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Is a FRAND Royalty a Point or a Range?

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A patent holder that submits to a standard-setting organization (SSO) a voluntary commitment to offer to license its standard-essential patents (SEPs) on fair, reasonable, and nondiscriminatory (FRAND) or reasonable and nondiscriminatory (RAND) terms is entitled to a reasonable royalty for patent infringement. Currently, a debate rages over whether, for a given SEP, there exists a range of FRAND or RAND royalties or, instead, there exists only a unique point value of a royalty that is FRAND or RAND. In the April 2017 decision in *Unwired Planet International Ltd. v. Huawei Technologies Co.*, for example, Mr. Justice Colin Birss of the High Court of Justice of England and Wales said that, under the intellectual property rights (IPR) policy of the European Telecommunications Standards Institute (ETSI),[1] there can be only a single FRAND royalty rate for a given set of circumstances between parties negotiating a license for an SEP.[2] Read narrowly, Justice Birss' conclusion that FRAND is a point means that a judge must, as a practical matter, render a decision regarding a FRAND or RAND royalty so as to resolve a justiciable dispute. Read too broadly, some might improperly infer from Justice Birss' opinion that FRAND or RAND can be only a single point in a voluntary negotiation between two parties, or that a given SEP must command the same price from every licensee.

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[1] European Telecommunications Standards Institute, ETSI Intellectual Property Rights Policy, Annex 6, (Apr. 5, 2017) [hereinafter ETSI IPR Policy], https://portal.etsi.org/directives/37_directives_apr_2017.pdf.

[2] [2017] EWHC (Pat) 711 [148] (Eng.). For early commentary on *Unwired Planet*, see Jorge L. Contreras, *Global Markets, Competition, and FRAND Royalties: The Many Implications of* Unwired Planet v. Huawei, 17 ANTITRUST SOURCE, Aug. 2017, at 1; Sophie Lawrance & Francion Brooks, Unwired Planet v Huawei*: The First UK FRAND Determination*, 8 J. EUR. COMPETITION L. & PRAC. (forthcoming 2017); Marco Lo Bue, *The High Court Judgment on* Unwired Planet vs. Huawei *Narrows the Scope of Competition Law Defence in SEP Litigation*, 4 ITALIAN ANTITRUST REV. 70 (2017); Damien Neven & Pierre Régibeau, Unwired Planet vs Huawei*: A Welcome Clarification of the Concept of FRAND and of the Role of Competition Law Towards SEP Licensing*, 8 J. EUR. COMPETITION L. & PRAC. 1 (forthcoming 2017).

The statement that only a single FRAND or RAND rate exists for a given SEP is incorrect from an economic perspective. Basic principles of bargaining theory show that multiple reasonable outcomes will occupy the bargaining range. The SEP holder's FRAND or RAND commitment does not alter this basic economic principle. Even if a court needs to determine a point royalty to decide a justiciable dispute between an SEP holder and an infringer, there still exists a range of possible outcomes that would be FRAND or RAND. That economic insight was recognized in *Licensing Terms of Standard Essential Patents: A Comprehensive Analysis of Cases*, a report that the European Commission's Joint Research Centre published in January 2017.[3] The report's authors, Chryssoula Pentheroudakis and Justus Baron, found that "FRAND is a range," and they emphasized that "[f]urther developing FRAND as a regulatory instrument for the future of SEP licensing requires that we understand and acknowledge that FRAND, by design and by necessity, defines a range—not a [single] rate."[4]

Legal considerations also call into question the generality of *Unwired Planet*'s conclusion that FRAND is a point. Justice Birss' interpretation of ETSI's FRAND commitment under French law, which controls the precise obligations arising from that commitment,[5] might differ from the same analysis if U.S. law instead controlled. In particular, judicial interpretation of the relevant U.S. statute, section 284 of the Patent Act,[6] supports the conclusion that a range of royalties will be considered reasonable in a voluntarily negotiated license agreement (unless by remarkable coincidence the licensor's minimum willingness to accept precisely equals the licensee's maximum willingness to pay). Under American law, any contractual bargaining away of the patent holder's statutory rights would need to be indisputably clear. Because a typical FRAND or RAND commitment contains no such provisions—and, to the contrary, permits the parties to a licensing transaction to negotiate a reasonable royalty for the use of an SEP—the conclusion that the FRAND or RAND rate is a single point would be incorrect as a legal matter in a case controlled by American law.

In Part I of this article, I analyze Justice Birss' reasoning in *Unwired Planet* that FRAND must be a single royalty rate. In Part II, I present an economic explanation for why, in any given patent-license negotiation, there will exist

[3] Chryssoula Pentheroudakis & Justus A. Baron, Joint Research Centre, European Commission, Licensing Terms of Standard Essential Patents: A Comprehensive Analysis of Cases (Nikolaus Thumm ed., 2017), http://publications.jrc.ec.europa.eu/repository/bitstream/JRC104068/jrc104068%20online.pdf. The Joint Research Centre "aims to provide evidence-based scientific support to the European policy-making process." *Id.*

[4] *Id.* at 12–13.

[5] ETSI IPR Policy, *supra* note 1, § 12, at 40 ("The POLICY shall be governed by the laws of France."); *see also Unwired Planet* [2017] EWHC (Pat) 711 [806] ("As a matter of French law the FRAND undertaking to ETSI is a legally enforceable obligation which any implementer can rely on against the patentee.").

[6] 35 U.S.C. § 284.

a range of mutually beneficial reasonable royalties rather than a single point royalty. I further show that principles of bargaining theory extend to the context of FRAND-committed and RAND-committed SEPs. In Part III, I show that differences in outside options, discount rates, and heterogeneous licensing preferences explain why different licensees agree to pay different royalties for the use of a given SEP. I further explain that imposing on the SEP holder a duty to license all licensees at the same rate would hinder the ability of the SEP holder and its potential licensees to negotiate mutually beneficial licenses for its standardized patented technology and would harm the parties to the license agreement as well as consumers. In Part IV, I explain that a patent holder is, under the default rule created by U.S. patent law, entitled to a range of reasonable royalties as a remedy for patent infringement under section 284 of the Patent Act. As I explain in Part V, no major SSO defines a FRAND or RAND royalty to be a unique point royalty, and a typical FRAND or RAND commitment does not require the SEP holder to waive its right under public law to a range of reasonable royalties.

I. The Logic and Limits of Justice Birss' Finding in *Unwired Planet* That a FRAND Royalty Is a Point

In *Unwired Planet*, Justice Birss considered "whether there can be a FRAND range rather than just a FRAND rate" under ETSI's FRAND commitment.[7] He determined that, "[f]or a given set of circumstances there is only one FRAND rate and, by parity of reasoning therefore, only one FRAND set of licence terms."[8]

In calling FRAND a unique point, Justice Birss sought to address what he called the "*Vringo* problem," in which the SEP holder has made a FRAND offer and the implementer has made a FRAND counteroffer and the court must determine whether to issue an injunction.[9] He explained that "if there can be a range of FRAND rates then asking if a rate is FRAND does not provide the court with a basis for resolving the dispute."[10] He also said that "[t]he equitable discretion relating to the injunction does not solve this problem."[11]

For example, Justice Birss rejected Huawei's argument that, if both the SEP holder and the implementer have extended FRAND offers, the court should simply refuse to enjoin the infringer, because "the implementer's offer

7 *Unwired Planet* [2017] EWHC (Pat) 711 [147].
8 *Id.* [148].
9 *Id.* [149] ("In *Vringo v. ZTE* . . . and in earlier judgments in these proceedings I considered what happens if each side in a patent dispute makes a FRAND offer. . . . This problem (the *Vringo* problem), in which offers presented by each party differ but are both FRAND, necessarily presupposes that different terms can both be FRAND.").
10 *Id.* [150].
11 *Id.*

is necessarily the one which must be accepted."[12] He reasoned that Huawei's argument rested on the flawed assumption that ETSI's FRAND commitment serves to benefit only implementers.[13] Similarly, Justice Birss rejected Unwired Planet's opposing argument that, in such a situation, the court should grant an injunction, because ETSI's FRAND commitment imposes on the SEP holder only a duty to make a FRAND offer, not a duty to execute a license.[14] Justice Birss said that Unwired Planet's argument "derives from too narrow a view of the wording of the FRAND undertaking and the reference to being 'prepared to grant irrevocable licences' on FRAND terms."[15] He said that such an interpretation of ETSI's FRAND commitment "is unrealistic since a process of fair negotiation will usually involve some compromise between the parties' rival offers."[16] Justice Birss added that "it makes much more sense to interpret the ETSI FRAND obligation as applicable primarily to the finally agreed terms rather than to the offers."[17] Hence, he concluded that, "[i]f more than one set of terms can be FRAND then the . . . problem of rival FRAND offers cannot be solved in a fair way."[18]

Requiring FRAND to be a single set of FRAND terms, according to Justice Birss, eliminates the *Vringo* problem.[19] The problem of rival FRAND rates becomes "simple enough" to resolve, he explained, because the court merely "has to decide what terms would be FRAND in the given circumstances and can grant a declaration to that effect."[20] Justice Birss emphasized that such an outcome would enable the court to "hold parties to their obligations arising from the FRAND undertaking," because "[b]oth parties would be entitled to insist on FRAND terms and neither would be entitled to insist on anything other than FRAND terms."[21] Such an interpretation of FRAND, Justice Birss said, "will promote certainty and will enhance the normative aspect of FRAND."[22]

