License to All or Access to All? A Law and Economics Assessment of Standard Development Organizations' Licensing Rules

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Abstract

In the continuing debate over licensing standard essential patents ("SEPs") on fair, reasonable, and non-discriminatory ("FRAND") terms and conditions, one of the most heated topics is whether FRAND commitments should be interpreted to require licensing all comers or whether access to standards can be achieved through other, less rigid means. This Article evaluates both the legal and the economic arguments underlying this debate. This Article concludes that neither the law nor economic welfare justifies a "license to all" interpretation of FRAND commitments and that imposition of such an interpretation would likely be harmful to social welfare.

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Introduction

The development of technology standards has been the topic of heated policy discourse for at least two decades now.[1] But a few years ago, a new question was added to the debate: whether a commitment to license patents essential for the practice of a standard (referred to as standard essential patents, or "SEPs"[2]) on fair, reasonable, and non-discriminatory ("FRAND") terms and conditions necessitates that the SEP holder provide licenses to any and all parties requesting them.[3]

Proponents of the "license-to-all" position make two related arguments. First, they contend that all entities in the chain of production of standardized products need licenses to SEPs to be able to participate in the relevant industries.[4] Second, advocates posit that, because

1 The origins of this discourse reach back at least to the early Federal Trade Commission ("FTC") patent ambush cases against Rambus, Inc., Union Oil Co. of California ("Unocal"), and Dell Computer Corp. *See* Rambus, Inc., 142 F.T.C. 98 (2006); Union Oil Co. of Cal., 138 F.T.C. 1 (2004); Dell Comput. Corp., 121 F.T.C. 616 (1996).

2 For a more in depth description of SEPs, see *infra* text accompanying notes 80–81.

3 The issue gained a higher profile in the *FTC v. Qualcomm Inc.* matter. *See, e.g.*, FTC v. Qualcomm Inc., No. 17-CV-00220-LHK, 2018 WL 5848999, at *1–2 (N.D. Cal. Nov. 6, 2018) (order granting partial summary judgment) (considering "whether two [standard development organizations' intellectual property rights policies] require Qualcomm to license its SEPs to other modem chip suppliers"), *vacated as moot,* No. 19-16122 (9th Cir. Aug. 11, 2020). Note that Mr. Stark's firm represented Qualcomm in that matter; Dr. Layne-Farrar had no involvement in that case.

4 *See* Juan Martinez, *FRAND as Access to All Versus License to All*, 14 J. Intell. Prop. L. & Prac. 642, 644 (2019) (discussing the contours of the license-to-all position).

of a need for licenses, the FRAND commitments entered into by SEP holders should be interpreted to require the holders to grant a license to anyone who requests one to carry out their part of the production chain, including, in particular, upstream makers of components used in downstream devices.[5]

The contrary view holds that, in fact, not all entities need SEP licenses and that FRAND commitments do not necessarily require that SEP holders grant licenses to all, but only that they make their patented technologies *available* by granting licenses on FRAND terms and conditions.[6] Such availability may be assured by a range of practices, including, for example, a practice of licensing at a certain level of the production chain while not asserting SEPs against other levels.[7] This type of "access-to-all" system is sufficient to ensure no one is blocked from using technology standards while respecting the patent rights of innovators.[8]

At its root, the license-to-all argument concerns the amount of royalties to be paid by standard implementers (e.g., cellular handset makers, infrastructure equipment manufacturers, or component suppliers). By attempting to drive licensing to the component level, advocates of license-to-all seek to restrict the per-unit price or profit on which a royalty rate can be applied, which in turn would limit the royalty payment made.[9] In the cellular industry, for example, patent royalties have traditionally been levied on complete cellular devices, which are often sold to consumers at $1,000 or more.[10] By moving

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5 *See id.*

6 *See, e.g.*, Bertram Huber, Why the ETSI IPR Policy Does Not and Has Never Required Compulsory "License to All": A Rebuttal to Karl Heinz Rosenbrock 7–9 (Sept. 15, 2017) (unpublished manuscript), https://ssrn.com/abstract=3038447 [https://perma.cc/P5W4-UCLR] (discussing how the European Telecommunications Standards Institute ("ETSI") designed its intellectual property rights ("IPR") Policy to ensure that implementers would have access to SEPs while leaving SEP holders the choice over selecting a level of production for granting a license).

7 *See, e.g.*, Martinez, *supra* note 4, at 645 (discussing the "have made rights" policy under the ETSI IPR Policy, which permits component manufacturers to operate pursuant to a license between end-device manufacturers and SEP holders).

8 *See id.*

9 *See, e.g.*, Gregory K. Leonard & Mario A. Lopez, *Determining RAND Royalty Rates for Standard-Essential Patents*, ANTITRUST, Fall 2015, at 86, 90 (discussing the view that determining royalty rates at the component level would lead to lower royalty rates, which advocates argue would be more advantageous for widespread adoption of a standard).

10 *See* Jorge Padilla & Koren W. Wong-Ervin, *Portfolio Licensing to Makers of Downstream End-User Devices: Analyzing Refusals to License FRAND-Assured Standard-Essential Patents at the Component Level*, 62 ANTITRUST BULL. 494, 500 (2017); *see, e.g.*, Vlad Savov, *In Less Than a Year, the $1,000 Phone Has Become Entirely Normal*, VERGE (Aug. 21, 2018, 8:40

away from licensing end-user devices and toward licensing components of those devices, implementers naturally hope to pay less in royalties. A 1% royalty on a $1,000 device would be $10, while the same 1% royalty applied to a $10 chip would be $0.10. The smaller the royalty base, the smaller the result of multiplying that base by a given percentage royalty rate, and hence the smaller the royalty payments owed by an implementer to an SEP holder.

Similar thinking applies even when other forms of royalty payments are used. For example, if the licensee is a component maker, then even if the royalty is computed as a fixed dollar amount per infringing unit (e.g., $0.15 for each covered unit), that fixed amount can, naturally enough, be compared to the component maker's per-unit price or profit in arguments about the fairness and reasonableness of the royalty. Likewise, lump-sum royalty payments are typically calculated by applying a percentage running royalty rate or fixed dollar amount to the anticipated sales of the infringing units.[11] Thus, if the licensee is a component maker, the lump sum arguably will be calculated using its revenues and profits, again pushing down the royalties paid as compared to those paid for end-user devices.

Viewed in this light, it is easy to see that the license-to-all argument is a strategy to try to force SEP holders to license their patents, or at least a substantial number of them, to component makers in an effort to focus discussions about royalties on the prices of components rather than of end-user devices.[12]

All of this would be expedient and desirable for implementers, the technology users. The question addressed in this Article is whether the royalty-depressing outcome desired by implementers is legally justified or economically efficient. Although, fundamentally, the debate over license-to-all is a commercial dispute over royalty payment amounts, it is also a struggle over how the fruits of technology standardization will be shared across industries and across players within any given industry. And the outcome of the license-to-all de-

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AM), https://www.theverge.com/2018/8/21/17763322/iphone-x-galaxy-note-9-smartphone-pricing-2018 [https://perma.cc/26JQ-GS9D].

11 *See* Lucent Tech., Inc. v. Gateway, Inc., 580 F.3d 1301, 1327 (Fed. Cir. 2009) ("Parties agreeing to a lump-sum royalty agreement may, during the license negotiation, consider the expected or estimated usage (or, for devices, production) of a given invention . . . .").

12 *See* Marvin Blecker et al., *An Experience-Based Look at the Licensing Practices that Drive the Cellular Communications Industry: Whole Portfolio/Whole Device Licensing*, 51 LES NOUVELLES 221, 230 (2016) (explaining that the motivation for advocates of component-level licensing is to reduce overall royalty payments).

bate will have significant implications for end consumers and for the wider economy.

This Article examines the call for a license-to-all obligation for FRAND-committed patents, considering the legal arguments both for and against such an interpretation of FRAND along with the likely economic implications. This Article concludes that imposing a license-to-all regime is not supported by patent, contract, or antitrust law, and indeed would likely be harmful to social welfare.

Before digging into the complexities of the license-to-all proposal, Part I of this Article summarizes the applicable principles of patent law and patent licenses. Part II reviews the contractual context for the opposing arguments, namely the intellectual property policies in place at the standard development organizations ("SDOs") that have been at the center of many of the FRAND litigations to date: the European Telecommunications Standards Institute ("ETSI") and the Institute of Electrical and Electronics Engineers ("IEEE"). Part III then turns to a review of the legal bases for the license-to-all proposal and an analysis of the economic impact that a license-to-all rule would be expected to have.

I. Principles of Patent Law and Licensing

To begin an assessment of the license-to-all proposal, it is important to establish some common legal footing, given the interplay of a number of rules.

A. Patents and Patent Infringement

A patent is a grant from the U.S. government to an inventor of "the right to exclude others from making, using, offering for sale, or selling" his or her invention for a limited time (20 years from the date of application).[13] It is a fundamental tenet of patent law that a patent is not an affirmative right to practice an invention. A patent confers only a negative right: the right to exclude others from practicing the covered invention.[14]

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13 *See* 35 U.S.C. § 154(a) (2018) ("Every patent shall contain . . . a grant to the patentee, his heirs or assigns, of the right to exclude others from making, using, offering for sale, or selling the invention . . . ."). Patent rights are grounded in the U.S. Constitution, Article I Section 8, Clause 8, which grants Congress the power "[t]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."

14 *See* 35 U.S.C. § 154(a) (granting this right to exclude); *see also* Masimo Corp. v. Philips Elec. N. Am. Corp., C.A. No. 09–80–LPS, 2015 WL 2406155, at *11 (D. Del. May 18, 2015)

To exercise that exclusive right successfully, a patent holder must clear a number of hurdles. Most importantly, of course, the patent owner must prove infringement. The alleged infringer has the right to raise a number of defenses.[15] If the patentee overcomes those defenses and succeeds in proving liability, the question of whether to enforce exclusivity through an injunction lies within the discretion of the court.[16] If the patent holder seeks damages in addition to or in lieu of an injunction, the amount of damages must be proved.[17]

The scope of the exclusive right granted in a patent is defined by the claims of the patent.[18] Each claim is a (possibly lengthy) statement containing a number of elements (also known as limitations).[19] If all the elements of a patent claim are shown to exist in an accused product or process, the claim (or, more loosely, the patent) is said to be infringed.[20] A claim is a conjunctive statement, an *and* construct, and the burden of proof is on the patent holder.[21] Thus, to succeed on a claim of infringement, the patent holder must show that *all* of the elements of one of his patent claims are present in the accused product.[22] If any one or more of the elements are missing, there is no infringement of that claim.[23] On the other hand, the presence of additional elements does not avoid infringement.[24] So, for the claim "A widget comprising A, B, and C," a widget with elements A, B, and C would infringe, as would a widget with elements A, B, C, and D. On the

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(describing the right of a patentee to exclude others from practicing an invention as the patentee's "core exclusionary . . . negative right").

15 *See, e.g.*, MARK S. LEE, ENTERTAINMENT AND INTELLECTUAL PROPERTY LAW § 4.30 (2019) ("A number of defenses can be asserted in patent infringement claims: noninfringement, invalidity, patent misuse, fraudulent procurement, and laches or estoppel.").

16 *See* eBay Inc. v. MercExchange, L.L.C., 547 U.S. 388, 391 (2006) (observing that under the Patent Act, "[t]he decision to grant or deny permanent injunctive relief is an act of equitable discretion by the district court").

17 *See* 69 C.J.S. PATENTS § 713 (2020).

18 *See* Johnson & Johnson Assocs. Inc. v. R.E. Serv. Co., 285 F.3d 1046, 1052 (Fed. Cir. 2002) (stating that courts "adhere[ ] to the fundamental principle that claims define the scope of patent protection").

19 *See* Markman v. Westview Instruments, Inc., 517 U.S. 370, 373 (1996).

20 *See id.* at 373–74.

21 *See id.* at 374.

22 *See* TIP Sys., LLC v. Phillips & Brooks/Gladwin, Inc., 529 F.3d 1364, 1379 (Fed. Cir. 2008) ("Under the 'all elements' rule, to find infringement, the accused device must contain 'each limitation of the claim, either literally or by an equivalent.'" (quoting Freedman Seating Co. v. Am. Seating Co., 420 F.3d 1350, 1358 (Fed. Cir. 2005))).

