



2018

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Recommended Citation

94 Notre Dame L. Rev. Online 55 (2018).

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ESSAYS

NONDISCRIMINATION IN 5G STANDARDS

*Eli Greenbaum**

INTRODUCTION

Nondiscrimination has been the neglected stepchild of the FRAND commitment. Patent owners participating in standards organizations typically commit to license their technology on “fair, reasonable, and nondiscriminatory (“FRAND”) terms.”¹ While a number of cases have provided extensive consideration of the first “fair and reasonable” part of FRAND, until recently, U.S. decisions provided only meager analysis of the second “non-discrimination” prong.² The recent *TCL* decision³ in the United States and the *Unwired Planet* decision⁴ in the United Kingdom provide significant new guidance concerning the FRAND nondiscrimination requirement. Unfortunately, advancing 5G technology will bring new difficulties in applying that requirement, and neither decision will assist in addressing these coming complexities.

5G refers to the soon-to-be-deployed⁵ fifth generation of mobile networking standards. Earlier versions—from 1G to 4G—moved cellular communications from their analog beginnings to our current sophisticated digital data transmission

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1 See *FTC v. Qualcomm Inc.*, No. 17-CV-00220, 2017 WL 2774406, at *2 (N.D. Cal. June 26, 2017).

2 *TCL Commc’n Tech. Holdings, Ltd. v. Telefonaktiebolaget LM Ericsson*, No. SACV 14-341, 2017 WL 6611635, at *55 (C.D. Cal. Dec. 21, 2017) (“No American cases have definitively addressed the non-discrimination requirement.”).

3 *Id.*

4 *Unwired Planet Int’l Ltd. v. Huawei Tech. Co.*, [2017] EWHC (Pat) 711 (Eng.), *aff’d*, [2018] EWCA (Civ) 2344.

5 Industry groups completed a substantial part of the 5G specifications in June 2018. See *Rel-15 Success Spans 3GPP Groups*, 3GPP (June 14, 2018), http://www.3gpp.org/news-events/3gpp-news/1965-rel-15_news.

networks.⁶ 5G promises faster speeds, more stability, and lower latency when compared to existing 4G networks. In addition, while previous generations focused on communications between individuals, 5G technology is expected to also support new use cases, including networking between devices with embedded sensors.⁷ 5G networks, for example, are expected to facilitate close-to-science-fiction technologies such as autonomous vehicle communications, smart grid (e.g., electricity and water distribution) networks, and remote surgery.⁸

The broad diffusion of 5G technology, and its incorporation into a hefty catalog of devices and machines, will put more pressure on the nondiscrimination prong of the FRAND commitment. The value of 5G technology to simple consumer electronics (such as home routers) will differ starkly from the value of the same technology to cutting edge equipment (such as for remote surgery). Does a nondiscrimination commitment allow patentees to charge differential royalties for 5G technology in such diverse use cases? Both *TCL* and *Unwired Planet* examined the requirements of nondiscrimination only as between companies providing similar products. Going forward, however, judicial and regulatory interpretation of the nondiscrimination requirement in the 5G context will require potentially controversial application of the FRAND commitment across different technological applications. In addition, 5G nondiscrimination debates will strain arrangements within standard organizations themselves. Neither *TCL* nor *Unwired Planet* provide guidance for these impending disputes.

I. NONDISCRIMINATION

Our information age relies on standardization. Perhaps most prominently, existing telecommunications networks require standardization to allow a diverse range of cellular devices to communicate and exchange data. The standardization process, while providing undisputed benefits, also presents well-analyzed problems for industry competition.⁹ Participants in standards development can try to move standards toward their own patented technology and then extract unreasonably high rents for use of that technology.¹⁰ As a result, standards organizations

⁶ For a brief history of telecommunications standards, see *Qualcomm*, 2017 WL 2774406, at *1–3.

⁷ BILJANA BADIC ET AL., ROLLING OUT 5G: USE CASES, APPLICATIONS, AND TECHNOLOGY SOLUTIONS 40–41 (2016) (“[5G’s] dramatic number of new use cases . . . present challenges for the entire industrial landscape. While a small number of major smartphone manufacturers currently supply the market . . . 5G is expected to shift productization to a large number of smaller players for addressing specific niche markets.”).

