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REASONABLE CERTAINTY IN CONTRACT AND PATENT
DAMAGES

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I. INTRODUCTION

Assessment of “reasonable royalty” damages for patent infringement has become a leading issue in the substance and procedure of modern patent law.¹ Occasional jury verdicts of several hundred million dollars or more have brought cries for reform.² On a more day-to-day basis, judges, attorneys, and damages experts grapple with ques-

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1. See, e.g., John C. Jarosz & Michael J. Chapman, *The Hypothetical Negotiation and Reasonable Royalty Damages: The Tail Wagging the Dog*, 16 STAN. TECH. L. REV. 769, 771 (2013) (“Reasonable royalty estimation in patent damages cases has come under increased scrutiny in recent years.”); David O. Taylor, *Using Reasonable Royalties to Value Patented Technology*, 49 GA. L. REV. 79, 81 (2014) (“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.”).

2. See John M. Golden, *Principles for Patent Remedies*, 88 TEX. L. REV. 505, 507 (2010) (“Eye-catching nine-figure damage awards stoke calls for changes to the law of patent damages.”); cf. Christopher B. Seaman, *Reconsidering the Georgia-Pacific Standard for Reasonable Royalty Patent Damages*, 2010 B.Y.U. L. REV. 1661, 1663–64 (2010) (listing recent jury awards of “over \$100 million” in reasonable royalties).

tions of what methodologies and evidence are acceptable to support reasonable royalty awards in individual cases.³

This Article contends that private law decisions and doctrines can provide inspiration for judges' efforts to regulate reasonable royalty awards in patent cases. In particular, the Article focuses on how contract law's demand for "reasonable certainty" with respect to damages can offer instruction on how courts might flexibly regulate proof of reasonable royalties. The basic contention is that, in both situations, a standard of reasonableness of proof allows courts, in addressing the admissibility or sufficiency of evidence, to take into account context-specific factors not currently highlighted by the standard *Georgia-Pacific* factors for assessing reasonable royalty damages in patent cases.⁴ Such context-specific factors include the size of claimed damages amounts, the relative innocence or blameworthiness of the parties, and the potential availability or non-availability of better methods or evidence for developing a damages calculus. Attention to these context-specific factors can enable courts to tailor their approaches to determining the sufficiency or admissibility of evidence on reasonable royalty awards in ways that support proper ex ante incentives to innovate and to patent, deter opportunistic behavior by infringers and patentees, and encourage use of the best techniques and evidence for assessing damages that are justifiable in light of their cost.

The Article proceeds as follows. Part II provides a primer on patent remedies law and continuing concerns with the calculation of reasonable royalty damages. Part III discusses how contract law has used a "reasonable certainty" requirement as a flexible and context-sensitive mechanism for regulating damages awards that can, in general, be only imprecisely assessed. Part IV describes how patent law might incorporate and implement a similar reasonableness requirement to regulate the availability and amount of reasonable royalty damages.

3. See *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1324 (Fed. Cir. 2009) (holding that "substantial evidence does not support the jury's verdict of a lump-sum royalty payment of \$357,693,056.18"); Douglas G. Smith, *The Increasing Use of Challenges to Expert Evidence Under Daubert and Rule 702 in Patent Litigation*, 22 J. INTELL. PROP. L. 345, 346 (2015) ("[P]arties in patent litigation are increasingly challenging the admissibility of expert testimony under [Federal Rule of Evidence] 702 and *Daubert* [*v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993)].").

4. JANICE M. MUELLER, PATENT LAW 639 (4th ed. 2013) (observing that, in applying a "hypothetical negotiation" approach to assess a reasonable royalty, "district courts have traditionally considered evidence . . . on an extensive list of factors as set forth in the leading case of *Georgia Pacific Corp. v. U.S. Plywood Corp.*," 318 F. Supp. 1116 (S.D.N.Y. 1970), *modified in irrelevant part* by 446 F.2d 295 (2d Cir. 1971)).

II. PATENT DAMAGES AND PATENT COMMUNITY DISCONTENT

Reasonable royalty damages are one of the fundamental forms of remedies for patent infringement explicitly made available by the U.S. Patent Act.⁵ This Part highlights key aspects of patent remedies doctrine as well as recent doctrinal developments and continuing concerns.

A. The Basic Remedies Framework

Reasonable royalty damages are a sort of residual remedy under the U.S. Patent Act. In a series of statutory sections, the Act provides that, as remedies for patent infringement, patent holders may obtain injunctions to prevent infringement,⁶ damages awards,⁷ enhanced damages increasing a damages award up to three times the amount otherwise assessed,⁸ and “in exceptional cases . . . reasonable attorney fees.”⁹ The Act’s section on damages explicitly presents reasonable royalty damages as a remedial floor that becomes effective when proof of greater damages fails. Specifically, 284 of the Act states:

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.¹⁰

Although the extent to which the statutory language on reasonable royalty damages means to guarantee a relatively substantial damages award is disputed,¹¹ that language might be viewed as consistent with Judge Learned Hand’s description of the reasonable royalty remedy as a mechanism to achieve at least a minimal level of justice for a patent owner whose rights have been infringed:

5. See 35 U.S.C. §§ 283–85 (providing for awards of injunctions, damages “in no event less than a reasonable royalty,” and attorney fees in patent cases).

6. 35 U.S.C. § 283.

7. *Id.* § 284; see Thomas F. Cotter & John M. Golden, *Empirical Studies Relating to Patents—Remedies*, in 2 THE ECONOMICS OF INTELLECTUAL PROPERTY LAW (B. Depoorter, P. Menell & D. Schwartz eds., forthcoming) (discussing forms of damages awards for patent infringement in subsection II.A.1).

8. 35 U.S.C. § 284.

9. *Id.* § 285.

10. *Id.* § 284.

11. See Oskar Liivak, *When Nominal Is Reasonable: Damages for the Unpracticed Patent*, 56 B.C. L. REV. 1031, 1038 (2015) (contesting the current understanding of § 284 as generally requiring “more than a nominal award in every case where infringement is proven”).

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.¹²

Almost needless to say, Hand's description of this approximation of the "really incalculable" leaves open how a reasonable royalty award is to be assessed — a question with which courts continue to struggle¹³ and that is discussed further in Sections II.B and II.C of this Article. But Hand's reference to a reasonable royalty as "a device in aid of justice" and his concern with "empty hands" might helpfully inform modern reasonable royalty analysis. In particular, these aspects of Hand's description can be understood to support Part IV's argument that relative blameworthiness and practical evidentiary difficulties should factor into the nature of a court's demands for proof of a specific value for a reasonable royalty.

B. Recent Developments in Patent Remedies Law

The first decades of the twenty-first century witnessed concerted efforts by industry incumbents to rein in the remedies available to so-called "non-practicing" patent holders, patentees who do not directly exploit the patented invention or substantial analogs through the manufacture, sale, importation, or use of goods or services.¹⁴ Although Congress was a prime target of these efforts,¹⁵ adjustments to the law on patent remedies or its manner of application generally came through the courts. In a 2006 decision in *eBay Inc. v. MercExchange*,

12. *Cincinnati Car Co. v. N.Y. Rapid Transit Corp.*, 66 F.2d 592, 595 (2d Cir. 1933); *see also Georgia-Pacific Corp. v. U.S. Plywood-Champion Papers Inc.*, 446 F.2d 295, 300 (2d Cir. 1971) (citing Judge Learned Hand in support of the proposition that "determination of an assumed reasonable royalty is in essence a device for retroactively reaching a just result").

