

UC Berkeley

Law and Economics Workshop

Title

Deal Or No Deal? Licensing Negotiations By Standard Development Organizations

Permalink

<https://escholarship.org/uc/item/1642q403>

Author

Gilbert, Richard

Publication Date

2010-08-01

Deal Or No Deal? Licensing Negotiations By Standard Development Organizations

Richard Gilbert*

August 2010

I. Introduction

The activities of a standard development organization (SDO) benefit consumers and producers by promoting the adoption and implementation of technologies,¹ but may create opportunities for the exercise of market power. One source of market power arises from investments by firms or consumers that are specific to a standard, which can cause firms and consumers to be “locked-in” to the use of products that comply with the standard.

Large specific investments by consumers increase the cost of switching and contribute to a low cross-elasticity of demand between products that comply with a standard and other products that may have been close substitutes “ex ante”, before the standard issues and firms and consumers make investments that are specific to the standard. Even small specific investments can cause technologies to be poor substitutes if there are large economies of scale or network effects, because switching to a different technology may not be individually profitable unless many others do the same.² Owners of intellectual property essential to a standard may have the ability to set opportunistic royalty and other licensing terms that reflect the low cross-elasticity of demand.^{3,4} This

* University of California, Berkeley. I am grateful for helpful comments from Jonathan Baker, Dennis Carlton, Damien Geradin, Lisa Kimmel, and Gregory Werden.

¹ I use the term “standard development organization” to refer generally to organizations accredited by the American National Standards Institute (ANSI) or another quasi-governmental body. A “standard setting organization” may refer to any organization that promotes a standard, regardless of accreditation. *See, e.g.,* Jonathan L. Rubin, *Patents, Antitrust, and Rivalry in Standard-Setting*, 38 RUTGERS L. J. 509, 513-14 (2007).

² A barrier to switching is the difficulty of aligning expectations. *See, e.g.,* Joseph Farrell & Garth Saloner, *Coordination Through Committees and Markets*, 19 RAND J. ECON., 235 (1988). Switching also may be difficult if alternatives are risky, if there is high demand for backward compatibility, or if switching would incur a loss of experience economies.

³ *See, e.g.,* U.S. Department of Justice and Federal Trade Commission, *Antitrust Enforcement and Intellectual Property Rights: Promoting Competition and Innovation*, April 2007 at 38 (“A holder of IP incorporated into a standard can exploit its position if it is costly for users of the standard to switch to a

type of market power arises “ex post”, i.e., after firms and consumers have made investments that are specific to the standard.⁵

Some SDOs have developed policies to address these concerns such as requiring owners of patents whose use would be required to comply with a standard to license their patents at terms that are fair, reasonable, and non-discriminatory (FRAND).⁶ Neither SDOs nor the courts have defined the contours of FRAND licensing terms.^{7,8} This

different technology after the standard is set.” (“IP Report”) and Joseph Farrell, et al., *Standard Setting, Patents, and Hold-up*, 74 ANTITRUST L. J. 603 (2007).

⁴ For ease of exposition, I focus on royalty terms in licensing agreements, while acknowledging that licensing terms other than royalties (such as field of use restrictions) are often very important to both licensors and licensees.

⁵ Opportunistic conduct may occur when the parties to an economic transaction make investments that are specific to the relationship and contracts do not completely specify the terms of trade. Specific investments create quasi-rents equal to the difference between the value of investments in the relationship and in their next most valuable use. If a contingency occurs that is not covered by the contract, parties can act strategically to obtain a share of these quasi-rents. For a sampling of the literature on specific investments and quasi-rents, see Ronald H. Coase, *The Nature of the Firm*, 4 *ECONOMICA* 386 (1937); Benjamin Klein, Robert C. Crawford & Armen A. Alchian, *Vertical Integration, Appropriable Rents, and the Competitive Contracting Process*, 21 *J. LAW & ECON* 297 (1978); Oliver E. Williamson, *THE ECONOMIC INSTITUTIONS OF CAPITALISM: FIRMS, MARKETS, RELATIONAL CONTRACTING* (1985); Paul L. Joskow, *Vertical Integration and Long-term Contracts: The Case of Coal-Burning Electric Generating Plants*, 1 *J. LAW, ECON & ORGANIZATION* 33 (1985); and Oliver D. Hart, *Incomplete Contracts* in J. Eatwell, M. Milgate, and P. Newman, eds., 2 *THE NEW PALGRAVE: A DICTIONARY OF ECONOMICS*, 752 (1987). The ability to act opportunistically does not imply that rights holders necessarily exercise this ability.

⁶ See, e.g., ANSI, *Guidelines for Implementation of the ANSI Patent Policy*, September 2008. (ANSI-accredited standards developer shall receive assurance that a license to essential patent claims will be made available to applicants desiring to utilize the license for the purpose of implementing the standard under reasonable terms and conditions that are demonstrably free of any unfair discrimination.) ANSI, the American National Standards Institute, establishes the consensus procedures that are the basis for about 9,500 voluntary standards. See http://www.ansi.org/about_ansi/faqs/faqs.aspx?menuid=1. I make no distinction between FRAND commitments and commitments to license under RAND (reasonable and non-discriminatory) terms.

⁷ See, e.g., Mark A. Lemley, *Intellectual Property Rights and Standard-Setting Organizations*, 90 *CALIF. L. R.* 1889, 1906 (2002) (“One of the most common requirements imposed on IP owners is an obligation to license IP rights on reasonable and nondiscriminatory terms. But virtually no SSO policies specify what that phrase means, leaving courts to decide what terms are ‘reasonable.’”) and Patrick D. Curran, *Comment, Standard-Setting Organizations: Patents, Price Fixing, and Per Se Legality*, 70 *U. CHI. L. R.* 983, 983 (2003). But cf. Joseph Miller, *Standard Setting, Patents and Access Lock-In: RAND Licensing and the Theory of the Firm*, 40 *IND. L. R.* 351 (2007) (A RAND promise shields adopters from threat of injunctions and is not needlessly vague.) The difficulty with this argument is that a promise to license means little unless the terms are reasonably specified.

⁸ Cases that have addressed FRAND licensing commitments include *Broadcom Corp. v. Qualcomm Inc.*, 2006 U.S. Dist. LEXIS 62090 (D.N.J., Aug. 31, 2006); *Nokia Corp. v. Qualcomm, Inc.*, No. 06-509 (D. Del Aug. 16, 2006); *Agere Sys. Guardian Corp. v. Proxim, Inc.*, 190 F. Supp. 2d 726 (D. Del. 2002);

ambiguity has led some SDOs to consider ex ante joint negotiations by their members with patent holders of the licensing terms for patents that are essential to a standard.⁹ Joint negotiation raises concerns that members of a SDO may engage in a different type of hold-up by suppressing royalty terms after rights holders have made irreversible research and development investments necessary to create and patent technologies that are essential to a standard, a concern that is particularly acute for “pure-play” R&D companies that derive all or most of their revenues from licensing. With R&D expenditures already sunk, patentees may have little choice but to accept low royalty terms. Their alternatives are not to license or to seek a different venue to commercialize their technologies. Often neither alternative is a practical choice for a patentee.

The U.S. Department of Justice and Federal Trade Commission issued guidance to two SDOs concerning a requirement that potential licensors disclose the maximum royalties and the most restrictive terms under which they would license their technologies.¹⁰ Such disclosure may be a prelude to negotiations over actual patent

Townshend v. Rockwell International Corp, 55 USPQ2d (BNA) 1011, 1018 (ND Cal 2000); and ESS Technology, Inc. v. PCTel, Inc., No. C-99-20292 (N.D. Cal. Nov. 4, 1999). None of these cases resolved the contours of FRAND licensing commitments. The Third Circuit in *Broadcom Corp. v. Qualcomm Inc.*, 501 F.3d 297 (September 4, 2007) held that a patent holder’s false promise to license technology on fair, reasonable, and non-discriminatory terms, coupled with the standard setting organization’s reliance on that promise when including the technology in the standard, is conduct actionable under the Sherman Act, but did not offer a workable definition of FRAND licensing terms. The Federal Trade Commission addressed royalties in its case against Rambus, Inc., but only in the context of remedies. *See Rambus, Inc.*, Docket No. 9302, (Fed. Trade Comm’n Feb. 2, 2007) (final order), <http://www.ftc.gov/os/adjpro/d9302/070205finalorder.pdf> and *Rambus, Inc.*, Docket No. 9302, (Fed. Trade Comm’n Feb. 2, 2007) (opinion of the Commission on remedy) <http://www.ftc.gov/os/adjpro/d9302/070205opinion.pdf>.

⁹ David Teece and Edward Sherry argue that total welfare is maximized if SDO members make technology choices based solely on performance and real resource costs. *See* David J. Teece & Edward F. Sherry, *Standards Setting and Antitrust*, 87 MINN. L. REV. 1913, 1931-34 (2003). There is controversy over whether total or consumer welfare is the appropriate standard for antitrust review. *See, e.g.*, Joseph Farrell & Michael Katz, *The Economics of Welfare Standards in Antitrust*, 2 COMPETITION POL’Y INT’L 3 (2006) and Ken Heyer, *Welfare Standards and Merger Analysis: Why Not the Best?* 2 COMPETITION POL’Y INT’L 53 (2006). Even under a total welfare standard, royalties are relevant because they affect incentives for innovation and rent-seeking. Furthermore, high royalties can create deadweight losses from underutilization of a technology that can offset performance benefits or resource savings. *See, e.g.*, Mark R. Patterson, *Antitrust and the Costs of Standard-Setting: A Commentary on Teece & Sherry*, 87 MINN. L. REV. 1995, 1999-2003 (2003).

¹⁰ *See* letter from Assistant Attorney General Thomas O. Barnett to Robert A. Skitol, October 30, 2006 (“VITA Letter”) and letter from Assistant Attorney General Thomas O. Barnett to Michael A. Lindsay, April 30, 2007 (“IEEE Letter”).

royalties and licensing terms.¹¹ Joint negotiation raises concerns about the coordinated exercise of monopsony power^{12,13} and the agencies have indicated that they would apply a rule of reason framework to evaluate the relative benefits and risks of joint negotiation of royalty terms.¹⁴ In this article I consider the factors that determine when a SDO has monopsony power and when its exercise would be troublesome.

Joint negotiation of licensing terms by the members of a SDO before a standard issues can help fill the void left by vague FRAND commitments in order to limit possible opportunistic conduct. However, a less restrictive alternative is to rely on bilateral

¹¹ The posting of a maximum rate could influence potential licensees to negotiate down the rate on an ex ante basis or not to vote for the technology in question. See, e.g., J. Gregory Sidak, *Patent Holdup and Oligopsonistic Collusion in Standard-Setting Organizations*, 5 J. COMPETITION L. & ECON. 123, 173 (2008) (The patent holder's unilateral declaration of its most restrictive terms is not really a unilateral act at all, but a response to a rule that implies that the patent holder's technology will be rejected for the standard in absence of such a declaration.)