[12] *Id.* [161].
[13] *Id.*
[14] *Id.* [158].
[15] *Id.*
[16] *Id.* [159].
[17] *Id.*; *see id.* ("In other words, [FRAND] is an obligation to enter into FRAND licences."). I respectfully disagree with Justice Birss on this point. I have explained at length elsewhere that a typical FRAND commitment imposes on the SEP holder a duty to offer to license its SEPs on FRAND terms. However, that duty cannot and does not guarantee that a license with a specific implementer will eventuate. There will be no voluntary agreement between the parties if the implementer is either unwilling or unable to pay a FRAND royalty for the use of the SEP. Therefore, it would be inappropriate to conclude that the SEP holder has failed to comply with its obligations arising from a FRAND commitment when it makes an offer in the FRAND range but cannot reach an agreement with the implementer. *See* J. Gregory Sidak, *The Meaning of FRAND, Part II: Injunctions*, 11 J. Competition L. & Econ. 201, 214–15 (2015). The *Vringo* problem is not any problem at all if the court were simply to require the parties to recognize basic contract principles about offer and acceptance.
[18] *Id.* [158].
[19] *Id.*
[20] *Id.* [165].
[21] *Id.* [156].
[22] *Id.*

Justice Birss acknowledged that evidence from real-world licenses shows that the SEP holder had licensed its portfolio for a *range* of royalties to different licensees, but he concluded that such evidence does not undermine his reasoning that for a given situation there is only one set of true FRAND terms.[23] He said that "[e]ach real licence was arrived at between particular parties in particular circumstances which may or may not be good evidence about what would be FRAND in the case in issue."[24] He also said that "[f]or concluded agreements . . . the importance of the FRAND undertaking will be historic."[25] In Justice Birss' view, FRAND describes not only a set of license terms," but also the process by which the parties negotiate that license.[26] He said:

> The process aspect of FRAND was important in requiring both sides to approach the negotiations appropriately and the requirement that a royalty rate had to be FRAND would be something to be prayed in aid during the negotiations. However once the agreement has been reached the contract must be the thing which governs the rights and obligations of the two parties with respect to each other while it is in force.[27]

Justice Birss thus implied that royalties determined in comparable licenses might not be FRAND.[28] Consequently, that an SEP holder has licensed an SEP for different royalties to different licensees does not disprove, in Justice Birss' view, the conclusion that, for a given set of circumstances surrounding the relationship between the SEP holder and the infringer, only one FRAND rate exists.

It is important not to broaden Justice Birss' narrow conclusion regarding FRAND as a point. Justice Birss implicitly acknowledged that, for a given SEP, there can exist *multiple* FRAND rates, depending on the parties to the license agreement and the economic circumstances surrounding the license negotiation.[29] Moreover, in another decision issued in July 2017, Justice Birss acknowledged that the FRAND royalty for a given portfolio of SEPs might

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23 *Id.* [157].
24 *Id.*
25 *Id.* [168].
26 *Id.* [162].
27 *Id.* [168]. Justice Birss said that interpreting FRAND as a point would not create legal uncertainty "by allowing a party who had to agree licence terms to later contend that the agreed terms were not FRAND because they differed from the sole 'true' FRAND terms." *Id.* [155]. He said that, after the parties execute a license agreement, "their rights and obligations under the ETSI FRAND undertaking will be discharged and replaced by their contractual rights under the licence." *Id.* Thus, the parties would be unable to "challenge [the] agreed terms as being non-FRAND." *Id.*
28 *Id.* [157] ("Furthermore the fact that the terms of a given comparable licence, objectively speaking, may not represent the true FRAND terms for the circumstances in which they were agreed does not mean those contracts would all be vulnerable to being unwound, for the reasons already addressed.").
29 *Id.* ("Each real licence was arrived at between particular parties in particular circumstances which may or may not be good evidence about what would be FRAND in the case in issue.").

change even between the same parties if they were to negotiate the terms and conditions at a different point in time.[30] He explained that "all sorts of relevant circumstances change"—patents expire, new patents are granted, and standards evolve—such that it is difficult to determine, under present circumstances, what the FRAND rate for a given portfolio of SEP would be in the future.[31] Therefore, Justice Birss understood that the royalty for a given SEP can vary depending on the circumstances surrounding the negotiation and the parties involved in it. He merely stated that, in a given set of circumstances surrounding the negotiation between an SEP holder and a given licensee, there will be only one FRAND rate.

II. Is There a Range of FRAND or RAND Royalties in a Negotiation Between an SEP Holder and a Given Implementer?

From an economic perspective, a range of reasonable royalties for a given patent must exist in any given negotiation between two parties for a patent license.[32] To analyze a negotiation for a patent license, one must consider the minimum royalty that the licensor would be willing to accept to license its patent (while still being better off than without issuing a license) and the maximum royalty that the licensee would be willing to pay to use that patent (while still being better off than without procuring a license).[33] Because a voluntary transaction necessarily makes both parties better off, a negotiated royalty must be situated between the licensor's minimum willingness to accept and the licensee's maximum willingness to pay.[34] Unless, by remarkable coincidence, the licensee's maximum willingness to pay precisely equals the licensor's minimum willingness to accept, there will be a range of mutually beneficial reasonable royalties. These basic principles apply both for implementation patents and for SEPs that are subject to a FRAND or RAND commitment.

A. Establishing the Bargaining Range and a Point Royalty of the Licensing Negotiation

A negotiation for a patent license will be successful if there is a positive bargaining range—that is, if the licensee's maximum willingness to pay exceeds the licensor's minimum willingness to accept. The ultimate outcome of the

[30] Unwired Planet Int'l Ltd. v. Huawei Techs. Co. [2017] EWHC (Pat) 1304 [15] (Eng.).
[31] *Id.*
[32] This discussion is adapted from J. Gregory Sidak, *Bargaining Power and Patent Damages*, 19 Stan. Tech. L. Rev. 1 (2015).
[33] *See id.* at 10.
[34] *Id.* at 10–13.

negotiation (that is, the point royalty that the final agreement ultimately specifies) will depend on the relative bargaining power of the licensee and the licensor. Nonetheless, a range of possible royalties occupy the bargaining range. Any one will make both parties better off than if the parties fail to execute a license.

1. The Bargaining Range

The licensor's minimum willingness to accept is the lower bound on the bargaining range and depends on the licensor's opportunity cost of licensing the patent to the licensee at the time of the negotiation. That opportunity cost is determined by the profits that the licensor can earn by *not* issuing a license and instead pursuing alternative licensing agreements that the licensor would forgo by licensing the patent in suit to the licensee.[35] In the case of an implementation patent, the licensor's alternatives include not only not licensing the patent at all, but also monetizing the patent through the licensor's manufacture of its own implementing product.

The licensee's maximum willingness to pay is the upper bound on the bargaining range and depends on the noninfringing alternatives available to the licensee at the time of the negotiation. The maximum royalty that the licensee would be willing to pay equals the incremental profit that the licensee could expect to earn by licensing the patent in suit rather than using the next-best noninfringing substitute available at the time of the negotiation.[36] It is critical that the costs of obtaining the next-best noninfringing substitute are included in the incremental-value analysis to ensure that the licensee has secured the lawful right to use the next-best substitute.[37]

2. The Selection of a Point Royalty

A fundamental principle of economics is that voluntary exchange mutually benefits the parties to the transaction, who divide their aggregate gains from trade, which economists call surplus.[38] In any negotiation, the total surplus from a successful transaction equals the distance between the

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[35] One source of empirical evidence that can be particularly probative of the licensor's minimum willingness to accept consists of the rates specified in comparable licenses that the licensor has executed for the patent in suit. *Id.* at 13–15.

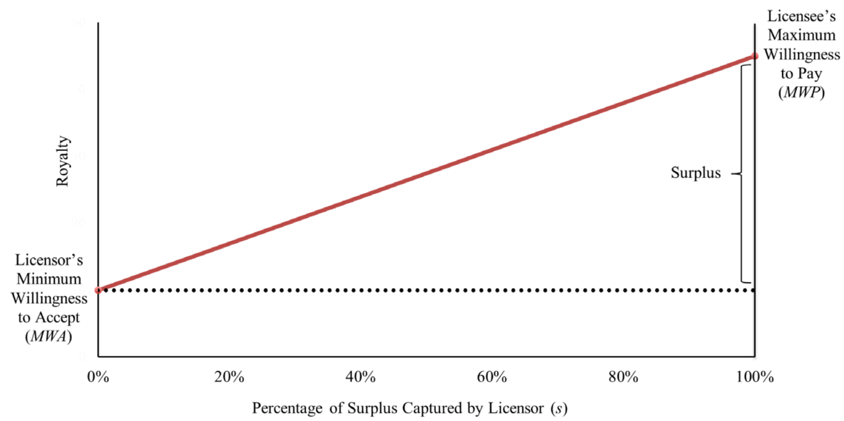
[36] *See, e.g.*, Riles v. Shell Expl. & Prod. Co., 298 F.3d 1302, 1312 (Fed. Cir. 2002) ("The economic relationship between the patented method and non-infringing alternative methods, of necessity, would limit the hypothetical negotiation."); *see also* Sidak, *Bargaining Power and Patent Damages*, *supra* note 33, at 16; J. Gregory Sidak & Jeremy O. Skog, *Hedonic Prices and Patent Royalties*, 2 Criterion J. on Innovation 601 (2017); J. Gregory Sidak, *Noninfringing Substitutes*, 2 Criterion J. on Innovation 901 (forthcoming 2017).

[37] J. Gregory Sidak, *The Meaning of FRAND, Part I: Royalties*, 9 J. Competition L. & Econ. 931, 935 (2013).

[38] *See* Jack Hirshleifer, Amihai Glazer & David Hirshleifer, Price Theory and Applications: Decisions, Markets, and Information 203–04 (Cambridge Univ. Press 7th ed. 2005).

licensee's maximum willingness to pay and the licensor's minimum willingness to accept. Figure 1 illustrates the bargaining range.

