avoid awarding royalties negotiated during times when particular patents were believed to be invalid because those negotiated royalties would incorporate substantial discounts compared to royalties negotiated during times when the patents were not believed to be invalid.<sup>132</sup> Representative of these early views, Judge Hand explained: “The whole notion of a reasonable royalty is a device in aid of justice, by which that which is really incalculable shall be approximated, rather than that the patentee, who has suffered an indubitable wrong, shall be dismissed with empty hands.”<sup>133</sup> Thus, to avoid injustice, reasonable royalties to some degree reflect *estimations* of actual harm. In this sense, some reasonable royalties reflect estimated lost profits when actual lost profits cannot be proved with the requisite evidentiary proof; other reasonable royalties reflect estimated lost royalties.<sup>134</sup>

Awarding reasonable royalties based on the value of the underlying patented technology rather than the value of patent rights likewise avoids injustice by eliminating discounting.

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<sup>130</sup> See *supra* Part III.A–B.

<sup>131</sup> See, e.g., *U.S. Frumentum Co. v. Lauhoff*, 216 F. 610, 616–18 (6th Cir. 1914) (discussing the basis for awards of reasonable royalties in these circumstances); *Suffolk Co. v. Hayden*, 70 U.S. 315, 320 (1865) (same).

<sup>132</sup> See, e.g., *Consol. Rubber Tire Co. v. Diamond Rubber Co. of N.Y.*, 226 F. 455, 458 (S.D.N.Y. 1915) (discussing the need for a reasonable royalty after concluding that money paid when the patent was believed to be invalid did not represent “a true established royalty”).

<sup>133</sup> *Cincinnati Car Co. v. N.Y. Rapid Transit Corp.*, 66 F.2d 592, 595 (2d Cir. 1933).

<sup>134</sup> Cf. Lemley, *supra* note 6, at 669–73 (criticizing use of reasonable royalties to estimate lost profits and advocating for a loosening of the stringent evidentiary requirements preventing patent owners who practice their own inventions from obtaining lost profits). When patent owners provide the requisite evidentiary proof that they would have made some but not all of the infringer's sales, courts split awards between lost profits that compensate for lost sales and reasonable royalties that compensate for lost royalties. See *State Indus., Inc. v. Mor-Flo Indus., Inc.*, 883 F.2d 1573, 1577 (Fed. Cir. 1989) (noting that a damages award in a patent case “may be split between lost profits as actual damages to the extent they are proven and a reasonable royalty for the remainder”).

Beyond avoiding undercompensation associated with nominal damages, it also avoids awarding royalties established during periods of suspected invalidity of patents. Indeed, focusing on the value of the patented technology would eliminate undercompensation associated with valuation based on all risks associated with liability, relief, and enforcement; costs of negotiation and litigation; and related risk aversion.

#### B. ELIMINATING INCENTIVES TO INFRINGE AND LITIGATE

Judge Howard Markey<sup>135</sup> later identified a specific reason—beyond the general concept of injustice associated with undercompensation—to award reasonable royalties, and specifically reasonable royalties exceeding negotiated royalties in magnitude: elimination of an otherwise existing incentive to infringe and litigate.<sup>136</sup> In particular, Judge Markey highlighted that the prospect of a remedy equal to a negotiated royalty may give a potential licensee reason to decline licensing a patent and instead challenge the patent's validity, enforceability, and infringement in court.<sup>137</sup> He thus identified what may be called a problem with holdout by potential licensees. In Judge Markey's words:

Except for the limited risk that the patent owner, over years of litigation, might meet the heavy burden . . . for recovery of lost profits, the [potential licensee] would have nothing to lose, and everything to gain if he could count on paying only the normal, routine royalty non-infringers might have paid.<sup>138</sup>

If the potential licensee won, for example, it would owe the patent owner nothing. More significantly, however, even if it lost, it

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<sup>135</sup> Judge Markey would become the first Chief Judge of the U.S. Court of Appeals for the Federal Circuit, the court given virtually exclusive jurisdiction starting in 1982 over appeals in patent cases. At the time he drafted the opinion in question, *Panduit Corp. v. Stahl Bros. Fibre Works, Inc.*, 575 F.2d 1152 (6th Cir. 1978), however, he was a judge on the Court of Patent Appeals and Interferences and sat by designation in the Sixth Circuit. *Id.* at 1154.

<sup>136</sup> *Id.* at 1158.

<sup>137</sup> *Id.* at 1158–59.

<sup>138</sup> *Id.* at 1158.

would owe the patent owner only the negotiated royalty—the same royalty that it would have paid for a license.<sup>139</sup> Thus, Judge Markey concluded that determination of a reasonable royalty—after the potential licensee’s election of using the invention, and taking the risk that litigation will ensue and that the patent will be found valid and infringed—“cannot, without injustice,” be treated as though the potential licensee had elected to negotiate a license and pay a negotiated royalty in the first place.<sup>140</sup> To do so would encourage infringement and costly litigation rather than respect for patent rights and efficiencies associated with settlement of disputes and licensing.<sup>141</sup> And it would systematically result in undercompensation of patent owners.<sup>142</sup> Judge Markey thus favored the elimination of an incentive to infringe and litigate by requiring infringers to pay full compensation for infringement to patent owners rather than discounted amounts.<sup>143</sup>

Judge Markey’s concern with the use of negotiated royalties as reasonable royalties highlights a significant problem associated with valuation of patent rights and a significant benefit associated with valuation of patented technology. As discussed above, negotiated royalties reflect the value of patent rights.<sup>144</sup>

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<sup>139</sup> *See id.* (stating that “the [potential licensee] would be in a ‘heads-I-win, tails-you-lose’ position”). The potential licensee in actuality would be in a “heads-I-win, tails-I-break-even” position. Neither characterization, however, takes into account attorneys’ fees and costs.

<sup>140</sup> *Id.* at 1159.

<sup>141</sup> *Id.* This theory is subject to criticism based on empirical data indicating that most infringers do not make a decision to infringe; most do not have knowledge of the relevant patents at the time they begin using patented technology or engage in copying of patented technology. Christopher A. Cotropia & Mark A. Lemley, *Copying in Patent Law*, 87 N.C. L. REV. 1421, 1462–65 (2009).

<sup>142</sup> While Judge Markey did not expressly identify undercompensation, it is a basic point of his argument. Relatedly, he also did not expressly identify what standard should govern an accurate determination of a reasonable royalty. Regardless, whatever standard is used to determine reasonable royalties, negotiated royalties will discount reasonable royalties based on the risks of litigation. Thus, what Judge Markey highlighted is the potential problem of circularity in reasonable royalty determinations and resulting undercompensation based on discounting for risk.

<sup>143</sup> The elimination of the incentive to infringe and litigate is not really deterrence. Punitive damages deter. The elimination of the incentive to infringe and litigate by causing infringers to internalize risk is not the creation of a disincentive to infringe and litigate; it merely makes the two options equal in economic impact to the decisionmaker-actor.

<sup>144</sup> *See supra* Part II.A.

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.<sup>145</sup> 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.

To understand the circularity problem associated with using negotiated royalties as reasonable royalties, assume that a court awards a patent owner a first reasonable royalty without the benefit of any prior negotiated royalties; parties negotiate royalties equal to an average of prior reasonable royalties but with discounts based on the patent owners' risks; and courts award subsequent reasonable royalties equal to an average of prior negotiated royalties. Further assume that the first reasonable royalty is \$1,000,000 and that the discounts always equal 50%.<sup>146</sup> In this scenario: (1) the court sets the first reasonable royalty at \$1,000,000; (2) the patent owner and one potential infringer negotiate a first negotiated royalty equal to the first reasonable royalty but with a first set of discounts based on the patent owner's risks, resulting in a first negotiated royalty of \$500,000; (3) a second court sets a second reasonable royalty equal to the first negotiated royalty, resulting in a second reasonable royalty of \$500,000; (4) the patent owner and another potential infringer negotiate a second negotiated royalty equal to an average of the first and second reasonable royalties, but include a second set of discounts based on the patent owner's risks, resulting in a second negotiated royalty of \$375,000; (5) a third court sets a third reasonable royalty equal to an average of the first and second

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<sup>145</sup> See *supra* Part II.A.

<sup>146</sup> The question of the appropriate level of reasonable royalties and the circularity problem persist, of course, only if the patent owner succeeds in each infringement case. If it does succeed, however, then the risk to the patent owner may be less with each subsequent lawsuit. This makes sense regarding, for example, invalidity challenges if each subsequent infringer uses the same arguments that failed in previous lawsuits. But potential infringers may also learn from failed strategies and try new ones. Furthermore, success in litigation may embolden patent owners to try to extend the scope of their patents to capture additional infringers, creating more risk of invalidity or non-infringement. Thus, for this simple model, I use one discount factor rather than multiple discount factors. Note, however, that the circularity problem continues to exist even if the discount factor reduces with each subsequent lawsuit, so long as it remains positive.

negotiated royalties, resulting in a third reasonable royalty of \$437,500; (6) the patent owner and yet another potential infringer negotiate a third negotiated royalty equal to an average of the first, second, and third reasonable royalties, but include a third set of discounts based on the patent owner's risks, resulting in a third negotiated royalty of \$322,916.67; (7) and so on and so on.<sup>147</sup>

This circularity problem<sup>148</sup> is a direct result of valuing patent rights. The assumption of validity, applied correctly, counteracts parties' agreed discounting based on the risk of invalidity. This doctrine therefore helps to eliminate some, but not all of the inherent circularity given all of the risk associated with liability, relief, and enforcement, as well as differential costs borne by parties to patent litigation. I will return to the problem of circularity,<sup>149</sup> but for now I want to highlight that valuation of patented technology does not include any discounts associated with the risk of liability, relief, or enforcement. Nor does it include any discounts associated with disproportionate costs of patent litigation.

#### C. PROVIDING OPTIMAL INCENTIVES TO INVENT

Modern commentators identify a different public policy to support awards of reasonable royalties. They focus on providing

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<sup>147</sup> Even if this simple model is changed to allow courts to include prior reasonable royalties in their averaging, a similar, but protracted, downward spiral results.

<sup>148</sup> Others have dubbed the effect of this circularity as "double-discounting." Cotter, *Four Principles*, *supra* note 6, at 752–53 (summarizing double-discounting); BLAIR & COTTER, *supra* note 117, at 230 (same); Stephen H. Kalos & Jonathan D. Putnam, *On the Incomparability of 'Comparables': An Economic Interpretation of 'Infringer's Royalties'*, 9 J. PROPRIETARY RTS. 4, 4 (1997) ("In essence, if actual arm's length royalties are awarded as damages there is a double counting of the discount for uncertainty."). Despite this label, the discounting is not necessarily limited to a double discount. Indeed, applying game theory to this simple scenario, where the number of determinations of reasonable royalties and negotiated royalties is infinite and there are no independent factors constraining either reasonable royalties or negotiated royalties, the negotiated royalties and reasonable royalties both approach zero. *Cf.* Golden, "Patent Trolls," *supra* note 6, at 2135 n.80 (making a similar point based on discounts associated with the patent holder's bargaining skill). If there is a factor that is independent of liability, then the reasonable royalty will converge on it rather than zero. If a patent owner can impose costs on a potential infringer that exceed its own costs, for example, then the negotiated and reasonable royalties may converge on the difference in costs. Examples of relevant costs include both direct expenditures and opportunity costs, such as the time relevant employees spend on patent infringement litigation rather than productive endeavors.

<sup>149</sup> See *infra* Part VI.A.

optimal incentives to invent.<sup>150</sup> This conception of reasonable royalties favors awarding the appropriate amount of money to patent owners (a) to spur investment in breakthrough inventions by prospective patent applicants, and (b) to spur investment in improvements by prospective users of patented technology.<sup>151</sup> Moreover, legal scholars have made the case that reasonable royalties should provide just enough incentive for prospective patent owners to invent, but no more.<sup>152</sup>

A recurring theme of these economic theories is that a reasonable royalty should be calculated by identifying the incremental profit of the patented technology,<sup>153</sup> or, in other words, the difference between the net value of the patented technology and the net value of the next-best non-infringing alternative to the patented technology.<sup>154</sup> While this calculation is not possible in every circumstance and whether the patent owner should be entitled to all of this difference is, at a minimum, debatable,<sup>155</sup>

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<sup>150</sup> See, e.g., Bailey et al., *supra* note 5, at 271 (offering an approach seeking to “align damages awards with incentives to innovate”); Elhauge, *supra* note 5, at 536 (determining that current royalties may be too low to incentivize optimal levels of invention); Kalos & Putnam, *supra* note 148, at 5 (analyzing types of royalties that preserve the incentive to engage in research and development); Lemley & Shapiro, *supra* note 3, at 194 (expressing concern about patent holdup’s ability to “distort or . . . dampen innovation incentives”); Sichelman, *supra* note 21, at 571 (“[P]atent law remedies should be tailored to optimize innovation incentives . . .”).

<sup>151</sup> See Landers, *supra* note 6, at 505 (“Achieving a workable patent system requires a balance between preserving incentives for the initial inventor and minimizing the detrimental impact to subsequent improvers. . . . The question of incentives must encompass a concern for sequential invention in order to fully conform with the central purpose of the patent system.”).

<sup>152</sup> See, e.g., Sichelman, *supra* note 21, at 542 (describing the “fundamental goal of patent law” as “to give as little protection as possible consistent with encouraging innovation”) (quoting Mark A. Lemley, *Property, Intellectual Property, and Free Riding*, 83 TEX. L. REV. 1031, 1051 (2005)); Brett M. Frischmann & Mark A. Lemley, *Spillovers*, 107 COLUM. L. REV. 257, 279 (2007) (“We do not need . . . to internalize all the benefits of innovation—just enough benefits to encourage the optimal level of innovation.”).

<sup>153</sup> See BLAIR & COTTER, *supra* note 117, at 215 (discussing the concept of incremental profit).