¹² In what follows, I use the term "monopsony power by a SDO" to refer to the collective exercise of monopsony or oligopsony power by members of the SDO.

¹³ The exercise of monopsony power by members of a SDO is a concern if, as is often the case, most members of a SDO are users rather than suppliers of technologies that are considered for adoption. See, e.g., David J. Teece & Edward F. Sherry, note 9 *supra* at 1928, 1931. While members of a SDO are often actual or potential competitors in markets for products that employ a technology that is included in a standard, that is not necessary for joint royalty negotiation to have anticompetitive effects. Technology users have a joint interest in securing a low royalty and through collective action may be able to negotiate a lower royalty than any one of them could obtain through independent bilateral negotiation.

¹⁴ See VITA Letter note 10 *supra* ("Unless the standard-setting process is used as a sham to cloak naked price-fixing or bid rigging, the Department analyzes action during the standard-setting process under the rule of reason."); IEEE Letter note 10 *supra* at 11; IP Report note 3 *supra* at 55-56 ("Given the strong potential for precompetitive benefits, the Agencies will evaluate joint *ex ante* negotiation of licensing terms pursuant to the rule of reason."); Deborah Platt Majoras, *Recognizing The Procompetitive Potential of Royalty Discussions in Standard Setting*, Conference on Standardization and the Law: Developing the Golden Mean for Global Trade, September 23, 2005. ("...joint ex ante royalty discussions that are reasonably necessary to avoid hold up do not warrant per se condemnation. Rather, they merit the balancing undertaken in a rule of reason review."); R. Hewitt Pate, *Competition and Intellectual Property in the U.S.: Licensing Freedom and the Limits of Antitrust*, EU Competition Workshop, June 3, 2005. ("There is a possibility of anticompetitive effects from ex ante license fee negotiations, but it seems only reasonable to balance that concern against the inefficiencies of ex post negotiations and licensing hold up."). The Agencies describe the general analytic framework for evaluation of collaborations among competitors in Federal Trade Commission and U.S. Department of Justice, *Antitrust Guidelines for Collaborations Among Competitors* (April 2000), available at <http://www.ftc.gov/os/2000/04/ftcdojguidelines.pdf>. For a different perspective, Cf. Damien Geradin & Miguel Rato, *Can Standard Setting Lead to Exploitative Abuse? A Dissonant View on Patent Hold-Up, Royalty Stacking and the Meaning of FRAND*, working paper (2006) and Damien Geradin & Anne Layne-Farrar, *The Logic and Limits of Ex Ante Competition in a Standard-Setting Environment*, 3 COMPETITION POL'Y INTL 79, 97 (2007).

negotiations between potential licensees and rights holders along with a clear non-discrimination requirement (i.e., the ND prong of FRAND). Preventing undue discrimination between similarly situated licensees assures technology adopters that they will gain the benefits of licensing terms negotiated before firms and consumers make investments that are specific to a standard. This alternative policy will require SDOs or the courts to better define the meaning and requirements of non-discrimination in a technology licensing context.

II. Rule of Reason Analysis for Ex Ante Joint Royalty Negotiation

Under the rule of reason “The central question is whether the relevant agreement likely harms competition by increasing the ability or incentive profitably to raise price above or reduce output, quality service or innovation below what likely would prevail in the absence of the relevant agreement.”¹⁵ Factors that are central to a rule of reason analysis of ex ante joint negotiation are the following.

1. The likelihood that firms and consumers will face high costs of switching to alternative technologies after a standard has issued and they make investments that are specific to the standard.
2. The licensing terms that would prevail in the absence of switching costs for technologies that are considered for ex ante joint negotiations.
3. The collective market power of the members of the SDO and rights holders that are engaged in ex ante joint negotiations.
4. The existence and adequacy of less restrictive alternatives.

In this section I describe each of the factors that contribute to the competitive risks and benefits from ex ante joint negotiation by the members of a SDO and identify situations in which a rule of reason analysis may conclude that joint negotiation of licensing terms by members of a SDO is unwarranted.

¹⁵ Federal Trade Commission and the U.S. Department of Justice, *Antitrust Guidelines for Collaborations Among Competitors*, note 14 *supra* at 4.

A. High switching costs from investments that are specific to the standard

The primary benefit from ex ante joint negotiation is the mitigation of hold-up.¹⁶ Collective negotiation of licensing terms is unnecessary for economic efficiency if hold-up is unlikely. Hold-up can be a significant risk if the cost of switching to an alternative technology is large as a consequence of investments or adoption decisions that are specific to the standard or if switching to an alternative technology requires a time-consuming alignment of expectations.^{17,18}

Competition in the product market is a constraint on the ability of an owner of intellectual property to engage in opportunistic pricing ex post. Hold-up is unlikely if consumers have close substitutes for products that comply with a standard or if the technology only covers a feature of a product that consumers can easily do without. For example, most content providers and manufacturers of consumer audio products support audio technologies licensed by Dolby and DTS. It is unlikely that either Dolby or DTS alone could engage in significant opportunistic pricing because content providers, equipment manufacturers and consumers can use the other technology.

Similarly, firms that supply infrastructure for mobile telephony make large investments that are specific to telecommunications standards such as GSM and CDMA. Consumers may be locked in to a particular mobile standard for a period of time corresponding to the length of their service contracts. However, assuming number portability, if a mobile telephony provider attempted to raise prices significantly, upon

¹⁶ Joint royalty negotiation also may confer benefits by aligning expectations about the merits of alternative technology choices. Such conduct differs from joint negotiation of royalty terms and is the type of conduct that normally occurs within a SDO.

¹⁷ For hold-up to be a significant concern, the profit-maximizing ex-post royalty must exceed the value difference between the chosen proprietary technology and its next-best alternative. If not, technology users are better off with the chosen proprietary technology despite the existence of switching costs that are specific to the standard. *See, e.g., Teece & Sherry, note 9 supra* at 1991.

¹⁸ Note that hold-up can disadvantage rights holders as well as consumers, particularly if standards invoke multiple complementary rights that lead to royalty stacking. *See* Mark Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEXAS L. R. 1991, 1992 (2007) and Michael A. Carrier, *Why Antitrust Should Defer to the Intellectual Property Rules of Standard Setting Organizations: A Commentary on Teece and Sherry*, 87 MINN. L. R. 2017, 2030-1 (2003) (“Holdup affects IP owners as well as IP users.”).

termination of their contracts consumers would have an incentive to switch to a provider that offered comparable service quality at a lower price.

The extent of competition in the product market depends on network effects. If network effects are significant and if alternative networks are not compatible with each other, the competitive constraint imposed by an alternative network depends on the number of other consumers that use the network. Consumers have little incentive to switch to other products if they do not already have or will soon accumulate a large installed base of users. Similarly, if economies of scale are significant, consumers will have little incentive to switch to other products if they are not available on the market in quantities to make them competitive.

On the supply side, the cost and time required to coordinate the adoption of alternative standards and the time required to make products that incorporate these standards introduce switching costs for products that must conform to an industry standard. Standardization decisions often require lengthy negotiations by members of a SDO, who may reach different conclusions about the performance values of different technologies and different assessments of their technological risks.

The profit-maximizing ex post royalty for a patent whose use is essential for a standard is not necessarily higher than the profit-maximizing royalty ex ante. Standardization does not guarantee market success. A new technology has to compete for market acceptance against other existing alternatives. Furthermore, if new users account for a large fraction of total market demand, and if technology rights holders cannot discriminate between new and old purchasers, then rights holders have an incentive to keep royalties low to attract new users even if past buyers are locked in to their purchases.

Standard-related hold-up does not occur merely because it is expensive to switch to an alternative technology. The switching costs must be the result of investments made by firms and consumers that are specific to the standard.¹⁹ Technology A may be far

¹⁹ See, e.g., Gerald F. Masoudi, *Antitrust Enforcement and Standard Setting: The VITA and IEEE Letters and the 'IP2' Report*, presented at the Spring Meeting of the American Intellectual Property Law

superior to its next best substitute and, as a result, consumers of technology A may face large costs of switching to an alternative. But these costs result from the superiority of technology A and are not the result of switching costs that arise because consumers or firms have made investments that are specific to a standard that includes technology A.

B. Licensing terms absent switching costs

The exercise of monopsony power through joint negotiation by the members of a SDO may distort resource allocation and reduce incentives to invest in innovation if royalty rates and other relevant license terms are squeezed below competitive levels. Royalties that are below competitive levels can bias technology adoption, potentially leading to the choice of inferior technologies.²⁰ Low royalties reduce incentives for innovation by lowering the return that innovators can expect to earn when they license their patents²¹ and can discourage standard setting by reducing the economic incentives for IP rights holders to participate in SDOs.²²

The competitive royalty is central to analysis of the potential costs of ex ante joint negotiation by members of a SDO. In a typical antitrust case alleging monopsony conduct, the competitive level is the price and other relevant terms of trade that would have prevailed in the absence of the challenged conduct.²³ However, in the context of ex

Association, May 10, 2007. (“Hold up involves market power that is created by a standard itself, *not* market power that would have existed regardless of the standard.”)

²⁰ For example, suppose that there are two alternative technologies with net values (including implementation costs) v_1 and v_2 and corresponding royalties r_1 and r_2 . Under a total welfare standard ignoring deadweight loss and technology rent-seeking effects, technology 2 is inferior if $v_2 < v_1$. Under a cost-based consumer welfare standard, technology 2 is inferior if $v_2 - r_2 < v_1 - r_1$. Focusing on costs, the SDO may choose technology 2 if its members can negotiate a royalty $r_2 < r_1 - (v_1 - v_2)$.

²¹ While a low royalty would distort technology choice and reduce R&D investment incentives, unlike monopsony for a conventional good with a marginal cost that increases with output, a low royalty would not necessarily reduce output because the marginal cost of licensing is often close to zero. *See, e.g., Farrell et al. note 3 supra* at 632.

²² *See* Anne Layne-Farrar & Josh Lerner, *To Join or Not to Join: Examining Patent Pool Participation and Rent Sharing Rules*, working paper (2006); Benjamin Chiao, Josh Lerner and Jean Tirole, *The Rules of Standard Setting Organizations: an Empirical Analysis*, RAND J. ECON., 2007; Josh Lerner and Jean Tirole, *A Model of Forum Shopping, with Special Reference to Standard Setting Organizations*, Working Paper no. 10664, National Bureau of Economic Research (2004).

²³ *See generally*, Roger D. Blair & Jeffrey L. Harrison, *Antitrust Policy and Monopsony*, 76 CORNELL L.R. 297, 301-2 (1991). There is precedent for per se illegality of joint royalty negotiations because

ante joint negotiation by members of a SDO, the competitive royalty is not necessarily the royalty that would obtain but-for the joint negotiation. A pro-competitive benefit of joint negotiation is to prevent a price increase that would result from opportunistic conduct with lock-in. To define the competitive level of the royalty as the level that would exist absent joint negotiation would negate the potential benefit joint negotiation.