Figure 1. The Bargaining Range



Any agreed-upon royalty situated along the line in Figure 1 will make both the licensor and the licensee better off than they would be if they did not execute the license.

To determine how the licensee and the licensor would divide the surplus (and thus find the agreed-upon royalty) from a successful agreement, one analyzes the parties' relative bargaining power.[39] A party's relative bargaining power reflects that party's need to reach an agreement, which depends on the benefit that that party will gain from that agreement.[40] The party that gains less from reaching the agreement will typically have greater bargaining power. The two parties will strike a bargain at a price closer to the licensee's maximum willingness to pay (a higher *s* in Figure 1) if the *licensor* has relatively greater bargaining power. Conversely, the two parties will strike a bargain at a price closer to the licensor's minimum willingness to accept (a lower *s*) if the *licensee* has relatively greater bargaining power. In other words, the licensee will agree to give a relatively large portion of the surplus to the licensor only if the licensee has less bargaining power; and the licensee will succeed in sharing a relatively small portion of the surplus with the licensor only if the licensee has greater bargaining power.

The benefits that each party gains from executing a transaction might be dynamic. Relative bargaining power depends not only on the overall size of the benefit from executing the agreement that each party expects, but also

[39] *See, e.g.*, Robert S. Pindyck & Daniel L. Rubinfeld, Microeconomics 494–95 (Pearson 6th ed. 2005).
[40] *See* Robert Gibbons, Game Theory for Applied Economists 68–71 (Princeton Univ. Press 1992).

on the benefit from agreeing to a contract at a particular time (relative to the possible benefit from agreeing to a contract at a later time). For example, if a patent holder has an urgent need to obtain cash to fund its ongoing business operations, then it will have limited bargaining power in negotiating an agreement to license its patents. However, the patent holder's bargaining power will increase if, before executing a license agreement, the patent holder receives (from some different source) a cash injection. Because the benefits that each party gains from executing a transaction are dynamic, each party's relative bargaining power must be evaluated at a particular point in time.[41] The party that suffers least from delaying the agreement—that is, the party that is most patient—will typically have more bargaining power.[42] The cost that each party bears from a delay is measured by its respective discount rate—that is, how much the party values costs and benefits in the present relative to in the future.[43] The dynamic nature of bargaining power indicates that the party with the lower discount rate will have more bargaining power (all other factors remaining constant) because it suffers less from a delay in reaching an agreement.

In sum, in a negotiation for a patent license between a licensor and a licensee, there will exist (in all but the exceptional case) a range of reasonable royalties for a given patent. Although the parties will ultimately agree upon a single point royalty within the bargaining range (as determined by their relative bargaining power), their agreement upon any other royalty within that range also would have made both the licensor and the licensee better off than if the negotiation had failed and the parties had not executed any license.

B. *Applying the Bargaining-Range Framework to a Negotiation for an SEP*

The principles of bargaining theory apply with equal force to license negotiations for an SEP. In such a negotiation, the bargaining range is defined by the SEP holder's minimum willingness to accept to license its SEP and

[41] *Georgia-Pacific* factor 15 states that the voluntary hypothetical negotiation would have occurred immediately before the first infringement, or on what some call "the eve of infringement." Georgia-Pacific Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970), ***modified and aff'd***, 446 F.2d 295 (2d Cir. 1971); *see also* LaserDynamics, Inc. v. Quanta Comput., Inc., 694 F.3d 51, 76 (Fed. Cir. 2012) ("[T]he hypothetical negotiation must focus on the 'date when the infringement began.'"); Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301, 1324 (Fed. Cir. 2009) ("[T]he hypothetical negotiation[,] or the 'willing licensor-willing licensee' approach, attempts to ascertain the royalty upon which the parties would have agreed had they successfully negotiated an agreement just before infringement began."); State Indus., Inc. v. Mor-Flo Indus., Inc., 883 F.2d 1573, 1580 (Fed. Cir. 1989) ("The determination of a reasonable royalty . . . is based . . . on what a willing licensor and licensee would bargain for at hypothetical negotiations on the date infringement started."); J. Gregory Sidak, *Ongoing Royalties for Patent Infringement*, 24 Tex. Intell. Prop. L.J. 161, 184 n.95 ("In practice, courts and litigants treat the 'moment of first infringement' as simultaneous with the 'eve of first infringement.'"). Thus, the finder of fact in an American patent-infringement trial must analyze the parties' relative bargaining power at that specified time.

[42] *See* Gibbons, *supra* note 40, at 68–71.

[43] *See* Pindyck & Rubinfeld, *supra* note 39, at 554.

the implementer's maximum willingness to pay to use that SEP; the point royalty at which the parties will agree to license the SEP depends on each party's relative bargaining power during the negotiation. Any point within the bargaining range is reasonable, in the sense that it makes both parties better off than they would be if they failed to execute the license.

The SEP holder's minimum willingness to accept will equal the amount that it could earn by *not* contributing its technology to the standard and instead pursuing alternative monetization options. For example, a practicing patent holder could opt to monetize its patent through its own exclusive use of the patented technology, by licensing its patent on an exclusive basis to a licensee, or by licensing its technology on a nonexclusive basis to a larger pool of licensees. The return that the patent holder expects to earn by pursuing the best of those alternatives defines its minimum willingness to accept for licensing its patent within a standard. No rational patent holder would decide to contribute its patent to a standard and license it on FRAND or RAND terms if the expected return from doing so were less than the patent holder's expected return from *not* contributing the technology to the standard and instead pursuing an alternative monetization option. Thus, the highest amount that the SEP holder could earn by *not* contributing its technology to the standard defines the minimum willingness to accept.

Meanwhile, the implementer's maximum willingness to pay for the use of the SEP equals the incremental profit that the licensee expects to earn by licensing the SEP rather than using the next-best noninfringing substitute available at the time of the negotiation. Although a potential licensee that is interested in implementing the standard has no option to design around the SEP (because the use of the SEP is, by definition, necessary to implement the standard), that licensee's maximum willingness to pay is still limited. Forgoing the use of the SEP, and consequently the use of the standard, is an alternative to licensing the SEP. When the return that the potential licensee expects to receive by not licensing the SEP exceeds the return that it expects to earn from licensing it, the potential licensee will rationally decide to forgo the use of the SEP. Thus, the incremental profit that the implementer expects to make from practicing the SEP defines the implementer's maximum willingness to pay for that SEP.

In a voluntary license agreement, the parties will agree upon a royalty that is situated along the bargaining range defined by the SEP holder's minimum willingness to accept and the implementer's maximum willingness to pay. As explained in Part II.A, any royalty within that range would make both parties better off than they would be if they failed to execute a license.[44] In that respect, any royalty within that range would be reasonable for either

[44] *See, e.g.*, Hirshleifer, Glazer & Hirshleifer, *supra* note 38, at 203.

party. A FRAND or RAND commitment does not alter this basic economic conclusion. From an economic perspective, there is no reason to assume that the SEP holder's FRAND or RAND commitment would restrict the bargaining range to a single point, such that only a single royalty within that range will be truly reasonable. There is also no provision in the FRAND or RAND commitment that dictates how the parties shall divide the gains from trade. From an economic perspective, all royalties that occupy the bargaining range for a given SEP should be understood to comply with the reasonableness requirement of the SEP holder's FRAND or RAND commitment.[45]

In sum, in any negotiation for a SEP, the SEP holder and the implementer could agree on a range of possible outcomes that would comply with the reasonableness requirement of a FRAND or RAND commitment. A court using the hypothetical-negotiation construct to determine damages for the infringement of SEPs would scrutinize evidence of the parties' relative bargaining power at the time of first infringement and, on the basis of that evidence, determine a royalty upon which the parties would have voluntarily agreed.[46] Any given point value within that range of possible royalties would be acceptable to both parties.

III. Why FRAND or RAND Royalties Vary Across Licenses for a Given SEP

If it is implausible from an economic perspective to conclude that FRAND or RAND must be a unique point royalty in a negotiation between an SEP holder and a given licensee, then it is even more implausible to suppose that an SEP must command the same price from all licensees. The same economic principles that generate a range of reasonable royalties in a negotiation for a given SEP between the SEP holder and a given licensee explain why different licensees might agree to different royalties for the use of the same SEP. The costs of not practicing a given standard will vary across licensees, as will the licensees' discount rates and their attitudes toward risk bearing. That variation alters the bargaining range in each negotiation, the bargaining power of the parties to that negotiation, and, consequently, the point royalty to which

[45] Whether the royalty complies with the nondiscrimination requirement of a FRAND or RAND commitment is a separate question. *See* J. Gregory Sidak, *Fair and Unfair Discrimination in Royalties for Standard-Essential Patents Encumbered by a FRAND or RAND Commitment*, 2 Criterion J. on Innovation 301 (2017).

[46] *See, e.g.*, LaserDynamics, Inc. v. Quanta Comput., Inc., 694 F.3d 51, 76 (Fed. Cir. 2012) ("[T]he hypothetical negotiation must focus on the 'date when the infringement began.'"); Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301, 1324 (Fed. Cir. 2009) ("[T]he hypothetical negotiation[,] or the 'willing licensor-willing licensee' approach, attempts to ascertain the royalty upon which the parties would have agreed had they successfully negotiated an agreement just before infringement began."); State Indus., Inc. v. Mor-Flo Indus., Inc., 883 F.2d 1573, 1580 (Fed. Cir. 1989) ("The determination of a reasonable royalty . . . is based . . . on what a willing licensor and licensee would bargain for at hypothetical negotiations on the date infringement started.").

the parties will agree. It is thus understandable that, in practice, licensees agree to pay different reasonable royalties for the use of a given SEP.