<sup>154</sup> FED. TRADE COMM’N, *supra* note 12, at 22.

<sup>155</sup> John Golden has explored these problems in some depth. Golden, *Principles for Patent Remedies*, *supra* note 6, at 529–39. As just one example, he provides a “simple model of patent racing show[ing] how divergence between public and private cost-benefit analyses can mean that the optimal value of reward . . . is less than an invention’s total social value.” *Id.* at 531. Relatedly, below I highlight that one of the open questions related to full adoption of a system of valuation focused exclusively on the value of patented technology is whether inventors should obtain all of the value of their inventions. See *infra* Part V.C.5.

inherent in this economic justification for reasonable royalties is that it focuses on the value of the relevant patented technology rather than the value of patent rights.

## V. REFORMING THE LAW TO FOCUS ON VALUING PATENTED TECHNOLOGY RATHER THAN PATENT RIGHTS

Modern courts have not perfectly focused reasonable royalties on the value of patented technology rather than patent rights. Indeed, there are ways the law governing reasonable royalties would change if it did so. I explore those ways here, and also consider some unresolved questions regarding a conception of reasonable royalties that focuses exclusively on the value of patented technology.

### A. EXISTING METHODS OF CALCULATION

Before considering ways the law governing reasonable royalties might change if it focused exclusively on valuing patented technology, consider the three primary methodologies used by courts to calculate reasonable royalties.

1. *The Analytical Method.* One available method to calculate reasonable royalties is the so-called “analytical method.”<sup>156</sup> It “focuses on the infringer’s projections of profit for the infringing product,”<sup>157</sup> and involves “subtract[ing] the infringer’s usual or acceptable net profit from its anticipated net profit realized from sales of infringing devices.”<sup>158</sup> The Federal Circuit, however, has recognized that the hypothetical negotiation construct, discussed in detail below, is more common than the analytical method in determining reasonable royalties.<sup>159</sup> Thus, in this Article I focus primarily on the hypothetical negotiation construct. I do highlight here, however, that the analytical method, or a modified version of it,<sup>160</sup> may be a useful tool to value patented technology rather than patent rights. In short, the difference between the infringer’s usual net profit and its anticipated net profit realized from use of

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<sup>156</sup> Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301, 1324 (Fed. Cir. 2009).

<sup>157</sup> *Id.*

<sup>158</sup> *Id.* (quoting TWM Mfg. Co. v. Dura Corp., 789 F.2d 895, 899 (Fed. Cir. 1986)).

<sup>159</sup> *Id.*

<sup>160</sup> See *infra* note 201 and accompanying text.



the patented technology may indicate one particular value of the patented technology—the value to the infringer—without regard for the value associated with the patent owner’s right to seek injunctive or monetary relief or impose costs through negotiation or litigation.

2. *The Georgia-Pacific Factors.* Courts have stressed that awards of reasonable royalties, by their very nature, require flexibility with respect to the type of evidence juries are allowed to consider given the impossibility of calculating precise awards in the absence of specific evidence of actual damages.<sup>161</sup> Consistent with this view, historically courts allowed juries to consider various types of evidence to determine reasonable royalties, including “the nature of the invention, its utility and advantages, and the extent of the use involved,”<sup>162</sup> “the profit made by the defendant and that lost by the plaintiff,”<sup>163</sup> and “the utility and advantage of the invention over the old modes or devices that had been used for working out similar results.”<sup>164</sup>

Modern courts typically point to a list of fifteen factors—the “*Georgia-Pacific* factors”—as representative of the various types of evidence courts have found relevant to determinations of reasonable royalties.<sup>165</sup> A district court drew these factors “from a conspectus of the leading cases” and reported them in its decision in a case brought by the Georgia-Pacific Corporation.<sup>166</sup> They are:

1. The royalties received by the patentee for the licensing of the patent in suit, proving or tending to prove an established royalty.

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<sup>161</sup> See, e.g., *Hartford Nat’l Bank & Trust Co. v. E.F. Drew & Co.*, 188 F. Supp. 353, 363 (D. Del. 1960) (“A meticulous calculation of a fair or reasonable patent royalty is for all practical purposes a physical impossibility. The field of economics—where a reasonable royalty lies—is not subject to the uncanny precision of mathematical sciences such as astronomy and electronics, since, unfortunately, business men do not at all times behave like heavenly bodies or charged particles. To strive for such precision would serve only to defeat the judicial purpose.”).

<sup>162</sup> *Dowagiac Mfg. Co. v. Minn. Moline Plow Co.*, 235 U.S. 641, 648 (1915).

<sup>163</sup> *Philp v. Nook*, 84 U.S. 460, 462 (1873).

<sup>164</sup> *Suffolk Co. v. Hayden*, 70 U.S. 315, 320 (1865).

<sup>165</sup> See, e.g., *Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1317 (Fed. Cir. 2011) (“This court has sanctioned the use of the *Georgia-Pacific* factors to frame the reasonable royalty inquiry.”).

<sup>166</sup> *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970).

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 the 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 his 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 the 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 promotor.

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 the patent and the term of the license.

8. The established profitability of the product made under the patent; its commercial success; and its current popularity.

9. The utility and advantages of the patent property over the old modes or 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 benefits to those who have used the invention.

11. The extent to which the infringer has made use of the invention; and any evidence probative of the value of that use.

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.

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.

14. The 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.<sup>167</sup>

The Federal Circuit has held that these factors do not represent a test for royalty calculations, but instead serve “only as a list of admissible factors informing a reliable economic analysis.”<sup>168</sup>

Note that some of these factors, including numbers 1 (any established royalty), 2 (comparable royalties), 5 (the commercial relationship between the licensor and licensee), and 6 (the value of the invention to the licensor as a generator of sales of his non-patented items), seem to focus on the value of patent rights. Other factors, however, focus on the value of the patented technology. These include numbers 8 (the established profitability of the product made under the patent), 9 (the utility and advantages of the patent property over the old modes or devices), 10 (any benefits to those who have used the invention), 11 (evidence probative of the value of the infringer’s use of the invention), and 13 (the portion of the realizable profit that should be credited to the invention as distinguished from non-patented elements, the

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<sup>167</sup> *Id.*

<sup>168</sup> *Energy Transp. Grp., Inc. v. William Demant Holding A/S*, 697 F.3d 1342, 1357 (Fed. Cir. 2012).

manufacturing process, business risks, or significant features or improvements added by the infringer).

It is important to recognize that the last of the fifteen *Georgia-Pacific* factors, the hypothetical negotiation construct, has, to a large degree, superseded the remainder of the factors in terms of importance.<sup>169</sup> Thus, I turn to its use next.

3. *Hypothetical Negotiation Construct.* The hypothetical negotiation “attempts to ascertain the royalty upon which the parties would have agreed had they successfully negotiated an agreement just before infringement began.”<sup>170</sup> To do so, it “tries, as best as possible, to recreate the *ex ante* licensing negotiation scenario and to describe the resulting agreement.”<sup>171</sup> Indeed, “as a legal construct, we seek to pin down how the prospective infringement might have been avoided via an out-of-court business solution.”<sup>172</sup> According to the Federal Circuit, the purpose of the hypothetical negotiation construct is “to discern the value of the patented technology to the parties in the marketplace when infringement began.”<sup>173</sup> This articulated purpose is consistent with the idea of determining the expected value of the patented technology. But whether use of the hypothetical negotiation construct actually achieves that purpose is questionable, as I will show.<sup>174</sup>

One of the primary benefits of the hypothetical negotiation construct is that it provides a way for a jury to conceptualize the legal question the court is asking it to decide. If a jury is able to understand factors that would impact a negotiation over a license to use technology, then it will be able to identify a reasonable royalty. Courts, however, use assumptions that either reinforce a natural understanding of this framework or undermine it. The hypothetical negotiation construct, for example, includes some assumptions that make it consistent with real licensing

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<sup>169</sup> See Jarosz & Chapman, *supra* note 5, at 782 (“The most important, and lasting, impact of *Georgia-Pacific 1970* (and the *Georgia-Pacific* line of cases) has been the elevation of a hypothetical negotiation construct as the primary tool for considering reasonable royalty damages.”).

<sup>170</sup> Lucent Techs. Inc. v. Gateway, Inc., 580 F.3d 1301, 1324 (Fed. Cir. 2009).

<sup>171</sup> *Id.* at 1325.

<sup>172</sup> LaserDynamics, Inc. v. Quanta Computer, Inc., 694 F.3d 51, 76 (Fed. Cir. 2012).

<sup>173</sup> *Id.*

<sup>174</sup> See *infra* Part V.B.1.

negotiations, but other assumptions and doctrines distinguish it from real licensing negotiations. For example, on the one hand, at least historically, one of the assumptions that made hypothetical negotiations consistent with real negotiations was the assumption that the licensee would seek to retain a reasonable profit.<sup>175</sup> Recent decisions, however, have seemingly called this assumption into question.<sup>176</sup>

On the other hand, there are several assumptions that are inconsistent with real licensing negotiations. One of these assumptions, derived from Judge Hand's decision in *Consolidated Rubber Tire Co. v. Diamond Rubber Co.*,<sup>177</sup> is that asserted patent claims are valid.<sup>178</sup> Another assumption that makes the

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<sup>175</sup> See, e.g., *Lindemann Maschinenfabrik GmbH v. Am. Hoist & Derrick Co.*, 895 F.2d 1403, 1408 (Fed. Cir. 1990) (rejecting an argument that a party would agree to pay a royalty greater than its expected profit as "absurd"); *Square Liner 360°, Inc. v. Chisum*, 691 F.2d 362, 377 (8th Cir. 1982) (rejecting an argument that a jury instruction must explicitly state that "a reasonable royalty would leave an infringer with a reasonable profit" because this concept was implicit in another jury instruction); *Hanson v. Alpine Valley Ski Area, Inc.*, 718 F.2d 1075, 1081 (Fed. Cir. 1983) (noting that it is implicit that a "reasonable royalty would leave an infringer with a reasonable profit" (quoting *Square Liner 360°*, 691 F.2d at 377)); *Georgia-Pacific Corp. v. U.S. Plywood-Champion Papers, Inc.*, 446 F.2d 295, 299 (2d Cir. 1971) (holding that when the trial court "did not allow [Georgia-Pacific] a reasonable profit after paying the suppositious royalty" it made "a basic error which should be corrected").

<sup>176</sup> The Federal Circuit has indicated that the reasonable royalty determined by way of the hypothetical negotiation need not leave the licensee with any actual residual profit. See *Douglas Dynamics, LLC v. Buyers Prods. Co.*, 717 F.3d 1336, 1346 (Fed. Cir. 2013) (holding that "the district court clearly erred by ensuring the ongoing royalty rate it awarded would 'leave some room for profit' by [the infringer] at its current prices"); *Mars, Inc. v. Coin Acceptors, Inc.*, 527 F.3d 1359, 1374 (Fed. Cir. 2008) (rejecting the notion that "a reasonable royalty can never result in an infringer operating at a loss"); *Golight, Inc. v. Wal-Mart Stores, Inc.*, 355 F.3d 1327, 1338 (Fed. Cir. 2004) ("There is no rule that a royalty be no higher than the infringer's net profit margin." (quoting *State Indus., Inc. v. Mor-Flo Indus., Inc.*, 883 F.2d 1573, 1580 (Fed. Cir. 1989))); *Monsanto Co. v. Ralph*, 382 F.3d 1374, 1384 (Fed. Cir. 2004) ("[T]he law does not require that an infringer be permitted to make a profit."); *State Indus.*, 883 F.2d at 1580 ("The determination of a reasonable royalty . . . is based not on the infringer's profit margin, but on what a willing licensor and licensee would bargain for at hypothetical negotiations on the date infringement started."); *Radio Steel & Mfg. Co. v. MTD Prods., Inc.*, 788 F.2d 1554, 1557 (Fed. Cir. 1986) (similar). Whether the infringer actually would have earned a profit is a separate question from whether the hypothetical licensee would have sought to earn a profit. See *Panduit Corp. v. Stahlin Bro. Fibre Works, Inc.*, 575 F.2d 1152, 1158, 1164 (6th Cir. 1978). Arguably, this distinction reconciles the apparent conflict between the cases in this and the preceding footnote.

<sup>177</sup> *Consol. Rubber Tire Co. v. Diamond Rubber Co.*, 226 F. 455, 458 (S.D.N.Y. 1915). See *supra* notes 86–89 and accompanying text.

<sup>178</sup> *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1325 (Fed. Cir. 2009). Courts, however, do not always make this assumption clear, particularly in the context of analyzing

hypothetical negotiation construct different than real negotiations is the assumption that the asserted claims are infringed.<sup>179</sup>

The so-called “book of wisdom” doctrine similarly distinguishes hypothetical negotiations from real negotiations. This doctrine originated in the Supreme Court’s opinion in 1933 in *Sinclair Refining Co. v. Jenkins Petroleum Process Co.*<sup>180</sup> In it, Justice Cardozo explained that evidence of increased efficiency or decreased costs associated with actual use of a patented technology may be used to determine a reasonable royalty, not just earlier “uncertain prophesy” about the technology’s value.<sup>181</sup> On the one hand, soon after a patent issues, “the only evidence available may be that supplied by testimony of experts as to the state of the art, the character of the improvement, and the probable increase of efficiency or saving of expense.”<sup>182</sup> On the other hand, “if years have gone by before the evidence is offered,” the Court explained, “[e]xperience is then available to correct uncertain prophecy.”<sup>183</sup> Commenting on the availability of this evidence of experience, the Court stated: “Here is a book of wisdom that courts may not neglect. We find no rule of law that sets a clasp upon its pages, and forbids us to look within.”<sup>184</sup>

Justice Cardozo’s metaphor provides a catchy shorthand (the book of wisdom doctrine) for the admissibility of evidence of *actual* increased efficiency or *actual* decreased costs, rather than limiting the evidence related to the hypothetical negotiation to predictions of these efficiencies or decreased costs. Stated otherwise, the distinction the Court drew is between the actual value of patented technology and the expected value of patented technology.<sup>185</sup> In focusing attention on the actual value of patented technology, the

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prior licenses to the patented technology. *See, e.g.,* *LaserDynamics, Inc. v. Quanta Comp., Inc.*, 694 F.3d 51, 79 (Fed. Cir. 2012) (“Actual licenses to the patented technology are highly probative as to what constitutes a reasonable royalty for those patent rights because such actual licenses most clearly reflect the economic value of the patented technology in the marketplace.”).