A reasonable competitive benchmark is the royalty (and other relevant licensing terms) that would obtain in the absence coordinated conduct *and* in the absence of switching costs created by investments that are specific to the standard.²⁴ It is unlikely that this benchmark would equal marginal cost, which is close to zero for intellectual property. Neither is the appropriate competitive benchmark likely to equal the outcome of Nash-Bertrand competition or a hypothetical auction market. There is no basis to conclude that these prices would reflect actual royalties or other contract terms negotiated in the absence of joint negotiation and switching costs from standard-specific investments.²⁵

To be more specific, suppose that there are two candidate technologies for inclusion in a standard. Technology A has a performance advantage relative to technology B equal to \$10 per unit. Absent switching costs from standard-specific investments and with no joint negotiation of royalty terms, technology A would command a royalty of \$20 per unit and technology B would command a royalty of \$10 per unit. With respect to technology A (or technology B) The \$10 per unit royalty (\$20 for B) is the appropriate benchmark to evaluate the exercise of monopsony power by

participants in a SDO are often actual or potential competitors and joint negotiation can be a form of buyer-side price-fixing. *See, e.g., Mandeville Island Farms v. American Crystal*, 334 U.S. 219 (1948); *National Macaroni Manufacturers Association v. FTC*, 345 F.2d 421 (7th Cir. 1965); *Knevelbaard Dairies v. Kraft Foods*, 232 F.3d 979 (9th Cir. 2000). In *Sony Electronics, Inc. v. Soundview Technologies, Inc.*, 157 F. Supp. 2d 180 (D. Conn. 2001), the court refused to dismiss an allegation that members of a standard development organization conspired to fix prices for patent licenses.

²⁴ “Reasonable *should* mean the royalties that the patent holder could obtain in open, up-front competition with other technologies, not the royalties that the patent holder can extract once other participants are effectively locked in to use technology covered by the patent.” Carl Shapiro & Hal R. Varian, *INFORMATION RULES: A STRATEGIC GUIDE TO THE NETWORK ECONOMY* (1999) at 241.

²⁵ Moreover, it does not follow that royalties established in bidding process should serve as a competitive benchmark if such a bidding process would not have existed absent efforts to develop a standard.

members of a SDO. A negotiated royalty that is substantially below the benchmark level should be presumptively unlawful as it results from the joint exercise of market power and does not confer benefits related to limiting opportunistic pricing from investments that are specific to the standard.²⁶

Given the difficulties of estimating the benchmark royalty, it is useful to have some rules of thumb to guide when negotiated royalties are significantly below competitive levels.²⁷ Royalties for comparable technologies for which users are not exposed to significant lock-in can serve as a competitive benchmark. For example, it might be common for rights holders to license audio compression technologies with a royalty equal to 0.5% of the product price in circumstances in which licensees have many technology choices and are not locked-in to any particular technology. The competitive benchmark for audio compression technology A can be the generally prevailing royalty, plus any incremental benefit provided by technology A relative to the next-best alternative.

There is a sense in which members of a SDO are not competitors with respect to the adoption of a standard because the specification of the standard is necessarily a joint decision that must be made jointly by the SDO members. Indeed, some have argued the members of a standard-setting organization, or at least the organization itself, should be treated as a single entity when involved in negotiations related to the standard.²⁸ However, this argument overlooks the fact that the members of a SDO, acting jointly, are

²⁶ Under Nash-Bertrand competition, or a hypothetical auction market run by the SDO, the equilibrium price with perfect information would be zero for technology B (assuming no licensing costs) and \$10 per licensed unit for technology A. A formal derivation of this result is in Richard Schmalensee, *Standard-Setting, Innovation Specialists and Competition Policy*, 42 J. IND. ECON. 526, 538 (2009).

²⁷ Prices are often presumed to be competitive in markets that are not concentrated. However, royalties for intellectual property typically are much larger than incremental costs, even in unconcentrated technology markets in which potential licensees have many alternatives.

²⁸ See, e.g., Mark R. Patterson, *Inventions, Industry Standards, and Intellectual Property*, 17 Berkeley Tech. L. J. 1043, 1078 (2002) (“[W]hen the goal of the negotiation is to procure a patent license that will enable the practice of the standard, and when the license will only be valid when it is used with the standard, the members can be thought of as negotiating for the standard itself. In such circumstances, the individual members are not pooling their market shares to gain greater power, but are using the power of the standard. In that respect, they are acting just as would the owner of an improvement patent in a situation in which its use of the patent was blocked by another patent.”).

likely to have more monopsony power in negotiating licensing terms than an individual member in bilateral negotiations with a rights holder. The individual member may be more inclined to accept a higher royalty than would be acceptable to the group because the individual may be concerned that a better alternative technology will not be selected or its selection will take a long time. These coordination problems are less likely when the members of the SDO negotiate jointly.

Furthermore, collective activities by members of a SDO can extend to non-price activities that affect the demand for and value of patented technologies. These include concerted refusals to license intellectual property and coordinated challenges to patent validity and scope. Collective activities by members of a SDO can reach many different venues that bear on patent values. For example, in *Sony v. Soundview*, the plaintiff alleged that members of a SDO acted collectively to petition a government agency to take actions that would undermine the value of a patent that was being considered in connection with a standard. The standard was for a “V-chip” to block television displays of violent or sexually explicit programming. The plaintiff alleged that members of the EIA standard development organization considered acting jointly to petition the FCC to extend the effective dates of the regulations that would affect the patent or to explore the FCC’s ability to preempt the intellectual property rights of holders unwilling to license the use of their patents on fair and reasonable terms.²⁹ Individual efforts by industry members would be less likely to achieve these alleged objectives.³⁰

When the competitive royalty is significantly greater than zero, there is a risk that the coordinated exercise of monopsony power from ex ante joint negotiation by members of a SDO will suppress the royalty far below the competitive level, as well as adversely affect other dimensions of competition that are relevant to technology choices. This risk

²⁹ *Sony Electronics, Inc. v. Soundview Technologies, Inc.*, 157 F. Supp. 2d 180, 181. In *Golden Bridge Tech., Inc. v. Nokia, Inc.*, 416 F. Supp. 2d 525 (E.D. Tex. 2006), plaintiff alleged that members of a standard setting organization conspired to remove the plaintiff’s technology from a standard in order to escape having to pay royalties.

³⁰ Noerr-Pennington may shield efforts to petition a regulatory agency from antitrust scrutiny. *E. R.R. President's Conf. v. Noerr Motor Freight*, 365 U.S. 127, 135-40 (1961); *United Mine Workers v. Pennington*, 381 U.S. 657, 670 (1965). This does not change the point that non-price conduct may be much more effective in limiting patent licensing terms if the conduct is coordinated by members of a SDO.

should be weighed against the potential benefit from limiting ex post opportunistic conduct. In contrast, if the competitive royalty is low, the risk that joint negotiation would harm competition by lowering the royalty is correspondingly small. Absent less restrictive alternatives, this small risk may be acceptable if there is also a high risk of opportunistic pricing when consumers are locked-in to the use of products that conform to the standard after firms and consumers have made investments that are specific to the standard.

C. The market power of the members of the SDO and rights holders

The likelihood that joint negotiations will distort licensing terms relative to competitive levels depends on the relative bargaining power of the members of the SDO and rights holders, which in turn depends on each side's "threat points", the payoffs they can guarantee in the event of a disagreement.³¹ Members of a SDO can adopt a technology with a lesser value, delay the standardization process, or fail to agree on any technology. A rights holder can seek alternative organizations or influential technology adopters to gain acceptance and revenue for its technology. If the rights owner has alternatives to adoption by the SDO that promise comparable industry acceptance, it would not accept licensing terms from the SDO that are less favorable than the terms it can negotiate by pursuing the next best alternative.

Alternative paths may include other standard development organizations that can perform similar functions. Personal computer dynamic random access memory devices (DRAM) offer an example of competing standardization paths by means of alternative standard development organizations. The established standard development organization for personal computer memory devices is the JEDEC technology association.³² Memory and computer manufacturers, concerned about slow progress at JEDEC, created other

³¹ See, e.g., Ken Binmore, Ariel Rubinstein, & Asher Wolinsky, *The Nash Bargaining Solution in Economic Modelling*, 17 RAND J. ECON. 176, 177 (1986).

³² JEDEC was originally an acronym for Joint Electron Device Engineering Councils and was once a division of the Electronic Industries Alliance. JEDEC has since become a separate SDO and has adopted JEDEC as its official name. JEDEC is accredited by the American National Standards Institute (ANSI). See http://www.jedec.org/join_jedec/history.cfm.

standardization consortia to provide alternative paths for adoption of new technologies. These included the SyncLink consortium of memory manufacturers, customers, and other industry participants that came together in the mid- to late-1990s,³³ the AMI consortium formed by Fujitsu, Hyundai, IBM, Infineon, Micron, Mitsubishi, Samsung, Toshiba, and others in 1999 to promote and coordinate the development of faster memory and complementary devices,³⁴ and the Advanced DRAM Technology (ADT) consortium created in January 2000 to develop guidelines for low-cost, high-performance computer memory, which included Intel, Samsung, Infineon and NEC, among others.³⁵ However, unlike JEDEC, these other consortia did not develop memory standards that were widely adopted by the computer industry. Indeed, they illustrate the difficulties of finding effective alternatives to an established industry SDO.

A rights owner may bypass standardization by a SDO and convince individual firms to license its technology, perhaps creating a bandwagon effect. These market-determined standards have the disadvantage that they are not endorsed by the industry consensus that most formal standard development organizations require, and proprietary market-determined standards raise concerns about hold-up if firms and consumers make investments that are specific to the standard. A market-determined standard is more likely to be a viable alternative to a standard developed by an industry SDO if there is a dominant firm in the industry that can influence the direction of technology adoption, but a dominant supplier cannot always dictate the course of technical evolution. For a time Intel supported the RDRAM memory device technology sponsored by Rambus, although Intel and the rest of the industry ultimately followed the lead of JEDEC, which developed standards for synchronous DRAMs.³⁶

³³ See <http://www.hpcwire.com/archives/10363.html>.

³⁴ “Memory Industry to Push Double Data Rate SDRAM Memory,” *Computergram International*, May 4, 1999, available at http://findarticles.com/p/articles/mi_m0CGN/is_3653/ai_54547002. SDRAM is synchronous dynamic random access memory.

³⁵ See <http://www.news.com/2100-1001-985260.html>.

³⁶ Intel supported the Rambus RDRAM memory technology at one time, but subsequently withdrew its support. “Intel, acting alone, did *not* successfully impart monopoly power on its temporarily anointed choice; nor was the withdrawal of its support the sole reason for the proliferation of SDRAM technologies.

A SDO can have monopsony power only if the development of a standard by the SDO makes adoption of a technology significantly more likely than it would be in the absence of the standard. Successful standardization is a process of building industry consensus to support a particular technological path. Achieving consensus can be very difficult and merely writing a standard specification is no assurance that the industry will adopt the standard. Adoption is not guaranteed even if a technology is clearly superior to other proposals.

