

## **SSO Rules, Standardization, and SEP Licensing: Economic Questions from the Trenches**

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This roundtable has gathered some very serious economists and legal scholars. I am neither; I am an active, practicing courtroom litigator. What do I have to bring to the table that could merit the attention of this group? What I bring are questions from the trenches of industry and law. After years of litigating and advising concerning the licensing of standards-essential patents (“SEPs”), I’m still short on answers, but believe I have questions that are of critical importance to the current policy debate, but that may not be apparent from an academic seat. I believe I also have some “How does it really work?” information that may be useful to you as you frame your own questions and research.

Because I claim to speak from experience, I should lay out that experience. I was dragged abruptly into the early stages of the FRAND licensing wars when I was brought in to represent Qualcomm in litigation against Nokia in 2007. This was the first case I am aware of in which parties submitted expert reports on the meaning of FRAND and how a FRAND commitment should be enforced. Since then, I have also litigated FRAND issues in two private arbitrations.

Intrigued by some of the historical record we dug up in the Nokia litigation, I later joined with Professor Geradin to publish an analysis of the development

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of the IPR licensing rules of the European Telecommunications Standards Institute (“ETSI”), one of the most commercially significant standards-setting organizations (“SSOs”). Primarily we addressed not an economic or legal question, but an historical one: “What did those who developed and adopted that particular policy intend at the time they adopted it?”

In addition to litigation and historical research, my role as a legal advisor has given me numerous real-world, real-time glimpses into how companies in standardized industries interact with the standards-setting process and with licensing under FRAND obligations. Among other things, I have observed or advised concerning the following:

- The actual process of negotiating changes to SSO IPR rules;
- Decisions as to whether to participate actively in particular standardization projects;
- Decisions concerning the allocation of resources to develop the technology that will—or might—make the next standard possible;
- Decisions as to what technologies to propose for inclusion in a standard, when to support proposals by others, and when to acquiesce in the proposals of others;
- Successful negotiations for patent licenses, before, during and after the adoption of relevant standards;
- Failures to reach agreement through negotiation, leading to litigation; and
- Litigation in turn leading back to the negotiation table, and resolution.

I have watched and advised real executives obliged to make real decisions in real time. That, perhaps, provides some data points that would be hard to come by in academia.

Meanwhile, I have also been listening to and participating in the policy debates taking place internationally concerning standards-setting and the use and licensing of SEPs. Troublingly, a great deal of the economic argument that I hear has little to do with what I have seen in the real world. Where, I have wondered, are the serious economists?

Two years ago, I worked with Professor Spulber on a project, and suddenly I *was* dealing with a very serious economist. And I began complaining to Professor Spulber about questions far beyond the scope of that project. That began a long-running conversation. Ultimately, he invited me to bring my questions to this gathering of experts, and I am honored to do so.

At the time of this writing, I have had the opportunity to review the abstracts of the papers to be discussed at the upcoming Roundtable, and it is clear that this gathering is starting an important process. Already new questions are being asked. More sophisticated analyses are being offered. I am hopeful that, given the importance of and interest in this topic area, many of the questions discussed during this gathering will take on a life of their own, and attract further work and publication by a wider circle of scholars. In that hope, I will put some additional questions on the table for the consideration of the Roundtable participants and others who may read the proceedings, along with some factual context that may shed light on the questions.

My real-world experience and my questions are in the context of the cellular telephony industry in particular. That is the context for the currently raging policy debate concerning standardization and licensing, but it is important to recall that standards, SEPs, and FRAND commitments are nothing new. Since the early twentieth century, at least hundreds of SSOs have operated and created literally thousands of

commercially important standards, all relying on consensus and basic tools such as FRAND commitments. Whatever governmental or judicial rules, whatever competition law doctrines emerge from the current debate will affect industries unrelated to cellular telephony, and had better be fundamentally sound. That which demonstrably needs fixing should be fixed based on careful economic analysis rather than partisan economic interest. That which is working must not be broken.

So, what is the situation in the cellular industry today? What is working? What needs fixing?