13. *See ResQNet.com, Inc. v. Lansa, Inc.*, 594 F.3d 860, 869 (Fed. Cir. 2010) ("Determining a fair and reasonable royalty is often . . . a difficult chore, seeming often to involve more the talents of a conjurer than those of a judge." (quoting *Fromson v. W. Litho Plate & Supply Co.*, 853 F.2d 1568, 1574 (Fed. Cir. 1988), *overruled in irrelevant part by Knorr-Bremse Systeme Fuer Nutzfahrzeuge GmbH v. Dana Corp.*, 383 F.3d 1337 (Fed. Cir. 2004) (en banc))).

14. *See Golden*, *supra* note 2, at 507 (observing that "information-technology incumbents such as Microsoft Corporation and Intel Corporation have pushed strongly for rules to limit the reasonable-royalty damages available to non-incumbent patent holders while leaving untouched the lost-profit remedies available to incumbents").

15. David W. Opperbeck, *Patent Damages Reform and the Shape of Patent Law*, 89 B.U. L. REV. 127, 128–29 (2009) (contending that, "under the pressure of patent-poor incumbents in the computer industry, Congress is being lobbied to squeeze [patent] law into a smaller shape").

L.L.C.,¹⁶ the Supreme Court embraced a “four-factor test” for permanent injunctions that explicitly places the burden on a patent holder to justify an injunction even after prevailing on questions of patent infringement and validity.¹⁷ The Federal Circuit understood this test generally to obliterate a prior presumption in favor of granting such relief.¹⁸ Meanwhile, in 2007, the Federal Circuit clamped down on the availability of enhanced damages by holding “that proof of willful infringement permitting enhanced damages requires at least a showing of objective recklessness,”¹⁹ although the Supreme Court later held that this requirement overly restricted the availability of enhanced relief.²⁰ Finally and without contradiction as of 2016, the Federal Circuit issued a series of decisions tightening the evidentiary standards for establishing the value of reasonable royalty damages.²¹ These decisions emphasized constraints on the use of expert testimony to support such damage awards,²² made clear the Federal Circuit’s willingness to overturn jury-determined damages as excessive,²³ and abrogated a “25% rule of thumb” that various district courts had used to treat a default portion of an infringer’s profits as the starting point for reasonable royalty assessment.²⁴ Even more specifically, the Fed-

16. 547 U.S. 388 (2006).

17. *Id.* at 391.

18. *See* Robert Bosch LLC v. Pylon Mfg. Corp., 659 F.3d 1142, 1149 (Fed. Cir. 2011) (“We take this opportunity to . . . confirm that *eBay* jettisoned the presumption of irreparable harm as it applies to determining the appropriateness of injunctive relief.”).

19. *In re Seagate Tech., LLC*, 497 F.3d 1360, 1371 (Fed. Cir. 2007) (en banc), *abrogated in part* by Halo Elecs., Inc. v. Pulse Elecs., Inc., 136 S. Ct. 1923 (2016).

20. *Halo*, 136 S. Ct. at 1935 (“The *Seagate* test . . . unduly confines the ability of district courts to exercise the discretion conferred on them.”).

21. Jonas Anderson, *Congress as a Catalyst of Patent Reform at the Federal Circuit*, 63 AM. U. L. REV. 961, 1000–02 (2014) (discussing a “flurry of noteworthy damages decisions from the [U.S. Court of Appeals for the] Federal Circuit”).

22. *See* Uniloc USA, Inc. v. Microsoft Corp., 632 F.3d 1292, 1317 (Fed. Cir. 2011) (“To be admissible, expert testimony opining on a reasonable royalty rate must ‘carefully tie proof of damages to the claimed invention’s footprint in the market place.’” (quoting *ResQNet.com, Inc. v. Lansa, Inc.*, 594 F.3d 860, 869 (Fed. Cir. 2010))).

23. *See* Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301, 1335 (Fed. Cir. 2009) (“[T]he jury’s award of a lump-sum payment of \$358 million does not rest on substantial evidence and is likewise against the clear weight of the evidence.”).

24. *Uniloc*, 632 F.3d at 1312–15 (examining and rejecting the “25 percent rule of thumb”). Arguably on the flip side of the moves to restrict remedies, the Supreme Court apparently broadened the range of circumstances that could lead to an award of attorney fees, holding that the Patent Act’s provision for attorney fees in “exceptional circumstances” meant just that and should not be limited further by prior Federal Circuit precedent requiring that “a district court either fin[d] litigation-related misconduct of an independently sanctionable magnitude or determin[e] that the litigation was both brought in subjective bad faith and objectively baseless.” *Octane Fitness, LLC v. ICON Health & Fitness, Inc.*, 134 S. Ct. 1749, 1757 (2014) (internal quotation marks omitted). But this broadening of availability of attorney-fee shifting was not broadening of a patent-infringement remedy in particular as the attorney-fee shifting remedy can operate in favor of a prevailing accused infringer as well as a prevailing patent holder, 35 U.S.C. § 285 (“The court in exceptional cases may award reasonable attorney fees to the prevailing party.”).

eral Circuit has held that (1) previously contracted licenses used as a basis for assessing a reasonable royalty must be shown to have substantial comparability²⁵ or be accompanied with testimony “accounting for . . . distinguishing facts,”²⁶ (2) a patentee may not generally use as the base for calculating reasonable royalties the “entire market value” of a product or process in which the patented invention has only a cameo role,²⁷ and (3) in such situations, the patentee instead must often use as the base the value of the “smallest salable patent-practicing unit,” the smallest salable portion of the overall accused product or process that embodies or performs the patented invention.²⁸

Nonetheless, the Federal Circuit and district courts have continued to demonstrate a willingness to allow parties to fudge certain aspects of the reasonable royalty calculus. Even after tightening the standards for proving reasonable royalty amounts, the Federal Circuit has emphasized that “[a] party challenging a jury’s verdict on damages must show that the award is, in view of all the evidence, either so outrageously high or so outrageously low as to be unsupported as an estimation of a reasonable royalty.”²⁹ The Circuit has noted that “estimating a reasonable royalty is not an exact science” and that “there may be more than one reliable method” for making such an estimate.³⁰ Although many lament the courts’ continued reliance on an unwieldy list of fifteen so-called *Georgia-Pacific* factors in assessing reasonable royalties,³¹ continued invocation of this laundry list might

25. *Lucent*, 580 F.3d at 1332 (emphasizing “Lucent’s burden to prove that the licenses relied on were sufficiently comparable to sustain a lump-sum damages award of \$358 million”); *ResQNet.com*, 594 F.3d at 873 (holding that “the district court erred by considering ResQNet’s re-bundling licenses to significantly adjust upward the reasonable royalty without any factual findings that accounted for the technological and economic differences between those licenses and the ‘075 patent”).

26. *Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201, 1227 (Fed. Cir. 2014).

27. *VirnetX, Inc. v. Cisco Sys., Inc.*, 767 F.3d 1308, 1326 (Fed. Cir. 2014) (“[W]hen claims are drawn to an individual component of a multi-component product, it is the exception, not the rule, that damages may be based upon the value of the multi-component product.”); *Uniloc*, 632 F.3d at 1320 (“This case provides a good example of the danger of admitting consideration of the entire market value of the accused [product] where the patented component does not create the basis for customer demand.”).

28. *LaserDynamics, Inc. v. Quanta Computer, Inc.*, 694 F.3d 51, 67 (Fed. Cir. 2012) (internal quotation marks omitted).

29. *Energy Transp. Grp., Inc. v. William Demant Holding A/S*, 697 F.3d 1342, 1356 (Fed. Cir. 2012).

30. *Summit 6, LLC v. Samsung Elecs. Co.*, 802 F.3d 1283, 1296 (Fed. Cir. 2015).