⁸ See, e.g., Bijan Khosravi, *Autonomous Cars Won’t Work—Until We Have 5G*, FORBES (Mar. 25, 2018), <https://www.forbes.com/sites/bijankhosravi/2018/03/25/autonomous-cars-wont-work-until-we-have-5g/#38de0bc9437e>; Katy Scott, *How 5G Could Change Everything From Music to Medicine*, CNN (Feb. 5, 2018), <https://money.cnn.com/2018/02/05/technology/business/5g-internet-of-skills/index.html>; Jay Stanley, *The State of 5G: When It’s Coming, How Fast It Will Be & The Sci-Fi Future It Will Enable*, TECHSPOT (Feb. 25, 2018), <https://www.techspot.com/article/1582-state-of-5g-wireless/>.

⁹ See, e.g., Joseph Farrell et al., *Standard Setting, Patents, and Hold-Up*, 74 ANTITRUST L.J. 603, 616–18 (2007).

¹⁰ See, e.g., *Qualcomm*, 2017 WL 2774406, at *2.

typically require participants to license standard-essential patents (“SEPs”) under FRAND terms.¹¹ This licensing commitment is intended to assure implementers that proprietary technology in standards will be available on reasonable terms while simultaneously assuring innovators that they will receive reasonable returns on their investments.¹² Unfortunately, FRAND commitments typically provide only indistinct principles rather than clear criteria for setting royalty rates. Disputes over the meaning of FRAND have required courts to establish frameworks for negotiation and to calculate specific royalty amounts.

Uncertainty over the nondiscrimination prong of the FRAND commitment has been especially pronounced, and that ambiguity has lingered in the absence of court decisions definitively addressing the requirement.¹³ Economic analysis of the FRAND commitment—as with economic analysis generally—has often supported the right of patentees to price discriminate between different end uses of the technology. For example, in their influential analysis, Dennis Carlton and Allan Shampine assert that FRAND prohibits only discrimination between firms that “expect to obtain the same incremental value from the patented technology.”¹⁴ According to this position, differential royalties could be charged to firms producing diverse products that do not compete with each other—for example, patentees could price discriminate between handset manufacturers and wireless heart monitors. Other economists have similarly suggested that FRAND nondiscrimination would permit royalties that vary “depending on each player’s bargaining power or business features,”¹⁵ or price differentials that do not have “anticompetitive effects.”¹⁶

Notwithstanding theoretical academic analyses, firms have already fought the first skirmishes to define the 5G interpretation of nondiscrimination. In May 2017, the European Commission announced that it would issue guidance for the

11 Farrell et al., *supra* note 9, at 609.

12 See Mark A. Lemley & Carl Shapiro, *A Simple Approach to Setting Reasonable Royalties for Standard-Essential Patents*, 28 BERKELEY TECH. L.J., 1135, 1137 (2013).

13 J. Gregory Sidak, *Fair and Unfair Discrimination in Royalties for Standard-Essential Patents Encumbered by a FRAND or RAND Commitment*, 2 CRITERION J. ON INNOVATION 301, 307–08 (2017) (“[C]ourts have largely ignored the nondiscrimination requirement’s existence and consequently have offered little guidance as to its meaning.”).

14 Dennis W. Carlton & Allan L. Shampine, *An Economic Interpretation of FRAND*, 9 J. COMPETITION L. & ECON. 531, 546 (2013); see also Daniel G. Swanson & William J. Baumol, *Reasonable and Nondiscriminatory (RAND) Royalties, Standards Selection, and Control of Market Power*, 73 ANTITRUST L.J. 1, 35 (2005) (asserting that nondiscriminatory pricing requires that the royalty rate differ “precisely by the amount that the corresponding final product prices vary”). *But see* Richard J. Gilbert, *Deal or No Deal? Licensing Negotiations in Standard-Setting Organizations*, 77 ANTITRUST L.J. 855, 872–73 (2011) (requiring patentees to offer the same schedule of licensing terms to every potential licensee). Permitting differential royalties may also be supported by caselaw. See Jorge L. Contreras, *A Brief History of FRAND: Analyzing Current Debates in Standard Setting and Antitrust Through a Historical Lens*, 80 ANTITRUST L.J. 39, 80 (2015) (opining that historical caselaw supports “differential pricing between different distribution channels or categories of licensees”).