A. Why Licensees Negotiate Different Royalties for the Same Patent

Two factors cause the negotiated royalty for a given SEP to differ across licensees: (1) variation in the bargaining range from one negotiation to the next, and (2) variation in each licensee's respective bargaining power relative to that of the SEP holder.

1. Differences in the Bargaining Range

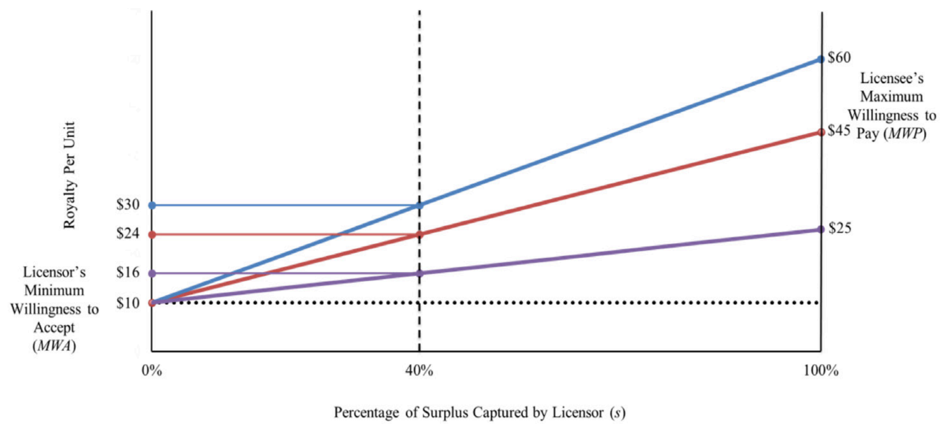
The bargaining range for a given patent will vary across licensees, depending on each licensee's maximum willingness to pay. Because the maximum willingness to pay forms the upper bound on the bargaining range, a difference in the maximum willingness to pay across two or more licensees will affect the total surplus generated by a successful license agreement.

Licensees might have a different maximum willingness to pay for the use of a given SEP. As I explained in Part II.A, the licensee's maximum willingness to pay depends on its expected profits from using the next-best noninfringing substitute for the patented technology. Although designing around an SEP is not an option, forgoing use of the SEP (and consequently forgoing use of the standard) is an outside option to licensing. However, the opportunity cost of forgoing use of the SEP, measured in terms of the licensee's forgone profit, can vary across licensees. (One might consider this opportunity cost to be the cost of designing around the standard itself.) Licensees' expected profits from implementing the SEP would be uniform only if all licensees have identical cost functions and produce homogeneous goods (for which there would be identical demand). It is more likely that licensees will vary in their expected profits from executing a license for the SEP. Consequently, they will have different opportunity costs of forgoing that license. Variation in each licensee's opportunity cost of forgoing a license for a given SEP will affect each implementer's maximum willingness to pay and, therefore, the bargaining range for that SEP.

All else equal, a change in the bargaining range will lead licensees to agree to different royalties for a given SEP. To illustrate, suppose that three licensees separately negotiate for a license to an SEP. Suppose further that each of the three licensees has a different maximum willingness to pay to use the SEP. If the three licensees have the same relative bargaining power, each hypothetical negotiation will result in the same division of surplus—in this example, 40 percent captured by the SEP holder and 60 percent captured by the licensee. However, the point value of the royalty that results will vary, because the surplus to be divided differs in each hypothetical negotiation.

Figure 2 shows the result of a reasonable-royalty analysis in which each defendant has the same bargaining power but negotiates over a different bargaining range.

Figure 2. Three Licensees with Different Bargaining Ranges but the Same Relative Bargaining Power



Although each licensee has comparable bargaining power relative to the SEP holder, the royalty that each licensee will pay varies because each negotiates with the SEP holder over a different amount of surplus.

Therefore, variation in licensees' costs of forgoing a license to a given SEP will lead to variation in each licensee's maximum willingness to pay for a given SEP. Across licensees, there will thus be variation in the bargaining range for a given SEP.

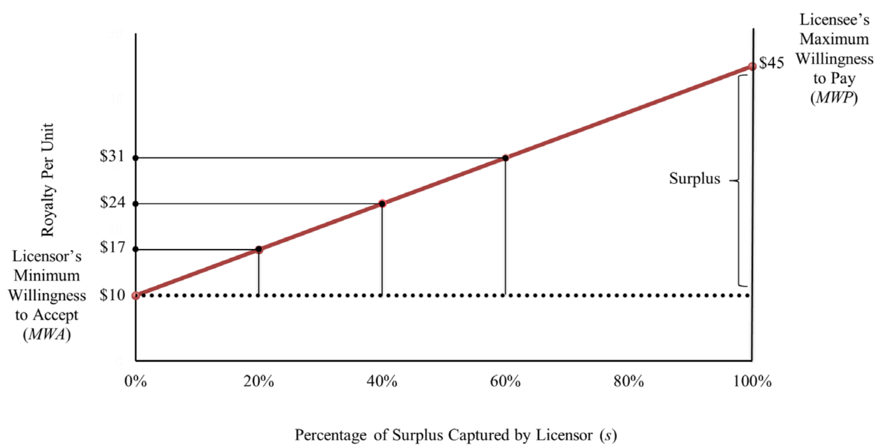
2. *Differences in Bargaining Power*

Licensees for a given SEP will also have different relative bargaining power in negotiating a license agreement with the SEP holder. As explained in Part II.A, a party's bargaining power is determined by that party's need to reach an agreement, which in turn depends on the benefit that the party expects to receive from the agreement. The party that has the least to gain from executing a license agreement will be most willing to walk away from the license negotiation and, consequently, has more bargaining power than the counterparty. However, the need to reach an agreement—typically measured in the form of discount rates—might vary across licensees.

For example, consider a licensee that is cash constrained but needs to obtain rights to a given SEP before the impending release of its product. That licensee will have a high discount rate. Such a licensee might prefer to pay a higher total royalty for a license paid out over a number of years, instead of a lower total royalty fully paid upfront at the time of the contract. In contrast, another licensee might have a low discount rate. Such a licensee might prefer to pay a lower total royalty fully paid upfront at the time of the contract instead of a higher total royalty for a license paid out over a number of years. Therefore, in a voluntary negotiation, licensees will have different discount rates and, consequently, different levels of relative bargaining power.

Each party's relative bargaining power affects the division of surplus, which in turn informs the ultimate calculation of a point estimate for a reasonable royalty. For example, suppose that the facts of a specific case indicate that one licensee would have had very great bargaining power, the second moderate bargaining power, and the third very little bargaining power, relative to the SEP holder. Suppose further that the bargaining range was the same for all three licensees. Figure 3 depicts the outcome of each of the three hypothetical negotiations, given that the finder of fact has determined the bargaining power of each would-be licensee.

Figure 3. Three Licensees with the Same Bargaining Range
but with Different Degrees of Relative Bargaining Power



In Figure 3, the licensee with very great bargaining power would capture 60 percent of the surplus, the licensee with moderate bargaining power would capture 40 percent of the surplus, and the licensee with very little bargaining power would capture 20 percent of the surplus. (I use these particular percentages strictly as numerical examples.) Although the bargaining ranges in this scenario are identical in each of the hypothetical negotiations between the patent holder and the three licensees, the outcome differs due to variation in each licensee's level of bargaining power, which in turn depends on the unique facts and data concerning that licensee.

In sum, principles of bargaining theory explain why different licensees will agree to different royalties for the use of a given SEP. Licensees have different outside options and different discount rates. Those features alter the bargaining range between the negotiating parties as well as the parties' relative bargaining power, and those differences cause the FRAND or RAND royalty to vary across licenses for a given SEP.

B. Heterogeneous License Preferences

The royalty that each licensee pays for the use of a given SEP might also vary when licensees can choose from among a menu of alternative license options. The selection of different license options will likely result in different royalty payments for a given SEP across licenses.

For example, an SEP holder might offer to its licensees the option to choose from among different royalty structures. Possible structures include: (1) an *ad valorem* royalty rate, (2) a per-unit royalty, or (3) a lump-sum royalty. If the license specifies an *ad valorem* royalty rate, the parties will calculate the royalty payment as a percentage of a royalty base—typically the sales price of each sold product that practices the licensed technology. Under that structure, the royalty payment is positively correlated with both the price and the number of sold units of the product practicing the licensed patent. When a license specifies a per-unit royalty, the royalty payment is positively correlated with the volume of patent-practicing products that the licensee sells during the term of the license agreement. However, unlike an *ad valorem* royalty rate, a per-unit royalty is independent of changes in the sales price of the patent-practicing product. In contrast to an *ad valorem* royalty rate or a per-unit royalty, a lump-sum royalty specifies a fixed, aggregate amount that the licensee must pay to obtain the right to use the patented technology during the term of the license. That total royalty payment is independent of the licensee's actual use of the licensed technology.

Licensees for a given SEP might prefer different royalty structures. A risk-averse licensee might prefer a fixed lump-sum payment over a variable payment.[47] In contrast, a licensee with a greater risk tolerance might prefer a variable royalty payment. Thus, licensees whose risk preferences differ will opt for different royalty structures. When this self selection occurs, it would be strictly coincidental for two licensees to pay identical royalties for the use of a given SEP. The ultimate royalty payment that the licensee makes to

[47] Pindyck & Rubinfeld, *supra* note 39, at 161 ("An individual who is risk averse prefers a certain given income to a risky income with the same expected value."). Some use the term "risk" (in an economic sense) to "refer[] to situations in which we can list all possible outcomes and know the likelihood of each occurring," and the term "uncertainty" to "refer to situations in which many outcomes are possible but the likelihood of each is unknown." *Id.* at 154 n.1; *see also* Frank H. Knight, Risk, Uncertainty, and Profit 19–20 (Houghton Mifflin 1921) (differentiating between "risk" and "uncertainty"). However, some also use "risk" and "uncertainty" interchangeably for simplicity. Pindyck & Rubinfeld, *supra* note 39, at 154 n.1. My argument that licensees will choose different royalty payment structures depending on their risk preferences applies regardless of the definition of risk that is used.

the SEP holder will depend on a number of variables, such as the quantity of licensed products that the licensee will sell and the price of those products.[48] It is therefore likely that licensees that opt for different royalty structures will pay different royalties for a given SEP.