23 *See id.*

24 *See* A.B. Dick Co. v. Burroughs Corp., 713 F.2d 700, 703 (Fed. Cir. 1983) ("It is fundamental that one cannot avoid infringement merely by adding elements if each element recited in the claims is found in the accused device.").

other hand, a widget with elements A and C, but lacking B, would not infringe. Moreover, someone who sells a larger product that incorporates one or more widgets, each containing elements A, B, and C, would also infringe the claim.[25] The question posed by a claim of infringement is simply, "Did the defendant make, use, sell, or offer to sell an infringing product?"[26] If the defendant sold something that contained an infringing product, the answer to the question is yes.

Thus, whenever there are multiple levels of players in an industry that each use a patented technology, a patent owner may, depending on the scope of the patent, have a choice regarding the level at which it will assert its patent. For example, the manufacturers of widgets may infringe the hypothetical widget claim by making and selling widgets. Their customers may also infringe the claim by using widgets to make more complex devices and selling widgets embedded in the devices they make. And the device makers' customers may infringe by using widgets when they use the devices. Potential infringement exists at each level, and the patent owner has the option to sue at any of them, based on the owner's practical and strategic considerations. Patent law does not dictate that choice.

Defendants have strategic decisions of their own to make. In particular, they may avail themselves of a number of possible ways to avoid infringement liability. First and foremost, defendants can contest the claim of infringement. If a defendant negates the patent holder's proof as to any element of an asserted claim, infringement will not be found.[27] There is also an impressive array of affirmative defenses available to the alleged infringer. These defenses chiefly comprise of ways to contest the validity of a patent (e.g., lack of novelty or obviousness).[28] If the defendant prevails on any of its defenses, the claim of infringement fails.[29] Or, alternatively, an alleged infringer may choose to enter into a license agreement, thus avoiding claims of infringement by contractual means.[30]

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25 *See, e.g.*, Rembrandt Wireless Techs., LP v. Apple Inc., No. 2:19-CV-00025-JRG, 2019 WL 6344471, at *4 (E.D. Tex. Nov. 27, 2019) (analyzing claim of direct infringement because defendant makes and sells products that incorporate the accused device).

26 *See* 35 U.S.C. § 154(a)(1) (2018).

27 *See* Roger Allan Ford, *Patent Invalidity Versus Noninfringement*, 99 CORNELL L. REV. 71, 81–85 (2013) (discussing the noninfringement defense).

28 *See id.* at 78–81 (discussing the invalidity defense); *see also* Sparton Corp. v. United States, 89 Fed. Cl. 196, 208 (2009) (same).

29 *See* 69 C.J.S. PATENTS § 614 (2020).

30 *See infra* Section I.B.

If the patent owner succeeds in its infringement suit, the owner is entitled to a remedy. One possible remedy is monetary damages.[31] Patent damages are intended, and required by statute, "to compensate for the infringement," and shall be "in no event less than a reasonable royalty for the use made of the invention by the infringer."[32]

The actual quantification of damages is a matter for the finder of fact. A body of caselaw has developed to guide the assessment of patent infringement damages.[33] An important aspect of this caselaw is the notion of apportionment. Generally speaking, the patent holder "must in every case give evidence tending to separate or apportion the defendant's profits and the patentee's damages between the patented feature and the unpatented features."[34] In recent years, the courts have developed an outgrowth of the apportionment principle, known as the smallest salable patent practicing unit ("SSPPU") approach. SSPPU emerged as a means of limiting the specter of runaway patent infringement damages awards, particularly in jury cases.[35] The idea is that it is often appropriate, especially in jury cases, to limit the royalty base in a damages calculation to the price of the SSPPU rather than a more complex and expensive end-user product (e.g., a component of a disk drive, rather than an entire laptop computer).[36]

The SSPPU approach is not the exclusive means of determining patent infringement damages.[37] Apportionment can also be accom-

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31 *See* 35 U.S.C. § 284.

32 *Id.*; *see also* Gen. Motors Corp. v. Devex Corp., 461 U.S. 648, 654–55 (1983) (stating that a successful patent plaintiff is entitled to "full compensation for 'any damages' [the plaintiff] suffered as a result of the infringement").

33 *See, e.g.*, LaserDynamics, Inc. v. Quanta Comput., Inc., 694 F.3d 51, 66–67 (Fed. Cir. 2012) (discussing reasonable royalty damages and observing that such a calculation can be an "exceedingly difficult and error-prone task"); ResQNet.com, Inc. v. Lansa, Inc., 594 F.3d 860, 869 (Fed. Cir. 2010) (stating that damages analysis "requires a [factfinder] to hypothesize, not to speculate"); Riles v. Shell Expl. & Prod. Co., 298 F.3d 1302, 1311 (Fed. Cir. 2002) (stating that damages analysis "requires sound economic and factual predicates").

34 Garretson v. Clark, 111 U.S. 120, 121 (1884) (quoting Garretson v. Clark, 10 F. Cas. 40, 44 (C.C.N.D.N.Y. 1878) (No. 5,248)).

35 *See* Cornell Univ. v. Hewlett-Packard Co., 609 F. Supp. 2d 279, 283, 288 (N.D.N.Y. 2009) (discussing the "smallest salable infringing unit" approach in the context of evaluating a jury damage award).

36 *See, e.g.*, *id.* at 287–88 (finding that no reasonable jury could have relied on the plaintiff's proposed royalty base because it encompassed defendant's CPU bricks, which were more complex and expensive than the infringing processor); *see also* VirnetX, Inc. v. Cisco Sys., Inc., 767 F.3d 1308, 1327 (Fed. Cir. 2014) ("[T]he smallest salable unit approach was intended to produce a royalty base much more closely tied to the claimed invention than the entire market value of the accused products.").

37 *See, e.g.*, Commonwealth Sci. & Indus. Research Org. v. Cisco Sys., Inc., 809 F.3d 1295,

plished by adjusting the royalty rate.[38] Moreover, SSPPU runs into problems in cases involving large numbers of patents covering many aspects of accused products.[39] In such cases, there may not be a single SSPPU for all the patents, and it may not be practical to determine separate SSPPUs for all the individual patents or categories of patents.[40] In any event, SSPPU does not govern how private parties negotiate license agreements; they are free to reach whatever arrangements they find to be convenient. In fact, in real-world licenses and real-world negotiations, parties seldom if ever use an SSPPU as a royalty base.[41]

The patent owner may also be entitled to an injunction that precludes the infringer from continuing its infringing activities.[42] The granting of an injunction lies within the discretion of the court, pursuant to consideration of the equities.[43] A patent holder may also apply to the U.S. International Trade Commission ("USITC") for an order excluding infringing products from importation into the United States.[44]

B. Patent Licensing

Simply put, a license is a contracted-for defense to claims of patent infringement. It is a promise by the patent holder not to assert claims of infringement of specified patents (or claims of patents) against an identified counterparty.[45] This follows from the nature of

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1303 (Fed. Cir. 2015) (rejecting the argument that all damages models must be based off of the SSPPU).

38 *See, e.g.*, Exmark Mfg. Co. v. Briggs & Stratton Power Prods. Grp., LLC, 879 F.3d 1332, 1348 (Fed. Cir. 2018) (using the entire accused product as the royalty base was appropriate because "apportionment can be addressed in a variety of ways," including adjustment of the royalty rate).

39 For a discussion of shortcomings in the SSPPU approach, see Anne Layne-Farrar, *The Patent Damages Gap: An Economist's Review of U.S. Statutory Patent Damages Apportionment Rules*, 26 TEX. INTELL. PROP. L.J. 31, 42–46 (2018).

40 *Id.* at 42–44.

41 *See* David Kappos & Paul R. Michel, *The Smallest Salable Patent-Practicing Unit: Observations on Its Origins, Development, and Future*, 32 BERKELEY TECH. L.J. 1433, 1442 (2017) ("SSPPU is a flexible evidentiary tool, not an unyielding substantive requirement of patent damages law."); *see, e.g.*, Blecker, et al., *supra* note 12, at 230–31 (explaining that device-level licensing is the norm in the cellular communication industry).

42 *See* 69 C.J.S. PATENTS § 690 (2020).

43 eBay Inc. v. MercExchange, L.L.C., 547 U.S. 388, 391 (2006) (explaining that, under the Patent Act, "[t]he decision to grant or deny permanent injunctive relief is an act of equitable discretion by the district court").

44 *See* 19 U.S.C. § 1337(b), (d)(1) (2018) (granting the USITC authority to enter exclusion orders).

45 *See* McCoy v. Mitsuboshi Cutlery, Inc., 67 F.3d 917, 920 (Fed. Cir. 1995) ("[A] patent

patents themselves. As explained above, a patent is merely a right to exclude others from practicing an invention; a license is a suspension or exemption from that right, which the patent holder, in its sole discretion, may grant.[46]

A license may be very broad, or it may be limited by a number of parameters.[47] One dimension in which a patent license may be limited is the "who"; that is, who is licensed.[48] Typically, the licensee will be a single contractual counterparty to the patent holder. Other basic dimensions include "when" (time) and "where" (geography). For time limitations, a patent license may run for fixed period of time, or until the expiration of the last licensed patent.[49] For geographical limitations, the license may cover only certain specified states, regions or countries, or it may provide worldwide rights.[50] Another critical dimension of licensing limitations is the "what"—the specific patents that fall within a license's scope.[51] The license may specify individual patents by listing them (e.g., by patent number),[52] or a set of patents defined by description (e.g., all patents covering long-term evolution ("LTE") technology held by the licensor as of a particular date).[53] One more aspect to the "what" of a patent license is that the license may be limited to one or more "fields of use" (e.g., the manufacture, use, or sale of a particular type of device).[54]

It is a common misconception to think of a patent license as providing the *ability* to make and sell some product.[55] People unfamiliar with patents often imagine a patent license to confer some "secret rec-

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owner . . . may contract to confer a license on another party. . . . A licensee, of course, has an affirmative defense to a claim of patent infringement.").

46 *See supra* Section I.A.

47 *See* DONALD M. CAMERON & ROWENA BORENSTEIN, OGILVY RENAULT, KEY ASPECTS OF IP LICENSE AGREEMENTS 11 (2003), http://www.jurisdiction.com/lic101.pdf [https://perma.cc/Q483-PPZR] (discussing potential limitations on IP license agreements).

48 *Id.* at 9.

49 *See* 69 C.J.S. PATENTS § 462 (2020).

50 *See* CAMERON & BORENSTEIN, *supra* note 47, at 11.

51 *See* D. PATRICK O'REILLEY & D. BRIAN KACEDON, DRAFTING PATENT LICENSE AGREEMENTS § 11.03.A (9th ed. 2019).

52 *See, e.g.*, *id.* at app. D (giving an example of a nonexclusive cross-license agreement form whereby the licensor lists the patent numbers for the licensed patents).

53 *See, e.g.*, *LTE/LTE-A*, SISVEL, https://www.sisvel.com/licensing-programs/wireless-communications/lte-lte-a/introduction [https://perma.cc/7WGQ-JM6S] ("Sisvel's LTE/LTE-A patent pool offers manufacturers and users of 4G devices licenses under patents essential to LTE/LTE-A and SAE held by any of the participating patent owners . . . .").

54 *See* CAMERON & BORENSTEIN, *supra* note 47, at 11.

55 *See* Nina Zipkin, *4 Intellectual Property Myths That You Should Avoid*, ENTREPRENEUR (Oct. 7, 2015), https://www.entrepreneur.com/article/251007 [https://perma.cc/5VUA-V768] ("Myth: Copyrights, patents and trademarks and trade secrets are interchangeable.").

ipe," the proverbial "formula for Coke," without which the licensee would be unable to make or sell a class of products.[56] Agreements of that sort are known as technology transfers and can entail the conveyance of technical information, know-how, documentation, or even physical materials, facilities, and personnel, to enable the transferee to manufacture a particular product or carry out a process, for example.[57] A patent license will often accompany a technology transfer, perhaps in the same contractual document.[58] But it is quite common for parties to enter into patent licenses without engaging in any technology transfer, with each promising not to sue the other over patent infringement (and each using its own know-how).[59]

Because a patent license is not about gaining access to the know-how or the technical capability needed to participate in a commercial endeavor, a license is not necessarily required for an implementer to carry on its business. Implementers can, and often do, manufacture and sell products and use processes that may be patented by others.[60] The risk of infringement litigation is just that—a risk, one among many, that comes with making business decisions. While lawyers and other advisors can help a business assess its risk levels,[61] obtaining a license is usually a good way to mitigate patent infringement litigation.[62] It may, however, make no sense to obtain a license to every patent that might conceivably be asserted against your business. For many businesses, the sheer administrative burden would be far too great given that the negotiation process can take months or even years and that only a tiny fraction of the hundreds of thousands of patents

56 *See id.*

57 *See* David M. Haug, *The International Transfer of Technology: Lessons That East Europe Can Learn from the Failed Third World Experience*, HARV. J.L. & TECH., Spring 1992, at 209, 211–13.