The development of a formal standard is likely to be critical to the commercial success of a technology when there are powerful economies of scale and a need for coordination to achieve compatibility. But neither factor alone is sufficient to make a standard developed by a SDO critical to the adoption of a technology. Scale economies can create a de facto standard by making a single product cheaper to produce than multiple products and the demand for compatibility can cause an industry to conform to the specifications of a market leader.

In evaluating whether ex ante joint negotiation passes a rule of reason test, the first inquiry should be whether there is a significant risk of ex post hold-up for the technologies at issue resulting from investments that firms and consumers make that are specific to a standard. If the risk of ex post hold-up is small, there should be little tolerance for joint negotiations that may exercise collective monopsony power. If hold-up is a concern, less restrictive alternatives to collective ex ante negotiation also should be considered. In the next section I consider different alternatives, including FRAND licensing terms and ex ante bilateral licensing negotiations between owners of proprietary technologies and the individual participants in an industry, reinforced by a clear non-discrimination commitment.

III. Less restrictive alternatives

Proposals to allow ex ante joint negotiation of licensing terms by members of a SDO are in part a response to limitations of other measures, in particular, commitments

Rather, the record shows that JEDEC's standards captured the market." Federal Trade Commission, In the Matter of Rambus Incorporated, Opinion of the Commission, Docket 9302 (August 2, 2006) at 80.

by technology rights holders to license intellectual property that may be essential to use of standard at terms that are “fair, reasonable and non-discriminatory.” I discuss different interpretations of “fair and reasonable” and describe obstacles to a workable definition of fair and reasonable royalty terms. In contrast, the “non-discrimination” prong of a FRAND commitment is amenable to a workable definition. The combination of a clear non-discrimination requirement and bilateral bargaining can be a useful and less restrictive alternative to ex ante joint negotiation for most standardization efforts.

A. “Fair and reasonable” licensing terms

No SDO, court, or enforcement agency has offered a workable definition of “fair and reasonable” licensing terms, which leaves rights holders and potential licensees free to opine about what “fair and reasonable” may require. One interpretation is that a FRAND commitment is no more than a commitment to license at mutually agreeable terms, and the only limitation of “fair and reasonable” is to rule out terms that are tantamount to a refusal to license.³⁷ Licensing terms are “fair and reasonable” under this definition if they are consistent with a willingness to license by the rights holder, even if investments that are specific to a standard increase the cost of switching to an alternative ex post and allow the rights holder to set a royalty that is much higher than the royalty that would have been established in the absence of standard-specific investments.

In making an assessment of “fair and reasonable” under this definition, the standard reference for a determination of a “reasonable royalty” is the court opinion in *Georgia-Pacific Corp. v. United States Plywood Corp.*, which lists fifteen factors that enter into the determination of a reasonable royalty for the assessment of patent

³⁷ See, e.g., Damien Geradin, Standardization and Technological Innovation: Some Reflections on Ex-Ante Licensing, FRAND, and the Proper Means to Reward Innovators, TILEC Discussion Paper DP 2006-017 (June 2006) at 6. (“The main purpose behind FRAND is thus to ensure that any standard adopted remains available for implementation by all companies willing to take advantage of the opportunity to negotiate and enter into a licence agreement. FRAND therefore aims at preventing an outright refusal to license.”)

infringement damages.³⁸ However, none of these factors address opportunistic conduct resulting from investments that are specific to standards.

A different assessment of a “fair and reasonable” royalty is the royalty that the rights holder would obtain in competition with other technologies in the absence of any investments that are specific to a standard that includes the technology.³⁹ Some scholars make a logical leap from this concept to a definition of “fair and reasonable” that is the ex ante incremental value of the licensed technology relative to its next-best alternative. This is the outcome of a Nash-Bertrand market or an auction market for a technology with a stand-alone value and no uncertainty.⁴⁰ Specifically, suppose a patented technology offers a net benefit that has a value v for each licensed unit relative to the next-best alternative, before firms and consumers have made investments that are specific to the technology. These specific investments create a switching cost in the amount K per unit. Ex post, after firms and consumers have made investments that are specific to the standard, the owner of an essential patent can charge $v + K$ per unit without inducing a switch to an alternative technology. An argument is that royalties are fair and reasonable if they are no more than v per unit.⁴¹

³⁸ *Georgia-Pacific Corp. v. United States Plywood Corp.*, 318 F. Supp. 1116, 1119-20 (S.D.N.Y. 1970), *modified and aff'd*, 446 F.2d 295 (2d Cir.).

³⁹ See, e.g., Farrell et al, note 3 *supra* at 612-613.

⁴⁰ Swanson and Baumol show that v is the outcome of a hypothetical competitive auction run by the SDO. The SDO would select the most desirable technology at a royalty equal to the difference between its value and the value of the next-best substitute including implementation costs. See Daniel G. Swanson and William J. Baumol, *Reasonable and Nondiscriminatory (FRAND) Royalties, Standards Selection, and Control of Market Power*, 73 ANTITRUST L. J. 1 (2005). See also Robert A. Skitol, *Concerted Buying Power: Its Potential for Addressing the Patent Holdup Problem in Standard Setting*, 72 ANTITRUST L. J. 727 (2005).

⁴¹ Several conditions have to be met for an auction to deliver this result. For a discussion of the difficulties of using ex ante auction markets to determine royalties in more realistic settings see, e.g., Richard Schmalensee, note 26 *supra* at 537-42; Damien Geradin, Anne Layne-Farrar, and A. Jorge Padilla, *Standard Setting, Rand Licensing and Ex Ante Auctions: The Policy Implications of Asymmetry*, SIIT 2007 Proceedings 143; and Damien Geradin & Anne Layne-Farrar note 14 *supra* at 97. For a general discussion of auction design and performance see Paul Klemperer, *AUCTIONS: THEORY AND PRACTICE*, Princeton University Press (2004).

There is little evidence that royalties, or for that matter goods prices, correspond to this theoretical construct.⁴² Relative values of different technologies are difficult to estimate in practice and competition does not necessarily force royalties to zero for technologies that offer similar functionality. Even if the value of a technology can be accurately estimated relative to the next-best alternative, this does not determine the royalty in a hypothetical market with zero switching costs from standard-specific investments. It only determines the upper limit of the royalty *relative* to the cost of the next-best alternative, assuming that the user is well-informed and makes a rational technology choice.

The actual royalty depends on the cost of the next-best alternative. If the next-best alternative is available at zero cost, the relative value of the technology can be a reasonable estimate of the upper limit of the royalty that an informed and rational user would pay. This is, however, a special case. Moreover, it is not obvious that courts can accurately measure relative technology values,⁴³ and it is not obvious that technology users make the kind of critical comparisons of relative technology values that are implicit in this calculation.

Some technologies are licensed before and after they are incorporated in a standard. The pre-standard license terms offer a convenient way to assess whether post-standard licenses are fair and reasonable after firms and consumers have made investments that are specific to the standard. However, widespread adoption of a

⁴² The Internet provides evidence that actual markets do not always mirror the predictions of a theoretical Nash-Bertrand or auction market. Consumers can search the Internet for identical products with little more effort than a mouse click. This is a test case for Nash-Bertrand competition with homogenous products. The theory predicts that in the absence of capacity constraints, price should converge to the marginal cost of the second least-expensive provider. Yet actual markets exhibit considerable price dispersion. See Michael Baye & John Morgan, *Price Dispersion in the Lab and on the Internet: Theory and Evidence*, 35 RAND J. ECON. 449 (2004).

⁴³ The Federal Trade Commission estimated a reasonable royalty of 0.25% for Rambus patents related to JEDEC-compliant SDRAM devices, with zero royalties after three years. Rambus argued that 2% (for the duration of the patent) was a standard rate for licenses. See U.S. Federal Trade Commission, In the Matter of Rambus Incorporated, Docket No. 9302, Final Order, February 2, 2007, at 20. While the FTC and Rambus generally agreed that rates for comparable licenses provided an appropriate basis to determine reasonable royalties, they reached very dissimilar conclusions from the available evidence. Such disagreements are likely to be the norm.

standard alters the demand for the technology and hence may alter the profit-maximizing royalty, even in the absence of switching costs.⁴⁴

The determination of a “fair and reasonable” royalty for a technology is yet more difficult when the technology is one of many that are essential to practice a standard, as is often the case for compatibility standards.⁴⁵ If many technologies are essential to make or sell a product, the allocation of value to a particular technology becomes arbitrary. Every technology has a claim to the entire value of the product for which it is essential. However, this yields a contradiction when there is more than one essential technology.⁴⁶

If each patent is equally essential to the standard, a plausible starting point for assigning value to the patents is to allocate the value V equally to each patent after deducting the contribution of other inputs to the value of the product.⁴⁷ However, some essential patents are more valuable than other essential patents. Some technologies are specific to a particular standard, while other technologies have actual or potential uses outside the standard, either as stand-alone technologies or as components of a different

⁴⁴ The increase in demand for a patented technology can be attributed to the adoption of the standard rather than to value created by the technology. Mark Patterson has argued that the patentee should not be entitled to appropriate that component of the increase in demand that is the result of the standard. *See* Mark R. Patterson, note 28 *supra* at 1046 (Contributions of a standard, such as interoperability, should be given independent legal significance. Interoperability creates product demand independent of those aspects of the products that comply with the standard.) and Mark R. Patterson, note 9 *supra* at 2009 (To allow the patentee to charge a royalty based on the demand for the standard would be to give it a return on the efforts of the standard-setter, thus conferring a windfall, at least if the invention did not provide any benefits specifically related to standardization.) In practice it is likely to be difficult to sort out the demand created by a patented technology and the demand created by a standard unless the technology has been utilized in comparable circumstances with and without the standard.

⁴⁵ For example, MPEG LA lists more than 150 essential patent families for the MPEG-2 standard. *See* MPEG LA, *MPEG-2 Patent Portfolio License Briefing*, August 4, 2010, at 4.

⁴⁶ *See, e.g.,* Armen A. Alchian & Harold Demsetz, *Production, Information Costs, and Economic Organization*, 62 AMER. ECON. REV. 777, 779 (1972). For illustrations of royalty allocations for essential technologies under different assumptions, *see* Anne Layne-Farrar, A. Jorge Padilla & Richard Schmalensee, *Pricing Patents for Licensing in Standard Setting Organizations: Making Sense of FRAND Commitments*, 74 ANTITRUST L. J. 671 (2007) at 685-705.

⁴⁷ There is some theoretical justification for this assignment of equal value to essential patents as it provides efficient incentives for investment in R&D to create the technologies in the first place under some conditions if the patented technologies have no value other than when used to implement the standard. *See, e.g.,* RICHARD GILBERT & MICHAEL KATZ, *Efficient Division of Profits from Complementary Innovations*, University of California Working Paper, May 2010 at 2, 24.

standard. Furthermore, when technologies have uses outside the standard, their values in these alternative uses may differ.⁴⁸

Consider a more specific example. Suppose that ten patented technologies are essential to a standard, which has a value of \$30 per unit, net of the contribution of other inputs. Nine of the patents are useful only for the implementation of this standard. The other patent (“patent A”) has a standalone value in another use (which could be a different standard) of \$20 per unit. Bargaining theory predicts that patent A should receive at least its \$20 standalone value, plus its contribution to the standard.⁴⁹ Thus patent A should receive a disproportionate share of value of the standard in this example.

