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I. INTRODUCTION

In the past few years, issues related to fair, reasonable, and non-discriminatory ("FRAND") licensing rates for patents have garnered considerable attention.[2] The issues most often come up in the context of standard-essential patents ("SEPs"). However, some FRAND commitments have been undertaken for patents that have not been formally declared as standard essential.[3] In this paper, we consider the development of FRAND-encumbered patents outside the context of a standard-setting organization and the policy issue of whether injunctive relief should apply equally to owners of both types of FRAND-encumbered patents. For ease of exposition, we will refer to two types of FRAND-encumbered patents—SSO FRAND-encumbered patents and non-SSO FRAND-encumbered patents.

II. THE DIFFERENCE BETWEEN SSOs AND DE FACTO STANDARDS

SEPs are patents that cover technologies that are incorporated into a standard established by a Standard Setting Organization ("SSO"). Some of the SSOs are accredited by the International Organization for Standardization ("ISO)" or a similar group, and are called Standard Developing Organizations ("SDOs"). In addition to SDOs, SSOs include consortiums or alliances and other groups of companies collaborating on common industry standards.[4]

Some standards are formally defined—imposed by law, or defined by an SSO—while others become a standard because they are widely used. The latter are sometimes referred to as

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[2] FRAND rates are also called RAND rates in the literature. We will use FRAND notation for both throughout. US DOJ and USPTO, *Policy Statement on Remedies on Standards-Essential Patents Subject to Voluntary F/RANDs Commitments*, 01/08/2013, footnote 2, at http://www.uspto.gov/about/offices/ogc/Final_DOJ-PTO_Policy_Statement_on_FRAND_SEPs_1-8-13.pdf.

[3] For example, Philips and Sony jointly developed a de facto CD standard that was later adopted as a formal standard by the International Organization for Standardization. Philips and Sony then licensed patents for the CD standard on FRAND terms. See *Commission settles allegations of abuse and clears patent pools in the CD market*, 3 COMPETITION POL'Y NEWSLETTER, (Autumn 2003) at http://ec.europa.eu/competition/publications/cpn/2003_3_56.pdf. Similarly, *see* the Microsoft statement on "Interoperability Principles," which describes Microsoft's commitment to FRAND licensing terms at http://www.microsoft.com/openspecifications/en/us/programs/interop/interoperability-principles/default.aspx.

[4] For a list of international consortia that carry out standardization activities in Information and Communication Technologies provided by the European Committee for Standardization, *see* http://www.cen.eu/cen/Sectors/Sectors/ISSS/Consortia/Pages/default.aspx.

"de facto" standards. For example, Adobe PDF, Java, and HP's PCL originated as de facto industry standards. Some of the de facto standards may be established by a single company or a small group of companies, and these standards are sometimes called "proprietary" standards. De facto standards also may become adopted as formal standards.[5]

The distinction between formal and de facto standards is that SSOs and SDOs typically have a fairly open formal process of establishing a standard, including an opportunity for other companies to join in standard-setting activities. In contrast, some of the de facto standards, e.g. proprietary standards, are privately established, rely mostly on technology developed by its members, and the group creating the de facto standard may not be open to additional members.[6]

Another difference between standards set by SSOs/SDOs and de facto standards, especially proprietary standards, arises from the fact that because SSOs/SDOs rely on an open process of establishing a standard, there is more contextual information available about the adoption of the standard and the choice of technologies incorporated into the standard. For example, in a recent decision in *Microsoft v. Motorola*, the court relied on the factual record from the time when the standard was established to determine a licensing rate for the SEPs in suit.[7] In particular, the judge relied on the discussion of the contribution of particular patents to the standard and the value of those patents relative to the competing technologies available at the time the relevant standard was adopted.[8] For proprietary standards, these discussions may not exist (*e.g.,* the companies combine their existing technologies and do not look at what else is available on the market at the time the standard is being adopted) or the record may not be available.

SSOs usually require that owners of patents that are (a) essential technologies that (b) become incorporated into a standard commit to licensing their patents on FRAND terms. However, SSOs do not usually explicitly define or require their participants to declare what constitutes a FRAND rate. Hence, when a prospective licensee and a licensor negotiate licenses for FRAND-encumbered patents, they begin by negotiating an appropriate licensing rate, which means that there is the potential that the parties may not come to an agreement.

Most of the discussion in the economic and legal literature on FRAND issues has focused on SEPs that have been declared essential by an SSO. However, as mentioned above, some FRAND licensing commitments are also undertaken outside of SSOs, *i.e.*, FRAND commitments are undertaken unilaterally without a request from an SSO.[9] The discussion on these types of FRAND commitments has been much more limited.