31. *See, e.g.*, William F. Lee & A. Douglas Melamed, *Breaking the Vicious Cycle of Patent Damages*, 101 CORNELL L. REV. 385, 417 (2016) (“The *Georgia-Pacific* factors themselves introduce ex post contamination in the hypothetical negotiation [used as a model for calculating a reasonable royalty].”); Jonathan S. Masur, *The Use and Misuse of Patent Licenses*, 110 NW. U. L. REV. 115, 119 (2015) (describing “the influential fifteen-step *Georgia-Pacific* test” as “a laundry list of factors that shed little light on the appropriate dollar figures”); J. Gregory Sidak, *Bargaining Power and Patent Damages*, 19 STAN. TECH. L. REV. 1, 2 (2015) (“Even jurists who disagree on patent law agree that *Georgia-Pacific* needs clarification.”).

further indicate courts' commitment to flexibility in seeking to combine containment of damage amounts with assurance that, when a patentee establishes a substantial pattern of infringing conduct, there generally will be some legally acceptable means to support a more than nominal patentee recovery.³² As Part III shows, this combination of a demand for restraint and a commitment to context-sensitive flexibility also characterizes substantial chunks of the jurisprudence on contract damages.

C. Continuing Concerns with Damages Valuation

The fundamental concern with reasonable royalty calculations is that, even after several years of increased scrutiny and new instruction from the courts, they remain enmeshed in massive methodological and quantitative uncertainty. With patent licenses generally held secret, much activity relating to patent valuation remains confidential and effectively inaccessible for parties and courts looking to assess the value of individual sets of patent rights.³³ The resulting relative dearth of available information complicates a search for comparable licenses that can already be independently difficult in light of both the technically required uniqueness of patented inventions³⁴ and the frequent tailoring of licenses to contracting parties' individual circumstances.³⁵ Even if one can find a license that is in many ways comparable and does not seem unduly subject to bootstrapping, under-compensation, or over-compensation concerns,³⁶ it will often in-

32. *Cf.* *Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1327 (Fed. Cir. 2014) ("Because no less than a reasonable royalty is required [by the Patent Act], the fact finder must determine what royalty is supported by the record."), *overruled in irrelevant part* by *Williamson v. Citrix Online, LLC*, 792 F.3d 1339 (Fed. Cir. 2015) (en banc).

33. *Golden*, *supra* note 2, at 512 ("[K]nowledge regarding the many transactions that determine how technology markets operate is embarrassingly thin, in large part because the content and frequency of most patent licensing are confidential.")

34. 2 DAN B. DOBBS, *DOBBS LAW OF REMEDIES* § 6.2(3), at 35–36 (2d ed. 1993) ("Although there are some cases of 'established' royalty rates, in many other cases the formal uniqueness of the patent means that there cannot be any literal market in exclusive licenses for use of similar patents."); *Golden*, *supra* note 2, at 526 (noting the requirement "that a patentable invention be useful, novel, and nonobvious"); *cf.* Steven J. Shapiro, *Pitfalls in Determining the Reasonable Royalty in Patent Cases*, 17 J. LEGAL ECON., Oct. 2010, at 75, 77 ("It has been the author's experience that it is possible that the particular patent in dispute is so unique that comparables are not available from a review of licensing databases.")

35. *See* F. Scott Kieff, *Coordination, Property, and Intellectual Property: An Unconventional Approach to Anticompetitive Effects and Downstream Access*, 56 EMORY L.J. 327, 334 (2006) (noting the possibility of "textured contracts with many terms, including . . . a host of seemingly esoteric and unique provisions — such as technical support, field-of-use or territory limitations, grant-backs, cross-licenses, payment schedules, and most-favored-nation provisions"); *cf.* *Golden*, *supra* note 2, at 541–43 (discussing different structures for licensing agreements).

36. The bootstrapping concern reflects the fact that, as parties agree to patent licenses in the shadow of the law, courts might to some extent be looking in a mirror when they look to patent licenses to determine damage awards, with this supposed market test for value there-

volve the licensing of multiple patents beyond those that a court has found to have been infringed.³⁷ Separating out the licensing value of the individual patented inventions featured in such a bundled license can be about as challenging or even more challenging than separating out a patented invention's value from that of multiple other innovative aspects of a complicated product or process. The facial comparability of these apportionment tasks is telling, as the task of apportioning technological value has been long understood to present profound, if not insurmountable, difficulties.³⁸

Indeed, the difficulty of assigning a reasonable royalty value is suggested by the very "hypothetical negotiation" standard that is often cited as the model for how such assessment should proceed.³⁹ This standard has a certain commonsense feel and is, in fact, strongly analogous to the standard used when courts must assess damages for loss or injury to real or personal property.⁴⁰ Under the hypothetical negotiation standard for a reasonable royalty, a court asks what amount for a license would have been found agreeable by both a willing licensor

by being essentially no more reliable than the courts' independent capacity to assess value. Golden, *supra* note 2, at 508 ("[U]nder a pure damages regime, a judicial system that looks to the market to assess patent value might find itself looking in the mirror."). Overvaluation relative to a patented invention's social value can occur if "holdup" conditions were present at the time of licensing. *Id.* at 518 (noting that "switching costs" can cause "a 'trapped' party" to pay "inflated royalties"). Undervaluation might result if courts do not correct for the unusual weakness of a relevant licensor's bargaining position, *see* John M. Golden, "Patent Trolls" and Patent Remedies, 85 TEX. L. REV. 2111, 2142 (2007) (noting that "discounting according to something like bargaining skill *B* might result, roughly and indirectly, when courts seek to gain a sense of what a reasonable royalty might be by considering prior licensing agreements"), or the fact that, at the time of licensing the patent was not assumed to be valid and infringed, *see infra* text accompanying notes 42–43.

37. Michele K. Herman, *Negotiating Standards-Related Patent Licenses*, 3 LANDSLIDE, Sept./Oct. 2010, at 35, 37 ("[F]ew licensees will seek a license of only essential claims and will, in many instances, enter into broader portfolio licenses and cross-licenses that will be unique to each particular patentee and licensee.").

38. *See* 3 PHILLIP E. AREEDA & HERBERT HOVENKAMP, ANTITRUST LAW: AN ANALYSIS OF ANTITRUST PRINCIPLES AND THEIR APPLICATION ¶ 707j, at 293 (3d ed. 2008) ("In theory, the appropriate [royalty] rate is measured by the value of the patent, but value is almost impossible to determine, apart from such an obvious case as an improved process that reduces everyone's production costs by, say, 10 percent."); SUZANNE SCOTCHMER, INNOVATION AND INCENTIVES 143 (2004) ("If several patent holders are vying for the value of the second-generation product, and all the technologies are essential to its development, there is no natural benchmark to establish how the profit on the second-generation product should be divided.").

39. *See, e.g.*, *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1324 (Fed. Cir. 2009) (describing "the hypothetical negotiation or the 'willing licensor-willing licensee' approach"); Cotter & Golden, *supra* note 7 ("[I]n the U.S. the most common approach for estimating a reasonable royalty involves the reconstruction of the hypothetical bargain the parties would have negotiated as of a date just prior to the date on which the infringement began.").

