TESTIMONY OF ERICSSON

BEFORE THE U.S. SENATE COMMITTEE ON THE JUDICIARY

SUBCOMMITTEE ON ANTITRUST, COMPETITION POLICY AND CONSUMER RIGHTS

HEARING ON "STANDARD ESSENTIAL PATENT DISPUTES AND ANTITRUST LAW"

DIRKSEN SENATE OFFICE BUILDING, ROOM 226

JULY 30, 2013

Madam Chairman and Members of the Subcommittee:

Ericsson Inc. and its related companies ("Ericsson") appreciate the opportunity to provide written comments to the committee for the record of the hearing entitled "Standard Essential Patent Disputes and Antitrust Law" held on July 30, 2013.

1. Statement of interest & relevant expertise: Ericsson invests heavily in research and development for open standards and is experienced in F/RAND licensing

Established in 1876, Ericsson employs more than 100,000 employees who have pioneered the development of the modern cellular network. Over 1,000 networks in more than 180 countries use Ericsson equipment. In the United States, Ericsson employs more than 10,000 people and supplies standards-compliant network equipment and/or services to every major U.S. telecommunications operator from offices in California, Colorado, Georgia, Illinois, Kansas, New Jersey, New York, Texas, and Washington, among others.

Ericsson has been a major contributor to the development of global standards enabling mobile telecommunications over the last 25 years, such as GSM, WCDMA/HSPA and LTE, and has invested billions of dollars in this effort. Looking to the future, Ericsson sees an even more connected world, in which there will be more than fifty billion connected devices, all of which will require better networks and greater capacity. To meet that need, Ericsson currently devotes more than 20,000 employees and almost 15% of its net sales to research and development, much of which is focused on creating open standards for the information and communications technology industry. Ericsson's contributions to open standards are widely recognized,

including awards in 2010 and 2011 for its contributions to the 4G LTE standards by Informa Telecoms & Media.

Ericsson's strong commitment to research and development has been rewarded with 33,000 issued patents worldwide. Ericsson has successfully licensed its patent portfolio through more than 100 patent license agreements, which frequently cross-license technology from other patent holders needed to manufacture Ericsson's products. Ericsson uses the associated royalties to fund its continued contribution to the development of tomorrow's telecommunications standards.

2. Standards and patents promote competition and innovation

Standard-essential patents ("SEPs") play an important role in the formation of open global standards that encourage competition and innovation. Many talented entities contribute cutting-edge technology to standard-setting organizations. The resultant standards promote competition and consumer welfare by lowering barriers to entry, assuring interoperability, and enabling new products and services that better serve the end-user customers. Thanks to standards, new entrants to the market can build exciting and innovative products that take advantage of the standards with minimal impediments to entering the market, especially in the case of telecommunications where open standards provide complete "blueprints" for a product. Companies that contribute to the standards receive reasonable licensing fees that enable them to continue to invest in R &D, and continue to make cutting-edge contributions to future standards. Consumers reap the benefits of the competitive landscape that relies on this balance, by enjoying a multitude of interoperable innovative products, offered at competitive prices.

3. The F/RAND ecosystem safeguards competition through balancing the interests of patent holders and implementers

Commitments to license SEPs under Fair, Reasonable and Non-Discriminatory ("F/RAND") terms have been used by collaborative standards development organizations for many years as a mechanism that safeguards competition while balancing the rights and interests of implementers and patent holders. On the one hand, F/RAND commitments ensure that companies holding patents reading on a technology that has been incorporated into a standard do

not use them to exclude new products from the market or to extract overcompensation for them. On the other hand, they secure a fair and reasonable return on the patent holders' investment in R&D, allowing such holders to continue making these investments.

Like the dual objectives of a F/RAND policy, licensors' and licensees' conduct within a F/RAND licensing system is also a "two-way street." It requires both the licensor and the licensee to be fair and reasonable. Thus, both the licensor and the licensee are under obligation to negotiate and earnestly seek and conclude a license on F/RAND terms.[1]

In other words, the F/RAND eco-system is in place to safeguard against the potential for both "hold-up" through asserting the patent to exclude a competitor's product from the market or obtain a higher price for its use and "reverse hold-up", e.g. through the potential licensee's constructive refusal to negotiate in an attempt to avoid paying due royalties to the patent holder.[2] It is wrong to focus only on one type of hold-up. A disproportionate focus on the former type of hold-up is disconnected from market realities because not only is "reverse hold-up" equally problematic, but it also appears to be the more prevalent phenomenon of the two.

4. The F/RAND ecosystem continues to work well

Overall, the F/RAND balancing ecosystem, with the possibility of using injunctive relief to protect a SEP holder's basic right to prevent others from using its patented inventions,[3] has worked well for many years, and continues to work well today. The success of the telecoms sector, and its vibrant, dynamic and competitive landscape, are clear evidence that the existing F/RAND ecosystem represents a well-balanced approach that fosters innovation, competition and growth. Fiercely competitive landscapes and dynamic emerging markets are often

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[1] *Ericsson Inc. v. D-Link Systems, Inc.*, No. 6:10-CV-473, 2013 U.S. Dist. LEXIS 110585 (E.D. Tex. Aug. 6, 2013) (memorandum opinion and order), also *available at* http://essentialpatentblog.com/wp-content/uploads/2013/08/13.08.06-Dkt-615-Ericsson-v.-D-Link-Order-on-Post-Trial-Motions.pdf, at 50-51.

[2] This balance is recognized in the U.S. Dep't of Justice and U.S. Patent & Trademark office "POLICY STATEMENT ON REMEDIES FOR STANDARD-ESSENTIAL PATENTS SUBJECT TO VOLUNTARY F/RAND COMMITMENTS" *available at* http://www.justice.gov/atr/public/guidelines/290994.pdf.

[3] Under the WTO TRIPs agreement, to which the U.S. is a signatory, a patent shall confer on its owner the basic right to exclude third parties from using it without having the owner's consent, see WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (Apr. 15, 1994) Article 28 (1), *available at* http://www.wto.org/english/tratop_e/trips_e/t_agm3c_e.htm#5.

characterized by power struggle between competitors, and some of the litigation we are witnessing merely reflects these dynamic competitive forces. Consumers are the beneficiaries of fierce competition, as it results in better and more innovative product offerings at competitive prices.

5. Ericsson's position on the availability of injunctive relief for SEPs

As a company that regularly finds itself as both a licensor and a licensee of SEPs, Ericsson is committed to ensuring a balanced ecosystem that supports open standards and a robust and unfettered competitive process. Ericsson therefore believes that SEPs should continue to be eligible for entry of injunctions or exclusion order as long as the patent owner has not failed to abide by its commitment to offer a license on F/RAND terms. Ericsson advocates this policy as an optimal middle ground between the more extreme positions advocated by others. Entirely ignoring a patent owner's commitment to license on F/RAND terms will disserve the public interest because SEP owners could engage in hold-up. But a policy that entirely precludes injunctive relief with respect to SEPs (or imposes overly restrictive conditions on its availability to SEP owners) serves the public interest no better. Without an established and effective means to enforce SEPs against unwilling licensees, potential licensees would be encouraged to engage in reverse hold-up, and patent holders' incentives to innovate and contribute technology to standards would be diminished, to the detriment of consumers.[4]

6. Worldwide patent litigation on a country-by country basis is unfeasible in our global world

Standardization does not involve a standard-setting organization merely adopting an existing standard at a single moment in time. Rather, the standardization process is an ongoing process among industry players to find the best solutions to the technical challenges underlying the standards, such as increased data rates, reliability, and security. The standardization process never stops. For example, as we enjoy the new high-speed 4G LTE cellular networks in the

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[4] See also FED. TRADE COMM'N, THE EVOLVING IP MARKETPLACE: ALIGNING PATENT NOTICE AND REMEDIES WITH COMPETITION, at 224 ("an injunction preserves the exclusivity that provides the foundation of the patent system's incentives to innovate. Altering that exclusivity must be undertaken with significant care not to undermine those incentives") *available at* http://www.ftc.gov/os/2011/03/110307patentreport.pdf.

United States and around the world, standardization bodies continue to improve the 4G LTE standard and have already defined the details of LTE-Advanced, which will be the next generation of mobile broadband technology. For this reason, most contributors to open standards have large and dynamic portfolios of essential patents that exist in countries all around the world.

For this reason, injunctive relief can be a necessary remedy against infringers that are unwilling to negotiate a F/RAND license in a timely fashion. Absent injunctive relief (or by imposing overly restrictive conditions on its availability with respect to SEPs), a SEP owner would be left with separate lawsuits in separate countries on separate patents and the corresponding court-awarded damages as the only remedy for infringement of its SEPs. Litigating for damages only, on a country-by-country and patent-by-patent basis, is not a workable solution, however, since it would take years and impose very high litigation costs on SEP holders and potential licensees alike, all of which would be passed through to end-consumers. In addition, the litigation effort will still result in sub-F/RAND rates in many jurisdictions, such as those that do not provide for discovery into the licensee's sales or those that do not provide for compensatory damages.

7. Changing the existing legal framework may discourage incentives to participate in standard-setting and undermine open standards

Unless a SEP holder is ensured a fair return on its R&D investment, there will be no real incentive to continue to invest in open standards. Diminished return on R&D investments would result in fewer such investments as well as disincentives to share cutting edge technologies into standards – both resulting in reduced innovation and weaker standards, to the detriment of consumers. The need for any reform of the F/RAND system must therefore be carefully considered so as to avoid chilling out incentives to standardize or encourage patent holders to keep supreme technologies outside open standards.