Following in the footsteps of several major articles published by Professors Shapiro, Farrell, Lemley and others in 2007,<sup>1</sup> the FTC has for several years been asserting that standardization causes or will cause SEP owners “to negotiate high royalty rates and other favorable terms, after a standard is adopted, that they could not credibly demand beforehand, a form of ‘patent hold-up’”.<sup>2</sup> “[T]he threat of hold-up”, the FTC has said, “gives patent holders excessive bargaining power in component-based industries that allows the patent owner to capture value that has nothing to do with its

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<sup>1</sup> See, e.g., Joseph Farrell, John Hayes, Carl Shapiro & Theresa Sullivan, *Standard Setting, Patents, and Hold-Up*, 74 ANTITRUST L.J. 603, 608 (2007) [hereinafter “Farrell, *Patents and Hold-Up*”] (“Standards hold-up is both a private problem facing industry participants and a public policy problem.”); Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 2016 (2007) [hereinafter “Lemley, *Patent Holdup and Royalty Stacking*”] (“[The] problems of holdup and royalty stacking can be severe in the case of private standard setting.”); Mark A. Lemley, *Ten Things to Do About Patent Holdup of Standards (And One Not To)*, 48 B.C. L. REV. 149, 154 (2007) [hereinafter “Lemley, *Ten Things*”] (“Standard setting makes the holdup problem worse because it leads to the creation of irreversible investments.”).

<sup>2</sup> Brief of Fed. Trade Comm’n as Amicus Curiae Supporting Neither Party, at 4, *Apple Inc. v. Motorola, Inc.*, No. 2012-1548 (Fed. Cir. Dec. 4, 2012) [hereinafter “FTC Amicus”]; see also FED. TRADE COMM’N, *THE EVOLVING IP MARKETPLACE: ALIGNING PATENT NOTICE AND REMEDIES WITH COMPETITION*, 8, 22 (March 2011) [hereinafter “FTC, *Evolving IP Marketplace Report*”] (asserting that there are “many cases” where hold-up can occur and presuming that it does).

invention”.<sup>3</sup> “Moreover, hold-up and the threat of hold-up can discourage innovation by increasing costs and uncertainty.”<sup>4</sup> The FTC has also asserted that where a product practices a large number of standardized patents, so-called “patent thickets” are created, which will “increase transaction costs for manufacturers that seek to clear the rights needed to produce a product”.<sup>5</sup>

An industry on the brink of being throttled by patent hold-up, by excessive royalty demands and excessive licensing transaction costs. An ugly picture.

These warnings date back to 2007 and before. What has actually been happening since then?

It is probably fair to say that cellular technology has worked the fastest and most pervasive technological transformation in history. With nearly *6 billion* cellular subscriptions globally today<sup>6</sup> and over *1 billion* smartphone users<sup>7</sup>, cellular devices are by far the most widespread communications technology and by far the largest computing platform ever to exist. And numerically speaking, they hardly existed 25 years ago.

Every level of the industry has made and continues to make massive investments to create and support these new technologies. Qualcomm alone has invested

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<sup>3</sup> FTC, Evolving IP Marketplace Report, *supra* note 2, at 225 (internal quotation marks omitted).

<sup>4</sup> *Id.* at 226.

<sup>5</sup> *Id.* at 147. The European Commission has similarly sounded the alarm about hold-up, stating its concern about standardization causing SEP-holders to “extract[] excess rents by way of excessive royalty fees”. European Comm’n, *Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements*, 2011 O.J. (C11) 1, 58 [hereinafter “EC, Horizontal Merger Guidelines”].

<sup>6</sup> See Int’l Telecom. Union, *The World in 2011: ICT Facts and Figures*, at 2, available at [www.itu.int/ITU-D/ict/facts/2011/material/ICTFactsFigures2011.pdf](http://www.itu.int/ITU-D/ict/facts/2011/material/ICTFactsFigures2011.pdf).

<sup>7</sup> See Sara Dover, *Study: Number of smartphone users tops 1 billion*, CBSNews.com (Oct. 17, 2012), [www.cbsnews.com/8301-205\\_162-57534583/study-number-of-smartphone-users-tops-1-billion/](http://www.cbsnews.com/8301-205_162-57534583/study-number-of-smartphone-users-tops-1-billion/).