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[5] One example is Adobe's Portable Document Format (PDF). *See* Elisabeth Montalbano, *ISO Approves PDF as an International Standard*, COMPUTERWORLD, 07/02/2008 at http://www.computerworld.com/s/article/9106158/ISO_approves_PDF_as_an_international_standard.

[6] Some de facto standards may be developed as open standards by open source community.

[7] *See Findings of Fact and Conclusions of Law Findings of Fact and Conclusions of Law*, 4/25/2013, *Microsoft Corporation v. Motorola, Inc., et al.*, Case No. C10-1823JLR.

[8] *Id.*

[9] In some cases, companies might adopt FRAND commitments under the pressure from competition authorities. For example, see *Public undertaking by Microsoft*, 12/16/2009, at http://www.microsoft.com/en-us/news/presskits/eu-msft/docs/microsoftinteroperabilityundertaking16dec2009.doc.

III. FRAND COMMITMENTS

Many tend to think about patents as conferring market power to the patent owner, but the reality is more complex. A patent confers no more than a right to exclude others from making, using, or selling the patented technology for the life of the patent. Whether a patent is valuable or confers meaningful market power depends on the alternative technologies that are available to potential licensees or the substitutability of downstream products that incorporate alternative technologies.

Patents that cover technologies that are incorporated into a standard may become more valuable by virtue of being a part of the standard.[10] That is, once the technology is incorporated into a standard, prospective licensees and downstream users may have fewer alternatives to use; accordingly, the standard itself may confer meaningful market power on the owner of that patent. Of course, the degree of market power depends on the value of the standard and the bargaining power that the patent owner gains relative to potential licensees who must license the patent in order to comply with the standard. The additional bargaining or "hold up" power could allow the patent owner to negotiate higher royalty rates.[11]

Potential licensees and adopters of the standard are keenly aware of this potential for hold up. To mitigate concerns about a potential hold up and to ensure widespread adoption of the standard, SSOs have adopted FRAND licensing terms.[12] Similarly, FRAND commitments in the context of de facto standards ensure the widespread adoption of the standard.

However, de facto standards may be—and have been—established without any FRAND commitment by the patent owners. To mitigate the threat of a hold up and ensure adoption, some de facto standards rely on royalty-free licenses (which have some of the features of a FRAND commitment, but at a predetermined zero licensing rate), while others rely on patent pools (again, with licensing rates announced to potential licensees prior to adoption). There are, however, de facto standards that have formal FRAND obligations. For example, Philips and Sony developed a de facto CD standard. The standard, which was adopted later as a formal standard, incorporated patented technology that was ultimately licensed on FRAND terms.[13] In this paper, we focus only on de facto standards that have FRAND commitments.[14]

Whether a FRAND commitment is undertaken within an SSO or outside of an SSO, from an economics perspective, such a commitment imposes similar obligations on the patent owner

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[10] Daniel Swanson, *Evaluating Market Power in Technology Markets when Standards are Selected in Which Private Parties Own Intellectual Property Rights*, Joint Hearing of the US DOJ and the FTC regarding Competition and Intellectual Property Law and Policy in the Knowledge-Based Economy, April 18, 2002.

[11] US DOJ & USPTO, *Policy Statement on Remedies on Standards-Essential Patents Subject to Voluntary F/RANDs Commitments,* 01/08/2013, p. 4 at http://www.uspto.gov/about/offices/ogc/Final_DOJ-PTO_Policy_Statement_on_FRAND_SEPs_1-8-13.pdf.

[12] Some standards impose royalty-free licensing obligation on those who contribute proprietary IP to the standard, which is a kind of a FRAND rate with a predetermined licensing rate of zero. *See*, for example, the patent policy for the W3C standard at http://www.w3.org/Consortium/Patent-Policy-20040205/.

[13] Commission, *supra* note 3.

[14] While de facto standards with FRAND commitments may be rare today, they may become more common if there is a change in the treatment of SSO FRAND-encumbered patents relative to non-SSO FRAND-encumbered patents (e.g. in terms of limits on the availability of injunctive relief).

in exchange for similar expected benefits.[15] In either case, a FRAND commitment is voluntary, whether it is achieved by a consensus among collaborating SSO participants, voluntarily embraced as part of SDO rules, or unilaterally adopted by a company that develops a standard on a proprietary basis.[16] A FRAND commitment implies that the patent owner will be compensated for its patent rights, but limits the potential licensing rate that the patent owner may command in patent licensing negotiations to "fair and reasonable."[17] It also limits the patent owner's right to refuse an offer to license the technology. However, in exchange, the patent owner obtains the benefit of having its technology incorporated into a standard and, hence, broader expected adoption of its technology.