58 *See id.* at 214–15.

59 *See generally* CAMERON & BORENSTEIN, *supra* note 47, at 1, 4–5 (discussing how license agreements may sometimes include "know-how" and indicating that this is a soft IP right, which is often distinct from a hard IP right like a pure patent license).

60 *See* SUZANNE MICHEL ET AL., FED. TRADE COMM'N, THE EVOLVING IP MARKETPLACE: ALIGNING PATENT NOTICE AND REMEDIES WITH COMPETITION 8 (2011) ("In many cases, the licensee or purchaser already uses the patented technology when approached by the patent owner, but it lacks a license to use the technology.").

61 *See* Kimberly Cauthorn, *Three Rules for Managing the Financial Impact of IP Risk*, IPWATCHDOG (Nov. 27, 2018), https://www.ipwatchdog.com/2018/11/27/managing-financial-impact-ip-risk/id=103438/ [https://perma.cc/T96D-VZYR].

62 *See* Prism Techs. LLC v. Sprint Spectrum L.P., 849 F.3d 1360, 1370 (Fed. Cir. 2017) (observing that the core of a patent license "is an elimination of the potential for litigation").

granted by the U.S. Patent Office each year will ever be asserted in litigation.[63] The same holds true for standard essential patents.[64]

Patent licensing is an important means for innovators to monetize their inventions and earn a return on their investments. In designing a licensing program, a patent owner, as a general matter, has a great deal of freedom. The owner can limit the scope of the licenses it grants in a number of ways. For example, the patent owner may choose which patents to license and the duration of its licenses. It can choose how many licenses it will grant. In the first instance, a patent holder has no obligation to license anyone; it may simply choose to keep to itself the exclusive right to practice the invention.[65] Alternatively, the patent holder may choose to permit only a single exclusive licensee to use the invention.[66] Or it may license any number of nonexclusive licensees.[67]

The patent owner may narrow the "what" of its licenses in terms of a limited field of use as well. For example, a licensor could grant licenses to some entities to use its patented inventions in a certain type of device and other entities for other types of devices.[68] In gen-

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63 *See* PwC, 2018 Patent Litigation Study 2 (2018), https://www.ipwatchdog.com/wp-content/uploads/2018/09/2018-pwc-patent-litigation-study.pdf [https://perma.cc/FH35-LT66] (showing that while almost 350,000 patents were granted in 2018, around only 4,000 patent cases were filed in the federal courts).

64 Thousands of patents have been declared to ETSI as potentially essential for 3G, 4G, and 5G standards. For example, a recent search for 3G, 5G, LTE, and LTE-Advanced under the standards enacted by the 3GPP technical committees yielded 16,302 standards. *See Search & Browse Standards*, ETSI, https://www.etsi.org/standards-search#Pre-defined%20Collections [https://perma.cc/PFK2-A982] (follow "Search" hyperlink with nothing in the search bar; filter search results by "All versions"; filter search results by selecting the keywords "3G," "5G," "LTE," and "LTE-Advanced"; and filter search results by selecting all technical committees beginning with "3GPP"). There have, however, only been a relatively small number of patent infringement cases that involved SEPs. One study reviewed cases filed in U.S. District Courts and the USITC between 2001 and 2013 and found a total of 111 patent and FRAND contract cases filed between participants in the smart phone industry, involving 402 unique patents. *See* Kirti Gupta & Mark Snyder, *Smart Phone Litigation and Standard Essential Patents* 6–9 (Hoover IP^2 Working Paper Series, Paper No. 14006, 2014), https://ssrn.com/abstract=2492331 [https://perma.cc/Z469-KFSZ]. Of the 111 cases, less than one-third involved any SEPs. *See id.* at 10. And of the 402 unique patents, only 144 (or 36%) could be characterized as SEPs. *See id.* For a more recent review of global SEP litigation, see Chryssoula Pentheroudakis & Justus A. Baron, Eur. Comm'n, Licensing Terms of Standard Essential Patents (2017), https://publications.jrc.ec.europa.eu/repository/bitstream/JRC104068/jrc104068%20online.pdf [https://perma.cc/K366-62SK].

65 *See* McCoy v. Mitsuboshi Cutlery, Inc., 67 F.3d 917, 920 (Fed. Cir. 1995).

66 *See* Cameron & Borenstein, *supra* note 47, at 9.

67 *See generally Prism Techs.*, 849 F.3d at 1370 (explaining that nonexclusive licenses are "nothing but a covenant not to sue").

68 *See* Cameron & Borenstein, *supra* note 47, at 11.

eral, patent law imposes no constraints on any of these licensing choices.

Finally, the patent owner may also choose to limit the "who" of its licenses. In particular, the patent owner can elect to grant licenses to certain entities and not to others; or it may grant licenses at one level of the supply chain and not at other levels. For example, the owner of the hypothetical widget patent might choose to license the manufacturers of infringing widgets. But it could appropriately choose instead to license the manufacturers of devices that incorporate widgets, as these manufacturers also infringe the widget patent.

There may be a number of good business reasons to pursue a strategy of licensing the manufacturers of devices that incorporate widgets, rather than the widget makers themselves.[69] For example, the patent holder may have many different patents reading on many different aspects of the devices, not just widgets, so that device makers are the logical licensees for the entire portfolio of patents.[70] It also may be that monitoring and enforcement of licenses is more practical and less expensive at the device-maker level as compared to the widget level.[71] It may be industry custom to license patents at the device-maker level.[72] And it may simply be more profitable, and more appropriate in terms of economic incentives, to do so.[73] For example, if licensing has historically been done at the end-device level and widget makers have set prices by adding competitive margins to their bills of materials, without reflecting the value of the patented technologies of others that are implemented within the widgets and without capturing the value of those technologies to end consumers, then it will not be practical for innovators to recover reasonable returns for their innovations at the widget-maker level.

The point here is not to argue that all licensing should be at the end-device level. To the contrary, component licenses may make business sense in many circumstances. The point is simply that flexibility in the business choices involved in licensing patents, and in particular

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69 *See* Blecker et al., *supra* note 12, at 230–32.

70 *See id.* at 231–32; *see also* Padilla & Wong-Ervin, *supra* note 10, at 500–01 (explaining that patent licenses for cellular technology should be directed to the end-user device level of the production chain rather than the component level).

71 *See* Padilla & Wong-Ervin, *supra* note 10, at 501.

72 *See id.*

73 *See* FTC v. Qualcomm Inc., No. 19-16122, slip op. at 34 & n.15, 37 (9th Cir. Aug. 11, 2020) (noting that Qualcomm's policy of licensing only device makers was profit-maximizing and supported by the reasonable, procompetitive justification of efficiency and cautioning against conflating profit-maximization with anticompetitive intent).

the choice of *where* to focus licensing efforts, is a fundamental freedom provided to all patent holders.

C. *Patent Exhaustion*

One aspect of patent law that significantly affects licensing is the doctrine of patent exhaustion. Because of this doctrine, the level in the supply chain at which the patent owner chooses to seek licenses can have important consequences.

Patent exhaustion, or the "first sale" doctrine, is a defense to a claim of patent infringement.[74] It provides that once there has been a sale of an article that "substantially embodies"[75] the patent, the patent owner's rights have been exhausted as to that article.[76] That is, as a matter of patent law, if the patent owner or its licensee sold an article substantially embodying its patent, the owner cannot succeed on a claim that a subsequent user or purchaser of the article infringes the patent.[77]

As a practical matter, this means that a patent owner likely can collect royalties from only one level of a supply chain.[78] For example, consider again the hypothetical widget. If the owner of the widget patent chose to license widget makers and collect royalties from them, it could not later succeed on a claim that a device manufacturer who uses the licensed widgets infringes the widget patent. The patent owner's patent rights are exhausted on the first sale of a widget; subsequently, that widget is no longer subject to the patent.[79]

If, on the other hand, the patent owner chose not to license widgets, it could preserve its ability to assert its patent against the makers of devices that incorporate widgets, which could encourage device makers to sign licenses. When licensing takes place farther down the

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74 *See* Quanta Comput., Inc. v. LG Elecs., Inc., 553 U.S. 617, 625 (2008) ("The longstanding doctrine of patent exhaustion provides that the initial authorized sale of a patented item terminates all patent rights to that item."); *see also* 69 C.J.S. PATENTS § 458 (2020) ("Under the 'first sale' doctrine, absent unusual circumstances the courts infer that a patent-owner has given up the right to exclude concerning a patented article that the owner sells . . . .").

75 Substantial embodiment exists when the article "embodies essential features of [the] patented invention." *Quanta Comput.*, 553 U.S. at 627 (quoting United States v. Univis Lens Co., 316 U.S. 241, 250–51 (1942)).

76 *See* 69 C.J.S. PATENTS § 458 (2020).

77 *See id.*

78 *See id.* ("Absent a valid contractual restriction, restraints upon the downstream use or sale of a patented product offend against the ordinary and usual freedom of traffic in chattels . . . .").

79 *See id.* ("[T]he patent monopoly ceases after the first sale of the patented article and the buyer can use it or sell it as the buyer wishes.").

supply chain, there may be a concern that the patent owner might try to collect royalties from multiple members of the supply chain—in this case, the widget producers as well as the device manufacturers. This, however, is not a practical concern because if the patent owner were to assert its patent against widget makers, it would undermine its existing device licensing program. If the patent owner were to collect license royalties from widget makers, the widget sales would become authorized, exhaustive sales and the patent owner would not be able to assert its patent against device makers who incorporated the widgets under license. In other words, if a patent owner has chosen to license at the device level, it has already signaled that it does not seek to license at the component level.

D. SEPs and FRAND

The above general principles inform the debate in the controversial area of SEPs and FRAND. In the process of developing technological standards, SDOs commonly incorporate technologies developed by private sector participants.[80] To protect their investments in developing technologies for use in industry standards, companies typically apply for patents on their innovations. Logically they will then seek to earn a return on their investment through licensing (in addition to or instead of selling standards-compliant products). When the claims of a patent read on an aspect of a standard, so that it is not possible to practice the standard without infringing, the patent is "essential" and is referred to as an SEP.[81]

As part of their governing rules, SDOs typically publish policies regarding patents or intellectual property rights ("IPRs") more generally.[82] IPR policies usually ask that the SDO's members identify their patents that may be essential to the SDO's standards.[83] When a member identifies a potential SEP, it is also asked to declare whether it will agree to license the patent on FRAND terms and conditions.[84] The

80 *See, e.g.*, FTC v. Qualcomm Inc., 411 F. Supp. 3d 658, 671 (N.D. Cal. 2019) (discussing how SDOs in the cellular industry work with patent holders to develop technological standards), *rev'd and vacated*, No. 19-16122 (9th Cir. Aug. 11, 2020).

81 *See In re* Innovatio IP Ventures, LLC Patent Litig., No. 11 C 9308, 2013 WL 5593609, at *1–2 (N.D. Ill. Oct. 3, 2013). For an example of the dynamic between patent holders, SEPs, and SDOs, see *id.* at *2–4.

82 *See, e.g.*, Apple, Inc. v. Motorola Mobility, Inc., 886 F. Supp. 2d 1061, 1083–84 (W.D. Wis. 2012) (describing the "policies and bylaws" set by an SDO).

83 *Id*. at 1067 ("The policies often require or encourage members of the organization to identify patents that are essential to a proposed standard . . . .").

84 *Id.* (stating that SDO policies can require members to "agree to license their essential patents on fair, reasonable and nondiscriminatory terms to anyone who requests a license"); *In*

precise terms of FRAND declarations vary across different SDOs, and may vary from declarant to declarant.[85]

Under U.S. caselaw, FRAND declarations are contractual in nature. Each FRAND declaration is a contract between the SEP holder and the SDO, and implementers of the relevant industry standard are third-party beneficiaries of the contract.[86] Because FRAND declarations are contracts, there is no single interpretation of a FRAND obligation in the abstract;[87] rather, the usual principles of contract interpretation apply.

As with any other contract, to understand a party's FRAND obligations in a particular case, one must start by examining the language of the relevant contract. This language resides in the relevant FRAND declaration along with the IPR policy under which the declaration was made.[88] The goal of contract interpretation is to give effect to the parties' intentions as expressed in the contract itself.[89] When the meaning of certain contractual terms "depends on trade or industry practice," courts can consult the testimony of expert witnesses.[90] Ambiguities may be resolved with the assistance of extrinsic evidence, such as other SDO documents that shed light on the meaning of particular terms or otherwise illuminate the parties' intent.[91]

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re Innovatio, 2013 WL 5593609, at *2 (noting party's agreement with SDO "to license any patents that were essential to the operation of the 802.11 wireless standard on reasonable and nondiscriminatory ('RAND') terms").