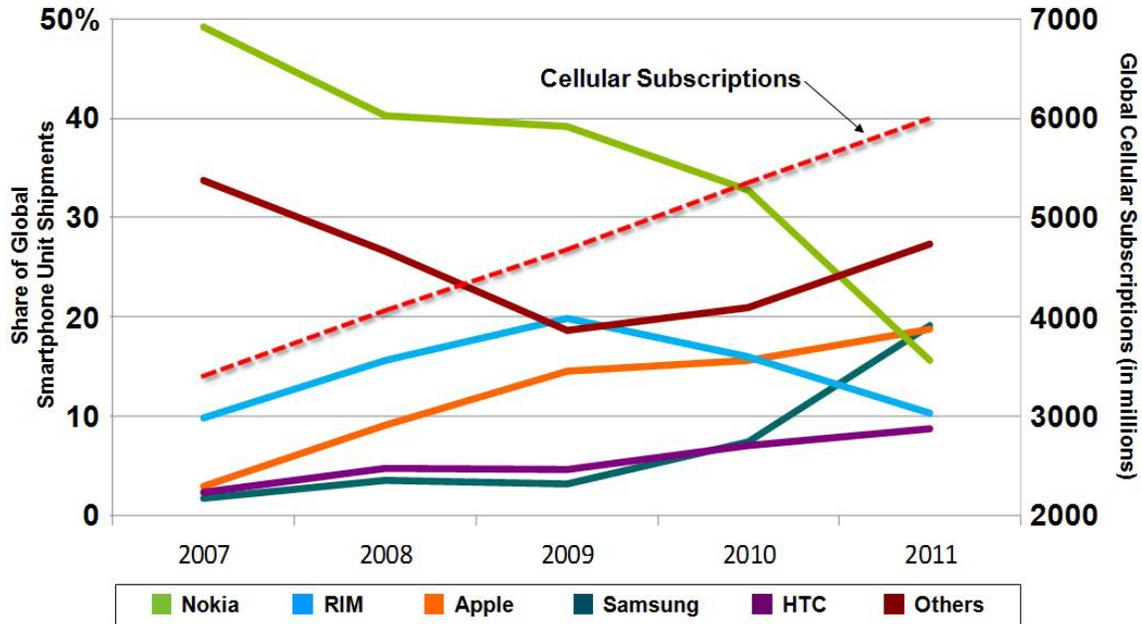
more than \$9 billion in R&D in just the last three years.<sup>8</sup> Neck-and-neck competition to bring the latest, greatest smartphones to the market continually dominates the financial and popular press. Carriers are spending billions sending trucks and crews to upgrade tens of thousands of cell base stations to support each new generation. Consumers are willing to camp out overnight in front of the carriers' stores to buy the devices. One can always argue that the "but-for" world would be better in some way, but in terms of the objective criteria of scale of investment, speed of innovation and commercial roll-out and consumer adoption, it is difficult to imagine how much better that "better world" could be.

I also observe a particularly interesting fact concerning this industry. The most important portfolios of SEPs are owned by early industry participants and R&D investors, including Qualcomm, Nokia, Ericsson and Motorola (now Google). If excessive royalties were favoring patentees and burdening other implementers, this should have the effect of raising barriers to the entry of new participants. But in fact, what we find is a pattern of successful entry at multiple levels by companies that did *not* participate significantly in the process of creating the 3G and 4G standards and did *not* invest substantially in the R&D that enabled those standards relative to other companies. For example, Apple and HTC are both successful "late-comer" entrants into the handset business, while Nokia and RIM have seen their shares of smartphone sales reduce significantly over the last few years.

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<sup>8</sup> Qualcomm, Inc., Annual Report (Form 10-K) (Nov. 7, 2012).

**Table 1: Global Shares of Leading Smartphone Industry Participants and Global Cellular Subscribers**



Sources: Bloomberg Finance LP and ITU Statistics (<http://www.itu.int/ict/statistics>)

So while popular models of this industry predict patent hold-up and market-damaging royalties, the cellular industry is in fact exhibiting rude health and intense competition open to new entrants. When model and reality disagree to this extent, surely there are interesting questions to be asked. When policy prescriptions are being urged and adopted based on models that do not describe the observed facts, we are at risk of breaking rather than fixing. More than a century ago, in a context also dealing with recovery of value for patent rights, the Supreme Court cautioned that “The vast pecuniary results involved in such cases, as well as the public interest, admonish us to proceed with care . . .”. *Adams v. Burke*, 84 U.S. (17 Wall.) 453, 455 (1873). I am concerned that when it comes to standardized industries, the “pecuniary” stakes have increased by several orders of magnitude, and the “public interest” is gravely implicated, yet the world regulatory community is not “proceeding with care”. Again, I’m hopeful

that the work done by the Roundtable participants, and the further questions they pose to the academy, will begin to change that situation.

