

THE MEANING OF “FAIR AND REASONABLE” IN THE CONTEXT OF THIRD-PARTY DETERMINATION OF FRAND TERMS

*Damien Geradin**

INTRODUCTION

The meaning of the voluntary commitment made by holders of standards-essential patents (“SEPs”) to license these patents on fair, reasonable, and non-discriminatory (“FRAND”) terms has been the subject of significant debate in the legal and economic literature.¹ While some authors consider FRAND to have generally worked well in that the overwhelming majority of agreements to license SEPs are concluded through arm’s-length negotiations,² others have found this notion too vague to prevent alleged patent abuses.³

The concern over abuses has led some scholars to suggest interpretations of or additions to FRAND whereby, for instance, “fair and reasonable” means that a patent holder: (1) could charge no more than the *ex ante* “incremental value” of his invention over the next best technical alternative;⁴ (2) has to set his royalty rate based on a mathematical proportion of

* Professor of Law, George Mason University School of Law and Professor of Competition Law & Economics, Tilburg University. The Author has advised a number of companies on standards-essential patent-related issues both on the licensor and the licensee sides. The opinions expressed in this Paper are the Author’s own only.

¹ See, e.g., George S. Cary et al., *Antitrust Implications of Abuse of Standard-Setting*, 15 GEO. MASON L. REV. 1241, 1254 (2008); Philippe Chappatte, *FRAND Commitments—The Case for Antitrust Intervention*, 5 EUR. COMPETITION J. 319, 319 (2009); Thomas F. Cotter, *Patent Holdup, Patent Remedies, and Antitrust Responses*, 34 J. CORP. L. 1151, 1152 (2009); Joseph Farrell et al., *Standard Setting, Patents, and Hold-Up*, 74 ANTITRUST L.J. 603, 603 (2007); Damien Geradin & Miguel Rato, *FRAND Commitments and EC Competition Law: A Reply to Philippe Chappatte*, 6 EUR. COMPETITION J. 129, 129 (2010) [hereinafter Geradin & Rato, *Reply*]; 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*, 3 EUR. COMPETITION J. 101, 101 (2007) [hereinafter Geradin & Rato, *A Dissonant View*]; Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 1991 (2007); Daniel G. Swanson & William J. Baumol, *Reasonable and Nondiscriminatory (RAND) Royalties, Standards Selection, and Control of Market Power*, 73 ANTITRUST L.J. 1, 1 (2005).

² See Geradin & Rato, *Reply*, *supra* note 1, at 152.

³ See, e.g., Chappatte, *supra* note 1, at 319.

⁴ See Lemley & Shapiro, *supra* note 1, at 1996; see also Dennis W. Carlton & Allan L. Shampine, *An Economic Interpretation of FRAND*, 9 J. COMPETITION L. & ECON. 531, 536 (2013) (“In a patent infringement case not involving standards, a reasonable royalty is one that would have been negotiated *ex ante*—that is, one that would have been negotiated before the potential licensee had adopted the technology at issue and incurred sunk costs—a rate that does not reflect the ability of the patent

all patents essential to the practice of a standard;⁵ and (3) has to set his royalty rate in such a way as to prevent cumulative royalties on the standardized product from exceeding a low percentage of the total sale price of that product.⁶

Although much of the policy debate during the past several years has focused on the availability of injunctions to enforce SEPs against infringers,⁷ the meaning of FRAND is still of considerable importance in contexts requiring third parties to determine FRAND terms as part of settling SEP-related licensing disputes. For instance, in *Microsoft Corp. v. Motorola, Inc.*,⁸ U.S. District Judge Robart set both a FRAND rate and range per unit for the purpose of helping the jury determine whether Motorola had breached its FRAND commitments related to several video coding and wireless networking patents.⁹ More recently, in *In re Innovatio IP Ventures, LLC Patent Litigation*,¹⁰ U.S. District Judge Holderman determined the FRAND rate per chip that manufacturers had to pay to Innovatio for licensing its wireless networking patents.¹¹

Given the positions recently adopted by the Federal Trade Commission (“FTC”) in its Google consent decree,¹² and the growing interest of scholars¹³ and practicing lawyers¹⁴ in the potential need for third-party de-

holder to “hold up” the licensee. The maximum royalty *ex ante* in such a situation is based on the incremental value that the technology brings to the licensee compared to the alternatives available at that time. Typically, this incremental value will be less than the full profits of the licensee and it will not reflect the profits from complementary products. Only the incremental profits of the patent licensee—that is, those that are directly attributable to the use of the patented technology compared with alternatives—determine this maximum royalty rate.” (footnote omitted)

⁵ See Chappatte, *supra* note 1, at 340-41.

⁶ See Lemley & Shapiro, *supra* note 1, at 2010-11.

⁷ An example can be found in the recent debate over whether President Obama should veto an International Trade Commission patent ruling that would have banned the import of some models of the iPhone and iPad. See Connie Guglielmo, *President Obama Vetoes ITC Ban On iPhone, iPads; Apple Happy, Samsung Not*, FORBES (Aug. 3, 2013, 9:40 PM), <http://www.forbes.com/sites/connieguglielmo/2013/08/03/president-obama-vetoes-itc-ban-on-iphone-ipads-apple-happy-samsung-not/>; see generally Peter Camesasca et al., *Injunctions for Standard-Essential Patents: Justice Is Not Blind*, 9 J. COMPETITION L. & ECON. 285 (2013); James Ratliff & Daniel L. Rubinfeld, *The Use and Threat of Injunctions in the RAND Context*, 9 J. COMPETITION L. & ECON. 1 (2013).

⁸ 854 F. Supp. 2d 993 (W.D. Wash. 2012).

⁹ See *id.* at 999.

¹⁰ 921 F. Supp. 2d 903 (N.D. Ill. 2013).

¹¹ See *id.* at 915-17.

¹² For instance, pursuant to the consent decree, “[a]t least sixty (60) days prior to pursuing Covered Injunctive Relief, Respondents shall deliver to the Qualified Recipient(s) of the Potential License an Offer to Arbitrate the terms of a License Agreement.” See Motorola Mobility LLC & Google Inc., FTC File No. 1210120, at 10 (July 24, 2013), <http://www.ftc.gov/sites/default/files/documents/cases/2013/07/130724googlemotorolado.pdf> (decision and order).

¹³ See, e.g., Mark A. Lemley & Carl Shapiro, *A Simple Approach to Setting Reasonable Royalties for Standard-Essential Patents*, 28 BERKELEY TECH. L.J. 1135, 1136-37 (2013).

termination of FRAND terms, there are reasons to believe that the decisions of Judges Robart and Holderman will not remain isolated. When parties are unable to reach an agreement on their own over licensing terms, they could increasingly resort to courts or other forms of third-party determination,¹⁵ such as arbitration.¹⁶ This raises the question of which methodologies these courts or arbitration tribunals should use when asked to set FRAND-compliant licensing terms.

To answer that question, it is critical to observe that FRAND is a voluntary contract between the SEP holder and the standard-setting organization (“SSO”) by which the holder makes its commitment with standard implementers as third-party beneficiaries.¹⁷ The logical consequence of viewing the SEP holder’s commitment as contractual is that it should be interpreted through traditional means of contract interpretation in the event of FRAND litigation. Disagreements over contractual terms are by no means unique to licensing disputes, and there is a wide body of legal literature and court precedents that establish proper methods to follow when contractual terms are subject to conflicting interpretations by the parties.¹⁸ As will be seen, and pursuant to the traditional canons of contractual interpretation, courts have to discern and give effect to the “intent of the parties” rather

¹⁴ The American Bar Association has, for instance, an “SEP ADR Project,” also referred to as “ASAP.”

¹⁵ A judicial determination of FRAND rates also took place in China where the Shenzhen Intermediate People’s Court recently ruled that the royalties to be paid by Huawei Technologies Co., Ltd. for InterDigital Inc.’s 2G, 3G, and 4G SEPs should not exceed 0.019 percent of the actual sales price of each Huawei product. See Shylah R. Alfonso & Kevin A. Zeck, *Chinese Court Issues Landmark Decision Determining a FRAND Royalty Rate*, TIDBITS (Am. Bar Ass’n Section of Antitrust Law, Intellectual Prop. Comm.), Apr. 1-5, 2013, at 1, 1-2, available at http://www.americanbar.org/content/dam/aba/publications/antitrust_law/at315000_tidbits_20130405.authcheckdam.pdf.

¹⁶ An important question is whether the courts or arbitration tribunals handling licensing disputes between SEP holders and standards implementers should set a specific FRAND rate or limit themselves to a set range within which royalties that would have been proposed by the SEP holders should be considered to be FRAND. For the reasons that will be discussed *infra*, courts or arbitration tribunals should generally do the latter. See *infra* text accompanying notes 86-88. However, for the sake of simplicity, this Paper refers to third-party FRAND rate determination without distinguishing between setting up FRAND rates and establishing FRAND ranges.

¹⁷ This is the position that Roger Brooks and this Author defended in a 2011 paper. Roger G. Brooks & Damien Geradin, *Interpreting and Enforcing the Voluntary FRAND Commitment*, INT’L J. IT STANDARDS & STANDARDIZATION RES., Jan.-June 2011, at 1. Since then, U.S. federal courts have recognized this position. See, e.g., *Apple, Inc. v. Motorola Mobility, Inc.*, 886 F. Supp. 2d 1061, 1087 (W.D. Wis. 2012) (“Motorola’s membership in ETSI and IEEE and the intellectual property declarations it made established a contractual relationship that required Motorola to license its essential patents to third parties on fair, reasonable and non-discriminatory terms.”); *Microsoft Corp. v. Motorola, Inc.*, 864 F. Supp. 2d 1023, 1031 (W.D. Wash. 2012) (“[A] contract is formed through . . . any essential patent holder’s . . . commitment to the [SSO] to license patents on [F]RAND terms.”).

¹⁸ The leading treatise on contract interpretation is E. ALLAN FARNSWORTH, *CONTRACTS* (4th ed. 2004).

than engage in complex economic theory.¹⁹ While economics may assist in helping to ascertain the intent of the parties underlying FRAND policies and commitments, methods based on abstract economic models or theories should not substitute for, or overrule evidence of, actual intent of the parties.²⁰

Some may, of course, argue that the FRAND commitment is in essence an *incomplete* contract,²¹ and that the terms “fair and reasonable” are particularly challenging to interpret. Yet, as will be seen below, commercial contracts, as well as statutes and regulations, regularly refer to the notions of fairness and reasonableness, with courts often being asked to determine how these notions should be interpreted in particular contexts. In the case of FRAND, exchanges that took place between SSO members in the elaboration of, and subsequent revisions to, the intellectual property rights (“IPR”) policies against which FRAND commitments are made facilitate the determination of what the parties meant. Thus, while the determination of contractual terms is much better left to the parties, there is no reason to believe that courts are unable to determine the meaning of “fair and reasonable” when asked to do so.

As will be shown through the analysis of the European Telecommunications Standards Institute (“ETSI”)²² IPR Policy, SSO member exchanges and IPR policies offer critical insights into what the ETSI members understood about the meaning of fairness and reasonableness at the core of their FRAND commitments.²³ These exchanges and policies make it abundantly clear that the SSO members adopting the ETSI IPR Policy sought to ensure a fair balance between the interests of SEP holders and standard users—i.e., to ensure the availability of the standards while also ensuring that the SEP holders are “adequately and fairly rewarded for the use of their IPRs.”²⁴ The question, of course, is what adequate and fair rewards mean in the context of FRAND licensing. Standardization is an evolutionary process, as illus-

¹⁹ See *infra* notes 54-57 and accompanying text.

²⁰ See *infra* note 107 and accompanying text.

²¹ Fiona M. Scott Morton, Deputy Assistant Attorney Gen. for Econ. Analysis, Antitrust Div., U.S. Dep’t of Justice, Keynote Address at the Fifth Annual Searle Center Conference on Antitrust Economics and Competition Policy: Patent Portfolio Acquisitions: An Economic Analysis 5 (Sept. 21, 2012), <http://www.justice.gov/atr/public/speeches/288072.pdf> (“Another important set of incomplete contracts are the FRAND commitments concerning SEPs into which the original owner may have entered.”). For a general discussion regarding FRAND as an incomplete contract, see Joshua D. Wright, Comm’r, Fed. Trade Comm’n, Remarks at the Center for the Protection of Intellectual Property Inaugural Academic Conference: SSOs, FRAND, and Antitrust: Lessons from the Economics of Incomplete Contracts 2 (Sept. 12, 2013), http://www.ftc.gov/sites/default/files/documents/public_statements/ssos-frand-and-antitrust-lessons-economics-incomplete-contracts/130912cpip.pdf.

²² ETSI is a critically important SSO given the fundamental standardization role it plays in the wireless communication field.

²³ See *infra* notes 65-69 and accompanying text.

²⁴ ETSI, INTELLECTUAL PROPERTY RIGHTS POLICY § 3.2 (2013) [hereinafter ETSI IPR POLICY], available at <http://www.etsi.org/images/files/IPR/etsi-ipr-policy.pdf>.

trated in the mobile communications field, where standards keep evolving. As a result, rewards will only be adequate and fair if they both compensate SEP holders for the risky research and development (“R&D”) investments they have made to develop the technologies that form the standard—including investments in failed projects²⁵—and also give SEP holders sufficient profit incentives to keep investing in the development of standardized technologies.