The companies advocating to eliminate injunctive relief for SEPs altogether appear to disregard the important need to maintain sufficient incentives for furthering the development of telecoms standards. These companies, who often have not contributed significantly, or at all, to telecoms standards, prefer their short term commercial interests over the long term interests of consumers and the industry as a whole. A breakdown of the open standards system will undermine interoperability while promoting multiple proprietary solutions, a result that will reduce efficiency, hamper innovation and lower consumer welfare.

Conclusion

SEP licensing on F/RAND terms play an important role in the formation of open global standards. Through the balancing F/RAND eco-system, open global standards tremendously promote competition, efficiency and consumer welfare by lowering barriers to entry, assuring interoperability, and enabling new products and services that better serve consumers. Overall, the current F/RAND eco-system continues to work well.[5] Any changes to it, let alone where there is no evidence that it is faltering, need to be very carefully considered, for the reasons described in this testimony.

Ericsson is grateful for this opportunity to share its experience and views, and would be happy to answer any follow up questions.

Sincerely,

Dina Kallay
Director, Intellectual Property & Competition
Ericsson Inc.

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[5] Evidence of this notion is also reflected in multiple submissions to the FTC's June 21, 2011 Workshop to Explore the Role of Patented Technology in Collaborative Industry Standards, *available at* http://www.ftc.gov/os/comments/patentstandardsworkshop/. For example, Intel's submission stated that "the evidence shows that standard-setting processes generally work well. Thousands of standards are developed every year, generally without incident, and they are normally followed by significant price drops year after year in almost all industry sectors where standards are used. Intel is unaware of any systemic problems of patentees misleading standard-setting organizations or refusing to abide by previous licensing commitments made to those organizations, including commitments to license on reasonable and nondiscriminatory ("RAND") terms"; the American IP Law Association (AIPLA) submission stated that: "the current voluntary consensus-based system is and has continued to be successful due to its ability to adapt and respond to market needs"; the American National Standards Institute ("ANSI") submission stated that the "ANSI Patent Policy….has proven over time to be a flexible and effective means of addressing the incorporation of patented technology into standards. Indeed, out of the approximately 10,000 current ANSs, for only a relatively small number have questions ever been formally raised regarding the ANSI Patent policy."

The Honorable Amy Klobuchar
Chairman
Senate Judiciary Subcommittee on Antitrust,
Competition Policy and Consumer Rights
302 Hart Senate Office Building
Washington, DC 20510

The Honorable Michael Lee
Ranking Member
Senate Judiciary Subcommittee on Antitrust,
Competition Policy and Consumer Rights
316 Hart Senate Office Building
Washington, DC 20510

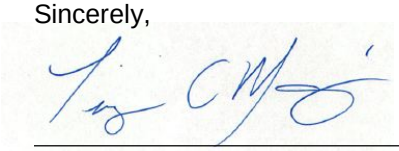
Dear Chairman Klobuchar and Ranking Member Lee:

On behalf of BSA | The Software Alliance, I write to express our strong support and gratitude for your work in the Antitrust, Competition Policy and Consumer Rights subcommittee around the recent hearing on "Standard Essential Patent Disputes and Antitrust Law."

BSA is the leading global advocate for the software industry. It is an association of world-class companies that invest billions of dollars annually to create software solutions that spark the economy and improve modern life. BSA members include software and computer companies that collectively hold hundreds of thousands of patents around the world. Our members invest billions of dollars in research and development every year and are very active in standard settings bodies. Every one of our companies relies on intellectual property protection for the viability of its business.

The issues discussed in this hearing, therefore, are very important to BSA members, and we would appreciate it if you would please submit into the hearing's record the attached Public Comments we filed in a recent International Trade Commission Investigation on the Standard Essential Patents issue.

Sincerely,



Timothy Molino
Director, Government Relations

Attachment: BSA | The Software Alliance's Response to the Commission's Request for Additional Written Submissions on Remedy and the Public Interest.

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UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON, DC 20436

In the Matter of CERTAIN ELECTRONIC DEVICES, INCLUDING WIRELESS COMMUNICATION DEVICES, PORTABLE MUSIC AND DATA PROCESSING DEVICES, AND TABLET COMPUTERS	Investigation No. 337-TA-794

BSA | THE SOFTWARE ALLIANCE'S RESPONSE TO THE COMMISSION'S REQUEST FOR ADDITIONAL WRITTEN SUBMISSIONS ON REMEDY AND THE PUBLIC INTEREST

April 3, 2013

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INTRODUCTION

Pursuant to the International Trade Commission's ("Commission") March 13, 2013, Request for Additional Written Submissions on Remedy and the Public Interest, the BSA | The Software Alliance ("BSA")[1] respectfully submits the following comments in response to Questions 1 and 3.

Although the Commission has requested that submitters avoid discussing issues related to standard-setting when addressing how an exclusion order would affect the public interest as identified in 19 U.S.C. §§ 1337(d)(1) and (f)(1), BSA believes that, in the context of the above-captioned Investigation, the impact of an exclusion order cannot be properly evaluated without discussing standard-setting issues. There is no dispute that the complainant made an irrevocable commitment to license U.S. Patent No. 7,706,348 ("'348 patent") on Fair, Reasonable, and Non-Discriminatory ("FRAND") terms. The complainant's FRAND obligation has consequences and cannot be ignored. Accordingly, BSA respectfully submits that the Commission cannot fully and fairly address the public interest impact of an exclusion order without consideration of the complainant's FRAND obligation.

Before issuing an exclusion order, the Commission is mandated to consider whether such an order will help or harm the public interest.[2] Should the Commission ultimately find a violation of Section 337, BSA believes that it is in the public's interest that an exclusion order not be issued in this case or in other cases with similar facts and circumstances.

BSA believes all patentees should be free to exercise their intellectual property rights as they see fit. It should be their choice, for example, whether or not to submit their patented

[1] The members of the BSA include Adobe, Apple, Autodesk, Bentley Systems, CA Technologies, CNC/Mastercam, Dell, Intel, Intuit, McAfee, Microsoft, Minitab, Oracle, PTC, Rosetta Stone, Siemens PLM, Symantec, TechSmith, and The MathWorks.
[2] 19 U.S.C. § 1337(d)(1), (f)(1)

technologies to become part of internationally recognized standards. But if they make the choice to participate in creating such a standard and in the process commit to licensing their technologies on FRAND terms, then they should not be allowed to circumvent their original commitment by using the Commission to obtain an exclusion order which could result in extracting unreasonable royalties. Internationally recognized technical standards play a critically important role in today's technology-driven society. Allowing patentees who commit to FRAND licensing and to renege on such commitments would have a chilling effect on competition, and it would harm consumers.

BACKGROUND

BSA is the leading global advocate for the software industry. It is an association of more than 70 world-class companies whose technology solutions spark the economy and improve modern life. Our members invest billions of dollars a year in research and development. Those investments depend on intellectual property protections and internationally recognized standards-setting systems that are predictable, transparent, and fair. When these core values are compromised, BSA members cannot innovate, produce new products, or conduct business in an ecosystem that adds value and provides choices for consumers.

BSA members hold hundreds of thousands of patents around the world, and they have adopted corporate policies that respect others' intellectual property rights. BSA members also participate widely in standards-setting organizations.

WHY STANDARDS ARE IMPORTANT FOR INNOVATORS AND CONSUMERS

Internationally recognized standards are part of the foundation of today's competitive technology marketplace. They allow firms to develop competing, but compatible, products and

technologies. Promoting standards does not mean that all products will contain the same features, functions, or performance standards. Quite the opposite.

Consider, for example, the case of two international standards that are built on a foundation of standards-essential patents: Wi-Fi and the Universal Serial Bus, or USB. Because of these two standards, technology companies have had predictable platforms on which to create new and innovative products that give consumers a dazzling variety of choice. The Wi-Fi standard lets consumers connect a range of wireless devices to the same wireless router — from laptops and printers to smartphones, wireless medical devices and much more. Similarly, consumers can connect many of those same devices using cables and standards-enabled USB ports. The creation and adoption of these and other standards have given rise to tremendous diversity and richness in today's marketplace. The benefits are immeasurable, as would be the consequences of undermining them. Without standards, innovation would slow, the market would balkanize, and consumers would be stuck in a world of incompatible technologies — a different port or router for every device — creating less value at greater cost.

In order for companies to commit resources to creating and adopting standards, they must trust that their commercial efforts will not be put in peril by a patentee attempting to exclude them from the market. This is precisely why standards-setting bodies require that participants in the process commit to licensing their patents under FRAND terms before they are included in a standard. For example, the European Telecommunications Standards Institute ("ETSI") — the standards body responsible for promulgating the wireless standard to which the complainant claims its '348 patent to be essential — requires parties submitting ideas to the organization for possible adoption to commit to making their intellectual property available under FRAND terms. The ETSI policy states:

> When an ESSENTIAL IPR [Intellectual Property Right] relating to a particular STANDARD or TECHNICAL SPECIFICATION is brought to the attention of ETSI, the Director-General of ETSI shall immediately request the owner to give within three months an irrevocable undertaking in writing that it is prepared to grant irrevocable licenses ***on fair, reasonable and non-discriminatory terms*** and conditions under such IPR to at least the following extent:
>
> - MANUFACTURE, including the right to make or have made customized components and sub-systems to the licensee's own design for use in MANUFACTURE;
> - sell, lease, or otherwise dispose of EQUIPMENT so MANUFACTURED;
> - repair, use, or operate EQUIPMENT; and
> - use METHODS.[3]

These commitments give companies the confidence they need to invest the millions of dollars it takes to develop technology using a standard. Without such commitments, standards would not be developed, or, if somehow developed, they would not be widely adopted.