An additional concern is that the assignment of equal value to essential patents provides an incentive for filing patents and asserting that those patents are essential to use the standard and for subdividing claims into multiple patents. While the contours of a standard may be well-defined, the standard does not specify the patents that may be infringed by use of the standard. This ambiguity is an invitation to strategic patenting to appropriate a larger share of the value of the standard. Moreover, the allocation of value to each patent would change over time with changes in the number of patents that are declared to be essential for a product.⁵⁰ For example, the number of essential patents in the MPEG-2 pool increased from 27 in 1997 to more than 150 in 2010.⁵¹

⁴⁸ Some have argued for equal value per patent for particular technologies. *See, e.g.,* David J. Goodman & Robert A. Myers, *3G Cellular Standards and Patents*, IEEE WIRELESSCOM 2005, (June 13, 2005). Cf. Donald L. Martin & Carl De Meyer, *Patent Counting, a Misleading Index of Patent Value: A Critique of Goodman and Myers and Its Uses*, SSRN working paper (December 4, 2006).

⁴⁹ *See, e.g.,* Binmore et al. note 31 *supra* for the determination of payoffs under Nash bargaining. Other bargaining models, such as the Shapley value, lead to different outcomes in some situations, but they share the property that a patent’s value generally depends on its standalone value and its contribution to the value of the standard. *See, e.g.,* Anne Layne-Farrar et al. note 46 *supra* at 693-696 and David J. Salant, *Formulas for Fair, Reasonable and Non-Discriminatory Royalty Determination*, 7 J. IT STAND. & STAND. RES. 67, 71-72 (January-June 2009).

⁵⁰ *See, e.g.,* Damien Geradin, *Ten Misconceptions about Antitrust, Intellectual Property and Standardization*, presented at ABA Section of Antitrust Innovation Symposium, Stanford Law School, 21-22 May 2010 at 14.

⁵¹ *See* Business Review Letter from Joel I. Klein, Assistant Att’y Gen., U.S. Dep’t of Justice, to Garrard R. Beeney, Esq. (June 26, 1997), *available at* <http://www.usdoj.gov/atr/public/busreview/215742.pdf> and MPEG LA (“MPEG LA Business Review Letter”), *MPEG-2 Patent Portfolio License Briefing*, note 45 *supra*.

Intellectual property rights holders often have different business objectives that affect their technology licensing strategies and the royalties they would seek if they licensed their intellectual property. Some firms are vertically integrated “technology implementers.” These firms have the primary objective of obtaining access to intellectual property in order to sell products. Obtaining revenues from licensing is a secondary concern, although a vertically integrated rights holder could have strategic incentives to raise royalties to competing technology buyers in an attempt to raise its rivals’ costs.⁵² Other firms are un-integrated “technology innovators.” These firms earn their revenues primarily by licensing the intellectual property that they create.

When multiple patents are essential to use a standard and some technology implementers are content to charge low royalties, this leaves more “headroom” for other patentees – including technology innovators – to charge relatively high royalties. Different strategies for the licensing of intellectual property create a potential conundrum for the evaluation of “fair and reasonable” royalties. In particular, if the criterion for a “fair and reasonable” royalty is the royalty that a firm would have charged in the absence of switching costs, it would be incorrect to conclude that a “fair and reasonable” royalty is an equal share of the value of the technology if rights holders would not have chosen similar royalty terms in the absence of switching costs. Patentees with different licensing objectives may charge different ex ante royalties for patents that are equally essential to a standard and have identical opportunity costs. Under this baseline, considerations of “fair and reasonable” royalties ex post should account for these different licensing strategies.

Some commentators accept the difficulty of defining a “fair and reasonable” royalty, but nonetheless argue that bilateral bargaining between individual licensees and rights holders with a FRAND commitment has some power because it obligates the rights

⁵² See, e.g., Steven C. Salop & David T. Scheffman, *Cost-Raising Strategies*, 36 J. IND. ECON. 19 (1987) and Janusz A. Ordover, Garth Saloner, and Steven C. Salop, *Equilibrium Vertical Foreclosure*, 80 AMER. ECON. REV. 127 (1990). For pricing incentives under mixed vertical integration, see, e.g., Sung-Hwan Kim, *Vertical Structure And Patent Pools*, 25 REV. IND. ORG., 231, 247 (2004); Klaus M. Schmidt, “Licensing Complementary Patents and Vertical Integration,” University of Munich Working Paper, November 2006; R. Preston McAfee, *The Effects of Vertical Integration on Competing Input Suppliers*, 35 Federal Reserve Bank of Cleveland Economic Review (1999); and Richard Schmalensee, note 26 *supra* at 534-5 (2009).

holder to offer a license and eliminates the threat of an injunction.⁵³ However, the value of FRAND promise is dubious without some measure of a reasonable royalty. There is a better alternative, which is to couple ex ante bilateral bargaining with a clear non-discrimination commitment.

B. Bilateral bargaining with a non-discrimination commitment

Ex ante bilateral negotiations protect those who make binding agreements with rights holders. But those who do not negotiate ex ante, including firms and consumers that enter the industry after a standard has issued, do not have the protection of licensing agreements settled ex ante and may be exposed to ex post opportunistic conduct. The non-discrimination prong of a FRAND commitment provides an umbrella of protection for technology users that negotiate licenses after firms and consumers have made investments that are specific to a standard as well as for users that have little bargaining power to negotiate royalties ex ante.

While the “fair and reasonable” prong of FRAND is inherently ambiguous, the “non-discrimination” prong, if clearly defined, can provide meaningful protection against ex post hold-up in conjunction with ex ante bilateral negotiations between rights holders and industry members before a standard issues.⁵⁴

The ND in FRAND may mean more than licensing terms that would be acceptable before firms and consumers make investments that are specific to a standard. It is not unusual for licensors to negotiate very different licensing terms with licensees for technologies that are not standardized and for which switching to other technologies is not difficult. Licensors may wish to reward early adopters or large buyers or may respond to different bargaining power by licensees by offering different terms. Formal

⁵³ See, e.g., Joseph Miller, *Standard Setting, Patents and Access Lock-In: RAND Licensing and the Theory of the Firm*, 40 IND. L. R. 351, 358 (2007) (The core meaning of the RAND promise is an irrevocable waiver of injunctive relief and other extraordinary remedies for patent infringement.)

⁵⁴ See also Anne Layne-Farrar, *Considering Whether Ex Ante Joint Negotiations within Standard Setting Are “Reasonably Necessary,”* GCP (May 2008) and Anne Layne-Farrar, Gerard Llobet, & Jorge Padilla, *Preventing Patent Hold Up: An Economic Assessment of Ex Ante Licensing Negotiations in Standard Setting*, 37 AIPLA Q. J. 445 (2009) (Once pivotal players obtain reasonable rates, the “non-discriminatory” component of a RAND licensing commitment ensures that other pivotal players receive reasonable rates as well.).

standardization decisions have the intent to encourage adoption of a technology by creating a “level playing field” for adopters to compete.⁵⁵ It could be contrary to the objectives of formal standardization to create an environment in which some adopters are favored by terms that are much more advantageous than the terms that are offered to other adopters.

It is artificial and counterproductive to impose a definition of non-discrimination that requires identical licensing terms for every licensee. Such a requirement is facially ambiguous and, if defined literally to mean that every licensee pays the same amount, would sacrifice economic efficiency. Does a non-discrimination requirement mean that every licensee pays the same total amount for a license, or that every licensee pays the same amount per licensed unit? If the license applies a percentage royalty to a downstream product, should the percentage royalty be the same for all licensees, or should the total royalty be the same, and should the royalty be the same for all products that employ the licensed technology?

Actual licensing programs differ for patents that are subject to FRAND commitments. MPEG LA administers several patent licensing programs. ATSC is a set of standards for the transmission of digital television signals. MPEG-LA offers a portfolio license for ATSC patents with a fixed royalty of \$5.00 for each ATSC receiver product.⁵⁶ AVC/H.264 (MPEG-4 Part 10) is a digital video coding standard used in set-top boxes and other devices. The license terms for the MPEG LA AVC/H.264 patent portfolio depend on the number of licensed products and whether AVC/H.264 products are sold to end users or enterprises. The royalty terms include fixed fees and fees that decline with the number of licensed units subject to a cap, and allow small numbers of units to be licensed with no royalty.⁵⁷ MPEG-2 is a standard for the compression of audio and video signals. MPEG LA offers a portfolio of MPEG-2 system licenses with a

⁵⁵ The ANSI Vice President and General Counsel cites the objective of developing standards to ensure a “level playing field.” See Patricia A. Griffin, *Overview of the American National Standards Process*, Presented at NIST Panel on Open Standards (March 13, 2006) at 11.

⁵⁶ MPEG LA, *ATSC Patent Portfolio License Briefing*, March 25, 2010, at 7.

⁵⁷ MPEG LA, *AVC Patent Portfolio License Briefing*, August 1, 2010, at 8-9.

fixed royalty for each licensed mobile MPEG-2 systems signal receiver and a different fixed royalty for all other MPEG-2 systems devices.⁵⁸ MPEG LA represents that these patents licenses have “reasonable terms and conditions” or provide “fair, reasonable, and nondiscriminatory access” to its administered portfolios.⁵⁹ Yet the royalty schedules differ qualitatively as well as quantitatively for these patent portfolios.

Sisvel manages a licensing program for patents that are essential to the Digital Video Broadcasting - Terrestrial (“DVB-T”) standard, which specifies the framing structure, channel coding, and modulation for digital terrestrial television broadcasting. SISVEL licenses DVB-T essential patents on terms that it describes are fair, reasonable, and non-discriminatory. Licensees pay a fixed fee of 0.75 euro for every DVB-T receiver product sold if they select coverage under all DVB-T essential patents or 0.50 euro if they select coverage for only a subset of the patent portfolio.⁶⁰ SISVEL also offers licenses under FRAND terms for patents that cover the CDMA2000 cellular standard. The royalty rate is a fixed fee per unit sold subject to a cap, both of which depend on the licensed functionality.⁶¹

VIA Licensing administers the licensing programs for several patent portfolios and represents that its licenses are intended to be offered “to the entire market on Reasonable And Non-Discriminatory (RAND) terms.”⁶² The royalty for a portfolio license for patents that are essential to 802.11 wireless standards range from \$0.55 per licensed product for sales of less than 500,000 units per year to \$.05 per licensed unit for

⁵⁸ MPEG LA, *MPEG-2 Systems Patent Portfolio License Briefing*, May 28, 2010, at 7.

⁵⁹ MPEG LA specifically notes that it licenses MPEG-2 systems and AVC/H.264 patents on “reasonable terms and conditions” (see <http://www.mpegla.com/main/programs/M2S/Pages/FAQ.aspx> and <http://www.mpegla.com/main/programs/AVC/Pages/Agreement.aspx>) and provides “fair, reasonable, and nondiscriminatory access” to its portfolios of patents relevant to the MPEG-4 and ATSC standards. See <http://www.mpegla.com/main/pages/MediaArchive.aspx> and <http://www.mpegla.com/main/pages/media.aspx>.