15 Mario Mariniello, *Fair, Reasonable and Non-Discriminatory (FRAND) Terms: A Challenge for Competition Authorities*, 7 J. COMPETITION L. & ECON. 523, 532 (2011).

16 Anne Layne-Farrar, *Nondiscriminatory Pricing: Is Standard Setting Different?*, 6 J. COMPETITION L. & ECON. 811, 832 (2010) (emphasis omitted).

valuation of standard technology.¹⁷ One of the purposes of the initiative was to “provide a level playing field to businesses preparing 5G and those using connectivity applications.”¹⁸ The Fair Standards Alliance, an industry organization which includes large technology companies such as Apple, Google, and Intel among its members,¹⁹ responded to the initiative by asserting that allowing use-based royalty discrimination “could harm the European economy at a critical time for development and proliferation of [Internet of Things] and 5G technologies”²⁰ since it would allow patentees to “seek compensation for unpatented technologies or technologies that the patent holder did not invent or create.”²¹ Opponents of this position responded with press releases and articles arguing that a prohibition on use-based licensing would stifle innovation.²² The Commission eventually issued guidance that did not address the issue, declining to take sides between the warring sides.²³

II. TCL AND UNWIRED PLANET

*TCL Communication Technology Holdings, Ltd. v. Telefonaktiebolaget LM Ericsson*²⁴ and *Unwired Planet International Ltd. v. Huawei Technologies Co.*²⁵ were the first court decisions in the United States and United Kingdom, respectively, to directly address discrimination between similarly situated firms. Commentators hailed the decisions as providing “crucial guidance,”²⁶ “helpful insights,”²⁷ and “important guideposts”²⁸ in assessing FRAND obligations. Unfortunately, however, these decisions addressed only relatively straightforward questions of nondiscrimination. Both cases examined differential royalties

17 *Standard Essential Patents for a European Digitalised Economy*, at 2, European Comm’n (Oct. 4, 2017), https://ec.europa.eu/info/law/better-regulation/initiatives/ares-2017-1906931_en.

18 *Id.* at 3.

19 *About Us*, FAIR STANDARDS ALL., <http://www.fair-standards.org/about-us/> (last visited Oct. 10, 2018).

20 *European Commission Roadmap: Standard Essential Patents for a European Digitalised Economy Feedback*, at 3 (May 8, 2017), https://ec.europa.eu/info/law/better-regulation/initiatives/ares-2017-1906931/feedback/F1743_en?p_id=20114.

21 *Id.*

22 *See, e.g., Who Is Going to Win the Big EU Commission SEP Licensing Battle—“Use-Based” or “Licence to All”?*, IPKAT (Nov. 9, 2017), <http://ipkitten.blogspot.co.il/2017/11/who-is-going-to-win-big-eu-commission.html>.

23 *Communication From the Commission to the European Parliament, the Council and the European Economic and Social Committee—Setting Out the EU Approach to Standard Essential Patents* (Nov. 29, 2017), <https://ec.europa.eu/docsroom/documents/26583/attachments/1/translations/en/renditions/native>.

24 No. SACV 14-341, 2017 WL 6611635 (C.D. Cal. Dec. 21, 2017).

25 [2017] EWHC (Pat) 711 (Eng.).

26 Sophie Lawrance & Francion Brooks, *Unwired Planet v Huawei: The First UK FRAND Determination*, 9 J. EUR. COMPETITION L. & PRAC. 170, 170 (2018).