PUBLIC INTEREST POSITIONS

Granting Exclusion Orders for Standards-Essential Patents Would Have a Chilling Effect on Competition

If companies cannot trust FRAND commitments made during the standards-setting process, they will have little incentive to participate and competition will suffer. Fewer standards will be developed, and they will not be as widely implemented. Rather than sharing their technologies through standards organizations, companies will horde innovations and create a variety of proprietary platforms. Firms might still enter into one-on-one agreements to cross-license and develop compatible products, but such small-scale developments have higher transaction costs. These increased costs — and the additional costs of having to individually

[3] ETSI's IPR Policy (Nov. 30, 2011) (emphases added). Other prominent standards-setting organizations also have similar requirements, *e.g.*, IEEE, ITU, ANSI, JEDEC. In fact, a 2002 study found that 29 of the 36 standards-setting bodies studied that had written intellectual property policies required participants to license under FRAND terms. Mark A. Lemley, *Intellectual Property Rights and Standard-Setting Organizations*, 90 Cal. L. Rev. 1889, 1906 (2002).

negotiate licenses for intellectual property (where no FRAND commitment was made) — will create entry barriers that most new competitors will be unable to overcome. All of these negative consequences will have a chilling effect on today's robust and competitive technology industry.

Exclusion Orders for Standards-Essential Patents Would Harm Consumers

Without question, consumers benefit immensely from the creation and use of internationally recognized standards. These standards allow consumers to have advanced technology broadly implemented in a variety of devices that work together. This is why, for example, consumers have a plethora of choices when they shop for a printer to use with their computers. It is also one of the main reasons why consumers' transition costs are low when switching or upgrading a device: they can be sure the new device will work with rest of their personal technology, and the rest of their technology can be upgraded or replaced independently.

If holders of standards-essential patents are able to seek exclusion orders (despite promises to the contrary), then companies likely will respond by forgoing the development or adoption of new standards. Companies will instead produce redundant technology, and the market will become balkanized. This will mean that fewer companies will invest in the market and the pace of innovation will severely slow down. Reduced competition will drive prices up and diminish value for consumers.

CONCLUSION

For the reasons set forth above, it is not possible to discuss the public impact of an exclusion order without giving full and fair consideration to the commitments that follow from a patent holder's FRAND obligation. Where, as here, a patentee makes a commitment to license its technology for FRAND terms during a standard-setting process if that technology is made

part of the standard, the patentee should be held to its promise. Allowing companies to circumvent their promises by using the Commission's sole remedy of an exclusion order would have a detrimental effect on internationally recognized standards systems. The ultimate result of a less robust standards system will be fewer choices for consumers, higher prices, and diminished innovation. Thus, the public's interest will be best served if an exclusion order is not issued in this investigation or any other investigation resting on similar facts and circumstances.

Dated: April 3, 2013

Respectfully Submitted,

/s/ Timothy A Molino
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SUPPLEMENTAL STATEMENT FOR THE RECORD OF INTEL CORPORATION

For The

SENATE COMMITTEE ON THE JUDICIARY
SUBCOMITTEE ON ANTITRUST, COMPETITION POLICY AND CONSUMER RIGHTS

On

STANDARD ESSENTIAL PATENT DISPUTES AND ANTITRUST LAW

A. Douglas Melamed
Senior Vice President and General Counsel
Intel Corporation

August 13, 2013

This Supplemental Statement addresses an important topic that was briefly mentioned at the July 30, 2013 hearing, but that Intel did not have an opportunity to discuss. The topic concerns the possibility of so-called "hold out" by those who implement standards or use products that implement standards, all of which for simplicity are referred to herein as "implementers."

Some SEP holders have argued that the threat of an injunction or exclusion order is necessary to bring implementers to the bargaining table. According to these SEP holders, absent the leverage inherent in such a threat, implementers will know that the worst that can happen to them is a court order to pay reasonable royalties, and some will therefore choose to make the SEP holders sue them—to "hold out"—instead of willingly negotiating a reasonable royalty. Because such a hold-out strategy would cause large implementers to wind up paying both a reasonable royalty and the high costs of patent litigation, it is not a prudent strategy for, and is unlikely to be used by, those entities. Small implementers might choose this strategy, however, in the expectation that, at some point, the cost to the SEP holder of seeking them out and litigating will exceed the benefits.

In its Prepared Statement and in oral testimony at the hearing, Intel explained that the threat of an injunction enables a SEP holder to "hold up" implementers—both large and small—by inducing them to pay excessive royalties to avoid the risk that an injunction could take from them the entire value of their products. The Federal Trade Commission submitted a written statement and oral testimony to the same effect. In his August 3, 2013 letter to the Chairman of the International Trade Commission, the United States Trade Representative expressed the same concern.

The policy question is whether the potential risk of "hold out" is more serious than the demonstrated likelihood of "hold up" and thus warrants permitting SEP holders to obtain injunctions from implementers that have not entered into license arrangements satisfactory to the SEP holder. Intel believes that the risk of "hold out" does not justify permitting a SEP holder to continue to use the threat of injunctions to "hold up" implementers for excessive royalties.

In essence, some SEP holders are arguing that they should have the ability to induce countless implementers to pay excessive royalties in order to guard against the risk that a few implementers will play hard-to-get. That is an extraordinary argument which, if accepted, would be rare and unprecedented in U.S. law. Injunctions are used to protect a property owner's right to prevent others from using that property. But where, as here, the property owner has voluntarily relinquished that right and committed to license its patents on reasonable terms, damages are the appropriate remedy. If the implementer behaves improperly, the damages remedy can be supplemented by sanctions imposed on the wrongdoer. The prospect that a few implementers might engage in wrongdoing does not warrant enabling the SEP holder to extract excessive royalties from nearly all implementers.

The availability of injunctive remedies is especially inappropriate in this context, for several reasons.

First, some SEP holders want to have their cake and eat it too. They made a bargain: They traded the licensing freedom they would otherwise have had in exchange for the vastly increased use of their patented technologies made possible by inclusion of those technologies in the standard. Then, after the fact, they want to keep the benefit of the bargain—the millions of locked-in users of their patented technologies—but walk away from their promise not to hold up implementers with unreasonable demands. The "hold out" argument is their way of saying they want to back out of the bargain once they have the benefits of the bargain (i.e., large numbers of locked-in implementers) without having to give up anything in return.

Second, and even worse, the potential "hold out" problem is often of the SEP holder's own making. SEP holders can assert their patents against any party that they believe is infringing their patented technologies. They are usually able to choose among multiple implementers in the supply chain, from component manufacturers to device manufacturers to end users. SEP holders can minimize the risk of hold out by licensing at the earliest point in the chain in which they believe the patented technologies are used and can thereby often collect royalties on all uses of their SEPs with just a few licenses.

SEP holders, however, often go to great lengths to avoid licensing upstream component (e.g., chip) manufacturers and choose instead to license their patents downstream, at for example the device (e.g., computer) level. As Intel's Prepared Statement explains, they do so because they believe, and experience shows, that they are more likely to obtain excessive royalties when they license downstream. While licensing downstream is a profitable strategy for SEP holders, it does increase the number of unlicensed implementers and, thus, the risk of hold out. But that risk is created by the SEP holders' own strategy. Having created the potential problem, the SEP holders are hardly in a position to argue that the risk justifies giving them a weapon that can be used to extract excessive royalties from nearly all implementers.

Third, the "hold out" argument would deny implementers fundamental rights under the patent laws. The SEP holders would like the Subcommittee to believe that their patents give them a property right that implementers are flouting. To the contrary, the fact that a patent has been declared by the patent holder to be a SEP does not mean that it is a SEP or that the patent holder is entitled to royalties. That declaration does not eliminate what are often critical issues that go to the threshold question of whether the implementer actually has infringed a property right of the SEP holder. These issues include: (i) is the patented technology in fact essential to the standard; (ii) is the patent valid; and (iii) did the implementer in fact infringe it. These are not just theoretical questions. One SEP holder, for example, recently brought four different lawsuits against Intel or its customers in which it alleged infringement of ten different SEPS, but only three of the asserted patents were found to be valid and infringed. As another example, Apple has disclosed publicly that fewer than 20 percent of the more than thirty alleged

SEPs that have been asserted in various smartphone patent litigations to which it has been a party have been found to be valid and infringed.

It is fundamental to the patent laws that implementers be permitted to have questions of infringement and validity resolved by a court. What SEP holders call "hold out" is usually no more than implementers exercising those fundamental rights. Yet despite having voluntarily committed to accept reasonable royalties for their patented technologies, SEP holders want to hold the threat of an injunction over implementers in order to induce them to give up those fundamental rights and to agree to excessive royalties instead.

Fourth, some SEP holders seek to abuse a critical aspect of patent law that makes patents unlike ordinary property. Ordinary property rights protect the owner's right to use and enjoy his or her property and do not generally limit what others do on their property. Thus, for example, homeowners can get orders prohibiting others from trespassing on their property. Unlike ordinary property rights, however, patents enable the holder to reach out to third parties and to prevent them from using technology covered by the patents or to tax them for doing so. Notably, patents give the holder that right even if the third party did not copy the technology and even if the third party does not know that the technology it is using is claimed by someone else's patent. In this respect, patents are government-granted tools that enable patent holders to tax unknowing third parties and interfere with their commercial freedom under some circumstances.

The government grants these tools in order to create appropriate incentives for innovation and invention. But as explained in Intel's Prepared Statement, if those tools are abused or patent royalties are excessive, patents can both undermine innovation by imposing excess taxes on innovators and create perverse rent-seeking incentives to accumulate patents in order, not to promote innovation, but to tax others and to raise revenues. Those would be the consequences if SEP holders were permitted to wield the threat of an injunction against all implementers.

Fifth, the injunction threat is not necessary to deal with any "hold out" problem. For one thing, it is not clear that there is a "hold out" problem—that, in other words, what some SEP holders call "hold out" is anything more than implementers exercising their statutory right to challenge the validity and scope of a claimed SEP. Nor is it clear that the threat of injunctions would have much effect on any such problem. SEP holders will not have a credible threat of injunction against implementers that are too small to justify the costs of litigation, and the SEP holders will have ample incentive to seek royalties from the large implementers even without an injunction threat. It is unlikely that many implementers fall into the sweet spot in the middle.

