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The FRAND Licensing Regime in a Standard-Setting Environment: “If it ain’t broken don’t fix it”

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I. INTRODUCTION

Standard-setting activities, which aim to achieve device interoperability and product compatibility, play a fundamental role in fostering innovation and competition in a variety of markets. Such activities, typically carried out by armies of engineers, would generally not be expected to fascinate lawyers and economists. But they do - and they have recently received much attention as a result of high-profile cases,¹ complaints lodged with competition authorities,² and attempts by members of Standard-Setting Organizations (“SSOs”) to have their rules and procedures modified to prevent allegedly anti-competitive outcomes.³ There seems to be a growing perception, largely fed by certain interest groups, that current standard-setting procedures generally based on the so-called FRAND licensing regime⁴ unduly allow opportunistic holders of Intellectual Property (“IP”) embedded in a standard to extract excessive royalties from their licensees.⁵

Against this background, the objective of this paper is to demonstrate that the existing FRAND regime works. Ongoing proposals to alter it by tilting the bargaining position of licensors, in particular that of pure innovators, in favour of licensees are not only unnecessary, being based on false premises, but would also prove detrimental to investment and innovation. Fortunately, these attempts, and in particularly those to

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¹ See for instance David T. Beddow and Gregg H. Vicinanza, “FTC Charges Rambus With Abuse of Standard Setting Process”, Electronic Newsletter of the Intellectual Property Committee, American Bar Association (ABA) Section of Antitrust Law, 21 June 2002, available at http://www.abanet.org/antitrust/committees/intell_property/june21.html; For a recapitulation of the well-documented Rambus saga, see the Federal Trade Commission’s (“FTC”) decision In the Matter of Rambus, Inc., Docket No. 9302, available at <http://www.ftc.gov/os/adjpro/d9302/060802commissionopinion.pdf>.

² See for instance “European Panel Investigates DVD-Standards Rivalry”, New York Times, 9 August 2006; “Qualcomm rivals take case to EU”, Financial Times, 28 October 2005.

³ See for instance Robert McLeod, “ETSI talks failure puts onus on EC to resolve mobile telephone patent disputes”, MLex Comment, 13 November 2006.

⁴ See Part III below.

⁵ See Part IV below.

amend the rules and procedures of SSOs', have so far been unsuccessful. They remain nevertheless a constant threat.

This paper is divided in seven parts. Part II describes the main features of standard-setting processes, their significance and the strategic battles that may affect them. Part III focuses on the FRAND licensing regime traditionally prevalent in SSOs. Under this regime, owners of IPR that are essential to the standard typically commit to license such patents on "fair, reasonable and non-discriminatory terms". This Part begins by describing the scope of FRAND commitments. It then reviews the various meanings that have been attributed to the concept of FRAND and argues that a "FRAND royalty" cannot be determined in the abstract. Finally, the argument is made that, contrary to what has been suggested by a number of authors, by giving a FRAND commitment an owner of essential IPR cannot be deemed to have waived its fundamental right to seek injunctive relief in case its rights are infringed. Part IV reviews a number of academic studies which argue that the current FRAND regime has proved inadequate to prevent the emergence of a raft of perceived problems: anti-commons, patent thickets, patent hold-up, patent hold-outs, royalty stacking. It is shown that these studies have been seriously challenged and are subject to significant limitations. Moreover, it is argued that they fail to provide any empirical evidence of the problems denounced. Part V examines various proposals that have been made to reshape the FRAND regime. It shows that these proposals, most of which endorse - in one way or another - a compulsory regime of *ex ante* licensing, would create insurmountable practical difficulties and could raise serious competition law concerns. Part VI considers the applicability of Article 82 of the EC Treaty ("Article 82") to claims of excessive-pricing in the IP and standard-setting context. It shows that, should they be pursued, such claims would raise numerous conceptual and practical difficulties. Determining the competitive price of a tangible good is a notoriously complex undertaking, hence the European Commission's understandable reluctance to pursue excessive pricing cases except in a narrow set of circumstances. The potential for error will only be compounded when one deals with intangible assets. For these reasons, determination of appropriate royalty levels for valuable IP should be left to the market. Finally, Part VI contains a short conclusion.

II. GROWING IMPORTANCE OF STANDARD-SETTING PROCESSES

In this Part, we successively review the objectives and benefits of standardization (Section A), the various forms of standards (Section B), the strategic battles taking place in SSOs (Section C), and the traditional IPR policies adopted by SSOs (Section D).

A. Objectives and Benefits of Standardization

Industry standards ensure that products from multiple vendors are compatible and interoperable. A standard can be defined as a set of technical specifications which seeks to provide a common design for a product or process.⁶ The welfare benefits deriving from the existence of standards are obvious. By allowing complementary or component

⁶ See Herbert Hovenkamp, Mark D. Janis & Mark Lemley, *IP and Antitrust: An Analysis of Antitrust Principles Applied to Intellectual Property Law*, (2003-04 Supplement) at 35.1.

products from different manufacturers to be combined or used together, they increase consumer choice and convenience, and reduce costs.⁷ For instance, amongst other practical benefits, they allowed the authors of this paper to connect wirelessly to the Internet from different locations in search of relevant materials.⁸ These consumer benefits can be especially important in network markets, i.e. where the value of a product or a service to a particular consumer increases with the number of consumers using the same product or service.⁹ Examples of such markets abound in the information and communications technology (“ICT”) sectors, where protocols allowing devices to communicate seamlessly and networks owned by different providers to interconnect are essential.

In today’s technology-driven world, the importance of industry standardization, device interoperability and product-compatibility have become critical to promoting innovation and competition.¹⁰ Standardization has been one of the key factors explaining the significant growth in innovation and product differentiation, which has arisen in the ICT sector. Of course, achieving product compatibility through standardization usually entails making choices, the effects of which will represent a cost. Standardization may at some point and to some extent constrain a variety of technological options by reducing competition between rival technologies.¹¹ As will be seen below, it may also raise issues related to access where, as is generally the case, the standard embodies proprietary technology covered by intellectual property rights (“IPR”).¹²

B. Various Forms of Standards

Standardization may arise under three distinct sets of circumstances. First, a particular product or technical specification may evolve into a *de facto* standard through market dynamics, as a result of widespread adoption by consumers. This was the case, for instance, of the first commercially successful spreadsheet, Lotus 1-2-3. Second, in certain cases public authorities (governments, agencies or supra-national entities such as

⁷ See Amy A. Marasco, “Standards-Setting Practices: Competition, Innovation and Consumer Welfare”, testimony before the Federal Trade Commission and Department of Justice, available at <http://www.ftc.gov/opp/intellect/020418marasco.pdf>, p.3 (“Standards do everything from solving issues of product compatibility to addressing consumer safety and health concerns. Standards also allow for the systemic elimination of non-value added product differences (thereby increasing a user’s ability to compare competing products), provide for interoperability, improve quality, reduce costs and often simplify product development. They also are a fundamental building block for international trade.”)

⁸ Shapiro illustrates the benefits of standardization with the following anecdote: “during the great Baltimore fire of 1904, fire fighters called in from neighboring cities were unable to fight the blaze effectively because their hoses would not fit the Baltimore hydrants. The following year, national standards for fire hoses were adopted.” Carl Shapiro, “Setting Compatibility Standards: Cooperation or Collusion?”, in Rochelle Dreyfuss, Diane Zimmerman & Harry First, Eds., *Expanding the Bounds of Intellectual Property*, Oxford University Press, 2001 at Section I.

⁹ See Mark Lemley, “Intellectual Property Rights and Standard-Setting Organizations”, 90 (2002) *California Law Review*, 1889.

¹⁰ See Marasco, *supra* note 7.

¹¹ On the other hand, standardization promotes competition within a standard, i.e. between products implementing the standard. See David Teece & Edward Sherry, “Standards Setting and Antitrust”, (2003) 87 *Minnesota Law Review*, 1913, at 1915.

¹² See Shapiro, *supra* note 8, at Section III.

the EU) will specify that certain products or processes must comply with a standard and thus compel manufacturers to adopt it. These are usually referred to as *legal* standards. Third, private organisations, often congregating dozens of member companies and individuals, may cooperatively agree on a standard. Such private Standard Setting Organisations (“SSOs”) may adopt a variety of structures and decision-making processes, and some will be formal whilst others will rely on informal method of cooperation. Their creation will often be prompted or supported by public bodies.¹³ In this paper, we will focus on *SSO*-generated standards, as they are the most significant and raise the most important issues.

Standard-setting taking place in SSOs is typically open to all interested parties and is designed to foster consensus.¹⁴ Participation is voluntary and the policies and decision-making procedures of formal SSOs endeavour to ensure that standards are developed in an open environment. Membership, however, implies accepting the terms and conditions set out in SSOs’ bylaws. Where these are perceived as burdensome or unfair, they will deter technology developers from joining. As a rule, each participating member has the opportunity to contribute to the scope of the standard, participate in its development, take part in the “consensus-driven” approval process, and make its positions known. Moreover, even once it is determined within an SSO that a particular process or technology should be standardized, the majority of SSOs allow for appeals by dissenting members.¹⁵ These policies and procedures aim to allow the most appropriate technology to become standardized, based upon technical merit and other relevant factors and to ensure that no single participant can manipulate or abuse the standard-setting process. In that sense, their nature is often quasi-legislative. While firms compete to have their technologies included in a standard, checks and balances are generally built within the SSOs’ decision making procedures to ensure that the best technological option succeeds.