27 Sidak, *supra* note 13, at 307.

28 *See* Jorge L. Contreras, *TCL v. Ericsson: The First Major U.S. Top-Down FRAND Royalty Decision*, PATENTLY-O (Dec 27, 2017), <https://patentlyo.com/patent/2017/12/contreras-ericsson-decision.html>.

between handset providers, one of the most common use cases of current wireless communication standards.²⁹ Neither case, however, addressed the more controversial question to be presented by the broad implementation of 5G technology—discrimination between licensees receiving different incremental value from the technology.

TCL examined when cellular handset manufacturers should be considered “similarly situated”³⁰ for purposes of applying the nondiscrimination requirement. Ericsson held a large portfolio of patents covering several generations of cellular communications technology.³¹ Ericsson had pledged that these patents would be made available to companies under FRAND terms.³² *TCL*, a Chinese handset manufacturer, spent several years negotiating the terms of a license to those patents with Ericsson, but the parties were unable to come to an agreement.³³ In 2014, *TCL* asserted in court that Ericsson had failed to abide by its FRAND commitments.³⁴

In December 2017, the court issued a detailed opinion calculating the FRAND rates applicable to *TCL*’s use of the Ericsson patent portfolio. The decision provided extensive analysis of the nondiscrimination prong of FRAND.³⁵ Ericsson had argued that the largest handset manufacturers—specifically Samsung and Apple—were not “similarly situated” to *TCL* and, as such, Ericsson could discriminate against *TCL* by charging it higher royalty rates than those flagship brands.³⁶ The court rejected that argument and held that “the prohibition on discrimination would mean very little if the largest, most profitable firms could always be a category unto themselves simply because they were the largest and most profitable firms.”³⁷ In other words, the court held that high and low end vendors of the same product should be considered similarly situated—and patentees could not discriminate between such firms by offering them different royalty rates. According to the court, the “most important factor in determining which firms are similarly situated”³⁸ is the geographic scope of the license, rather than sales volume, profitability, or brand recognition of the licensee.³⁹

Broadly speaking, *Unwired Planet* addressed the same nondiscrimination questions raised in *TCL*, even as the United Kingdom court came to some different conclusions. *Unwired Planet*, a nonpracticing entity, commenced proceedings in

29 *TCL*, 2017 WL 6611635, at *3; *Unwired Planet*, [2017] EWHC at [66]. *Unwired Planet* also examined discrimination in royalties for “RAN infrastructure”—base stations through which mobile devices could access the network. *Unwired Planet*, [2017] EWHC at [488].

30 *TCL*, 2017 WL 6611635, at *29.

31 *Id.* at *1.

32 *Id.*

33 *Id.* at *1–3.

34 *Id.* at *3.

35 *Id.* at *29–35.

36 *See id.* at *29.

37 *Id.* at *33.

38 *Id.* at *32. *TCL* did hold that a patentee could discriminate between global firms and companies that sold into only a single market. *Id.*

39 *Id.* at *33.

2014 against a number of handset manufacturers.⁴⁰ Unwired Planet alleged that those firms infringed patents covering wireless telecommunication standards that Unwired Planet had purchased from Ericsson.⁴¹ As in *TCL*, the patent portfolio had earlier been committed under FRAND terms.⁴² The court, in a long and detailed opinion, calculated applicable FRAND royalties for the purchased patents.⁴³

As in *TCL*, the central nondiscrimination issue was whether the patentee could discriminate between manufacturers based on their respective size or market share.⁴⁴ As in *TCL*, *Unwired Planet* also held that a patentee could not discriminate between licensees based on their size.⁴⁵ Specifically, the *Unwired Planet* court asserted that a FRAND rate must be based on a benchmark value of the licensed patents—a patentee could not discriminate between licensees based on their size or other characteristics specific to the licensee.⁴⁶ In this respect, the court stated that “new entrants are entitled to pay a royalty based on the same benchmark as established large entities.”⁴⁷

Both *TCL* and *Unwired Planet* provide insights for the application of the FRAND nondiscrimination commitment. However, neither case addresses the pressing issues to be raised by the large-scale adoption of 5G technology. That technology will see wireless communication technology included in a diverse collection of products and services—from now-commoditized cellphones to leading-edge innovations. Courts will need to pass judgment on whether patentees can price discriminate between such products, capturing greater value from the more expensive, sophisticated products and services while allowing the commodity products to pay lower royalties. Neither *TCL* nor *Unwired Planet* provide guidance on this issue.⁴⁸

40 *Unwired Planet Int’l Ltd. v. Huawei Tech. Co.*, [2017] EWHC (Pat) 711, [76]–[78] (Eng.), *aff’d*, [2018] EWCA (Civ) 2344.