While the need to ensure such a fair balance may seem logical to the neutral reader, there has been a movement in the economic literature toward theories wherein standardization is seen as being at risk because of “holdup”²⁶ and “royalty stacking,”²⁷ and proposing that the solution to these problems is to weaken the bargaining position of SEP holders²⁸ by allowing them to charge no more than the ex ante incremental value of the essential patents in question.²⁹ As will be seen below, this proposed method is unsupported by the language and history of FRAND policies and comments. Furthermore, the proposal aims at the wholesale devaluation of patents rather than, as has been suggested, merely seeking to eliminate the potential for SEP holders to exploit sunk costs when downstream firms implement

²⁵ While innovators generally face significant risks given the painful nature of the “trial and error” process characterizing innovation, they face additional challenges when their research takes place in a field that is subject to industry standardization. The reason is that innovators have no guarantee that their technology, however valuable, will be selected as part of the relevant standard. The key function of standardization is to select the technologies that will be part of the standard, and, in the presence of several alternatives, competition for inclusion in the standard will generally be fierce. This competition may also be unfair, as its outcome often depends on the respective influence or strength of the various technology developers in the SSO in question, hence creating a risk that second-best technology will be selected. Thus, in a standardized industry even a “successful” R&D project—in the sense of developing a technically viable solution to an important problem—may lose out to a different and even inferior solution that is chosen for inclusion in the standard. While in some instances inter-standard competition or competition by a proprietary technology may be viable, in other cases the “loser” of the standardization process may be effectively shut out, obtaining zero return on investment. This adds to the “uncertainty” that characterizes innovation and the ability of innovators to earn a return on investment.

²⁶ On patent holdup, see generally Mark A. Lemley, *Ten Things to Do About Patent Holdup of Standards (and One Not to)*, 48 B.C. L. REV. 149 (2007); Mark R. Patterson, *Antitrust and the Costs of Standard-Setting: A Commentary on Teece & Sherry*, 87 MINN. L. REV. 1995 (2003); Mark R. Patterson, *Leveraging Information About Patents: Settlements, Portfolios, and Holdups*, 50 HOUS. L. REV. 483 (2012).

²⁷ Lemley & Shapiro, *supra* note 1, at 1993 (“Royalty stacking refers to situations in which a single product potentially infringes on many patents, and thus may bear multiple royalty burdens. The term ‘royalty stacking’ reflects the fact that, from the perspective of the firm making the product in question, all of the different claims for royalties must be added or ‘stacked’ together to determine the total royalty burden borne by the product if the firm is to sell that product free of patent litigation.”).

²⁸ For instance, it has been suggested that SEP holders should not be allowed to enforce their patents through injunctions. See Lemley & Shapiro, *supra* note 1, at 2008-10; cf. Vincenzo Denicolo et al., *Revisiting Injunctive Relief: Interpreting eBay in High-Tech Industries with Non-Practicing Patent Holders*, 4 J. COMPETITION L. & ECON. 571, 575-77 (2008).

²⁹ See Farrell et al., *supra* note 1, 642-43.

the standard.³⁰ More importantly, if courts or arbitrators setting FRAND terms during licensing disputes adopted this method,³¹ or any other method that breaches the balance of interests at the core of the FRAND concept, there would be serious negative consequences to some of the key features of the standardization process and to R&D investments that could provide the most useful technology for future standards.

First, standard implementers would be encouraged to have licensing terms determined by FRAND litigation instead of through arm's-length negotiations.³² This would undermine one of the key features of standardization, which is that while standards are the result of collective efforts, licensing terms are to be negotiated by the parties.³³ This model has allowed thousands of licensing agreements covering SEPs to be adopted every year through bilateral negotiations, and few will deny the superiority of bilateral negotiations over litigation in determining the content of an agreement. The recent burst of antitrust complaints and court litigation in the mobile device sector³⁴ should not lead us to believe that FRAND abuses are ubiquitous

³⁰ See *infra* Part III.A.2.

³¹ This risk is not theoretical. See *Microsoft Corp. v. Motorola, Inc.*, No. C10-1823JLR, 2013 WL 2111217, at *13 (W.D. Wash. Apr. 25, 2013), available at <http://www.essentialpatentblog.com/wp-content/uploads/sites/234/2013/04/2013.04.25-D.E.-681-Findings-of-Fact-and-Conclusions-of-Law-setting-RAND-royalty1.pdf> (“[E]x ante examination of the incremental contribution of the patented technology to the standard can be helpful in determining a RAND rate in the context of a dispute over a RAND royalty rate.”).

³² See Richard A. Epstein et al., *The FTC, IP, and SSOs: Government Hold-Up Replacing Private Coordination*, 8 J. COMPETITION L. & ECON. 1, 3 (2012) (“[I]f new approaches to setting value [such as incremental value] are made available to potential licensees as of right, they will have a strong incentive to abandon the voluntary market to obtain the benefit of such judicial pricing rules, which are systematically more favorable to their interests.”).

³³ ETSI, GUIDE ON INTELLECTUAL PROPERTY RIGHTS (IPRS) § 4.1 (2013), available at <http://www.etsi.org/images/files/IPR/etsi-guide-on-ipr.pdf> (“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.”); see generally Damien Geradin, *Standardization and Technological Innovation: Some Reflections on Ex-ante Licensing, FRAND, and the Proper Means to Reward Innovators*, 29 WORLD COMPETITION 511, 516 (2006).

³⁴ In the mobile communication devices sector, a number of antitrust complaints have been filed against SEP holders before the European Commission for alleged anticompetitive abuses, and some of these complaints have triggered investigations. See, e.g., Press Release, Eur. Comm’n, Antitrust: Commission Opens Proceedings Against Motorola (Apr. 3, 2012), available at http://europa.eu/rapid/press-release_IP-12-345_en.htm; Press Release, Eur. Comm’n, Antitrust: Commission Opens Proceedings Against Samsung (Jan. 31, 2012), available at http://europa.eu/rapid/press-release_IP-12-89_en.htm. Similarly, lawsuits have been filed against SEP holders alleging antitrust infringements or breach of contracts. For instance, Microsoft recently won a breach-of-contract suit against rival Motorola, with the jury awarding the Redmond software giant just over \$14.5 million in damages. The judgment is available at *Microsoft Corp. v. Motorola, Inc.*, No. C10-1823JLR (W.D. Wash. Apr. 25, 2013),

and that third-party determination should be a standard solution to what, as will be seen below, is not a pervasive problem.³⁵

Second, binding SEP holders' license fees to ex ante incremental value would create a risk of "reverse holdup" whereby SEP holders would be under-compensated for the investments they may have made and risks they have undertaken to develop the technologies that make possible the adoption of consistently improved standards.³⁶ While much of the academic and policy debate has revolved around the theoretical risk of holdup, whereby *opportunistic* SEP holders leverage any market power acquired through standardization to force implementers with sunk investments to pay inflated royalties, the converse risk that SEP holders could be under-compensated is very real.³⁷ The reason is that SEP holders also make significant sunk investments to develop their technologies,³⁸ and standard implementers can therefore behave opportunistically in order to pay infra-FRAND rates.³⁹ Neither standard implementers nor SEP holders have a monopoly on good or bad behavior. Just as SEP holders may have incentives to charge non-FRAND fees to increase their profitability, standard implementers have incentives to drive rates down as low as they can to decrease costs and in-

<http://www.essentialpatentblog.com/wp-content/uploads/sites/234/2013/04/2013.04.25-D.E.-681-Findings-of-Fact-and-Conclusions-of-Law-setting-RAND-royalty1.pdf>. These cases, however, have to be put into perspective. First, the mobile devices sector has been characterized in recent years by the entry of significant new players who have not contributed to the relevant standards, such as Apple, at the expense of players, such as Ericsson, Motorola, and Nokia, who actively contributed to the standards. Market shifts of that magnitude create a fertile ground for disputes and litigation, especially when the amounts at stake are very significant. Second, mobile devices are becoming increasingly complex and carry an ever-growing set of functions. Hence, a large number of patents are involved, and this further tends to trigger licensing disputes. In this context, the current outbreak of legal wrangling over SEPs is almost unavoidable. That result does not suggest, however, that there is a pervasive "problem" that needs to be solved through the adoption of rate-setting methodologies that would negatively affect the functioning of the standardization systems.

³⁵ See *infra* Part III.A.

³⁶ See Damien Geradin, *Reverse Hold-Ups: The (Often Ignored) Risks Faced by Innovators in Standardized Areas 7-9* (Nov. 12, 2010) (paper prepared for the Swedish Competition Authority on the Pros and Cons of Standard-Setting), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1711744.

³⁷ See Epstein et al., *supra* note 32, at 34 ("If the implementer is 'locked in' and vulnerable to hold-up once it has made 'sunk costs' investments in a particular technology, so too is an innovator 'locked in' to its technology after it has made the R&D investments necessary to develop that technology.").

³⁸ Leading mobile technology companies spend hundreds of millions of dollars every year to develop new technologies that will be integrated into standards. For instance, Qualcomm invested \$2.5 billion in 2010 and \$3 billion in 2011 in developing a variety of new, enabling technologies, in particular cellular communications and other advanced communications technologies. See Qualcomm Inc.'s Response to the Commission's Request for Comments on the Proposed Agreement Containing Consent Order at 1, Motorola Mobility LLC & Google Inc., FTC File No. 1210120 (July 24, 2013), available at http://www.ftc.gov/sites/default/files/documents/public_comments/2013/02/563708-00022-85574.pdf.

³⁹ See Geradin, *supra* note 33, at 518.

crease profit margins. Opportunism can thus be present on both sides of the FRAND divide.

FRAND determination methods not sufficiently rewarding SEP holders for the investments they have made and risks they have undertaken would in turn have two major negative consequences. First, as noted above, innovators may simply decide that it is no longer worth investing hundreds of millions or billions of dollars in developing technologies in standardized sectors as greater returns may be available in sectors in which patentees would not be so tightly constrained. It is a basic law of finance that capital flows where the best opportunities arise.

Relatedly, recent individual declarations by major innovators in the wireless communications sector suggest that they may decide to no longer participate in SSOs.⁴⁰ If this were to happen, it would destroy one of the reasons (i.e., broad participation) SSOs such as ETSI have been so successful in developing consistently improved standards. Hence, those who believe that FRAND commitments must impose strict constraints on the ability of SEP holders to monetize their patents should also be concerned that major technology contributors could decide to no longer participate in SSOs so as to avoid being bound by a FRAND commitment.⁴¹ As noted above, standardization is not a one-time event, and the debate around FRAND cannot be seen in a *static* perspective.

The purpose of this Paper is neither to predict the end of the standardization system as we know it nor to come to the rescue of SEP holders.⁴² It is, rather, to argue that SSO members knew what they were doing in using FRAND to balance the interests of SEP holders and standards implementers. The use of “fair and reasonable” terms to guide future behavior is well known in the law, and tribunals have experience adjudicating disputes over what these terms mean. Nonetheless, with little or no empirical evidence

⁴⁰ See Matthew Newman, *Ericsson, Qualcomm, Nokia Cool on Contributing Technology to Standards Bodies*, MLEX (June 14, 2013, 5:22 PM) (on file with author) (reporting that “[r]epresentatives of Ericsson, Nokia and Qualcomm said they were wary of contributing their technology to standard-setting organizations, or SSOs, because of the risk that companies licensing their inventions would no longer abide by fair and reasonable royalty terms”).

⁴¹ See *Microsoft Corp. v. Motorola, Inc.*, No. C10-1823JLR, 2013 WL 2111217, at *80 (W.D. Wash. Apr. 25, 2013), available at <http://www.essentialpatentblog.com/wp-content/uploads/sites/234/2013/04/2013.04.25-D.E.-681-Findings-of-Fact-and-Conclusions-of-Law-setting-RAND-royalty1.pdf> (“Companies and SEP holders might not participate in the standard-setting process or contribute their patents to the standard if they believe that they will not receive full and fair value for their patents. As a result, the standards might fail to incorporate the best technology available. Moreover, since licensing through SSOs under the RAND commitment is, at least for some entities, an important component of profitability, reducing that component would reduce the incentive to innovate and thereby slow the pace of innovation in the economy.” (citation omitted)).

⁴² One should be clear: FRAND licensing should not equate with SEP holder over-compensation. Thus, FRAND licensing may mean no or low royalties. This was the case in *Microsoft v. Motorola*, where Judge Robart convincingly showed that Motorola’s patents were at best marginal to the standard in question and to Microsoft’s products.

that corrective action is needed, there are proposals to judicially redefine what is meant by “fair and reasonable” regardless of what the parties to a FRAND agreement intended. These proposals use theoretical concerns to justify a monumental shift in how tribunals should value patented technologies. The effect of those proposed solutions would be to upset the balance struck by FRAND commitments in favor of standards implementers, with disturbing consequences for future standardization.