Even when licensees cannot choose from among different royalty structures, the royalty payments for the use of a given SEP might vary if the SEP holder offers to its licensees different licensing options.[49] For example, Sisvel, a patent pool that licenses patents essential to the Long-Term Evolution (LTE) standard for mobile communications, allows potential licensees to select between two nonlinear pricing schedules, one of which includes an "early bird" discount for promptly executing a license agreement.[50] Licensees that do not satisfy the requirements for the early bird discount pay a significantly higher royalty than do licensees that receive the discount.[51] Similarly, Via Licensing, another patent pool that licenses LTE SEPs, offers a discounted option to licensees that execute a license agreement within six months "of becoming aware of the . . . License Fees for General Terminal Products."[52] These examples show that, even when licensees do not select different royalty structures, they might pay different royalties for the use of a given SEP.

In sum, variation in the royalties that licensees pay for a given SEP arises not only because of differences in the size of the bargaining range and relative bargaining power across licensees, but also because licensees might choose from among different licensing alternatives. When an SEP holder permits its licensees to choose from among different royalty structures, or when it offers discounts for expeditious execution of the license agreement, licensees that make different selections will likely pay different royalties for a given SEP. It is thus understandable that the observed royalty rate for a given SEP routinely varies across licenses.

C. *The Welfare Implications of Imposing a Unique Royalty for a Given SEP Across All Licensees*

As shown in Parts III.A and III.B, divergences in the licensee's outside options, discount rates, and licensing preferences lead licensees to agree

[48] J. Gregory Sidak, *Converting Royalty Payment Structures for Patent Licenses*, 1 Criterion J. on Innovation 901, 903–04 (2016).

[49] *See, e.g.*, Richard J. Gilbert, *Deal or No Deal? Licensing Negotiations in Standard-Setting Organizations*, 77 Antitrust L.J. 855, 872 (2011) (observing that "[a]ctual licensing programs by patent pools for patents that are subject to FRAND commitments include a wide range of fixed and variable royalty terms, often within the same licensing program").

[50] *LTE/LTE-A License Terms*, Sisvel, http://www.sisvel.com/licensing-programs/wireless-communications/lte-lte-a/license-terms.

[51] *Id.*

[52] *LTE License Fees*, Via Licensing, http://www.via-corp.com/us/en/licensing/lte/licensefees.html.

to different royalties for the use of a given SEP. It would reduce economic welfare to require the SEP holder to license a given SEP at the same rate to all licensees. Restricting the parties' right to voluntarily determine the royalty rate by requiring a single FRAND or RAND rate across all licensees would harm licensees, the SEP holder, and ultimately consumers.

First, imposing a single FRAND or RAND rate across all licensees would restrict the licensee's ability to select the licensing option that best matches its preferences. When a licensee has multiple alternative options for a license to an SEP and selects one option over the others, that licensee does so because it expects to be made better off. Licensees with heterogeneous tastes will, in effect, self-discriminate by each selecting the option that maximizes its surplus. Of course, the option that provides the greatest expected payoff for one licensee will not necessarily provide the greatest expected payoff for another licensee. Requiring the SEP holder to license its SEP for a unique royalty across licensees would prevent a licensee from selecting the option that maximizes its surplus.

Second, defining FRAND or RAND as a unique point royalty would preclude price discrimination, which refers to the practice of charging different prices to different purchasers for the same good or service, even when there is no difference in the cost of providing that good or service to each purchaser.[53] It is well accepted in economic theory that price discrimination can increase consumer welfare.[54] Price discrimination might enable the seller to lower the price that it charges to consumers who would otherwise be priced out of the market; consequently, price discrimination can expand output and consumption.[55] Indeed, any undergraduate microeconomics textbook contains a passage to the effect that, when "price discrimination brings enough customers into the market, consumer welfare can increase to the point where both the producer and consumers are better off."[56] Allowing the SEP holder to price discriminate among licensees when licensing its SEPs

[53] Dennis W. Carlton & Jeffrey M. Perloff, Modern Industrial Organization 784 (Addison-Wesley 4th ed. 2005) (defining price discrimination as "nonuniform pricing in which a firm charges different categories of customers different unit prices for the identical good or charges each consumer a nonuniform price on different units of the good"); Jean Tirole, The Theory of Industrial Organization 133–34 (MIT Press 1988) ("[T]here is no price discrimination if differences in prices between consumers exactly reflect differences in the costs of serving these consumers."). I have explained at length elsewhere that the nondiscrimination requirement of a typical FRAND or RAND commitment does not prohibit the SEP holder from engaging in price discrimination. J. Gregory Sidak, *Fair and Unfair Discrimination in Royalties for Standard-Essential Patents Encumbered by a FRAND or RAND Commitment*, 2 Criterion J. on Innovation 301 (2017).

[54] *See, e.g.*, Pindyck & Rubinfeld, *supra* note 39, at 385–86; *see also* N. Gregory Mankiw, Principles of Economics 316–17 (Cengage Learning 7th ed. 2015); William J. Baumol & Alan S. Blinder, Microeconomics: Principles & Policy 231 (Cengage Learning 12th ed. 2012); Tyler Cowen & Alex Tabarrok, Modern Principles: Microeconomics 250–51 (Worth Publishers 2010).

[55] *See, e.g.*, Baumol & Blinder, *supra* note 54, at 231 ("[P]rice discrimination permits the firm to offer lower prices to certain customers, thereby attracting some business that it would not otherwise have.").

[56] Pindyck & Rubinfeld, *supra* note 39, at 386.

would increase consumer welfare if it expands output and consumption.[57] However, interpreting a FRAND or RAND royalty to be a unique point across all licensees would deprive marginal consumers of those potential benefits by implicitly prohibiting the SEP holder from practicing socially beneficial price discrimination. That interpretation would consequently deprive licensees and consumers of the potential welfare-increasing effects of price discrimination.

Third, defining FRAND or RAND as a unique point royalty would also impose on the SEP holder a duty to offer to license its SEP for the same rate irrespective of the cost of licensing. The SEP holder's cost of licensing a given SEP might vary across licensees. Suppose that licensee *A* executes a worldwide, perpetual license with the SEP holder, whereas licensee *B* insists on executing multiple licenses, each covering an individual geographical region. Suppose that licensee *B* insists also on executing a license for five years (rather than entering into a perpetual license). The SEP holder's cost of licensing licensee *B* exceeds the cost of licensing licensee *A*. Executing multiple licenses and renegotiating them every five years will require many negotiations, which in turn will increase the SEP holder's costs of licensing. It is economically rational for the SEP holder to charge a higher royalty to a licensee that imposes high licensing costs than to a licensee that imposes low licensing costs. However, requiring the SEP holder to license its SEP at the same rate to all licensees would effectively deny the SEP holder the ability to charge a royalty that reflects the difference in the cost of licensing each licensee.

Such a policy would hinder the SEP holder's ability to obtain adequate compensation for its contributions to the standard. It would also result in higher royalties for licensees that impose low licensing costs. Knowing that some licensees will impose higher licensing costs than others, the SEP holder, if required to charge a unique point royalty to all licensees, would have an incentive to set a higher royalty for its SEPs (which reflects the *average* cost of licensing) than it would if it could charge royalties corresponding to each licensee's *marginal* cost of licensing. Thus, the SEP holder would charge low-cost licensees a royalty that covers the cost of licensing high-cost licensees. If higher royalties result in higher prices for standard-compliant products, such a policy would also harm consumers. Therefore, imposing on the SEP holder a duty to license a given SEP for the same rate, regardless of the

[57] *See, e.g.*, Richard A. Posner, Antitrust Law 82 (Univ. of Chicago Press 2d ed. 2001) ("[B]ecause the marginal cost of intellectual property tends to be lower than its average total cost[,] . . . price discrimination is an attractive strategy for increasing output while covering total costs."); William J. Baumol & Daniel G. Swanson, *The New Economy and Ubiquitous* Competitive *Price Discrimination: Identifying Defensible Criteria of Market Power*, 70 Antitrust L.J. 661, 672 (2003) (showing that, in certain circumstances, charging customers discriminatory prices enables a firm to maximize profit and expand output relative to charging a nondiscriminatory price).

SEP holder's marginal cost of licensing a given licensee, would harm the SEP holder, implementers, and ultimately consumers.

IV. The Default Rule: A Reasonable Royalty Exists Anywhere Along a Range

The argument that FRAND or RAND is a range, rather than a point, finds support in American legal reasoning. Patents are creatures of public law. In contrast, the FRAND or RAND obligation is a creature of contract, which modifies the preexisting rights and duties of one who holds a patent, as well as the preexisting rights and duties of a third party who wishes to (or might already) practice that patent. Put differently, the public law governing patents creates default rules, which private parties by contract have modified through an SSO's patent policies, including the SSO's own idiosyncratic definition of the FRAND or RAND obligation.