⁶⁰ See <http://www.sisvel.com/english/licensingprograms/dvbt/licensingprogram>.

⁶¹ See <http://www.sisvel.com/english/licensingprograms/cda2/license-terms>.

⁶² VIA Licensing also represents that while it does not discriminate between licensees, “if there is something about the sample license that is impossible for you to comply with, Via Licensing would be happy to discuss the matter with you further.”

sales of more than 40 million units per year.⁶³ License fees for the VIA patent portfolio that covers Advanced Audio Coding (AAC) also decline with the number of units sold for consumer products, but are set at fixed per unit fees for professional products, some of which are subject to a maximum cap.⁶⁴ In addition, for cellular telephone products, licensees can choose from a royalty schedule that includes a fixed fee for sales of less than 7.5 million per year.⁶⁵ Via Licensing's patent portfolio for MPEG-2 ACC is a subset of the ACC portfolio.⁶⁶ Royalties for this portfolio decline with volumes sold for consumer decoder and codec channels, but are a flat rate for professional encoders.⁶⁷ The VIA licensing program for patents that cover the OpenCable Applications Platform is a fixed fee per license device and a fixed fee per subscriber.⁶⁸

The DVD6C Licensing Group offers licenses for various DVD products at the greater of a fixed royalty or a percentage of the product's net selling price.⁶⁹ The Licensing Group represents that its royalties are fair and reasonable and that it does not discriminate between licensees.⁷⁰

This is only a sample of the royalty terms for patent portfolios that the licensing administrators represent are fair, reasonable, and non-discriminatory. The royalty structures vary considerably among these programs and include fixed fees, fixed per unit fees, fees that decline with the number of licensed units, different fees for different products, maximum caps, and exemptions for small numbers of licensed units. If the definition of non-discriminatory is that every licensee pays the same amount, then some of these programs fail the non-discrimination prong of FRAND.

⁶³ See http://www.vialicensing.com/licensing/IEEE80211_fees.cfm.

⁶⁴ See http://www.vialicensing.com/licensing/AAC_fees.cfm

⁶⁵ *Id.*

⁶⁶ See http://www.vialicensing.com/licensing/MPEG2AAC_index.cfm.

⁶⁷ *Id.* note 64 *supra*.

⁶⁸ See http://www.vialicensing.com/licensing/OCAP_fees.cfm.

⁶⁹ See <http://www.dvd6cla.com/royaltyrate.html>.

⁷⁰ See <http://www.dvd6cla.com/faq.html>.

Requiring all licensees to pay the same amount is not a prescription that is either fair or would promote economic welfare. It is not fair to require a firm that sells 1,000 wireless units per year to pay the same fixed patent licensee fee as a firm that sells 1,000,000 wireless units per year. A fixed fee also is inefficient if it excludes potential licensees that have a low willingness to pay. Non-discrimination should not require fixed per unit royalties because fixed fees and royalties that decline with output have desirable efficiency properties by providing incentives for licensees to produce more to take advantage of lower fees.⁷¹ Furthermore, some licensees offer valuable consideration in trade, such as cross-licenses for their intellectual property, which may be netted against the price of a license.

Non-discrimination requires uniform treatment for similarly situated licensees, but it does not have to be interpreted rigidly. Some flexibility in licensing terms is desirable.⁷² A reasonable interpretation of the non-discrimination requirement of FRAND is that all licensees should be able to choose from the same schedule of royalties, which may be a single fixed fee, a fixed per-unit running royalty, a royalty that declines with output. It also can be pro-competitive to offer a choice of licensing terms, because licensees will choose the combinations of price and quantity that give them the highest values.

If royalties decline with output, under a non-discrimination commitment that point on the royalty schedule is available to other potential licensees. A concern, however, is that an influential adopter may negotiate a royalty schedule that declines sharply with output knowing that competitors are small and would have to pay a high royalty, or may include other terms in a licensing agreement that would be unfavorable to other licensees. In the extreme, the competitive effects of such a royalty schedule can be similar to an exclusive dealing arrangement and should be analyzed accordingly.

⁷¹ A fixed fee royalty is a type of non-linear royalty because the average royalty is a declining function of the licensee's output. The marginal royalty payment is zero for a fixed fee, which aligns with the low marginal cost of licensing.

⁷² Robert D. Willig, *Pareto-Superior Nonlinear Outlay Schedules*, 9 BELL J. ECON. 56 (1978) ("For any uniform price unequal to marginal cost, there is a nonlinear outlay schedule that is preferred by each consumer and that yields greater vendor profit.")

Royalties are only one component of a licensing arrangement. Non-price licensing terms can be equally important. The value of a license depends on the restrictions that attach to use of the licensed property, such as the fields of use or geographic areas in which licensed technologies can be used. Many FRAND licensing programs, such as programs administered by MPEG-LA, Sisvel and VIA Licensing, place no field of use restrictions on licensees while other programs restrict licenses to a particular use. The DVD6C Licensing Group offers a portfolio license only for patents that are necessarily infringed by implementation the DVD standard specifications for Read Only discs, Recordable Discs, Rewritable discs, Re-recordable discs, Rewritable/Re-recordable Discs, DVD Video Recording, and +R/+RW discs.⁷³

There are sound economic and business reasons for licensing restrictions.⁷⁴ Restrictions should not be inconsistent with the non-discrimination prong of FRAND if they are applied uniformly to all actual and potential licensees. A similar conclusion applies to licensing terms such as requirements that licensees grant back licenses to patents they file that are essential to a standard. The antitrust enforcement agencies have concluded that such requirements do not harm competition in many circumstances.⁷⁵

The combination of ex ante bilateral bargaining and the non-discrimination provision of a FRAND commitment can be effective to limit ex post opportunism in many circumstances. To achieve these benefits will require clear definitions of a non-discrimination commitment and the obligations of licensors that are subject to these commitments, including whether licensors that make a non-discrimination commitment must publicly announce their royalty schedules and other licensing terms.

⁷³ See <http://www.dvd6cla.com/faq.html>.

⁷⁴ For example, a licensing arrangement that prevents the licensee from dealing in other technologies may encourage the licensee to develop and market the licensed technology or specialized applications of that technology. U.S. Department of Justice and Federal Trade Commission (2005), *Antitrust Guidelines for the Licensing of Intellectual Property* at ¶4.1.2.

⁷⁵ See, e.g., MPEG LA Business Review Letter at 13, Business Review Letter from Joel I. Klein, Assistant Att’y Gen., U.S. Dep’t of Justice, to Garrard R. Beeney, Esq. (December 16, 1998), available at <http://www.usdoj.gov/atr/public/busreview/2121.pdf> at 14.

C. Limits to bilateral royalty negotiations with a non-discrimination commitment

Under some conditions bilateral ex ante negotiations plus a clear non-discrimination commitment protects the industry from hold-up following a decision to include a technology in a standard. How general is this claim and under what conditions is bilateral commitment plus non-discrimination a superior alternative to ex ante joint negotiations? A number of conditions have to be satisfied to make ex ante bilateral negotiations plus non-discrimination an effective less-restrictive alternative to ex ante joint negotiation as a policy to mitigate hold-up.

1. *Is ex ante bilateral bargaining plus non-discrimination more or less effective than ex ante joint negotiation in limiting ex post opportunism?*

A potential criticism of bilateral bargaining with a non-discrimination commitment is that it is not superior to ex ante joint negotiation because either one member will have bargaining power that is comparable to the power of all members acting jointly, in which case it offers no monopsony benefit relative to joint negotiation, or the rights holder will have the power to set licensing terms, in which case bilateral bargaining offers no protection from hold-up. In the first case, if the vote of a member of a SDO is pivotal to the adoption of a technology in a standard, that member can have the same bargaining power as the collective power of members of the SDO acting jointly. If the member is pivotal, the adoption of the technology will succeed or fail based on its vote, which gives the member the power to negotiate favorable licensing terms.⁷⁶ In the second case, if no member of the SDO is pivotal, then the intellectual property rights holder has the power to negotiate terms that are favorable to the licensor. The only recourse of a SDO member is to vote against inclusion of the technology in the standard,

⁷⁶ Under a unanimity requirement, each member of the SDO is pivotal to the adoption decision. Pivotal adopters can negotiate favorable royalty terms ex ante and avoid hold-up ex post. See, e.g., Anne Layne-Farrar, Gerard Llobet, & Jorge Padilla note 54 *supra*. See also Ilya Segal & Michael D. Whinston, *Naked Exclusion: Comment*, 90 AM. ECON. REV. 296 (2000) for a discussion on pivotal buyers in the context of exclusive dealing arrangements.

and this may be pointless if there is no clear alternative or if selection of a better alternative would take a long time.

This description of bilateral bargaining power is an oversimplification. In practice, rights holders will not know whether a particular member of a SDO is or is not pivotal to the technology adoption decision. The rights holder will have to negotiate licensing terms under the expectation that the SDO member may have some power to influence the decisions of the SDO, but that power will not be absolute. Furthermore, if the expectation of the rights holder is that no SDO member will be pivotal to the technology adoption decision, the rights holder still must be concerned that members will vote against its technology and will hedge this risk by offering licensing terms that are favorable to licensees.

Thus, the all-or-nothing characterization of the bargaining power of SDO members that engage in ex ante bilateral negotiations is not accurate. In practice, the bargaining power of SDO members that engage in bilateral negotiations with rights holders will vary and the power of the most effective members will be significant but less than the power of all SDO members if they bargain collectively. Most SDOs do not require unanimity, which would make every member pivotal to an adoption decision, but instead require “consensus” or a super-majority for adoption of a technology in a standard.⁷⁷ Acting alone, SDO members will have some market power in negotiations

⁷⁷ ANSI policy states that “Voluntary consensus standards serve as the cornerstone of the U.S. standardization system. These documents arise from an open process that depends upon data gathering, a vigorous discussion of all viewpoints, and agreement among a diverse range of stakeholders.” American National Standards Institute, “Overview of the U.S. Standardization System,” July 2007. The IEEE Standards Manual states that “The balloting group shall provide for the development of consensus by all interests significantly affected by the scope of the standard. This is achieved through a balance of such interests in the balloting group membership. Balance is defined as the avoidance of dominance by any single interest category.” IEEE-SA Standards Board Operations Manual available at <http://standards.ieee.org/guides/opman/sect5.html>. The JEDEC Manual of Organization and Procedure, JM21M, December 2006, states that “Unless specifically authorized by the Board [of Directors], all approval vote counts within JEDEC shall be a minimum of 2/3 of votes cast. All Board approval vote counts shall be a minimum of 3/4 of votes cast.” The IEEE requires that at least seventy-five percent of a working group must vote on a proposed standard and seventy-five percent of the votes must be in the affirmative to adopt the standard (IEEE-SA Standards Board Operations Manual, *available at* <http://standards.ieee.org/guides/opman/sb-om.pdf>). VITA has a similar policy (VITA Standards Org., VSO Policies and Procedures § 7.2.1.1 (rev. 2.0 June 2005), *available at* <http://www.vita.com/VOS-pp-draft2do.pdf>).

with rights holders, and the non-discrimination requirement will assure that weaker members of the SDO and potential licensees that do not participate in the SDO will benefit from the power of stronger members. However, it is unlikely that individual members of the SDO would have the same degree of monopsony power as they would have if they bargained jointly, and in this respect the combination of ex ante bilateral negotiations and a non-discrimination commitment is a less restrictive alternative to ex ante joint negotiations by a SDO.