<sup>179</sup> *Lucent Techs.*, 580 F.3d at 1325.

<sup>180</sup> 289 U.S. 689 (1933).

<sup>181</sup> *Id.* at 698.

<sup>182</sup> *Id.*

<sup>183</sup> *Id.*

<sup>184</sup> *Id.*

<sup>185</sup> *See id.* at 699 (“Value for exchange is not the only value known to the law of damages. There are times when heed must be given to value for use, if reparation is to be adequate.”).

Court explained that determining a reasonable royalty is unlike measuring damages for a breach of contract or a tort and that, as a result, there is nothing wrong with “correct[ing] uncertain prophecies.”<sup>186</sup> To do so “is not to charge the offender with elements of value nonexistent at the time of his offense,” but instead “to bring out and expose to light the elements of value that were there from the beginning.”<sup>187</sup> Notably, this reasoning tracks the reasoning justifying the assumption of validity built into the reasonable royalty analysis; it too “corrects uncertain prophecies” and “exposes to light the elements of value” of the patented technology that existed prior to a determination of liability. The book of wisdom doctrine eliminates discounting of the value of the patented technology due to imperfect information related to that value at a time just before infringement, while the assumption of validity eliminates discounting of the value of the patented technology due to imperfect information related to the validity of the patent.<sup>188</sup>

Justice Cardozo also highlighted, more generally, the problem of allowing the hypothetical negotiation construct itself to govern the determination of damages for patent infringement, because the hypothetical negotiation may devalue the patented technology. He explained that “[v]alue for exchange is not the only value known to the law of damages” and that “[t]here are times when heed must be given to value for use, if reparation is to be adequate.”<sup>189</sup> Notably, Justice Cardozo suggested that, “[t]he market test failing, there must be reference to *the values inherent in the thing itself*, whether for use or for exchange.”<sup>190</sup> Thus, at least in circumstances where reference to the market provides inadequate reparation to a patent owner, Justice Cardozo suggested that courts seek to award the value related to the patent owner’s use or sale of the patented technology.<sup>191</sup> Thus, the Court’s opinion in

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<sup>186</sup> *Id.* at 698.

<sup>187</sup> *Id.*

<sup>188</sup> See *supra* notes 90–92. This reasoning also calls into question the universality of the modern, widely-accepted conception of reasonable royalties as providing a tort law make-whole remedy. Sichelman, *supra* note 21, at 560.

<sup>189</sup> *Sinclair Ref.*, 289 U.S. at 699.

<sup>190</sup> *Id.* (emphasis added).

<sup>191</sup> *Id.* (“The market test failing, there must be reference to the values inherent in the thing itself, whether for use or for exchange. These will not be known by first imagining a

*Sinclair Refining*, like its opinion in *Suffolk*, reflects a sense that the relevant value is the value of the patented technology.

A modern case citing *Sinclair Refining* explains that the hypothetical negotiation construct “speaks of negotiations as of the time infringement began, yet [the book of wisdom doctrine] permits and often requires a court to look to events and facts that occurred thereafter and that could not have been known to or predicted by the hypothesized negotiators.”<sup>192</sup> Theoretically, these events and facts may include the jury’s later determination of infringement and no invalidity, thus providing another way to explain the assumptions of validity and infringement. But, as a practical matter, in litigation these events and facts typically include sales data and actual profits so that the hypothetical negotiation construct, conducted after-the-fact based on the time period before infringement, will reflect later reality.<sup>193</sup> For years, moreover, courts have limited the book of wisdom doctrine to benefit patent owners rather than infringers.<sup>194</sup> Thus, for example, the Federal Circuit has not allowed infringers to rely upon evidence of less-than-anticipated profits in an effort to reduce reasonable royalties.<sup>195</sup> As a result, in practice, *Sinclair Refining* has not exactly focused the attention of courts on the value of patented technology, let alone on its true value rather than its expected value in every instance.

#### B. SPECIFIC REFORMS TO FOCUS ON THE VALUE OF PATENTED TECHNOLOGY

There are several specific reforms that would make the law governing reasonable royalties further reflect valuation of patented technology rather than valuation of patent rights.

1. *Elimination of the Hypothetical Negotiation Construct.* Courts probably would not use the hypothetical negotiation

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forced sale, and then accepting as a measure its probable results. The law is not so tender to sellers in default.” (citation omitted)).

<sup>192</sup> *Fromson v. W. Litho Plate & Supply Co.*, 853 F.2d 1568, 1575 (Fed. Cir. 1988).

<sup>193</sup> *See, e.g., id.* at 1577 (discussing the plaintiff’s profits and sales data in determining a reasonable royalty).

<sup>194</sup> Paul M. Janicke, *Contemporary Issues in Patent Damages*, 42 AM. U. L. REV. 691, 726 (1992) (criticizing the Federal Circuit for “steadfastly refus[ing] to allow defendants the same privilege of the crystal ball in order to reduce their liability for reasonable royalties”).

<sup>195</sup> *Id.* at 726.



construct if they sought to focus exclusively on the value of patented technology. Indeed, use of the hypothetical negotiation construct exacerbates focus on factors reflecting the value of patent rights instead of only the value of patented technology.<sup>196</sup> It is built upon the idea of replicating negotiated royalties, when negotiated royalties necessarily reflect the value of patent rights and not just the value of the patented technology.<sup>197</sup> As discussed above, for example, negotiated royalties will include discounts based on the patent owner's risks associated with liability, relief, and enforceability.<sup>198</sup> Negotiated royalties may also include a discount if the patent owner has higher costs to negotiate and litigate compared to a potential infringer.<sup>199</sup> Or they may overcompensate the patent owner if the patent owner has lower costs to negotiate and litigate compared to a potential infringer.<sup>200</sup>

In place of the hypothetical negotiation, one possibility is to use a modified version of the analytical method in appropriate circumstances.<sup>201</sup> Unlike the original version of the analytical method, it would focus on the patent owner's profitability. This modified version of the analytical method would thus seek to identify the difference between the *patent owner's* usual net profit and *its* potential or anticipated net profit realized from use of the patented technology. Like the original version of the analytical method, though, it would ignore the value associated with the patent owner's right to seek injunctive or monetary relief or impose costs through negotiation or litigation.

It seems unlikely, however—absent statutory reform—that courts would dispense with use of the hypothetical negotiation given the primary benefit from its use, its ease of conceptualization, and its extensive historical pedigree as a common law doctrine. Thus, perhaps more realistic reforms would seek to devise additional assumptions to correct for aspects of the hypothetical negotiation construct that continue to allow for

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<sup>196</sup> See *supra* notes 55–60 and accompanying text.

<sup>197</sup> See *supra* note 85 and accompanying text (discussing valuation of patent rights using negotiated royalties).

<sup>198</sup> See *supra* note 120 and accompanying text.

<sup>199</sup> See *supra* notes 111–16 and accompanying text.

<sup>200</sup> See *infra* notes 204–05 and accompanying text.

<sup>201</sup> See *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1324 (Fed. Cir. 2009) (defining the analytical method).

valuation based on patent rights,<sup>202</sup> or to reform the law governing reasonable royalties in other ways.

2. *Use of Additional Assumptions.* Additional assumptions, besides the existing assumptions of validity and infringement,<sup>203</sup> technically would be necessary for the use of the hypothetical negotiation construct to result in valuation only of patented technology.

First, if the goal of the assessment of a reasonable royalty is to identify the value of the patented technology, consider potential undercompensation to the patent owner. To avoid incorporating discounts, assumptions of clear liability, entitlement to relief, and enforceability of the patent would be necessary in addition to existing assumptions of validity and infringement. To avoid allowing the royalty to be reduced in light of the potential for higher cost to the patent owner to negotiate and litigate an infringement claim (as compared to the potential infringer), an assumption would be necessary that, for purposes of the hypothetical negotiation, any negotiation or future litigation would be costless or that the cost to both parties would be the same. In addition, one would need to assume that the parties are equally risk averse.

Second, again if the goal of the assessment of a reasonable royalty is to identify the value of the patented technology, consider potential overcompensation to the patent owner. To avoid extraction of value from the potential to impose higher negotiation and litigation costs on accused infringers, it would be necessary to use an assumption that any negotiation or future litigation would be costless or that the cost to the parties would be equal. Similarly, to avoid extraction of value based on the availability of other monetary remedies—such as enhanced damages or

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<sup>202</sup> On the other hand, use of many corrective assumptions calls into question the use of the hypothetical negotiation construct in the first place. Criticism of the hypothetical negotiation construct based upon its need for corrective assumptions is not new. *See, e.g.*, Janicke, *supra* note 194, at 722 (“The list of justice-oriented premises that courts have now artificially encrusted upon the concept of hypothetical negotiation causes one to wonder whether the concept has outlived its usefulness.”).

<sup>203</sup> While recent patent reform efforts in Congress failed with respect to amending the statutory sections governing the awards of monetary relief in patent cases, one of the proposals is notable because it would have codified the assumption of validity built into the hypothetical negotiation construct. *See* Patent Reform Act of 2009, S. 610, 111th Cong. § 4(a) (2009).

attorneys' fees—an assumption that the patent owner would recover only reasonable royalties would be necessary. Again, one would also need to assume that the parties are equally risk averse.

There are other possible reasons for the hypothetical negotiation to result in valuation of patent rights and thereby overcompensate the patent owner. Mark Lemley and Carl Shapiro have theorized that patent owners may be able to extract inappropriately high negotiated royalties based in part on “patent holdup” and “royalty stacking.”<sup>204</sup> “Patent holdup” refers to the ability of patent holders to threaten injunctive relief against accused infringers that have “already invested heavily to design, manufacture, market, and sell the product with the allegedly infringing feature” in order “to negotiate royalties far in excess of the patent holder’s true economic contribution.”<sup>205</sup> “Royalty stacking refers to situations in which a single product potentially infringes on many patents, and thus may bear multiple royalty burdens.”<sup>206</sup> According to Lemley and Shapiro, “royalty stacking magnifies the problems associated with injunction threats and holdup, and greatly so if many patents read on the same product.”<sup>207</sup> While others have criticized their analysis,<sup>208</sup> one thing Lemley and Shapiro highlight is their belief that it is possible in particular situations for reasonable royalties to exceed the value of patented technology.<sup>209</sup>

To avoid extraction of value from patent holdup, the time period for the hypothetical negotiation should be assumed to be just prior to any investment by the infringer in developing or using the patented technology.<sup>210</sup> Adopting this time frame for the analysis

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<sup>204</sup> See Lemley & Shapiro, *supra* note 3, at 1993 (reasoning that the threat of patent holdup and royalty stacking provides patent holders too much leverage); Shapiro, *supra* note 5, at 283 (asserting that “[t]he prospect of such holdup affects the negotiating strengths of the two parties”).

<sup>205</sup> Lemley & Shapiro, *supra* note 3, at 1993.

<sup>206</sup> *Id.*

<sup>207</sup> *Id.*

<sup>208</sup> See generally Elhauge, *supra* note 5; Golden, “Patent Trolls,” *supra* note 6; Sidak, *supra* note 5.

<sup>209</sup> Lemley & Shapiro, *supra* note 3, at 2025 (indicating that “patentees can obtain royalties that exceed the value of their contribution to the product”).

<sup>210</sup> See, e.g., FED. TRADE COMM’N, *supra* note 12, at 22 (recommending that courts “set the hypothetical negotiation at an early stage of product development”). This assumption would eliminate any need to presume that the patent owner would not obtain injunctive relief.

would eliminate valuation of the disruption of the accused infringer's business and focus valuation on the value of the technology. Likewise, to avoid overcompensation associated with the problem of royalty stacking, an assumption should be made that the parties would take into account all of the patented technology and potential royalty burdens, which would assume foreknowledge of future patenting activities and royalty agreements.<sup>211</sup>

3. *Adjustments to Negotiated Royalties.* What these additional assumptions would, in part, require are adjustments to negotiated royalties relied upon by parties as indicative of a reasonable royalty. 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.

As seen in *ResQNet.com* and *Rude*, when determining reasonable royalties courts often refuse to consider settlement agreements or only reluctantly consider them.<sup>212</sup> To the extent they do so because of the risk that these agreements reflect the value of injunctive relief or attorneys' fees and the relative risk aversion of the parties, their exclusion reflects an attempt to focus on valuation of patented technology. Another approach, however, is to adjust the negotiated royalties included in these settlement agreements to reflect the assumptions already described.

But all license agreements, regardless of their proximity in time to litigation, must be evaluated to determine the extent to which they reflect the value of patent rights rather than the value of patented technology. Any license agreement may include discounts due to probabilities associated with liability, relief, and enforceability and the patent owner's costs and level of risk aversion. An agreement may also include extraction of value based on patent holdup, royalty stacking, litigation costs,

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<sup>211</sup> How the parties would actually determine the value of one particular patent in a royalty stacking scenario, however, is a different, difficult problem. Joseph Farrell et al., *Standard Setting, Patents, and Hold-Up*, 74 ANTITRUST L.J. 603, 642 (2007) (assessing the difficulty of this task).

<sup>212</sup> See Chapman, *supra* note 5, at 326–27 (identifying decisions that refused to consider settlement agreements).

enhanced damages, and the accused infringer's costs and level of risk aversion.