40. 1 DOBBS, *supra* note 34, § 3.5, at 324 (1993) ("In the no-market situation, courts usually begin by saying that fair market value is the amount which a willing buyer would pay and for which a willing seller would sell, neither being under any special compulsion.").

and a willing licensee at a time “just before infringement began.”⁴¹ Further, the court demands that the hypothetical negotiation proceed on the assumption that relevant patent claims are certainly infringed and valid,⁴² whereas these questions were likely debatable before and at the time infringement commenced.⁴³ The backward-looking inquiry into an appropriate royalty thus requires reasoning on the basis of a counterfactual world that, given the relative speeds of patent assertion, district court litigation, and technological development, is often located in a technologically distant past.⁴⁴

Moreover, assessment of the anticipated value to the hypothesized licensee of a past patent license generally requires legal understanding of relevant patent claims’ scope, technical understanding of the claimed invention’s significance to a product or process’s function, and economic understanding of the impact of any functional gains on a user’s net utility or income.⁴⁵ Discrepancies or errors in one or more of the required forms of interlocking understanding, as well as discrepancies or errors in inferences or estimates that are still often required to bridge evidentiary gaps, can lead experts to generate assessments for reasonable royalties that differ by more than a factor of ten and sometimes even more than a factor of hundred.⁴⁶ The vagaries and variation that predictably result from judges and juries using such information to assess reasonable royalty damages was one reason that courts traditionally issued permanent injunctions for continuing instances of patent infringement.⁴⁷ This practice helped enable

41. *Lucent*, 580 F.3d at 1324 (describing the “hypothetical negotiation” approach). Although, as noted in the text, the hypothetical negotiation standard has a commonsense feel, its articulation could use some fine tuning. As a technical matter, a more proper date for the hypothetical negotiation than one “just before infringement began” might be the date just before the infringer made commitments that could lead to an unduly inflated willingness to pay to use the patented technology. Lee & Melamed, *supra* note 31, at 426 (criticizing decisions under which the relevant date occurs “after the infringer has taken steps that have caused it to be locked in to the patented technology”).

42. *Lucent*, 580 F.3d at 1325 (“The hypothetical negotiation also assumes that the asserted patent claims are valid and infringed.”).

43. Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 2019 (2007) (noting that the assumption about validity and infringement “is highly counterfactual” because “patents are probabilistic rights”).

44. *Cf.* Masur, *supra* note 31, at 122 (“This inquiry is both hypothetical and well after the fact . . .”).

45. See Gregory K. Leonard & Mario A. Lopez, *Patent Damages: What Reforms Are Still Needed?*, 2 LANDSLIDE, May/June 2010, at 37, 38 (discussing how “the application of sound economic principles” determines a patented invention’s relevant value “by focusing on the ‘next best (non-infringing) alternative’ that was available to the defendant at the time of the hypothetical negotiation”).

46. John M. Golden, “*Patent Trolls*” and *Patent Remedies*, 85 TEX. L. REV. 2111, 2151 (2007) (giving examples of wide discrepancies in experts’ reasonable royalty estimates).

47. Mark P. Gergen, John M. Golden & Henry E. Smith, *The Supreme Court’s Accidental Revolution? The Test for Permanent Injunctions*, 112 COLUM. L. REV. 203, 212 (2012) (noting that, before *eBay*, various circuit courts presumptively awarded permanent injunctions against continuing infringement of copyright, patent, or trademark rights).

courts to avoid imposing an “ongoing royalty”⁴⁸ for continued infringement that, if errantly calculated, might distort future activity more harmfully than an errant judicial assessment of backward-looking damages.⁴⁹

Given the difficulty of hypothetical-negotiation calculations, it is perhaps no wonder that courts have developed a long list of potential factors in reasonable royalty calculations — namely, the *Georgia-Pacific* laundry list,⁵⁰ which essentially leaves the door open for consideration of any evidence potentially relevant to a hypothetical-negotiation calculation.⁵¹ Unfortunately, this long list can obscure, rather than clarify, the question of how demanding courts should be with respect to proof of any of these factors or their relative relevance, as well as with respect to proof of the ultimate question of the proper value of reasonable royalty damages. For help with this central question of what level of precision and rigor courts should demand with respect to proof of patent damages, courts can usefully look to the example of contract law.

III. UNCERTAIN DAMAGES IN CONTRACT LAW

The calculation of damages in contract cases is often straightforward compared to the calculation of a reasonable royalty in patent law.⁵² Where the relevant breach involves failure to deliver a known number of goods for which there are well-established market prices, damages calculations may often be derived with both precision and

48. *Paice LLC v. Toyota Motor Corp.*, 504 F.3d 1293, 1314 (Fed. Cir. 2007) (holding that, “[u]nder some circumstances, awarding an ongoing royalty for patent infringement in lieu of an injunction may be appropriate”).

49. Compare Louis Kaplow & Steven Shavell, *Property Rules Versus Liability Rules: An Economic Analysis*, 109 HARV. L. REV. 713, 720 (1996) (“[I]f a court sets damages equal to its best estimate of harm — the average harm for cases characterized by the facts the court observes — the outcome under the liability rule will be superior, on average, to the outcome under property rules”), with Vincenzo Denicolò, Damien Geradin, Anne Layne-Farrar & A. Jorge Padilla, *Revisiting Injunctive Relief: Interpreting eBay in High-Tech Industries with Non-Practicing Patent Holders*, 4 J. COMPETITION L. & ECON. 571, 578–79 (2008) (discussing how ongoing royalties, in contrast to solely retrospective reasonable royalties, are likely only to generate errors “in one direction, namely, under-rewarding the patent holder, since any mistake on the opposite side would be corrected by the subsequent negotiation between the parties”).

50. See MUELLER, *supra* note 4, at 639 & n.144 (describing the significance of the *Georgia-Pacific* factors and providing a comprehensive list of them).

51. *Powell v. Home Depot U.S.A., Inc.*, 663 F.3d 1221, 1239 n.3 (Fed. Cir. 2011) (characterizing the fourteenth and fifteenth *Georgia-Pacific* factors as being “the opinion testimony of qualified experts” and “the results of a hypothetical negotiation between the licensor and licensee,” respectively).

52. See Matthew Milikowsky, Note, *A Not Intractable Problem: Reasonable Certainty, Tractebel, and the Problem of Damages for Anticipatory Breach of a Long-Term Contract in a Thin Market*, 108 COLUM. L. REV. 452, 464 (2008) (“Reasonable certainty is rarely an issue in contract disputes; often the value of damages is readily accessible.”).

relative simplicity through a comparison of contract and market prices.⁵³ But in significant subsets of contract cases, such as cases involving a “new business”⁵⁴ or breach-induced declines in labor productivity,⁵⁵ concerns can arise about whether there is any amount of expectation damages that is certain enough to be properly awarded. These cases frequently feature not only problems of uncertainty but also needs for expert testimony that resonate with similar problems and needs in patent cases.⁵⁶ Such cases have unsurprisingly caused courts to develop a standard for what parties and their experts must do to overcome problems of uncertainty sufficiently to justify court-awarded damages — namely, the “reasonable certainty” standard for contract damages. Section III.A describes the reasonable certainty standard and its emergence in contract case law over the past two centuries. Section III.B discusses how context-sensitive application of this standard for the award of a classic legal remedy can track concerns of equity, enabling pragmatic or fairness-oriented adjustment of standards of proof on a case-by-case basis.

A. The Reasonable Certainty Standard

A requirement for certainty in contract damages emerged as a prominent part of U.S. case law in the mid-nineteenth century.⁵⁷ Alt-

53. *Id.* (“In a well-developed market the difference between contract and market price is not hard to determine.”); *cf.* RESTATEMENT (FIRST) OF CONTRACTS § 331 cmt. b (1932) [hereinafter “RESTATEMENT (FIRST)”] (“If [the contractual transaction] is merely the exchange of a commodity having a definite market price for an agreed sum of money, the profit resulting from the exchange is comparatively easy to estimate.”).

54. Roger I. Abrams, Donald Welsch & Bruce Jonas, *Stillborn Enterprises: Calculating Expectation Damages Using Forensic Economics*, 57 OHIO ST. L.J. 809, 810 (1996) (“[C]ourts have had (and continue to have) particular difficulty addressing contract damages issues involving new businesses that fail . . .”).