41 *Id.* at [1].

42 *Id.* at [4].

43 *Id.* at [475]–[80], [582]–[626].

44 *Id.* at [481] (Huawei asserting that “pursuant to the non-discrimination limb of FRAND Unwired Planet are obliged to offer the same or similar rates to Huawei as they have extended to Samsung”).

45 *Id.* at [806(8)].

46 *Id.*

47 *Id.*

48 While no U.S. court has directly examined the issue of discrimination between product lines, some decisions imply different approaches to the issue. *Compare* *Microsoft Corp. v. Motorola, Inc.*, No. C10-1823, 2013 WL 2111217, at *4 (W.D. Wash. Apr. 25, 2013) (setting different royalties rates for Microsoft Xbox products and “all other Microsoft products”), *with In re Innovatio IP Ventures, LLC*, No. 11 C 9308, 2013 WL 5593609, at *38 (N.D. Ill. Oct. 3, 2013) (advocating methodology for royalty calculation that would not result in discrimination between end use products). Unwired Planet itself calculated different royalty rates for handsets and “RAN infrastructure,” but these are not different end uses of the network so much as different parts of the network potentially covered by different patents. *See Unwired Planet*, [2017] EWHC (Pat) at [222].

III. ORGANIZATIONAL TENSIONS

Courts are not the only institutions responsible for clarifying FRAND obligations. Standards organizations draft the actual policies that detail FRAND licensing commitments, and the formulation of such policies can be the subject of extensive negotiation between members.⁴⁹ In particular, FRAND commitments need to balance the competing interests of contributors and implementers.⁵⁰ Speaking broadly, entities that primarily contribute to the intellectual property for a standard—on which they expect to be paid royalties—may advocate for looser FRAND standards that do not constrain their licensing demands. In contrast, entities that primarily produce goods implementing the standard—on which royalties need to be paid—may seek stricter FRAND policies that limit payable royalties. The specific FRAND policy of any particular standards organization reflects the tug-of-war between these opposing interests.⁵¹

If historical tensions in the standard setting arena have arisen between contributing and implementing firms, the adoption of 5G standards could also produce strains among implementers themselves. Prior generations of technology standards were incorporated into a limited range of goods, but 5G standards will be embedded in goods with a large variation in functionality, value, and price. Producers that create high-value goods may insist on stronger nondiscrimination requirements, so as to even out their possible royalty obligations with the reduced rates paid for different, lower-value products.⁵² Entities that produce such low-end items, in contrast, may press for looser nondiscrimination obligations: allowing some room for price discrimination could allow these latter entities to decrease their royalty obligations to more affordable levels.⁵³ In other words, prior

49 See generally Damien Geradin, *The Meaning of “Fair and Reasonable” in the Context of Third-Party Determination of FRAND Terms*, 21 GEO. MASON L. REV., 919, 934–38 (2014) (describing the process of formulating and negotiating the intellectual property policies of ETSI).

50 See Joshua D. Wright, *SSOs, FRAND, and Antitrust: Lessons From the Economics of Incomplete Contracts*, 21 GEO. MASON L. REV. 791, 801 (2014) (“[Standards organizations] have the features of a two-sided market . . . a successful SSO needs to attract members on both sides of the platform, by striking a balance for the two sides with respect to their rules and policies.”).

51 These conflicts surfaced in the recent tussle over revisions to the IEEE patent policy. Some companies and commentators perceived these revisions as favoring the rights of entities that produced standard-compliant goods over the rights of patentees that had contributed intellectual property to the standard. See Jorge L. Contreras, *IEEE Amends its Patent (FRAND) Policy*, PATENTLY-O (Feb. 9, 2015), <https://patentlyo.com/patent/2015/02/amends-patent-policy.html> (stating that the IEEE revision “highlights a rift in the standardization world between . . . patent-centric and product-centric firms”).