C. Strategic Battles in SSOs

The significance of the outcome of the debate over the most suitable technologies to be incorporated into any given standard have occasionally severely strained the process. This is the result of the inevitable tension between the incentives that every firm has to promote its own proprietary technology as part of the standard and the need for SSO members to work together to develop, establish, endorse, and promote those standards.¹⁶ This tension can be exacerbated by what may be a “winner-take-all” nature of standardization in sectors with significant network externalities such as the ICT sector.

¹³ For instance, the European Telecommunications Standards Institute (ETSI), headquartered in Sophia Antipolis, France, was formed in 1988 by the European Conference of Postal and Telecommunications Administrations (“CEPT”) and is officially recognized by the European Commission as the organization responsible for standardization of information and communication technologies within Europe. Its mission is to “develop globally applicable deliverables meeting the needs of the Information and Communications Technologies (“ICT”) community.” See generally Lemley, *supra* note 9.

¹⁴ See Shapiro, *supra* note 8, at 4.

¹⁵ See, for instance, Telecommunications Industry Association (TIA) Engineering Manual, Art. 13.2 and Annex A, Section A5, available at <http://www.tiaonline.org>

¹⁶ See Shapiro, *supra* note 8, at 1.

Another factor contributing to the tensions that may arise in standard-setting processes, but also more generally in the interpretation of the IPR policies of SSOs (see below) relates to the fact that firms involved in standard-setting often wear different “hats” corresponding to the fundamentally different business models they adopt.¹⁷ A distinction may be made between the following categories: (i) pure innovators or upstream-only firms (i.e., firms which develop technologies and earn their revenues solely by licensing them); (ii) pure manufacturers or downstream only firms (i.e., firms which manufacture products based on technologies developed by others but which have no relevant IPR); (iii) vertically-integrated firms (i.e., firms which develop technologies and manufacture products based on those technologies and the technologies of others; these firms may either license their technologies for revenue or choose not to engage in other than defensive licensing activities with their own IPR); and (iv) firms which do not create technologies or manufacture products, but buy products which are manufactured on the basis of patented technologies. These different firms operate in either the downstream product market, the upstream technology market or in both. As a result, their incentives are asymmetric, and their behaviour in the standard-setting context diverges accordingly, as explained below.

While there is a certain degree of fluidity between these categories, the following structure of incentives can be identified:

- Pure innovators are entirely dependent on licensing revenues to continue their operations. These revenues should be sufficient to cover the costs incurred in developing the technologies they seek or hope to license (including the costs of failed projects), as well as to give them sufficient incentives to engage in complex and risky projects.
- Pure manufacturers have converse incentives. As royalties represent a cost (not revenue) they have every incentive to reduce them. The lower the level of royalties payable to holders of IPR essential to the standards they practice, the higher their potential level of profits.
- Vertically-integrated firms that both develop technology and sell products have mixed incentives. On the one hand, they can draw revenue from their IPR if they so choose. On the other hand, they will have to pay royalties to other firms holding IPR essential to the standard for the products they manufacture. Since the bulk of the revenues (and profits) of these firms is generally made downstream, through product sales, they are much less dependent than pure innovators on revenues generated by royalties. In their licensing negotiations with other firms, they may well be more interested in protecting their downstream business from litigation than in charging royalties. They will therefore have a much stronger incentive to cross-license their own essential IPR in exchange for essential IPR held by other firms than in seeking royalties.

¹⁷ See Teece & Sherry, *supra* note 11, at 1929.

- The immediate incentives of buyers of products implementing standards relying on patented technologies are generally in line with manufacturers. They may consider that the royalties which manufacturers pay to IP holders will increase the price of the products they buy from such manufacturers. This will, however, only hold true if the product market is competitive. As will be seen below, the extent to which royalty savings are passed on to buyers will vary depending on the state of competition in the downstream market. If that market is not competitive, royalty savings are unlikely to be passed on.

D. Traditional IPR Policies Adopted By SSOs

Most formal SSOs have procedures, usually referred to as IPR policies, the primary goal of which is to address the two fundamental issues arising in standard-setting, i.e. disclosure and licensing of IPR incorporated into a proposed or adopted standard.¹⁸ Although their scope may vary significantly, these procedures seek to encourage IPR owners to make their proprietary inventions available for standardization and use without imposing on them undue obligations. At the same time, SSOs' IPR policies strive to accommodate the interests of implementers to obtain access to the standardized technology, by avoiding situations where IPR owners refuse to license their technology essential to the implementation of a standard to protect, for example, their positions in downstream markets.¹⁹

Most SSOs encourage IPR owners involved in standardization to disclose upfront, i.e. prior to the adoption of a standard, the IPR that they consider may be "essential" for its implementation.²⁰ Early disclosure of patents, for instance, "is likely to enhance the efficiency of the process used to finalize and approve standards" and "permits notice of the patent to the standards developer [...] in a timely manner, provides participants the greatest opportunity to evaluate the propriety of standardizing the patented technology, and allows patent holders and prospective licensees ample time to negotiate the terms and conditions of licences [...]."²¹

However, as a rule SSOs do not impose an obligation on IPR owners to conduct a search for, or guarantee the disclosure of, all IPR that may be essential to a given standard. This would prove extremely difficult, as it would require the complex determination of whether a patent or pending patent application reads on a proposed standard. Indeed, this determination may not be feasible as the scope of a standard evolves through its development or, if the relevant IPR is a pending patent application, as claims are modified during prosecution. Moreover, it is generally recognized that a

¹⁸ See Lemley, *supra* note 9, at 21 et. seq.

¹⁹ See, e.g. ETSI Guide on IPR, Art. 1 ("The ETSI IPR Policy seeks a balance between the needs of standardization for public use in the field of telecommunications and the rights of the owners of IPR").

²⁰ ETSI defines "Essential IPR" as meaning "that it is not possible on technical (but not commercial) grounds, taking into account normal technical practice and the state of the art generally available at the time of standardization, [to] comply with a standard without infringing that IPR." ETSI IPR Policy (version of 23 November 2005) at Art. 15.

²¹ See Guidelines for Implementation of the ANSI Patent Policy, at 3, available at <http://www.ansi.org/>

search obligation would be especially onerous for the owners of large patent portfolios.²² The fact that the scope of such disclosure and the obligations imposed on IPR owners by the IPR policies of some SSOs have in certain instances been the subject of conflicting and ambiguous interpretations has led some commentators to decry “the inadequacy of typical SSO disclosure policies.”²³ As will be shown below, these concerns are generally misplaced.

Once disclosure is made, or contemporaneously with disclosure, IPR owners are typically asked to provide an assurance or commitment that, should their IPR be essential for a standard, they will license them on fair, reasonable and non-discriminatory (FRAND) terms to members of the SSO and outsiders.²⁴ As will be seen below, the IPR policies of most SSOs do not oblige owners of essential IPR to grant irrevocable licences thereto on FRAND terms. This would amount to compulsory licensing and would deter many owners of valuable technology from joining. But the owner of the IPR has an incentive to make such a commitment voluntarily. In essence, if the owner of essential IPR seeks to have its technology included in a standard, there is an incentive but no obligation to provide the SSO with the contemplated assurance that it will license on (F)RAND terms. Given the fundamental importance of FRAND commitments, Part III of this paper explores in greater details the concept of FRAND in the context of IP licensing.

III. IP LICENSING UNDER FRAND COMMITMENTS

This Part successively reviews the traditional model of bilateral negotiations between potential licensors and licensees (Section A), the rationale behind FRAND commitments (Section B), and the various meanings that have been given to FRAND (Section C). It finally shows that FRAND works (Section D).

A. The Traditional Model of Bilateral Negotiations Between Potential Licensors and Licensees

Standards typically include technologies protected by IPR. IPR are legitimate exclusive rights, which confer upon their owners two basic prerogatives: (i) the right to prevent any third party from applying or using the subject-matter of the IPR;²⁵ and,

²² See Teece & Sherry, *supra* note 11, at 1947 (“An obligation to search for “implicated” IP can be extremely onerous. It is a major task to search a patent database and to compare it against the proposed standard. Patent searching is especially problematic when the standard evolves over time. Further, it is often difficult to know whether a patent “reads on” a proposed standard, as that may entail a major effort at claims construction and interpretation. A search requirement is especially onerous for IP owners who have substantial numbers of patents. Many firms in high-tech industries have thousands of patents, hundreds of which may be potentially relevant to a proposed standard.”).

²³ See Robert Skitol, “Concerted Buying Power: Its Potential for Addressing the Patent Holdup Problem in Standard-Setting”, (2005) *Antitrust Law Journal* 727.

²⁴ See Lemley, *supra* note 9, p. 26.