85 *See supra* Part II.

86 *See, e.g.*, *In re* Innovatio IP Ventures, LLC Patent Litig., 956 F. Supp. 2d 925, 933 (N.D. Ill. 2013) (explaining that FRAND commitments can be enforced by "potential users" of the standard at issue who are "third-party beneficiaries of the agreements between [the patent holder] and the [SDO]").

87 *See* Ericsson, Inc. v. D-Link Sys., Inc., 773 F.3d 1201, 1231 (Fed. Cir. 2014) (noting that "'RAND terms' vary" and the specific terms of the FRAND commitment at issue must be considered in each case).

88 *See* Padilla & Wong-Ervin, *supra* note 10, at 500 ("Because SDO policies vary widely, any analysis [of a FRAND commitment] must begin with the specific SDO IPR policy at issue.").

89 *See, e.g.*, Consol. Edison, Inc. v. Ne. Utils., 426 F.3d 524, 527 (2d Cir. 2006) ("Our 'fundamental objective' [when interpreting a contract] is to determine the intent of the contracting parties 'as derived from the language employed in the contract.'" (quoting Abiele Contracting v. N.Y. City Sch. Constr. Auth., 689 N.E.2d 864, 868 (N.Y. 1997))).

90 Am. Home Assurance Co. v. Cat Tech, L.L.C., 717 F. Supp. 2d 672, 682 (S.D. Tex. June 9, 2010) (approving the use of expert testimony to discern the meaning of industry-particular terms), *rev'd on other grounds*, 660 F.3d 216 (5th Cir. 2011).

91 *See* Padilla & Wong-Ervin, *supra* note 10, at 500–01 (analyzing the ETSI FRAND commitment by looking to other provisions of the ETSI IPR policy).

II. A Review of SDO Policies on Licensing

To put the license-to-all debate in context, one needs an understanding of the IPR policies in place at key SDOs because any claim that FRAND imposes a license-to-all obligation on SEP holders usually involves contracts based on language from these policies. These policies, while sharing some common elements, differ across organizations. For illustrative purposes, this article focuses on ETSI, which is the most important SDO in the cellular space,[92] and contrasts ETSI's IPR policy with that of the IEEE, which is an important SDO in the Wi-Fi standards space.[93] These two organizations have figured prominently in litigation matters where license-to-all arguments have arisen.[94]

A. The European Telecommunications Standards Institute ("ETSI")

Several clauses in ETSI's "Intellectual Property Rights Policy" ("ETSI IPR Policy") are relevant to the question of whether ETSI members are required to offer license agreements to any and all who ask (for whatever scope they request) or, rather, if licensing certain players and ensuring access to all others is sufficient. This Section presents and discusses each of these clauses.

1. Policy Objectives

Before laying out its specific provisions, the ETSI IPR Policy begins with a section titled "Policy Objectives."[95] It is worthwhile to consider this section in its entirety:

> 3.1 It is ETSI's objective to create STANDARDS and TECHNICAL SPECIFICATIONS that are based on solutions which best meet the technical objectives of the European telecommunications sector, as defined by the General Assembly. In order to further this objective *the ETSI IPR POLICY seeks to reduce the risk* to ETSI, MEMBERS, and others applying ETSI STANDARDS and TECHNICAL SPECIFICATIONS, *that investment*

92 *See Mobile Communications*, ETSI, https://www.etsi.org/technologies/mobile/mobile [https://perma.cc/TH5J-5UM7].

93 *See IEEE at a Glance*, IEEE, https://www.ieee.org/about/today/at-a-glance.html [https://perma.cc/FB52-XWUL].

94 *See, e.g.*, *In re* Innovatio IP Ventures, LLC Patent Litig., No. 11 C 9308, 2013 WL 5593609, at *2 (N.D. Ill. Oct. 3, 2013) (IEEE); Apple, Inc. v. Motorola Mobility, Inc., 886 F. Supp. 2d 1061, 1068 (W.D. Wis. 2012) (ETSI).

95 *See* European Telecomms. Standards Inst., ETSI Directives 39 (Apr. 9, 2019), https://portal.etsi.org/directives/40_directives_apr_2019.pdf [https://perma.cc/U5YG-4LFW].

> *in the preparation, adoption and application of STANDARDS could be wasted as a result of an ESSENTIAL IPR for a STANDARD or TECHNICAL SPECIFICATION being unavailable*. In achieving this objective, *the ETSI IPR POLICY seeks a balance between the needs of standardization for public use in the field of telecommunications and the rights of the owners of IPRs.*
>
> 3.2 IPR holders whether members of ETSI and their AFFILIATES or third parties, should be adequately and fairly rewarded for the use of their IPRs in the implementation of STANDARDS and TECHNICAL SPECIFICATIONS.
>
> 3.3 *ETSI shall take reasonable measures to ensure*, as far as possible, that its activities which relate to the preparation, adoption and application of STANDARDS and TECHNICAL SPECIFICATIONS, enable *STANDARDS and TECHNICAL SPECIFICATIONS to be available* to potential users in accordance with the general principles of standardization.[96]

ETSI's "Guide on IPRs" further explains that "[t]he Policy is intended to ensure that IPRs are identified in sufficient time to avoid wasting effort on the elaboration of a Deliverable which could subsequently be blocked by an Essential IPR."[97] ETSI participants foresaw that the use of patents to block the use of a standard would be counterproductive and indeed counter to the entire idea of an industry standard.[98] Thus, the IPR Policy focuses on the "availability" of ETSI standards.[99] Furthermore, ETSI highlights that any access that IPR holders provide should be "adequately and fairly rewarded,"[100] meaning that IPR holders are free to charge adequate and fair royalties (however one defines those terms).[101]

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96 *Id.* (emphasis added).

97 *Id.* at 56.

98 *See id.*

99 *See id.* at 39–40.

100 *Id.* at 39.

101 *See, e.g.*, Damien Geradin, *The Meaning of "Fair and Reasonable" in the Context of Third-Party Determination of FRAND Terms*, 21 GEO. MASON L. REV. 919, 922–23 (2014) ("[R]ewards will only be adequate and fair if they both compensate SEP holders for the risky research and development ('R&D') investments they have made to develop the technologies that form the standard . . . and also give SEP holders sufficient profit incentives to keep investing in the development of standardized technologies.").

2. Availability of Licenses

ETSI sets forth the procedures for licensing potentially essential patents in Clause 6 of its IPR Policy.[102] The first part of this clause is relevant to the analysis that follows. It states:

> 6.1 When an ESSENTIAL IPR relating to a particular STANDARD or TECHNICAL SPECIFICATION is brought to the attention of ETSI, the Director-General of ETSI shall immediately request the owner to give within three months an irrevocable undertaking in writing that it *is prepared to grant irrevocable licences on fair, reasonable and non-discriminatory ("FRAND") terms and conditions* under such IPR to at least the following extent:
>
> - MANUFACTURE, including the right to make or have made customized components and sub-systems to the licensee's own design for use in MANUFACTURE;
> - sell, lease, or otherwise dispose of EQUIPMENT so MANUFACTURED;
> - repair, use, or operate EQUIPMENT; and
> - use METHODS.
>
> The above undertaking may be made subject to the condition that those who seek licences agree to reciprocate.[103]

3. Discussion

The ETSI IPR Policy does not state any obligation to license each and every entity along the entire production chain. The policy merely asks that the patent owner agree "that it is prepared to grant irrevocable licenses," meaning that it will not simply keep its technology to itself and refuse to license anyone at all (as is the right of any patent holder absent a contrary commitment to an SDO).[104] That is, ETSI asks the patent owner to agree that it will not block access to the ETSI standard in question but will instead grant licenses, which it will not revoke, to standard implementers on FRAND terms and conditions.[105]

The ETSI IPR Policy does not state how many licenses the patent owner should grant, or to whom it should grant them. Indeed, in De-

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102 *See* EUROPEAN TELECOMMS. STANDARDS INST., *supra* note 95, at 39–40.

103 *Id.*

104 *Id.*

105 *See id.*

cember 2018, ETSI's Director General issued a statement clarifying this point: "The basic principle of the ETSI IPR regime remains Fair, Reasonable and Non-Discriminatory (FRAND) with no specific preference for any licensing model."[106] Rather, the ETSI policy defines the scope of the license rights in terms of the license's subject matter or field of use. Essentially, licensees should be granted at least the right to "MANUFACTURE . . . EQUIPMENT."[107] Words like these presented in all capital letters are defined within the policy.[108] In particular, "MANUFACTURE" is defined as the "production of EQUIPMENT."[109] In turn, "EQUIPMENT" is defined as "any system, or device fully conforming to a STANDARD."[110] Notably, the ETSI IPR Policy refers to "the right to make or have made customized components and sub-systems to the licensee's own design" as a right to be included in the right to "MANUFACTURE EQUIPMENT."[111] Thus, components and sub-systems are viewed as distinct from "EQUIPMENT," and are to be licensed only if they are of "the licensee's own design" and for the "MANUFACTURE" of "EQUIPMENT."[112] In short, SEP holders are asked to commit that they will grant licenses for the "MANUFACTURE" of only "fully conforming" devices and systems.[113]

In the context of ETSI documents and standards, conformance to a standard is defined by tests that validate the performance of infrastructure systems and end-user devices.[114] The language of the relevant technical standards documents shows that conformance applies to infrastructure and complete end-user devices, not components. For example, the mobile telecom standard UMTS defines a general architecture comprised of two "Domains": "User Equipment (UE)" and "Infrastructure."[115] In turn, the UE Domain is divided into two sub-

106 *See* Sophia Antipolis, *ETSI's Director General Issues Public Statement on IPR Policy*, ETSI (Dec. 3, 2018), https://www.etsi.org/newsroom/news/1458-etsi-s-director-general-issues-public-statement-on-ipr-policy [https://perma.cc/MY4W-UGAZ].

107 *Id.* at 40.

108 *Id.* at 39.

109 *Id.* at 45.

110 *Id.* at 44.

111 European Telecomms. Standards Inst., *supra* note 95, at 40, 45.

112 *Id.*

113 *Id.* at 44.

114 *See* European Telecomms. Standards Inst., Interoperability Best Practices 5–6 (2d ed.), https://portal.etsi.org/CTI/Downloads/ETSIApproach/IOT_Best_Practices.pdf [https://perma.cc/2TQV-Z8L8].

115 European Telecomms. Standards Inst., ETSI TS 123 101 v8.0.0: Universal Mobile Telecommunications System (UMTS); LTE; General UMTS Architecture (3GPP TS 23.101 version 8.0.0 Release 8), at 6–9 (2009), https://www.etsi.org/deliver/etsi_ts/123100_

Domains: "Mobile Equipment" and "USIM," the latter of which covers SIM cards.[116] The standard does not define a Domain for components of mobile equipment such as smartphones. Components of smartphones, such as chipsets do not "fully conform" to the standard, as they are not even discussed in the standard. Therefore, the commitment to grant licenses for the "MANUFACTURE" of "fully conforming" devices and systems, logically, does not include a commitment to license chipsets or other components of smartphones.

Moreover, no specific commercial terms for licenses are set forth in the ETSI IPR Policy. Indeed, ETSI specifically states that commercial terms are not discussed within the ETSI IPR Policy itself.[117] Those terms are to be negotiated bilaterally between each SEP holder and potential licensee.[118] Thus the ETSI IPR Policy (like most IPR policies) leaves the contours of FRAND terms and conditions undefined.

B. The Institute of Electrical and Electronics Engineers ("IEEE")

The other important SDO for the license-to-all debate is the IEEE Standards Association. Its Patent Policy differs significantly from ETSI's IPR Policy as a result of a major revision to IEEE's Policy that occurred in 2015.[119] This Section focuses on IEEE's current policy.

1. Licensing Policy

Under section 6.2 of its Patent Policy, IEEE states the following:

> IEEE standards may be drafted in terms that include the use of Essential Patent Claims. If the IEEE receives notice that a [Proposed] IEEE Standard may require the use of a potential Essential Patent Claim, the IEEE shall request licensing

123199/123101/08.00.00_60/ts_123101v080000p.pdf [https://perma.cc/4JRZ-ST56]. 3GPP is a global umbrella organization that includes ETSI. *About 3GPP*, 3GPP, https://www.3gpp.org/about-3gpp [https://perma.cc/5AX6-4WUU].