The default rules for patent infringement come from the public law consisting of patent statutes and the judicial interpretations of those statutes. To identify the positive law, I use Justice Oliver Wendell Holmes' famous definition of what the law is: "The prophecies of what the courts will do in fact, and nothing more pretentious, are what I mean by the law."[58] This Holmesian perspective implies that "soft law" statements about patent policy are not "the law"—unless it is objectively reasonable to expect a court to embrace the logic of these normative statements in the next litigated case to raise the particular issue. But that expectation would be whimsical at best. Such soft law must be understood to be as hortatory as a campaign speech or a law review article, and no more authoritative. The argument that a FRAND or RAND royalty is a unique point conflates positive statements of what the law is and normative statements of what the speaker wishes the law to become.

A. The Text of Section 284 of the Patent Act

Section 284 of the Patent Act provides that, upon a finding of patent infringement, "the court shall award the [patent holder] . . . damages adequate to compensate for the infringement, but in no event less than a reasonable royalty."[59] What is most noteworthy about this passage is Congress' choice of the article "a" rather than the article "the." Section 284 does not command a court to award the patent holder *the* reasonable royalty for the infringement of his patent. Such wording would imply uniqueness. The *Merriam-Webster*

[58] Oliver Wendell Holmes, Jr., *The Path of the Law*, 10 Harv. L. Rev. 457, 461 (1897). Unless otherwise noted, my analysis in this article will proceed under the assumption that U.S. law provides the relevant default rules.

[59] 35 U.S.C. § 284.

Dictionary, for example, defines this meaning of "the" as being "used as a function word to indicate that a following noun or noun equivalent is a unique or a particular member of its class," as in "*the* President [or] *the* Lord."[60] In contrast, Congress' use of the article "a" in section 284 negates any implication of uniqueness. The fact finder's determination that a particular amount of money would constitute *a* reasonable royalty implies that some other amount of money also could be reasonable. The question of reasonableness, in other words, does not have a unique solution.

Furthermore, section 284 specifies that a reasonable royalty is the minimum amount of compensation to which a patent holder is entitled for the infringement of its patents. In relevant part, section 284 states that the patent holder has the right to receive "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."[61] Consequently, under section 284, the patent holder may receive as compensation for patent infringement damages *exceeding* a reasonable royalty. The statutory right to receive a royalty exceeding a reasonable royalty is one of the valuable default rules that the patent holder bargains away when it declares its patents to be essential to a standard and accepts the terms of the SSO's FRAND or RAND commitment.

B. The Judicial Interpretation of Section 284

Courts have explicitly recognized that section 284 entitles the patent holder to a range of reasonable royalties. Although courts will typically search for an "established royalty" as evidence of a market-determined price for a given patent, they frequently find none and must rely instead on the hypothetical-negotiation framework and the remaining fourteen (or more) *Georgia-Pacific* factors to determine a reasonable royalty.[62]

1. Calculating Patent Damages Based on an "Established Royalty"

Courts generally agree that an established royalty is the "best measure of reasonable and entire compensation" for patent infringement.[63] It bears

[60] *The*, Merriam-Webster, https://www.merriam-webster.com/dictionary/the (emphasis in original).

[61] 35 U.S.C. § 284 (emphasis added); *see* Whitserve, LLC v. Comput. Packages, Inc., 694 F.3d 10, 28 (Fed. Cir. 2012) ("If lost profits are not at issue, the reasonable royalty is the floor for damages." (internal citation omitted)).

[62] Georgia-Pacific Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970), *mod. and aff'd*, 446 F.2d 295 (2d Cir. 1971). For a distillation of the *Georgia-Pacific* factors into a tractable framework of bilateral negotiation, see Sidak, *Bargaining Power and Patent Damages*, *supra* note 33, at 10, 17–20, which the Federal Court of Canada adopted in its March 2, 2017 decision in Airbus Helicopters, S.A.S. v. Bell Helicopter Textron Canada Limitée, 2017 F.C. 170 (Can.), http://decisions.fct-cf.gc.ca/fc-cf/decisions/en/223697/1/document.do.

[63] Tektronix, Inc. v. United States, 552 F.2d 343, 347 (Ct. Cl. 1977) (citing Carley Life Float Co. v. United States, 74 Ct. Cl. 682 (1932)); *see also* Hanson v. Alpine Valley Ski Area, Inc., 718 F.2d 1075, 1078 (Fed. Cir. 1983); Mobil Oil Corp. v. Amoco Chems. Corp., 915 F. Supp. 1333, 1342 (D. Del. 1994).

emphasis, however, that an established royalty emerges only under specific economic and legal conditions. Moreover, even an established royalty does not necessarily indicate a fixed point at which a court is compelled to set a reasonable royalty.

In economic terms, an established royalty can exist only in a liquid—or "thick"—market.[64] Put differently, an established royalty exists only in a market with a multitude of bilateral license transactions that produce over time a convergence in the dispersion of voluntarily negotiated prices for a given asset. The Supreme Court in *Rude v. Wescott* embraced that interpretation in 1889, when it said that a royalty is "accepted as a measure of damages against an infringer" when it is "paid by such a number of persons as to indicate a general acquiescence in its reasonableness by those who have occasion to use the invention . . . and [is] uniform at the places where licenses are issued."[65] However, no single rule in the case law defines what constitutes a sufficient number of licenses to support the finding of an established royalty.[66]

A royalty also must satisfy several legal conditions to be deemed "established." For example, courts have permitted only royalties negotiated before infringement to form the basis for an established royalty.[67] In addition, courts have found that, pursuant to Rule 408 of the Federal Rules of Evidence, past license *offers* to settle anticipated infringement litigation might be inadmissible as evidence probative of the existence of an established royalty.[68] Thus, evidence of *actual* past licenses, not mere offers, is necessary to support the finding of an established royalty.[69] Another legal condition that courts have imposed is that past royalties negotiated under the "threat or actuality of suit [are] insufficient to 'establish[] [an established royalty] . . . because a

[64] *See, e.g.*, Steven A. Lippman & John J. McCall, *An Operational Measure of Liquidity*, 76 Am. Econ. Rev. 43, 47 (1986) ("When there are many transactions per day of a homogeneous asset such as wheat or long term treasury bonds, the market for the asset is thick. . . . The number of transactions in a market is a function of several factors, including the frequency of offers received by any particular asset. Accordingly, the thickness of the market for an asset is said to increase with the frequency of offers.").

[65] 130 U.S. 152, 165 (1889). The Federal Circuit said in 2017 that an established royalty requires a finding of the "'common' [and] 'frequent occurrence' [of royalties] at 'uniform' rate[s], to establish 'such a market price for the article that it may be assumed to express, with reference to all similar articles, their salable value.'" Prism Techs. LLC v. Spring Spectrum L.P., 849 F.3d 1360, 1372 (Fed. Cir. 2017) (quoting *Rude*, 130 U.S. at 165).

[66] *See, e.g.*, Marvel Specialty Co. v. Bell Hosiery Mills, Inc., 386 F.2d 287, 289, 291 (4th Cir. 1967) (determining an established royalty of $6.00 "on the basis of 304 machines at a rental of $6.00 per machine per month"); *Amoco*, 915 F. Supp. at 1343 (finding an established royalty on the basis of "license and lease rates . . . paid by eleven chemical companies"); Julien v. Gomez & Andre Tractor Repairs, Inc., 512 F. Supp. 955, 958 (M.D. La. 1981) (determining an established royalty of $200.00 on the basis of "royalties [collected] from 1967 through 1975," without reporting the number of executed licenses during that period).

[67] *See, e.g.*, *Amoco*, 915 F. Supp. at 1342; *Rude*, 130 U.S. at 165.

[68] *See Hanson*, 718 F.2d at 1078 (citing Fed. R. Evid. 408).

[69] *See, e.g.*, *id.* ("[W]e cannot say that the magistrate erred in refusing to consider certain offers to license the Hanson patent at a 2 ½ percent royalty as showing an established rate. The magistrate excluded evidence of those proposals because they were offers in compromise made in contemplation of infringement litigation and therefore inadmissible under Rule 408 of the Federal Rules of Evidence.").

litigation-induced license may be motivated by '[t]he avoidance of the risk and expense of litigation.'"[70] Furthermore, courts have required that past licenses be "'sufficiently comparable to the hypothetical license at issue in suit.'"[71] In sum, only past real-world, comparable transactions for the patent in suit can provide evidence probative of an established royalty.

By definition, the market-disciplined price of an established royalty does not permit any significant deviation to exist among the valuations that the buyer and seller each place on the patent in question. Of course, a selection bias lurks here: if an established royalty exists, then a patent licensing negotiation is less likely ever to devolve into litigation. In contrast, when a legitimate divergence of opinion exists over the correct value of the patent in suit, courts do not expect a series of hypothetical negotiations to produce the identical prices that are the hallmark of established royalties. Not surprisingly, courts in patent-infringement cases have rarely found the existence of an established royalty.[72]

Moreover, even if a court finds that an established royalty exists, the court must further confirm that the established royalty is also a *reasonable* royalty on the basis of the relevant facts of the case. For example, in cases where the established rates are "artificially depressed because the patent had not yet gained public recognition or acceptance or due to widespread infringement or to avoid challenges to the patent," the established royalty "may be too low to be 'reasonable.'"[73] Under those circumstances, the finder of fact might award a reasonable royalty that exceeds the established royalty.[74] In this respect, even an established royalty does not necessarily constitute a unique point at which a court is compelled to set a reasonable royalty for patent infringement.

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[70] *Prism*, 849 F.3d at 1372 (quoting *Rude*, 130 U.S. at 163, 164).

[71] Multimedia Patent Trust v. Apple Inc., No. 10-CV-2618-H, 2012 WL 5873711, at *7 (S.D. Cal. Nov. 20, 2012) (quoting Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301, 1325 (Fed. Cir. 2009)); *see also* Microsoft Corp. v. Motorola, Inc., No. C10-1823JLR, 2013 WL 2111217, at *18 (W.D. Wash. Apr. 25, 2013) (Robart, J.) ("[T]o prove an established royalty rate for an SEP, the past royalty rates for a patent must be negotiated under the RAND obligation or a comparable negotiation.").