Against this background this Paper is divided into three parts. Part I introduces the “fair and reasonable” elements of FRAND. While these notions are generally considered problematic in the context of the licensing of SEPs, they are frequently used not only in contracts but in statutes and regulations, because it may not always be possible for parties to provide *ex ante* for all relevant future contingencies. Viewed with that awareness, the flexibility of notions of fairness and reasonableness should be seen as a strength rather than a weakness.⁴³ As FRAND is a contract, Part II looks to the main categories of information potentially relevant to contract construction in determining the meaning of “fair and reasonable,” examining the ETSI IPR Policy in particular and as an example. Part III first discusses the methodologies that have been regularly mentioned in setting FRAND licensing terms, including *ex ante* incremental value. While this method offers a superficially simple way to determine what a reasonable license fee should be, it is not consistent with the balance of interests that FRAND commitments are designed to achieve and suffers from several additional defects. Part III then examines the *Georgia-Pacific*⁴⁴ framework for setting FRAND licensing terms, concluding that it is preferable to the other methodologies discussed as long as it is applied in line with the intent of the parties. Part III is then followed by a brief conclusion.

I. A FOCUS ON THE “FAIR AND REASONABLE” ELEMENTS OF FRAND

As noted above, FRAND stands for “fair, reasonable and non-discriminatory.” This Paper focuses on the interpretation of “fair and reasonable” rather than “non-discriminatory.” The non-discrimination element of FRAND generally is easier to interpret than are notions of fairness and

⁴³ See Wright, *supra* note 21, at 10-11 (“The level of precision of the F/RAND term is a selection made by sophisticated parties informed by a number of tradeoffs. Most importantly, there is considerable uncertainty concerning the ultimate value of the technology, if adopted, especially in dynamic and ever-changing markets. Contractual flexibility *ex post* can be an important source of economic value. There are additional reasons parties favor less precision. For example, fear of antitrust liability imposes some costs of additional precision as such specificity with respect to prices, marketing, and distribution terms may be construed as unlawful price-fixing. Additional precision in the form of well-defined licensing commitments could also raise the costs of SSO participation.” (footnote omitted)).

⁴⁴ *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116 (S.D.N.Y. 1970).

reasonableness,⁴⁵ and it has been discussed in detail elsewhere.⁴⁶ There is indeed a consensus that non-discrimination does not mean that licensing terms should be identical for all licensees, as such an interpretation would ignore economic realities, but that “similarly situated” licensees should have access to the same licensing terms.⁴⁷ There will, however, always be some variations in the terms offered to licensees that may appear to be similarly situated, as licensing terms cover a wide array of issues. This includes not only the level of fees—including upfront payments, per-unit fees, and running royalty rates—but also other aspects, such as the volume of licensed products, scope of license (e.g., products, territory, “have made” rights, etc.), exhaustion of patent rights, cross-licenses, other technology transfer, technical support, possible product purchases, the formation of broader business relationships and cooperation, and any other business value exchanged.⁴⁸ Thus, although the notion of non-discrimination is conceptually clearer than the notion of fairness and reasonableness, it does raise highly complex considerations in particular cases.⁴⁹

While often claimed to be problematic in the context of FRAND licensing, it is striking to observe that the notion of fairness and reasonable-

⁴⁵ This is not to say that non-discrimination issues are less important. Interestingly, David Teece and Edward 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.

David J. Teece & Edward F. Sherry, *Standards Setting and Antitrust*, 87 MINN. L. REV. 1913, 1956 n.149 (2003).

⁴⁶ See, e.g., Richard J. Gilbert, *Deal or No Deal? Licensing Negotiations in Standard-Setting Organizations*, 77 ANTITRUST L.J. 855, 868-70 (2011).

⁴⁷ See, e.g., Carlton & Shampine, *supra* note 4, at 546 (“‘Non-discriminatory,’ in the context of a SSO setting standards for competing firms, can be interpreted to mean that all implementers of the standard should be offered licenses to the technology, and all ‘similarly situated’ firms should pay the same royalty rate.”).

⁴⁸ See Epstein et al., *supra* note 32, at 21 (“There are many reasons why identical terms will not be appropriate in all cases. In some instances, some licensees are in a position to supply cross-licenses of varying value to the licensor. In other instances, licensees are in a position to engage in some other form of valuable commercial cooperation. One type of cooperation commonly explored involves a commitment to make market-expanding investments. Another involves a commitment to engage in risk-sharing with the licensor through an up-front payment. Yet another involves a commitment to return valuable information to the patentee. Each of these forms of value may be balanced by a lower cash license fee or royalty rate.”).

⁴⁹ For an extensive discussion of the nondiscrimination principle and the challenges it raises in the context of FRAND, see generally Carlton & Shampine, *supra* note 4; Gilbert, *supra* note 46.

ness are used not only in many commercial contracts but also in many statutes and other regulatory schemes.⁵⁰ As abundantly discussed in the literature on the incompleteness of contracts, “parties may leave the contract incomplete because they suffer from bounded rationality, meaning that they lack the foresight to see and contract on all relevant future contingencies.”⁵¹ This is why parties may often stay silent on some aspects of the contractual relationship. Alternatively, they may refer to notions such as “fair and reasonable”—or other comparable concepts—rather than specify in great detail what the exact terms of performance should be, all the while knowing that a judge may later be asked by the parties to intervene if there is a dispute over the interpretation of these terms.⁵²

Thus, while incomplete contracts are sometimes presented as a unique problem to FRAND licensing, they are the rule rather than the exception, and methods have been devised to deal with situations where the parties are unable to agree over issues about which the contract is silent or vague. In other words, contractual reliance on the notions of fairness and reasonableness is neither a plot by SEP holders to keep their FRAND commitment vague and unenforceable, nor a unique weakness of the SEP licensing system. “Fair and reasonable” are common features of business life, which allow contracts to be concluded in a context where it is not possible, or would be excessively costly, to address all future contingencies.

⁵⁰ Like parties writing a contract, members of legislative bodies may be unable or unwilling to provide for every possible contingency when drafting a law.

[A] contractarian analysis of the lawmaking process helps to define instances in which legislators may broadly delegate power to other governmental branches. For example, lawmakers might enact an incomplete statute to avoid the transaction costs associated with reaching agreement on more precise statutory language. In addition, lawmakers might leave statutory gaps or ambiguities because they cannot foresee and account for all the future contingencies to which the law might apply. Lawmakers, after all, suffer from the same cognitive limitations as other contracting parties. Lawmakers also might enact an incomplete statute to give courts or agencies the flexibility to adapt the statute to changing circumstances, or because they do not (whereas a court or agency might) have the expertise to define precisely the scope of the legal obligations. Finally, lawmakers might enact an incomplete statute for strategic reasons. In particular, lawmakers might leave gaps in a statute to avoid the political costs associated with specific statutory language.

Scott Baker & Kimberly D. Krawiec, *The Penalty Default Canon*, 72 GEO. WASH. L. REV. 663, 672 (2004) (footnote omitted).

⁵¹ *Id.* at 665.

⁵² As pointed out by Professor Jules Coleman, one of the leading contracts scholars, and his coauthors:

Although imagining problems in contract design and execution and devising adequate safeguards against all possible sources of contract failure is a logical possibility, it remains (for everyone but the Gods) a practical impossibility. . . .

. . . When contingencies arise for which no adequate provisions have been made ex ante, the parties may disagree about their respective rights and duties ex post. Sometimes they are able to resolve the conflict privately. If they are unable to resolve the conflict privately, however, the parties may find themselves in court.

Jules L. Coleman et al., *A Bargaining Theory Approach to Default Provisions and Disclosure Rules in Contract Law*, 12 HARV. J.L. & PUB. POL’Y 639, 640-41 (1989).

In the case of the FRAND commitment, incompleteness is not only unavoidable but desirable. The FRAND commitment does not create in itself a license. Rather, it establishes a set of principles against which a license will be negotiated between an SEP holder and a standard implementer. Prescribing in every detail what FRAND means, and thus what SEP holders would have to commit to in the abstract, would be inefficient, as it would restrict licensing flexibility, which is highly desirable given the relationship-specific nature of licensing negotiations.

In other words, reliance on “fair and reasonable” is not unique to the standardization process, and much can be learned by looking at the way these notions have been interpreted in other contexts. While it is beyond the scope of this Paper to analyze in detail how notions of “fair and reasonable” have been interpreted in commercial contracts, both legal and economic scholars agree that identifying the intent of the parties is the key element of contractual interpretation.⁵³ Identifying the parties’ intent can be done either through the literal meaning of the contract or by its context, or through a determination of what the parties would have hypothetically agreed to if they had been willing and able to fully specify the terms of the contract. As summarized by leading contract law theorists, “[h]onoring the contractual intent of the parties is the central objective of contract law.”⁵⁴

II. ETSI IPR POLICY AS AN EXAMPLE OF INTERPRETING FRAND AS A VOLUNTARY CONTRACT

While contract law is applicable to any FRAND commitment, this Paper uses ETSI’s IPR policies as an example of how to employ standard tools of contractual interpretation within the FRAND context. This Paper’s focus on ETSI⁵⁵ also stems from the many publicized licensing disputes in the mobile devices industry which involved standards adopted within the ETSI framework. In addition, there is an extensive record of the debates that took place between ETSI members before and after the adoption of its IPR Policy. Finally, there are several categories of information potentially

⁵³ For an excellent discussion, see generally 3 ENCYCLOPEDIA OF LAW AND ECONOMICS: THE REGULATION OF CONTRACTS 1-222 (Boudewijn Bouckaert & Gerrit De Geest eds., 2000).

⁵⁴ Jody S. Kraus & Robert E. Scott, *Contract Design and the Structure of Contractual Intent*, 84 N.Y.U. L. REV. 1023, 1025 n.3 (2009) (“The search for intention is a key doctrinal element in determining whether the parties have made a binding agreement, the meaning that attaches to the terms of that agreement, the default terms implied in that agreement, and whether the obligations of the parties are impliedly conditioned on unstated assumptions . . .”).

⁵⁵ ETSI was formed in 1988 pursuant to the European Commission’s recommendation to establish a third European standard-setting body. In contrast with the broad field of activities covered by the European Committee for Standardization and the European Committee for Electrotechnical Standardization, the two standardization bodies that were earlier recognized by the European community, the activities of ETSI are confined to the areas of telecommunications, information technology, and broadcasting.

relevant to contract construction in determining the meaning of “fair and reasonable” within the ETSI IPR Policy.⁵⁶

As discussed above, identifying the intent of the parties can be done through several methods, such as looking at the “plain language” of the contract, which is discussed in Part II.A below. The intent of the parties may also be examined by looking at the relevant context,⁵⁷ such as the negotiation history of the ETSI IPR Policy and subsequent discussion among ETSI members over the meaning and scope of the FRAND undertaking, both of which are discussed in Part II.B.

A. *The Plain Language*

The starting point of any contract interpretation must be the language of the contract itself.⁵⁸ The terms “fair and reasonable,” which are expressly referred to at Article 6.1 of the ETSI IPR Policy, are on their face terms that imply wide latitude. This latitude is not due to an oversight. As will be seen below, the ETSI IPR Policy, including the use of fairness and reasonableness, was adopted after several years of intensive discussions and negotiations between ETSI members.

If ETSI’s priority when adopting its IPR Policy had been to ensure that its members holding SEPs were tightly constrained in their ability to monetize their patents, ETSI’s members could, for instance, have specified methodologies to determine “fair and reasonable” terms, but they did nothing of the sort, deciding instead that it was better to leave wide latitude to the parties when negotiating license terms. This does not mean that these terms, or the FRAND commitment generally, fall into an “interpretation gap,” since both were adopted against a background of contract law and determinations of “fair and reasonable” royalties rendered through patent litigation.⁵⁹

⁵⁶ See Brooks & Geradin, *supra* note 17, at 3.

⁵⁷ This is generally referred to as “contextualism.” See Robert Hardy, *The Feasibility Study’s Rules on Contract Interpretation*, 19 EUR. REV. PRIVATE L. 817, 823 (2011) (“Contextualism . . . implies that a court will primarily inquire into the actual intention of the parties. . . . In this case, the base of information or materials that the court can take into account in order to ascertain the actual intention of the parties is potentially unlimited. The court must discern what parties have actually meant, that is, uncover the expectations of parties, by considering not only the written words of the contract but also other contextual evidence, which is used to interpret the scope of the contract. Courts must then be careful to give weight only to outward manifestations of intent and not to the secret intentions of one party. However, the task of determining what the contract *is* necessarily extends beyond the ‘four corners’ of the written agreement.”).

⁵⁸ See, e.g., *Henkel Corp. v. Hartford Accident & Indem. Co.*, 399 F. Supp. 2d. 607, 613 (E.D. Pa. 2005) (stating that it is a “hornbook principle that *in contract disputes, the plain language of the agreement is the best evidence of the parties’ intent*”), *aff’d*, 271 Fed. App’x 161 (3d Cir. 2008).

⁵⁹ See the discussion of the *Georgia-Pacific* framework, *infra* notes 120-125 and accompanying text.

A useful point of reference for courts or arbitration tribunals determining FRAND licensing terms for a given case is the section of the ETSI IPR Policy dealing with its “Policy Objectives.” While the ETSI IPR Policy is not the “source” of the FRAND commitment (as such a commitment must *positively* be made by the SEP holder to the benefit of all standard implementers), it is nevertheless relevant in ascertaining the intent underlying FRAND commitments. The “Policy Objectives” section provides:

3.1. It is ETSI's objective to create STANDARDS and TECHNICAL SPECIFICATIONS that are based on solutions which best meet the technical objectives of the European telecommunications sector, as defined by the General Assembly. In order to further this objective the ETSI IPR POLICY seeks to reduce the risk to ETSI, MEMBERS, and others applying ETSI STANDARDS and TECHNICAL SPECIFICATIONS, that investment in the preparation, adoption and application of STANDARDS could be wasted as a result of an ESSENTIAL IPR for a STANDARD or TECHNICAL SPECIFICATION being unavailable. In achieving this objective, *the ETSI IPR POLICY seeks a balance between the needs of standardization for public use in the field of telecommunications and the rights of the owners of IPRs.*

3.2. *IPR holders* whether members of ETSI and their AFFILIATES or third parties, *should be adequately and fairly rewarded for the use of their IPRs* in the implementation of STANDARDS and TECHNICAL SPECIFICATIONS.