55. Daniel E. Toomey, Joshua S. Marks, Tong Zhao & J. Mark Dungan, *Calculating Lost Labor Productivity: Is There a Better Way?*, 35 CONSTRUCTION LAW., Spring 2015, at 27, 27 (“The calculation of lost labor productivity is controversial because of the widespread skepticism of . . . triers-of-fact, who may come to view the methodologies employed to calculate both the extent and value of the asserted damages as questionable, speculative, and illusory.”).

56. *See, e.g.*, RESTATEMENT (SECOND) OF CONTRACTS § 352 cmt. b (1981) [hereinafter “RESTATEMENT (SECOND)”] (noting that, with respect to lost profits of a new or speculative business, “damages may be established with reasonable certainty with the aid of expert testimony, economic and financial data, market surveys and analyses, business records of similar enterprises, and the like”); Abrams, Welsch & Jonas, *supra* note 54, at 825 (“In order to estimate loss to a stillborn enterprise, the forensic economist and the legal accountant must evaluate the competitive conditions faced by the failed business and analyze its projected performance . . .”); Toomey, Marks, Zhao & Dungan, *supra* note 55, at 27 (observing that pursuing or defending against “a loss-of-productivity claim” “normally involves retaining an experienced construction productivity expert”).

57. E. ALLAN FARNSWORTH, CONTRACTS §12.15, at 799 (4th ed. 2004) (discussing introduction of “the requirement of certainty” by U.S. judges “[i]n the middle of the nineteenth century”).

though the certainty requirement facially presents itself as a restriction, its emergence in fact reflected liberalization of the rules for awarding contract damages. Courts previously had refused to award lost profits,⁵⁸ and the certainty standard provided a means whereby courts could entertain lost-profit awards while at the same time retaining a capacity “to control the discretion of juries.”⁵⁹ According to Charles McCormick, “the doctrine of certainty” first developed in contract cases, where it remained “more rigorously” applied even after its expansion to tort.⁶⁰ Over time, many courts converged on a “qualified” requirement for certainty frequently described as one of “reasonable certainty” — that McCormick characterized as demanding that reasonable people, “acting upon inference and not from guess, can find [from the evidence presented] that damage did . . . result, and can derive substantial data for fixing the amount.”⁶¹

An important point highlighted by the two-part nature of McCormick’s characterization is that the requirement of reasonable certainty can have a dual or split nature. The requirement is invoked sometimes in relation to proof of actual harm from a breach, sometimes in relation to the amount of recoverable damages, and sometimes in relation to both.⁶² The dominant rule appears to be that the amount of damages, not merely the existence of relevant loss, needs to be reasonably certain.⁶³ But various courts have suggested that the reasonable certainty standard is to be applied with more rigor to the question of the existence of loss than to the question of the amount of loss.⁶⁴

58. Charles T. McCormick, *The Standard of Certainty in the Measurement of Damages*, 43 YALE L.J. 1109, 1110 (1934) (“The earlier vague and tentative doctrine, . . . outlawing ‘loss of profits’ as a measure of recovery, was one of those rather crude and arbitrary rules which the courts devised for curbing damages in contract cases, until they had found broader and more rational standards to use for the purpose.”).

59. FARNSWORTH, *supra* note 57, §12.15, at 799.

60. McCormick, *supra* note 58, at 1110–11; *see also* RESTATEMENT (SECOND), *supra* note 56, § 352 cmt. a (“Courts have traditionally required greater certainty in the proof of damages for breach of a contract than in the proof of damages for a tort.”).

61. McCormick, *supra* note 58, at 1111; *see also* FARNSWORTH, *supra* note 57, §12.15, at 800 (“Contemporary statements insist only on ‘reasonable certainty’ rather than on certainty itself.”).

62. McCormick, *supra* note 58, at 1112 (noting “the subdoctrine which endeavors to draw a distinction between ascertainment of the fact of damage, and ascertainment of its extent” (emphasis omitted)); Milikowsky, *supra* note 52, at 466 (“Courts differentiate between reasonable certainty as to the existence of damage and reasonable certainty as to the amount of damage.”).

63. *See* RESTATEMENT (SECOND), *supra* note 56, § 352 (“Damages are not recoverable for loss beyond an amount that the evidence permits to be established with reasonable certainty.”); RESTATEMENT (FIRST), *supra* note 53, § 331 (“Damages are recoverable for losses caused . . . only to the extent that the evidence affords a sufficient basis for estimating their amount in money with reasonable certainty.”).

64. *See* E. Allan Farnsworth, *Legal Remedies for Breach of Contract*, 70 COLUM. L. REV. 1145, 1214 (1970) (“[C]ourts have relaxed or abandoned the requirement where they have concluded that it has been met with respect to the ‘fact’ of loss and the only remaining questions go to the ‘extent’ of loss.”); Milikowsky, *supra* note 52, at 466 (“Many courts imply

This Article focuses on the second concern of the reasonable certainty analysis, proof of a particular damages amount. This focus reflects the fact that, when a court finds infringement of valid patent rights, the Patent Act mandates a monetary award “in no event less than a reasonable royalty.”⁶⁵ In other words, the statute effectively assumes that infringement generates some form of legal injury warranting damages. The key remaining question is the amount of damages that is appropriate. And for purposes of this Article, the pertinent sub-question is what reasonable certainty requires with respect to assessment of the damages amount.

In response to this sub-question, a first point is that reasonable certainty does not always require absolute mathematical precision.⁶⁶ For situations involving a breach of contract, precedent from various courts initially embodied a “new business rule” that generally precluded as overly speculative any award of expectation damages for the relative or complete failure of a new business.⁶⁷ But some courts took a substantially looser view of the demands of reasonable certainty, requiring little more than that damages have some nontrivial evidentiary support and not be entirely speculative.⁶⁸ Further, over the course of decades many courts relaxed their demands for reasonable certainty⁶⁹ and progressively took the steps of: (1) abandoning bars on the award of damages such as the “new business rule,”⁷⁰ (2) recognizing the capacity of statistical or other expert evidence to support inferences required for calculation of a damages amount,⁷¹ and (3) acknowledging the unfairness or the undesirability from a conse-

that the certainty required as to the amount is less than the certainty required as to existence.”); *cf.* FARNSWORTH, *supra* note 57, §12.15, at 800 (“[A] few courts have taken the extreme view that one need only prove the ‘fact’ as distinguished from the ‘extent’ of the loss with reasonable certainty.”).

65. 35 U.S.C. § 284.

66. *See, e.g.*, U.C.C. § 1-305 cmt. 1 (2001) (noting the Code’s purpose “to reject any doctrine that damages must be calculated with mathematical accuracy”); 24 WILLISTON ON CONTRACTS § 64.8 (4th ed. 2015) (“The exact amount need not be shown, since mathematical precision is not required.”).

67. Abrams, Welsch & Jonas, *supra* note 54, at 810–11 (describing the traditional “‘new business rule,’” under which courts refused expectation damages for lost profits when a business lacked “prior [profits] data”).

68. *See* 1 DOBBS, *supra* note 34, § 3.4, at 319–20 (“The soft approach in effect says that the plaintiff must show he has realized or will realize actual losses, but that once he has made this proof, the court will not require precision as to amounts.”).

69. FARNSWORTH, *supra* note 57, §12.15, at 800 (“Recent decades . . . have seen a relaxation of the requirement.”).

70. Abrams, Welsch & Jonas, *supra* note 54, at 812 (“The traditional new business rule has gradually disappeared from American jurisprudence.”).