In general, FRAND commitments aim to benefit potential licensees by protecting them from hold up by ensuring fair and reasonable licensing rates. However, the uncertainty over what is a FRAND rate for a particular patent has given rise to a policy debate over injunctive relief to owners of FRAND-encumbered patents.

IV. THE RECENT POLICY DEBATE OVER INJUNCTIVE RELIEF TO OWNERS OF FRAND-ENCUMBERED PATENTS

One of the current hotly debated policy issues is the availability of injunctive relief to owners of infringed FRAND-encumbered SEPs. For example, in January 2013, the U.S. Department of Justice, Antitrust Division and the U.S Patent and Trademark Office issued a joint policy statement in which they indicated that the availability of injunctive relief to owners of FRAND-encumbered patents "may harm competition and consumers by degrading one of the tools SDOs employ to mitigate the threat of such opportunistic actions by the holders of F/RAND-encumbered patents that are essential to their standards."[18]

In 2011, the FTC solicited public comments on whether injunction relief should be available to owners of FRAND-encumbered SEPs. A number of companies, including Broadcom, Cisco, HP, IBM, and RIM submitted comments stating that no injunctive relief should be available to owners of FRAND-encumbered SEPs.[19] At the same time, other companies, (e.g., Microsoft, Nokia, and Qualcomm) disagreed and argued that injunctive relief should be available to owners of FRAND-encumbered SEPs.[20]

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[15] We understand there may be differences in legal treatment in different jurisdictions of FRAND commitments that are made in the context of an SDO relative to FRAND commitments in the context of non-SDO SSOs or de-facto standards. Here, we focus on the economic aspects of the FRAND commitment.

[16] When a company unilaterally makes a FRAND commitment, it might do so in response to a request from competition authorities. *See*, for example, *Public undertaking by Microsoft*, 12/16/2009, at http://www.microsoft.com/en-us/news/presskits/eu-msft/docs/microsoftinteroperabilityundertaking16dec2009.doc.

[17] An important part of the FRAND controversy is the lack of clarity about what a "fair and reasonable" licensing rate might be for a particular patent.

[18] *Supra* note 11 at 6.

[19] Response of Cisco Systems, Hewlett Packard Company, International Business Machines Corporation and Research in Motion LTD To Federal Trade Commission Request for Comments on Standard Setting Issues, 08/012011, at http://www.ftc.gov/os/comments/patentstandardsworkshop/00035-80135.pdf and also Broadcom Comments, 08/11/2011, p. 5, at http://www.ftc.gov/os/comments/patentstandardsworkshop/00053-80206.pdf.

[20] *See* Comments of Qualcomm Incorporated, 06/13/2011, at http://www.ftc.gov/os/comments/patentstandardsworkshop/00011-60525.pdf, Microsoft Comments, 06/14/2011, at

The proposed limits on the availability of injunctive relief seem to range from a complete ban on injunctive relief to owners of FRAND-encumbered SEPs to other proposals that would make injunctive relief more difficult to obtain (e.g., allowing injunctive relief only in the case of an unwilling licensee refusing to license on FRAND terms). In what follows, we discuss the general implications of limiting the availability of injunctive relief with an understanding that more restrictive limits (or a total ban) would result in a larger effect.

Participants in this debate offer a number of arguments both for and against the availability of injunctive relief to owners of FRAND-encumbered patents. Availability—or not—of injunctive relief affects the relative bargaining positions of the licensee and the patent owner. The availability of injunctive relief strengthens the bargaining position of the patent owner and weakens that of the licensee and, all other things equal, will increase FRAND rates or encourage a licensee to take up a license sooner. Making injunctive relief unavailable to owners of FRAND-encumbered patents has the opposite effect.

Reducing the bargaining power of a patent owner in licensing negotiations (where a powerful potential threat of an injunction is no longer available) tilts the balance of bargaining power in favor of the licensees and may, in the limit, encourage infringement. Moreover, without the threat of an injunction, patent owners may expect lower returns on their investment in innovation, which may, more broadly, reduce the incentive to innovate, the incentive to submit a patent to a SSO, or both.

Here, we do not address whether the courts or regulators should make it more difficult to obtain injunctive relief to owners of FRAND-encumbered SEPs. This is a complex issue that requires its own analysis. Instead, we focus on the fact that the policy debate over injunctive relief has focused only on its application to SSO FRAND-encumbered SEPs. But, should a policy regarding injunctive relief also apply to non-SSO FRAND-encumbered patents?