²⁵ See Gerald F. Masoudi, Deputy Assistant Attorney General, Antitrust Division, U.S. Department of Justice, “Intellectual Property and Competition: Four Principles for Encouraging Innovation”, Digital Americas 2006 Meeting, Intellectual Property and Innovation in the Digital World, São Paulo, Brazil, 11 April 2006, p. 3 (“In the world of physical property, enforceability means the right to exclude: for example, the ability to evict a person from your land. In the world of intellectual property, the fundamental

correlatively, (ii) the right to set the conditions of a licence in consideration for use of the IPR and as a reward for the innovative contribution made. Except for certain exceptional circumstances,²⁶ a patent owner may therefore decide not to grant any third party a licence to practice the invention. These exclusive rights are recognized in all patent laws as well as in the TRIPS agreement.²⁷

SSOs generally do not force their member IPR owners, in the ICT sector usually patentees, to grant a licence for their patents. The ETSI IPR policy, for instance, does not contain any obligation to license essential IPR. Rather, it provides that a standard or specification may not be approved unless the owner of essential IPR provides an assurance of its intentions. For example, Section 6.1 of ETSI's IPR Policy provides that when essential IPR is disclosed, ETSI will request – but not oblige – the owner of the IPR to undertake in writing that it is prepared to grant irrevocable licences on FRAND terms and conditions, and as such to waive its right to refuse to offer a license to those seeking such. A FRAND undertaking also constitutes a waiver by the IPR owner of its right under patent law to grant exclusive licenses. Each of these waivers reflects a willingness by the patentee to forego some of its rights in exchange for the opportunity to have its patented technology included in a standard.

Even if the owner of an essential IPR decides not to make a FRAND commitment, it does not necessarily follow that the relevant IPR will be excluded from the standard. Under Article 8.1 of ETSI's IPR Policy, ETSI's General Assembly will examine whether alternate technical solutions exist. Where it concludes that this is not the case, the Director General may request the owner of the IPR to reconsider. However, the latter is not under an obligation to agree to license.²⁸

Consistent with a FRAND assurance is the need for standard implementers to still enter into a licence agreement with the IPR owner. In other words, a FRAND assurance is not, itself, a licence. Rather, in consideration for the IPR owner's willingness to forego

right is similar: an enforceable IP right means the right to exclude others from using your intellectual property right at all”).

²⁶ The ECJ, for instance, has held that such exceptional circumstances may occur where the refusal to license cannot be objectively justified and would eliminate all competition, in a downstream market, for a new product for which there is customer demand not offered by the owner of the IPR. See *inter alia* Case 238/87 *Volvo* 1989 4 CMLR 122, para. 8; Joined Cases C-241/91 P and C-242/91 P *RTE and ITP v Commission* ('*Magill*') [1995] ECR I-743, para. 50; Case C-418/01 *IMS Health GmbH & Co. OHG v NDC Health GmbH & Co. KG*, paras. 35 and 52

²⁷ Article 28 of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS agreement.), Annex 1C to the Marrakech Agreement Establishing the World Trade Organization, signed in Marrakech, Morocco on 15 April 1994.

²⁸ This was recently confirmed by a Working Committee of the International Association for the Protection of Industrial Property (AIPPI) which stated the following with regard to the relationship between technical standards and patent rights: “The owner of a relevant patent can, in principle, not be forced to grant licenses to other members of the organization or to outsiders. Only in a few exceptional cases should compulsory licences be admissible according to the conditions of Art. 31 TRIPS or the respective national laws” and “(...) A patent right whether owned by a member of the organization or a third party, which has been identified as relevant for a ‘de jure’ standard, may be used in the standard only with the consent of the owner.” Summary Report on Question Q157 “The Relationship between Technical Standards and Patent Rights”, AIPPI Congress Melbourne, 2001, paras. 3.2 and 4, available at <http://www.aippi.org>.

certain of its exclusive rights, the standard implementer must obtain a grant to use the technology covered by IPR. Licensing negotiations between IPR holders and potential licensees, however, are conducted outside SSOs. For example, ETSI makes clear that such discussions will not take place under its standard development activities, as it takes the view that its role is directed to technical rather than commercial issues.²⁹ The “reasonable” and “non-discriminatory” character of any licence must be addressed in a commercial context outside the standards-setting environment. Recent proposals made by some members of ETSI to revise its current IPR policy in order to introduce the principles of “aggregated reasonable terms” and “proportionality” into the definition of FRAND did not succeed.³⁰ No consensus as to the need for or desirability of the proposed reform could be achieved among ETSI members as to these issues.

B. Rationale behind FRAND Commitments

The rationale behind the FRAND commitment is to ensure dissemination of the essential IPR contained in a standard, thereby allowing it to remain available for adoption by members of the industry, whilst at the same time making certain that holders of those IPR are able to reap adequate rewards from their innovations. The ETSI IPR Policy, for example, provides that IPR holders should be rewarded properly, explicitly recognizing that patent holders “should be adequately and fairly rewarded for the use of their IPR”.³¹

The terms and conditions of any licence arising from a FRAND commitment are the result of a normal process of commercial negotiations between the licensor and the licensee. A commercial market-driven negotiation of licence terms is not only what FRAND suggests but is also justified from an economic perspective, as it supports dynamic competition and provides incentives to innovate. Firms engaged in the development of innovative technologies “must not be restricted in the exploitation of intellectual property rights”³² lest their incentives to innovate be hindered. SSOs recognise that an IPR owner must be free to seek compensation that is sufficient to maintain investment incentives.

²⁹ ETSI’s Guide on IPR provides that “specific licensing terms and negotiations are commercial issues between the companies and shall not be addressed within ETSI. Technical Bodies are not the appropriate place to discuss IPR issues. Technical Bodies do not have the competence to deal with commercial issues. Members attending ETSI Technical Bodies are often technical experts who do not have legal or business responsibilities with regard to licensing issues. Discussion on licensing issues among competitors in a standards making process can significantly complicate, delay or derail this process.” ETSI Guide on IPR, Section 4.1.

³⁰ Pursuant to this proposal, called “Minimum Change, Optimal Impact”, Aggregated Reasonable Terms would mean that “in the aggregate the terms are objectively commercially reasonable taking into account the generally prevailing business conditions relevant for the standard and applicable product, patents owned by others for the specific technology, and the estimated value of the specific technology in relation to the necessary technologies of the product.” In turn, proportionality would mean that “compensation under FRAND must reflect the patent owner’s proportion of all essential patents.” See “Vendors Seek Compromise on LTE”, *Informa Telecoms and Media*, 20 March 2006.

³¹ See ETSI IPR Policy, Article 3.2.

³² See the European Commission’s “Guidelines on the application of Article 81 of the EC Treaty to Technology Transfer Agreements” [2004] OJ C 101/2, at para. 8.

Furthermore, given the voluntary nature of participation in SSOs, allowing IPR owners to seek adequate compensation is paramount to ensuring that those who own valuable proprietary technology remain involved in the standard-setting process.³³ Securing the participation of holders of valuable IPR allows SSOs to adopt standards based upon the best technological solutions. The adoption of a standard incorporating second-best technology would have potentially damaging consequences negating the purpose of standardization itself.³⁴ It would thwart the standard's acceptance by industry and consumers alike and lead to the development of incompatible products based on conflicting technologies.

The ability to license IPR on FRAND terms is, in this respect, a flexible tool which secures the availability of essential IPR without unduly constraining licensors.

C. Meaning(s) of FRAND

Despite its prevalence in the IPR policies of the majority of SSOs, virtually no SSO policies define the FRAND commitment as specifying or dictating a particular licensing result.³⁵ There is a regular refrain in the literature that the meaning of (F)RAND is unclear and that SSOs do too little to explain the scope and nature of the concept. Whilst recognizing that the “non-discriminatory” aspect of the FRAND promise is straightforward, certain authors have cast doubts on the intelligibility and therefore

³³ “Given the consequences of SSO rules and the nature of voluntary participation, SSOs must tread warily. IP holders must believe that their interests will be protected in the standards-setting process, or they may choose not to participate. Indeed, the proliferation of voluntary special-purpose consortia in many technological areas means that a number of different SSOs, to a greater or lesser extent, “compete” with one another to develop standards. Thus, IP holders that believe that a particular SSO does not adequately protect their interests may be in a position to leave that SSO and participate in another SSO that provides better protection for their IP rights”, See Teece & Sherry, *supra* at note 22 , p.3.

³⁴ See James C. DeVellis, “Patenting Industry Standards: Balancing the Rights of Patent Holders with the Need for Industry-Wide Standards”, (2003) 31 *AIPLA Q.J.* 301, 343 (“A simplistic view of the standardization conflict -- one that views the choice among patent policies as a choice between favoring patent holders and serving the public -- overlooks the fact that all sides will suffer if the standardization process fails to attract the best, most innovative technologies. If a standard-setting organization adopts an inferior standard because someone owns a patent on a superior technology and refuses to make it available on RF [royalty-free] terms, the standard-setting organization runs a real risk that the chosen standard will not be widely adopted. Certainly, the patent owner would not adopt the RF-based standard for itself, and other market participants may be willing to pay a licensing fee to access the superior technology. The inferior standard will thus compete with the patented technology, dividing the market, reducing that market's network effects, and working against the very reasons standard-setting organizations were created.”) and 344 (“The patent policy of a standard-setting organization may affect members' motivation for innovation. In the absence of an incentive allowing a patent holder to recover development costs, it is improbable that research and development will occur at the highest level in technological fields. ... Because patents frequently represent extensive research efforts and are expensive and time consuming to obtain, it is likely that if companies perceive that participation in the standard-setting process threatens patent portfolios, there will be a significant reluctance to participate in the process. Under a RAND system, a company has an incentive to compete for the adoption of its (often patented) standard. This competition in the standard-setting process leads to innovation and adoption of the optimal standard among the various options in the market.”).