71. *See* RESTATEMENT (SECOND), *supra* note 56, § 352 cmt. a (“[I]ncreasing receptiveness on the part of courts to proof by sophisticated economic and financial data and by expert opinion has made it easier to meet the requirement of certainty.”); *cf.* Abrams, Welsch & Jonas, *supra* note 67, at 812 (noting the present availability of “sophisticated econometric tools for projecting future loss in new business cases”).

quentialist standpoint of effectively prohibiting expectation damages in whole classes of economically and individually significant situations that frequently involve new businesses, construction contracts, or long-term relationships.⁷² On the one hand, the more liberal approach to certainty toward which courts ultimately gravitated enables them to adapt the scope of permissible ways to prove damages as new circumstances and valuation methodologies develop.⁷³ On the other hand, the more liberal approach places added responsibility on appellate courts to ensure that relaxed reasonable certainty standards do not leave too much unguided discretion to trial judges. Without effective policing of individual trial court decisions by appellate courts, the more liberal approach could upset capacities for planning and private risk allocation — as well as interests in substantially equal treatment — by fostering widely disparate treatments of similar factual scenarios.⁷⁴

In short, in contract cases as in many other types of cases, courts have commonly converged on a reasonable certainty requirement that demands that the case for a particular damages award be more than merely speculative but that, beyond this demand, can be fairly hazy in how it channels trial court discretion. Given this haziness, one might worry that the reasonable certainty requirement in contract cases might offer little useful instruction for courts in patent cases. But more detailed consideration of how courts have conducted reasonable certainty analysis in contract cases clarifies the analogy's value by illustrating the breadth and potential weights of factors that can properly enter into a court's assessment of the admissibility and sufficiency of evidence on damages. Section III.B discusses such factors and, in particular, focuses on concerns of blameworthiness and the state of the art in assessing damages. These concerns do not appear in rote recitations of patent law's *Georgia-Pacific* factors for reasonable royalty damages.⁷⁵ Nor are they straightforwardly derived from general evidentiary rules requiring that expert submissions possess sufficient "evidentiary relevance and reliability."⁷⁶ Deployment of these factors in contract cases demonstrates how concerns of both equity and pragmatics can shape courts' assessments of the admissibility and

72. Abrams, Welsch & Jonas, *supra* note 54, at 811 (discussing how courts came to "rea-son[n] that an absolute denial of contract recovery to stillborn enterprises was unfair and unnecessary").

73. See Milikowsky, *supra* note 52, at 467 ("Most courts agree that reasonable certainty as to damages is a flexible, inexact concept.")

74. See *id.* at 491 (concluding that "a 'reasonable estimate' standard" leaves "enough wiggle room for a determined factfinder to award a windfall to either party"); *cf.* 1 DOBBS, *supra* note 34, § 3.4, at 320 (describing both a "soft approach" and a "hard approach" to reasonable certainty as lacking "much actual content").

75. See MUELLER, *supra* note 4, at 639 n.144 (listing the *Georgia-Pacific* factors).

76. *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 594–95 (1993).

sufficiency of evidence for even the classic legal remedy of money damages.

B. The Equity and Pragmatics of Reasonable Certainty

Common caricatures of law and equity portray law and legal remedies as rigidly defined and lacking sensitivity to general concerns of pragmatism or fairness,⁷⁷ whereas equity and equitable remedies are substantially the opposite, so malleable in the face of such general concerns that they are the playthings of individual jurists.⁷⁸ But these caricatures are in many respects untrue. Equity has developed various rule-like doctrines and practices.⁷⁹ Likewise, law and legal remedies can exhibit context sensitivity and attention to culpability that mirror aspects of equity.⁸⁰

The evolved doctrine of “reasonable certainty” in contract damages is an example of law’s ability to act in the manner of equity. Damages are perhaps the most classic form of legal remedy,⁸¹ a form that courts must generally find inadequate before they decide to award the equitable remedy of an injunction.⁸² But courts have been willing to take into account concerns of blameworthiness in applying the requirement of certainty with respect to damages. Both the First and Second Restatements of Contracts indicate in relation to the certainty requirement that “[d]oubts are generally to be resolved against the party in breach.”⁸³ Further, as noted above, concerns of pragmatism or

77. Thomas O. Main, *Traditional Equity and Contemporary Procedure*, 78 WASH. L. REV. 429, 430 (2003) (describing a historical “struggle between the regimes of law and equity” in which “[e]quity moderates the rigid and uniform application of law by incorporating standards of fairness and morality into the judicial process”).

78. H. Jefferson Powell, “*Cardozo’s Foot*”: *The Chancellor’s Conscience and Constructive Trusts*, 56 L. & CONTEMP. PROBS., Summer 1993, at 7, 8 (discussing John Selden’s classic critique of equity as “a cover for the imposition of one person’s private moral perspectives on those brought before him”).

79. See Gergen, Golden & Smith, *supra* note 47, at 222 (“The availability of injunctive relief has commonly been determined with the aid of a structured set of presumptions”); Henry E. Smith, *The Equitable Dimension of Contract*, 45 SUFFOLK U. L. REV. 897, 903–05 (2012) (contending that “[e]quity is not the caricature of a ‘realist’ approach to judging — doing whatever seems best to the judge ex post in the individual case” — but instead is marked by limitations and presumptions that contain potential chilling effects).

80. Cf. Mark P. Gergen, *Causation in Disgorgement*, 92 B.U. L. REV. 827, 839–41 & nn.50–56 (2012) (discussing traditional common-law principles shifting burdens of proof or taking expansive views of recoverable damages to the detriment of parties found to have engaged in fraud or other forms of culpable misrepresentation).

81. See Smith, *supra* note 79, at 897 (“Contracts are usually enforced with damages, the classic common law remedy.”).

82. See Gergen, Golden & Smith, *supra* note 47, at 207 (“to obtain an injunction, a movant did commonly have to show that the movant would otherwise suffer an injury that could not be adequately redressed through legal remedies.”).

83. RESTATEMENT (SECOND), *supra* note 56, § 352 cmt. a; accord RESTATEMENT (FIRST), *supra* note 53, § 331 cmt. c (“Doubts are generally resolved against the party committing the breach of contract.”).

fairness have led courts to abandon draconian demands or rigid rules relating to the certainty required for contract damages.⁸⁴ The qualifier “reasonable,” appended to the requirement of certainty, has provided a natural outlet for such concerns.

Moreover, courts have allowed for pragmatic or fairness-oriented tuning of certainty standards on a retail as well as a wholesale basis.⁸⁵ In particular, courts have been willing to dial down the demands of reasonable certainty when, for example, the state of the art or other circumstances do not permit more precise or robust proof of damages,⁸⁶ or the nature of the breaching party’s conduct is especially egregious.⁸⁷ As with abandonment of the “new business rule,” the rationale for weakening the certainty requirement on a case-by-case basis can reflect not only a moral concern with individualized justice but also pragmatic recognition that even a roughly cut remedy can improve the law’s provision of ex ante incentives, at least as long as the rough cuts are not systematically biased.⁸⁸ In short, as embodied in a reasonable certainty standard, the certainty requirement has become more than a tool for limiting the possibilities for errant jury verdicts. It has become a means by which judges can bring principles of individualized justice, context-sensitive common sense, and pragmatic calculus to bear on what arguments and allegations can support potentially substantial, rather than merely nominal, monetary relief. That courts have justifiably taken such a flexible and context-sensitive approach to the reasonable certainty standard for expectation damages in contract law, even though expectation damages are commonly backed up by possibilities of damages based on theories of reliance or restitution,⁸⁹ suggests that such an approach might well be justified *a fortiori*

84. See *supra* text accompanying notes 69–72.

85. McCormick, *supra* note 58, at 1133 (noting that “actual use of [the certainty requirement] varies in the different classes of cases, and within the classes varies with the slant of the balance of sympathy, justice, and equity in the particular case”).