116 *See* EUROPEAN TELECOMMS. STANDARDS INST., *supra* note 115, at 7–8.

117 EUROPEAN TELECOMMS. STANDARDS INST., *supra* note 95, at 68 ("Specific licensing terms and negotiations are commercial issues between the companies and shall not be addressed within ETSI.").

118 *See id.*

119 *See IEEE Statement Regarding Updating of its Standards-Related Patent Policy*, IEEE (Feb. 8, 2015), https://web.archive.org/web/20200128025125/https://www.ieee.org/about/news/2015/patent-policy.html [https://perma.cc/6NY3-CJNC]; *see also* 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 [SDOs]) took no position on how to calculate a FRAND royalty. In February 2015, the IEEE reversed its policy and became the first [SDO] to regulate the calculation of FRAND royalties.").

> assurance, on the IEEE-SA Standards Board approved Letter of Assurance form, from the patent holder or patent applicant. The IEEE shall request this assurance without coercion.[120]

The policy then goes on to set the terms by which a submitter of a Letter of Assurance ("LOA") must offer any licenses:

> The licensing assurance shall be either:
>
> a) A general disclaimer to the effect that the Submitter without conditions will not enforce any present or future Essential Patent Claims against any person or entity making, having made, using, selling, offering to sell, or importing any Compliant Implementation that practices the Essential Patent Claims for use in conforming with the IEEE Standard; or,
>
> b) A statement that the Submitter will make available a license for Essential Patent Claims to an unrestricted number of Applicants on a worldwide basis without compensation or under Reasonable Rates, with other reasonable terms and conditions that are demonstrably free of any unfair discrimination to make, have made, use, sell, offer to sell, or *import any Compliant Implementation that practices the Essential Patent Claims for use in conforming with the IEEE Standard*. An Accepted LOA that contains such a statement signifies that reasonable terms and conditions, including without compensation or under Reasonable Rates, are sufficient compensation for a license to use those Essential Patent Claims and precludes seeking, or seeking to enforce, a Prohibitive Order except as provided in this policy.[121]

As with the ETSI IPR Policy, the capitalized terms are specifically defined within IEEE's Patent Policy;[122] the definitions, however, are in several instances quite different from ETSI's. In particular, IEEE defines "Compliant Implementation" as "any product (e.g., component, sub-assembly, or end-product) or service that conforms to any mandatory or optional portion of a normative clause of an IEEE

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120 INST. OF ELEC. & ELECS. ENG'RS, IEEE-SA STANDARDS BOARD BYLAWS 2 (2015), https://standards.ieee.org/content/dam/ieee-standards/standards/web/documents/other/approved-changes.pdf?_ga=2.253899336.1993707867.1578516919-579556728.1578516919 [https://perma.cc/Z3KK-FSFV] (brackets in original).

121 *Id.* at 3 (emphasis added).

122 *Id.* at 1–2.

Standard."[123] This contrasts with ETSI's requirement that equipment be "fully conforming to a STANDARD."[124]

IEEE's "Reasonable Rates" term also takes a more stringent approach than ETSI's, with the following elements required:

> "*Reasonable Rate*" shall mean 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. In addition, determination of such Reasonable Rates should include, but need not be limited to, the consideration of:
>
> - The value that the functionality of the claimed invention or inventive feature within the Essential Patent Claim contributes to the value of the relevant functionality of the smallest saleable Compliant Implementation that practices the Essential Patent Claim.
> - The value that the Essential Patent Claim contributes to the smallest saleable Compliant Implementation that practices that claim, in light of the value contributed by all Essential Patent Claims for the same IEEE Standard practiced in that Compliant Implementation.
> - Existing licenses covering use of the Essential Patent Claim, where such licenses were not obtained under the explicit or implicit threat of a Prohibitive Order, and where the circumstances and resulting licenses are otherwise sufficiently comparable to the circumstances of the contemplated license.[125]

Notwithstanding the particular licensing rules laid out above, IEEE states in its policy that "[n]othing in this policy shall preclude a licensor and licensee from voluntarily negotiating any license under terms mutually agreeable to both parties."[126] And, further, the IEEE Policy states that

> The Submitter and the Applicant should engage in good faith negotiations (if sought by either party) without unreasonable delay or may litigate or, with the parties' mutual agreement, arbitrate: over patent validity, enforceability, essentiality, or infringement; Reasonable Rates or other rea-

123 *Id.* at 1.

124 EUROPEAN TELECOMMS. STANDARDS INST., *supra* note 95, at 44.

125 INST. OF ELEC. & ELECS. ENG'RS, *supra* note 120, at 2.

126 *Id.* at 4.

> sonable licensing terms and conditions; compensation for unpaid past royalties or a future royalty rate; any defenses or counterclaims; or any other related issues.[127]

2. *Discussion*

The IEEE Patent Policy does not expressly state any obligation to license each and every entity along the entire production chain. But the IEEE Patent Policy differs from the ETSI IPR Policy in a number of ways. For one, it states that the patent holder must make licenses available to an unrestricted number of applicants.[128] More importantly, it defines the scope of the license rights to be granted as covering any "Compliant Implementation"—a term that is defined to include components, sub-assemblies, and end-products.[129] This is a fundamental difference from the ETSI IPR Policy.[130]

Further, the IEEE Patent Policy, unlike the ETSI IPR Policy, attempts to add some specificity to the idea of FRAND terms and conditions by identifying factors to be considered in determining reasonable rates.[131] Notably, while the ETSI IPR Policy expressly avoids any discussion of commercial terms, the IEEE Patent Policy invokes the SSPPU approach for determining patent infringement damages directly within its IPR rules.[132]

Perhaps not surprisingly, IEEE's adoption of the above rules in 2015 was quite controversial. Since the adoption, some members have submitted so-called "negative LOAs" in which they decline to provide a licensing assurance pursuant to IEEE's Reasonable Rate guidelines and instead agree to make licenses available pursuant to a less rigid definition of FRAND.[133] The option to deviate from IEEE's Reasonable Rate guidelines has been available on IEEE's LOA form for many

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127 *Id.*

128 *See id.* at 3.

129 *See id.* at 1, 3.

130 *See supra* Section II.A.3.

131 *See* INST. OF ELEC. & ELECS. ENG'RS, *supra* note 120, at 2.

132 *See id.* ("[D]etermination of such Reasonable Rates should include . . . the consideration of[ ] [t]he value that the functionality of the claimed invention or inventive feature within the Essential Patent Claim contributes to the value of the relevant functionality of the smallest saleable Compliant Implementation that practices the Essential Patent Claim.").

133 *See* Kirti Gupta & Georgios Effraimidis, IEEE Patent Policy Revisions: An Empirical Examination of Impact 14–15 (May 23, 2018) (unpublished manuscript), https://ssrn.com/abstract=3173799 [https://perma.cc/M8CV-ZA4A].

years, but in the wake of the policy change, more members appear to have taken advantage of it.[134]

III. A Law and Economics Review of "License to All"

A. *Legal Analysis of the License-to-All Argument*

As noted at the outset of this article, proponents of the "license-to-all" position generally make two related contentions. First, they assert that all entities in the chain of production of standardized products need licenses to SEPs to be able to participate in the relevant industries.[135] Second, they argue that, because of the supposed need for licenses, SDO policies require SEP holders to grant licenses to all comers for all purposes.[136] As a legal matter, the first of these contentions is untenable.[137] As for the second, what exactly a particular SDO policy requires of SEP holders is a question of contract interpretation, which depends on the language of the particular policy at issue.[138] An across-the-board, generic interpretation of FRAND obligations is not possible.

1. *Are SEP Licenses Needed by All?*

It is not the case, either legally or practically, that all entities in the chain of production require SEP licenses. As a legal matter, there simply is no law that requires anyone to take a license under any patent. There is no requirement in patent law for a potential infringer to sign a license. There are, however, potential consequences for declining to take a license, as discussed in greater depth below.

Licenses are also not required as a practical, technical matter to make standard compliant products. As noted above, a patent license is not equivalent to know-how—it is not the proverbial "formula for Coke."[139] A license does not endow the licensee with the technical ability to manufacture a commercial product or carry out an industrial process.[140] A patent license merely gives the licensee a pass on claims of patent infringement from the licensor.[141] It is perfectly possible for a company with sufficient resources and expertise to design and man-

134 *See, e.g.*, *id.* at 21–22 (showing an increase in negative LOAs for 802.11 SEPs beginning in 2015).

135 *See supra* text accompanying note 4.

136 *See supra* text accompanying note 5.

137 *See supra* Section I.C.

138 *See supra* text accompanying notes 86–91.

139 *See supra* text accompanying note 56.

140 *See supra* text accompanying note 56.

141 *See supra* text accompanying notes 45–46.

ufacture products of all sorts without any patent licenses. This is particularly true in the realm of industry standards, because the standards' specifications give detailed descriptions of each element of the standard.[142] Thus, as a practical matter, patent licenses are unequivocally not required.

But, as noted above, patent licenses are all about risk management. So, the question remains: Are manufacturers up and down the chain of production exposed to risks of patent infringement claims by SEP holders such that they would be well-advised to take licenses? To answer this question, one needs to ask which patents could be asserted against which players in the industry. As an initial matter, an upstream supplier might not infringe any relevant SEPs. Consider the widget and device example presented above.[143] Assume further that the hypothetical device complies with a given standard, and widgets incorporated into such devices contribute in some way to the overall functioning of devices but do not themselves fully practice the standard. In this hypothetical, it may well be that many patents essential to the standard are infringed by devices but not by widgets. A manufacturer who supplies widgets to device makers (and does not itself make devices) does not directly infringe device-level SEPs.[144] As a matter of patent law, a widget manufacturer may have no need for a license to device SEPs because the device makers would be the logical licensees. The widget maker should be primarily concerned with SEPs that read on widgets (if there are any).

Now assume there are some SEPs under the relevant standard that read specifically on widgets. How much risk does a widget maker face if it does not have a license under those SEPs? The answer is that it depends. If the widget maker's device manufacturer customers are licensed, the widget maker may have little or no risk. One might argue that an implementer cannot knowingly choose to ignore SEPs without running the risk of being tagged as an "unwilling licensee," with the attendant risk of an injunction or enhanced damages.[145] But an implementer does not need to *seek out* SEP licenses to show good faith.

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142 *See, e.g.*, EUROPEAN TELECOMMS. STANDARDS INST., *supra* note 95, at 39 (describing ETSI's measures for preparing, adopting, and applying standards or technical specifications); *see also supra* Section II.A.1 (same).

143 *See supra* Section I.A.

144 *See supra* Section I.A.

145 *See, e.g.*, *In re* Qualcomm Litig., No. 3:17-cv-108-GPC-MDD, 2019 WL 7834768, at *7 (S.D. Cal. Mar. 20, 2019) (allowing Qualcomm's claim to proceed for a "declaration that Apple has engaged in conduct that constitutes unreasonable holdout behavior and demonstrate that it is an unwilling licensee").

Rather, in typical negotiations, implementers merely have to *respond* to SEP owners' FRAND offers.[146] So long as implementers respond in a timely and good faith manner, they should have little or no concern about being deemed an "unwilling licensee."[147] Indeed, this is the process that is envisioned by the world's leading case on the subject, the European Court of Justice's decision in *Huawei Technologies Co. v. ZTE Corp*.[148] Courts in the United States would likely take a similar view.[149] Since many SEP owners (like patent owners more generally) choose not to assert their patents (some patent holders use their patents only defensively—that is, they will sue only if sued),[150] implementers can safely wait to be contacted by SEP owners, and only then engage in licensing negotiations

In reality, the level of risk in not having a license depends on who owns the SEPs and what their licensing practices are. If all the relevant SEPs are held by an entity that does not seek to enforce its patents, then there is no risk to the widget maker. Similarly, if all the relevant SEPs are owned by an entity that chooses to monetize its

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146 *See* Case C-170/13, Huawei Techs. Co. v. ZTE Corp., ECLI:EU:C:2015:477, ¶¶ 60–64 (July 16, 2015).

147 *See id.* ¶¶ 65–68.

148 Case C-170/13, Huawei Techs. Co. v. ZTE Corp., ECLI:EU:C:2015:477, ¶ 71 (July 16, 2015). The U.K. Court of Appeal also focused on FRAND as a good faith process, rather than simply a range of royalty rates. *See* Unwired Planet Int'l Ltd. v. Huawei Techs. Co. [2018] EWCA (Civ) 2344 [266]–[267], [285] (Eng.). And ETSI's IPR Policy, particularly section 3.1, also makes the two-sided nature of good faith bargaining clear. *See* EUROPEAN TELECOMMS. STANDARDS INST., *supra* note 95, at 39.