³⁵ See Lemley, *supra* note 9, at 38.

effectiveness of the notions of “fair” and “reasonable” terms.³⁶ Others have gone so far as arguing, albeit without concrete support, that the supposedly vague (F)RAND promise is a “tool for misuse”.³⁷

As explained above, the fact that FRAND is not further defined cannot be viewed as a shortcoming of SSOs IP policies. Much to the contrary, it is the very absence of a definition mechanically translatable into concrete terms that bestows on the FRAND commitment the suppleness required to achieve one of the fundamental aims of standardization, i.e. to ensure the widest availability of the technology embodied in the standard in the widest possible variety of circumstances. In this respect, FRAND is very much akin to a general clause. It is to be shaped and given meaning by reference to concrete objective and subjective circumstances. The specific meaning of FRAND can only be established in concrete situations, in particular taking into account the positions of the licensor and the licensee. In the following sections we try to flesh out the meaning of the FRAND commitment and examine its different elements.

1. Willingness to negotiate in good faith/no constructive refusal to license

A FRAND commitment is intended to prevent an outright refusal to license or the setting of royalty rates and other terms and conditions so high as to suggest an intent by the IPR owner to do indirectly what it has committed not to do directly: refuse to license its essential IPR to other firms (i.e. a constructive refusal to license). It therefore entails a promise by the IPR owner that it is prepared to engage in good faith negotiations with any company wishing to implement the standard with a view to reaching a licensing agreement that will be defined in light of all circumstances present between the two parties at the time of the negotiations.

2. Fairness and reasonableness

The question of the meaning of the terms “fair” and “reasonable” contained in the FRAND promise has absorbed the attention of several legal and economic commentators in the last few years. Most of the literature does not distinguish between “fair” and “reasonable”, in part due to the fact that the term “fair” is specific to the EU context (US-based SSOs tend to refer to the concept of RAND as one variant, not FRAND). Various meanings have been given to these terms.

Several economists suggest that a reasonable royalty is the royalty that the essential patent holder could have obtained *before* a standard was adopted, i.e. on an *ex ante* basis. For example, Shapiro and Varian state that “[r]easonable should mean the royalties that the patent holder could obtain in open, upfront competition with other

³⁶ See Daniel Swanson & William Baumol, “Reasonable and Nondiscriminatory (RAND) Royalties, Standards Selection, and Control of Market Power,” 73 Antitrust L.J. 1, at 3 (“[a] RAND commitment is of limited value in the absence of objective benchmarks that make clear the concrete terms or range of terms that are deemed to be reasonable and nondiscriminatory”); Lemley, *supra* note 9, at 127 (“It is all well and good to propose that SSOs require licensing on reasonable and nondiscriminatory terms. But without some idea of what those terms are, reasonable and nondiscriminatory licensing loses much of its meaning”).

³⁷ See Skitol, *supra* note 23, at 2.

technologies, not the royalties that the patent holder can extract once other participants are effectively locked in to use technology covered by the patent.”³⁸ Similarly, Swanson and Baumol argue that “[i]f the primary goal of obtaining RAND licensing commitments is to prevent IP holders from setting royalties that exercise market power created by standardization, then the concept of a ‘reasonable’ royalty for purposes of RAND licensing must be defined and implemented by reference to ex ante competition, i.e., competition in advance of standard selection.”³⁹ This position, however, is based on the unsupported premise that standardization necessarily establishes market power beyond the “power” conferred by the patent itself. As will be seen below, this is not certain.

In our view, the question of what “reasonable terms” may consist of goes back to the second prerogative of the patent owner, i.e. its right to be rewarded for the innovative contribution made and to ask the price that the market is willing to pay for its IPR (i.e. how valuable the IPR is to others). As noted above, standardization does not deprive a patent owner of this prerogative. The only material consequences of making a FRAND commitment is that the IPR owner waives its rights to refuse to engage in good faith negotiations to license and to grant an exclusive licence. The specific terms of any such licence, however, are left to be determined by the parties to the negotiation.

Thus, FRAND does not impose any specific and concrete obligations on the licensor with regard to the actual level of royalties or any other terms and conditions provided for in licensing agreements, outside of the context of a constructive refusal to license. Rahnasto, for instance, explains that “the [FRAND] rule leaves the determination of exact terms for the parties to decide. This case-by-case determination allows parties to a particular licensing transaction to find their own interpretation of ‘fair and reasonable’.”⁴⁰ He further adds: “In connection with standardization, the term ‘fair and reasonable’ is usually understood as a reference to the economic reality. Generally, a licence is fair and reasonable if the terms would be acceptable in arm’s-length-negotiations.”⁴¹

“Fair and reasonable” licensing terms would therefore consist of those terms determined through fair, bilateral negotiations between individual IPR owner and standard-adopter in accordance with the market conditions prevailing at the time of such negotiations.

3. *Non-discrimination*

Most authors consider that the “non-discriminatory” element of the (F)RAND promise is straightforward, requiring that IPR owners license similarly situated adopters

³⁸ See Carl Shapiro & Hal Varian, *Information Rules: A Strategic Guide to the Network Economy*, Boston: Harvard Business School Press, 1999, at 241.

³⁹ See Swanson & Baumol, *supra* note 36, p.5.

⁴⁰ See Illka Rahnasto, *Intellectual Property, External Effects and Anti-trust Law*, Oxford University Press, 2003, para.4.105.

⁴¹ *Id.* at para. 6.34.

on the same terms.⁴² Discriminating between similarly situated competitors active in the markets for the product incorporating the standardised IPR would hinder the competitive process, as would allowing licensees to mix and match various provisions of individual licence agreements that reflect trade-offs between the original parties.

Another interpretation has been suggested by Swanson and Baumol, who argue that an SSO participant that competes downstream with other adopters in the market for the standardized product must treat its adopter-licensees no less favourably than it treats itself. In other words, it should charge licensees what it “implicitly charges itself for use of the [intellectual] property.”⁴³ Swanson and Baumol also suggest a principle for determining license fees based on the “efficient component pricing rule” (ECPR), which they claim is “both necessary and sufficient for a license fee to be competitively neutral in downstream markets and, therefore, at least on that basis, a necessary condition for that fee to be non-discriminatory. That is to say, any license fee that substantially departs from the ECPR level can be deemed to violate the RAND requirement of non-discrimination.”⁴⁴

4. *What is a FRAND royalty? Can it be determined in abstract?*

The semantic concern with the meaning of the FRAND promise is usually linked to the more practical question of how to determine whether a specific royalty level complies with a FRAND commitment. In our view, the answer to this question turns on the merits of the long-established model of bilateral negotiations between IPR owner and standard-adopter.

As seen above, a licence can be deemed fair and reasonable if its terms would be acceptable in arm’s-length-negotiations. These terms can therefore not be determined in a vacuum, without subjective reference to specific IPR owner and standard adopter. Moreover, royalties are but one element of the consideration agreed upon between the parties. It is therefore unfortunate that the misleading term “FRAND royalty” has become shorthand for the more accurate “Royalty rate established under an agreement negotiated in accordance with a FRAND commitment” Other elements susceptible of pecuniary valuation, such as a cross-licence to the licensees’ IPR or an upfront fee, are

⁴² Interestingly, Teece & Sherry have argued that the problem of non-discrimination should in theory be of greater importance to firms than the issue of fairness: “[F]irms would prefer not have to pay royalties, just as they would prefer not to have to pay their rent or their income taxes. But so long as every firm must pay, then the cost of the royalties can be built into the price of the product being sold, just as the cost of the raw materials and labor needed to make and sell the product is likewise built into the price. That is, prospective licensees may rationally be far more concerned about the ‘non-discriminatory’ aspect of the RAND requirement than they are about the ‘reasonable’ aspect. This, in turn, implies that from an economic and organizational behavior perspective, it is quite rational for SSOs to pay much more attention to the requirement that licenses be available on (unspecified) RAND terms than they pay to the question of what the ‘reasonable’ royalty rates should be.” See Teece & Sherry, *supra* note 11, at note 149.

⁴³ See Swanson & Baumol, *supra* note 36, p. 11.

⁴⁴ *Id.*

taken into account and their value is often significantly higher than that the royalty itself.⁴⁵

This does not mean that participants in the standard-setting process as well as outsiders will be unable to estimate the royalty level that a given IPR owner can be expected to charge for its essential IPR. In fact, patent owners have the incentive to engage in such ex ante licensing conduct because it affords a greater likelihood that their patented technology will be included in the standard.⁴⁶ As explained by the American National Standards Institute (ANSI), “[a] patent holder may have a strong incentive to provide an early assurance that the terms and conditions of the license will be reasonable and demonstrably free of unfair discrimination because of its inherent interest in avoiding any objection to the standardization of its proprietary technology.”⁴⁷ In addition, patent holders demanding unreasonable and/or discriminatory terms and conditions may be expected to have great difficulty in convincing SSOs in the future to adopt standards incorporating their essential IP in the continually evolving technology marketplace.

In our view, the term “FRAND royalty” has no meaning. Where it is used as an abbreviated synonym for the royalty rate established under an agreement negotiated in accordance with a FRAND commitment, it obscures the fact the royalty rate itself conveys little information as to the fairness and reasonableness of the overall licensing terms.