V. ASSESSING A POLICY THAT APPLIES INJUNCTIVE RELIEF TO SSO FRAND-ENCUMBERED SEPS ONLY

In considering the policy implications of initiatives seeking to limit injunctive relief to owners of SSO FRAND-encumbered SEPs, we focus on three issues: (a) the incentive of patent owners to participate in a standard that is being developed by an SSO, (b) the incentive to develop technology in the hopes that the technology would, one day, become standard essential technology, and (c) the incentive to acquire and sell SEPs. We consider two scenarios: a scenario in which all FRAND-encumbered patents are treated the same way and a scenario in which limits on injunctive relief apply to owners of SSO FRAND-encumbered SEPs, but not to owners of non-SSO FRAND encumbered patents.

http://www.ftc.gov/os/comments/patentstandardsworkshop/00009-60523.pdf, and the Nokia Response, 07/08/2011, at http://www.ftc.gov/os/comments/patentstandardsworkshop/00032-60891.pdf.

A. Scenario 1: Applying the Same Relief to Owners of All FRAND-Encumbered Patents

Suppose the courts or regulators determine that injunctions are not available for any types of FRAND commitment—*e.g.*, whether or not made in the context of a formal SSO.[21] In this situation, the incentives of companies to participate in the standard, develop standard essential technology, and transact FRAND-encumbered patents would be affected in a similar way, whether the patents are part of an SSO standard or not.

In this scenario, there likely would be no effect on a patent owner's decision to either participate in an SSO or to create a de facto standard—as the limitation on injunctive relief would apply in either case—but it could affect the incentive to develop potentially standard-essential technology and the incentive to acquire SEPs. It is also likely to reduce the incentive to encumber the patents with a FRAND commitment, whether as an SSO or a de facto standard. If the policy is to limit injunctive relief to owners of *all* FRAND-encumbered patents, then those patents will be less attractive to own and develop.

The lack of injunctive relief—which, as we explained above, would likely lead to relatively lower royalty rates or slower uptake of licenses—also would reduce the incentive to invest in innovations that could lead to technologies that are so important that they could become part of a standard. This is not to say that the incentive to innovate is lower overall. Instead, all other things being equal, investments in innovation may shift toward technologies that are less likely to be part of a standard. Likewise, the market for all FRAND-encumbered patents is likely to be affected, as well, by the level and type of innovation that occurs.

Alternatively, companies may continue their innovative activities but choose to avoid FRAND commitments—both by staying out of SSOs and by avoiding FRAND commitments in a non-SSO setting. This might make adoption of socially beneficial technologies less rapid as potential licensees hesitate to implement a technology without FRAND commitment.

In contrast, if the status quo remains in place—where injunctive relief is available to owners of all FRAND-encumbered patents—then there would be no change in the level and types of innovative activity we observe today. However, the negotiated FRAND rates are likely to be higher, or licensing agreements would be reached sooner, than they would be in the scenario in which injunctive relief is not permitted.

B. Scenario 2: Imposing Limits on Injunctive Relief to Owners of SSO FRAND-Encumbered Patents Only

Suppose instead that the courts or regulators limit the availability of injunctive relief only to owners of patents that have FRAND commitments made in the context of a formal SSO (as the current policy discussion seems to suggest). In that scenario, owners of patents that joined an SSO would be placed at a disadvantage relative to owners of non-SSO FRAND-encumbered patents.

[21] Of course, this is a simplification of the current debate where the arguments are made for limiting the availability of injunctive relief to owners of FRAND-encumbered SEPs, but not necessarily for an outright ban.

Such a policy:

1. Would discourage owners of technology from contributing their patents to an SSO. A patent owner may choose to forgo the opportunity to submit its patent to an SSO because, by staying out of the SSO, injunctive relief would continue to be available. Indeed, some companies have already declared that they may reduce their participation in the SSOs.[22] If owners and developers of new technologies turn away from SSOs, the benefits that SSOs provide in facilitating standardization may be compromised.
2. May also discourage innovators from developing potentially standard essential technology (with the goal of joining a formal SSO).
3. Would reduce the incentive to acquire SSO FRAND-encumbered SEPs, which, in turn, would further reduce incentives to develop such patents because of loss of future value.