In short, to the extent that negotiated royalties are inconsistent with the assumptions I have described, the negotiated royalties must be adjusted. Rather than excluding evidence of negotiated royalties, economists may adjust negotiated royalties based on the extent to which they reflect valuation of patent rights. Indeed, to the extent settlement agreements reflect more certainty regarding liability, economists may be able to use them, rather than other agreements, to identify more easily the true value of patented technology.<sup>213</sup>

Relatedly, if the law fully embraced valuation of patented technology, courts would not award unadjusted established royalties as reasonable royalties. Awards of unadjusted established royalties are inconsistent with providing compensation to patent owners equal to the value of patented technology. Unadjusted established royalties, because they *are* negotiated royalties, reflect valuation of patent rights. Parties effectively agree to adjustments to the value of the patented technology based on the patent owner's risks related to liability, relief, and enforcement, the patent owner's relative level of risk aversion, relative cost, and other factors.<sup>214</sup>

As described above, the law moved in the direction of limiting use of unadjusted established royalties when Judge Hand rejected a royalty established during disrepute of a patent based on suspected invalidity, and modern courts apply assumptions of validity and infringement to reasonable royalty calculations.<sup>215</sup> Moreover, modern law typically allows for consideration of an established royalty as a *starting point* for evaluation of a proper reasonable royalty rather than as a reasonable royalty in and of

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<sup>213</sup> *Cf. id.* at 349–50 (stating that courts may consider “[t]he effect of litigation costs on the terms of the settlement license . . . to determine the extent to which the terms of the settlement license provide useful guidance”). *But see* ResQNet.com, Inc. v. Lansa, Inc., 594 F.3d 860, 872 (Fed. Cir. 2010) (“This court observes . . . that the most reliable license in this record arose out of litigation. On other occasions, this court has acknowledged that the hypothetical reasonable royalty calculation occurs before litigation and that litigation itself can skew the results of the hypothetical negotiation. . . . Similarly this court has long recognized that a reasonable royalty can be different than a given royalty when, for example, widespread infringement artificially depressed past licenses.” (citations omitted)).

<sup>214</sup> *See generally* Schlicher, *supra* note 5.

<sup>215</sup> *See supra* Part III.B.

itself.<sup>216</sup> But there is still law indicating that established royalties, when they exist, are the “best measure” of reasonable royalties.<sup>217</sup> For reasonable royalties to reflect only the value of patented technology, it must be a requirement that negotiated royalties, including established royalties, be adjusted to correct for their reflection of the value of patent rights.

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Of course these and other potential reforms focusing reasonable royalties only on the value of patented technology would not necessarily make determining reasonable royalties easy or inexpensive. Identifying the value of patented technology is *not* easy or inexpensive. Moreover, even if the law perfectly focused on the value of patented technology, there would still be several open questions. I turn to these open questions next.

#### C. OPEN QUESTIONS RELATED TO VALUING PATENTED TECHNOLOGY

If the decision is made to focus the law governing reasonable royalties exclusively on the value of patented technology—to embrace the paradigm shift this Article contemplates—several questions remain that would affect how any reform might be implemented. This subpart identifies several of these open questions.<sup>218</sup>

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<sup>216</sup> See, e.g., *Syntex (U.S.A.) Inc. v. Paragon Optical Inc.*, Nos. CIV-84-260-PHX-WPC & CIV-85-910-PHX-WPC, 1987 WL 124333, at \*63 (D. Ariz. Nov. 23, 1987) (“Although pre-existing royalty rates are evidence of a reasonable royalty, the law is explicit that prior royalty rates establish only a minimum floor below which reasonable royalty damages cannot fall.” (citing *TransWorld Mfg. Corp. v. Al Nyman & Sons, Inc.*, 750 F.2d 1552, 1568 (Fed. Cir. 1984))).

<sup>217</sup> See, e.g., *Monsanto Co. v. McFarling*, 488 F.3d 973, 978–79 (Fed. Cir. 2007) (“An established royalty is usually the best measure of a ‘reasonable’ royalty for a given use of an invention because it removes the need to guess at the terms to which parties would hypothetically agree.”).

<sup>218</sup> In this Article, I seek to focus attention on the fundamental principle of using reasonable royalties to value patented technology. As this Part of the Article shows, however, this attention highlights several open questions. To be clear, I do not purport to answer here all of these open questions. Instead I seek to identify them, to analyze briefly their potential answers, and to encourage their further study by economists and legal scholars.

1. *Value Perspective: Patent Owner, Infringer, or Society.* Even if there is agreement on using reasonable royalties to value patented technology, a relevant question is “value to whom”: the value the patented technology provides to the patent owner, to the infringer, or to society? Savings or marginal profits earned by an infringer due to use of patented technology reflect the value of the patented technology to the infringer, while savings or marginal profits earned by the patent owner due to use of patented technology reflect its value to the patent owner. Should reasonable royalties reflect either of these values, or instead, the value to society?

Consider each option. A first option is to have reasonable royalties reflect the value of use of the patented invention by the patent owner, which is another way of describing the patent owner’s lost profits.<sup>219</sup> A second option is to have reasonable royalties reflect the value of use of the patented invention by the infringer, which is another way of saying the infringer’s profits derived from the patented invention.<sup>220</sup> In accounting terms, either of these two options would involve comparing the relevant party’s profit absent use of the patented technology with its profit given use of the patented technology. Any difference between the patent owner’s change in profit and the infringer’s change in profit would reflect the two parties’ relative efficiencies. In economic terms, either of these two options would involve comparing the relevant party’s producer surplus absent use of the patented technology with its producer surplus given use of the patented technology. Of these two options, the value to the patent owner seems more appropriate because reasonable royalties are presumed damages provided to compensate patent owners for infringement and to stimulate or reward their inventive activities.<sup>221</sup> And as it turns out, there is precedent indicating that this is the required perspective.<sup>222</sup> Thus, courts could use the

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<sup>219</sup> This option presumes that, for some reason, the patent owner is not able to obtain an award for its lost profits. Cf. Lemley, *supra* note 6, at 656 (criticizing use of reasonable royalties to estimate lost profits).

<sup>220</sup> Consider, for example, the possibility that the infringer is able to exploit a market inaccessible to the patent owner.

<sup>221</sup> See discussion of “general damages,” *infra* notes 308–09.

<sup>222</sup> *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 377 U.S. 476, 505 (1964) (plurality opinion) (“The purpose of the [statutory] change [in 1946] was precisely to eliminate the

modified version of the analytical method I have described to determine reasonable royalties by comparing the patent owner's profits with and without use of the patented technology.<sup>223</sup>

A third option, however, is to have reasonable royalties reflect the value society gains by use of the patented technology. In economic terms, this would be measured by comparing social welfare absent use of the patented technology with social welfare given use of the patented technology. It is an open question whether patent owners are entitled to all of this difference, and I return to this concept below when I address the extent to which courts should award the full value of patented technology.<sup>224</sup>

Significantly, the hypothetical negotiation construct seeks to identify a value of patent rights on a spectrum between the value to a patent owner and the value to an infringer, the exact value determined as a matter of bargaining power.<sup>225</sup> The lack of a definitive resolution as to where within this range the appropriate balance should be struck fosters uncertainty regarding how a factfinder will award a reasonable royalty in any given situation. This same uncertainty might apply to assessments of reasonable royalties based upon the value of patented technologies unless a particular party's value is selected.

2. *Subjective Versus Objective Valuation.* A related unresolved question is whether the value of patented technology is a subjective one or an objective one. The hypothetical negotiation construct—at least somewhat—abstracts away from particular patent owners and particular infringers, instead relying upon an imaginary *willing* patent owner and an imaginary *willing* licensee.<sup>226</sup> If the focus of a reasonable royalty assessment is on the value of patented technology, a similar question exists.

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recovery of profits as such and allow recovery of damages only.”); *id.* at 507 (“[T]o determine the damages that may be recovered from [the infringer] here, we must ask how much [the patent owner] suffered by [the infringer’s] infringement—how much it would have made if [the infringer] had not infringed.”).

<sup>223</sup> See *supra* Part V.A.1.

<sup>224</sup> See *infra* Part V.C.5.

<sup>225</sup> When a patent owner's value is higher than an infringer's value, there is no room for negotiation. Courts have adopted the patent owner's value in this situation.

<sup>226</sup> See, e.g., *LaserDynamics, Inc. v. Quanta Computer, Inc.*, 694 F.3d 51, 76 (Fed. Cir. 2012) (“[T]he basic question posed in a hypothetical negotiation is: if, on the eve of infringement, a willing licensor and licensee had entered into an agreement instead of allowing infringement of the patent to take place, what would that agreement be?”).



Regardless of whether the value is from the perspective of the patent owner or the infringer, is the value that of the particular party, or instead an ordinary patent owner or an ordinary infringer? If the assessment of damages is primarily remedial, the value to the particular party seems appropriate. But if the assessment of damages is primarily to shape incentives for future conduct by other potential parties, the perspective of an ordinary party may be more appropriate.

3. *Exclusive Versus Non-Exclusive Use of the Patented Technology.* To the extent that the value of the patented technology lies in its ability to increase demand and allow its user to increase the price of related goods or services at a given level of supply, another relevant, unresolved question is whether the reasonable royalty should reflect *exclusive* use of the patented technology or *non-exclusive* use of the technology. This issue can be tied to whether the law governing the determination of reasonable royalties under the hypothetical negotiation construct should presume that, absent an agreement, the patent owner would obtain injunctive relief. If reasonable royalties are determined based on an assumption of injunctive relief, then reasonable royalties presumably value exclusive use of the patented technology. If reasonable royalties are determined based on an assumption of no injunctive relief, then reasonable royalties presumably value non-exclusive use of the patented technology.

One of the *Georgia-Pacific* factors is the “nature and scope of the license (exclusive or nonexclusive, restricted or nonrestricted by territory or product type).”<sup>227</sup> While this factor highlights a focus on patent rights—nature and scope of the *license* rather than nature and scope of the *use of the patented technology*—it also highlights the importance of deciding whether use would be exclusive or non-exclusive. Exclusive use would support a higher reasonable royalty in the absence of acceptable non-infringing substitutes—market power could be exploited. Non-exclusive use would allow for competition from others using the patented technology, preventing, or at least limiting, the ability to use market power even in the absence of acceptable non-infringing substitutes. But *Georgia-Pacific* and the hypothetical negotiation

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<sup>227</sup> *Whitserve, LLC v. Computer Packages, Inc.*, 694 F.3d 10, 27 n.11 (Fed. Cir. 2012) (quoting *i4i LTD P’ship v. Microsoft Corp.*, 598 F.3d 831, 854 n.3 (Fed. Cir. 2010)).

construct leave the determination to the fact-finder whether an exclusive license or a non-exclusive license would be appropriate; they make resolution of this matter a question of past practices by the patent owner as well as bargaining power and other factors affecting licensing negotiations.<sup>228</sup>

Some economists have stressed that the reasonable royalty should focus on the value of non-exclusive licensing (and therefore non-exclusive use) of the patented technology.<sup>229</sup> Others, however, have stressed the opposite.<sup>230</sup> While economists typically present these arguments in the context of the hypothetical negotiation construct, and, therefore, to valuation based on patent rights, their arguments apply equally to valuation of patented technology. In other words, to the extent reasonable royalties focus on the value of use of patented technology, the question regarding exclusivity is still relevant.

To resolve uncertainties, the law should make clear whether reasonable royalties should reflect exclusive or non-exclusive use of patented technology rather than leaving the matter to the fact-finder to determine based on past practices by the patent owner as well as bargaining power and other factors affecting licensing negotiations. An assumption of non-exclusivity would effectively create a compulsory licensing scheme, while an assumption of exclusivity would effectively provide patent owners with the highest possible economic value of their patented technologies, which would depend on competition from available non-infringing alternatives.

4. *Anticipated Versus Actual Value.* Another open question relates to whether the relevant value is the anticipated value of the patented technology or its actual value. The hypothetical negotiation construct seems to focus on projections made by patent

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<sup>228</sup> See *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116, 1121 (S.D.N.Y. 1970).

<sup>229</sup> See, e.g., Jarosz & Chapman, *supra* note 5, at 819 (“Under ideal circumstances, a Licensing Comparables analysis is based on a real-world license that is essentially identical to the hypothetical license. Such a real-world license would be naked, nonexclusive, and cover only the infringed patent.”).

<sup>230</sup> See, e.g., 2 JOHN W. SCHLICHER, PATENT LAW, LEGAL AND ECONOMIC PRINCIPLES § 13:150 (2d ed. 2012) (“In a hypothetical negotiation in the absence of infringement, the patent owner will seek a royalty that would maximize licensing revenue. Licensing revenue will be maximized if the patent owner licenses at a rate equal to the rate of profit that a single supplier would make when selling at the most profitable price and quantity.”).

owners and potential infringers because the hypothetical negotiation is set just before infringement begins.<sup>231</sup> But the book of wisdom doctrine permits consideration of later, actual sales data and profits, and therefore in some circumstances allows for determinations of actual value rather than projections of value.<sup>232</sup>

If it is more appropriate to award actual value rather than the projected value,<sup>233</sup> there would be no reason to focus on the time period just before infringement began (consistent with current law)<sup>234</sup> or just before any decision was made to invest in developing or using patented technology (as others have suggested);<sup>235</sup> the assessment of reasonable royalties would use hindsight to determine actual value of patented technologies. Actual sales data and profits rather than projected sales data and profits would be relevant data, regardless of previous projections.

5. *All Versus Some of the Value.* Another unresolved question is whether patent owners should be awarded all of the value associated with use of their inventions, only enough to exceed marginal costs to create some reasonable profit, or only the marginal incremental value of the patented technology. A related problem is that it is not possible to identify the value of use of the patented technology in every situation.

In this last regard, consider the situation of complementary technologies. One problem related to complementary technologies

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<sup>231</sup> See *Lucent Techs. Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1324 (Fed. Cir. 2009).