149 *See, e.g.*, u-blox AG v. InterDigital, Inc., No. 3:19-cv-001-CAB-(BLM), 2019 WL 1574322, at *3 (S.D. Cal. Apr. 11, 2019) ("While InterDigital has introduced evidence outside of the pleadings that u-blox did not negotiate in good faith, u-blox has introduced evidence and has alleged in the Complaint that it did. . . . [T]here is a triable issue as to whether u-blox negotiated in good faith." (citations omitted)); TCL Commc'n Tech. Holdings, Ltd. v. Telefonaktiebolaget LM Ericsson, Nos. SACV 14-341 JVS(DFMx), CV 15-2370 JVS(DFMx), 2018 WL 4488286, at *55 (C.D. Cal. Sept. 14, 2018), *vacated and rev'd on other grounds*, 943 F.3d 1360 (Fed. Cir. 2019) ("In assessing the breach of contract claim, the parties focus on two components: the mutual duty of the parties to negotiate in good faith and the duty to offer a rate which are in fact FRAND."); Apple Inc. v. Qualcomm Inc., No. 3:17-cv-00108-GPC-MDD, 2017 WL 3966944, at *10 n.7 (S.D. Cal. Sept. 7, 2017) ("Of course, if Apple wishes to enforce Qualcomm's commitment to ETSI it must demonstrate that it was a willing licensee and, therefore, a proper third-party beneficiary."); Ericsson Inc. v. D-Link Sys., Inc., No. 6:10–CV–473, 2013 WL 4046225, at *25 (E.D. Tex. Aug. 6, 2013) (licensing commitments are "a two-way street"), *aff'd in part, vacated in part, and rev'd in part*, 773 F.3d 1201 (Fed. Cir. 2014).

150 *E.g.*, Danny Nelson, *Blockstack Pledges to Enforce Patents for 'Defensive Purposes' Only*, COINDESK (Apr. 28, 2020, 6:16 PM), https://www.coindesk.com/blockstack-pledges-to-enforce-patents-for-defensive-purposes-only [https://perma.cc/N7QB-7ARG] (discussing that the firm Blockstack declared that it will "enforce its patents 'for defensive purposes only'" (quoting Interview by CoinDesk with Muneeb Ali, Chief Exec. Officer, Blockstack)).

patents only at the device level by licensing and charging royalties to device makers, then, again, there is no risk to the widget maker.[151] The SEP holder's business model depends on licensing device makers in this hypothetical. It has no interest in pursuing widget makers and, as a result, will not contact widget makers with opening FRAND offers. Indeed, because of the law of patent exhaustion, trying to obtain royalties from widget makers would be detrimental to the SEP holder's chosen device-level licensing program because it could be forced to give up those device-level royalties, at least in part, for any device makers supplied by a licensed widget maker.[152]

The most likely scenario for component-level implementers, though, is that the relevant SEPs are owned by a number of entities with differing policies and practices.[153] In this case, the widget maker could proactively identify the SEP owners—a matter of public record[154]—and ascertain which, if any, pose a significant threat of asserting patent infringement claims. In practice, this is often well known in the relevant industry. The more salient point, however, is that patent holders seeking to monetize their patents have to identify themselves to make their claims,[155] reinforcing the point that widget makers can simply wait to be contacted with opening FRAND offers. Once the relevant set of SEP holders has been self-identified through such offers, the widget maker simply needs to negotiate licenses with that narrower set of SEP holders in good faith.

Note that it is certainly *not* true that the widget maker always needs licenses to *all* SEPs or from *all* SEP holders. Critically, any individual SEP holder can remove the risk of infringement for widget makers by adopting a policy of not asserting its SEPs against them.[156] In short, there is no legal or practical basis for the blanket claim that all entities in the chain of production need patent licenses or face meaningful risks by not proactively seeking them. Thus, to the extent that the license-to-all argument depends on an assumption that all entities in a production chain absolutely require licenses to SEPs, that predicate is false.

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151 *See supra* Section I.B.

152 *See supra* Section I.C.

153 *See* Blecker et al., *supra* note 12, at 224–25.

154 *See* 69 C.J.S. PATENTS § 235 (2020).

155 *See id.* § 583.

156 *See supra* Section I.B.

2. *Do SDO Policies Require Licenses for All Entities (and All Purposes)?*

Proponents of license-to-all may reply that they should not have to rely on the (possibly changeable) non-assertion policies of SEP holders and that, for this reason, SDOs' IPR policies require SEP holders to grant a license to anyone who requests one, and for any scope desired by the requester.[157] Because FRAND commitments are contractual, whether the license-to-all claim holds water is a question of what the relevant contracts say and an inquiry subject to the usual rules of contract law.[158]

When interpreting a contract, one must in every case begin by looking at the language of the relevant contract to discern the parties' intent.[159] The relevant contract language varies depending on the specific SDO at issue.[160] Thus, there is no such thing as an abstract FRAND obligation that applies in all cases.

For example, the ETSI IPR Policy contains no provision that requires an SEP holder to grant licenses to all.[161] Rather, an entity that declares a patent potentially essential to an ETSI standard is asked to commit that "it is prepared to grant irrevocable licences."[162] This language indicates that the patent holder is asked to state that it will not keep its patented invention exclusively to itself (as it would otherwise be entitled to do). And the patent holder is prepared to grant "licences," plural,[163] meaning that it will not restrict its licensing to a single exclusive licensee (again, as it otherwise would be entitled to do). Nothing in the ETSI IPR Policy says that the patent holder will grant licenses to anyone and everyone who asks.[164]

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157 *See generally* Martinez, *supra* note 4, at 644 ("Since 'Non-Discrimination' is understood as not treating different categories of parties in a 'significantly different manner,' 'License to All' supporters conclude that SEP holders cannot exclude any category of licensee, for instance, component manufacturers, from the right to get a licence. This approach is, in their view, also confirmed by the fact that the ETSI IPR licensing declaration form does not include exceptions for different categories of licensees." (footnote and citation omitted)).

158 *See supra* Section I.D.

159 *See* M&G Polymers USA, LLC v. Tackett, 574 U.S. 427, 435 (2015).

160 *See supra* Part II.

161 *See supra* Section II.A.

162 EUROPEAN TELECOMMS. STANDARDS INST., *supra* note 95, at 39–40.

163 *Id.*

164 The authors wish to note, for clarity, that the contractual documents at issue would include not only the SDO policy documents, but also the declaration(s) made by the SEP holder to the SDO. In a particular case, the language used in those declarations could be important. This Article simply assumes that the SEP holder made a declaration fully consistent with the language of the relevant SDO policy.

Even if one were inclined to read the words "prepared to grant irrevocable licences"[165] to mean "agrees to grant irrevocable licences to any and all who request licences," there is a further qualification in the ETSI IPR Policy: the field of use. The patent holder is asked to state that it is prepared to grant licenses "at least" to manufacture fully standard-compliant devices.[166] The patent holder may, but need not, offer broader licenses.[167] There is no requirement in the ETSI IPR Policy that a patent holder grant licenses for the manufacture of components.[168] Thus, even if a widget maker were entitled to demand and receive a license to SEPs under the ETSI IPR Policy, the patent holder could determine the scope of that license and could satisfy its obligation under the Policy by granting the widget maker a license to make end-user devices—not widgets. This simply reinforces the idea that the obligation to grant licenses under the ETSI IPR Policy is a qualified one. It is not an obligation to grant a license for all purposes to anyone who asks.

Further confirmation of this interpretation can be found in the ETSI IPR Policy's statement of its objectives. Clause 3.1 of the policy states the goal of reducing the risk that the investment in developing a standard "could be wasted as a result of [essential patents] being unavailable."[169] The policy also states as one of its objectives that patent holders "should be adequately and fairly rewarded for the use of their" patents.[170] The policy seeks to further both of these somewhat opposing aims. The policy avoids the risk that essential patents might be unavailable, and that investments might then be wasted, by asking SEP holders to make licenses available for the manufacture of standard-compliant devices.[171] Manufacturers of standardized devices, thus, will be authorized to make and sell their products, and the standard therefore can be commercialized. At the same time, the policy allows SEP holders to earn "adequate and fair" compensation for the use of their patents, in that it does not impose overly broad licensing requirements.[172] In particular, it does not require them to license upstream suppliers of components, which could create exhaustion issues

165 *See* EUROPEAN TELECOMMS. STANDARDS INST., *supra* note 95, at 39–40.

166 *Id.* at 40; *see also supra* Section II.A.3 (discussing the ETSI IPR Policy).

167 *See* EUROPEAN TELECOMMS. STANDARDS INST., *supra* note 95, at 40.

168 *See id.*

169 *Id.* at 39.

170 *Id.*

171 *See id.* at 39–40.

172 *See id.*

that would negatively impact SEP holders' efforts to monetize their patents.[173]

To the extent, if at all, that evidence extrinsic to the ETSI IPR Policy itself may be considered relevant, one need not look any further than ETSI's "Guide on IPRs."[174] The Guide confirms that the purpose of the ESTI IPR Policy is to avoid situations where lack of access to SEPs may "block" the implementation of a standard while not interfering with patent holders' rights to fair compensation.[175] This is accomplished by requesting specific, circumscribed licensing commitments from SEP holders.[176]

It is clear that the intent of the ETSI IPR Policy is only to require licensing the manufacture of standard-compliant devices, not upstream components. The ETSI IPR Policy does not impose a blanket obligation to license anyone who asks, for whatever scope they may request.

IEEE's Patent Policy takes a different tack. The IEEE Policy requests LOAs that would expressly require holders of SEPs to grant licenses "to make, have made, use, sell, offer to sell, or import any Compliant Implementation."[177] IEEE defines "Compliant Implementation" to include "any product (e.g., component, sub-assembly, or end-product) or service that conforms to any mandatory or optional portion of a normative clause of an IEEE Standard."[178] Components are expressly included, and rather than ETSI's "fully conforming to a STANDARD," IEEE refers to conformance with any "portion . . . of a . . . clause of an IEEE standard."[179] This is a far broader statement than anything in the ETSI IPR Policy and appears to seek to impose a requirement to grant licenses to any standard implementer who asks for a field of use that includes manufacturing any component that conforms with any portion of an IEEE standard. Even so, to understand a given patent owner's commitment under the IEEE Policy, the specific LOAs provided must be reviewed because a "negative LOA" would not bind the SEP holder in the same way as a "positive" one presumably would.[180]

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173 *See supra* Section I.C.

174 EUROPEAN TELECOMMS. STANDARDS INST., *supra* note 95, at 56.

175 *See id.*

176 *See id.* at 57.

177 INST. OF ELEC. & ELECS. ENG'RS, *supra* note 120, at 3.

178 *Id.* at 1.

179 *Compare* EUROPEAN TELECOMMS. STANDARDS INST., *supra* note 95, at 44, *with* IEEE, *supra* note 120, at 1.

180 *See* Gupta & Effraimidis, *supra* note 133, at 14–15.

In sum, whether an SEP holder's FRAND commitments require it to grant licenses to all comers, and for all purposes, is very much a question that depends on the language of the relevant FRAND policy and the specific individual commitments made to an SDO. The IEEE Patent Policy can be read as supporting a broad obligation. The ETSI IPR Policy, on the other hand, cannot.

3. Arguments Based on Antitrust Law

A full discussion of potential antitrust issues is beyond the scope of this Article. It is, however, important to note that some parties have argued that antitrust law may impose a duty to license all comers to FRAND-committed SEPs, or at least that a refusal to grant licenses to those SEPs could, in certain circumstances, lead to an antitrust violation.[181] While there is no support for compulsory licensing in American law, except in the narrowest of circumstances,[182] a number of theories have been advanced concerning circumstances in which antitrust liability under section 2 of the Sherman Act[183] might attach for failure to license a FRAND-committed SEP.

For example, it has been argued that when an SEP holder promises to grant licenses to its SEPs but then refuses to do so, there may be a claim for monopolization based on an "intentionally false promise."[184] In *Broadcom Corp. v. Qualcomm Inc.*,[185] the Third Circuit allowed such a claim to withstand a motion to dismiss where the plaintiff alleged: "(1) . . . a consensus-oriented private standard-setting environment, (2) a patent holder's intentionally false promise to license essential proprietary technology on FRAND terms, (3) . . . an SDO's reliance on that promise when including the technology in a standard, and (4) the patent holder's subsequent breach of that promise."[186] But as the Ninth Circuit recently explained in *FTC v.*

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181 *See, e.g.*, Brief for Appellee at 69, FTC v. Qualcomm Inc., No. 19-16122 (9th Cir. Aug. 11, 2020) ("[A] monopolist SEP holder" may commit an antitrust violation when it "commits to license its rivals on FRAND terms, and then implements a blanket policy of refusing to license those rivals on any terms, with the effect of substantially contributing to the acquisition or maintenance of monopoly power in the relevant market.").