3.3. ETSI shall take reasonable measures to ensure, as far as possible, that its activities which relate to the preparation, adoption and application of STANDARDS and TECHNICAL SPECIFICATIONS, *enable STANDARDS and TECHNICAL SPECIFICATIONS to be available to potential users* in accordance with the general principles of standardization.⁶⁰

The above language makes it clear that the rationale behind the FRAND commitment—and the “fair and reasonable” terms that are part of it—is twofold: (1) to ensure that SEPs are *available* for the manufacture, sale, and use of standard-compliant products, while at the same time (2) making certain that holders of IPRs are able to reap *adequate and fair rewards* from their innovations.⁶¹

The reasons behind this two-fold rationale are easy to identify. First, and as has been discussed elsewhere,⁶² SSOs are composed of companies with different business models. While some firms have a licensing business model in which licensing revenues are important, other firms are essentially manufacturers implementing the standard into compliant products and who

⁶⁰ ETSI IPR POLICY, *supra* note 24, at § 3 (emphasis added).

⁶¹ Interestingly, Professors Mark Lemley and Carl Shapiro, who are some of the strongest defenders of curbing the ability of SEP holders to monetize their patents, recognize these objectives. *See* Lemley & Shapiro, *supra* note 13, at 1138 (observing that the twin goals of FRAND commitments are “freedom to implement the standard along with reasonable returns to inventors who contribute patented technology to the standard”). Of course, their view of what “reasonable returns” means differs from mine.

⁶² *See* Geradin, *supra* note 33, at 516-517.

thus see licensing fees as a cost they want to minimize.⁶³ As correctly observed by Federal Trade Commission (“FTC”) Commissioner Joshua D. Wright, “SSOs thus have the features of a two-sided market, where they serve as platforms to join together contributors and adopters. As a platform, a successful SSO needs to attract members on both sides of the platform, by striking a balance for the two sides with respect to their rules and policies.”⁶⁴ Because of the diversity of business models, a definition (or interpretation) of FRAND that would favor licensees at the expense of licensors (or vice-versa) would not obtain sufficient support from ETSI’s membership.

Second, although most manufacturers of standard-compliant products would like to save on their licensing costs in the context of a given negotiation, they also know that their ability to sell products for which there is significant demand largely depends on the development and adoption of new, improved standards. This is, for instance, very clear in the mobile devices industry where the advent of new standards (2G, 3G, and 4G) created massive commercial opportunities for manufacturers.⁶⁵ Thus, while standard implementers might wish to save on licensing fees in the context of a given negotiation, they also understand that innovators will not contribute their innovations or engage in technology development unless they are fairly compensated for the risks assumed in undertaking the expensive R&D that fuels innovation and allows standards to evolve.⁶⁶

Finally, and perhaps more importantly, a definition of FRAND that would unduly constrain the ability of SEP holders to monetize their patents would create an issue of participation or contribution.⁶⁷ One of the aspects

⁶³ This being said, most firms are vertically integrated in that they develop technologies that may find their way into standards but also manufacture standard-compliant products. See *infra* note 128 and accompanying text.

⁶⁴ See Wright, *supra* note 21, at 18-19.

⁶⁵ The massive growth of mobile devices, such as smartphones and tablets, has led some analysts to observe that we are seeing the end of the PC era. See Tim Worstall, *The End of the PC Era*, FORBES (Jan. 19, 2012, 12:04 PM), <http://www.forbes.com/sites/timworstall/2012/01/19/the-end-of-the-pc-era/>.

⁶⁶ The goal of motivating future investment lies at the heart of the patent system and is essential to the success of the standards enterprise. For instance, a European Commission communication issued in 1992—just at the time ETSI began developing its IPR policy—emphasized the prospective, motivational imperative specifically in the standards context. *Intellectual Property Rights and Standardization*, at 1, COM (1992) 445 final (Oct. 27, 1992) (“[T]he incentive to develop new products and processes on which to base future standardization will be lost if the standard-making process is carried out without due regard for intellectual property rights.”); see also *Guidelines on the Application of Article 81 of the EC Treaty to Technology Transfer Agreements*, 2004 O.J. (C 101/02) 2, 3 (“In order not to reduce dynamic competition and to maintain the incentive to innovate, the innovator must not be unduly restricted in the exploitation of intellectual property rights that turn out to be valuable. For these reasons the innovator should normally be free to seek compensation for successful projects that is sufficient to maintain incentives, taking failing projects into account.”).

⁶⁷ See Letter from David Heiner, Vice President and Deputy Gen. Counsel, Microsoft Corp., & Amy Marasco, Gen. Manager, Standards Strategy and Policy, Microsoft Corp., to Fed. Trade Comm’n,

that are often ignored by those who would like to unreasonably constrain the ability of SEP holders to monetize their patents is that SSO membership is *purely voluntary*, and that participation cannot be taken for granted. As pointed out by Anne Layne-Farrar et al., the often-made presumption that all innovations required for the standard (or for a particular component of the standard) have already been developed and that all innovators have already chosen to participate in the SSO is not generally met in practice.⁶⁸ Thus, as noted above,⁶⁹ unless FRAND is interpreted in a manner that properly balances the interests of SEP holders and standard users, there is a risk that innovators may decide to stay out of some SSOs, withhold FRAND commitments, and/or employ their capital and other resources in endeavors other than R&D toward technologies useful in standards.

In other words, although the terms fair and reasonable can be subject to differing interpretations, Article 6.1 of the ETSI IPR Policy and the rationale behind it exclude any interpretation that constrains SEP holders unreasonably and disincentivizes them from further investing in developing valuable technologies. This tacit recognition of the *dynamic* aspect of the standardization process cannot be lost to short-term *static* considerations of reduced licensing costs for a single patent or group of patents.

B. *Looking at the Broader Contractual Context: The Policy Debates that Took Place Between ETSI Members Before and After ETSI's IPR Policy Was Adopted*

The negotiation history of the ETSI IPR Policy and subsequent debates between ETSI members over that policy are well documented. They shed light on what ETSI members understand they are agreeing to when they make an ETSI-derived FRAND commitment.

Office of the Sec'y 5 (June 14, 2011), *available at* http://www.ftc.gov/sites/default/files/documents/public_comments/request-comments-and-announcement-workshop-standard-setting-issues-project-no.p111204-00009%C2%A000009-60523.pdf (noting that “[m]ost SSOs have an IPR (or patent) policy that seeks to balance the rights and interests of their stakeholders by seeking commitments from participating patent holders that they will offer patent licenses for their essential patent claims on reasonable and non-discriminatory (RAND) terms and conditions” and that “[s]tandards will not fulfill their salutary purposes if standards policies deter innovators from contributing patented technologies or investing in further innovation related to standardized technology”).

⁶⁸ Anne Layne-Farrar et al., *Payments and Participation: The Incentives to Join Cooperative Standard Setting Efforts 5* (July 29, 2011) (unpublished manuscript), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1904959.

⁶⁹ *See supra* text accompanying note 41.

1. The Negotiation History of ETSI's IPR Policy

The negotiation history makes it absolutely clear that one central concern of the ETSI IPR Policy is to ensure a proper balance of interests between licensors and licensees, and to rule out measures that would tip the balance in favor of one category of members.

When it set out to adopt an IPR policy in the early 1990s, ETSI looked to the International Organization of Standardization (“ISO”) IPR policy in general, and in particular with respect to FRAND licensing.⁷⁰ Based on the principle of voluntary participation, the ISO’s Directives require that if a standard is prepared “in terms which include the use of items covered by patent rights,” the patent-holder must promise “to negotiate worldwide licenses under his rights with applicants throughout the world on reasonable and non-discriminatory terms and conditions.”⁷¹ Beyond promising to license its SEPs at reasonable conditions, patent holders do not have to commit to additional restrictions.

However, the commission that had been set up following ETSI’s creation to develop conditions for the inclusion of IPRs within its standards decided to go further and proposed a set of rules, known as “IPR Policy and Undertaking,” that could be referred to as “licensing by default.”⁷² Unless specific actions were taken, an IPR owner was considered to have automatically agreed to license under fair, reasonable and non-discriminatory conditions.⁷³ This document also provided for a variety of measures that were unfavorable to SEP holders, such as, for instance, “a requirement of advance declaration of maximum royalty rates, a rule precluding required cross-licenses, and a mandatory arbitration requirement.”⁷⁴ Fierce controversy broke out over these proposed, heightened restrictions.⁷⁵ Nevertheless, at the March 1993 ETSI General Assembly, and under pressure from the national delegations representing the interests of the state-owned carriers and manufacturers, the IPR Policy and Undertaking was approved despite heated opposition including threats by large patent holders.⁷⁶

Following its adoption, several important IPR owners objected strongly to the “automatic licensing” provision, and the Computer and Business

⁷⁰ See Rudi Bekkers & Isabelle Liotard, *European Standards for Mobile Communications: The Tense Relationship Between Standards and Intellectual Property Rights*, 3 EUR. INTEL. PROP. REV. 110, 119 (1999).

⁷¹ ISO/IEC DIRECTIVES, PART 1: CONSOLIDATED ISO SUPPLEMENT—PROCEDURES SPECIFIC TO ISO § 2.14, at 36-37 (4th ed. 2013), available at http://www.jisc.go.jp/international/pdf/isoiec_directives_part1_iso_supplemet_2013.pdf.

⁷² See Brooks & Geradin, *supra* note 17, at 8-9.

⁷³ *Id.*

⁷⁴ *Id.* at 8.

⁷⁵ See Bekkers & Liotard, *supra* note 70, at 120.

⁷⁶ See, e.g., Brooks & Geradin, *supra* note 17, at 9 n.14 (noting IBM’s opposition to the proposal).

Equipment Manufacturers' Association ("CBEMA") filed a complaint with the European Commission asserting that novel aspects of the policy (including the requirement of advance disclosure of royalty rates) were anticompetitive.⁷⁷ Key participants threatened to withdraw from ETSI if the policy were implemented.⁷⁸ The dissension among the membership was so serious that the ETSI Technical Assembly chairman warned that the organization might not survive.⁷⁹ On July 22, 1994, before awaiting the outcome of the complaint to the Commission, the ETSI General Assembly voted to abandon the IPR Policy and Undertaking.⁸⁰

Finally, at ETSI's November 1994 General Assembly, the ETSI membership approved an IPR Policy from which the restrictions described above were removed, and which established a much better balance between the interests of standard implementers (in terms of ensuring access to the standards) and SEP holders (in terms of being free to decide whether or not to license their SEPs and—if they decided to license these SEPs as is generally the case—to obtain fair and adequate compensation for their investments). The 1994 Policy remains in effect today, with minor changes.

What the legislative history of the ETSI IPR Policy shows is that attempts by standard implementers to devalue SEPs through the FRAND commitment failed. It also shows that IPR rules and principles that were hostile to SEP holders could not reach consensus and, critical to the analysis made in this Paper, that the adoption of such rules and principles created serious participation issues and threatened ETSI's very existence.

⁷⁷ For a discussion, see Allen N. Dixon, *The ETSI Complaint and the European Commission's Communication on Standardization*, in 1 INTERNATIONAL INTELLECTUAL PROPERTY LAW & POLICY 369, 369 (Hugh C. Hansen ed., 1996).

⁷⁸ Eric J. Iversen, *Standardization and Intellectual Property Rights: ETSI's Controversial Search for New IPR-Procedures*, IEEE 4 (1999), http://eprints.utas.edu.au/1297/1/Iversen_ETSI_2002.pdf ("ETSI received between 12-14 letters from parties . . . who threatened to pull out of ETSI if it implemented the 1993 Policy.").

⁷⁹ Brooks & Geradin, *supra* note 17, at 9. The threats of participants such as IBM to withdraw from ETSI, and the chairman's comment quoted above, raise the interesting point that an SSO—even an SSO such as ETSI which has been granted a supposed monopoly position by law or regulation—does not have an unconstrained ability to set restrictive IPR policies. Development of successful next-generation standards in high-technology fields can only be accomplished through the intensive efforts of industry leaders, and unpalatable SSO IPR policies may cause key players to channel those efforts through other SSOs. See also *Commission White Paper on Modernising ICT Standardisation in the EU - The Way Forward*, at 2-3, COM (2009) 324 final (July 3, 2009) (noting the emergence of global consortia as "world-leading ICT [information and communication technology] standards development bodies," and stating that "the EU risks becoming irrelevant in ICT standard setting").

⁸⁰ Brooks & Geradin, *supra* note 17, at 9.

2. Post-1994 ETSI Debates on the FRAND Undertaking

Post-adoption ETSI commentary and actions establish that the ETSI membership has consistently rejected subsequent efforts to alter the balance of interests between SEP owners and licensees by changing the meaning of FRAND.