<sup>232</sup> See *Fromson v. W. Litho Plate & Supply Co.*, 853 F.2d 1568, 1575 (Fed. Cir. 1988) (“At times the only evidence available may be that supplied by testimony of experts as to the state of the art, the character of the improvement, and the probable increase of efficiency or savings of expense. . . . This will generally be the case if the trial follows quickly after the issue of the patent. But a different situation is presented if years have gone by before the evidence is offered. Experience is then available to correct uncertain prophecy. Here is a book of wisdom that courts may not neglect. We find no rule of law that sets a clasp upon its pages, and forbids us to look within . . . .” (quoting *Sinclair Ref. Co. v. Jenkins Petroleum Co.*, 289 U.S. 689, 698 (1933))).

<sup>233</sup> Gregory Sidak effectively advocates for awards of reasonable royalties to reflect actual value rather than projected value given what he calls the “real option value”: the ability of copiers to sit on the sideline and wait to copy only successful technologies. See Sidak, *supra* note 5, at 736–43.

<sup>234</sup> See *Lucent Techs.*, 580 F.3d 1301, 1324 (Fed. Cir. 2009).

<sup>235</sup> See, e.g., FED. TRADE COMM’N, *supra* note 12, at 22 (recommending that courts set the hypothetical negotiation at an early stage of product development). This assumption would eliminate any need to assume that the patent owner would not obtain injunctive relief.

is the so-called “Cournot complements” problem.<sup>236</sup> This problem relates to “royalty stacking” and the theory that inventors of complementary inventions are unable to each charge users of their inventions the price that would maximize their own profits.<sup>237</sup> That is, “when multiple firms engage in complementary innovation, it is not possible . . . for each innovator’s reward to equal its invention’s incremental contribution.”<sup>238</sup> In other words, in situations involving complementary technologies, reasonable royalties cannot equal the entire marginal value of the patented technology. Any assessment of reasonable royalties must correct for this potential problem by taking into account complementary technologies and identifying relative contributions to their gross value, which, at a minimum, is a “difficult task that will not have an ideal solution.”<sup>239</sup> One can imagine a scenario, however, in which it is not really possible to identify the marginal value of use of certain patented technology. This scenario occurs when the patented technology is useful *only* with other technology, and the other technology is useful *only* with the patented technology. If the marginal incremental profit of a device implementing the combined technology is \$10, it is not clear how much of that \$10 should be attributed to the patented technology versus the other technology. A division of the profit between the technologies would seem to be arbitrary.

More generally, however, as Mark Lemley has explained, “[t]he assumption that intellectual property owners should be entitled to capture the full social surplus of their invention runs counter to our economic intuitions in every other segment of the economy.”<sup>240</sup> Indeed, there is reason to think that patent owners should not be entitled even to the entire difference in consumer surplus caused by the use of patented technology, even if it is identifiable, but

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<sup>236</sup> See AUGUSTIN COURNOT, RESEARCHES INTO THE MATHEMATICAL PRINCIPLES OF THE THEORY OF WEALTH 99–104 (Nathaniel T. Bacon trans., Augustus M. Kelley 1960) (1838) (describing how this problem arises with jointly consumed commodities).

<sup>237</sup> Cotter, *Patent Holdup*, *supra* note 6, at 1169 (“As explained by Augustin Cournot almost two centuries ago, when separate owners of complementary inputs each demand what is (for them) the individually profit-maximizing price, in exchange for permission to include those inputs in an end product, the cost of producing the end product will result in a price for the end product that is higher than the social optimum.”).

<sup>238</sup> *Id.* (quoting Farrell et al., *supra* note 211, at 622).

<sup>239</sup> Farrell et al., *supra* note 211, at 642.

<sup>240</sup> Lemley, *supra* note 152, at 1046.

instead only to “a return in excess of marginal cost.”<sup>241</sup> This argument, which is based on a purely incentive-driven analysis of remedies, strikes at the core understanding of the purpose of reasonable royalties. If reasonable royalties reflect the value of patented technologies rather than patent rights, this argument remains relevant. In short, should reasonable royalties compensate patent owners for the full marginal value of the patented technology or instead whatever amount is enough to induce the creation of the patented technology?<sup>242</sup>

While these theories suggest that potential inventors should obtain a reasonable return just above the marginal costs required to create patented technology, this conception of reasonable royalties would allow significant uncertainty and unpredictability to remain; the only way to determine whether any proposed reasonable royalty is truly “reasonable” would be to litigate—or perhaps arbitrate<sup>243</sup>—the matter to resolution. A more definite

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<sup>241</sup> *Id.* at 1059.

<sup>242</sup> For a recent, extended analysis of this question as applied to all legal remedies in patent infringement cases, see generally Ted Sichelman’s article entitled *Purging Patent Law of “Private Law” Remedies*, *supra* note 21. In his article, Sichelman argues that private law remedies derived from tort law that seek to return patent owners to their economic position prior to infringement fail to focus on advancing the relevant policy underlying patent law, the promotion of innovation. *Id.* at 519. He also shows how “make-whole damages” fixated on tort law-based compensation schemes—rather than a patent law-based incentive scheme—may overcompensate or undercompensate patent owners depending on the relevant circumstances. *Id.* at 555–60.

<sup>243</sup> Mark Lemley and Carl Shapiro have proposed a solution to the problems associated with identifying compliance with FRAND (fair, reasonable, and non-discriminatory) patent licensing commitments made by members of standard setting organizations. Mark A. Lemley & Carl Shapiro, *A Simple Approach to Setting Reasonable Royalties for Standard-Essential Patents*, 28 BERKELEY TECH. L.J. 1135, 1138 (2013). Their solution is based on so-called “baseball-style” arbitration. *Id.* It is noteworthy that Lemley and Shapiro advocate for no assumption of liability built into their determination of a FRAND royalty. *Id.* at 1139. They seek to build into the FRAND royalty a discount based on the potential for invalidity and non-infringement. *Id.* at 1150–52. They do so regardless of the “double discount” others have identified as associated with royalties calculated in litigation. *Id.* at 1147 n.34. Presumably they do so because of low costs associated with arbitration, as well as the fact that in their proposal the arbitrator would be called upon only to identify the likelihood of liability rather than whether there actually is liability. *Id.* at 1145, 1152. They do not address the burden that the patent holder has to bear the risk “twice”—once in advance of the arbitration and once at the arbitration. Their model therefore is based on a particular valuation of patent rights rather than exclusively on valuation of patented technology. That, however, may be unavoidable given that what they seek to do is to evaluate whether actual negotiated royalties comply with a commitment to negotiate royalties in a certain manner. As I have explained, negotiated royalties value patent rights

baseline, rather than one focused on reasonableness, would seemingly both reduce the need for a dispute resolution mechanism and reduce the complexity of any such mechanism.

On the other hand, while increasing certainty, awarding *all* of the *infringer's* profit as a categorical rule governing all awards of reasonable royalties would effectively reinstitute disgorgement of profits as a remedy for patent infringement. At least according to the Supreme Court, Congress eliminated this remedy in 1952.<sup>244</sup> Moreover, as a matter of policy, disgorgement risks over-deterrence of potentially innovative conduct.

The answer to this problem may be to seek to award the marginal incremental profit associated with use of the patented technology. Mark Lemley has argued that a reasonable royalty “might serve as a reasonable proxy for the intrinsic value of [a patented] innovation. . . . even if its relationship to real social contribution is somewhat arbitrary.”<sup>245</sup> But a reasonable royalty arguably serves as a reasonable proxy of this value only if profit is apportioned to reflect the marginal incremental value of the patented technology.<sup>246</sup> Indeed, rather than seeking to identify

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rather than just patented technologies. Thus, it is not surprising that Lemley and Shapiro's methodology reflects the value of patent rights.

<sup>244</sup> See *infra* note 307 (discussing disgorgement).

<sup>245</sup> Mark A. Lemley, *Taking the Regulatory Nature of IP Seriously*, 92 TEX. L. REV. 107, 114 (2014).

<sup>246</sup> See, e.g., Bailey et al., *supra* note 5, at 259 (“Under a sound economic approach, the reasonable royalty award (in dollars) should reflect the incremental value (in dollars) of the patented technology to the defendant as compared to the next best alternative.”); Landers, *supra* note 6, at 476–77 (stating that an apportionment “approach requires an evaluation of the infringed claim's advance over existing knowledge”). Notably, in *Dowagiac*, the Supreme Court did not reverse its holding in *Coupe*, see *Dowagiac Mfg. Co. v. Minn. Moline Plow Co.*, 235 U.S. 641, 649 (1915), and one might harbor the false impression that *Coupe* rejected valuation of patented technology. One might harbor this false impression because the patent owner in *Coupe* *did* introduce evidence of the expected cost savings from using the patented technology, and yet the Court still required only a nominal award rather than a reasonable royalty. *Coupe v. Royer*, 155 U.S. 565, 583 (1895). The requirement to provide evidence to apportion profits, however, explains both the Court's holding in *Coupe* and why that holding should not be understood broadly to represent the view that evidence of the value of patented technology is insufficient. As highlighted later in *Dowagiac*, the Court's holding in *Coupe* turned on a failure of proof, in particular the absence of evidence of what portion of the cost savings the reasonable royalty should be. *Dowagiac*, 235 U.S. at 649. Besides explaining how *Coupe* does not broadly reject the concept of valuation of patented technology, this view of *Coupe* may suggest that the answer to this question—about whether the patent owner is entitled to all of the value associated with its use—is not open.

what a reasonable return just above the marginal costs required to create patented technology is—a rather uncertain and unpredictable quest—the better approach may be to seek to identify the marginal incremental profit associated with use of the patented technology.

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Notably, each of the open questions identified here already exists under the current methods of calculating reasonable royalties, which allow for valuation of patent rights. This is because valuing patent rights necessarily includes as one of its components the valuation of patented technology. If a decision is made to focus reasonable royalties only on the value of patented technology, however, it would provide an opportunity to confront and resolve these questions to provide additional clarity, certainty, and predictability with respect to the law governing reasonable royalties.

#### VI. ELIMINATING PROBLEMS BY FOCUSING ON THE VALUE OF PATENTED TECHNOLOGY

Even if these open questions are not resolved, focusing the law governing reasonable royalties on identifying the value of patented technology would provide several important benefits.

##### A. ELIMINATING CIRCULARITY AND ASSOCIATED PROBLEMS

I have described the circularity problem associated with using negotiated royalties to calculate reasonable royalties and vice versa.<sup>247</sup> Parties negotiate royalties in view of potential reasonable royalties; they assess negotiated royalties based on expected reasonable royalties. But, likewise, courts determine appropriate royalties in the shadow of negotiated royalties; they assess reasonable royalties based on past negotiated royalties. This circularity, left unchecked, may devalue reasonable royalties given risk associated with liability, relief, and enforcement. This

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In effect, the Court seemed to say, “No, just part of it. And you have to introduce evidence to show how much of it.”

<sup>247</sup> See *supra* notes 146–48 and accompanying text.

circularity, however, left unchecked, may also overvalue reasonable royalties given other considerations.

Consider, first, *devaluation* of reasonable royalties given the patent owner's risk. As I have mentioned, one partial solution to this particular circularity problem is to use assumptions, including but not limited to the assumptions of validity and infringement.<sup>248</sup> As I have described, courts developed the assumption of validity built into the reasonable royalty calculation following the decision by Judge Hand to reject the use of a royalty established after a circuit court found a patent invalid but before the Supreme Court found the patent not invalid.<sup>249</sup> The reason for the assumption of validity in this context is clear: an established royalty reflects a general consensus regarding the expected validity of a patent; without adjusting an established royalty upward to account for the difference between the previous consensus regarding *expected* validity and the judgment *confirming* validity, setting a reasonable royalty equal to an established royalty has the pernicious effect of encouraging further discounting by negotiating parties. As I have shown, the same thing can be said of reasonable royalty calculations based on unadjusted negotiated royalties; without adjusting the negotiated royalties upward to account for the difference between the parties' *expectations* regarding validity and the judgment *confirming* validity, setting a reasonable royalty equal to negotiated royalties has a similar effect of encouraging additional discounting by negotiating parties.<sup>250</sup> While Judge Hand focused on validity given the facts he confronted, additional assumptions are required besides an assumption of validity to account for the circularity, including assumptions of liability (covering validity, infringement, and equitable defenses), relief, and enforceability.

Now consider how the circularity inherent in the hypothetical negotiation, left unchecked, may *overvalue* reasonable royalties. In particular, if negotiated royalties used to calculate reasonable royalties are not representative of the complete range of negotiated royalties, but instead are selected from the more expensive end of the range, then the resulting, calculated

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<sup>248</sup> See *supra* Part V.A.3.

<sup>249</sup> See *supra* Part III.B.

<sup>250</sup> See *supra* Part IV.B.



reasonable royalties will exceed the true reasonable royalties. Mark Lemley and Carl Shapiro have made the argument that there is such a selection effect, and that this effect causes reasonable royalties to exceed a benchmark for reasonable royalties.<sup>251</sup> A possible solution to this possibility is increased rigor in the analysis of alleged comparable negotiated royalties to identify and correct for selection effects. Another way in which the circularity problem, left unchecked, may overvalue reasonable royalties results from patent holdup and royalty stacking. To the extent patent holdup and royalty stacking may cause negotiated royalties to exceed the value of patented technology in particular situations,<sup>252</sup> the circular nature of the hypothetical negotiation construct may cause reasonable royalties to exceed the value of the patented technology in those situations.<sup>253</sup>

The circularity problem and the potential for undervaluation or overvaluation, however, results from use of the hypothetical negotiation construct and its focus on valuing patent rights rather than patented technology. If courts shift the focus of the reasonable royalty analysis to the actual value of the patented technology, there is no longer circularity and the potential for systemic undervaluation or overvaluation is reduced. Indeed, dispensing with the circularity associated with the hypothetical negotiation construct would eliminate the need to use so many corrective assumptions. And by focusing only on the actual value of patented technology, the analysis would be easier to perform, presumably resulting in cost savings as well as increased accuracy and predictability, as discussed in more detail below.<sup>254</sup>

#### B. INCREASING GUIDANCE AND ACCURACY

Focusing the analysis on the value of patented technology would provide significant guidance for experts, juries, and courts. A common criticism of the *Georgia-Pacific* factors is that they provide little guidance to experts, juries, and courts. In the words

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<sup>251</sup> Lemley & Shapiro, *supra* note 3, at 2022.