86. See FARNSWORTH, *supra* note 57, §12.15, at 800 (“Courts are also less demanding if it appears that . . . proof with precision is inherently impossible.”); McCormick, *supra* note 58, at 1119 (noting an apparent tendency of courts “not only to insist that the claimant furnish the best available proof of the amount of loss, but also to hold it sufficient if he has furnished the most satisfactory data that the particular situation admits of”); cf. UCC 1-305 cmt. 1 (“Compensatory damages are often at best approximate: they have to be proved with whatever definiteness and accuracy the facts permit, but no more.”).

87. See FARNSWORTH, *supra* note 57, §12.15, at 800 (“Courts are . . . less demanding in applying the requirement [of certainty] if the breach was ‘willful,’ in spite of the general tenet that the amount of contract damages does not turn on the character of the breach.”); McCormick, *supra* note 58, at 1133–34 (noting that the requirement of certainty “is relaxed somewhat if the breach was avoidable and deliberate”).

88. See Kaplow & Shavell, *supra* note 49, at 729–30 (defending damage awards even when based on “rough judgments and intuitions” but acknowledging cause for concern if courts “set damages systematically below average harm”).

89. See RESTATEMENT (SECOND), *supra* note 56, § 344 (describing judicial remedies for breach of contract as “protect[ing] one or more of” a promisee’s expectation, reliance, and restitution interests); FARNSWORTH, *supra* note 57, § 12.16, at 805 (“[A] party that has

with respect to assessment of reasonable royalty damages in patent law, where a reasonable royalty is in essence the residual measure for damages after others have failed.⁹⁰ From the standpoint of Judge Hand's concern about sending away a wronged party "with empty hands,"⁹¹ a rigid requirement of strict certainty is more pernicious when there are no backups to the measure for which strict certainty is demanded.

IV. REASONABLE CERTAINTY FOR REASONABLE ROYALTIES

As discussed above, assessment of reasonable royalty damages in patent law often involves difficult inquiries into proper apportionment of technological or licensing value or, alternatively or additionally, into how to make use of values assigned to the same patent or others in distinct contracting circumstances.⁹² In responding to these concerns, courts have generally focused on the nature of the economic evidence proffered, rather than whether the level of scrutiny applied to such evidence should reflect additional pragmatic or equity-oriented factors. This Part argues that, in determining the nature of evidence admissible or sufficient to support reasonable royalty awards, courts may, and in various circumstances should, apply analogs of pragmatic and equity-oriented aspects of the reasonable certainty requirement for contract damages. Such a course of action can help not only to address concerns of substantive justice, but also to provide incentives for socially desirable behavior on the parts of patentees, their affiliates, and potential infringers.

The basic legal foundation for applying pragmatic and equity-oriented aspects of contract law's reasonable certainty analysis to the assessment of reasonable royalties is not too hard to establish. First, reasonable certainty has become a quite general requirement for damage awards in U.S. civil litigation.⁹³ Consequently, to the extent one

relied on a contract can usually meet the burden of proving with sufficient certainty the extent of that reliance, even if unable to meet that burden as to profits."); *id.* § 12.19, at 821 ("Since the restitution interest is ordinarily the smallest of the three interests, the injured party will usually find restitution less attractive than enforcement of the other party's broken promise, either by specific relief or by an award of damages based on the injured party's expectation or reliance interest."); 24 WILLISTON ON CONTRACTS, *supra* note 66, § 64:2 (discussing situations in which courts award damages based on reliance or restitution interests).

90. *See supra* text accompanying notes 6–12.

91. *Supra* text accompanying note 12.

92. *See supra* text accompanying notes 33–44.

93. 1 DOBBS, *supra* note 34, § 3.4, at 318–19 (describing as general restrictions on "consequential damages" the requirements that the existence of loss be adequately proven and that the amount of loss be shown with sufficient precision); McCormick, *supra* note 58, at 1110–11 ("While the development of the doctrine of certainty was worked out in the first instance in the contract cases, its applicability to cases of tort is now conceded . . .").

accepts — as the Supreme Court has repeatedly emphasized⁹⁴ — that patent law is not an island, there is cause to look to reasonable certainty as a potential standard to apply in assessing patent damages. Indeed, the residual nature of a reasonable royalty as a measure of patent damages makes flexible and pragmatic aspects of reasonable certainty doctrine in contract law seem, if anything, more apt for reasonable royalty assessment in patent law.⁹⁵ Second, for reasonable royalty damages in patent-infringement cases, the notion of incorporating context-sensitive pragmatic or equitable considerations into the assessment of whether damages are sufficiently proven might be viewed as implicit in the term “reasonable royalty” itself, as well as in Learned Hand’s classic conception of patent law’s reasonable royalty as “a device in aid of justice.”⁹⁶ As “reason” is commonly understood to correspond to “what is right or practical or practicable,”⁹⁷ it makes some plain-language sense that judicial assessment of a “reasonable royalty,” including assessment of whether evidence proffered for a particular amount of the royalty is admissible or adequate, should be sensitive to pragmatic concerns and concerns of substantive justice.

The next question should be obvious. What pragmatic or equitable considerations does the reasonable certainty analysis suggest for patent-infringement cases? As examples of potential considerations, one might posit (1) the blameworthiness or egregiousness of one or another party’s conduct, (2) the state of the art or of the availability of evidence for proving damages, and (3) the amount of damages alleged. The remainder of this section will discuss what these considerations might entail and how their deployment in the context of reasonable royalty analysis can be justified as a matter of good policy.

Rationales for making blameworthiness or egregiousness of a party’s behavior a factor seem relatively clear. To the extent one is concerned with fairness, one can point to the fact that, in awarding remedies, equity commonly disfavors parties with “unclean hands.”⁹⁸ Likewise, one can oppose systematically exempting from substantial

94. *See, e.g.*, *Medtronic, Inc. v. Mirowski Family Ventures, LLC*, 134 S. Ct. 843, 850 (2014) (criticizing a “burden shifting rule” specific to patent cases for being “difficult to reconcile with a basic purpose of the Declaratory Judgment Act”); *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 391 (stating that “familiar [equitable] principles apply with equal force to disputes arising under the Patent Act”); *Dickinson v. Zurko*, 527 U.S. 150, 152 (1999) (holding that the Administrative Procedure Act’s “standards governing judicial review of findings of fact made by federal administrative agencies” apply “when the Federal Circuit reviews findings of fact made by the Patent and Trademark Office”).

95. *See supra* text accompanying notes 89–92; *cf. McCormick, supra* note 58, at 1111 (“[T]he standard is more rigorously applied, even now, in contract claims.”).

96. *Supra* text accompanying note 12.

97. *THE POCKET OXFORD AMERICAN DICTIONARY OF CURRENT ENGLISH* 664 (2002) (defining “reason”).

98. *Smith, supra* note 79, at 907 (“Unclean hands and estoppel . . . are at the heart of equity, and serve to pick out situations that present a great danger of opportunism.”).

infringement remedies someone who has deliberately inflicted a difficult-to-value harm.⁹⁹ Further, applying the reasonable certainty requirement in only a loose fashion when an infringer has acted egregiously can ensure more effective deterrence of such egregious behavior, which might also be more likely to inflict substantial harm or to generate substantial benefits for the wrongdoer than less egregious behavior that might be less likely to be deliberate or otherwise well crafted to serve the wrongdoer's particular interests.¹⁰⁰

Consideration of the relative blameworthiness of the parties in assessing the admissibility or adequacy of evidence of reasonable royalty damages can help provide proper incentives for patent holders as well. Patent holders might thereby have reason to be more scrupulous in ensuring adequate or, at least, relatively maximal practical notice to potential infringers. Such notice might make more likely a later finding that infringement was not only willful but in fact egregiously willful, a finding that might in turn trigger a relatively relaxed standard for evidence of reasonable royalty damages. Likewise, inexcusably poor notice or objectionably opportunistic behavior by a patent holder in enforcing its rights — what some might term “troll”-like behavior¹⁰¹ — might provide reason for courts to be particularly demanding of the support for a reasonable royalty amount alleged by the patent holder.