Moreover, there are several alternative ways to deal with individual implementers that take advantage of SEP holders without exposing all implementers to a coercive threat of an injunction. As explained in Intel's Prepared Statement, while injunctions should not be available to SEP holders in general, they should be available where the implementer is not willing to pay a reasonable royalty; and if an implementer is beyond

the reach of U.S. courts for damage remedies, an ITC exclusion order might be appropriate. Further, where an implementer is willfully infringing a valid patent—and is not merely exercising in good faith its rights under the patent laws—existing law permits a patent holder to obtain up to three times the reasonable royalty as a remedy for willful infringement. *See* 35 U.S.C. § 284. And if additional remedies are needed, the patent laws could be amended to provide for "fee shifting" so that the prevailing party in patent litigation can recover its attorney fees and costs from the losing party. Fee shifting is common in patent cases outside the U.S., and would make it both more costly for implementers to engage in hold out and significantly less costly for SEP holders to pursue implementers that do hold out. Fee shifting would also reduce the incentive of patent holders to assert invalid patents or to assert patents against parties that do not actually use the patented technologies.

* * *

In sum, the availability of an injunction remedy enables SEP holders to coerce excessive royalties and litigation settlements from nearly all implementers. The theoretical concern about "hold out" by some implementers does not justify that result because the "hold out" problem is less serious than alleged and is often caused by the SEP holder itself and because other remedies are available for actual instances of hold out.

Standards Essential Patent Disputes and Antitrust Law:
Evaluating Patent Hold-up (and Hold-out) Theories

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Testimony Submitted to:
Senate Judiciary Committee's Antitrust Subcommittee on standard setting organizations, standard essential patents, and the competition issues

I. Introduction

This statement will explore the standard-setting process and consider if it works well enough in contexts where standard essential patents are implicated. In particular, it will explore whether there are realistic concerns that the safeguards put in place by standard setting organizations to guard against patent "hold-up" (in which patent owners somehow extract in royalties more than their fair share of the benefits from patented technology) are adequate and can be improved upon by so called "ex ante" approaches to patent valuation.

I have a particular interest in policies that enhance technological innovation and economic growth. This has been the heart of my scholarly research for more than 30 years. I am concerned that large (incumbent) firms that infringe the intellectual property of others opportunistically appeal to patent "hold-up" theories to claim harms to themselves and to the innovation process. I am concerned that complaints of abuse of the system by infringers are little more than thinly disguised efforts to deny patent owners their fair return on their invention(s). I will review both the theories and evidence on patent hold-up and hold-out issues and review whether the frameworks and actions of the standard-setting organization are adequate for the issues at hand.

II. Employing advanced technology in the standard-setting process

Few commentators have a solid understanding of how standards get started and how licensing contracts are negotiated and structured. Closer examination of emerging issues shows a standard-setting system that works well for society. While there are disputes around patent licensing, much is inevitable given the number of holders of relevant patents; the number of implementers making standards-compliant products; the fact that patents are not "self-enforcing" and that patent holders cannot physically withhold their patented technologies from others, but may have to resort to the legal system to induce others to pay for their use of patented technology; and the importance of standards and intellectual property ("IP") licensing in in the information and communications industries. The level of actual litigation is quite small relative to the number of potential disputes. The domains in which these disputes occur are also characterized by extremely high levels of technological change, dynamic competition, and market growth, implying a lot of money at stake.

Standards provide benefits to developers, manufacturers, and consumers of products and services. In network industries such as telecommunications and computers, it is crucial that products from different manufacturers interconnect in networks and interoperate with products from other manufacturers. It is also important that standards, especially for "next-generation" products, incorporate the best cutting-edge technology, which (not surprisingly) is often patented. (Imagine how outdated standards for cutting-edge products would be if they had to rely only on older public-domain technology.)

Mobile handsets from one manufacturer must also connect to mobile networks and work together with handsets and cellular base stations made by other manufacturers. Memory chips must work in computers, cell phones, and tablets from various manufacturers; and printers must work with multiple computers. Compatibility standards allow this interconnection and interoperability to occur. Moreover, standard functionality must be the best-value proposition available for the consumer, and not simply that which is consistent with the lowest royalty burden.

Formal standard setting at standards setting organizations (SSOs, such as the ITU-T, ETSI, IEEE, or ANSI) is a cooperative, consensus-based process aimed at developing technical standards for next-generation products in the relevant technical field (e.g., in the case of the ITU-T, the field of telecommunications, including wired and wireless communications). The process involves the cooperative efforts of numerous stakeholders interested in positive outcomes for the user. Stakeholders can have different interests, different business models, and different beliefs. Nevertheless, well-chosen common standards will benefit multiple parties

[1] I am also chairman of the Berkeley Research Group and have provided expert testimony in numerous patent cases for patent inventors, owners, and patent users. I have also consulted for many innovative companies in the United States and abroad. The views herein are my own and don't reflect the views of the University of California or any other organization I belong to or have been associated with.

Because standards are being set for the next generation of products, it is not surprising and standard-setting organizations (SSOs) and standards determining organizations (SDO's) adopt cutting-edge technology into their standards. That technology first has to be developed; that development involves significant cost, and (not surprisingly) firms seek to patent their innovations—for both "defensive" and "offensive" reasons.

The range of standards-compliant products can vary dramatically, and often dozens if not hundreds of firms make thousands of standards-compliant products. As such, the scope for commercial disagreements between patent holders and those wanting to make, use, or sell standards-compliant products is considerable.

Claims are sometimes made that the patent system as a whole does not work well, particularly complaints that the U.S. Trade and Patent Office grant too many unwarranted patents, raising concerns about "patent thickets," "royalty stacking," and "the tragedy of the anti-commons." Whatever the merits of such claims, they are directed to the patent system as a whole, not to how well (or poorly) the system of "reasonable and non-discriminatory" ("RAND") licensing works. They are not something that SSOs can do much, if anything, about. Competition authorities frequently claim that royalties are too high. These agencies often have political agendas. With representative democracy, there is a tendency to favor the interests of today's consumers. Couple that with the antitrust employment of static models (that focus on the here and now and not the future) and there is a "baked in" bias against innovation emanating from Washington.

III. Business model difference amongst participants

One obvious difference between firms is the extent to which they have intellectual property rights (notably, issued patents and pending patent applications, which each raise different issues) that may be incorporated into a proposed standard. Many different business models are at work in today's economy. Some firms "wear three hats." As patent holders, they out-license their patented technology to others in order to make standards-compliant products, and as such are "sellers" in the technology market. As manufacturers, they are sellers in the product market. And also as manufacturers, they need to have access to others' standards-essential patented technology, and thus are "buyers" in the technology markets.

Other firms do not fit this mold. In particular, pure-play technology firms are sellers in the technology market but do not participate in the product market. Manufacturers that have no patented technology of their own to contribute or "barter" for cross-licenses are sellers in the product market and buyers (but not sellers) in the technology market. This heterogeneity creates competitive richness. It also sometimes creates a bewildering array of licensing situations that require understanding.

The economic system needs to reward investors who develop commercially valuable technology. Unfortunately, our antitrust agencies (the FTC and DOJ) are frequently not the champions of innovation, although they claim otherwise. From a societal perspective, royalty payments for the use of patented technology are transfer payments: the licensee pays royalties and thus has less money, but the patent holder receives royalties and thus has more money. To a good first approximation (ignoring the economic costs of rent-seeking behavior and assuming royalties do not materially affect final product demand), royalty payments might be seen as cancelling each other out. From a societal perspective, the money largely transfers from one group to another, as with tax revenues and tax receipts.

Of course, the effect is not neutral. From the perspective of particular firms, which naturally are concerned about their own private costs/benefits, royalty payments are a quite real private cost. A royalty payment is a private cost to the firm paying the royalties, and a private benefit to the patent holder that receives the royalties. The level of royalty payments may not be neutral from a societal point of view either, since it affects the returns to technology development and the incentives for further innovation. Very low royalty rates likely provide miniscule returns to technology developers.

It is unlikely that this can be fully compensated for by "first-mover" advantages in the product market. In particular, the technology developer may not operate in the product market. Moreover, higher unit sales of licensed standardized products might not materialize (i.e., one cannot be sure that a low royalty rate will be make up for by volume). Conversely, a licensor might be disadvantaged in the product market by high costs, especially if it bears costs that its rivals do not. Consumers are best served when streams of new products are being developed and are available at competitive prices.

Royalty levels should represent a balance of interests for the technology developer, implementer, and consumer. This balance is at the core of SSO IPR policies and the RAND commitment. Because the standard-setting process is voluntary, firms can elect not to participate if they believe that their interests are not protected. This "participation constraint" implies that care must be taken to adopt IP policies that strike a "balance" between the interests of different stakeholders. The consensus-based nature of the standard-setting process allows SDOs to take account of this need for balance.

There is a fundamental difference between intangible assets such as standards-essential patent rights that can be used as inputs into the production of standards-compliant products and tangible inputs (e.g., cellular chipsets) that are also inputs into the production of standards-compliant products (e.g., cellular handsets). Once a patent has issued, it is a public document; the patent holder cannot physically withhold from others the ability to use the patented technology and has to resort to the legal system (and litigation) to seek to compel others either to pay fair compensation for that use or to cease infringing. By contrast, the supplier of a tangible input can refuse to supply the input to those who do not pay for it.

Some argue that there is another difference: intangible inputs are (physically) non-"rival" in use. The fact that one person uses some patented technology to make and sell my products does not restrict another's ability to use the same patented technology to make and sell products (though there clearly is a sense in which the patent holder and its licensees may compete for customers, and their use of the patented technology is "rival" in an economic sense).