<sup>252</sup> See *supra* notes 204–09 and accompanying text.

<sup>253</sup> Lemley & Shapiro, *supra* note 3, at 2021–22 (“The consequence of this circularity is that reasonable royalties are elevated above the benchmark level.”).

<sup>254</sup> See *infra* Part VI.B–C.

of critics, they are “poorly defined and explained”<sup>255</sup> and provide “little or no practical guidance.”<sup>256</sup> Likewise, the hypothetical negotiation construct is said to be “poorly grounded and loosely defined.”<sup>257</sup> As a result, attempts have been made to better explain the relevance of individual factors, for example by grouping them into logical components of a structured test for assessing reasonable royalties.<sup>258</sup> These attempts, however, fail to the extent that they do not identify a unifying goal for a reasonable royalty analysis. Focusing the analysis on the value of patented technology would provide that unifying goal. It would also effectively provide context for consideration of the *Georgia-Pacific* factors, should some be retained as suggestions of the kind of evidence that might be relevant to the ultimate question of the value of the patented technology.

Identifying the goal of valuing patented technology would also increase the accuracy of reasonable royalty calculations. Because the *Georgia-Pacific* factors and the hypothetical negotiation construct fail to identify the goal of the reasonable royalty determination, other than the circular notion of reflecting the result of a hypothetical negotiation based on a slew of competing considerations, a critique is that they are not tied to any conception of what constitutes an accurate determination of a reasonable royalty. In short, the law fails to identify a clear, non-circular substantive goal of the reasonable royalty calculation.<sup>259</sup> Instead, the law largely places the procedure of the analysis before

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<sup>255</sup> Jarosz & Chapman, *supra* note 5, at 808.

<sup>256</sup> Durie & Lemley, *supra* note 1, at 631.

<sup>257</sup> Jarosz & Chapman, *supra* note 5, at 807.

<sup>258</sup> Durie & Lemley, *supra* note 1, at 629 (breaking the *Georgia-Pacific* test down to three fundamental questions).

<sup>259</sup> One way to address the lack of a *non-circular* substantive goal of the reasonable royalty calculation within the hypothetical negotiation construct is to define exactly how parties would reach agreement on the appropriate reasonable royalty *without considering actions the patent owner or a court might take to enforce any patent rights*. In this regard, the assumption of validity seeks to remove from consideration the possibility that a court might invalidate a patent. As I have discussed, however, additional assumptions would be necessary to eliminate completely the inherent circularity built into the hypothetical negotiation construct. See *supra* Part V.B.2. But even without any circularity, the law currently does not identify a clear substantive goal of the hypothetical negotiation itself. The two options I identify here are either (1) to value the patent rights, which—*after eliminating circularity by eliminating consideration of actions a court might take to enforce any patent rights*—would be particularly ironic; or (2) to value the patented technology.

its substance. Relatedly, a familiar criticism is that the hypothetical negotiation seems to be based on the conception that bargaining power is a critical component of the appropriate way to determine reasonable royalties, and therefore that discounts or surcharges based on bargaining power are critical components of reasonable royalties themselves. Scholars have recently debated the appropriateness of allowing bargaining power to impact reasonable royalties and negotiated royalties.<sup>260</sup> In the absence of agreement regarding the substantive goal of reasonable royalty calculations, it is easy to criticize results as inaccurate.<sup>261</sup> If the law identifies the goal of the reasonable royalty analysis as determining the value of the patented technology, by contrast, it would at least provide a clear target. As a result, it would be easier to identify error in particular instances, resulting in greater overall accuracy as steps can be taken to correct for these errors.

Courts may be able to increase accuracy by dispensing with the hypothetical negotiation construct given its focus on negotiated royalties and inherent circularity, and instead adopt a modified version of the analytical method.<sup>262</sup> The alternative I have identified is to maintain the hypothetical negotiation construct, but require additional corrective assumptions to eliminate valuation based on patent rights.<sup>263</sup> But there is reason to think that juries may not apply these assumptions to their logical conclusions. In this regard, consider what an assumption of liability requires a jury to do. Somewhat ironically, according to the assumption of liability, a jury should apply a *higher* multiplier to negotiated royalties in *close* cases compared to *easy* cases.

Consider two examples. For the first example, assume (1) a close case in which a jury ultimately concludes that an accused infringer is liable for patent infringement, and (2) that for

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<sup>260</sup> Compare Lemley & Shapiro, *supra* note 3, at 1997–99 (including bargaining power as a variable in a benchmark reasonable royalty rate), Shapiro, *supra* note 5, at 288–89 (same), and Lemley & Shapiro, *supra* note 3, at 2164–68 (arguing that bargaining power is an appropriate factor in a benchmark reasonable royalty rate), with Elhauge, *supra* note 5, at 543, 545 (arguing that bargaining power is not an appropriate factor in a benchmark reasonable royalty rate), and Golden, “Patent Trolls,” *supra* note 6, at 2115 (same).

<sup>261</sup> Jarosz & Chapman, *supra* note 5, at 807 (criticizing current law as not always leading to fair and reasonable outcomes).

<sup>262</sup> See *supra* note 201 and accompanying text.

<sup>263</sup> See *supra* Part V.B.2.

damages purposes the jury is presented only one prior negotiated royalty where another accused infringer paid the patent owner \$1 million. It seems likely that the jury would base its determination of how the negotiating parties assessed the likelihood of liability with how the jury itself assessed the closeness of its case. Thus, further assume (3) the jury believes the negotiating parties estimated the patent owner's chances of success at 50% on validity and 50% on infringement, with no other relevant contingencies, equal negotiation and litigation costs borne by those parties, and equal risk aversion. What should the jury do according to an assumption of liability built into a reasonable royalty calculation? If infringement and validity are independent variables, then the multiplier resulting from the assumption of liability should be four; that is, the jury should multiply the negotiated royalty reflecting 50% probability of validity and 50% probability of infringement by four to obtain a reasonable royalty reflecting certainty as to liability. The jury should therefore award a reasonable royalty of \$4 million.

For the second example, assume (1) an easy case in which a jury concludes that an accused infringer is liable for patent infringement, and (2) again, that for damages purposes the jury is presented only one prior negotiated royalty where another accused infringer paid the patent owner \$1 million. It still seems likely that the jury would base its determination of how the negotiating parties assessed the likelihood of liability with how the jury itself assessed the closeness of its case. Thus, (3) assume the jury believes the negotiating parties estimated the patent owner's chances of success at 100% on validity and 100% on infringement, again with no other relevant contingencies, equal negotiation and litigation costs borne by those parties, and equal risk aversion. What should the jury do according to the assumption of liability built into the reasonable royalty calculation? In this situation, the multiplier resulting from the assumption of liability should not exceed one; that is, the jury should not increase the negotiated royalty at all because it already reflects certainty as to liability. The jury should therefore award a reasonable royalty of \$1 million.

Now, does anyone really think that in a *close* case a jury will multiply pre-litigation royalties by *four*, while in a case of *blatant liability* a jury will *not increase pre-litigation royalties at all*? It

seems likely that the opposite would occur more often: that in close cases the jury would not increase the royalty, but in blatant cases of liability the jury would increase the royalty. That is, it seems likely that juries will award damages based on the equities rather than on the economic theory, even if given relatively clear jury instructions to the contrary. And that is consistent with how some litigators view the performance of juries in patent cases: dispensing punishment regardless of jury instructions not to do so.<sup>264</sup> In short, while the theory and math behind the assumption of liability is clear, whether a jury would follow the theory and math to its logical conclusion seems dubious.

Now consider the practical ability of damages experts to correct a negotiated royalty to reflect an assumption of liability. How will a damages expert decide whether to multiply negotiated royalties by four, some other factor, or not adjust them at all? In particular, where will the damages expert obtain information related to the parties' estimations of the probabilities of liability?

In this regard, consider Thomas Cotter's summary of various critiques of the law governing the award of reasonable royalties and the Federal Circuit's decisions responding to those critiques.<sup>265</sup> He "attempts to place these decisions within a comprehensive analytic framework for calculating damages and suggests some remaining areas in need of reform."<sup>266</sup> Within this framework, his fourth principle "is that, in awarding reasonable royalties based on the estimated terms that the parties would have agreed upon *ex ante*, the trier of fact should consider variables that reflect the *ex ante* value of the technology and that would have constrained real-world negotiations as a general rule."<sup>267</sup> This principle is consistent with identifying the expected value of patented technology.

Cotter, however, purports to *exclude* the real-world consideration of "parties' *ex ante* probability estimates of patent validity, enforceability, and infringement" using the assumption of

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<sup>264</sup> Martha K. Gooding & William C. Rooklidge, *The Real Problem with Patent Infringement Damages*, 91 J. PAT. & TRADEMARK OFF. SOC'Y 484, 485 (2009) (claiming that jurors may approach damages deliberations with a desire to punish the infringer).

<sup>265</sup> See Cotter, *Four Principles*, *supra* note 6, at 731–34.

<sup>266</sup> *Id.* at 734.

<sup>267</sup> *Id.* at 741.

liability.<sup>268</sup> He believes considering probability estimates “would lead to incorrect calculations in court”<sup>269</sup> because “[s]tandard analysis shows that *not* making this assumption at trial, after the patentee has already borne the risk that the court would find the patent invalid or not infringed, would in effect amount to double discounting.”<sup>270</sup> As a result, Cotter believes “the trier of fact should assume that, at the time of the hypothetical negotiations, the patentee and the would-be user believed the patent to be valid and infringed.”<sup>271</sup> In effect, he argues that the assumption of liability is necessary to assess reasonable royalties correctly. Cotter’s argument supports the assumption of liability, and it makes economic sense to do so, along with other assumptions to eliminate the inherent circularity in the hypothetical negotiation construct, as I have discussed.<sup>272</sup>

But, to be clear, Cotter’s purported exclusion of parties’ ex ante probability estimates is really no exclusion at all. To assess properly the relevance of a real-world royalty in a negotiated agreement, the trier of fact *must* consider the parties’ ex ante probability estimates. This is so because (in my simplified examples) the trier of fact must multiply the real world royalty by the inverse of the discount factor reflected in the parties’ ex ante agreement. If the trier of fact does not do so, the trier of fact builds into the reasonable royalty the parties’ agreed discount based on the probability of liability.

So where will the jury or damages expert turn? Consider the damages expert. She surely cannot get the proper adjustment from the parties’ technical experts addressing infringement and validity. Given the discoverability of experts’ conversations, absent delay of damages discovery until after a liability determination and perhaps even if there is this delay, it seems highly likely that the patent owner’s technical experts will tell its damages expert that the probability of infringement and validity was and is 100%, while the accused infringer’s technical experts

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<sup>268</sup> *Id.* at 752.

<sup>269</sup> *Id.*

<sup>270</sup> *Id.* at 752–53. This is a reference to the same “double-discounting” that I have already discussed. *See supra* note 148. In reality, the discounting is not limited to a double-discounting. *See supra* note 148.

<sup>271</sup> Cotter, *Four Principles*, *supra* note 6, at 753.

<sup>272</sup> *See supra* Part V.B.2.

will tell its damages expert that the probability of each was and is 0%. (This, despite the fact that (a) a patent owner would want any negotiated royalty increased, which would require a determination that a negotiated royalty reflected a discount based on probable invalidity and non-infringement; and (b) an infringer would not want any negotiated royalty increased, which would require a determination that a negotiated royalty reflected no discount based on agreed validity and infringement. Presumably both sides would rather win on liability than win on the factor used to increase reasonable royalties.)

Documentary evidence contemporaneous with the negotiations of royalties may be the only realistic possibility. It may constitute reliable evidence indicating the extent to which negotiating parties discounted an agreed royalty based on risk. For example, they may have done so based upon identified concerns with invalidity, non-infringement, and equitable defenses. I have found one example of a case where a damages expert was able to point to documentary evidence showing what parties to a patent license agreement may have estimated to be the probability of liability at the time of their negotiations.<sup>273</sup> But it seems unlikely that many damages experts would be able to point to any reliable documentary evidence on point. Rather, it seems likely that a patent owner would seek to include self-indulging statements in license agreements regarding large discounts provided given relevant risks, so as to set the stage for large multiplications of negotiated royalties in later infringement litigation. But given the assumption of liability, any negotiated royalty should be adjusted given *real-world* discounts based on the probability of liability, and each damages expert must be able to point to some reliable basis for any opinion indicating that a particular increase is appropriate for the jury to adopt.<sup>274</sup>

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<sup>273</sup> See *Mondis Tech., Ltd. v. LG Elecs., Inc.*, No. 2:07-CV-565-TJW-CE, 2011 WL 2417367, at \*7 (E.D. Tex. June 14, 2011) (allowing a damages expert to rely upon “charts or other information . . . that were presented during various license negotiations” and reflected a 33% discount to support an opinion that a reasonable royalty should be three times the negotiated royalty of 1%).

<sup>274</sup> FED. R. EVID. 702 (establishing requirements for admission of expert testimony); *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 589 (1993) (holding that courts must ensure that all scientific testimony is reliable).