[72] *See, e.g.*, Hollister Inc. v. Zassi Holdings Inc., No. 3:13-cv-132-J-32PDB, 2016 WL 1238025, at *12 (M.D. Fla. Mar. 30, 2016) ("Because of these stringent criteria, few courts have actually found an established royalty." (citing Mobil Oil Corp. v. Amoco Chems. Corp., 915 F. Supp. 1333, 1342 (D. Del. 1994)), *appeal docketed*, No. 17-10135 (11th Cir. Jan. 6, 2017).

[73] *Amoco*, 915 F. Supp. at 1343 (D. Del. 1994); *see also* Julien v. Gomez & Andre Tractor Repairs, Inc., 512 F. Supp. 955, 958 (M.D. La. 1981) ("The established standard royalty rate does not necessarily per se constitute a reasonable royalty." (citing Trio Process Corp. v. L. Goldstein's Sons, Inc., 612 F.2d 1353, 1358 (3d Cir. 1980); General Motors Corp. v. Blackmore, 53 F.2d 725 (6th Cir. 1939))).

[74] *Amoco*, 915 F. Supp. at 1343 ("'While existence of an established royalty usually sets the *minimum* recovery by a patent owner for infringement, it does not necessarily set the *maximum* recovery. Such an established royalty does not preclude the patent owner from recovering a greater sum under a reasonable royalty theory where the established rate was unfairly depressed because the patent had not yet gained recognition or because of widespread infringing activity.'" (emphasis in original) (quoting 5 Donald S. Chisum, Chisum on Patents: A Treatise on the Law of Patentability, Validity and Infringement § 20.03[2], at 20–145 (Bender 1978))); *see also* 7 Donald S. Chisum, Chisum on Patents: A Treatise on the Law of Patentability, Validity and Infringement § 20.06 (Bender 2017).

2. *Calculating Patent Damages Based on the Hypothetical-Negotiation Framework*

Given the rarity of an established royalty in litigated patent disputes, U.S. courts routinely apply the hypothetical-negotiation framework to determine a reasonable royalty.[75] The hypothetical-negotiation framework (or, equivalently, the "willing licensor-willing licensee" framework[76]) "attempts to ascertain the royalty upon which the parties would have agreed had they successfully negotiated an agreement just before infringement began."[77] The finder of fact typically relies on the various factors enunciated in *Georgia-Pacific*[78] to "determine the outcome of the hypothetical negotiation."[79] Courts have recognized that proper analysis of the hypothetical negotiation "requires consideration not only of the amount that a willing licensee would have paid for the patent license but also of the amount that a willing licensor would have accepted."[80] Consequently, the finder of fact will typically establish a bargaining range over which a willing licensor and a willing licensee would have negotiated; the finder of fact will then identify the point within that range upon which the parties would have most likely converged.[81] The Federal

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75 *See* Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301, 1324–25 (Fed. Cir. 2009); Hanson v. Alpine Valley Ski Area, Inc., 718 F.2d 1075, 1078 (Fed. Cir. 1983) ("The reasonable royalty may be based upon an established royalty, if there is one, or if not upon a hypothetical royalty resulting from arm's length negotiations between a willing licensor and a willing licensee.").

76 *Lucent*, 580 F.3d at 1324.

77 *Id.*; *see also* Faulkner v. Gibbs, 199 F.2d 635, 639 (9th Cir. 1952) ("The primary inquiry, often complicated by secondary ones, is what the parties would have agreed upon, if both were reasonably trying to reach an agreement."); Horvath v. McCord Radiator & Mfg. Co., 100 F.2d 326, 335 (6th Cir. 1938) ("In fixing damages on a royalty basis against an infringer, the sum allowed should be reasonable and that which would be accepted by a prudent licensee who wished to obtain a license but was not so compelled and a prudent patentee, who wished to grant a license but was not so compelled.").

78 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970), *modified and aff'd*, 446 F.2d 295 (2d Cir. 1971).

79 *In re* Innovatio IP Ventures, LLC Patent Litig., No. 11-cv-09308, 2013 WL 5593609, at *5 (N.D. Ill. Oct. 3, 2013); *see also* Wordtech Sys., Inc. v. Integrated Network Solutions, Inc., 609 F.3d 1308, 1319 (Fed. Cir. 2010) ("A reasonable royalty can be calculated from . . . a hypothetical negotiation between the patentee and infringer based on the factors in *Georgia-Pacific*." (citing *Lucent*, 580 F.3d at 1324)).

80 Georgia-Pacific Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1121 (S.D.N.Y. 1970), *modified and aff'd*, 446 F.2d 295 (2d Cir. 1971); *see also* Asetek Danmark A/S v. CMI USA Inc., 852 F.3d 1352, 1363 (Fed. Cir. 2017) (Taranto, J.) ("A hypothetical-negotiation analysis for a royalty considers not only the patent owner's interests, but also the other side of the negotiation table under the particular conditions of the hypothetical negotiation."); Aqua Shield v. Inter Pool Cover Team, 774 F.3d 766, 771 (Fed. Cir. 2014) (Taranto, J.) ("[T]he ultimate royalty determination must reflect the two-sided nature of the posited negotiation."); Ellipse Corp. v. Ford Motor Co., 461 F. Supp. 1354, 1368 (N.D. Ill. 1978) ("In entering negotiations, a willing buyer for a patent license must make a decision as to the maximum he can pay . . . and still be better off than choosing an available alternative. Similarly, the willing seller must make a decision as to the minimum royalty he can accept . . . and still be better off than choosing an alternative course of action.").

81 *See, e.g.*, Numatics Inc. v. Balluff, Inc., 66 F. Supp. 3d 934, 954–55 (E.D. Mich. 2014) ("After calculating a reasonable royalty between 6.9 percent and 13.2 percent, Lasinski [the plaintiff's damages expert] applied the relevant fifteen factors in *Georgia-Pacific* . . . . Lasinksi concluded that all but one of those factors suggested a royalty on the higher end would be appropriate."); Parker-Hannifin Corp. v. Champion Labs., Inc., No. 1:06-cv-02616, 2008 WL 3166318, at *16 (N.D. Ohio Aug. 4, 2008) ("The Court concludes that, given all of the relevant evidence, the parties would have agreed to a royalty rate of $2.00 per unit. The midpoint between $0.85 and $2.89 is $1.87. The Court finds that the parties would have agreed to a rate slightly above this midpoint."); Linear Tech. Corp. v. Micrel, Inc., No. 94-cv-01633, 2006 WL 8425047,

Circuit has confirmed that, in any given case, "[t]he record may support a range of reasonable royalties, rather than a single value."[82] Thus, courts' application of the hypothetical-negotiation framework supports the proposition that there exists for a given patent a range of reasonable royalties rather than a unique point royalty.

Furthermore, at least one court that has applied the hypothetical-negotiation framework to determine a RAND royalty for an SEP portfolio has recognized the existence of a range of reasonable royalties. In *Microsoft v. Motorola*, Judge James Robart of the U.S. District Court for the Western District of Washington sought to determine whether Motorola's offers to license its SEP portfolio to Microsoft violated Motorola's RAND obligations to the Institute of Electrical and Electronics Engineers (IEEE) and the International Telecommunication Union (ITU).[83] To establish that violation, he said, "a fact-finder must be able to compare [Motorola's offers] with a reasonable RAND royalty rate and, because more than one rate could conceivably be RAND, a reasonable RAND royalty range."[84] Ultimately, Judge Robart found that the RAND royalty for Motorola's 802.11 SEP portfolio ranged between 19.5 cents per unit and 0.8 cents per unit.[85] A jury found that, because Motorola's offers to license its portfolio to Microsoft included royalties that were outside the RAND range that Judge Robart calculated, Motorola breached its RAND obligations. Judge Robart adopted that finding in his final judgment.[86] The Ninth Circuit affirmed.[87]

Consequently, courts have recognized that the patent holder is entitled to a range, rather than a unique point, of reasonable royalties for an infringed patent. Furthermore, at least one court has applied the hypothetical-negotiation framework to determine a range of RAND royalties for an SEP portfolio. Given that courts have adopted a bargaining framework to determine a reasonable royalty for an infringed patent, it is understandable from an

at *55–58 (N.D. Cal. June 9, 2006) (analyzing the relative bargaining position of each party to determine the upper and lower bounds on the bargaining range of the hypothetical negotiation as well as the point royalty that the parties would have accepted); Promega Corp. v. Lifecodes Corp., No. 2:93-cv-00184, 1999 WL 1427829, at *12–16 (D. Utah Oct. 27, 1999); W.L. Gore & Assocs., Inc. v. Carlisle Corp., No. 4160, 1978 WL 21430, at *17 (D. Del. May 17, 1978) (denying the plaintiff an award of a reasonable royalty for failing to provide any evidence that would enable the court to establish a bargaining range and "to choose a specific royalty within that bargaining range"); *see also* 7 Chisum, *supra* note 74, § 20.07[2] (observing that the *Georgia-Pacific* factors generally fall into two groups—one that "sets the range of feasible rates" and another that "points to the rate that the parties would have adopted within that range").

82 Summit 6, LLC v. Samsung Elecs. Co., 802 F.3d 1283, 1296 (Fed. Cir. 2015) (citing Apple Inc. v. Motorola, Inc., 757 F.3d 1286, 1315 (Fed. Cir. 2014), *overruled on other grounds by* Williamson v. Citrix Online, LLC, 792 F.3d 1339 (Fed. Cir. 2015)).