5. *FRAND and injunctive relief*

A number of authors have argued that by making a FRAND commitment an essential patent holder waives its right to seek injunctive relief in case of infringement

⁴⁵ For example, Grindley & Teece have found that in the fields of semiconductors and electronics cross-licensing is more complex than the exchange of individual property rights. Patent holders in these industries generally license a portfolio of patents within a field of use due to the transaction costs associated with negotiating and monitoring infringement of individual patents and the needed freedom to design and manufacture without infringement. Negotiating a patent portfolio license often involves negotiating a balancing of royalty payments according to the “value of the patent portfolios of each party” and the value of each party’s exposed product sales. Peter C. Grindley & David J. Teece, “Managing Intellectual Capital: Licensing and Cross-Licensing in Semiconductors and Electronics”, 39 (1997) *California Management Review*, 9.

⁴⁶ As explained by Richard Holleman, a former IBM executive with extensive standards experience in the U.S. and internationally: “I believe there is a misperception of how potential license terms are discussed. First, more often than not, patent owners provide statements that if they have patents that are essential to implementation of the standard being developed they will license such patents on reasonable nondiscriminatory terms. Then, outside the activities of the SDO, individual standards participants are able to approach the patent holder to inquire of available licensing terms. The patent holder is also free to publicly state what its license terms will be. To the extent the patent holder does not make such a statement, or declines to engage in discussions with individual standards participants, it is always the discretion of the standards participant to not support the patent holder’s technology or to propose an alternative technology to the standards developing committee. Ultimately, a consensus will establish what technology to support.” Submission of Richard J. Holleman, *Comments on Standards Setting and Intellectual Property*, to the Joint Hearings of the United States Department of Justice and the Federal Trade Commission Regarding Competition and Intellectual Property Law and Policy in the Knowledge-Based Economy, 10 April 2002, 2.

⁴⁷ See ANSI Guidelines for Implementation of the ANSI Patent Policy at 3-4.

(the “waiver theory”). Dolmans, for instance, claims in a paper published in 2002 that “[o]wners of essential IPR for *de facto* or *de jure* standards (and especially those who have committed to FRAND licensing in order to obtain an exemption under Article 81(3) EC) should limit themselves to suits for damages and refrain from requesting injunctive relief against implementers.”⁴⁸

More recently, Miller argues that “the RAND promise’s core function is to achieve a business organization goal that all SSOs confront - namely, removing the threat of post-adoption hold-up, thus inducing group production of a viable standards-based technology platform.”⁴⁹ According to Miller: “[e]very participating patent owner has, by making the RAND licensing promise, irrevocably waived its right to seek that most traditional of intellectual property law remedies, a court injunction against unauthorized access. The only relief a frustrated patent owner can seek against an adopter thereafter is the reasonable royalty expressly contemplated”. Although Miller is not always clear as to why he thinks that a FRAND commitment should mean that the essential IP holder who has so committed loses its right to seek injunctive relief, he seems to suggest that this is due to the fact that the threat of injunctive relief could negatively affect licensees’ incentives to make the necessary investments to implement the standards. Miller’s position is, however, based on the premise that U.S. courts would automatically grant permanent injunctions against the standard implementer’s use of essential IPR. Following the ruling of the U.S. Supreme Court in *eBay*, this no longer seems to be the case.⁵⁰

Shapiro and Lemley have also argued that firms that hold patents that are essential to implement a standard should not be entitled to seek injunctive relief. However, their argument is based on economic and public policy grounds rather than on an analysis of current SSOs’ IPR policies and an interpretation of existing FRAND commitments. For instance, in a paper released in May 2006 relying on bargaining theory, they argue that “the threat to obtain a permanent injunction greatly enhances the patent holder’s negotiating power, leading to royalty rates that exceed a natural benchmark level based on the value of the patented technology and the strength of the patent.”⁵¹

While the above authors argue that holders of IPR embedded in a standard have or should have no right to seek injunctive relief and instead could only seek damages for infringement of those IPR, their position is grounded neither on statute nor case-law, as there is no such precedent for them to invoke. Instead, it merely reflects policy preferences that may or may not be deemed in future to have merit, but for which no historical consideration was given when most (F)RAND policies were adopted.⁵²

⁴⁸ See Maurits Dolmans, “Standards for Standards”, (2002) 26 *Fordham Int’l L J* 163.

⁴⁹ See Joseph Miller, “Standard Setting, Patents, and Access Lock-in: RAND Licensing and the Theory of the Firm”, forthcoming 40 *Indiana Law Review* 2006.

⁵⁰ See *eBay Inc. v. MercExchange, L.L.C.*, 126 S. Ct. 1837, 1838-39 (2006).

⁵¹ See Mark Lemley and Carl Shapiro, “Patent Hold Up and Royalty Stacking”, July 2006, *Stanford Law and Economics Olin Working Paper No. 324*, available at SSRN: <http://ssrn.com/abstract=923468>

⁵² Lemley explicitly admits that he is “aware of no cases treating this issue”, stating that it is his “policy preference” that an IPR owner’s commitment to an SSO be construed as itself implying the grant of a licence, with the result that the IP owner is precluded from seeking an injunction for patent infringement. See Lemley, *supra* note 9.

While the right of IP holders to seek injunctive relief is expressly guaranteed under US federal law,⁵³ it is also recognized under international trade law and EU law. Article 41(1) of the TRIPS Agreement provides that Members shall ensure that enforcement procedures as specified in TRIPS are available under their law so as to permit effective action against any act of infringement of IPR.⁵⁴ They also include the right to seek and obtain an injunction, i.e. a court decision whereby a party is ordered to desist from an infringement of an IPR. These injunctions can be imposed by way of preliminary measure (interlocutory injunction) (Article 50(1)) or as a measure resulting from a decision on the merits of the case (permanent injunction) (Article 44(1)). The first type of injunction is intended to provide an expeditious remedy to prevent an infringement and constitute a deterrent to further infringements. The second type of injunction is meant as a final remedy. The IP Enforcement Directive also states that EU Member States must ensure that in cases where there is a finding of an infringement of an IPR (Article 11) courts can issue both an interlocutory injunction intended to prevent an imminent infringement or to enjoin the continuation of the alleged infringements (Article 9), as well as a permanent injunction.⁵⁵

The making of a FRAND commitment by an essential patent holder cannot be interpreted as an implicit waiver to its right to seek injunctive relief as recognized in the law. Such an interpretation would be in sharp contradiction to an established principle of law according to which a waiver of right can never be assumed lightly and must always be made explicitly or at least should be derived from circumstances that cannot possibly be interpreted any differently than the right owner's consent to waive his right. This very basic principle is recognized in all European continental⁵⁶ and common law legal systems.⁵⁷

There is no provision whatsoever contained in ETSI's IPR Policy – nor in any other SSO IPR policy – that requires the patentee to undertake in writing that it will never apply for an injunction against infringers, for instance should the said standard adopter fail to subscribe to a FRAND licence. Consequently, there is no waiver by the patent holder to seek an injunction when good faith negotiations to agree on a FRAND licence have failed. ETSI and other SSOs only require patent holders to engage in good faith negotiations with a view to conclude a licence on FRAND terms.

Finally, in our view the policy considerations that underlie the “waiver theory” are misconceived, although this paper is not the proper place to expand on the topic. If an IPR owner were only able to obtain a judicial ruling establishing that its IPR has been

⁵³ See US Patent Act, Part III., Chap.29, Section 283.

⁵⁴ See Article 42 of the TRIPS agreement, supra note 27.

⁵⁵ See Directive 2004/48 of the European Parliament and of the Council of 29 April 2004 on the enforcement of intellectual property rights, O.J. L 157 of 30 April 2004.

⁵⁶ See, e.g., Belgian Supreme Court, 19 September 1997, *Arr. Cass.* 1997, 840 and French Supreme Court, 10 May 2000, Case No. 97-13907.

⁵⁷ See, e.g., *Schoon v. Troy Corp.*, C.A. No. 1677-N, 2006 Del. Ch. LEXIS 123, *7 (Del. Ch. June 27, 2006) stating that “[t]here can be no waiver of a statutory right unless that waiver is clearly and affirmatively expressed in the relevant document,” and that no waiver existed where the contract at issue “did not in any way, explicitly or implicitly, contractually limit the information that must be provided [...] in the exercise of [...] statutorily protected rights under [8 Del. C. § 220]”.

infringed and if its only relief were an *ex post* award of damages, standards' adopters would be invited to take their chances in court and begin immediately using the invention without trying to obtain a licence. For those adopters, the worst case scenario would merely be a requirement to pay damages once a court had established the infringement. It would therefore be akin to compulsory licensing. Such an interpretation of the FRAND commitment would be a patent infringers' charter and provide an incentive for implementers of a standard to refuse beforehand to enter into licence agreements on FRAND terms. In those circumstances, patentees would arguably prefer to settle for a licence on terms that would not provide a fair return on their investment, in other words not FRAND, rather than face lengthy, onerous and uncertain court proceedings for the award of damages. This would amount to nothing less than an "*inverse patent hold-up*", this time committed by the standard adopter, who would be in a position to refuse the FRAND licence terms proposed by the patentee but still remain immune from injunctions for infringement. Patentees could even draw the conclusion that they should refrain from participating in future standard-setting processes. In both instances, consumer welfare and innovation would be significantly hampered.