2. *Disclosure of intellectual property rights*

Potential licensees cannot negotiate favorable licensing terms with rights holders before the standardization decision unless they are aware of proprietary rights for technologies that might be included in a standard specification. Without ex ante disclosure of proprietary rights, technology users may be exposed to ex post hold-up.

Recent antitrust actions have focused on inadequate disclosure in standard development contexts as a significant competitive issue.⁷⁸ However, disclosure requirements raise many thorny issues, such as who is responsible to search for patents that might be relevant to a standard, the evaluation of patent claims, and whether disclosure extends to pending patents, patent applications, and planned applications.⁷⁹ Given the burden of disclosure requirements and the complex implications of disclosure for research plans that companies may wish to remain confidential, it is not surprising that many standard development organizations have weak or non-existent patent disclosure requirements.⁸⁰ The absence of disclosure is a limitation on bilateral bargaining with a non-discrimination commitment, but this limitation applies equally to ex ante joint negotiation of licensing terms. In this respect, bilateral bargaining with a

⁷⁸ These include Federal Trade Commission enforcement actions such as *In re Dell*, 121 F.T.C. 616 (1996) (No. C-3658), *In re Rambus, Inc.*, No. 9302 (F.T.C. 2002), *In re Union Oil Co. of Cal.*, No. 9305 (F.T.C. Mar. 4, 2003), and private cases such as *Wang Laboratories, Inc., v. Mitsubishi Electronics America, Inc.*, U. S. Court of Appeals for the Federal Circuit, 103 F.3d 1571 (January 3, 1997).

⁷⁹ See, e.g., Mark A. Lemley, *Ten Things To Do About Patent Holdup Of Standards (And One Not To)*, 47 B.C. L. Rev 149 (2007) at 157.

⁸⁰ See Lemley note 7 *supra* at 1905-6 and François Lévêque & Yann Ménière, *Technology Standards, Patents and Antitrust*, 9 COMPETITION & REG. IN NETWORK INDUS. 29, 39-40 (2008).

clear non-discrimination is not inferior to ex ante joint negotiation. Furthermore, the absence of disclosure is a limitation for any policy that relies on negotiation of ex post licensing terms or a FRAND commitment, unless FRAND can be interpreted to apply retroactively to any intellectual property that should have been disclosed ex ante.⁸¹

3. *Incomplete ex ante licensing contracts*

Ex ante licensing terms, whether negotiated jointly by members of the SDO or bilaterally, can protect licensees against ex post opportunism from irreversible specific investments only if the terms anticipate the possible scenarios in which hold-up may occur.⁸² Agreements, however, may fail to specify all of the relevant payments and conditions corresponding to every conceivable outcome, either because the outcomes are too uncertain or too numerous to describe or because outcomes cannot be described in ways that are enforceable under the contract. A royalty agreement may not anticipate changes in prices of complementary products that affect the value of a licensed technology. A licensee may agree to a high ex ante royalty under the belief that the licensed technology offers large benefits relative to alternatives, but that may turn out not to be the case. Having made investments that make it costly to switch to an alternative, the licensee may have little choice but to pay the license fee. Alternatively, the technology may prove much better than anticipated relative to available alternatives, but the contract may leave little room to negotiate better terms for the licensor. This contractual incompleteness creates the potential for ex post opportunism by both licensors and licensees when parties bargain after costs have been sunk and the contract does not specify the terms of trade.⁸³

⁸¹ For a proposal along these lines, see Robert Merges & Jeffrey Kuhn, *An Estoppel Doctrine for Patented Standards*, 97 CA. L. R. 1 (2009).

⁸² See Oliver E. Williamson, *Credible Commitments: Using Hostages to Support Exchange*, 73 AMER. ECON. REV., 519 (1983) and the references in note 5 *supra* and Lévêque & Ménière, note 80 *supra* at 38 (“Apart from the specifics of investment and opportunism, hold up can only occur when contracts are incomplete.”)

⁸³ Contractual incompleteness is also a problem from the viewpoint of the licensor as well as the licensee. The licensor may underestimate the value of its technology ex ante, which may lead the firm to accept royalties that are much less than the technology’s value in the absence of switching costs.

Incomplete contracts pose a risk of ex post opportunism whether ex ante bargaining is bilateral or occurs jointly with the members of the SDO. One way to guard against ex post opportunism is through what Oliver Williamson calls an exchange of hostages.⁸⁴ Suppose a member of a SDO is considering whether to support a technology that is covered by a proprietary intellectual property right for inclusion in a standard and is concerned that the rights owner would charge a royalty ex post that would make the technology unattractive. The rights owner may offer a “hostage” to mitigate this risk by entering into separate agreements with members of the SDO in which the members agree to invest in technologies that would benefit the rights owner, and which are independent of the standardization decision. If the rights owner charges opportunistic royalties post-standardization, the members of the SDO can respond by withdrawing their support of technologies that would benefit the rights owner.

Alternatively, the rights owner could enter into cross-licenses with members of the SDO. Cross-licenses with zero royalties would not pose a risk of ex post opportunism. If the cross-license carries a royalty, an attempt by the rights owner to raise royalties ex post could be met with a similar increase in royalties charged by the partner in the cross-license. This is another reason for allowing rights holders to enter into cross-licenses or other types of “hostage exchange” without violating non-discrimination commitments.

4. *Ability to enforce non-discrimination*

The requirement that rights holders subject to a non-discrimination commitment must disclose the terms at which they will license their intellectual property and adhere to those terms does not guarantee equal treatment for all similarly situated licensees. Suppose that firm A commits to license patent X with a royalty of \$1 for every unit of a product sold that uses the licensed technology. There are two licensees, firms B and C. Both firms sell one million units per year of products that use the licensed technology. Firm B has a patent portfolio that has value to the rights holder. Firm C has nothing to

⁸⁴ See Oliver E. Williamson, note 82 *supra*.

offer in trade with firm A. In the absence of the license for patent X, firm A would negotiate a cross-license with firm B in which A would pay firm B \$500,000 per year for the rights to its patent portfolio.

If firm A pays an amount for the cross-license that differs from \$500,000 per year, the difference between the amount that firm A actually pays for the cross-license and \$500,000 is equivalent in some respects to a royalty discount or premium for patent X. Suppose firm A pays \$250,000 for the cross-license. In terms of total compensation, this is equivalent to a payment of \$500,000 for the cross-license and a license to patent X with a royalty of \$0.75 per unit.⁸⁵ If firm A pays \$750,000 for the cross-license, the total compensation is equivalent to a payment of \$500,000 for the cross-license and a license to patent X with a royalty of \$1.25 per unit.

It would be exceedingly difficult to audit every trade between a rights holder that is subject to a non-discrimination commitment and its licensees and to compare the terms to what might have occurred in the absence of the license. Although the inability to track and measure trades that might be equivalent to royalty discounts or premiums undermines the force of a non-discrimination commitment, this is not cause to abandon non-discrimination as a less restrictive alternative for ex ante joint negotiation, for several reasons. First, the important question is whether the licensee faces a different marginal cost for a license relative to other licensees. Suppose firm B offers firm A \$250,000 per year for a cross-license that would otherwise cost firm B \$500,000 in the absence of a license. The marginal cost of selling another unit of a product that requires a license to patent X is still \$1. The difference of \$250,000 is a lump sum, which does not affect the pricing incentives of firm B and therefore does not create a competitive advantage for firm B relative to firm C.

Second, the set of licensees that can offer significant value to trade for a royalty discount is limited. For those firms that can offer valuable potential trades, it is not clear that they would want to offer value in return for a discounted royalty or that the rights

⁸⁵ Firm B might be able to obtain access to firm A's patent at zero additional cost if it already has a portfolio license with firm A or a sufficiently broad existing cross-licensing arrangement with firm A that covers firm A's patent.

holder would want to negotiate different terms of trade. Third, as described above, the ability to enter into cross-licenses offers a possible “exchange of hostages” that can address the failures of incomplete contracting for intellectual property rights. Finally, the problem of monitoring and enforcing compliance with a non-discrimination commitment is no different for a non-discrimination commitment that is combined with ex ante bilateral bargaining than it is for any other non-discrimination commitment. This includes a FRAND commitment and ex ante joint negotiation with non-discrimination.

5. *Disincentives to lower royalties*

The non-discrimination requirement extends the bargaining power of individual firms to current and future technology adopters. In doing so, a non-discrimination requirement raises concerns that it will discourage rights holders from entering into discounted licensing arrangements that are particularly favorable for some licensees. A non-discrimination requirement is similar in some respects to a most-favored-customer (MFC) clause in a contract, under which a customer is assured that its price will be no higher than the lowest price paid by any another customer.⁸⁶ If the seller negotiates a lower price with another customer, it is obligated to refund the difference to the customer with the MFC clause. Critiques of MFC provisions point out that they discourage price-cutting and can lead to higher equilibrium prices.⁸⁷ For example, suppose that 100 consumers are willing to pay up to \$10 and 50 consumers are willing to pay up to \$5 for one unit of a good. If a seller can identify customers’ willingness to pay, offer differential prices, and avoid arbitrage, she would charge the first group \$10 and the second group \$5. The seller would serve both groups and earn revenues of \$1,250, with an average price of \$8.33. If the seller offers a MFC commitment or agrees not to offer differential prices, she has to set a single price and would choose between the \$10 price

⁸⁶ A MFC commitment is not equivalent to non-discrimination because it does not necessarily apply to every customer and it does not prevent more advantageous terms for those customers that have a MFC commitment.

⁸⁷ See, e.g., Thomas E. Cooper, Most-Favored-Customer Pricing and Tacit Collusion, 17 RAND J. ECON. 377 (1986) and Aaron S. Edlin, *Do Guaranteed-Low-Price Policies Guarantee High Prices, And Can Antitrust Rise To The Challenge?*, 111 HARV. L. R. 528, (1997).

that only the first group would pay and the \$5 price that both groups would accept.⁸⁸ In this example the seller would choose a price of \$10 and not satisfy the demand of the second group of customers.