83 Microsoft Corp. v. Motorola, Inc., No. C10-1823JLR, 2013 WL 2111217, at *1 (W.D. Wash. Apr. 25, 2013).

84 *Id.* at *3.

85 *Id.* at *4.

86 Microsoft Corp. v. Motorola, Inc., No. C10-1823JLR, 2013 WL 6000017, at *2 (W.D. Wash. Nov. 12, 2013).

87 Microsoft Corp. v. Motorola, Inc., 795 F.3d 1024 (9th Cir. 2015).

economic perspective that they have also recognized that there is a range of reasonable royalties.

V. Does a FRAND or RAND Commitment Define a Unique Point Royalty?

Although section 284 entitles a patent holder to a range of reasonable royalties as a remedy for infringement, one might argue that an SEP holder's voluntary commitment to offer to license its SEPs on FRAND terms to willing third parties seeking to implement the standard constitutes the SEP holder's waiver by contract of that statutory right to a range of reasonable royalties.[88] However, that argument does not withstand scrutiny. There is no indication that a typical FRAND or RAND commitment provides either an explicit or an implicit waiver of the SEP holder's right to a range of reasonable royalties.

A. *Does a Patent Holder's FRAND or RAND Commitment Explicitly Supersede the Public-Law Default Rule That a Reasonable Royalty Is Not Confined to a Unique Point?*

The patent policies of major SSOs contain no provisions specifically defining a FRAND or RAND royalty to be a unique point, rather than a range. Indeed, patent policies of most major SSOs give little direction for determining a FRAND or RAND royalty for an SEP; instead, they allow the SEP holder and the implementer to set mutually agreeable licensing terms (including the royalty) through bilateral, arms-length negotiations.[89]

For example, the IEEE's patent policy—which, of all the major SSOs' patent policies, has contained since 2015 the most detailed guidance for determining a RAND royalty[90]—defines a reasonable rate as "appropriate compensation to the patent holder for the practice of an Essential Patent Claim excluding the value, if any, resulting from the inclusion of that Essential Patent Claim's technology in the IEEE Standard."[91] Despite the IEEE's recommendations for calculating a RAND royalty, its patent policy

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88 *See* J. Gregory Sidak, *The Meaning of FRAND, Part II: Injunctions*, 11 J. Competition L. & Econ. 201, 213 (2015) ("A FRAND commitment imposes duties on the SEP holder that circumscribe by contract the rights that the patent system has statutorily awarded the SEP holder.").

89 *See* FTC v. Qualcomm Inc., No. 5:17-CV-00220-LHK, 2017 WL 2774406, at *2 (N.D. Cal. June 26, 2017) (Koh, J.) ("Most SSOs rely on the outcome of bilateral negotiations between the parties, with resort to remedies available from courts in the event of disagreement.").

90 *See* J. Gregory Sidak, *The Antitrust Division's Devaluation of Standard-Essential Patents*, 104 Geo. L.J. Online 48, 49 (2015) ("Before 2015, the IEEE (like other SSOs) took no position on how to calculate a FRAND royalty. In February 2015, the IEEE reversed its [patent] policy and became the first SSO to regulate the calculation of FRAND royalties.").

91 Institute of Electrical and Electronics Engineers, IEEE-SA Standards Board Bylaws § 6.1, at 16 (Dec. 2016) [hereinafter IEEE Standards Board Bylaws], http://standards.ieee.org/develop/policies/bylaws/sb_bylaws.pdf.

specifies that "[n]othing in this policy shall preclude a licensor and licensee from voluntarily *negotiating* any license under terms mutually agreeable to both parties."[92] Similarly, ETSI's IPR policy directs "its members (as well as non-ETSI members) to engage in an impartial and honest Essential IPR licensing *negotiation* process for FRAND terms and conditions."[93] The patent policies of the Joint Electron Device Engineering Council (JEDEC), the American National Standards Institute (ANSI), and the ITU also permit the SEP holder and the implementer to set the FRAND licensing terms and conditions for an SEP through negotiation outside the SSO.[94]

Consequently, evidence from the patent policies and the supporting documents of the major SSOs shows that the licensing terms and conditions for an SEP are to be determined through voluntarily negotiated agreements. As I showed in Part II, from an economic perspective, an SSO that allows the parties to determine a FRAND or RAND royalty through negotiation must allow for a range of FRAND or RAND royalties for a given SEP. There is no provision in the FRAND or RAND commitment that restricts the bargaining range for a given SEP or that dictates how the parties should divide the gains from trade from executing a license agreement. Thus, there is no evidence that the patent policy of *any* major SSO defines FRAND or RAND as unique point.

B. *Does a Patent Holder's FRAND or RAND Commitment Implicitly Supersede the Public-Law Default Rule That a Reasonable Royalty Is Not Confined to a Unique Point?*

One might argue that, by committing to license its patents on FRAND or RAND terms, the SEP holder *implicitly* waives the right to a range of reasonable royalties for the use of its SEPs. However, that legal argument is unpersuasive. The Supreme Court has said that an implicit waiver of a statutory right is disfavored unless it is made clearly and manifestly. In *Metropolitan Edison*

[92] *Id.* § 6.2, at 18 (emphasis added).

[93] ETSI IPR Policy, *supra* note 1, § 4.4, at 65 (emphasis added).

[94] *See* Joint Electron Device Engineering Council, JEDEC Manual of Organization and Procedure § 8.2.8, at 28 (July 2015) [hereinafter JEDEC Patent Policy], https://www.jedec.org/sites/default/files/JM21R.pdf ("JEDEC makes no representation as to the reasonableness of any terms or conditions of the license agreements offered by such patent rights holders, and all negotiations regarding such terms and conditions must take place between the individual parties outside the context of JEDEC."); American National Standards Institute, Guidelines for Implementation of the ANSI Patent Policy 5 (Oct. 2012) [hereinafter ANSI Patent Policy], https://share.ansi.org/Shared%20Documents/Standards%20Activities/American%20National%20Standards/Procedures,%20Guides,%20and%20Forms/ANSI%20Patent%20Policy%20Guidelines%202012%20final.pdf (encouraging early disclosures of SEPs to "allow[] patent holders and prospective licensees ample time to negotiate the terms and conditions of licenses outside the standards development process itself"); International Telecommunications Union, Common Patent Policy for ITU-T/ITU-R/ISO/IEC [hereinafter ITU Patent Policy], http://www.itu.int/en/ITU-T/ipr/Pages/policy.aspx ("The patent holder is willing to negotiate licenses with other parties on a non-discriminatory basis on reasonable terms and conditions. Such negotiations are left to the parties concerned and are performed outside ITU-T/ITU-R/ISO/IEC.").

Co. v. NLRB, the Court said that it "will not infer from a general contractual provision that the parties intended to waive a statutorily protected right unless the undertaking is 'explicitly stated.'"[95] Such a waiver "must be clear and unmistakable."[96]

By the same reasoning, a court would properly disfavor a contractual interpretation of the SEP holder's FRAND or RAND obligation that supposed that the SEP holder implicitly waived rights originating in the federal patent statute. There is no reason to believe that, by implication when accepting the FRAND or RAND obligation and having its patents adopted into the SSO's standard, the SEP holder clearly and manifestly relinquished its right existing under the default rule (expressed in the Patent Act and the federal judicial opinions interpreting it) that the law defines a reasonable royalty as a range rather than a unique point. As I explained in Part V.A, the absence of evidence to the contrary in the patent policies and supporting documents of the major SSOs confirms that the SEP holder retains that statutory right when committing to offer to license its SEPs on FRAND or RAND terms.

Conclusion

Justice Birss said in *Unwired Planet* that there can be only a single FRAND royalty rate for a given set of circumstances between parties negotiating a license for an SEP. However, it would be untenable on both economic and legal grounds to infer from that opinion that FRAND or RAND can be only a single point in a voluntary negotiation between two parties, or that an SEP must command the same price across all licensees for a given SEP.

As an economic matter, an SEP holder's commitment to license its SEPs on FRAND or RAND terms generates a range of reasonable royalties upon which the negotiating parties could voluntarily agree. The SEP holder's minimum willingness to accept to license its SEPs and the licensee's maximum willingness to pay to use those SEPs identify the bounds on the bargaining range. Any agreed-upon royalty within that prescribed range will make both the SEP holder and the licensee better off than they would be if they were not to execute the license. In a given negotiation, the royalty will converge on a point within that range according to the relative bargaining power of the specific negotiating parties. However, the ultimate point value of that royalty is not preordained by the supposed uniqueness of a FRAND or RAND rate; rather, the ultimate point value of the FRAND or RAND royalty in a given license depends on the circumstances surrounding the negotiation. Differences in the size of the bargaining range and differences in the relative bargaining power of the SEP holder and the implementer will

[95] 460 U.S. 693, 708 (1983) (quoting Mastro Plastics Corp. v. NLRB, 350 U.S. 270, 283 (1956)).
[96] *Id.*

surely exist across licenses for a given SEP, and those differences explain why the observed royalty rate for a given SEP routinely varies across licenses.

Legal interpretation of the FRAND or RAND commitment (under American law) independently confirms that a FRAND or RAND royalty may be situated anywhere along a range of possible outcomes. In both their interpretation of section 284 of the Patent Act and their application of the hypothetical-negotiation framework to determine damages for patent infringement under section 284, the federal courts recognize that a range of reasonable royalties exists for a given patent. Any contractual bargaining away by the patent holder of its rights arising from that statutory framework would need to be indisputably clear. However, such clarity is nonexistent. The patent policies of the major SSOs allow the SEP holder and the implementer to set licensing terms for an SEP, including the ultimate royalty rate, through voluntary, bilateral negotiation. Far from dictating a unique point value, that mechanism permits a range of FRAND or RAND royalties for a given SEP.