That brings me back to questions. I must rely on trained economists to sift out the questions of true theoretical interest, and to frame them properly, but properly framed or not, I do have questions from one end of the standardization process to the other. I've gathered what seem to me the most important and interesting questions under six headings:

1. **Economics of SSO Rules Selection.** How do SSO rules regarding patent identification, declaration, and licensing come about? Why are they what they are?
2. **The Economics of Standards Creation.** What investments are necessary for the creation of a commercially successful standard? Who makes those investments, and in response to what incentives? What impact would various changes to those incentives have on the standards-creation process?
3. **Standardization and Risk.** How does the *fact* of standardization affect incentives facing industry participants, as compared to a non-standardized industry? Does standardization inherently reduce risk for all participants? For some but not others?
4. **Standardization and Hold-Up, In Theory and Practice.** Why do SSOs report no hold-up problems on their turf? Why do standardized industries flourish under the existing rules? And why do those who will require licenses—and who are thus theoretically at risk of hold-up—continue to invest heavily?
5. **Single Patent Models and Portfolio-Based Reality.** How, if at all, do models built around the development or licensing of a single invention relate to an industry uniformly characterized by portfolio licensing?
6. **FRAND Enforcement Mechanisms.** How does the selection of available enforcement mechanisms affect incentives?

## I. ECONOMICS OF SSO RULES: WHY ARE SSO RULES WHAT THEY ARE?

A great many voices, both governmental and academic, are currently making assertions concerning what IPR licensing rules SSOs *should* adopt. Royalty caps, allocation of royalties based on numbers of SEPs, arbitration of royalty disputes, a prohibition on seeking injunctions.<sup>9</sup> The *fact*, however, is that essentially no major SSOs have IPR policies requiring any of those things. Beyond requiring “fair and reasonable” licensing, those policies say very little that could be considered to speak in any way to the *allocation* of value as between patentee and licensee, or as between multiple patentees.

Taking the ETSI policy as an example, the policy was adopted in more or less its present form in 1994, and as Professor Geradin and I have detailed elsewhere, various members have proposed major changes have from time to time.<sup>10</sup> But as it stands today, the primary “policy objective” stated in ETSI’s IPR policy that is relevant to

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<sup>9</sup> For example, the DOJ has recommended that SSOs consider adopting policies that would include arbitration requirements and definitions of what a RAND rate is. See Joseph Wayland, Acting Assistant Attorney General, Antitrust Division, Dep’t of Justice, Remarks Prepared for the Fordham Competition Law Institute: *Antitrust Policy in the Information Age: Protecting Innovation and Competition*, at 9 (Sept. 21, 2012), available at [www.justice.gov/atr/public/speeches/287215.pdf](http://www.justice.gov/atr/public/speeches/287215.pdf). Professor Lemley argues that SSOs should adopt policies prohibiting injunctions and requiring *ex ante* commitment to specific royalty rates, and step-down royalty rates for later-disclosed SEPs. Lemley, *Ten Things*, *supra* note 1, at 157-61. The European Commission has also suggested that policies requiring *ex ante* disclosure of licensing rates would serve as a safe harbor from antitrust liability. See EC, Horizontal Merger Guidelines, *supra* note 5, at 62-63 (“[S]hould a standard-setting organization’s IPR policy choose to provide for IPR holders to individually disclose their most restrictive licensing terms, including the maximum royalty rates they would charge, prior to the adoption of the standard, this will normally not lead to a restriction of competition within the meaning of Article 101(1).”).

<sup>10</sup> Roger G. Brooks & Damien Geradin, *Taking Contracts Seriously: The Meaning of the Voluntary Commitment to License Essential Patents on "Fair and Reasonable" Terms*, in INTELLECTUAL PROPERTY AND COMPETITION LAW: NEW FRONTIERS 389, 398-401 (Steven Anderman & Ariel Ezrachi eds., 2011) [hereinafter “Brooks & Geradin, *Taking Contracts Seriously*”].

implementers is the modest goal of ensuring that necessary licenses be “available”.<sup>11</sup> The only “allocation-related” policy objective set out in the ETSI IPR Policy looks to protect the interests of *patentees*, not implementers or the public: “IPR holders . . . should be adequately and fairly rewarded for the use of their IPRs”.<sup>12</sup>

The interesting question is: **why are the IPR rules uniformly what they are, rather than what wise heads and regulators say they *should* be?**

I was delighted to see Professors Poblete and Llanes begin to dig into the economics of SSO rules. They focus on rules governing the *development* of standards rather than the rules relating to licensing, but the two surely interact.

I will suggest that any answer to “Why are SSO licensing rules what they are?” must begin with a model of what an SSO is for, *from the perspective of its members*. In my view, some of the recommendations regarding SSO licensing rules assume that a fundamental purpose of SSOs is to ensure equitable allocation of value among members. But I believe this hypothesis is the wrong place to start, and will not explain SSO rules as they actually exist.