For instance, in 2006, an effort to tighten the flexible nature of “fair and reasonable” was made within ETSI, with Nokia and two other manufacturers advocating that ETSI introduce principles of “aggregated reasonable terms” and “proportionality” into the definition of FRAND.⁸¹ Pursuant to that proposal, aggregated reasonable terms (“ART”) meant that in the aggregate the terms of all SEPs considered together, without regard to their individual owners, were to be “objectively commercially reasonable” taking into account: (1) the generally “prevailing business conditions relevant for the standard and applicable product”; (2) patents owned by others for the specific technology; and (3) the estimated value of the specific technology in relation to the necessary technologies of the product. In turn, proportionality meant that the compensation under FRAND had to reflect the patent owner’s proportion of all essential patents.

The proposal was “intensely controversial within ETSI, and was not adopted by the General Assembly.”⁸² In addition to the fact that this proposal would have created perverse incentives,⁸³ it would also have breached the balance of interests at the core of the FRAND concept. It was, indeed, a thinly veiled attempt by major device manufacturers to cap cumulative rates at a level that would necessarily be low, and shift to themselves, and away from innovators, the value of the innovations.⁸⁴ Similar efforts to adopt

⁸¹ *Id.* at 10. For a discussion of this proposal and the negative impact it would have had, see Geradin, *supra* note 33, at 511.

⁸² Brooks & Geradin, *supra* note 17, at 10.

⁸³ Such as, for instance, incentivizing firms to generate as many essential—or at least claimed-to-be essential—patents as they could. For a criticism of numerical proportionality, see Geradin & Rato, *A Dissonant View*, *supra* note 1, at 159.

⁸⁴ This is clear from earlier declarations made by the proponents of this proposal. For instance, in 2002, mobile device makers—such as NTT DoCoMo, Ericsson, Nokia, Siemens, and several Japanese manufacturers—had reached an understanding on an arrangement to “enable the cumulative royalty rate for W-CDMA to be at a modest single digit level.” Press Release, Nokia, Industry leaders NTT DoCoMo, Ericsson, Nokia and Siemens, and Japanese Manufacturers Reach a Mutual Understanding to Support Modest Royalty Rates for the W-CDMA Technology Worldwide (Nov. 6, 2002), *available at* <http://press.nokia.com/2002/11/06/industry-leaders-ntt-docomo-ericsson-nokia-and-siemens-and-japanese-manufacturers-reach-a-mutual-understanding-to-support-modest-royalty-rates-for-the-w-cdma-technology-worldwide/>. A Nokia press release specified that “[u]nder this proposal no manufacturer should pay more than 5% royalties covering all essential WCDMA patents from all patent holders.” Press Release, Nokia, Nokia Advocates Industry-Wide Commitment to 5% Cumulative IPR Royalty for WCDMA (May 8, 2002), *available at* <http://press.nokia.com/2002/05/08/nokia-advocates-industry-wide-commitment-to-5-cumulative-ipr-royalty-for-wcdma/>.

numerical proportionality as a means to allocate royalties were subsequently rejected by the wireless communications community.⁸⁵

Thus, any court or arbitration tribunal looking at the ETSI record to understand what FRAND means will find no support in the proposition that FRAND rates should be calculated on the basis of some magic, mathematical formula such as ART and proportionality or the ex ante incremental value rule discussed below. Such formulae upset the balance between the interests of standard implementers and IPR holders. This does not mean that a FRAND commitment is unenforceable and that limits can never be placed on the demands of SEP holders (as they should be if the demands are not fair and reasonable), but rather reflects the fact that methods designed to hurt SEP holders (or, conversely, standard implementers) are not in line with the intent of ETSI members as captured in ETSI's IPR Policy.

III. METHODOLOGIES TO SET FRAND LICENSING TERMS

The preceding Part argued that because FRAND commitments are contracts they should be interpreted in accordance with contractual means of interpretation and, in particular, the intent of the parties. It was also established that while the terms “fair and reasonable” may be open to different interpretations, the language of the ETSI IPR Policy makes it clear that the rationale behind the FRAND commitment—and the “fair and reasonable” terms that are part of it—is twofold, ensuring availability of standards and that SEP holders are able to reap *adequate and fair rewards* from their innovations. This two-fold rationale behind the FRAND commitment was confirmed by the negotiation history of the ETSI IPR Policy, as well as subsequent discussions over the definition of FRAND within ETSI.

While Part II has shown the importance of respecting the intent of the parties to a FRAND agreement, it does not provide a methodology to courts or arbitration tribunals asked to determine appropriate FRAND licensing terms during a given dispute. This Part will thus consider the default rules that have been suggested for interpreting the meaning of fair and reasonable in the context of FRAND litigation.

Section A first looks at the “holdup” and “royalty stacking” theories, explaining why they are not sufficient to justify a redefinition of the notion

⁸⁵ These efforts, made within the Next Generation Mobile Networks Alliance (“NGMN”), a private body launched by a number of mobile operators, sought to incorporate into NGMN's IPR regime essentially the same proportionality and “aggregate reasonable terms” proposed to ETSI. Although a preliminary IPR policy incorporating numerical proportionality was drafted and released by NGMN, the response within the mobile telecommunications community was clear—virtually all companies refused to accept it. Eventually, NGMN adopted an alternative IPR policy focused on transparency of licensing terms rather than the imposition of licensing terms based on numerical proportionality. See *Vision & Mission*, NEXT GENERATION MOBILE NETWORKS, <http://www.ngmn.org/aboutus/faq.html> (last visited Feb. 3, 2014).

of FRAND, since a variety of factors make the occurrence of such “problems” unlikely. With that backdrop in place, and turning to the setting of FRAND terms by the courts, Section B then introduces the ex ante incremental value method that has been proposed by several influential economists, and shows that this method not only is flawed but also directly contradicts the intent of the parties as described in Part II, thereby making it unfit for determining FRAND licensing terms. Section C then discusses the multi-factor approach contained in the *Georgia-Pacific* framework, which provides a sounder starting point for the analysis of appropriate FRAND-based licensing terms. The *Georgia-Pacific* framework is sufficiently flexible to allow judges to establish a balance between the dual objectives of IPR policies, including those found within ETSI’s IPR framework, and thereby remain in line with the intent of the parties to the FRAND contract.

Although each methodology operates very differently, both typically try to determine FRAND licensing terms by analogy to the outcome that would have emerged from a “hypothetical negotiation” between the SEP holder and the standards implementer.⁸⁶ This raises the question of *when* this hypothetical negotiation would/should be imagined as having taken place. While in the ex ante incremental value method the hypothetical negotiation is assumed to take place immediately before the standard is adopted, in the *Georgia-Pacific* framework it is supposed to take place at the beginning of the infringement. As will be seen below, one glaring problem with the ex ante incremental value method is that it is not a true ex ante rule. While it applies before the standard is adopted and before standards implementers make sunk investments, it also applies *after* SEP holders have incurred sunk R&D investments.⁸⁷ As a result, the ex ante incremental value method does not eliminate the risk of holdup, but simply transfers such risks from standards implementers to SEP holders.

Before turning to the analysis of these methodologies, an important question to address is whether a court or arbitration tribunal asked to enforce the FRAND contract should set a precise FRAND rate and/or a range within which a particular rate should be considered to be FRAND. When an SEP holder makes a binding offer, the latter approach should prevail. In agreeing to license on FRAND terms, the intellectual property (“IP”) owner has not agreed to constrain its licensing terms more tightly than the “range of reasonableness” contemplated by the FRAND commitment.⁸⁸ The terms

⁸⁶ This approach is in line with the default rule generally recommended by law-and-economics scholars in cases of contract incompleteness whereby default rules should reflect those rights and duties to which the parties would have agreed ex ante. See Coleman et al., *supra* note 52, at 641 (“[W]hen transaction costs make an explicit agreement too costly ex ante, the court should apply a *default* rule that ‘mimics’ the outcome of a hypothetical contract between them. The hypothetical contract is the one the parties would have made had transaction costs not made their doing so irrational.” (footnote omitted)).

⁸⁷ For an excellent discussion of this aspect of applying the ex ante incremental value method, see Epstein et al., *supra* note 32, at 8-10.

⁸⁸ See Brooks & Geradin, *supra* note 17, at 11 (internal quotation marks omitted).

“fair and reasonable” on their face imply some latitude; they are broad terms for which conceptually there is no one right interpretation. Thus, if an offer has been made and refused, then the only contractual question to be adjudicated is whether the terms offered, taking into account all of the specific circumstances between the parties and prevailing market conditions, fall outside the *range of reasonableness* contemplated by the FRAND commitment. By contrast, when the SEP holder has not made an offer, it may be necessary for the court or the arbitration tribunal to set a specific rate. In addition to according due consideration to the “fair and reasonable” language of the FRAND commitment, from a policy standpoint this approach has the advantage of inducing SEP holders to make a FRAND offer, and standards implementers to accept offers they consider to be FRAND.

A. *The Holdup and Royalty Stacking Theories*

This Section briefly describes the “holdup” and “royalty stacking” theories, presenting them as they have been described in several scholarly papers and policy documents. As will be seen, although holdup and royalty stacking could occur in theory, there is little evidence that they regularly occur in the real world. In the absence of such evidence, they do not serve as a sufficient justification for altering FRAND terms.

1. The Patent “Holdup” Theory

Over the past decade, some economists have expressed concerns that SEP holders could leverage the market power they might acquire by incorporating their proprietary technologies into a standard (and hence, making their patents “essential”) to create a “holdup,” whereby standards implementers could be charged licensing fees in excess of FRAND rates.⁸⁹

The holdup theory is of course neither new nor specific to the licensing of SEPs,⁹⁰ and it is premised on two conditions: (1) at least one of the parties has to make investments in *specific* assets (which, because they cannot be easily redeployed, may create a lock-in effect); and (2) at least one of the parties in the contract is *opportunistic*.⁹¹ Some economists claim that pricing methodologies, such as the ex ante incremental value, are designed to deprive SEP holders of the quasi-rents generated by the above described

⁸⁹ See, e.g., Chappatte, *supra* note 1, at 335; Farrell et al., *supra* note 1, at 636-37.

⁹⁰ See Benjamin Klein, Robert G. Crawford & Armen A. Alchian, *Vertical Integration, Appropriate Rents, and the Competitive Contracting Process*, 21 J.L. & ECON. 297, 297 (1978). *But see* Ramon Casadesus-Masanell & Daniel F. Spulber, *The Fable of Fisher Body*, 43 J.L. & ECON. 67 (2000).

⁹¹ Oliver Williamson, the Nobel Prize winner in economics, defined the concept of opportunism as “self-interest seeking with guile.” See OLIVER E. WILLIAMSON, *THE ECONOMIC INSTITUTIONS OF CAPITALISM* 47 (1985).

lock-in—i.e., the alleged exploitation of the standard implementers' switching costs. However, as will be seen below, these methods go much further, depriving SEP holders of fair and adequate compensation, and therefore cannot possibly be reconciled with the language and purposes of FRAND policies and commitments.

It is important to make two observations. First, while holdup is conceivable,⁹² it is hardly inevitable. Not every licensing dispute between SEP holders and standard implementers implies a holdup. Parties to a negotiation may legitimately disagree over the terms and conditions of the contemplated agreement, and when the stakes are high litigation may be necessary to reach agreement. Just as patentees may seek the highest prices they are able to obtain, standards implementers may seek to reduce or eliminate fees to decrease their costs and increase profit margins. The fact that an SEP holder and a standards implementer disagree over FRAND thus cannot be equated to a holdup, especially since courts can step in if the parties are unable to resolve their disagreement.

In fact, holdups are unlikely to occur regularly in the area of patent licensing for several reasons.⁹³ First, as recognized in the economics-of-contract literature, one of the factors that constrain opportunism is the parties' desire to protect their reputation.⁹⁴ This factor is particularly important when the parties are involved in a "repeated game,"⁹⁵ as is the case in the field of standardization where new standards involving the same actors are adopted on a regular basis. This is, for instance, clearly the case in the mobile communications industry, which has gone through several generations

⁹² It has been further theorized that some SEP holders that do not practice the standard in question ("NPEs") may not be subject to the same constraints as practicing entities (because they are immune to counterclaims) and may thus engage more easily in opportunistic behavior, especially if they do not intend to participate in future standardization efforts.

⁹³ In the *Microsoft Corp. v. Motorola* case, the economic experts sponsored by Microsoft (who were advancing a holdup theory) were unable to identify any instance in which holdup had distorted the terms of a license agreement. *See, e.g.*, Transcript of Trial Day 1, at 180, *Microsoft Corp. v. Motorola Inc.*, No. 2:10-cv-01823-JLR (W.D. Wash. Nov. 13, 2012) (testimony of University of Chicago Booth School of Business Professor Kevin Murphy acknowledging that the existence of holdup "is an open question"); Transcript of Trial Day 4, at 67, *Microsoft Corp. v. Motorola Inc.*, No. 2:10-cv-01823-JLR (W.D. Wash. Nov. 16, 2012) (testimony of Boston University School of Management Assistant Professor Timothy Simcoe acknowledging that he has "no evidence that the dispute between Motorola and Microsoft in this case is in fact based on hold-up" and that he "can't nail down any particular license from any company as an example of hold-up"); *id.* at 135-36 (testimony of Matthew Lynde, Vice President of Cornerstone Research, acknowledging that he has "no basis from economic evidence to conclude whether or not patent hold-up is a real problem").