This is fundamentally different from tangible inputs such as computer chips, which are rival in use in the physical sense: namely, you and I cannot incorporate the same physical chip into both of our products. This fundamental asymmetry between intangible and tangible inputs is a key factor affecting the need for owners of intangible patented technology to rely on the legal system, rather than on "self-help" mechanisms such as the refusal to deliver tangible goods to those who do not pay for them. This difference needs to be taken into account when one is asked whether there is "too much" patent litigation.

Put another way, patent rights are not self-enforcing. Parties can and do genuinely disagree whether one firm uses patented technology belonging to another. Patents may be seen as invalid, as not infringed, or both. There is only some (positive) probability that, if such disputes were litigated, the patent holder would prevail against a putative infringer on validity and infringement grounds. Given the large number of patents declared as being "essential" to some standard—and given the large number of firms making, using, or selling standards-compliant products—there is bound to be some level of disagreement on such issues. This factor has no analog in the context of physical inputs to the production process, where issues of ownership of inputs are rarely disputed. This factor, too, needs to be taken into account when assessing whether there is "too much" standards-related patent litigation.

Because the patented technology already exists (and the cost of developing it is a "sunk cost") by the time manufacturers and designers get around to using it to make and sell standards-compliant products, some argue that one should pay more attention to the interests of manufacturers than of patent holders. Others disagree, contending that it is important to respect both of their interests.

Empirical studies of the private and social returns to innovation demonstrate that inventors generally are undercompensated for others' use of their patented innovations.[2] Accordingly, it is important to avoid favoring users of patented technology at the expense of the developers of that technology. Incentives to invest in research and development (R&D) will be jeopardized along with incentives to participate in standard setting itself. Each is potentially damaging to society. Advocates, especially those who focus on the possibility of "hold-up" by patent holders (and who frequently pay little attention to the converse possibility of "reverse hold-up") are usually deaf to such concerns—a natural consequence of their employment of intellectual frameworks that are inherently static. Hence, it is most important that competitors' policy advocates be challenged to explain why their positions are not simply tantamount to favoring today over tomorrow. It is "deficit spending" in a different guise. The result is the same. Future generations of consumers are paralyzed tomorrow (through lower rates of innovation) to support consumption today.

IV. Policies of standard-setting organizations

SSOs face many policy issues. One is whether to incorporate technologies in standards where those technologies may be covered by patents. The issue is complicated by the fact that it might not be known that a technology included on a standard is patented or likely to be patented (because there may be many thousands of potentially relevant patents, and it would be burdening to do a full search, which SSOs typically do not require). The "metes and bounds" of patent rights are often unclear and disputed, and there are time lags between patent application and the grant of patents.

Almost all standard-setting bodies[3] have determined that it is desirable to allow the use of patented technologies in standards—so long as patent owners, whether members of SSOs or not, agree to make licenses to their patents available to potential implementers of the standard on RAND terms. To do otherwise would of course deprive society of the benefits of patented technology. Such benefits are often considerable. Not surprisingly, practically all SSOs embrace patents, so long as RAND licenses are available.

Empirical studies confirm that RAND licensing is the rule.[4] However, relatively few SSOs give much explanation of what those terms mean or how licensing disputes would be resolved. SSOs quite properly leave licensing terms to negotiations among the parties.

That lack of specificity as to what RAND means persists in the IP policies studied more recently by Bekkers and Updegrove,[5] who say that "none of the policies attempts to even define what 'fair' or 'reasonable' fees are intended to mean in context. Nor do they state that at minimum, such fees must bear a reasonable relationship to the economic value of the IPR …" Bekkers and Updegrove go on to say, "Likewise, 'non-discriminatory' also is left the parties involved to agree upon (or to the courts, if they cannot. Nor are the policies of the study set unusual, as this absence of definitions is normative across virtually all IPR policies." That is, despite a decade of study, commentary, and controversy, there has been little change in the fundamental issues of what RAND means or how it is to be interpreted. Clearly, SSOs have come to see ambiguity as a benefit, as it allows flexibility and adaptation to particular circumstances.

Some economists associated with the competition policy agencies have endeavored to articulate what an IP policy "should" include. For instance, Fiona Scott Morton (2012), formerly of the Antitrust Division of the U.S. Department of Justice, has suggested:

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[2] Mansfield, E., 1991, "Social Returns from R&D: Findings, Methods and Limitations", *AAAS Science and Technology Policy Yearbook 24, p.24-27.*

[3] There are a handful of examples, primarily in the Internet space (such as the World Wide Web Consortium), of SSOs that reject the use of known-patented technology unless the patent holder agrees to license its patents on a royalty-free basis.

[4] See Mark Lemley, "Intellectual Property Rights and Standard-Setting Organizations," 90 *Calif. L. Rev.* 1889–1980 (2002).

[5] Rudi Bekkers and Andrew Updegrove, "A Study of IPR Policies and Practices of a Representative Group of Standards Setting Organizations Worldwide" (September 2012), accessed September 5, 2013, at http://sites.nationalacademies.org/xpedio/groups/pgasite/documents/webpage/pga_072197.pdf

(1) "IPR policies should create as strong a commitment as possible to bind future owners of the IPR to any F/RAND commitments made to the SSO"
(2) "A F/RAND commitment should include a commitment to a process that is faster and lower cost [than litigation] for determining a F/RAND rate or adjudicating disputes over FRAND," which "might include arbitration, alternative dispute resolution within the SSO, an allowed range for a royalty rate, and specification of the base to which a royalty should apply"
(3) "The F/RAND dispute resolution process should require that the licensor specify a cash price for its SEPs to aid in evaluation of the proposed license terms by the third party"
(4) "The F/RAND commitment should include a dispute resolution process preceding any action for injunction or an exclusion order"[6]

I understand that the U.S. Federal Trade Commission (FTC) and European Commission DG Competition (DG Comp), the European antitrust authority, have made similar suggestions as to how SSO rules "should" be amended to address various competition-policFy concerns.

I note that none of the SSOs that Bekkers and Updegrove studied—nor, indeed, any other SSO that I am familiar with—have adopted anything like the range of Dr. Scott Morton's proposals as to what IP policies "should" look like. All her suggestions would involve changes from the current system, and in some cases very significant changes in procedures. Bekkers and Updegrove found some SSO policies that address the transfer of patents encumbered with licensing obligations, but they found that treatments were often unclear, possibly inconsistent, and applied only to some SSOs. They note that some SSOs address transfer issues but struggle to define workable policies, and believe that "transfer of patents… has not yet been satisfactorily addressed in most IPR policies." Beyond this, they do not report any SSO policy procedures aimed to (a) speed dispute resolution, (b) specify cash royalties, or (c) specify a dispute-resolution process preceding any action for injunction, in the ways Dr. Scott Morton proposes.

It is clear that SSOs eschew the suggestions from the competition agencies. This is no surprise. SSOs are committed to setting standards, and one-sided approaches (that favor licensees over licensors, or vice versa) impair the process and deny members and society the benefit of standards and the competitive opportunities that result. SSOs seem to believe that the proposals of academic economists at competition agencies are untried, untested, and impractical. As Nobel Laureate, economist Ronald Coase has observed, it is often necessary to "save the economy from the economists,"[7] as economists are prone to ignore history, institutions, and innovation.

Many observers fail to understand that the issues at hand are clearly very nuanced. In a 2003 article on "Standards Setting and Antitrust" a coauthor and I wrote that:

"There is no reason why a 'one size fits all' mandatory-type approach is appropriate. … [W]e believe that the antitrust authorities are likely to give too little weight to the fact that SSOs, as voluntary organizations, must often walk a fine line between competing interests. In our view, ex post intervention runs the serious risk of failing to recognize the ex ante balancing of competing interests."[8]

We would go further. It is one thing to propose that certain rules "should" be adopted on a going-forward basis, to govern future RAND commitments and disputes over them. It is quite another to argue that proposed rules "should" be applied, retroactively, to previously adopted standards and previously made commitments (and disputes about them). Many current proposals for "clarifying" SSO rules are effectively of the latter, retroactive, sort.

V. The meaning of RAND

From an economic perspective, a RAND commitment[9] by a patent owner is an important commitment. It involves restrictions on the activities of the patentee. It has four main implications:

(1) The patent holder must make licenses available. It cannot keep its technology to itself and refuse to make licenses available (which, absent the RAND commitment, it would otherwise be entitled to do). This locks the patent owner into a licensing business model with respect to the technologies issue.
(2) The patent holder must make licenses widely available to anyone who wishes to make standards-compliant products. It cannot "pick and choose," agreeing to license some (e.g., business allies) and refusing to license others (e.g., rivals). And it cannot make just a limited number of licenses available, "auctioning off" to the "highest bidders."
(3) The patent holder must make licenses available on "reasonable terms and conditions," which may include terms and conditions other than royalty rates.
(4) The patent holder must make licenses available on a "non-discriminatory" basis.

Many commentators have focused on the third ("fair and reasonable," or "FR") and fourth ("non-discrimination," or "ND") aspects of a RAND commitment, largely glossing over the first two requirements (that the patent holder must make licenses available to all interested parties), which significantly limits what the patent holder would otherwise be free to do with its patented technology. Yet many SSOs make it clear that the requirement that licenses be made available lies at the core of a

[6] See Fiona Scott-Morton, "Standard Setting Organizations can Help Solve the Standard Essential Patents Licensing Problem", *CPI Antitrust Chronicle*, Competition Policy International, Inc, (March 2013), pp.4.
[7] Coase, R, " Saving Economics from Economist, Harvard Business Review, (December 2012).
[8] David Teece and Ed Sherry, "Standards Setting and Antitrust," Minnesota Law Review. (June 2003), pp. 1966-1987.
[9] The term "RAND" is more commonly used by U.S.-based SSOs; the term "fair, reasonable, and non-discriminatory" ("FRAND") is more commonly used by European-based SSOs. I am not aware of any suggestion that FRAND differs from RAND in any significant way, and the terms are used interchangeably in the literature. In this paper, I use the RAND acronym.