D. The Enforceability of FRAND

Where difficulties in reaching a mutually satisfactory licence agreement do arise, a standard implementer may seek judicial relief and request that a court evaluate the reasonableness of the IPR owner's offer. The enforceability of the FRAND obligation results from the fact that it forms part of a private agreement between an IPR owner and a SSO. The IPR owner's refusal to enter into licensing negotiations may represent a breach of contract. The obligation may be provided in a SSO's bylaws, internal rules or IPR policies to which all members must adhere, and therefore stem directly from the IPR owner's membership of the particular SSO. It may also be provided in a written agreement whereby the SSO member undertakes to licence its essential IPR in respect of a specific standard.

A FRAND commitment may also be viewed as imposing a duty on the owner of an essential IPR to engage in the licensing negotiations in good faith. Thus, an effort to impose terms that constructively preclude a standards adopter from gaining access to the technology incorporated in the standard might be deemed not differ from an outright refusal to negotiate a licence. The laws of most jurisdictions recognize an obligation to negotiate in good faith, and if a prospective licensee can marshal evidence to prove the lack of good faith, it should have recourse to the courts of the competent jurisdiction. The burden of proof should, however, be placed on the prospective licensee. Otherwise, claims of unreasonable licensing terms would simply reflect a desire by the prospective licensee to avoid having to take a licence on terms it simply does not like.

In the context of assessing an IPR owner's good faith in negotiating a licence, as well as the equivalent obligation of the prospective licensee to act in good faith, a court might also assess what a FRAND licence might be by weighing all factors applicable to the specific situation. In some respects, this analysis might borrow from patent law principles for determining a "reasonable royalty" for damages purposes. Courts are called upon regularly to determine damages based on a reasonable royalty analysis

arising from patent infringement actions. In such cases, (patent) courts evaluate all factors that are relevant to the particular circumstances. For instance, American courts today give great weight to 15 factors that were employed to determine a reasonable royalty in the seminal *Georgia-Pacific* case.⁵⁸ These factors included *inter alia* considering licence fees for similar patents as benchmarks, measures of the nature and scope of the patent, consideration of the next best alternative to the patent and any cost savings from using it as opposed to older modes or devices, the opinion testimony of qualified experts, consideration of the particular benefits to the licensee and the commercial relationship between IPR owner and prospective licensees.⁵⁹ The *sine qua non*, however, is prior licence agreements for the very patent(s) for which damages are being determined and what those licensees have agreed to. It must be understood, however, that such an analysis would not provide a static definition of FRAND; it would address specific circumstances and allow for a balanced consideration of all relevant and applicable factors.

E. FRAND works

Contrary to the pronouncements of the theoretical literature that will be discussed below in Part IV below, the SSOs' preference for a flexible system of fair, reasonable and non-discriminatory licensing of IPR essential to a standard appears to be justified. Clearly, it has allowed thousands of standard implementers and owners of IPR essential to the standard to reach mutually satisfactory agreements and SSOs to conduct valuable standardization activities in a number of vastly different fields.

That is not to say that the FRAND model will not give rise to occasional difficulties. Friction and even outright hostility can be expected to arise where companies must remunerate IPR owners for those rights. There is a sort of love and hate relationship between innovators (licensors) and implementers (licensees). While implementers are keen to acquire technologies from innovators, they hate the idea of paying royalties to them until the relevant patents expire. This explains why some SSO members whose revenues are not primarily derived from royalties but rather on manufacturing or services seek to modify SSOs' IPR policies in order to alter the respective bargaining power of licensors and licensees in a way that is favourable to the latter. Although attempts to redefine FRAND have failed at ETSI, this is nevertheless a serious threat. As pointed out by Teece and Sheery, "[o]ne major public policy issue thus involves balancing the interests of intellectual property owners and the users of that intellectual property. Almost by definition, the latter are likely to outnumber the former; a patent has only one owner, but multiple manufacturers may need to use the patented technology. Hence, SSOs tend to be dominated by the demand side of the technology

⁵⁸ *Georgia-Pacific Corp. v. U.S. Plywood-Champion Papers Inc.*, 446 F.2d 295 (2nd Cir. 1971).

⁵⁹ For a more recent application of the multifactor *Georgia-Pacific* test, see *Interactive Pictures Corp. V. Infinite Pictures, Inc.*, 274 F.3d 1371 (Fed. Cir. 2001); also Roy J. Epstein & Alan J. Marcus, "Economic Analysis of the Reasonable Royalty: Simplification and Extension of the *Georgia-Pacific* Factors", (2003) 85 *Journal of the Patent and Trademark Office Society*, 7.

market, and they are likely to adopt procedural and substantive rules that favour IP users over IP owners.”⁶⁰

Despite these tensions, recent submissions made by SSOs seem to confirm that, with very few exceptions, current IPR policies have largely been successful.⁶¹

IV. PERCEIVED PROBLEMS WITH THE TRADITIONAL FRAND REGIME

While SSOs have significantly contributed to the development of, and the growing competition within, high-tech sectors, there are concerns that their activities could produce anti-competitive effects. We have seen that under traditional standard development procedures members of SSOs are asked to disclose the IPR that they consider may be essential for implementation of a standard.⁶² At the same time, they typically provide an assurance or commitment that, if their IPR are included in a standard and are therefore in fact essential, they are prepared to license their IPR on FRAND terms, with or without monetary compensation.

Some commentators believe that these licensing commitments are insufficient.⁶³ It has been said that the current FRAND regime or more generally the procedures and IPR policies of the SSOs would prove inadequate to prevent the emergence of a raft of perceived problems, holding a variety of labels, such as anti-commons, patent thickets, patent hold-up and hold-outs, royalty stacking. These problems would have as a common theme that as more and more firms take out patents on their inventions and standards in high-tech sectors embed patented technologies, the royalty costs of implementing standards will reach levels that make such implementation impossible. The cumulative royalties charged by essential patent holders would indeed be such that implementing standards would no longer be attractive and thus useful innovations would no longer make it to the marketplace. In the developments that follow, we review the various theories underlying these gloomy predictions.

⁶⁰ See Teece & Sherry, *supra* note 11, at 1935.

⁶¹ For instance, in observations submitted in the context of the FTC/DOJ public hearings on "Competition and Intellectual Property Law and Policy in the Knowledge-Based Economy", the Standards Association of the Institute of Electrical and Electronics Engineers (IEEE-SA) stated: "Participation in standards developing committees is voluntary and disclosure of patents is based on the willingness of the individual participants to disclose any known patents whose use would be required in the practice of the standard and for such patents to be licensed on reasonable terms that are not unfairly discriminatory. With very few exceptions, this approach has worked very successfully for at least the past twenty years in the development of IEEE Standards by protecting the rights of the patent holder while meeting the need for standards that incorporate the best technology and which can be promulgated throughout industry on a worldwide basis." Cited by Teece & Sherry, *supra* note 11, at 28.

⁶² ETSI defines "Essential IPR" as meaning "that it is not possible on technical (but not commercial) grounds, taking into account normal technical practice and the state of the art generally available at the time of standardization, [to] comply with a standard without infringing that IPR." ETSI IPR Policy (version 23 November 2005) at Art. 15.

⁶³ See, e.g., Gil Ohana, Marc Hansen & Omar Shah, "Disclosure and Negotiation of Licensing Terms Prior to Adoption of Industry Standards: Preventing Another Patent Ambush", (2003) 24 *European Competition Law Review*, 644; Robert A. Skitol, "Concerted Buying Power: Its Potential for Addressing the Patent Holdup Problem in Standard Setting, (2005) 72 *Antitrust Law Journal*, 727.

A. Anti-commons

The roots of such propositions as royalty stacking and patent thickets can be traced back to Heller and Eisenberg who, in a seminal article published in 1998, suggest that the combination of pioneer and follow-on inventors could lead to “too many” patents in biomedical research, ending in a “tragedy of the anti-commons”.⁶⁴ The tragedy of the commons is a well known problem in joint ownership, when multiple owners share some property (like a village commons on which sheep graze) and no one has the right to exclude any one else. The tragedy occurs from overuse - the villagers let their sheep graze too much, so that the field is completely destroyed.⁶⁵ The tragedy of the anti-commons is the mirror image of the tragedy of the commons. When multiple owners share the rights to property but every one of them has the right to exclude all others, the tragedy occurs from under-use. Heller and Eisenberg argue that an anti-commons tragedy could develop in biomedical research via one of two paths. First, the privatization of biomedical research through patenting might create “too many concurrent fragments of intellectual property rights in potential future products”. Alternatively, patent policy might permit “too many upstream patent owners to stack licenses on top of the future discoveries of downstream users.”⁶⁶

The anti-commons claims have not gone unchallenged. Wagner argues that the hypotheses based on notions of a commons or public domain for research have overlooked important mitigating factors.⁶⁷ Two key points that the anti-commons theory ignores, according to Wagner, are (i) the difference between physical property and intellectual property and (ii) the difference between the short-term and the long-term. While the village green can be reduced to dust from too many grazing sheep, “in the information commons, no such zero-sum game exists.” For example, a patent on a particular form of hybrid corn may prevent other agribusinesses from exactly copying the corn, but they can learn the value of hybrid corn to the market by observing the patented product’s success and this can spur them to try other hybridization processes. Patenting should thus stimulate innovation.