Importantly, SSO rules are debated and decided by members *before* the creation of a standard. Agreed rules are a precondition to all the efforts, technical contributions and FRAND commitments necessary to that standard. In other words, the first and primary goal of the rules will necessarily be to *enable the creation* of new value that may otherwise never exist, rather than to achieve an *allocation* of value that has already been created. Because major SSOs are continually developing new or enhanced

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<sup>11</sup> ETSI Rules of Procedure, 30 November 2011, Annex 6, § 3.3, *available at* [www.etsi.org/images/etsi\\_ipr-policy.pdf](http://www.etsi.org/images/etsi_ipr-policy.pdf).

<sup>12</sup> *Id.* at §§ 3.1-3.2.

standards, every proposed rule change should be evaluated in light of its impact on the development of the *next* standard.

Thus, I will suggest that an SSO should be conceptualized as cooperation between R&D innovators and market-building implementers, between direct competitors and those in vertical relationships, with a primary goal of *creating* value that will not exist without cooperation by this full suite of participants. As a result, I will also suggest that, when debating FRAND licensing rules *prior* to the creation of a standard, *none* of the participants would favor IPR rules that foreseeably threaten depressed returns to patentees, or conversely that would enable “hold up” of licensees. If any participant can expect to be victimized in this way, then *all* participants must predict sub-optimal investment by that particular participant (or class of participants), and underinvestment at any point in the chain will result in lost value.

Of course, self-interested positions might be very different if the question on the table is retroactive policy changes that will affect standards already created and investments already made. But I would think that the disinterested policymaker, or the economist, should insist on a thoroughly *ex ante* analysis of the existing SSO IPR rules, or any proposed changes to those rules. Coming at the question from that angle, I believe there is important work to be done to explain why SSO rules are what they are.

## **II. ECONOMICS OF A SUCCESSFUL STANDARD.**

A complex mix of participants must be appropriately motivated if a standardization process is going to succeed, from R&D through actual standardization through commercial implementation. As we discuss changes to law or policy that would alter incentives, it would be prudent to have at least a basic model of the machine we are

adjusting. What categories of investment must be motivated in order for a standards project to succeed? I see a minimum of five major categories.

*First*, we need to motivate the investment in R&D necessary to create a solution that is better than the status quo technology. This cannot be taken for granted. Free-riding in the form of refraining from substantial standard-specific R&D investment, or a “wait and see” approach that leaves the most risky investment to others, is a viable business strategy followed by many companies. Professors Biagi and Denicolo discuss what I’ll call the “After you!” effect.

*Second*, we need to motivate formal participation in this SSO. This also cannot be taken for granted. Because non-members are fully entitled to practice standards and benefit from FRAND commitments, but do not themselves face any disclosure obligations, standing on the sidelines may be an option for some players in some settings. Given the anecdotal history I uncovered concerning previous threats by important members to leave ETSI over disputes about IPR licensing rules,<sup>13</sup> I am intrigued by the abstract of Drs. Layne-Farrar, Llobet and Padilla promising an analysis of the potential for ill-advised SSO rules to motivate industry participants to “sit out” the process and refrain from membership.

*Third*, our standardization project needs more than mere formal membership. We need to motivate substantive and indeed intensive participation in the standard-setting process itself. As a result of my representations on cases relating to the standardization process, I have learned that—over and above the cost of R&D—standardization is itself a costly process, and in particular for innovators who must do the heavy lifting of standardization. A cellular standard can run to thousands of technical

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<sup>13</sup> See Brooks & Geradin, *Taking Contracts Seriously*, *supra* note 10, at 399.

pages, developed over multiple years through thousands of technical submissions and hundreds of meetings in locations around the globe, requiring the time-consuming attendance of highly expert and hence particularly “expensive” engineers. No doubt companies are motivated to participate by their desire to have their own technology included in standards, and Professors Kyle and Salant discuss this incentive in their paper. But I have not encountered in any model or discussion a recognition of this cost—that standardization is time-consuming, expensive work. Again, standing on the sidelines and free-riding is a viable strategy, as late entrants to standardized industries have repeatedly proven. No doubt some free-riding can be tolerated, but for a standard to succeed, we need to attract the “all in” efforts of at least a number of major innovators.

*Fourth*, we need patentees to make FRAND commitments. Accepting these restrictions, however defined, is surely a major “investment” by the patentees—how major depending on how the commitment is defined. Again, FRAND commitments cannot be taken for granted without regard to nature of the IPR policies and the success in building genuine consensus concerning the standard.