RAND regime. That requirement ensures that holders of standards-essential patents ("SEPs") cannot block others from making and selling standards-compliant products and thus cannot block the development of competitive markets for standards-compliant products. Conflicts over the ND and (especially) the FR aspects of RAND, by contrast, are at their core commercial disputes over licensing terms. They are examined below.

a. Reasonable

As noted, most SSOs provide little or nothing in the way of guidance as to what "reasonable terms and conditions" (including what "reasonable" royalty terms) means. The ITU-T patent policy, for example, says that the ITU-T will not get involved in disputes over such "terms and conditions," saying that they are "left to the parties concerned."

For many years, some commentators have claimed that the meaning of RAND lacks clarity.[10] Some academics and other scholars have called on SSOs to provide additional details, have provided their own interpretations of what RAND "should" mean in order to achieve certain goals, or have made proposals for "clarification" as to what RAND means.

To take one example, in November 2011 a number of firms (including Apple) made submissions to the European Telecommunications Standards Institute (ETSI) as to how RAND "should" be interpreted, each offering differing interpretations.[11]

Following Sherry and Teece (2003), some commentators have noted that "reasonable" can be interpreted in two different senses: what is reasonable *ex ante*, before the standard has been adopted; and what is reasonable *ex post*, after the standard has been adopted. Like the policies of many SSOs, the ITU-T patent policy is silent on this issue, merely saying that "negotiations are left to the parties concerned and are performed outside ITU-T/ITU-R/ISO/IEC," and that the ITU-T does not get involved in resolving disputes between the parties over licensing terms and conditions.

Because such negotiations are almost always conducted *ex post*, one might interpret the ITU-T patent policy as (tacitly) endorsing an *ex post* interpretation of what "reasonable" means; certainly, nothing in the current ITU-T patent policy (or, for that matter, of any other SSO of which I am aware) explicitly endorses an *ex ante* approach to determining what is "reasonable."

In addition, in some (though not all) cases, no licenses specific to a particular standards-related patents will be negotiated on an *ex ante* basis. That is not surprising, as until the standard is formally adopted, the parties will not know precisely what patents will be incorporated in the standard, or the exact value of being able to use the patented technology in connection with standards-compliant products. But this fact makes it difficult to implement an *ex ante* approach to assess the "reasonableness" of royalty rates by appealing to real-world *ex ante* licensing terms.[12] And almost by definition, patent litigation over standards-compliant products occurs *ex post*, after the standard has been adopted and after firms begin to make standards-compliant products. Most SSOs[13] do not require the patent holder to announce its proposed license terms in advance of adopting the standard, but merely require a statement that the patent holder is willing to license on (unspecified) "reasonable and non-discriminatory" terms. Instead, royalty rates are left to the parties for negotiation.

SSOs likely avoid addressing the reasonableness of licensing terms for four reasons. First, determining whether a particular rate is "reasonable" often goes beyond the competence and/or expertise of the SSO or its participants. The "reasonableness" of royalty rates is an economic or business issue, not a technical one. The SSO representatives, generally chosen for their technical knowledge of the technology being standardized, frequently have little or no experience or expertise in negotiating royalty rates or determining what an appropriate rate should be.

Second, trying to determine an appropriate royalty rate is often difficult when technology changes rapidly, as is often the case in the context of standards for the next generation of products. From an economic standpoint, patent holders are naturally reluctant to quote a royalty rate for their patents in advance. This is especially true because of the asymmetric (one-way) nature of the commitment. Asking the patent holder to commit to a royalty rate prior to the standard's adoption would, presumably, bind the patent holder, in the sense that the patent holder could not increase the rate, though it could always agree to accept a lower royalty. But the rate would not be binding on the prospective licensees. They would have made no commitment to take a license to agree to pay royalties. Not surprisingly, patent holders are reluctant to constrain their future negotiating position in such an asymmetric fashion.

Third, potential antitrust issues might arise if the SSO (or its members, as potential licensees of the patent) were to try to determine whether a proposed rate was "reasonable." Antitrust issues clearly would arise if the SSO explicitly conditioned its acceptance (or rejection) of a proposed standard implicating a patent on the asked-for royalty rates. Indeed, even asking the patent holder to announce its proposed rates in advance, and then having the SSO determine whether or not to adopt the standard in light of the announced rates, may be problematic from an antitrust standpoint.

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[10] See., e.g., Lemley, "Intellectual Property Rights and Standards Setting Organizations" (2002).

[11] Jorge L. Contreras, "Guest Post: The February of FRAND," *PatentlyO* blog (March 6, 2012), accessed at: http://www.patentlyo.com/patent/2012/03/february-of-frand.html

[12] Before patent applications have been resolved (in terms of the patent office granting or denying a patent application), there are likely to be such disparities in value perception between potential licensers and licensees that *ex ante* licensing of SEPs as a practical matter is a near impossibility.

[13] I am aware of only one SSO—VESA (the Video Local Bus Association)—that requires holders of essential patents to disclose their "not to exceed" royalty rates and other licensing terms. The IEEE allows, but does not require, patent holders to disclose their "not to exceed" terms.

Fourth, SSOs know the issue of royalty rates pits the interests of some participants (patent holders) against those of other participants (prospective licensees), and SSOs do not want to "take sides" in such matters. Doing so could jeopardize the standard fielding process, which has enough protections built into it anyway.

Concerns or disputes about what "reasonable" means in practice have faced SSOs since at least the 1970s, when SSO IPR policies began to be adopted. We know of no reason why the current situation raises any "new issues" that were not anticipated long ago. The assertion in a recent ITU-T press release that "the definition of what constitutes 'reasonable'… is now emerging as a major point of contention" strikes me as incorrect. Legal systems rely on "reasonableness" standards when addressing complex and various relationships in which any more "precise" a formula or rule of thumb would inevitably fit in some cases and not others.

Moreover, the "point of contention" has been there all along, and both the ITU-T and other SSOs have maintained their current policies in place for many years, presumably because many SSOs operate by consensus, and there never was "consensus" over a need to change the RAND-based IP policy rules nor how to "clarify" them without undermining the flexibility inherent in the "reasonable" portion of the RAND commitment against those of other participants. Sometimes a degree of ambiguity (or a lack of clarity) is needed in order to achieve consensus and socially desirable outcomes. Henry Kissinger coined the term "constructive ambiguity" to refer to the deliberate use of ambiguous language in order to advance negotiation and agreement. Ambiguity also allows learning.[14]

To be clear, however, proposals to "clarify" the existing SSO IPR or RAND policies by "reading into" existing RAND declarations requirements not already agreed to do not, in our opinion, amount to a "clarification" so much as to a substantive rewriting of the rules. This affects the respective positions of patent holders and manufacturers of standards-compliant products. In particular, issues surrounding *ex ante* and *ex post* reasonable are discussed in section IV below.

b. Non-discriminatory

Just as with the "(fair and) reasonable" aspect of RAND, most SSOs provide little or no guidance as to how they interpret the "non-discrimination" aspect of RAND. From economic and public-policy perspectives, one can think of the non-discrimination aspect of RAND as having two different facets, which I will term the "process focus" and the "outcome focus," respectively, in what follows.

Both focuses take as their starting point the proposition that a licensor should treat "similarly situated" licensees (or prospective licensees) similarly. But "similarly" does not necessarily mean "identically." And the determination of whether two prospective licensees are "similarly situated" raises a host of complicated issues, especially since a patented technology can be used in very different ways at different levels of the overall "value chain."

The "process focus" acknowledges that the licensing process generally involves negotiations back and forth between the prospective licensor and the prospective licensee, in which the parties make tradeoffs among various considerations (e.g., the scope of the license (whether restricted to certain products or fields of use or unrestricted), patents covered, duration of the license, form of payment (whether running royalty or lump sum), other differences (including the geographic distribution of the licensee's production and sales of licensed products), extent of any cross-license, and a host of other tradeoffs that can vary across different prospective licensees and over time depending on market conditions).

Prospective licensees may be concerned that the patent holder is "discriminating" against them during the negotiation *process*, treating some licensees more or less favorably when negotiating different terms that satisfy the licensee's particular preferences. A non-discriminatory licensing *process* would require that the patent holder respond similarly to different prospective licensees, while still allowing licensees to negotiate terms that suit their particular needs.

By contrast, the "outcome focus" looks at the outcomes of the licensing process, whether in the form of the initial licensing offers or (more commonly) the terms of the agreed-upon licenses. Using an outcome focus approach, there could be (some degree of) "discrimination" if different licensees paid different royalties for similar license rights.

By way of illustration, suppose two licensees received otherwise-identical license grants (same patents, same geographic territories, same fields of use, etc.), but one licensee paid a 4-percent royalty while another paid a 5-percent royalty. Looking only at the final *outcome*, one might argue that the result involved "discrimination." But from a process perspective, the *process* leading up to the different license terms might not have been discriminatory. For example, it is a commonplace in countries in which bargaining or haggling is the norm for different buyers to pay different prices for "the same good" as a result of differences in their bargaining abilities or relative bargaining positions. There may have been no "discrimination" in the negotiation *process*—each party to the negotiation sought to achieve the best deal it could, with offers and counteroffers, and during the back-and-forth negotiation process, it can transpire that some buyers are just "better bargainers" than others. By way of contrast, if the seller resolves that it will treat certain types of buyers differently (e.g., by treating rivals differently than non-rivals) during the negotiation *process*, then from a "process focus" perspective the negotiation may be "discriminatory" even if the *outcomes* of two negotiations might turn out to be the same.