Epstein and Kuhlik argue that Heller and Eisenberg “supplied little, if any empirical evidence for their assertion that the patent blockade dominates patent innovation.”⁶⁸ Much in the same vein, Kitch argues that Heller and Eisenberg’s arguments are “based on theory not experience” and he concludes that the “tragedy of the anti-commons in this area of biomedical research is something that could have occurred as a matter of theory. It is not as yet, however, a problem that has been shown to have

⁶⁴ See Michael Heller & Rebecca Eisenberg, “Can Patents Deter Innovation? The Anticommons in Biomedical Research,” (1998) 280 *Science*, 698-701. This article was based on a more formal analysis by Michael Heller in “The Tragedy of the Anticommons: Property in the Transition from Marx to Markets,” (1998) 3 *Harvard Law Review*, 621.

⁶⁵ See Garret Hardin, “The Tragedy of the Commons” (1968) 162 *Science*, 1243-1248.

⁶⁶ See Heller & Eisenberg, *supra* note 64, at 699.

⁶⁷ See R. Polk Wagner, “Information Wants to be Free: Intellectual Property and the Mythologies of Control,” (2003) 1 *Columbia Law Review*, 995.

⁶⁸ See Richard A. Epstein & Bruce N. Kuhlik, “Is There a Biomedical Anticommons?” *Regulation*, Summer 2004, p.55. See also Richard Epstein, “Studying the Course: Property Rights in Genetic Material”, *The Chicago Working Paper Series*, March 2003.

actually occurred. At least so far, the patent system appears to have been an experiment that has worked.”⁶⁹ As will be seen throughout this Part, lack of evidence that the combined growth of patenting and IP fragmentation has brought innovation to a halt or at least reduced the level of innovation that would have been reached in the absence of this phenomenon.

Epstein and Kuhlik also point to patent holders’ self interest as another deterrent to the tragedy of the anti-commons.⁷⁰ Patent holders, at least non-vertically integrated ones, profit from licensing their patents, thus the authors argue that “[r]efusing to deal is a loss of opportunity. In addition, the patent is always a wasting asset; not only is it limited in time, but even during the period of its unquestioned validity its holder faces the possibility that new patents, old patents that have expired, and new techniques that come into the public domain will erode its dominance. Those who do not deal will not prosper...”⁷¹

B. Patent Thickets

In 2001, Shapiro picked up one of the threads from the anti-commons debate, pronouncing the existence of a “patent thicket” in “several key industries”.⁷² The key extension here is the application of the anti-commons theory to high technology industries involved in standard setting. Shapiro argues that “[t]he need to navigate the patent thicket and hold-up is especially pronounced in industries such as telecommunications and computing in which formal standard-setting is a core part of bringing new technologies to market.”⁷³ To bolster this claim, Shapiro cites the dramatic increase in patenting and the potential implications in terms of IP licensing costs in these two sectors. According to Shapiro, “the danger of paying royalties to multiple patent owners is hardly a theoretical curiosity in industries such as semiconductors, in which many thousands of patents are issued each year and manufacturers can potentially infringe on hundreds of patents with a single product.”⁷⁴ Nonetheless, Shapiro does not present any evidence on licensing difficulties or “hold-up” within the semiconductor or telecommunications industries, instead referring to unsupported hypothetical results.

One of the key distinctions for patent thicket theory as applied to standard setting lies in the timing of licensing negotiations. For those technologies that are easy to invent around, Shapiro argues, “the patented technology contributes little if anything to the final product, and any ‘reasonable’ royalty would be modest at best.”⁷⁵ But after the technology is included in a standard or after potential licensees have started manufacturing, the patent holder “can credibly seek far greater royalties, very likely

⁶⁹ See Edmund Kitch, “Comment on the tragedy of the Anti-Commons on Biomedical Research”, in S; Kieff, Ed., *Perspectives on Properties of the Human Genome Project*, Elsevier, 2003, at 271, 272.

⁷⁰ See Epstein & Kuhlik, *supra* note 68, at 55.

⁷¹ *Id.*

⁷² See Carl Shapiro, “Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard-Setting,” in *Innovation Policy and the Economy*, Volume I, Adam Jaffe, Joshua Lerner & Scott Stern, Eds, MIT Press, 2001.

⁷³ See Shapiro, *supra* note 72, abstract.

⁷⁴ *Id.*, p. 7.

⁷⁵ *Id.*

backed up with the threat of shutting down the manufacturer...” Shapiro sees little relief for this ex post “hold-up” aspect of patent thickets short of reforming patent law.

One clear limitation of Shapiro’s argument, however, is that standardization only grants additional market power and thus enhances the essential patent holder’s ability to charge royalties when the patented technology can be easily designed around. In the presence of a technology for which there is no alternative as is often the case in complex industries, the ability of the patent essential holder to seek significant royalty rates exists prior to the adoption of the standard.⁷⁶ Standardization will certainly benefit essential patent holders as standardization stimulates the implementation of selected technologies and thus expands royalty revenues, but in the case of technologies for which there is no reasonable alternatives the ability for licensors to extract rents originates in the uniqueness of their inventions.

C. Patent Holdout and Hold-up

A related, but distinct, strand of the literature focuses on non-cooperation. Under patent holdout and hold-up, a firm with relevant IP emerges after a standard is set and demands high royalty payments. Thus, the focus here is not on too many rights spread across a great many rights holders, but rather on the questionable behaviour of one rights holder. In some instances, the firm participates in the standard setting process, at least to some extent, but either does not declare its relevant patents to the standardization body or declares them but then prices those patents unreasonably during ex post negotiations.⁷⁷ The strategy of participating in a standard but not disclosing IPR has become quite risky in recent years, since a number of firms engaged in such tactics have been prosecuted. But, of course, some holdouts never directly join in standard setting efforts. They instead watch the process from the sidelines and reveal their patents after a standard has been set.

Nonetheless, Shapiro argues that hold-up is a regular occurrence: “[t]he principal finding in this paper is that the current U.S. patent system systematically over-rewards the owners of weak patents [defined as those covering only minor inventions], especially in the information technology sector where a single product can incorporate many patented features.”⁷⁸ He develops a model in which patent holders use the threat of injunction to push firms into paying more for a license than the underlying technology

⁷⁶ But the incorporation of a patented technology into a standard does not always create market power. A patented technology may be so fundamental to the subject matter of a standard as to have no viable alternatives. A technology also may be so superior to its alternatives that a standards body may have no practical choice but to incorporate it into a standard. In either case, any market power that may be enjoyed by the patent owner would arise from the market's demand for the invention and not from its incorporation into the standard. Moreover, the incorporation of the patented technology into a standard may not confer market power at all if alternative standards exist or if the standard otherwise fails to secure market acceptance.” See Joseph Kattan, “Disclosures and Commitments to Standard-Setting” (2002) *Antitrust* 22.

⁷⁷ See, for example, the discussion of Wang’s refusal to license its Single In-Line Memory Modules (SIMMs), after lobbying JEDEC to adopt the technology as a standard, in Janice M. Mueller, “Patent System Reform: Patent Misuse Through the Capture of Industry Standards,” (2002) *Berkeley Technology Law Journal*, 659.

⁷⁸ See Carl Shapiro, “Injunctions, Hold-Up, and Patent Royalties,” Working Paper, Draft 17 April 2006, <http://faculty.berkeley.edu/shapiro/royalties>.

deserves. The intuition is that a manufacturer facing plant shutdown or a costly product redesign will be willing to pay considerably more than a patent is “worth” to avoid those costs.⁷⁹

Lichtman, however, offers a different view of the hold-up problem. He argues that at some point, a fragmentation of IP rights - so denigrated in the anti-commons theory - can actually be a good thing: “The large number of overlapping patents that makes it difficult for firms to license necessary rights at the same time dampens the costs associated with each specific failure to license [...] some resources will come into efficient use precisely because there are so many patent holders who each can plausibly veto another firm’s use.”⁸⁰ In other words, when a relatively large number of firms follow a patent holdout strategy, actual hold-up is far less attractive: “More patents means less money per patent holder. Less money, in turn, means less of an incentive for a firm to strategically delay in the hopes of being a patent holdout, and less of an incentive for an accidental patent holdout to actually bring suit.”⁸¹

D. Royalty Stacking

In essence, this theory is a less extreme version of the anti-commons problem. Rather than grinding all innovation to a halt, the many IPR distributed across numerous rights holders lead to an extremely costly and inefficient outcome.

Royalty stacking can be explained simply. A firm wishing to produce a good, especially one embodying a technical standard, typically needs to acquire rights to the intellectual property underlying the good. When that good is comprised of multiple complementary components, each of which is necessary for production and each of which is covered by patents held by separate firms, the aggregate royalty fees for licensing all of the required pieces can, it is sometimes suggested, add up to a very large amount - perhaps so large that it is no longer economical for the manufacturing firm to make the good. This can allegedly happen even if each component’s patent is offered on “reasonable” terms. Stacking up so many reasonable terms would indeed lead to an unreasonable sum.