*Fifth* and finally, once we have the technology and the standard in hand, we need to motivate what I will call the many classes of “market-creation investments”, including investments in product design, supporting infrastructure, development of complementary technologies, and marketing.

I understand that the real world is immensely complex, and that economic modeling requires simplification. But when I read policy arguments from important governmental sources that go no farther than arguing that royalties should be lower, because this will pass through in the form of lower prices to consumers, I fear that we have moved from the usefully simplified to the dangerously simplistic. I urge—no, I beg

for—an effort to develop a model of standardization and licensing that, at least to some degree, takes into account the five necessary categories of investment identified above.

This is closely related to the problem of static analyses. A great deal of much-cited work about SEP licensing and hold-up relies on static models; the authors *assume* the existence of the technology, the existence of the standard, and the existence of FRAND commitments on all SEPs. I expect that any model of standardization that really begins “*ex ante*” and takes into account these five categories of essential investment will demonstrate by contrast that static models are so unrelated to the real-world operation of an SSO as to be facially useless as a basis for policy recommendations.

### **III. STANDARDIZATION AND RISK.**

Concerns about incentives for investment are often brushed aside with a loose and sometimes unarticulated assumption that standardization provides a sweet and essentially “risk free” deal to innovators, who will be more than amply rewarded even if legal rules are changed so as to drive down royalties. As an observer through at least parts of two investment/standardization cycles in the cellular industry, I have seen something different: not necessarily the reduction of risk, but *changes* in the nature of risk and in the locus of risk. I will suggest that there is important work to be done here: From a truly *ex ante* perspective, before any companies’ investment decisions are made, and before any costs are “sunk”, how does standardization affect the risk facing needed investors of various classes? Whose risk is reduced? Whose is increased?

**Risks facing the R&D Investor.** For the fundamental R&D investor, what I have seen is *increased variance* in outcome. There is of course always the risk that an R&D project will fail technically. In a standardized industry, in which I as an innovator cannot feasibly take my solution to market unless it becomes part of the

standard, we must add to that the risk that even if I “succeed” in my R&D, a competitor’s solution will be selected for the next standard, resulting in *zero* market adoption of my invention. Of course, the flip side is that my invention may achieve “guaranteed” widespread use if it is included in the standard.<sup>14</sup> I have seen this added level of “all or nothing” risk influence management decisions, so I am interested in the finding of Professors Baron and Pohlmann that R&D consortia form more readily where independent research would lead to substitutable technologies—exactly where this added “all or nothing” risk exists. In other words, companies are sensitive to this risk, and look for ways to mitigate it.

Has standardization decreased *total ex ante* risk for the pre-standardization R&D investor? I must ask economists to tell us about the conditions that would make that true. And if I am correct that standardization increases *variance* for some classes of investors, what is the result for incentives and investment if we lay a legal hand on only one side of the risk distribution, attempting to cap the upside return in the event of success by limiting royalties to a “but for standardization” measure?

**Risks facing the post-standardization investor.** Other classes of investors make their investment decisions only *after* the standard is adopted: product developers, infrastructure developers, marketers. As in the “but for standardization” world, these participants in the value-creation chain face the risk of horizontal competition. However, they face a reduced risk of “betting on the wrong horse”, of

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<sup>14</sup> Of course, as Sprint’s WiMax experience reminds us, not all standards—even standards with billions in investments behind them—achieve commercial success, so general legal principles to govern licensing of SEPs cannot assume that inclusion in a standard guarantees large returns. Sprint invested heavily in WiMax as a head-to-head competitor with LTE, launching WiMax handsets in 2010 and providing WiMax coverage in many U.S. cities, but in 2011 Sprint announced that it is shifting to LTE. See Christina Bonnington, *So Long, WiMax: Sprint Confirms LTE Rollout by 2013*, Wired.com (Oct. 7, 2011), [www.wired.com/gadgetlab/2011/10/Sprint-lte-rollout-2013/](http://www.wired.com/gadgetlab/2011/10/Sprint-lte-rollout-2013/).

making technology-specific investments in expertise, manufacturing capabilities, complementary technologies, infrastructure or marketing that lose out when a different solution wins in the competition to be included in the standard.<sup>15</sup>

It is a fair question whether standardization in some other way decreases risks for R&D investors, or increases risks for post-standardization investors; I cannot claim to be comprehensive. My suggestion is simply that standardization may increase as well as decrease risks affecting needed investors, and that the affect of standardization on risks and incentives has not been studied with any rigor.