I draw this distinction between an "outcome" and "process" focus view of RAND because it reflects two somewhat different, though in many ways complementary, ways of understanding and interpreting what a RAND assurance requires. In my opinion, the two approaches should be used in combination when determining whether a prospective licensor complied with its RAND assurance.

[14] Stefan T. Trautmann, and Richard J. Zeckhauser, "Shunning Uncertainty: The Neglect of Learning Opportunities," 79 *Games and Economic Behavior*, 44–55 (May 2013).

I note that *some* sorts of price-setting mechanisms involve situations that clearly are non-discriminatory from both outcome and process focus perspectives. The best known is the Western practice for many mass-market products and services, whereby a seller posts a price for a given commodity with fixed features, sells the commodity at that price to anyone that wishes to purchase at that price, and does not negotiate terms with anyone. Such a "take it or leave it" approach to pricing is common in Western societies, as anyone who has shopped in a supermarket can attest.

But such an approach is much less realistic when the non-price "terms and conditions" of the sale vary depending on customers' needs. Using a simple "take it or leave it, fixed terms" negotiation approach can be entirely impracticable when some prospective licensees want paid-up licenses, others want percentage-based running royalties, and still others want cents-per-unit running royalties—or when some prospective licensees are willing to accept narrower license grants (e.g., only to the licensor's existing portfolio of "essential" patents, or to a subset of that portfolio), and other prospective licensees want broader license grants (e.g., to include after-acquired patents or non-essential patents).

Because of these differences, it is not uncommon for different licensees to negotiate licenses with different scope and different licensing terms.

More, overemphasis on an "apples-to-apples"–type outcome-focus comparison of licensing terms is complicated when license terms or conditions vary. When determining whether two licenses that call for the licensees to pay different running royalties are "discriminatory" in the "outcome focus" sense, there is no clear way to go about weighing in to balance the fact that the other, *non*-royalty terms of those licenses, or the conditions under which the licenses were entered into, may be or may have been different.

I do not mean to suggest that a "uniform" licensing policy, in which all licensees selling comparable products receive the same non-monetary terms and pay the same running royalties (whether percentage- or cents-per-unit based) would be inconsistent with a RAND assurance. By way of analogy, there does not appear to me to be any "discrimination" when a supermarket posts its prices (e.g., $2.59 per box for Cheerios) and charges all customers that same price. But in my opinion, such uniformity is not required, even on an outcome-focus basis, in order to comply with a RAND assurance.

It is worth pursuing the supermarket analogy a bit further. It is commonplace that retailers put items "on sale." Cereal that sold last week for $2.59 per box is now on sale for $1.99 per box for a limited time. After the sale is over, the price will go back up to $2.59 per box. A disgruntled customer who wants to buy when the cereal is *not* "on sale" might argue that he/she is being "discriminated against" because another customer, who bought the cereal while it *was* on sale, paid a lower price for what is otherwise "the same" cereal.

There clearly is a sense in which such limited-time sales are arbitrary. Why should a customer who buys at 10 minutes *before* the sale starts pay a different price than a customer who buys the same product 10 minutes *after* the sale starts? But a strong argument can be made that there is no "unfair discrimination" here. Both customers have the opportunity to buy the item at the then-prevailing price. The fact that the then-prevailing price *changes* over time does not mean that there is any "unfair discrimination."

In particular, a patent holder may give more favorable licensing terms to early licensees in an effort to induce others to take licenses and "validate" its licensing program, as firms are naturally reluctant to take licenses (and pay royalties) when their competitors are not paying. In our view, such a situation is not "discriminatory" in any economically meaningful sense.

VI. *Ex ante* and *ex post* reasonable royalties: Patent "hold-up" and "reverse hold-up"

a. Introduction

"Hold-up" concerns are central to many current proposals for restrictions on RAND licensing These concerns are usually advanced along with arguments that the return to the patent owner for the use of its technology should be limited to the "inherent" contribution of the technology and its "incremental value" compared to alternatives, prior to the adoption of the standard, with no allowance for the value derived from the adoption of the standard itself. In other words, it is argued that RAND royalties should not benefit from any *ex post* "hold-up" advantage derived from essentiality and the implied switching costs.

Reverse "hold-up" or "hold-out" occurs when infringers fail to take licenses and claim the price is too high. In the absence of a court ordered injection, this behavior can continue for long periods of time. There may or may not be genuine issues of fair or unfair royalties at issue.

The theoretical possibility of "hold-up" is the main basis for arguments to limit the availability of injunctions for SEP owners as a means of applying this market power, and for *ex ante* royalty rates based on the incremental value of the technology compared to the next best alternative, such as in *ex ante* licensing auctions. The issues of hold-up and appropriate royalty rates may be aggravated by royalty stacking, though the issues of cumulative royalties for complementary IP inputs are conceptually separate and may best be treated independently.

Yet the bases for these interpretations of hold-up are by no means clear and in many cases may not bear close economic analysis. The definitions are often vague and not clearly distinguished from the exclusionary power that is part of the patent grant for any patent, SEP or non-SEP. The typical definition of hold-up applied to SEPs is "excessive" royalty demands by a patent holder, made possible by opportunistic licensing by patent holders that may occur if firms exploit market power they may have gained through their technology's inclusion in a standard. In particular, if the holder of patents on key technologies for a given standard refuses to license those patents on reasonable terms, SSO members can face significant switching costs in redefining or abandoning the standard. This is a standard hold-up problem as described in Farrell et al. (Farrell, Hayes, Shapiro & Sullivan, 2007)[15], Lemley and Shapiro (Lemley & Shapiro, 2013)[16].

[15] Farrell, Hayes, Shapiro & Sullivan, "Standard Setting, Patents, and Hold-Up," *Antitrust Law Journal* 74:3 (Fall 2007): 603-670.

The key distinction is that for SEPs, switching costs of not using the standards essential technology may be greater than for a "stand-alone" technology, since the licensee would need to give up the benefits of producing standards-compatible products, as well as "writing-off" other standards- or patent-specific investments it has made. As far as is possible to tell from the various representations of hold-up, the key complaint of the proponents of *ex ante* licensing is that allowing an SEP owner to benefit from the standard would be economically inefficient because the return that can be claimed is greater than the contribution of the technology to the final product.

Farrell, Hayes, Shapiro & Sullivan and Lemley &Shapiro claim that this contribution should be limited to the "inherent" improvement of the technology compared to the status quo, or in some cases the next-best alternative technology. There would be no allowance for the value of the standard itself, even though this may have been enabled by the technology in question. I note that, from a public policy perspective, there is no *a priori* reason why patent holders, who participate in the collaborative standardization process, should not receive some portion of the "gains from trade" associated with that standardization, in the form of royalty rates that exceed the "inherent" *ex ante* value of their patented technology. Otherwise, *all* "gains from trade" flow to implementers or end users.

From an economic viewpoint, appropriate royalties may be measured against a backdrop of economic efficiency. The amount paid for access to the technology should reflect the contribution of the technology. This is essentially the measure adopted by Farrell, Hayes, Shapiro & Sullivan and subsequent commentators. However, the interpretation of this measure, and in particular what should count as the total contribution of the technology in question, may leads to different views on appropriate royalties. At one extreme, for Farrell, Hayes, Shapiro & Sullivan, it may lead to blanket assertions that any monopoly premium pricing due to standards essentiality is barred.

However, appropriate incentives for both innovation and application of technology are necessary, and patent holder should be able to claim a return that is consistent with the total contribution of the technology to the value of products incorporating the technology. This is how the patent system works: the inventor has an opportunity to earn a reward in the marketplace. This may not be directly linked to the invention and R&D effort, since the return must allow for unpredictability of innovation and for the funding of failed projects and dry wells. But overall, to cover the often high costs of R&D, the return in technology market supply and demand should equate on average the return to R&D should be sufficient to ensure further investment and should reflect the value created in the product market. This is not only how the patent system works; it is also how economists expect competitive markets to work in the long term—suppliers earn a return consistent with their contribution to the product.

Critically, the contribution includes some of the value generated by the standardization process itself. This is necessary to correctly align the incentives for participation in the development as well as the implementation of new technology and standards. I also note that the alleged theoretical problems of hold-up do not appear to be borne out in practice, based on the lack of evidence of actual cases of hold-up in the industry.[17] From a practical and theoretical viewpoint in ICT industries, this value is best identified in bilateral portfolio licensing negotiations normally carried out *ex post*, once the standard and products are established. Moreover, the problem of reverse hold-up or simple "holding-out" (i.e. infringing) ought to be of symmetric concern. After all, the patent owner has a lot at risk too… often years of sunk investment in R&D.

More generally, I also believe that greater stress should be given to the total welfare benefits of innovation and standardization. Any potential allocated inefficiencies associated with the share of rents to developer and implementer, which in practice are likely to be of a "second order" compared to the total economic impact of the new standard, must be balanced against the potentially much greater harm to dynamic efficiencies and competition and the social costs of delay in the development and introduction of new technology. The bulk of the benefits of innovation and standardization are likely to go to consumers in the form of lower prices and higher quality products. Potential damage to the timely development of technology and introduction of new standards is likely to have a greater negative impact on total welfare than potential issues about the allocation of rents in licensing negotiations. Competition analysis may be expected or required to assess competition by including rule of reason or public interest tests. This last is missing from most discussions of hold-up and competition.

b. Origins of "hold-up" theories in economics

As noted, recent debate has discussed whether "reasonable" royalties should be determined on an *ex ante* or *ex post* basis. This is a complex issue. In order to determine what is correct, some background is first necessary.