⁹⁴ Timothy J. Muris, *Opportunistic Behavior and the Law of Contracts*, 65 MINN. L. REV. 521, 527 (1981) ("[I]f good reputation has importance to the potential opportunist, the risk of a bad reputation may deter some acts of opportunism.").

⁹⁵ In game theory, a repeated game is an extensive form game that consists of some number of repetitions of some base game. *See generally* DREW FUDENBERG & JEAN TIROLE, *GAME THEORY* 145-206 (4th prtg. 1995).

of standards. In addition, the fact that most companies are active both on the licensor side (as they have a portfolio of SEPs) and on the licensee side (as they need to obtain licenses covering the products they manufacture and/or sell) considerably reduces the risk of opportunism. As a repeat player, any SEP holder that would aggressively license its patent portfolio risks retaliation in the form of a denial of reasonable terms from other licensors.⁹⁶

Second, when considering the possibility of holdup, one should not ignore the risk of reverse holdup where SEP holders are not over-compensated, but rather under-compensated, by the standards implementers.⁹⁷ The same factors that give rise to concerns about holdup can also motivate standards implementers to act opportunistically vis-à-vis SEP holders. Just as standards implementers make *specific* investments in production and manufacturing, SEP holders also make *specific* investments developing the technologies that enable the creation of a standard. These SEP holder investments are particularly risky considering the uncertainty inherent in R&D. Thus, standards implementers can exploit their own holdup power to behave opportunistically by exploiting the lock-in effects created by SEP holders' R&D investments. This is why the various proposals that have been made to weaken the bargaining power of SEP holders—by, for instance, allowing standards implementers to engage in monopsony pricing—are generally undesirable. Such proposals may, contrary to their purported intent, trigger or facilitate opportunistic behavior.⁹⁸ In other words, the premises undergirding the economic methodologies that are proposed to constrain the ability of SEP holders to monetize their patented technologies are often misguided.

2. The Royalty Stacking Theory

The mobile devices industry is often used as an example of the fact that the royalties charged by SEP holders could cumulate to unsustainable levels. For instance, Professors Mark Lemley and Carl Shapiro cite esti-

⁹⁶ This is why vertically integrated companies involved in SEP licensing disputes always end up signing a licensing agreement, sometimes after litigation. See, e.g., Matt Richtel, *In Settlement, Nokia Will Pay Royalties to Qualcomm*, NY TIMES (July 24, 2008), <http://www.nytimes.com/2008/07/24/technology/24qualcomm.html>. This line of reasoning does not apply to pure upstream firms, as they are not interested in cross licensing and do not fear retaliation of the type described above.

⁹⁷ See Geradin, *supra* note 36, at 3.

⁹⁸ This point has been made by Rich Gilbert in a recent paper:

Joint negotiation raises concerns that members of an SSO may engage in a different type of hold-up. In particular, joint negotiation may create opportunities for potential licensees to exercise buyer market power, and suppress royalty terms ex ante, but after rights holders have made irreversible research and development investments necessary to create and patent technologies that are essential to a standard.

Gilbert, *supra* note 46, at 856 (footnote omitted).

mates whereby the total cost of these stacked royalties could be as high as 30 percent.⁹⁹ This has led some to conclude that royalty stacking would harm consumers and deter innovation. As in the case of holdup, however, the royalty stacking theory suffers from major flaws.

First, the royalty stacking theory is based on the assumption that all SEPs included in any given standard should not be awarded more than a certain percentage of the price of products that comply with the standard, and that percentages above that level would be considered “unreasonable.”¹⁰⁰ But this assumption does not get us any closer to knowing how high the total royalty burden could become. It is obvious that the IPR contribution to a product can vary from nil (e.g., raw materials) to 100 percent (e.g., software). To make the case that any particular royalty level is “reasonable” for a particular product would require, at the very least, an extensive, properly defined and calculated empirical analysis of the relative costs of the different inputs comprising such a product, including the R&D costs incurred to create the incorporated IPR, manufacturing costs, marketing costs, etc. Given the growing number of technologies included in mobile communication devices—as a result of which their performance consistently increases—it should come as no surprise that the percentage of IPR costs relative to other costs are of some significance. It is only once such an analysis is conducted that costs and “reasonable” returns can then be apportioned among all firms in the production chain. Only then could one be in a position to argue that a particular total royalty burden is not warranted by the IPR contributed to a particular product and is therefore “unreasonable.”

Second, even assuming that the above assessment could be made, the question remains whether—in light of the licensing practices of SEP holders in high-technology industries—the royalty stacking theory is likely to be a frequent occurrence. The answer is undoubtedly “no” where there is cross licensing between the parties to a licensing agreement. Cross licensing is a common licensing practice in high-technology industries and drastically reduces the risk of royalty stacking. Anecdotal evidence seems to confirm the importance of cross licensing as a means of dampening the effects of royalty stacking. For instance, Ericsson, which has on many occasions

⁹⁹ See Lemley & Shapiro, *supra* note 1, at 2026-27 (“It is not clear what the total cost of these stacked royalties is. We have seen estimates as high as 30% of the total price of each phone, but those were based on summing royalty demands before any cross-licensing negotiations began. Bekkers suggests that the cost of patent licenses for cell phone Internet functionality after cross-licensing offsets is in the range of 20% of the price of the entire phone. And of course Internet functionality is only one feature contributing to the cost and value of the phone. Nokia sought unsuccessfully to cap royalties for Internet functionality at 5% of the price of the phone. Thelander suggests that actual royalties may run 22.5% for the WCDMA technology, in addition to the 15–20% for GSM technology if the phone is dual band. Critically, he also notes that these are just the royalties for companies who have identified their essential patents and excludes expected payments to important patent holders such as AT&T.” (footnotes omitted)).

¹⁰⁰ See Geradin & Rato, *Reply, supra* note 1, at 138.

complained about royalty stacking in the mobile telecommunications industry, has nevertheless publicly stated that “[o]n only a few occasions the IPR rate for WCDMA and HSPA is higher than 4-5%.”¹⁰¹ Similarly, Nokia has stated publicly that the total (cumulative) royalty rate it pays for products implementing the UMTS/WCDMA standard is not higher than 3%.¹⁰²

In fact, the only firms that may pay significant royalties are those that have no valuable SEPs—or other elements¹⁰³—to trade and are thus unable to offer value through cross licensing. It is far from clear, however, that the cumulative royalty rates such firms would have to pay, even if it rose to sizable amounts (e.g., 20 percent), would be unreasonable. The patent portfolios held by the vertically integrated or pure upstream firms are generally the result of costly and risky R&D efforts, which need to be adequately rewarded. It should therefore be expected that pure downstream firms would pay higher royalties to be able to implement technology they did not invent in order to participate in a market they did little to help create. Otherwise, such firms would effectively enjoy a cost advantage over those that incurred the expense of developing the relevant technologies. Indeed, if a firm active in a high-tech industry merely implements the innovations of others, adding little aside from its manufacturing skills, a cumulative royalty rate of 20 percent might in fact be *too low*.¹⁰⁴

The fact that pure manufacturers that do not invest in R&D may in certain circumstances have to pay significant royalties to SEP owners is merely a reflection of the Coasean “make-or-buy” decision faced by every firm once it has to consider whether to produce a manufacturing input in-house (through vertical integration) or to acquire it on the open market.¹⁰⁵ Should

¹⁰¹ Interview by Paul Lambert, Senior Analyst, Informa Telecoms & Media, with Håkan Eriksson, Chief Tech. Officer, Ericsson (Feb. 21, 2007).

¹⁰² See Ralf Jurrien, *Nokia WCDMA Handsets*, LETSGOMOBILE (Apr. 19, 2007, 8:19 PM), <http://www.letsgomobile.org/en/1218/wcdma-handsets/> (“Nokia confirmed that until 2007 it has paid less than 3 per cent aggregate license fees on WCDMA handset sales under all its patent license agreements. This number represents Nokia’s aggregate gross royalty payments made under all the numerous patent license agreements applicable to its WCDMA handsets.”).

¹⁰³ Nothing should prevent holders of nonessential patents to put such patents in the balance. Commercially essential patents may be very attractive to an SEP holder and thus may be used by a standards implementer to lower or even eliminate the cost of licensing the SEP in question.

¹⁰⁴ Moreover, allowing firms to freely benefit from the investments of others would have several negative consequences. First, it would encourage inefficient entry. Second, the results of such R&D efforts would be expropriated to the benefit of firms that had not undertaken similar efforts (in this case the pure manufacturers). This would negatively affect incentives to invest in R&D. See Damien Geradin, *What’s Wrong with Royalties in High Technology Industries?*, in *COMPETITION POLICY AND PATENT LAW UNCERTAINTY: REGULATING INNOVATION* 462, 466-68 (Geoffrey A. Manne & Joshua D. Wright eds., 2011).

¹⁰⁵ See generally R. H. Coase, *The Nature of the Firm*, 4 *ECONOMICA* (n.s.) 386 (1937); see also Peter C. Grindley & David J. Teece, *Managing Intellectual Capital: Licensing and Cross-Licensing in Semiconductors and Electronics*, *CAL. MGMT. REV.*, Winter 1997, at 1, 1 (“Firms that are high net users

pure manufacturers decide that their interests are best served by lowering their royalty payments through cross licensing of essential patents, they will have an incentive to engage in R&D to develop their own portfolio of SEPs or to acquire them from a third party.¹⁰⁶

B. *The Ex Ante Incremental Value Method*

Having addressed and rebutted some frequently raised concerns about SEP holders' bargaining power, this Paper will now turn to proposed ways of interpreting "fair and reasonable" in the FRAND context. The ex ante incremental value rule amounts to determining a licensing rate based on that which would have resulted from ex ante competition between the selected technology and alternative technological solutions, and then using that rate as a benchmark in determining whether a particular royalty is fair and reasonable.¹⁰⁷

The ex ante incremental value method can be illustrated by a model developed by Professors Daniel G. Swanson and William J. Baumol.¹⁰⁸ In this model, SSOs organize an auction-like process for the selection of technologies to be embodied in a given standard, whereby the owners of competing technologies (e.g., the upstream SEP holders) offer bids of a license fee per unit of output to downstream standards implementers who are selecting which technology should be embodied in a given standard.¹⁰⁹ To keep the model simple, Swanson and Baumol make the following assumptions: (1) all R&D investments by the SEP holders already have been sunk, and the SEP holders do not anticipate recurring costs as a consequence of licensing their patents; (2) the choice of technology has no effect on the quality of the downstream product but does affect downstream production costs; and (3) standards implementers use the IP to produce perfect substitutes, and SEP holders do not also produce final products.¹¹⁰

of others' patents have a choice. They must increasingly pay royalties, or they must develop their own portfolios so as to bring something to the table in cross-licensing negotiations.").

¹⁰⁶ This is, for instance, what Google has done with the acquisition of Motorola. See Quentin Hardy, *Google Buys Motorola for Patent Parts*, FORBES (Aug. 15, 2011, 8:46 AM), <http://www.forbes.com/sites/quentinhardy/2011/08/15/google-buys-motorola-for-patent-parts/>.

¹⁰⁷ This seems to be the approach favored by the FTC. See FED. TRADE COMM'N, THE EVOLVING IP MARKETPLACE: ALIGNING PATENT NOTICE AND REMEDIES WITH COMPETITION 194 (2011).

¹⁰⁸ A similar idea was developed earlier by Professors Carl Shapiro and Hal R. Varian. See CARL SHAPIRO & HAL R. VARIAN, INFORMATION RULES: A STRATEGIC GUIDE TO THE NETWORK ECONOMY 241 (1999) ("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.").

¹⁰⁹ See Swanson & Baumol, *supra* note 1, at 19.

¹¹⁰ *Id.* at 18-19.

In that simplified scenario, there are two competing technologies, *A* and *B*, owned by firms *A* and *B* respectively, with different cost implications for downstream firms. The best IP option is *A*, which would result in downstream production costs of \$5 per unit of output. Use of *B* would result in downstream production costs of \$6. If the above information is known and *A* and *B* compete to be selected by offering per-unit license fees, *A* will offer a license to its technology for \$1 per unit of output and be chosen. That is because under Bertrand competition,¹¹¹ *A* and *B* will compete each other down to marginal costs, and *A* will only be able to charge a licensee fee equal to the incremental value of its technology as compared to the competing alternative (i.e., *B*). Thus, under this model, when the difference in incremental value between technologies *A* and *B* is large, the licensee fee will be high, whereas when *A* and *B* are close or perfect substitutes, the licensee fee will tend to zero.

While this model offers a superficially simple way to determine what a reasonable license fee should be, the application of this model to the standardization context is limited given that: (1) the simplifying assumptions on which it is based are hardly ever present in practice;¹¹² and (2) its application of the incremental value method suffers from significant practical difficulties. For instance, it may not necessarily be easy to identify the “next best alternative” ex ante standard adoption, especially if the ex ante incremental value method is used to determine FRAND licensing terms many years after the adoption of a given standard. Moreover, a standard typically contains hundreds of specifications, each of which requires technology selection. This is why in the real world SEPs are typically licensed on a portfolio basis. The determination of a FRAND royalty for an SEP holder’s portfolio through the ex ante incremental value method would entail the collection of a vast amount of information, as well as require complex calculations. Judge Robart thus rejected such an “incremental value” approach on the ground that an accurate analysis is too complicated for courts to perform:

In practice, approaches linking the value of a patent to its incremental contribution to a standard are hard to implement. Calculating incremental value for multi-patent standards “gets very complicated, because when you take one patent out of a standard and put another one in you may make other changes, the performance of the standard is multidimensional, different people value different aspects.”¹¹³

¹¹¹ Bertrand competition is a model of price competition between duopoly firms wherein each firm charges the price that would be charged under perfect competition, also known as marginal cost pricing.