#### **IV. STANDARDIZATION AND HOLD-UP**

It is now the received wisdom that standardized industries, and the cellular industry in particular, are threatened or actually afflicted by a grave “patent hold-up” problem.<sup>16</sup> Hold-up is variously defined.<sup>17</sup> Most often, those using the term in the policy debate today appear to use it loosely to represent the conviction that SEP patentees are, after establishment of a standard, demanding and obtaining higher royalties than they would have been able to demand “but for” inclusion of their technology in the standard. (Stating the “problem” this way excludes from consideration the possibility that, due to changes to the *ex ante* risk profile facing R&D investors, the need to induce costly participation in the standardization process, or for other reasons, it might be economically

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<sup>15</sup> Investments by Sprint and Clearwire in WiMax appear to represent a (very large) “betting on the wrong horse” loss at the level of infrastructure investment, but this simply highlights the continued reality of later-stage competition *between* standards.

<sup>16</sup> *See supra* notes 1 and 2.

<sup>17</sup> In his foundational work on hold-up, Professor Williamson developed a definition that included “guile”, *see* Oliver Williamson, *THE ECONOMIC INSTITUTIONS OF CAPITALISM: FIRMS, MARKETS, RELATIONAL CONTRACTING* 61-63 (1985), and Professor Spulber’s analysis of “patent surprise” appears to implicate related concerns. However, many authors today are working with a definition of hold-up that apparently requires no element of either guile or surprise. *See, e.g.,* Farrell, *Patents and Hold-Up*, *supra* note 1, at 603-04.

*appropriate* that SEPs should earn higher royalties than those inventions could have commanded apart from standardization.) Professor Shapiro, before his time at the DOJ, published articles modeling, ostensibly with mathematical precision, how standardization results in hold-up.<sup>18</sup>

A. The Mystery of the Missing Hold-Up.

Is Shapiro's model predictive of empirical reality? We have already seen statistics concerning the cellular industry which I believe depict a flourishing and competitive market. I will also mention some more subjective evidence. Three SSOs submitted comments to the FTC shortly after it issued the Evolving IP Marketplace Report, including the Telecommunications Institute of America ("TIA") that sets U.S. cellular standards. The TIA as well as the Alliance for Telecommunications Industry Solutions reported that they had never encountered any complaints of "patent hold-up" in their industries,<sup>19</sup> while the American National Standards Institute, which describes itself as setting literally thousands of standards for industries ranging from "acoustical devices to construction equipment, from dairy and livestock production to energy distribution", reported that questions relating to hold-up had only been raised for "a relatively small number" of its standards.<sup>20</sup> Microsoft also submitted comments at that time asserting that it has seen "little evidence that 'patent hold-up' in the standards context is a real

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<sup>18</sup> See Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting*, in 1 INNOVATION POLICY AND THE ECONOMY 119, 149-50 (Adam B. Jaffe, Josh Lerner & Scott Stern eds., MIT Press 2001) [hereinafter "Shapiro, *Navigating the Patent Thicket*"]; see also Lemley, *Patent Holdup and Royalty Stacking*, *supra* note 1, at 1995-2003.

<sup>19</sup> Comments of Telecomms. Indus. Ass'n, June 14, 2011, *Fed. Trade Comm'n Request for Comments and Announcement of Workshop on Standard-Setting Issues*, Project No. P11-1204 [hereinafter "FTC Workshop"], at 4; Comments of Alliance for Telecomm. Indus. Solutions, June 14, 2011, FTC Workshop, at 1.

<sup>20</sup> Comments of Am. Nat'l Standards Inst., June 10, 2011, FTC Workshop at 12; see also About ANSI Overview, available at [www.ansi.org/about\\_ansi/overview/overview.aspx](http://www.ansi.org/about_ansi/overview/overview.aspx).

problem”.<sup>21</sup> Life and litigation being what they are, however, just over a year later Microsoft was putting noted University of Chicago economist Kevin Murphy on the stand in the Western District of Washington to warn of the problems associated with patent hold-up. But under cross-examination, Professor Murphy was unable to identify even a single SEP license that he believed included terms resulting from “hold-up”, and instead testified that the existence of hold-up “is an open question”.<sup>22</sup>

Once again, when the real-world facts and the received theory point in opposite directions, it seems to me that there is important work to be done on the theory. *Why* do SSOs report no hold-up problems on their turf? *Why* do standardized industries flourish under the existing rules? And why do those who will require licenses—and who are thus predictably at risk of hold-up if Shapiro’s model is indeed predictive—continue to invest heavily?