182 Only a handful of American laws permit compulsory licensing of intellectual property rights: the Plant Variety Protection Act, 7 U.S.C. §§ 2402–2404 (2018); the Copyright Act of 1976, 17 U.S.C. §§ 111, 115–116, 118 (2018); the Atomic Energy Act of 1954, 42 U.S.C. § 2183 (2018); and the Clean Air Act of 1970, 42 U.S.C. § 7608 (2018).

183 Sherman Antitrust Act of 1890 § 2, 15 U.S.C. §§ 1–7 (2018).

184 Broadcom Corp. v. Qualcomm Inc., 501 F.3d 297, 314 (3d Cir. 2007).

185 501 F.3d 297 (3d Cir. 2007).

186 *Id.* at 314. Proving an intentionally false promise can be quite difficult. Allegations of mere breach of FRAND obligations are insufficient. *See, e.g.*, TCL Commc'ns Tech. Holdings,

Qualcomm Inc.,[187] the mere fact that a patent holder declined to license a subset of potential users of its technology without a finding of intentional deception does not fall within the Third Circuit's "false promise" holding.[188] Thus, *Broadcom* does not stand for the general proposition that holders of FRAND-committed SEPs must license all comers

Moreover, as the D.C. Circuit held in *Rambus, Inc. v. FTC*,[189] deceitful conduct of the type alleged in *Broadcom* is not actionable as an antitrust violation absent exclusion of rivals.[190] The D.C. Circuit cited *NYNEX Corp. v. Discon, Inc.*[191] for the proposition that "an otherwise lawful monopolist's use of deception simply to obtain higher prices normally has no particular tendency to exclude rivals and thus to diminish competition."[192] Lacking any allegations of exclusion, the D.C. Circuit went on to comment that the Third Circuit's decision in *Broadcom* "may have rested on a supposition that there is a cognizable violation of the Sherman Act when a lawful monopolist's deceit has the effect of raising prices (without an effect on competitive structure), [in which case] it conflicts with *NYNEX*."[193]

Another angle that has been considered is a claim of "refusal to deal" under *Aspen Skiing Co. v. Aspen Highlands Skiing Corp*.[194] In that case the Supreme Court held that Aspen Skiing's refusal to deal with Aspen Highlands was properly found to be exclusionary conduct under section 2 of the Sherman Act.[195] The Court held that Aspen Skiing's decision, as the owner of three ski facilities, to discontinue a popular ticket that provided for access to all four major ski facilities in Aspen, Colorado and its refusal to cooperate with Aspen Highlands on a replacement four-mountain ticket program harmed consumers, harmed Aspen Highlands, and was intended to reduce competition.[196]

Ltd. v. Telefonaktienbolaget LM Ericsson, No. SACV 14–0341 JVS (DFMx), 2016 WL 7049263, at *4–6 (C.D. Cal. Aug. 9, 2016) (granting summary judgment against TCL's claim that Ericsson violated California's Unfair Competition Law by making an "intentionally false promise" regarding its FRAND obligations because "TCL does not identify even innuendo of Ericsson making intentionally false promises to ETSI").

187 No. 19-16122 (9th Cir. Aug. 11, 2020).

188 See id. at 38–39.

189 522 F.3d 456 (D.C. Cir. 2008).

190 *See id.* at 464–67.

191 525 U.S. 128 (1998).

192 *Rambus*, 522 F.3d at 464.

193 *Id.* at 466.

194 472 U.S. 585, 604–05 (1985).

195 *See id.* at 611; 15 U.S.C. § 2 (2018).

196 *See Aspen Skiing*, 472 U.S. at 605–11.

The *Aspen Skiing* decision has been controversial in the world of antitrust law because it runs counter to traditional American notions of competition and freedom of contract. Competing firms are expected to work *against* one another and are not generally required to cooperate. The Supreme Court itself has explained that "as a general matter, the Sherman Act 'does not restrict the long recognized right of [a] trader or manufacturer engaged in an entirely private business, freely to exercise his own independent discretion as to parties with whom he will deal.'"[197] *Aspen Skiing* stands as a "limited exception" to that general rule, based on the unusual facts of the case that suggested that the defendant ceased a voluntary course of conduct, sacrificing short-term profits, to achieve a long-term anticompetitive end.[198] In other words, firms do not generally have any duty to help their competitors and "*Aspen Skiing* is at or near the outer boundary of [Sherman Act] § 2 liability."[199] For these reasons, "refusal to deal" claims based on *Aspen Skiing* succeed rarely, if ever.[200] Indeed, in *FTC v. Qualcomm Inc.*,[201] the district court held Qualcomm liable under the Sherman Act for refusing to license rival chipmakers, based in part, on *Aspen Skiing*.[202] The Ninth Circuit reversed, holding that "none of the required elements for the *Aspen Skiing* exception are present," and therefore Qualcomm was "under no antitrust duty to license rival chip suppliers."[203] Notably, even the FTC—the plaintiff in the case—conceded that the district court's application of *Aspen Skiing* was erroneous.[204]

Finally, the FTC has argued that Sherman Act section 2 liability applies where "a monopolist SEP holder commits to license its rivals

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197 Verizon Commc'ns Inc. v. Law Offices of Curtis V. Trinko, LLP, 540 U.S. 398, 408 (2004) (quoting United States v. Colgate & Co., 250 U.S. 300, 307 (1919)).

198 *Id.* at 409.

199 *Id.*

200 *See* Howard A. Shelanski, *Unilateral Refusals to Deal in Intellectual and Other Property*, 76 ANTITRUST L.J. 369, 393 (2009) ("There have been relatively few successful claims for refusal-to-deal liability . . . ."); *see also* Barry Nigro, Deputy Assistant Attorney Gen., U.S. Dep't of Justice, Remarks at The Capitol Forum and CQ's Fourth Annual Tech, Media & Telecom Competition Conference (Dec. 13, 2017), https://www.justice.gov/opa/speech/deputy-assistant-attorney-general-barry-nigro-delivers-remarks-capitol-forum-and-cqs [https://perma.cc/L7RX-8NEE] ("Decades since *Aspen Skiing*, courts have moved away from section 2 liability for unilateral refusals to deal, an evolution that culminated in the Supreme Court's 2004 Trinko decision. . . . Since Trinko, valid unilateral refusal to deal claims have been very rare, and for good reason.").

201 411 F. Supp. 3d 658 (N.D. Cal. 2019), *rev'd and vacated*, No. 19-16122 (9th Cir. Aug. 11, 2020).

202 *See id.* at 758–62.

203 *See FTC v. Qualcomm*, slip op. at 35–36, 56.

204 *See id.* at 33.

on FRAND terms, and then implements a blanket policy of refusing to license those rivals on any terms, with the effect of substantially contributing to the acquisition or maintenance of monopoly power in the relevant market."[205] This argument appears to be a hybrid of the "intentionally false promise" theory (without requiring evidence of any intentionally false statement) and the "refusal to deal" theory (without satisfying the requirements of *Aspen Skiing*). The FTC's theory was rejected by the Ninth Circuit in *FTC v. Qualcomm.*[206]

Under any Sherman Act section 2 theory, a plaintiff would have to demonstrate that a refusal to license an SEP actually had the effect of excluding the plaintiff from a relevant market.[207] For the reasons mentioned above, the mere lack of a patent license is not exclusionary. A firm *can* manufacture its products without a license, and in many circumstances, the risk of doing so is negligible.[208] Even if sued for infringement, in most cases the implementer would, at worst, only be required to pay a FRAND royalty.[209]

So long as the SEP holder has afforded others the freedom to participate in the manufacture of devices compliant with the relevant standard (for example, by licensing end-user device makers and not asserting patent infringement claims against widget makers), there would be no exclusion. It is, thus, not correct to argue that an SEP holder must grant licenses to all to avoid section 2 liability.

B. Important Economic Issues

Separate from any legal arguments relating to a license-to-all interpretation of FRAND, important economic factors should be considered as well. This is especially so because the ultimate goal of the patent system is "[t]o promote the Progress of Science and useful Arts."[210] Thus, an assessment of how a license-to-all regime would affect economic incentives to create and invest in new inventions needs

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205 Brief for Appellee at 69, *FTC v. Qualcomm*.

206 *See FTC v. Qualcomm*, slip op. at 33–36.

207 *See id.* at 29–31, 48–49, 56; United States v. Microsoft Corp., 253 F.3d 34, 50–51 (D.C. Cir. 2001).

208 *See supra* Section III.A.1.

209 In practice, the owner of a FRAND-committed patent will need to make an offer of a license on FRAND terms and conditions to the alleged infringer prior to, or contemporaneously with, commencing patent infringement litigation. Absent unusual circumstances, it will be challenging for the patent owner to prove that it is entitled to any remedy other than damages, and the measure of damages will be a royalty determined by the court to be consistent with the patent owner's FRAND commitment.

210 U.S. CONST. art. I, § 8, cl. 8.

to be part of the calculus for whether such a regime would be sound policy.

The most important issue is how a license-to-all rule could affect the expected return on investment ("ROI") for SEPs. The call for licensing component makers in place of end-product makers is ostensibly based on the notion that limiting the royalty base will better capture the value of using the SEP technologies. Put differently, the arguments in support of a license-to-all FRAND interpretation assume that SEP holders will be overcompensated if FRAND rates are set at the end-product level.[211] To determine the impact of imposing license-to-all, one therefore needs to ask whether the overcompensation assumption is warranted.

The answer depends on the specific circumstances at hand and cannot be answered in the abstract. Consider, for example, patented technology that improves the life of a battery, say by regulating when a mobile device's screen switches into sleep mode.[212] Modern smartphones and tablets typically contain proximity sensors that can tell when the device is held near to the user's body, like when the phone is in call mode and held close to the head.[213] Other sensors are triggered as the phone is lifted upright.[214] These various sensors communicate with the device processors, causing the screen to light or dim or radio transmission power to adjust, among other things.[215] For technology of this sort, no single component of the device captures the full functionality of the invention. And the value of the technology to the device maker is commensurate with the value to the end user because this dictates how much the device maker can increase the price customers pay for the end-user device.[216]

Questions of how the technology is deployed are important because they relate directly to the value that users obtain from the technology and hence what device makers can earn from the technology's use. Components, particularly semiconductor chips, are often sold as

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211 *See* Martinez, *supra* note 4, at 649.

212 *See* U.S. Patent No. 6,999,800 B2 col. 1 (filed July 1, 2003).

213 *See* David Nield, *All the Sensors in Your Smartphone, and How They Work*, GIZMODO (July 23, 2017, 11:49 AM), https://gizmodo.com/all-the-sensors-in-your-smartphone-and-how-they-work-1797121002 [https://perma.cc/U28W-4TRL].

214 *See id.*

215 *See, e.g.*, Andrew Bookholt, *iPhone 4 Gyroscope Teardown*, IFIXIT (Sept. 16, 2019, 12:59 PM), https://ifixit-guide-pdfs.s3.amazonaws.com/pdf/ifixit/guide_3156_en.pdf [https://perma.cc/WRQ6-PWCT] (describing how the iPhone gyroscope works and interacts with the iPhone processor).

216 *See* Layne-Farrar, *supra* note 39, at 37–42.

commodities, with prices set just above the aggregate cost of the bill of materials.[217] This is a common practice in many industries (established before the current FRAND debates began) because IPR licensing takes place downstream from the component level, most often at the end-product level.[218] When this is the case, the price for that component will not reflect the value of using the SEPs, for either the end user or the component supplier.[219] Thus, neither the prices nor the profit margins at the component level will be an appropriate royalty base for determining FRAND payments because licensing has not historically occurred at the component level.

This is true both as a matter of law and economics. On the legal side, the Patent Act provides that damages for infringement shall be no less than "a reasonable royalty for the *use made of the invention by the infringer*."[220] As discussed above, in the realm of complex devices, a given patent may be infringed by both a component maker and an end-user device maker.[221] Royalties calculated on a base that only reflects the cost of the physical inputs plus the component manufacturer's (often slim) profit margin will not capture the value of "the use made"[222] by the infringing maker of an end-user device.[223] In other words, measuring the value of any given SEP technology needs to be a case-specific task, taking into account the physical location of the technology implementation, how that technology is used, and where its benefits emerge, as well as industry practices in terms of patent licensing and product pricing.[224]

On the economic side, royalties set on a base that does not reflect the value to end users of the patented technology (and hence to the end-user device makers supplying them) are likely to undercompensate the SEP holder. This follows for the reasons explained above: if a component maker has not incorporated the value or cost of the IPRs, then it will have set its prices too low. The component maker's profit margin will be the competitive rate for the component maker and typically these are not markets with sufficient market power to enable

217 *See* Martinez, *supra* note 4, at 649.