¹¹² As Sawnson and Baumol themselves recognize.

¹¹³ See *Microsoft Corp. v. Motorola*, No. C10-1823JLR, 2013 WL 2111217, at *13 (W.D. Wash. Apr. 25, 2013) (citation omitted), available at <http://www.essentialpatentblog.com/wp-content/uploads/sites/234/2013/04/2013.04.25-D.E.-681-Findings-of-Fact-and-Conclusions-of-Law-setting-RAND-royalty1.pdf>.

However, there are more fundamental reasons why the *ex ante* incremental value methodology should not be relied on to determine licensing terms in the context of FRAND litigation.

First, the *ex ante* incremental value method breaches the interpretation of FRAND reflected in the intention of the parties and the objectives of the ETSI IPR Policy as described above.¹¹⁴ While the pricing of SEPs at incremental value may facilitate the dissemination of the standard in the short term, the licensing fee resulting from the incremental value of the SEP holder's technology would in most instances not be enough to properly compensate for the investment costs and risks the company incurred in developing its superior technology. Nor would the licensing fee be sufficient to incentivize the company to invest in new technologies.

In any event, nothing in ETSI's IPR Policy suggests that the "availability" of standards should be made at the expense of the "fair and adequate compensation" of the SEP holders. Such an approach would not only breach the intent of the parties but would also be self-defeating, as it would create significant issues with participation in SSOs and dry up the investment in R&D for technologies that are necessary for the continued development of standards. In a recent paper, Layne-Farrar et al. find that:

the imposition of an incremental licensing rule reduces the R&D investment that a patent holder makes in relevant technologies and lowers the probability that it will join the SSO. . . . The reason is that patent holders would benefit from not committing *ex-ante* to the standard, anticipating that if their technology ever turned out to be better than the one accepted by the SSO there would be some room for a profitable *ex-post* negotiation. To ensure the patent holder's participation, then, we find that SSO members are able to and will be interested in increasing the licensing fees paid to the patent holder above the level dictated by the incremental value rule.¹¹⁵

Both Judges Robart and Holderman share this observation. As pointed out by Judge Robart, "[t]o induce the creation of valuable standards, the RAND commitment must guarantee that holders of valuable intellectual property will receive reasonable royalties on that property."¹¹⁶ Similarly, Judge Holderman notes that "a RAND rate must be set high enough to ensure that innovators in the future have an appropriate incentive to invest in future developments and to contribute their inventions to the standard-setting process."¹¹⁷

The incremental value method also amounts to replacing an alleged inefficient outcome (the *monopoly* pricing of SEPs) with another inefficient outcome (the *monopsony* pricing of SEPs). As pointed out by Professor J.

¹¹⁴ See *supra* text accompanying notes 53-67.

¹¹⁵ Layne-Farrar et al., *supra* note 68, at 6.

¹¹⁶ *Microsoft Corp.*, No. C10-1823JLR, 2013 WL 2111217, at *12.

¹¹⁷ *In re Innovatio IP Ventures, LLC Patent Litig.*, No. 11 C 9308, 2013 WL 5593609, at *11 (N.D. Ill. Oct. 3, 2013).

Gregory Sidak, the only reason why the incremental value model limits the SEP holder's compensation to the incremental value of its technology compared to the next best alternative ($\$6 - \$5 = \$1$) is because the costs of developing the patent-protected technology are sunk and there are no other potential buyers for that technology outside of the SSO. In other words, the SEP holder has no choice but to accept the incremental value of its technology even if that value does not cover its sunk R&D costs.¹¹⁸

This unsatisfactory outcome arises because, contrary to the way it is labeled, the *ex ante* incremental value rule is not a true *ex ante* method. It is *ex ante* with regard to the adoption of the standard in question and the sunk investments made by standards implementers, but *ex post* with regard to the investments made by the SEP holders. This imbalance effectively creates the conditions for a reverse holdup. The *ex ante* incremental rule is thus not so much an instrument to prevent the theoretical risks of holdup but a tool to lower royalty rates to the benefit of standards implementers.

In sum, and as confirmed by both Judges Robart and Holderman, the *ex ante* incremental value rule is unfit as a method to determine licensing terms in the context of FRAND litigation. This does not mean that the presence of alternatives to the technology selected in the standard in question cannot be an element taken into account for a tribunal in its determination. But license fees should not be determined through a methodology that would produce results not seen in the real world, and that would have a potentially devastating impact on innovation incentives and standards.

C. *The Multifactor Test Contained in Georgia-Pacific*

In the seminal case of *Georgia-Pacific Corp. v. United States Plywood Corp.*,¹¹⁹ the U.S. District Court for the Southern District of New York came up with what has now become the most common way to compute reasonable royalty damages. The district court reasoned that a "hypothetical negotiation" between a "willing licensor" (the patent owner) and a "willing licensee" (the infringer) at the time the infringement began may be used to determine reasonable royalty damages.¹²⁰ The court then listed fifteen fac-

¹¹⁸ This leads Sidak to observe that this "interpretation of FRAND demands that the SSO must play the role of a buyer's cartel in the innovation market." J. Gregory Sidak, *The Meaning of FRAND, Part I: Royalties*, 9 J. COMPETITION L. & ECON 931, 985 (2013).

¹¹⁹ 318 F. Supp. 1116 (S.D.N.Y. 1970).

¹²⁰ Interestingly, in one discussion paper created by the ETSI General Assembly Ad Hoc Group in 2003, the reporters (themselves representatives of RIM) wrote that "If one were to read the important '*Georgia-Pacific*' case cited in United States law as a method to determine a 'reasonable royalty', it can readily be seen to be a test that closely parallels the concept of 'fair, reasonable, and non-discriminatory' license obligations." TOM SANCHEZ & WILLY VERBESTEL, EUR. TELECOMMS. STANDARDS INST., FRAND – FAIR, REASONABLE, AND NON-DISCRIMINATORY I (2003).

tors offering a variety of benchmarks to determine such damages.¹²¹ Applied to the FRAND context, a hypothetical negotiation under *Georgia-Pacific* would thus take place at a time when *both* SEP holders and standards implementers have made sunk investments, thereby creating a more symmetrical negotiation platform than the ex ante incremental value rule.

A key strength of the *Georgia-Pacific* framework is that it is sufficiently flexible to establish a balance between the dual objectives of SSOs' IPR policies, such as those expressed in Section 6.1 of the ETSI IPR Policy, which ensure both the standard dissemination and adequate remuneration of the SEP holder. In other words, unlike abstract mathematical methods that, as seen above, are easily tipped in favor of the prospective licensee (or the prospective licensor), the multifactor test at the core of the *Georgia-Pacific* framework reduces the risk of bias when properly carried out. While some factors may play into the hand of the licensor, others may be helpful to the position of the licensee, and in the end they may balance out.

Another strength of the *Georgia-Pacific* framework is that it allows the judge to take into account a wide range of information, just as the prospective licensor and the prospective licensee do during licensing negotiations.¹²² In contrast with what many economists seem to assume or believe, parties to a licensing negotiation do not use any magic formula that delivers a precise royalty rate for a given agreement. In other words, licensing negotiations are not about feeding numbers into equations that will deliver a FRAND rate. On the contrary, both parties examine a variety of factors that allow them to identify, typically through iterative negotiation and analysis, a mutually acceptable licensing agreement. Thus, if the role of the judge is to determine what the parties actually would have done if they had fully specified the contractual terms ex ante (the "hypothetical negotiation"), the *Georgia-Pacific* framework is much closer to reality than any abstract mathematical formula.

While not all of the *Georgia-Pacific* factors will be relevant to every question regarding the fairness and reasonableness of proffered license terms, a court may well find that the *Georgia-Pacific* list provides a useful framework or starting point for the inquiry.¹²³ Notably, royalties received under prior and existing licenses for the very patents being litigated often represent the most influential factor in determining "reasonableness" under

¹²¹ See *Georgia-Pacific*, 318 F. Supp. at 1120.

¹²² *Gen. Tire & Rubber Co. v. Firestone Tyre & Rubber Co. Ltd.* [1975] F.S.R. 273 (H.L.) 280 ("[E]vidence may consist of the practice, as regards royalty, in the relevant trade or in analogous trades; perhaps of expert opinion expressed in publications or in the witness box; possibly of the profitability of the invention; and any other factor on which the judge can decide the measure of loss."); Patentgesetz [Patent Law], May 5, 1936, BGBl § 139, para. 2, as amended (Ger.) (providing that the royalty rate of a hypothetical license agreement must be determined in the light of all relevant circumstances).

¹²³ At least one U.S. court has adopted the *Georgia-Pacific* factors to assess the reasonableness of a licensing offer challenged on FRAND grounds. See *ESS Tech., Inc. v. PC-Tel, Inc.*, Nos. C-99-20292 RMW, C-01-1300 VRW & C-01-1981 VRW, 2001 WL 1891713, **3-6 (N.D. Cal. Nov. 28, 2001).

the *Georgia-Pacific* framework, and could arguably have the same role in the context of FRAND litigation.¹²⁴ The nature and scope of the license is also a key factor, as they may justify different royalty rates to companies that superficially appear to be similarly situated.¹²⁵ In all instances, the application of the *Georgia-Pacific* framework in the context of FRAND litigation raises at least three concerns that must be addressed: adjustments to the *Georgia-Pacific* framework for the FRAND context; potential pitfalls of *Georgia-Pacific*'s "benchmarking" approach; and whether patent pools provide an effective benchmark reference relative to FRAND licensing terms.

1. Should the *Georgia-Pacific* Framework Be Adjusted in the FRAND Context?

The first issue of importance is whether the *Georgia-Pacific* framework must be adjusted to account of the purpose of the FRAND commitment. It is not clear why such an adjustment would be necessary considering that one of the advantages of the *Georgia-Pacific* framework is that it allows significant flexibility. The court can ignore some factors if they do not appear to be relevant in the FRAND context. Conversely, if some factors not included in the list are particularly relevant to the FRAND context, the court can add them to the analysis. As to whether individual factors themselves need to be adjusted, this should likewise be left to the discretion of the court. There is no reason to believe that factors should be adjusted automatically in a particular direction because opportunistic behavior can take place on both the licensor and licensee side. Thus, whether adjustment is needed at all should depend on the circumstances of a given situation.¹²⁶

A related issue is whether the *Georgia-Pacific* framework should be modified to take into account the risks of holdup and royalty stacking. As to the holdup problem, there is no evidence that such conduct is prevalent, and when the royalty demands of an SEP holder are claimed to be excessive, judges can use the benchmarks that form part of the *Georgia-Pacific*

¹²⁴ This corresponds to factor 1: "The royalties received by the patentee for the licensing of the patent in suit, proving or tending to prove an established royalty." *Georgia-Pacific*, 318 F. Supp. at 1120.

¹²⁵ This corresponds to factor 3: "The nature and scope of the license, as exclusive or non-exclusive; or as restricted or non-restricted in terms of territory or with respect to whom the manufactured product may be sold." *Id.*

¹²⁶ This does not mean that the *Georgia-Pacific* framework should not be subject to any adjustment. For example, this framework is based on the assumption that, at the time of the hypothetical negotiation (i.e., when the actual infringement begins) both parties agree that the patent is valid and infringed. Because this assumption is unrealistic in that patents are probabilistic, judges and arbitrators may wish to adjust the FRAND rate to take this aspect into account. See Mark A. Lemley & Carl Shapiro, *Probabilistic Patents*, J. ECON. PERSP., Spring 2005, at 75, 75-76.

framework to verify whether the claim is meritorious. In addition, if the risk of holdup were to be taken into account, the same should be true for the risk of reverse holdup, since, as seen above, both SEP holders and standards implementers can behave opportunistically.

As to royalty stacking, and to the extent it creates a risk of excessive royalties, it is not unique to standardized fields. There are many products and services that involve large numbers of patents held by several companies—so-called “patent thickets.” In addition, as discussed in Part III.A above, in the vast majority of cases the cumulative royalty burden is moderated through cross licensing between parties negotiating licenses. In other words, while potential licensor X may typically ask a royalty of 2.5 percent for its SEP portfolio, that rate may significantly decrease if potential licensee Y also has a valuable SEP portfolio. In that case the fee that X would typically seek would be partially or totally offset.¹²⁷ In industries such as the mobile devices sector, where the vast majority of SEP holders are vertically integrated,¹²⁸ the risk of royalty stacking is more theoretical than real.¹²⁹ As to the standards implementers that do not have SEPs or other valuable elements to put into the balance, it is logical that they pay higher rates. Because they are unable to pay in “kind” (i.e., through cross licensing), they have to pay in cash.¹³⁰ Any other outcome would be unfair.

2. Potential Pitfalls of the *Georgia-Pacific* Benchmarking Approach

A second concern in applying *Georgia-Pacific* to FRAND contexts is that while reliance on the benchmarks contained in the *Georgia-Pacific* list makes a lot of sense (and is certainly much better than abstract formulae), it is important not to lose sight of the potential pitfalls of benchmarking license agreements. As noted above, licensing agreements are highly relationship specific, and thus agreements will always be hard to compare. This

¹²⁷ For example, Grindley and 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*, CAL. MGMT. REV., Winter 1997, at 8, 9.