My U.C. Berkeley colleague, Nobel Laureate economist Oliver Williamson, was the first to introduce the concept of "hold-up" into the scholarly literature.[18] The concept derives from what he called a "simple contracting schema" in which special purpose technology is needed to perform an economic task, and it requires investment in transaction specific durable assets. Williamson notes that when transactions require investment in special purpose technology, "productive value would be sacrificed if transactions of this kind were to be prematurely terminated."

Moreover, in case the purchasing party engages in *ex post* opportunism, Williamson saw the need for "safeguards." The protective safeguards to which he refers:

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[16] Lemley & Shapiro, "A Simple Approach to Setting Reasonable Royalties for Standards-Essential Patents", *Berkeley Technology Law Journal* , (March 30, 2013)

[17] See Damien Geradin, Anne Layne-Farrar, and Jorge Padilla, "The Complements Problem within Standard Setting: Assessing the Evidence on Royalty Stacking", *Boston University Journal of Science and Technology*, Vol. 14, No. 2, (2008).

[18] Williamson, however, attributes it further back to Alfred Marshall (see footnote 10, p. 52, Williamson (1985)).

> "… normally take on one of more of three forms. The first is to realign incentives, which commonly includes some type of severance payment or penalty for premature termination. A second is to create and employ a specialized governance structure to which to refer and resolve disputes. The use of arbitration, rather than litigation in the courts, is thus characterization of node C governance. A third is to introduce trading regulating that support and signal continuity intentions. Expanding a trading relationship from unilateral to bilateral exchange… through the concerted use, for example, of reciprocity… thereby to effectuate equilibrium of trading hazards is an example of the last. This simple contracting scheme applies to a wide variety of contracting issues" (Williamson, 1985, pp. 33–34).[19]

The premature contractual termination to which Williamson refers is due not to force majeure and acts of God but to opportunism by the party that has not made specific (irreversible) investments to support the transaction. However, Williamson does "not insist that every individual is continuously or even largely given to opportunism" (p. 64). He merely assumes that "some individuals are opportunistic some of the time" (p. 64). Williamson is also quick to point out that "absent the hazard of opportunism, the difficulty would vanish" (p. 63). Williamson defined "opportunism" as "self-interest seeking with guile." Guile involves some degree of trickery or underhanded behavior. However, Williamson did not see this as a problem that required regulatory intervention. Rather, "*ex ante* screening efforts are made and *ex post* safeguards are created. Otherwise, those who are least principled (most opportunistic) will be able to exploit egregiously those who are more principled" (p.64).

While Williamson has identified a class of phenomenon of great theoretical interest, he is quick to recognize that it only comes into play in very limited circumstances. Specifically, "it is when incomplete contracts are confronted by unanticipated disturbances that interesting choices among alternative modes of contracting… are posed" (Williamson, 1999)[20]. This leads inexorably to his statement that "my position, then and now, is that simple hold-up is rare and that the central problem of economic organization is adaptation" (Williamson, 1999, p. 34).

Moreover, in Williamson's pioneering framework, the risks of hold-up, however small, can be managed through "safeguards." In the context of patents and the licensing of SEPs, RAND provides the necessary safeguards for those rare instances in which "hold-up" is a problem. Another form of safeguard is what he calls the "exchange of hostages", represented in the patent context by cross licensing.

Some scholars, purportedly relying on the Williamson framework, attempt to justify what can be referred to (at least in theory) as an *ex ante* approach to royalties. According to certain scholars, royalties are to be set for SEPs, somehow, before the standard is agreed. This doctrine has serious problems, from both theoretical and practical positions. These can be disaggregated into the following:

a. Temporal problem

When exactly is the *ex ante* period? When does the *ex post* period begin?

b. Extreme fuzzy boundary problems

How does one actually determine the boundaries, claims, and value of a patent, often long before it is issued or before one has market evidence of the commercial success of the technology? Calculating the value of property rights not yet existing when there is also great uncertainty as to its likely metes and bounds, and the commercially available substitutes, is a herculean task.

c. Distributional issue

When the patents at issue help shape the standard and improve its attractiveness, what portion (if any) of the values conferred by standard adoption should be shared with the patent owner? What portion should ensure to the benefit of the licensees? This needs to be looked at from social and private welfare perspectives.

Some of these issues are discussed in more detail below. Consider first the temporal issue. In order to understand the economic implications of patent licensing, it is useful to review the temporal perspective one should utilize for determining a royalty rate consistent with a RAND commitment. Simplistic distinctions between *ex ante* and *ex post* are, from an economic perspective, not useful for specifying a framework to determine royalty rates consistent with a RAND commitment. Serious problems would be encountered in endeavouring to implement and operationalize an *ex ante* framework. An *ex ante* approach would almost certainly lead to a series of disputes that would make the approach impossible to implement in almost all circumstances. These disputes would, among other things, encompass appropriate timing, information to be considered, and relevance and feasibility of purported alternatives.

Most scholars and the courts purpose is utilizing the construct of a hypothetical negotiation to set the rate that would have been set if the infringer had taken a licence. To use this construct, one must determine the appropriate date of the hypothetical negotiation. Consideration of the proper date is important because perceptions of the value for any specific unit of IP may change over time. For those that advocate an ex ante approach, there is no consensus as regards an *ex ante* date of negotiation for FRAND royalties. For these advocates, it could not be the date of first infringement, as that would be *ex post* (i.e., after adoption of the standard). Should it be before the first meeting of the relevant standards committees? Is it to be the date the specific IP at issue is first discussed by the SSO (assuming such a date can be identified with any precision)? The date or dates on which one or more competing IP proposals were rejected? The date the draft standard first incorporates the chosen IP? Or any one of a myriad of other possible dates? Clearly, an ex ante approach is fraught with hazards and is non-robust as to time period.

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[19] Williamson, O., The Economic Institutions of Capitalism, (Free Press, 1985).

[20] Williamson, O., "Strategy Research: Governance and Competence Perspectives," *Strategic Management Journal*, December 1999, 20, pp. 1087-1108.

As noted, one obvious problem with a rigid valuation approach focused on the period prior to elimination of any technical alternatives during the standard-setting process is that many of the patents that will become SEPs may not have even been issued at that time. In such cases, neither the ultimate existence of a patent nor the scope of that patent would be clear to either the owner or the prospective user.

This points to another practical problem in implementing an *ex ante* approach: the fact that on the date set for any hypothetical negotiation, there may have been no actual negotiations for the IP in question, because no patent may have existed at all. It seems unlikely that IP owners could be adequately compensated for their IP before a patent has even issued, as prospective buyers might dispute whether a patent would ever be issued and, if it was, dispute the likely scope of any claims associated with any possible patent.

Even aside from this significant problem, unlike many reasonable royalty cases, there may be no actual negotiations that could be used (either for the technology in question or presumed "alternative" or even "comparable"[21] technologies) to provide guidance as to value at the chosen hypothetical negotiation date. Add likely disputes about the perceived value of the technology at issue as at the chosen date and other problems, and one can understand why the supposedly simple framework articulated by *ex ante* advocates would generally be difficult to put into practice, even if there were a consensus that it would be preferred.

The situation becomes even more complex once one recognizes that SEPs are virtually always licensed as portfolios, so there may be a different date associated with each of the patents in the SEP portfolio of the IP owner.[22] Moreover, the relative usefulness of, or potential alternatives to, a particular technology may be different depending on the date chosen. Further, one would need to assess the alternatives available at some hypothetical negotiation date for each SEP in the portfolio.

I. By way of summary:

a. A RAND commitment is fundamentally one that requires an appropriate balance between the needs of IP owners and IP users.

b. Owners of SEP's should not capture value that is not implicit in the technology they contribute; nor should they be denied the value associated with their contribution to the standard. A balancing of interests between technology developers and users is required.

c. There are fundamental problems in trying to implement an (ex ante) approach that asserts that all patents must be valued at a specific point in time, prior to their adoption in the standard. This scenario is likely to predate the availability of knowledge about the contribution of the technology to the standard.

d. Information on patent values changes over time. Newly available information can indicate technology is more or less valuable than its perceived value at prior points in time (when less information was available).

e. The standard-setting process plays an important role in disseminating information about technology (both the selected technology and any technical substitutes). SSO working groups generally attempt to incorporate what they believe to be the best technology given the circumstances and objectives. Consequently, the SSO process itself helps inform participants about the value of the technology they adopt (and its value in relation to any alternatives that might be proposed).

f. Ultimately, the most efficient and effective manner to achieve the objectives of a RAND commitment would be to: (i) recognize the constraints that a RAND commitment imposes on IP owners; (ii) incorporate the information on value that, among other sources of information, the SSO process provides; and (iii) engage in commercial negotiations to achieve a mutually satisfactory IP license.

g. However, I recognize that it is not always possible for IP owners and users to achieve this result in commercial negotiations despite their best efforts to do so; or, in some cases, simply because one or other of the parties is not negotiating in good faith and/or is an unwilling licensor or licensee. In those cases, my view is that the parties should resolve their differences through a judicial process, or possibly through a quasi-judicial process such as arbitration.

My view is (a) that patent hold-up is rare and that (b) patent hold-up or hold-out is as serious issue and (c) RAND commitments, from an economic perspective, are contractual commitments that readily lend themselves to resolution (assuming both parties are willing buyers/sellers) in a forum designed to resolve contractual disputes. Endeavouring to introduce ex ante valuation concepts, as if ex poste opportunism is a serious problem, will simply encourage more infringement and clutter the courts with disputes that could otherwise be resolved in the marketplace so long as balancing of interests is the leitmotif of all parties to the transactions in question.

[21] There would likely be disputes in many cases as to what constituted "alternative" or "comparable" technologies.

[22] Fixing a separate *ex ante* date for each SEP in a portfolio would likely both complicate the negotiation process to such an extent that agreement might never be possible and substantially increase transaction costs.