218 *See* Huber, *supra* note 6, at 4.

219 *See, e.g.*, Layne-Farrar, *supra* note 39, at 41 (discussing how the cost of implementing wireless technology in an airplane can lead to savings in fuel costs that far exceed the cost of the technology itself).

220 35 U.S.C. § 284 (2018) (emphasis added).

221 *See supra* Section I.A.

222 35 U.S.C. § 284.

223 *See supra* notes 217–19 and accompanying text.

224 *See* Layne-Farrar, *supra* note 39, at 39–43 (exploring the values of SEP technology for different cases).

supracompetitive margins.[225] Thus, if that competitive margin must now be split with IPR holders, neither the component maker nor the IPR holders will earn an adequate ROI as too many parties will be sharing a too-small pie. Particularly in litigation, where juries look at the small profit margins that component makers earn in competition with other component makers, royalty awards may allow only a small portion of the component maker's profit to be paid to an IPR holder.[226] In some cases, the value of using the patented technology in the end product (reflecting interactions like those in the battery example above) may even exceed the entirety of a single component maker's profits.[227] In this case, to reward the SEP holder for the value of using its patented technology and provide the implementer with a competitive profit margin at the same time, the profit margin of the component would need to be increased, which can only be accomplished by raising the component's price.[228] In competitive component markets, this is a difficult coordination problem and one unlikely to be undertaken voluntarily.[229]

It is important to understand that the potential to undercompensate SEP holders is not just the problem of the SEP holders, but rather is something that would affect the economy and society at large. First, if inventors and investors expect royalty rates for their new patented technology to be undervalued, that affects their ROI calculations because the ROI for a new technology is equal to a discounted cash flow of the payments that invention is expected to generate over its lifetime of use.[230] The expected cash flow reflects the risk that an investment will not yield a viable invention.[231] Even assuming that the risky research and development ("R&D") process yields a commercial invention, with limits placed on licensing via the license-

225 *See, e.g.*, Mary Ellen Biery, *These Industries Generate The Lowest Profit Margins*, FORBES (Sept. 24, 2017, 2:56 PM), https://www.forbes.com/sites/sageworks/2017/09/24/these-industries-generate-the-lowest-profit-margins/#38fe185f49d2 [https://perma.cc/U7M2-GHZ2] (indicating that the semiconductor and other electronic component manufacturing sector earned net profits of -0.3% in the 12-month period ending July 31, 2017).

226 *See* Layne-Farrar, *supra* note 39, at 41.

227 *See id.* at 42–46.

228 *See id.* at 45.

229 *See id.* at 45–46 (discussing how adjusting component prices to account for SEP royalties could only be undertaken with "serious transition pains for all the companies involved").

230 *See* LAUREN JOHNSTON STIROH & RICHARD T. RAPP, NERA, MODERN METHODS FOR THE VALUATION OF INTELLECTUAL PROPERTY 9–13 (1998), https://www.nera.com/publications/archive/1998/modern-methods-for-the-valuation-of-intellectual-property.html [https://perma.cc/EDH3-TE2H].

231 *See id.* at 11.

to-all approach, the risk of undercompensation must be added to the ROI equation as well. Because SEPs are licensed and not used exclusively by the SEP holder, expected royalty payments are a key element of the ROI calculation for firms that anticipate monetizing their innovations through SEP licensing. The lower the expected return on a given invention, the lower the investments that will be made in that invention, even holding constant the risks of obtaining a successful, patentable invention in the first instance. Investments at the margin will not be made at all due to the increased risk of undercompensation. In short, if SEP holders expect to be undercompensated, they will reduce investments in innovations targeting standards, which will reduce SEPs meaning fewer new technologies for interoperability standards and slower standards evolution over time.

Furthermore, as the license-to-all argument concerns only patents with a FRAND commitment, a second likely impact of imposing this rule on SEP licenses is that more entities will choose not to participate in cooperative standard development. In economic parlance, the expected FRAND royalty payment creates an incentive constraint for participating in an SDO. If potential SDO contributors anticipate undercompensation for their standard contributions, they will choose not to participate.[232] Put differently, participating in cooperative standards development entails substantial investments of R&D resources.[233] The expected benefits of participation must equal or exceed the expected costs before a firm will choose to participate. Should FRAND royalty rates be lowered below the value of using certain patented technologies, the overall benefits of participating in the SDO would fall for innovation contributors, leading to lower participation rates.[234]

The strategy of abstaining from participation in an SDO can be risky, as it means the firm will not have any influence over the direction of the standard. However, the more pivotal the firm's technology is for the standard under development, the more attractive abstention can be—and the more harmful it would be to the SDO, its members, and all consumers of products compliant with the standard for that

232 *See* Anne Layne-Farrar et al., *Payments and Participation: The Incentives to Join Cooperative Standard Setting Efforts*, 23 J. ECON. & MGMT. STRATEGY 24, 27 (2014).

233 *See* Blecker, et al., *supra* note 12, at 223–24 (describing the "laborious process" of standards development).

234 *See* Layne-Farrar et al., *supra* note 232, at 33–34. For an economic model of this phenomenon in the context of FRAND rates set at the "incremental value" level, see *id.* at 28–48. For an empirical example of this phenomenon, see Thimo Stoll, *Are You Still In? – The Impact of Licensing Requirements on the Composition of Standards Setting Organizations* (Max Planck Inst. for Innovation & Competition, Research Paper No. 14-18, 2014).

contributor to refuse to join.[235] Moreover, complete abstinence is not the only response to anticipated undercompensation for certain SEPs: innovative firms can continue to participate in an SDO but refuse to contribute certain technologies to its standards; or firms may shift their R&D programs away from essential technology areas and toward optional elements or non-essential but commercially valuable technology areas. Any of these responses to a license-to-all regime would be likely to harm technology standard development because they limit important technologies that contribute to the functionality of a standard. And when standards do not attract the best technologies, the users of those standards will suffer as well.

In sum, an absolute license-to-all rule could force a regime of component-only licensing. That kind of regime would be at odds with patent law, which guarantees a reasonable royalty based on the use of the technology. And it would be at odds with economics, which relies on the expectation of reasonable royalties to maintain incentives for risky R&D investments. Sometimes licensing at the component level will be the optimal approach, but other times it will most decidedly not be the best approach. Impairing the SEP holder's freedom to choose the most sensible layer in the production chain for its licensing efforts can be expected to have detrimental economic effects.

C. Less Harmful Alternatives

If one views the goal of SDO IPR policies as ensuring that no supplier in the chain of production of standardized products will be excluded, there are a variety of ways to accomplish that goal without requiring licenses to all. As this Article argues, the ETSI policy already accomplishes this aim by asking SEP holders to commit that they will license the manufacture of standard-conforming end-user devices.[236] In practice, this approach ensures that makers of end-user devices have the freedom to operate under explicit licenses and their suppliers, as a practical matter, will not face exclusion.[237] But ETSI's approach is not the only way to achieve the same end.

An SEP holder may adopt a licensing practice of only asserting its SEPs and seeking to license them at one level of the chain of produc-

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235 *Cf.* Stoll, *supra* note 234, at 2 ("[C]ertain important potential contributors might not participate in the standards setting process if a [royalty-free] licensing requirement is imposed upon them. Their benefits from generating licensing revenue might be greater than those derived from a faster development and implementation process.").

236 *See supra* Section II.A.3. Of course, individual SEP holders remain free to license at the component level instead of at the end-device level.

237 *See supra* Section II.A.3.

tion. That practice amounts to a tacit commitment not to assert SEPs at other levels. This approach leaves manufacturers at other levels free to operate, even though they are unlicensed, because they will not be approached to negotiate any FRAND licenses.[238]

To the extent that firms may seek greater assurance that they will not face exclusion by the assertion of SEPs, SDOs could request a further commitment from SEP holders. Specifically, an SEP holder could commit to make a FRAND offer before seeking any injunction against an implementer, and also to negotiate in good faith to conclude a license on FRAND terms. If the SEP holder never intends to assert its SEPs against a firm or class of firms, then that SEP holder gives up nothing by making such a commitment.[239] Manufacturers of components of standardized devices should also be satisfied with such a commitment. Not being the target of an SEP assertion would be ideal for any firm, far better than having to pay royalties. But if an SEP were asserted against a component manufacturer, the best result the target could expect, even under a license-to-all paradigm, would be a license on FRAND terms. The sort of commitment proposed here provides the same result.[240]

Another licensing practice that SDOs might encourage or require could be for SEP holders to charge royalties in terms of fixed dollar amounts per end-user unit—e.g., $1 per device. Those licenses could operate like coupons, which could be made available at any level of the production chain. If a device maker so chose, it could purchase one million license coupons from a given SEP holder to cover one million devices. Or, alternatively, a component maker could purchase one million license coupons and sell both components and license coupons to device makers, relieving the device makers of any patent infringement concerns with the licensor's SEPs. As long as the SEP holder gets its price for the use of its patented technology, it should be

238 *See* FTC v. Qualcomm Inc., No. 19-16122, slip op. at 35–36 (9th Cir. Aug. 11, 2020) (describing Qualcomm's practice of licensing end-user devices and not components, Qualcomm's "policy toward rival chipmakers," as "no license, no problem" and finding that it was "not an anticompetitive violation of the Sherman Act"); *supra* text accompanying notes 145–51.

239 Note that this practice is consistent with the European Court of Justice's ruling in *Huawei Technologies*, suggesting that SEP holders intending to offer licenses covering Europe may already be bound by a FRAND offer commitment. *See* Case C-170/13, Huawei Techs. Co. v. ZTE Corp., ECLI:EU:C:2015:477, ¶ 71 (July 16, 2015).

240 An SDO commitment of this sort would codify a rule already established by the courts. In *Realtek Semiconductor Corp. v. LSI Corp.*, the court ruled that it is a breach of FRAND for an SEP holder bound by a FRAND commitment to seek an exclusion order at the USITC without having first made a FRAND offer to the alleged infringer. *See* Realtek Semiconductor Corp. v. LSI Corp., Case No. C–12–03451–RMW, 2013 WL 3568314, at *1 (N.D. Cal. July 12, 2013).

indifferent as to who pays that price. And component makers and device makers can both have freedom to operate and can work out among themselves who should purchase the coupons. That kind of system, though possibly raising administrative costs, would provide a way for SEP holders to make licenses available to all, while recovering the full amount of per-device royalties to which they believe they are entitled without incurring risks of exhaustion.

Conclusion

The license-to-all debate is, at its core, a commercial dispute over royalty payment amounts. License-to-all is a strategy to try to force SEP holders to license their patents to component makers in an effort to drive royalty negotiations (and litigations) toward lower numbers. Essentially, it is a tactic to game FRAND obligations and exhaustion law to the detriment of SEP holders.

As a legal matter, the argument that a license-to-all interpretation should generally apply to FRAND commitments is untenable. The assumption that all firms in a chain of production need licenses to SEPs is unsupported by patent law or commercial realities. The argument that SDOs' IPR policies require SEP holders to grant licenses to all comers for all purposes is not true as a general matter. To know whether a given SDO's policy imposes any particular obligation, one must, as a matter of contract law, examine the language of the policy and commitments in question. For example, as this article shows, the ETSI IPR Policy does not require licensing all comers for all purposes. And, while the state of antitrust law is in flux, it would be extremely difficult, if not impossible, in most circumstances to argue that there is an antitrust duty to license all.

As an economic matter, the license-to-all debate has significant implications for end consumers and the wider economy. If the existing system of intellectual property rights and licensing were altered to impose a license-to-all regime for all FRAND encumbered patents, that policy would reduce important licensing flexibility for SEP holders. While component-level licensing can make economic sense in some circumstances, it will not in all circumstances. As a result, a license-to-all regime would reduce at least some incentives for innovation. In many realistic scenarios, a license-to-all regime would undermine the rights of SEP holders to such a degree that it would substantially devalue SEPs. This, in fact, appears to be the aim of the argument. But if that aim were achieved, it would reduce firms' incentives to invest, innovate, and participate in SDOs. Such a policy would impede, rather

than promote, "the Progress of Science and useful Arts"[241] and likely have a negative impact on social welfare.

241 U.S. CONST. art. I, § 8, cl. 8.