¹²⁸ Leading innovators in the field of wireless technologies, such as Blackberry, Ericsson, Huawei, Qualcomm, Motorola, Nokia, and Samsung, are all vertically integrated.

¹²⁹ See Damien Geradin et al., *The Complements Problem Within Standard Setting: Assessing the Evidence on Royalty Stacking*, 14 B.U. J. SCI. & TECH. L. 144, 149 (2008) (“We find little evidence of systematic problems of royalty stacking within standard setting that are not already adequately dealt with through existing mechanisms, including cross licensing, patent pools, and repeat play reputation.”).

¹³⁰ See Geradin, *supra* note 104, at 468-69.

is true whether comparisons are made between agreements covering different standards (e.g., 2G versus 3G, or Wi-Fi versus 3G), or between agreements covering a similar standard. Variations in the scope of the license can, for instance, have significant repercussions.¹³¹ This is where econometric analysis can be used to properly control for differences between licensing agreements. This type of analysis may, however, be quite complex, although parties involved in FRAND litigation may find it worth conducting.

A possible benchmark is to compare the rate offered ex post standardization by the SEP holder in question with the rate offered for the same patents ex ante standardization.¹³² If the rate asked by the SEP holder ex post standard adoption is no higher than the rate he obtained ex ante standard adoption, the ex post rate must be FRAND, as, all things being equal, no ex post opportunism can be identified on the part of the SEP holder. The ex ante rate should thus act as a “safe harbor” against any claim of opportunism. However, there seems to be no convincing reason why licensors should be prohibited from charging higher rates ex post than ex ante. First, when parties contract for a license, they may not have a complete view of the commercial applications of the technology at hand, which may only be realized at a later date. Thus, the full commercial potential of a technology can be highly uncertain when the FRAND contract is entered into. While the licensor and licensee can attempt a flexible contract in recognition of this uncertainty, foreseeing all future contingencies is an unattainable goal.¹³³ As a result, ex post contracts may be more efficient in that they incorporate a clearer understanding of the technology and the market in which that technology will be deployed, thereby avoiding multiple renegotiations. Forcing SEP holders to charge similar rates ex ante and ex post would also deprive them of the ability to give preferential terms to early adopters of their technology, although it has been argued that preferential treatment may not survive a non-discrimination analysis.¹³⁴

3. Using Patent Pools as Benchmarks for FRAND Terms

A third issue that may arise under *Georgia-Pacific* and within several standardized sectors is whether patent pools offer a useful benchmark for determining FRAND license terms. Whether this issue can be raised de-

¹³¹ See *supra* text accompanying note 48.

¹³² See Geradin & Rato, *A Dissonant View*, *supra* note 1, at 154.

¹³³ See, e.g., Philippe Aghion, Mathias Dewatripont & Patrick Rey, *Renegotiation Design with Unverifiable Information*, 62 *ECONOMETRICA* 257, 257 (1994); Oliver Hart & John Moore, *Incomplete Contracts and Renegotiation*, 56 *ECONOMETRICA* 755, 755 (1988); Eric Maskin & John Moore, *Implementation and Renegotiation*, 66 *REV. ECON. STUD.* 39, 39-41 (1999).

¹³⁴ See Gilbert, *supra* note 46, at 868-70.

depends first on the existence of a successful patent pool. Because of the difficulties in forming a patent pool, and the different business models of the relevant patent holders, there are many standardized sectors in which no such pools exist. There is, for instance, no sizable patent pool covering the 3G and 4G wireless standards. Thus, in principle using a patent pool as a benchmark will make more sense if that pool represents 90 percent of the patents essential to a standard rather than 10 percent of such patents. However, extreme caution should be taken regarding the use of patent pools as benchmarks for FRAND rate determination purposes because in the vast majority of cases pools will not be the right benchmark.

First, in many areas, patent pools are formed by SEP holders whose revenues are essentially drawn from manufacturing and selling products—and who therefore do not care about obtaining FRAND compensation. They will thus use these pools not to ensure revenues but to avoid transaction costs. Second, and relatedly, the method of remuneration of the SEP holders participating in the pool is often based on numerical proportionality, which—as mentioned in Part II.B.2 above—means that compensation is unrelated to the strength of the patents. The result is that SEP holders have incentives to inflate the number of patents they contribute to the pool.¹³⁵ Thus, a rate higher than the one that would result from patent pool benchmarking may well be FRAND.¹³⁶

In the *Innovatio* judgment, Judge Holderman uses the “Top Down” methodology advocated by Dr. Gregory Leonard, as expert for the manufacturers, as an alternative to benchmarking when no relevant benchmark is available. Judge Holderman describes this method as follows:

Based on that average price, Dr. Leonard . . . calculated the average profit that a chipmaker earns on the sale of each chip, thereby isolating the portion of the income from the sale of the chip available to the chipmaker to pay royalties on intellectual property. Next, Dr. Leonard multiplied the available profit on a chip by a fraction calculated as the number of *Innovatio*'s 802.11 standard-essential patents, divided by the total number of 802.11 standard-essential patents. Dr. Leonard also provided several alternative calculations for this step by varying the denominator of the fraction to account for varying conclusions about the value of *Innovatio*'s patents to the 802.11 standard.¹³⁷

¹³⁵ See *Microsoft Corp. v. Motorola, Inc.*, No. C10–1823JLR, 2013 WL 2111217, at *80 (W.D. Wash. Apr. 25, 2013), available at <http://www.essentialpatentblog.com/wp-content/uploads/sites/234/2013/04/2013.04.25-D.E.-681-Findings-of-Fact-and-Conclusions-of-Law-setting-RAND-royalty1.pdf> (“Another problem with using patent pools as the *de facto* RAND royalty rate is that the patent-counting royalty allocation structure of pools does not consider the importance of a particular SEP to the standard or to the implementer’s products as the court’s hypothetical negotiation requires.”).

¹³⁶ *Id.* (“Based on this extensive testimony, the court agrees as a general matter that patent pools tend to produce lower rates than those that could be achieved through bilateral negotiations. Indeed, the uncontroverted trial evidence is that a rate higher than a pool rate could still be RAND.”).

¹³⁷ *In re Innovatio IP Ventures, LLC Patent Litig.*, No. 11 C 9308, 2013 WL 5593609, at *38 (N.D. Ill. Oct. 3, 2013) (citations omitted).

As implemented in *Innovatio*, this methodology relies on the following formula to determine a FRAND royalty. First, the average sale price of what can be referred to as the “relevant” product (“ASP”) is multiplied by the average profit on the sale of this “relevant” product (“AP”). The result is then multiplied by what can be referred to as a “value” percentage (“VP”), which is then multiplied by the number of patents contained in the SEP holder’s portfolio (“NP”), divided by the total number of SEPs (“TNP”):

$$(\text{ASP} \times \text{AP}) \times (\text{VP} \times (\text{NP}/\text{TNP})) = \text{FRAND royalty}$$

In the context of the case in question, Judge Holderman considered that the average Wi-Fi chip price was \$14.85 and that the average profit margin was 12.1 percent. The “value” percentage, used to take into account the value of the patents of the SEP holders, was based on a 1998 paper finding that the top 10 percent of all electronics patents account for 84 percent of the value in all electronics patents.¹³⁸ Since Judge Holderman considered that *Innovatio*’s patents were all of “moderate to moderate-high importance to the standard, meaning that they provide significant value to the standard,”¹³⁹ he decided to apply the 84 percent value percentage to them. The number of SEPs at stake was 23, while the total number of SEPs to the 802.11 standard was estimated at 3,000.

The result of the calculation was thus as follows:

$$(\$14.85 \times 12.1\%) \times (84\% \times (23/3000)) = 9.56 \text{ cents/Wi-Fi chip.}$$

Although a detailed analysis of this Top Down methodology would go beyond the scope of this Paper, it is important to make the following observations.

First, before applying this methodology, Judge Holderman carefully observed that while some methodologies may be better than others, “no approach for calculating a RAND rate is [perfect] in light of the inherent uncertainty in calculating a reasonable royalty.”¹⁴⁰ Judge Holderman also noted that this uncertainty is heightened in SEP cases “where the court must reconstruct a hypothetical negotiation under a variety of assumptions and inferences about the influence of the RAND obligation on hypothetical parties negotiating at a hypothetical time under hypothetical circumstances.”¹⁴¹

¹³⁸ Mark Schankerman, *How Valuable Is Patent Protection? Estimates by Technology Field*, 29 RAND J. ECON. 77, 94 & n.12 (1998).

¹³⁹ *In re Innovatio*, 2013 WL 5593609, at *43.

¹⁴⁰ *Id.* at *37.

¹⁴¹ *Id.*

These wise words suggest that given the limitations of the methodologies that can be used to determine FRAND rates or ranges, bilateral negotiations between SEP holders and standard implementers are the surest way to reach an optimal FRAND outcome.

Second, in the first part of the equation, Judge Holderman relied on the average sales price of the “relevant” product, which in this case he considered to be the chip rather than the end product. As this Author and Layne-Farrar observed in another paper, whether the component (in this case the chip) or the entire product (e.g., a smartphone) should be selected as the base for calculating a royalty depends on the circumstances of each case.¹⁴² For instance, when a particular patented component at issue enables other components or the product as a whole,¹⁴³ it may be preferable to calculate the average sales price of other components or of the entire product.¹⁴⁴

Third, while Judge Holderman considered that Dr. Leonard’s method of basing the total potential royalty for all 802.11 SEPs on the chipmaker’s profit “insures that the total royalty stack will not exceed an amount that would force chipmakers out of the business,”¹⁴⁵ this approach is not without pitfalls. First, from a practical standpoint, calculating royalties on the basis of profit margins creates serious risks of under-reporting. Moreover, Innovatio’s expert Dr. David Teece cautioned that “in some cases, widespread infringement may have allowed manufacturers to set their prices very low, essentially ignoring the value of the intellectual property included in their products.”¹⁴⁶ While Judge Holderman “agree[d] that the profit margin on an accused product is not always dispositive,”¹⁴⁷ he nevertheless decided to rely on the existing profit margin on chips appearing in the record of the case in finding that there was no evidence of widespread infringement of 802.11 standards-essential patents.

Finally, although Judge Holderman considered that Dr. Leonard’s Top Down methodology “d[id] not apportion to the value of Innovatio’s patented features based *solely* on the numerical proportionality of Innovatio’s patents to all 802.11 standard-essential patents,”¹⁴⁸ given the application of the percentage “value,” the methodology nevertheless relies on a numerical approach dividing the number of patents comprised in the SEP holder’s portfolio by the total number of declared standards-essential patents. This

¹⁴² See Damien Geradin & Anne Layne-Farrar, *Patent Value Apportionment Rules for Complex, Multi-Patent Products*, 27 SANTA CLARA COMPUTER & HIGH TECH L.J. 763, 791-92 (2011).

¹⁴³ For instance, the high data transmission rate that is allowed by 3G mobile telecommunications standards is what enables many of the more advanced applications that can be found in smart phones today, particularly those involving data transmission and Internet access. But again, smart phones include a great deal of other valuable technology in addition to the high-speed radio transmission.

¹⁴⁴ Geradin & Layne-Farrar, *supra* note 142, at 774-76.

¹⁴⁵ *In re Innovatio*, 2013 WL 5593609, at *38.

¹⁴⁶ *Id.*

¹⁴⁷ *Id.* at *39.

¹⁴⁸ *Id.* (emphasis added).

may incentivize SEP holders to inflate their SEP portfolio to obtain higher royalties.

CONCLUSION

The fact that FRAND is a voluntary contract between the SEP holder and other SSO members is key to understanding the notions of fairness and reasonableness that are critical to the concept of FRAND. For instance, the plain language of the ETSI IPR Policy, its legislative history, and the debates that follow its adoption make crystal clear that the FRAND commitment pursues a twofold rationale: ensuring access to the standard while guaranteeing that the SEP holder obtains fair and adequate compensation for its patents. The fairness and reasonableness (or adequateness) of licensing terms for SEPs should be determined in light of this twofold rationale and should also take into consideration the dynamic nature of standardization.

FRAND determination methods that breach this balance of interests standing at the core of the FRAND commitment would not only violate the intent of the parties to the FRAND contract but also threaten the viability of standardization. Such methods would incentivize parties to litigate rather than negotiate and would run the risk of disincentivizing standard contributors, reducing their willingness to make risky investments in standardized sectors or even participate in SSOs. In particular, the *ex ante* incremental value method is unfit as a tool to determine FRAND rates because it fails to take into account the balance of interests inherent to the FRAND licensing context. A much sounder approach for the determination of licensing terms in the context of FRAND litigation is to rely on the *Georgia-Pacific* framework, which because of its multi-factor approach is more in line with the “hypothetical negotiation” that would take place between SEP holders and standards implementers if they had been able to agree on and fully specify the terms of their licensing agreement while standing on equal footing with regard to sunk costs. For the same reason, the *Georgia-Pacific* framework is also less subject to bias than the abstract formulae that are favored by many economists since, as illustrated by the *ex ante* incremental approach, such formulae can be easily tipped in favor of one category of SSO members.