Significantly, these difficulties for juries and damages experts might be eliminated, or at least reduced, by focusing on valuation of patented technology, and particularly its actual value, in the first place. In short, the assumption of liability—and the other assumptions I have identified<sup>275</sup> that would direct the hypothetical negotiation construct away from the value of patent rights and toward the value of patented technology—attempts to redirect the hypothetical negotiation construct so that it focuses on the salient issue, the value of the patented technology. Indeed, by distracting from the relevant question, the hypothetical negotiation construct inserts a perhaps intractable problem into the analysis: how much to inflate negotiated royalties given real world risks and costs with respect to proving liability for patent infringement, obtaining orders for relief, and enforcing those orders to obtain monetary damages and to prevent infringement.<sup>276</sup>

#### C. REDUCING UNCERTAINTY AND UNPREDICTABILITY

Focusing the analysis on the value of patented technology only would also increase certainty and predictability, perhaps dramatically. A problem with the *Georgia-Pacific* factors and the hypothetical negotiation construct is that their flexibility leads to great uncertainty.<sup>277</sup> Uncertainty is seen as endemic in patent law.<sup>278</sup> And it is particularly problematic given the fundamental idea that companies and individuals will not make decisions to invest in research and development—or at least will not do so efficiently—absent clarity regarding whether they will be able to obtain a sufficient return on their investments.<sup>279</sup> But the uncertainty created by the *Georgia-Pacific* factors and the

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<sup>275</sup> See *supra* Part V.B.2.

<sup>276</sup> I do not mean to argue for exclusion of consideration of negotiated royalties in determinations of reasonable royalties, but instead to highlight the need to adjust negotiated royalties using appropriate methods and data, and the difficulty of doing so accurately and efficiently. The point is that this difficulty might be eliminated or reduced by focusing in the first instance on the relevant question, the value of use of the patented technology.

<sup>277</sup> See Jarosz & Chapman, *supra* note 5, at 808–09 (recognizing that some courts have expressed disdain at the uncertainty generated by these factors).

<sup>278</sup> S. Jay Plager, *The Federal Circuit as an Institution: On Uncertainty and Policy Levers*, 43 LOY. L.A. L. REV. 749, 749 (2010).

<sup>279</sup> See generally David O. Taylor, *Formalism and Antiformalism in Patent Law Adjudication: Rules and Standards*, 46 CONN. L. REV. 415 (2013).



hypothetical negotiation are said to be “tremendous . . . [given] widely divergent royalty recommendations (and outcomes).”<sup>280</sup> At the time of any hypothetical negotiation over the value of patent rights, “[t]here are two fundamental dimensions of uncertainty: 1) uncertainty about the commercial significance of the invention being patented, and 2) uncertainty about the validity and scope of the legal right being granted.”<sup>281</sup> One proposed solution is to eliminate some of the flexibility and, indeed, the hypothetical negotiation construct itself to provide more certainty and predictability.<sup>282</sup>

Focusing on the value of patented technology rather than the value of patent rights may reduce or eliminate the second area of uncertainty, which is derived from risks associated with validity, relief, and enforceability. The complete elimination of this uncertainty, however, would require eliminating use of the hypothetical negotiation because, even though its corrective assumptions seek to reverse discounts based on these risks, the corrective assumptions themselves involve significant uncertainty. Likewise, the complete elimination of this uncertainty would require eliminating use of comparable agreements because they too require corrections to reverse discounts based on these risks.

Notably, however, the first area of uncertainty regarding the commercial significance of the patented invention can also be eliminated if the relevant value is the actual value rather than the expected value that is perceived or forecasted at a time period just before infringement or the decision to infringe. If this first area of uncertainty is eliminated—and it is largely a creation of the *law* rather than accounting or economics—reasonable royalty awards would be much more predictable. This predictability might encourage more investment in inventive efforts.

#### D. BOUNDING EXPERT TESTIMONY

No doubt one contributing factor to inaccuracy, uncertainty, and unpredictability regarding reasonable royalties is the

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<sup>280</sup> Jarosz & Chapman, *supra* note 5, at 809.

<sup>281</sup> Lemley & Shapiro, *supra* note 52, at 76.

<sup>282</sup> See Jarosz & Chapman, *supra* note 5, at 811–12 (advocating elimination of the hypothetical negotiation and proposing that courts instead consider all available evidence).

relatively unbounded expert testimony and evidence allowed by the *Georgia-Pacific* factors and the hypothetical negotiation construct. Indeed, according to one critique, it is difficult to exclude evidence or expert testimony “espousing virtually any theory of reasonable royalty damages, no matter how outlandish.”<sup>283</sup> One solution is to cabin the reasonable royalty analysis by eliminating the hypothetical negotiation construct in favor of an objective analysis grounded in economic theories of valuation of patented technology, rather than valuation of patent rights.<sup>284</sup> Another, more limited reform is to encourage additional gatekeeping by courts, including encouraging more use of *Daubert* motions by parties, with the purpose of excluding expert testimony embracing the value of patent rights rather than the value of patented technology.<sup>285</sup>

By narrowing the inquiry to the value of patented technology, it might be possible to restrict the breadth of expert testimony allowed on the subject of reasonable royalties. For example, damages experts’ reliance on comparable license agreements relating to patents not asserted in the litigation (and therefore relating to different technologies) reflects a focus on valuation of patent rights rather than valuation of patented technology. In short, the paradigm of valuing patented technology rather than patent rights would provide a principled basis for courts to exclude expert testimony.

#### E. IMPROVING SUBSTANTIVE REVIEW

Another problem associated with the *Georgia-Pacific* factors and the hypothetical negotiation is the difficulty they create for substantive review of reasonable royalty determinations given their inherent flexibility.<sup>286</sup> It has been said to be “extremely difficult for judges to review a jury damage award for substantial evidence, either on judgment as a matter of law (JMOL) or on

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<sup>283</sup> Durie & Lemley, *supra* note 1, at 632.

<sup>284</sup> Jarosz & Chapman, *supra* note 5, at 811–12.

<sup>285</sup> *Cf.* FED. TRADE COMM’N, *supra* note 12, at 23 (recommending that courts test the admissibility of expert opinion by determining whether it would assist the trier of fact in assessing the parties’ hypothetical negotiation).

<sup>286</sup> *See* Durie & Lemley, *supra* note 1, at 632–33 (explaining the difficulty in applying the factors).

appeal.”<sup>287</sup> In the absence of the establishment of a new test for determining reasonable royalties,<sup>288</sup> an indirect way to review jury awards is to review the reliability of expert testimony under *Daubert*.<sup>289</sup>

The ability of courts to review awards of reasonable royalties may also be improved by focusing the law on the value of patented technology. It might encourage analyses of the relevant substantive question rather than analyses of the procedural framework for determining the answer to the substantive question. Indeed, much of the law governing reasonable royalties seems to be focused on the procedure of the hypothetical negotiation construct and the *Georgia-Pacific* factors rather than the substance of economic analyses addressing the relevant substantive question.<sup>290</sup>

#### F. REDUCING THE COST OF DETERMINATION

Patent infringement cases are expensive.<sup>291</sup> Complex damages analyses no doubt contribute to the expense. The multitude of *Georgia-Pacific* factors and the circular analysis required by the hypothetical negotiation construct make analyzing damages in patent infringement cases particularly difficult and, as a practical matter, typically require expert testimony. One proposed solution to reduce costs is to bifurcate patent infringement cases (not just trials) between liability and damages, such that discovery regarding damages experts does not occur unless and until patent owners prove liability for infringement. The reality, however, is that judges rarely bifurcate patent infringement trials,<sup>292</sup> and so it does not seem likely that they would bifurcate entire cases. A

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<sup>287</sup> *Id.* at 632.

<sup>288</sup> *See id.* at 629 (noting that the *Georgia-Pacific* test remains the “universally accepted test for reasonable royalty damages”).

<sup>289</sup> *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 597 (1993) (requiring trial judges to test the reliability of the foundation and relevance of expert testimony).

<sup>290</sup> *See supra* Part V.A.2–3.

<sup>291</sup> *See* AM. INTELL. PROP. L. ASS’N, *supra* note 54 (reporting results of a survey regarding litigation costs and listing a median cost of \$2 million for all patent infringement lawsuits with between \$1 million and \$10 million at risk).

<sup>292</sup> PETER S. MENELL ET AL., *PATENT CASE MANAGEMENT JUDICIAL GUIDE* § 8.1.1.3 (2d ed. 2012) (“In practice, most courts decline requests to bifurcate damages.”).

more limited proposal would restrict discovery related to damages and impose a shifting of costs for additional discovery.<sup>293</sup>

Reduction of costs may be another benefit of focusing the reasonable royalty analysis on the value of patented technology in the first instance—rather than first on the value of patent rights and then on how to modify the value of patent rights to reflect the value of patented technology using corrective assumptions. Translating from valuation of patent rights to valuation of patented technology using corrective assumptions is difficult and, regardless, juries may not do so.<sup>294</sup> By focusing on the relevant question, the value of patented technology, in the first place, the use of assumptions and the difficulty and expense associated with translating between the two types of valuation might be avoided.

Within an analysis translating the value of patent rights to the value of patented technology, default starting points, rebuttable presumptions, or safe harbors might reduce expenses but also reduce the accuracy and admissibility of the resulting valuations. For example, if empirical studies indicate that parties usually discount the value of use of patented technology by about 50% given the risk of non-liability due to invalidity, non-infringement, and other common defenses, then an appropriate factor to correct for this discount when analyzing agreements alleged to be comparable to a hypothetically-negotiated agreement might be two. But of course in any particular case the appropriate factor might not be two given the circumstances, and so it would seem that both patent owners and accused infringers should be able to challenge any factor based on an average given past data. Indeed, the Federal Circuit recently rejected a similar method of short-circuiting an economic analysis of damages in a patent case—the so-called “25-percent rule” for distributing profits between patent owners and licensees in hypothetical negotiations—and so at least under current law there is little tolerance for these types of potentially significant cost-saving mechanisms.<sup>295</sup>

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<sup>293</sup> Innovation Act, H.R. 3309, 113th Cong. § 6(a) (2013), available at <http://www.gpo.gov/fdsys/pkg/BILLS-113hr3309rfs/pdf/BILLS-113hr3309rfs.pdf> (proposing restrictive discovery and requiring parties seeking additional discovery to bear the associated cost).

<sup>294</sup> See *supra* notes 263–64.

<sup>295</sup> *Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1315 (Fed. Cir. 2011) (“This court now holds as a matter of Federal Circuit law that the 25 percent rule of thumb is a

## VII. RESPONSES TO POTENTIAL OBJECTIONS

As David Opderbeck has recognized, “the patent damages debate is really one of the front lines in a broader ideological and theoretical debate about the fundamental nature of the patent grant.”<sup>296</sup> Thus, one response to the suggestion that reasonable royalties should reflect the value of patented technology only—and not the value of patent rights—is the idea that patent law should utilize and reflect property rules rather than liability rules.<sup>297</sup> A property rule requires a person wishing to remove a legal right from its owner to buy it in a voluntary transaction at the subjective price agreed to by the owner.<sup>298</sup> A liability rule, by contrast, contemplates a person paying an objectively-determined amount of money to the owner of a legal right after unilaterally destroying it.<sup>299</sup> Awards of injunctions enforce property rules, while awards of damages enforce liability rules.<sup>300</sup>

The assessment of compensatory damages enforces a liability rule; any assessment of damages occurs after a determination of liability for infringement, where the infringer has already unilaterally destroyed the patent owner’s right to exclude. Determining reasonable royalties under the hypothetical negotiation construct, however, applies a property rule-like analysis, despite the fact that the infringer has already unilaterally destroyed the right to exclude. This is because the hypothetical negotiation construct focuses on identifying the value of the patent owner’s legal rights to the patent owner before appropriation of the right to exclude.

Determining reasonable royalties by identifying only the value of the patented technology would seemingly move away from a

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fundamentally flawed tool for determining a baseline royalty rate in a hypothetical negotiation.”).

<sup>296</sup> David W. Opderbeck, *Patent Damages Reform and the Shape of Patent Law*, 89 B.U. L. REV. 127, 137–38 (2009).

<sup>297</sup> See Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089, 1092 (1972) (distinguishing property rules from liability rules).

<sup>298</sup> Opderbeck, *supra* note 296, at 160 (citing Calabresi & Melamed, *supra* note 297, at 1092).

<sup>299</sup> *Id.* (citing Calabresi & Melamed, *supra* note 297, at 1092).

<sup>300</sup> Eugene Kontrovich, *Liability Rules for Constitutional Rights: The Case of Mass Detentions*, 56 STAN. L. REV. 755, 764 (2004).

property rule-like analysis. The focus would no longer necessarily be on the subjective value to the patent owner of the patent owner's legal rights at a time period before appropriation of the right to exclude. The question, really, is the extent to which reasonable royalties should move away from a property rule-like analysis. For example, a reasonable royalty analysis could focus on the objective value to society of the patented technology after unilateral appropriation of the right to exclude, rather than the subjective value to the patent owner. Or a reasonable royalty analysis could become something in between a property rule-like analysis and a pure liability analysis by focusing on the subjective value to the patent owner of the patented technology after unilateral appropriation of the right to exclude. Indeed, the extent to which reasonable royalties should move away from a property rule-like analysis relates to the open questions I have already identified.<sup>301</sup>

There are reasons to prefer a more liability rule-like analysis over a more property rule-like analysis for reasonable royalties. These reasons reflect some of the same problems I have already identified that point in favor of valuing patented technology over patent rights. In a hypothetical negotiation focused on valuation of patent rights, there is the problem of holdout. The patent owner, for example, may hold out by demanding a greater share of the potential infringer's profits given the existence of complementary technologies. There is also the problem of free riding. A potential infringer, for example, may decline licensing patented technology in the belief that the relevant patent is invalid and in the hope that a third party will invalidate the relevant patent, or at least offer smaller royalties than acceptable to the patent owner given different estimations of the possibility of invalidity. There too is the problem of transaction costs. High negotiation costs may serve as a barrier to transactions or inflate the ability of patent owners to extract value from potential infringers. For these reasons, the hypothetical *ex ante*, market-based negotiation of patent rights may not succeed in allowing for efficient use of the patented technology—use of the patented technology by the most efficient user. In place of this hypothetical

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<sup>301</sup> See *supra* Part V.C.

market, a liability rule may allow for more efficient use. Relatedly, an assessment of reasonable royalties based on the value of the patented technology would favor the basic purpose of allowing for efficient use of patented technology as well as the additional goal of incentivizing invention.<sup>302</sup> And this would be consistent with the utilitarian—rather than natural rights—goal of “promot[ing] the Progress of . . . useful Arts.”<sup>303</sup>

In some regards, however, the shift to a technology-focused analysis of reasonable royalties might actually act more like a property rule. That is, if valuing patented technology rather than patent rights would increase reasonable royalty awards (by, for example, eliminating discounting due to risk of liability, relief, and enforcement), then potential infringers might refrain from unilaterally appropriating the right to exclude and instead engage in *ex ante* negotiations with the patent owner to license the right to use the patented technology at a lower royalty.