Concerns of pragmatics and fairness also justify courts' consideration of the nature of available methodologies and evidence in determining what sorts of proof are needed for reasonable royalty damages. Where damages are systematically difficult to prove with precision, strict deployment of a certainty requirement threatens to generate substantial under-deterrence and under-compensation. Further, as long as damages subject to a flexible reasonable certainty requirement are awarded relatively often, one can hope that vagaries in their assessed amounts will largely wash out on average and over time — just as the average step away from the starting position of a random walk converges to a length of zero as the number of steps tends to infinity.¹⁰²

Reference to the state of the art or the availability of evidence might provide added incentive for an adjudged infringer to use as high

99. *Cf.* RESTATEMENT (FIRST), *supra* note 53, § 331 cmt. a (stating that, in cases where “the experience of mankind is convincing that a substantial pecuniary loss has occurred [but] it is of such a character that the amount in money is incapable of proof, . . . the defendant usually has reason to foresee this difficulty of proof and should not be allowed to profit by it”).

100. *Cf.* Gergen, *supra* note 80, at 840 (“Generally, causal uncertainty is resolved against a wrongdoer when his conduct is deemed wrongful precisely because it has a strong propensity to cause the type of harm that ensued.” (internal quotation marks omitted)).

101. *Cf.* Mark A. Lemley, *Are Universities Patent Trolls?*, 18 *FORDHAM INTELL. PROP. MEDIA & ENT. L.J.* 611, 630 (2008) (“In my view, troll is as troll does.”).

102. *See* RONALD E. WALPOLE & RAYMOND H. MYERS, *PROBABILITY AND STATISTICS FOR ENGINEERS AND SCIENTISTS* 210 (1989) (discussing the Central Limit Theorem).

quality a methodology as possible in generating a damages assessment to compete with that of the patent holder. The accused infringer's methodology and evidence can help prove that the patent holder's evidence for its asserted reasonable royalty amount falls short of the quality possible in light of the state of the art and in light of evidence that should, if the patent holder's claim were justified, be readily available for the patent holder's use. In this way, the accused infringer's offering of evidence on damages can compete both directly and indirectly with the patent holder's: directly by potentially providing stronger proof than the patent holder's, and indirectly by suggesting that the patent holder's offering should be disqualified for failure to use an approach or evidence well designed to yield a practically achievable level of certainty.

Finally, the size of asserted damages can affect the appropriate level of certainty demanded.¹⁰³ If asserted damages are small, it likely makes little sense to spend large amounts to try to determine them with great precision. For example, requiring expenditure on careful surveys or econometric analysis to generate a damages award substantially less than the cost of investigative expenditure is unlikely to advance societal interests in large swaths of cases. Private parties are unlikely to see any positive value in making such expenditures, and the result would be an effective forfeiture of their capacity to obtain more than nominal damages — damages that would be unlikely to provide a patent holder with sufficient recompense for bringing suit.¹⁰⁴ If we presume the patent system is socially justified for a substantial number of patents likely to be rendered effectively unenforceable in this way, such effective unenforceability is likely to seem problematic. In theory, society could respond by subsidizing private enforcement suits or subjecting patent rights to public enforcement, but even if society's rewards from enforcement were greater than a private patent holder's, the required investigative costs for damages would still likely tip various marginal patent cases into the realm of effective unenforceability.

A high demand for certainty might even be socially undesirable for much more substantial but still relatively moderate amounts of asserted damages. Even if asserted damages are not small relative to the costs of satisfying the posited reasonable certainty standard, errors and vagaries in the award of damages might predictably wash out, on average, if the magnitude of damages at issue is no larger than that in

103. See DOUGLAS LAYCOCK, *MODERN AMERICAN REMEDIES: CASES AND MATERIALS* 106 (concise 4th ed. 2012) (“In cases with smaller stakes, the plaintiff herself, or her accountant, may offer evidence that is conceptually similar to a formal model, even if the witness’s methodology is less sophisticated.”).

104. See 1 DOBBS, *supra* note 34, § 3.3(2), at 294 (“Nominal damages are damages in name only, trivial sums such as six cents or \$1.”).

a large number of cases. Here again, the point is that, as the number of damage awards of a characteristic size tends to infinity, one reasonably expects the percentage error in the sum of the awards to converge on zero.¹⁰⁵

In contrast, if asserted damages are of an exceptionally large size — i.e., a size that is very rarely seen in actual court awards — one might have less reason to hope that an error with respect to an award of such size will be effectively counterbalanced within a socially relevant time span. There simply might not be enough comparable awards — or cases litigated to judgment that involve comparable award scenarios — for a substantial error with respect to such an award to be effectively washed out. Moreover, salience effects might exacerbate reasons to be concerned about the distortive impact of an errantly large damages award on parties' ex ante behavior.¹⁰⁶ Consequently, when especially large damage awards are asserted, courts can sensibly demand a higher than usual level of rigor in their proof as a way to protect against the potentially atypically harmful effects of damages awards that are both erroneous and enormous.

In short, pragmatism and fairness concerns provide multiple justifications for believing that party blameworthiness, the nature of available royalty-estimation methodologies and evidence, and the size of asserted damages should inform what courts demand for proof of damages in individual patent cases. Fortified by analogy to contract law's reasonable certainty analysis, these justifications provide grounds for deploying these factors in assessing the adequacy of a party's proof of reasonable royalty damages.

V. CONCLUSION

Contract law's reasonable certainty requirement for damages provides helpful instruction on how courts can regulate proof of reasonable royalty damages in patent cases. In patent law, reasonable royalty damages play the role of remedial failsafe or, in Learned Hand's language, "a device in aid of justice" that can provide relief when other measures of damages fail.¹⁰⁷ Because of contract law's reputation as a field in which the reasonable certainty standard is particularly strin-

105. See *supra* text accompanying note 102.

106. Cf. Jean Galbraith, *Treaty Options: Towards a Behavioral Understanding of Treaty Design*, 53 VA. J. INT'L L. 309, 350 (2013) ("Empirical research also suggests that the salience with which information is presented affects the average extent to which individuals make use of it, in a way that goes beyond what we would expect from rational actors."); Cass R. Sunstein, *Timing Controversial Decisions*, 35 HOFSTRA L. REV. 1, 3–4 (2006) ("[P]ublic concern outruns actual fluctuations in the important case of 'panics,' bred by vivid illustrations that do not reflect changes in levels of danger.").

107. See *supra* text accompanying note 12.

gent,¹⁰⁸ the flexibility and context sensitivity of contract law's reasonable certainty requirement suggests that at least a similar level of flexibility and context sensitivity is desirable and achievable with respect to patent law's residual remedy of reasonable royalty damages.¹⁰⁹ In this vein, contract law demonstrates how courts can assess the adequacy of proof of perhaps the most classic form of legal remedy, standard money damages, with an eye toward pragmatic and equitable concerns such as the relative blameworthiness of the parties, the state of the art and availability of evidence for proving damages, and the amount of damages alleged. Such deployment of reasonableness and context sensitivity within the domain of legal remedies sometimes favors right holders and sometimes favors right violators. More generally, such deployment illustrates how law can, like equity, account for concerns of justice and pragmatism without abandoning pursuit of the predictability and consistency commonly thought vital for both public and private spheres of human activity.

108. *See supra* text accompanying note 60.

109. *See supra* text accompanying notes 89–90.