Given these reduced incentives a patent owner may wish to establish a de facto standard instead of developing or using technology that could otherwise have been incorporated into the formal SSO.[23]

Is it likely that there will be a shift to de facto standards? The existence of de facto standards indicates that it is possible. Patents involved in some of the recent FRAND disputes are often parts of large portfolios controlled by major industry players. Such players may have—or may be able to acquire if needed—enough complementary patents to support a de facto standard. Or, they may collaborate with other patent owners to set up a de facto standard, perhaps via a patent pool. For acquisitions and collaborations that involve complementary—rather than competing—technologies, antitrust scrutiny is unlikely.

Of course, consumers benefit from de facto standards also, but SSOs have long played a valuable role in defining and developing standards. To the extent that de facto standards are substitutes for the standards set by an SSO, there may not be an adverse effect on innovative activity overall, but for developers of new technology, staying out of an SSO creates certain risks. For example, there is a risk that there would be a competing de facto standard or a risk that an SSO would create a standard based on a different technology.

To mitigate this risk, the patent owner's de facto standard would need to gain industry and marketplace acceptance. One way of encouraging adoption of a de facto standard is, of course, to offer patented technology on a royalty-free basis, as is the case with open standards. But if the patent owner wishes to collect licensing revenues (as a means of recovering the perhaps substantial costs of creating and developing the technology), then he may wish to undertake a voluntary FRAND commitment instead.

[22] Testimony of Donald J. Rosenberg, Executive Vice President, General Counsel, and Corporate Secretary of Qualcomm Incorporated, prepared for the hearing on "Standard Essential Patent Disputes and Antitrust Law," at http://www.judiciary.senate.gov/pdf/7-30-13RosenbergTestimony.pdf.

[23] *SSOs, FRAND, and Antitrust: Lessons from the Economics of Incomplete Contracts*, Remarks of Joshua D. Wright, FTC Commissioner at George Mason University School of Law, 09/12/2013, at http://ftc.gov/speeches/wright/130912cpip.pdf.

For licensees, a non-SSO FRAND commitment may be inferior to a FRAND commitment that is made in an SSO setting. For example, SSOs offer more transparency in standard setting. The open process of setting a standard within an SSO often involves discussion and consultation with the technology that is chosen, comparing it to other technologies on the market. In contrast, the non-SSO standard-setting process sometimes lacks transparency regarding the process that is used to choose a technology vis-à-vis available alternatives.

In addition, the number of participants that are involved in determining a non-SSO standard tend to be lower, which could result in a narrower standard or in the inclusion of technologies that are only part of the full standard. Hence, a prospective licensee may need to adopt several de facto standards to replicate what one SSO accomplishes today, which may raise transaction costs.

Another concern with a shift toward de facto proprietary standards, whether administered by a single firm or a small group of collaborators, is the possibility that the technology owner may not wish to make a FRAND commitment. Without an SSO, any such commitment is voluntary. Not making a FRAND commitment would, of course, increase the risk that the de facto standard will fail to be adopted, but it preserves the patent owner's bargaining position through availability of injunctive relief.

Like a FRAND commitment in an SSO, a FRAND commitment in the context of a de facto standard is a promise to the market participants. In both instances, the promise is there to facilitate adoption of the standard. That suggests that they should be treated the same from the policy perspective.[24]

VI. TOWARD A LEVEL PLAYING FIELD FOR ALL FRAND-ENCUMBERED PATENTS

In general, economists agree that SSOs are welfare enhancing. Thus, it is important to consider what impact policy decisions have on SSOs, particularly as they relate to the incentive of parties to invest in R&D and to contribute their technology to an SSO. If a policy decision is likely to steer participants to an alternative arrangement outside of SSO (*e.g.*, toward de facto standards), we should understand the consequences. For example, some commentators have suggested that de facto standards may be less efficient for a number of reasons.[25] These reasons include the lack of openness and contextual information in establishing a standard, or duplicative R&D spending as firms compete to establish a de facto standard instead of collaborating on one.

Whether limits on injunctive relief should become public policy for SEPs is still hotly debated. But the debate apparently has not explored with much depth the effect of a policy that treats FRAND commitments that are made in the context of an SSO differently from those outside of an SSO. A policy that favors non-SSO FRAND commitments will put SSOs at a disadvantage. Whether this is good public policy needs more attention.

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[24] Creating a level playing field for all FRAND-encumbered patents would not prevent a potential shift to de facto standards without FRAND commitments. The consequences of that are perhaps different from what we describe here and merit further analysis as well. That analysis is beyond the scope of this paper.

[25] *See*, for example, *Paul Belleflamme Coordination on formal vs. de facto standards: a dynamic approach,* 18(1) EUR. J. POLITICAL ECON. 153-176 (March 2002); and Victor Stango, *The Economics of Standards Wars*, 3(1) REV. NETWORK ECON. (March 2004).