Moreover, regardless of the extent to which reasonable royalties should reflect the characteristics and usefulness of liability rules—a somewhat ironic question in the first place given that reasonable royalties are the result of imposition of a liability rule—the quintessential property rule still exists. Injunctive relief is available even if reasonable royalties focus on the value of patented technology.<sup>304</sup> And injunctive relief requires an infringer wishing to remove the right of the patent owner to exclude the infringer from using the patented technology to buy that right from the patent owner in a real (no longer hypothetical) voluntary transaction at the subjective price agreed to by the patent owner.<sup>305</sup>

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<sup>302</sup> See Calabresi & Melamed, *supra* note 297, at 1110 (recognizing that a liability rule promotes both efficiency and innovation).

<sup>303</sup> U.S. CONST. art. I, § 8, cl. 8.

<sup>304</sup> While the Supreme Court’s decision in *eBay, Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 391–92 (2006), eliminated the presumption that injunctive relief should follow a finding of liability, injunctive relief is still available.

<sup>305</sup> An exception is when courts stay injunctive relief on the condition that infringers pay ongoing royalties to patent owners, where the ongoing royalties are determined by the court. See, e.g., *Pressure Prods. Med. Supplies, Inc. v. Greatbatch Ltd.*, 599 F.3d 1308, 1314 (Fed. Cir. 2010) (describing how the district court stayed the injunction, conditioning the stay on a deposit of an ongoing royalty into an escrow account or the court registry). An assessment of ongoing royalties probably should reflect a property rule-like analysis in these circumstances because they replace injunctive relief. Thus, there are certainly limits

Another objection might be that a technology-based analysis of reasonable royalties seems less like a *damages* analysis and more like a *value* analysis.<sup>306</sup> Lost royalties—for example, unadjusted established royalties—seem to represent the extent to which a patent owner was damaged by an infringer declining to pay a negotiated royalty and instead infringing. As I have shown, however, the history of reasonable royalties reflects a movement toward a conception of reasonable royalties that focuses on the value of the patented technology rather than on the value of patent rights. Indeed, while the hypothetical negotiation construct contemplates the patent owner and the infringer negotiating over the value of patent rights, the assumption of liability purposefully increases the damages award above what an actual negotiation over patent rights would contemplate. The very goal of this assumption is to translate a valuation of patent rights to a valuation of patented technology only. Regardless, a technology-based analysis of reasonable royalties is still a damages analysis.<sup>307</sup> While reasonable royalties may not be *actual*

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to the idea of pushing monetary remedies further toward valuation of patented technology and away from valuation of patent rights.

<sup>306</sup> Ted Sichelman, for example, in defense of his theory that, as a normative matter, patent remedies should reflect the goal of creating innovation incentives, concedes that, as a descriptive matter, “the Patent Act enshrines the tort law compensatory rationale right into the statutory framework for damages.” Sichelman, *supra* note 21, at 567. It certainly does. But Sichelman focuses on the portion of 35 U.S.C. § 284 that governs awards of lost profits, and specifically the language that courts should award “damages adequate to compensate for infringement.” *Id.* at 566–67 (quoting 35 U.S.C. § 284 (2012)). The remainder of the statutory language (“but in no event less than a reasonable royalty for the use made of the invention by the infringer”) applies to reasonable royalties, and it is less clear whether reasonable royalties must always be exactly compensatory in the sense of exactly reflecting lost royalties—and not just as a textual matter. *See* 35 U.S.C. § 284 (2012). Indeed, as I have shown, courts awarding reasonable royalties have sought to increase lost royalties given problems with discounting, circularity, and the creation of an incentive to infringe. *See supra* Part IV.B. Thus, consistent with this precedent, there appears to be room within the Patent Act to award reasonable royalties that reflect the value of patented technology.

<sup>307</sup> A related objection might be that a conception of reasonable royalties as valuing patented technology *from the perspective of the infringer* effectively disgorges the infringer’s benefit of use of patented technology. This, so the argument would go, is improper because Congress eliminated disgorgement of profits “as such” as a remedy for infringement of utility patents. *See Aro Mfg. Co. v. Convertible Top Replacement Co.*, 377 U.S. 476, 505 (1964) (plurality opinion) (“The purpose of the [statutory] change [in 1946] was precisely to eliminate the recovery of profits as such and allow recovery of damages only.”). *But see* Caprice L. Roberts, *The Case for Restitution and Unjust Enrichment Remedies in Patent Law*, 14 LEWIS & CLARK L. REV. 653, 685 (2010) (arguing that patent owners should be able to obtain disgorgement of profits). But the relevant report of the House of Representatives



damages, they are still *general* damages,<sup>308</sup> or what may be called *presumed* damages or *estimated* damages; they represent a legal construct not exactly reflective of the extent to which the patent owner was actually harmed by a decision not to license and instead to infringe.<sup>309</sup> Rather, we effectively presume that the patent owner and infringer would be able to predict with perfect accuracy the result of the infringement trial and agree upon a royalty that is equal to the value of the patented technology. In this sense, it is an imperfect estimate of the patent owner's actual damages.<sup>310</sup>

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indicates that an infringer's profits may, at a minimum, be considered as an element of general damages. See H.R. REP. NO. 1587, at 2 (1946) ("[T]he bill would not preclude the recovery of profits as an element of general damages."). Regardless, as I have indicated, it is an open question whether the relevant perspective for valuing the patented technology should be the infringer's perspective. See *supra* Part V.C.1.

<sup>308</sup> See H.R. REP. NO. 1587, at 1 (1946) ("The object of the bill is to make the basis of recovery in patent-infringement suits *general damages*, that is, any damages the complainant can prove, not less than a reasonable royalty, together with interest from the time infringement occurred, rather than profits and damages." (emphasis added)); U.S. Frumentum Co. v. Lauhoff, 216 F. 610, 617 (6th Cir. 1914) ("This damage or compensation is not, in precise terminology, a royalty at all, but it is frequently spoken of as a 'reasonable royalty'; and this phrase is a convenient means of naming this particular kind of damage. It may also be well called '*general damage*'; that is to say, damage not resting on any of the applicable, exact methods of computation but upon facts and circumstances which permit the jury or the court to *estimate* in a general, but in a sufficiently accurate, way the injury to plaintiff caused by each infringing sale." (emphases added)); see also Suffolk Co. v. Hayden, 70 U.S. 315, 319 (1865) ("There being no established patent or license fee in the case, in order to get at a fair measure of damages, or even an approximation to it, *general evidence* must necessarily be resorted to. And what evidence could be more appropriate and pertinent than that of the utility and advantage of the invention over the old modes or devices that had been used for working out similar results? With a knowledge of these benefits to the persons who have used the invention, and the extent of the use by the infringer, a jury will be in possession of material and controlling facts that may enable them, in the exercise of a sound judgment, to ascertain the damages, or, in other words, the loss to the patentee or owner, by the piracy, instead of the purchase of the use of the invention." (emphasis added)).

<sup>309</sup> See Lindemann Maschinenfabrik GmbH v. Am. Hoist & Derrick Co., 895 F.2d 1403, 1406 (Fed. Cir. 1990) ("When a 'reasonable royalty' is the measure [of damages], the amount may again be considered a factual inference from the evidence, yet there is room for exercise of a common-sense estimation of what the evidence shows would be a 'reasonable' award.").

<sup>310</sup> See, e.g., Hunt Bros. Fruit-Packing Co. v. Cassidy, 64 F. 585, 587 (9th Cir. 1894) ("In this class of patents there are necessarily no data from which the value of a royalty can be calculated with mathematical certainty. The damages here, like damages in many other classes of cases, are calculable upon such evidence as it is in the nature of the case possible to produce. The plaintiff was clearly entitled to damages for the infringement. If there had been an established royalty, the jury could have taken that sum as the measure of damages. In the absence of such royalty, and in the absence of proof of lost sales or injury by

Moreover, there does not appear to be anything improper about awarding presumed or estimated damages. By doing so, courts avoid difficulty and expense. An analysis of actual harm, for example, would be even more complex than the current reasonable royalty analysis, which typically requires a jury to select a royalty rate and apply it to a royalty base in the form of the actual sales of the infringer. The current statute requires this focus on the actual use of the patented technology by the infringer.<sup>311</sup> A technically accurate measure of actual damages, by contrast, would require a complete (and completely hypothetical) reconstruction of the relevant market to identify what the actual sales volume would have been had the patent owner and the infringer negotiated the royalty, had the royalty affected the sales price, and had the sales price affected the sales volume of the infringer.<sup>312</sup> Like the statute's focus on the actual sales of the infringer, valuation of patented technology likewise reduces difficulty and expense in determining a reasonable royalty, as I have described, while also satisfying the concerns judges have expressed with undercompensation.<sup>313</sup>

Finally, one might argue that valuation of patent rights would infect a system built upon valuation only of patented technology. Consider the following example, where we, for now, assume that the goal of the reasonable royalty calculation is to identify the value of the patented technology as compared to the next-best *non-infringing* alternative.<sup>314</sup> Suppose a damages expert working with a technical expert determines that the only (and therefore the next-best) alternative to the patented technology is itself patented. One response to this situation would include identifying the cost of licensing the next-best alternative patented technology to make it, effectively, non-infringing for purposes of the reasonable royalty

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competition, the only measure of damages was such sum as, under all the circumstances, would have been a reasonable royalty for the defendant to have paid.”)

<sup>311</sup> 35 U.S.C. § 284 (2012) (requiring “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”).

<sup>312</sup> See SCHLICHER, *supra* note 230, §§ 13:149–:151 (discussing how to measure damages accurately).

<sup>313</sup> See *supra* Part IV.A. An answer to the question whether the patent owner is entitled to the full value of the use of the patented technology by the infringer would reduce additional uncertainty, as would answers to all of the open questions that I have identified.

<sup>314</sup> See FED. TRADE COMM’N, *supra* note 12, at 22.

computation. This response would itself involve consideration of a hypothetical negotiation, which would necessarily include determining the likelihood that the other patent is valid and infringed and the ability of the patent owner to extract value from threatening litigation and potential injunctive relief, among all of the other components of a negotiation of patent rights.<sup>315</sup> There is a solution to this apparent problem, however. To maintain a technology-focused (rather than rights-focused) reasonable royalty analysis, one would need to abandon the constraint requiring the next-best alternative to be unpatented. In other words, one might compare the value of use of the patented technology under consideration with the value of use of the next-best alternative to the patented technology, regardless of whether the next-best alternative is patented. By doing so, one would avoid the need to determine the cost of licensing the next-best alternative patented technology and therefore all of the problems associated with valuing patent rights.

In short, there are significant practical reasons to consider the alternative paradigm of focusing the law governing reasonable royalties on the value of patented technology only, rather than on the value of patent rights.

### VIII. CONCLUSION

Since the 1800s, the law governing the award of reasonable royalties in patent cases has been moving from a traditional paradigm focused on valuing patent rights toward an alternative paradigm focused exclusively on valuing use of patented technology. The assumption of validity associated with the hypothetical negotiation construct, for example, focuses the analysis on the value of the patented technology. So too does the exclusion of litigation-induced settlement agreements that reflect the value of avoiding risk and expense associated with litigation. These constraints respectively eliminate from reasonable royalty calculations the value associated with an infringer's threat of challenging a patent's validity in litigation and a patent holder's

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<sup>315</sup> Tom Cotter highlighted this scenario in discussions with me about whether a version of the problem of valuing patent rights would "infect" a valuation system purportedly built upon valuing only patented technology.

threat of seeking injunctive and monetary relief. What is left is the value of the patented technology. Indeed, there is reason to think that, ideally, courts should award compensatory damages—whatever their form—equal to the marginal incremental value of the use of patented technology; doing so would avoid undercompensation associated with nominal damages and established royalties, would refrain from creating incentives to infringe and litigate, and would permit courts to create incentives to innovate.

The conversion to this alternative paradigm—a fully technology-focused inquiry—however, is not yet complete. If, as a substantive matter, the focus of the reasonable royalty calculation should be on the value of the patented technology, how would the law change? It probably would dispense with a mode of calculation—the hypothetical negotiation construct—that focuses on the value of patent rights, or at least substantially rethink it. Left unchecked, the hypothetical negotiation construct inappropriately undercompensates or overcompensates patent owners. Even when properly checked, however, it requires numerous assumptions that contradict the very basis for its use, ease of conceptualization. The assumptions, therefore, undermine its usefulness. Anyway, current law does not even include all of the assumptions necessary to focus only on the value of patented technology.

In short, the law is moving in the direction of asking juries and courts to focus only on the value of patented technology, rather than to engage in an expensive, distorted procedure-based analysis that inherently focuses on a circular question—the value of patent rights. Economists and legal scholars should consider the normative basis for this alternative paradigm and address several open questions related to its full adoption.