As with a MFC clause, a non-discrimination commitment can discourage a licensor from negotiating lower royalties or different licensing terms ex ante. However, if lock-in is significant, a non-discrimination commitment is not likely to result in a large group of un-served customers. Licensees may have a low willingness-to-pay ex ante for a technology that is included in a standard. But ex post, if they are locked in, their willingness-to-pay is higher. The lock-in that allows a rights holder to engage in hold-up also makes it unlikely that a potential licensee will refuse a license ex post, even if she had a low willingness-to-pay for the technology ex ante. The non-discrimination commitment may result in a royalty that a potential licensee would find unattractive ex ante, but the royalty will not prevent the licensee from taking a license ex post, because lock-in makes alternative arrangements even less attractive.⁸⁹

As with a most-favored customer commitment, a non-discrimination commitment can discourage discounting and, as a consequence, may lead to higher royalties. This is a disadvantage of any licensing commitment with a non-discrimination requirement. It is also a disadvantage of ex ante joint negotiation, which likely would require similar treatment for similarly situated licensees.

6. *Diverse preferences*

Bilateral bargaining with a non-discrimination commitment does not necessarily balance the preferences of pivotal technology adopters against the preferences of potential licensees who have little or no influence on technology adoption decisions by a SDO. Suppose most industry participants prefer technology A, but there is one pivotal adopter who strictly prefers technology B. The pivotal adopter's bargaining power may

⁸⁸ No other uniform price would be more profitable.

⁸⁹ It does not follow that lock-in would create no deadweight loss in this example. While locked-in licensees would not refuse a license, the higher cost would be passed on to consumers and likely create a deadweight loss relative to lower prices.

be sufficient to cause the adoption of technology B. The non-discrimination commitment would extend contractual protections negotiated by the pivotal adopter to other industry members, but this may provide little solace if technology B is not their preferred technology.

This outcome presumes the existence of a pivotal adopter whose preferences uniquely determine the SDO's decisions to include a technology as a standard. In practice, if enough members of the SDO oppose technology B, they will vote against its adoption provided there is a better technology for which a consensus will emerge. Moreover, joint negotiation is not immune from the problem of balancing technology preferences. Influential SDO members may be able to force their preferences over that of others in joint negotiations with rights holders.⁹⁰

IV. Policy Recommendations

The federal antitrust enforcement agencies have adopted a rule of reason approach to ex ante joint negotiation by SDOs. The balancing that should take place under the rule of reason should compare the potential benefit from preventing hold-up against the potential harm to competition. This can be a daunting task and SDOs engage in a very large number of standardization decisions.⁹¹ Each technology has different potential risks for hold-up, and each technology may compete in a different technology market with different competitive constraints from alternative technologies and downstream products. The following roadmap for a rule of reason analysis of joint negotiation of licensing terms by members of a standard development organization provides some guidance for this assessment.

⁹⁰ In particular, innovator firms, implementers, and vertically integrated firms are likely to have different preferences for alternative technologies. *See, e.g.,* Richard Schmalensee note 26 *supra* at 543. (“[T]he different strategic positions of integrated firms and innovation specialists may lead to the selection of inferior standards.”)

⁹¹ The IEEE alone has an active portfolio of nearly 1,300 standards and projects under development. *See* <http://standards.ieee.org/announcements/index.html>, accessed March 10, 2008.

1. *Is there a significant risk of hold-up after firms and consumers have made investments that are specific to the standard?*

If there is no significant risk of hold-up, then there is no pro-competitive benefit from joint negotiation of licensing terms. The risk of hold-up could be minimal because specific investments are small and there are no significant network effects. Specific investments are not sufficient to create concerns about hold-up because product market competition can mitigate hold-up by making it unprofitable for an intellectual property rights holder to charge high royalties. Product market competition is intense if consumers are willing and able to switch easily to products that do not employ the proprietary technology. If there risk of hold-up is minimal, there should be a presumption that joint negotiation is unlawful because joint negotiation entails some competitive risks. This presumption can be overturned by demonstrating pro-competitive benefits that are likely to outweigh any competitive harms. An example of pro-competitive benefits is the reduction of transaction costs from technology licensing, which justifies collective rights organizations such as patent pools, the American Society of Composers, Authors, and Publishers (ASCAP) and Broadcast Music Incorporated (BMI). Competitive harms may be unlikely if the interests of SDO members that are technology implementers and innovators are aligned, perhaps because they meet frequently and would internalize any disincentives for innovation from licensing terms technology innovators or because technology innovators are influential members of the SDO and the governance rules of the SDO ensure that the interests of technology innovators are well-represented. Furthermore, a presumption of legality does not extend to discussions of technology characteristics and other factors that are relevant to technology adoption decisions but do not impact the economic terms under which technologies are licensed.

2. *Are there ex ante close substitutes for the technologies being considered for adoption in a standard?*

If the risk of hold-up is significant, the next step in the rule of reason analysis is to assess the potential for members of a SDO to exercise monopsony power through joint negotiation. The scope to exercise monopsony power is more limited if the technologies

being considered for adoption in a standard have close substitutes because the competitive benchmark level of royalties is likely to be lower than the benchmark level if the technology has no close substitutes. Existence of close substitutes ex ante is not sufficient to eliminate the risk of monopsony power. The competitive benchmark royalty could be substantially greater than the incremental cost of licensing even if a technology has close substitutes.

The potential harm to competition from ex ante joint negotiation depends in part on the magnitude of the royalty that would exist in the absence of joint negotiation and investments that are specific to a standard (the “ex ante competitive royalty”). The higher the ex ante competitive royalty, the greater the risk that joint negotiation will depress the royalty significantly below the competitive level. Figures 1 and 2 illustrate two different examples. Figure 1 describes a situation in which the risk from coordinated negotiation is relatively low compared to the potential benefits. In this example, the competitive ex ante royalty is small relative to the switching costs that are incurred after firms and consumers make investments that are specific to a standardized technology. These switching costs create the potential for hold-up, which is large compared to the ex ante competitive royalty. Ex ante negotiation of royalty terms can limit the potential for hold-up. The risk is that ex ante negotiation would squeeze royalties below the competitive level, but this level is small compared to the switching costs from specific investments.

Figure 2 describes a market in which the ex ante competitive royalty is large and the risk of hold-up is relatively small. In this example, the competitive risks of joint negotiation are likely to exceed the expected benefits. Ex ante negotiation could squeeze royalties far below the competitive level. The benefit would be an avoidance of hold-up, but the risk of hold-up is small in this example.

3. *Are there alternative paths for commercialization of the technology being considered for adoption in a standard?*

Members of a SDO are not likely to have monopsony power if the technology rights holder has alternative ways to promote the use of her technology. These

alternatives may include other standard development organizations, influential firms or consumers that can start a bandwagon effect to promote use of the technology, or market forces that are likely to focus on the technology because it has clear benefits or scale economies that overcome any natural obstacles to coordination. If there are close substitutes for the SDO, its members are unlikely to have the ability to exercise monopsony power through ex ante joint negotiation.

4. *Are there less-restrictive alternatives to ex ante joint negotiation that can achieve similar benefits?*

Under many circumstances, the combination of ex ante bilateral bargaining and a clear non-discrimination commitment can achieve most of the benefits of joint negotiation with less risk of monopsony power. This is likely to be the case if there are influential members of the SDO and the non-discrimination commitment is defined clearly and enforced through public disclosure of licensing terms.⁹²

Competition policy should focus on disclosure of intellectual property rights to SDOs and participation of rights holders in standard setting decisions. Ex ante royalty negotiations are meaningless, whether joint or bilateral, without disclosure of the existence of those rights before standards are specified and participation by rights holders in standard development. Hold-up and the adverse consequences that follow from it cannot be avoided if rights holders do not disclose the existence of intellectual property rights and anticipated applications for intellectual property rights that are essential to a standard.

Given the competitive risks of ex ante joint negotiation by a SDO and the existence of less restrictive alternatives in many circumstances, SDOs should exercise caution before entering into joint negotiations with intellectual property rights holders. The best case for pro-competitive benefits from ex ante joint negotiation by a SDO is one in which there is a significant risk of hold-up ex post and there is clear evidence of at

⁹² This roadmap is consistent with conclusions in the U.S. Department of Justice and Federal Trade Commission IP Report, note 3 *supra* at 53, with the additional emphasis on less-restrictive alternatives.

least one of the following conditions: the SDO lacks meaningful market power because there are alternative paths to adopt and promote a technology; there are many technology alternatives that offer approximately equal performance ex ante and can be licensed at low or non-existence royalties; or technology buyers cannot independently protect themselves from high royalties through less restrictive alternatives such as ex ante bilateral bargaining with a non-discrimination commitment.

V. Concluding Remarks

In many circumstances, the combination of ex ante bilateral bargaining and a clear non-discrimination commitment will provide protection from ex post opportunistic conduct without the risk of abuse of monopsony power that may occur with joint negotiation of licensing terms by the members of a SDO. The non-discrimination commitment extends the bargaining power of influential technology adopters to other industry participants, including other members of a SDO and firms that may seek licenses after a standard issues and firms and consumers make investments that are specific to the standard.

Antitrust enforcers should be vigilant to assure that ex ante joint royalty negotiations by a SDO is limited to those situations in which it is most likely to enhance economic efficiency. The potential for anticompetitive outcomes from joint royalty negotiations with SDOs is particularly severe when alternative technologies are distant substitutes for the technology protected by proprietary intellectual property rights and there are no viable alternatives to the SDO for the adoption and promotion of the technology. A worry is that this is precisely the circumstance in which the members of a SDO that are primarily technology implementers rather than innovators may collectively exercise monopsony power and would have an incentive to do so to obtain more advantageous licensing terms.

Royalties Ex Ante and Ex Post

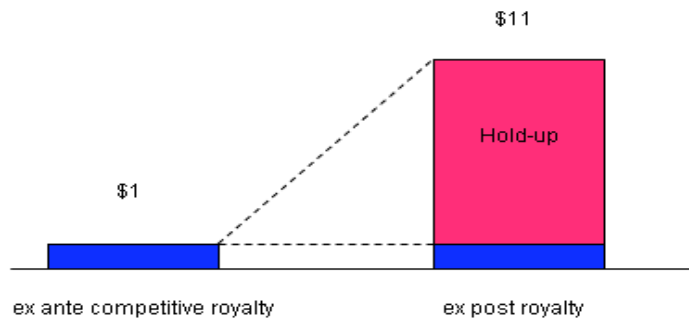


Figure 1. Low ex ante competitive royalty and high hold-up risk

Royalties Ex Ante and Ex Post

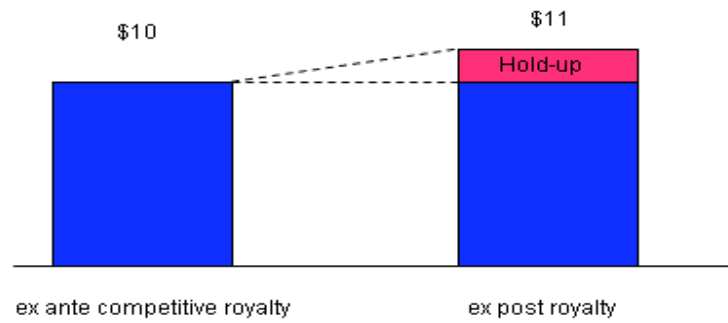


Figure 2. High ex ante competitive royalty and low hold-up risk