Four factors are implicit in the royalty stacking proposition. First, innovation must be sequential and cumulative, so that the patents are overlapping and interrelated. Otherwise, the royalties could not stack up. Second, there must be many patents for a given product, such as one embodying a technical standard. Otherwise, the stack would be small and either inconsequential or relatively easy to negotiate out of. Third, the many patents must be held by numerous, distinct rights holders. Otherwise, negotiating the use

⁷⁹ Mark Lemley echoes many of the same arguments, without any models: “Our goal should be to create a world in which patent owners can get paid for the technology they contribute, but in which what they get paid bears some reasonable resemblance to what they actually contributed.” See Mark Lemley, “Ten Things to Do About Patent Holdup of Standards (and One *Not* to),” working paper 2006.

⁸⁰ See Douglas G. Lichtman, “Patent Holdouts and the Standard-Setting Process”, *University Chicago Law and Economics, Olin Working Paper No. 292*, May 2006. Available at SSRN: <http://ssrn.com/abstract=902646> at 13.

⁸¹ *Id.* at 10.

of the many patents would be fairly straightforward, involving a limited number of bilateral negotiations. Fourth, the given licensee or all licensees must have no patents to trade with licensors. Otherwise, cross-licensing would drastically reduce the risk of royalty stacking.⁸²

Lemley and Shapiro extend the discussion of patent hold-up and injunctions to royalty stacking. They note that “[a]s a matter of simple arithmetic, royalty stacking magnifies the problems associated with injunctive threats and hold-up, and greatly so if many patents read on the same product.”⁸³ Lemley and Shapiro argue that a manufacturer’s margin is a limiting factor in royalty negotiations, but that amount typically leaves considerable room for patent holders to overcharge compared to the value of the technological contribution.

In order to give credibility to their claims, Lemley and Shapiro (2006) present two case studies as empirical evidence of a royalty stacking problem.

They begin with third-generation (3G) cellular technology, which involves several standards and allegedly several thousand patents disclosed as “essential” for each one. Those patents are held by a fairly large number of firms - for WCDMA, one of such standards, forty-one firms in all are represented, although roughly 75% of the patents are held by just four firms. At least on the surface, then, WCDMA would be a candidate for royalty stacking. Lemley and Shapiro argue that a royalty stacking problem actually exists on the basis of one questionnaire conducted before the standard was adopted. Firms that had declared patents as relevant for WCDMA were asked, hypothetically, what they would like to charge for their patents if they were found to be essential to the standard. Summing all of the answers (and not everyone responded) yielded a cumulative royalty rate of 130%. While it is a striking figure, it is also extremely misleading. What a firm will quote as its desired royalty in a hypothetical survey is quite different from what it can negotiate with real licensees (see our discussion of the horizontal constraints constraining essential patent holders’ ability to charge high royalty rates). Moreover, at the time of the questionnaire, the standard was not yet settled, so it was unclear what IP would in fact be essential. In reality, WCDMA technology is being licensed and has achieved remarkable penetration today, which belies any extreme cumulative royalty predictions made several years ago. Not only were Lemley and Shapiro’s predictions based on an inaccurate analysis, but they proved to be wrong.

In their Wi-Fi case study, Lemley and Shapiro again incorrectly assume that the mere presence of a large number of rights holders necessarily implies a royalty stacking problem. They also note that one patent lawsuit related to the standard ended with a 6% royalty rate award. Certainly if every patent holder were able to charge 6%, there would be a royalty stacking problem. But that cannot be assumed. First, technological contributions vary substantially across patents, so knowing that one patent was awarded 6% by the courts tells us nothing about the remaining IP—that one patent might have

⁸² This assumption raises the problem that in most high-technology industries, most licensors are also licensees, and therefore will be able to reduce any eventual royalty-stacking.

⁸³ See Lemley & Shapiro, *supra* note 51, at 2.

been the most pivotal for the standard. Second, court awarded royalty rates often include an element of punishment to ensure that future infringement is deterred. Furthermore, Lemley and Shapiro note that several of the Wi-Fi standard participants have already formed a patent pool, meaning a substantial portion of the standard's IP is available in a single-price bundle.

E. Conclusion on Perceived Problems

The above developments show that a number of authors have picked on the anti-commons theory to predict adverse possible development in a range of industries. Other authors have expressed scepticism about the anti-commons theory and its possible implications.

The most striking aspect of our survey of the literature is that while the theoretical literature is fairly rich the empirical literature testing the validity of the royalty stacking and anti-commons theories in the real world is sparse and often not very rigorous. More importantly, the existing evidence is mixed. Researchers have found a possible and limited royalty stacking effect in the software industry,⁸⁴ a possible effect in the semiconductor industry,⁸⁵ though apparently mitigated by market mechanisms (cross-licensing),⁸⁶ and no effect in the biomedical industry.⁸⁷ A recent paper by Layne-Farrar and Padilla also investigates royalty stacking in a 3G standard for cellular telecommunications.⁸⁸ Building on the existing literature, they examine publicly traded firms operating in the cellular telecommunications industry and find - just as others participants in the industries mentioned above have - no consistent evidence of royalty stacking effects. First, they find no robust evidence of such a problem for upstream (R&D-only) firms. Moreover, the results for vertically integrated firms are inconclusive. While some empirical specifications suggest that increased fragmentation lowers vertically integrated firms' market values, other equally reasonable specifications find little or no effect. Perhaps most importantly, using a standard empirical measure of IPR fragmentation established by the literature, the authors find almost no evidence of any fragmentation of IPR within the 3G mobile industry - instead, the rights appear quite concentrated.

V. CURRENT ATTEMPTS TO RESHAPE THE FRAND MODEL: ENCOURAGING EX ANTE COMPETITION TO PREVENT EX POST OPPORTUNISM

This Part successively reviews the question of what the notion of *ex post* opportunism means (Section A), the proposals made to mandate potential licensors to disclose their licensing on an *ex ante* basis (Section B), the Swanson-Baumol model of *ex*

⁸⁴ See Michael D. Noel and Mark A. Schankerman, "Strategic Patenting and Software Innovation", *CEPR Discussion Paper No. 5701*, May 2006. Available at SSRN: <http://ssrn.com/abstract=922111>

⁸⁵ Bronwyn H. Hall and Rosemarie Ham Ziedonis, "The patent paradox revisited: an empirical study of patenting in the U.S. semiconductor industry, 1979-1995," *RAND Journal of Economics*, vol. 32 no. 1, Spring 2001.

⁸⁶ See Anne Layne-Farrar & A. Jorge Padilla, "Royalty Stacking in High Tech Industries: Separating Myth From Reality", 2006, not yet published. Shapiro, *supra* note 72, p. 13.

⁸⁷ See Heller & Eisenberg, *supra* note 64.

⁸⁸ See Anne Layne-Farrar & A. Jorge Padilla, *supra* note 86.

ante auctions (Section C), the proposals for collective negotiations of royalties (Section D), the proposals for mandatory *ex ante* disclosure of licensing terms to SSOs (Section E), the proposals for voluntary *ex ante* disclosure of licensing terms to SSOs (Section F), the proposals to impose royalty-caps and allocation mechanisms (Section G). Section H presents our conclusions on the efforts to reshape the current FRAND model.

A. What is Ex Post Opportunism?

As seen above, one of the criticised pitfalls of standard-setting is allegedly the risk that owners of IPR essential to a standard will be able to unduly capture some of the economic value attributable not to the intrinsic value of those rights but to standardization itself. It is argued that if members of an SSO had known *ex ante* the standard being set the terms under which such IPR owners would license their rights, they might have chosen an alternative technology (provided, of course, such alternative technology existed). But once the standard has been adopted and implemented, switching to an alternative technology may have become too onerous for those practicing it. The argument continues that the bargaining power of the owner of essential IPR will have thus increased and that it may be able to extract more favourable licensing terms *ex post* standardization than would otherwise have been the case. This phenomenon is described as *ex post* opportunism.

As noted by Teece & Sherry, the theory of *ex post* opportunism is based on the premise that alternative technologies existed at the time of adoption of a particular standard, and that the SSO in question would have chosen one of them.⁸⁹ This is a significant limitation, as in many instances of standard development no suitable alternative technology would have been found to exist. Another often overlooked premise of the theory is that if the licensing terms offered by the IPR owner *ex post* standardization are, on the whole, similar to those offered *ex ante*, then no opportunism can be deemed to have occurred - even if the members of the SSO were unaware of those terms when they cast their votes. Such terms would arguably also comply with the IPR owner's FRAND obligation.

In the following sections we examine current proposals to surmount the allegedly ubiquitous risk of *ex post* opportunism and describe some of the concerns they raise.

B. The Ex Ante Approach

As mentioned, under traditional standard development procedures IPR holders are encouraged or required to disclose the IPR that they consider may be essential for a standard. They also undertake to make licenses to their essential IPR available on FRAND terms. Licensing negotiations are, however, conducted outside SSOs either on

⁸⁹ See Teece & Sherry, *supra* note 11, p. 10 (“Whether the SSO would have in fact adopted another alternative had it known of the patent claims raises a complex counterfactual question: ‘What would the SSO have done if the world had been different?’ The answer is likely to be hotly debated, and depends on the particular facts of the standard at issue. The greater the advantages of the (patented) standard over the alternatives that were considered and rejected at the time the standard was originally set, the less likely it is that an alternative would, in fact, have been chosen.”)