52 The recent participation of automotive companies in industry groups advocating for stricter nondiscrimination requirements may be driven by such considerations. See FAIR STANDARDS ALL., APPLICATION-DEPENDENT SEP LICENSING 1 (Aug. 30, 2016), <http://www.fair-standards.org/wp-content/uploads/2016/09/FSA-Application-Dependent-Licensing-Paper.pdf> (expressing concern that by “licensing SEPs at different royalty rates based on the application the licensee develops, a patent owner may seek compensation for value that it did not create”); Press Release, Fair Standards All., Daimler and Hyundai Motor Company Join the Fair Standards Alliance (Nov. 15, 2016), <http://www.fair-standards.org/2016/11/15/1263/>.

53 See Layne-Farrar, *supra* note 16, at 833 (“[E]ven within a standard-setting context, different users are likely to place different valuations on the same IP and hence will negotiate

generations of telecommunications technology often saw a commonality of interests across companies implementing the standard. This commonality will not persist, adding to the strains within standards organizations, as companies incorporate 5G technology into a diverse multitude of devices.

CONCLUSION

Questions of nondiscrimination are not, of course, unique to intellectual property law. Similar inquiries arise in such varied fields as constitutional law, telecommunications law,⁵⁴ and international trade law.⁵⁵ Common to all of these fields, however, is the fundamental question of whether the parties are “similarly situated,” such that similar or like treatment is mandated.⁵⁶ Both *TCL* and *Unwired Planet* admit that FRAND nondiscrimination inquiries also incorporate this central question—which parties should be seen as similarly situated for purposes of determining whether patentees can charge differential royalties.⁵⁷ Unfortunately, however, both *TCL* and *Unwired Planet* offer limited guidance for future challenges in the area, as both cases involved discrimination between producers of a relatively homogenous catalog of products. Caselaw has yet to struggle with the nondiscrimination issues that a broad inventory of products, such as those expected to incorporate 5G connectivity, would present.

different prices. The different valuations may derive from . . . different price points served—basic, low-end devices versus high-end, full-feature devices, for example.”); *see also* Sidak, *supra* note 13, at 360 (discussing different interests of high- and low-value manufacturers).

54 The Telecommunications Act of 1996, for example, provides that “[i]t shall be unlawful for any common carrier to make any unjust or unreasonable discrimination.” 47 U.S.C. § 202(a) (2012); *see also* Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56.

55 PETER VAN DEN BOSSCHE & DENISE PRÉVOST, *ESSENTIALS OF WTO TRADE LAW* 13 (2016) (“The prohibition of discrimination is a key concept in WTO law and is often the subject of trade disputes between WTO Members.”).

56 *City of Cleburne v. Cleburne Living Ctr., Inc.*, 473 U.S. 432, 439 (1985) (describing the Equal Protection Clause as “essentially a direction that all persons similarly situated should be treated alike”); *Orloff v. FCC*, 352 F.3d 415, 420 (D.C. Cir. 2003) (a telecommunications common carrier can justify different treatment of customers by showing that such differences are “reasonable”); BOSSCHE & PRÉVOST, *supra* note 55, at 20 (“Determining whether products are ‘like’ for purposes of international trade law “is often a difficult and controversial exercise.”).

57 *TCL Commun. Tech. Holdings, Ltd. v. Telefonaktiebolaget LM Ericsson*, No. SACV 14-341, 2017 WL 6611635, at *29 (C.D. Cal. Dec. 21, 2017) (“The parties agree that like, or close to, like rates must be offered to firms which are similarly situated.”); *see also* *Unwired Planet Int’l Ltd. v. Huawei Tech. Co.*, [2017] EWHC (Pat) 711, [488] (Eng.), *aff’d*, [2018] EWCA (Civ) 2344 (finding that both “Samsung and Huawei are ‘similarly situated’ on any view”).