B. Market Constraints on Hold-Up.

In their 2012 paper in the *Journal of Competition Law and Economics* (a project initially funded by Qualcomm), Professors Spulber, Epstein and Kieff hypothesized a number of mechanisms that may operate to prevent hold-up in standardized industries: the widespread need for cross-licenses; the “repeat play” nature of standards-setting and license negotiation and related reputational effects; the ability of major industry participants to negotiate important portfolio licenses prior to the setting of

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<sup>21</sup> Comments of Microsoft Corp., June 14, 2011, FTC Workshop at 16.

<sup>22</sup> Hearing Transcript at 180, *Microsoft Corp. v. Motorola, Inc.*, No. 10-cv-1823 (W.D. Wash. Nov. 13, 2012). Two other experts sponsored by Microsoft testified similarly. *See* Hearing Transcript at 67, *Microsoft Corp. v. Motorola, Inc.*, No. 10-cv-1823 (W.D. Wash. Nov. 16, 2012) (Testimony of Timothy Simcoe) (acknowledging that he has “no evidence that the dispute between Motorola and Microsoft in this case is in fact based on hold-up” and that he “can’t nail down any particular license from any company as an example of hold-up”); *id* at 135-36 (Testimony of Matthew Lynde) (acknowledging that “I have no basis from economic evidence to conclude whether or not patent hold-up is a real problem”).

relevant standards; and more.<sup>23</sup> These hypotheses are interesting. I think they are probably genuinely explanatory. In fact, as a legal advisor I have personally seen each and every one of these mechanisms affect the course of real-world SEP license negotiations. But I do not believe that any attempt has been made to model any of them in any formal way.

C. “Ex Ante” or “In Media Res”?

It is now commonly urged that the solution to the assumed hold-up problem is for courts and regulators to enforce a rule that a patentee must seek royalties no higher than it could have obtained in a negotiation conducted before its technology became “essential” to the standard.<sup>24</sup> This is regularly referred to as a hypothetical *ex ante* negotiation. It is contended that to extract any higher rate must be an exploitation of standard-induced “lock in”, must be a violation of a “fair and reasonable” commitment, and may violate competition laws of some jurisdictions.

In that same paper, Professors Spulber, Epstein and Kieff pointed out that the so-called *ex ante* negotiation hypothesized in these arguments is in fact misnamed. Certainly, it occurs before the implementer has sunk any costs, but it occurs *after* the innovator has sunk *all* the costs of developing the technology.<sup>25</sup> In other words, it is a negotiation “*in media res*”, half-way through the investment sequence. What result do we predict from negotiating in that context? It is true that a great many patent licenses in the world are negotiated in that *in media res* context, with the patentee having sunk

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<sup>23</sup> Richard A. Epstein, F. Scott Kieff & Daniel F. Spulber, *The FTC, IP, and SSOs: Government Hold-Up Replacing Private Coordination*, 8 J. COMPETITION L. & ECON. 1, 15-25 (2012) [hereinafter “Epstein, *Hold-Up*”].

<sup>24</sup> See, e.g., FTC, *Evolving IP Marketplace Report*, *supra* note 1, at 9, 22-23.

<sup>25</sup> See Epstein, *Hold-Up*, *supra* note 23, at 8-10.

essentially all its costs, while the licensee has made at most early-stage investments. But on the other hand many licenses are negotiated after the licensee has also already made substantial investments—a “double *ex post*” context, with sunk costs and “lock in” all around. And finally, some licenses are indeed negotiated in a true, “double *ex ante*” context, in which *neither* side has yet sunk its major costs: an example would be development agreements in the form of “if you succeed in developing a drug that meets the following milestones, *then* I have an option to take rights in it on the following terms”. Is any one of these three “time of negotiation” alternatives in any meaningful sense a “truer” way of fixing the value of the licensed technology? Is there anything one can say about how these relate to the SSO members’ truly *ex ante* goal of creating incentives that will optimize all necessary investments so as to maximize value creation?

D. Competition Law and “Mandatory FRAND”.

Under the heading of “hold up”, let me raise a question concerning the origin of FRAND obligations. The European Commission’s *Guidelines On the Applicability of Article 101 of the Treaty On the Functioning of the European Union to Horizontal Co-Operation Agreements* could be read to suggest that for a patentee to demand royalties for SEPs higher than justified by an *ex ante* pricing model may represent hold-up and be an actionable misuse of market power *even if no FRAND commitment was ever given*.<sup>26</sup> I understand that argument. But if accepted, the implication of this argument is that a FRAND obligation is automatic and unavoidable once a decision of an SSO transforms it into an SEP. What would the effect of such a rule be on the nature of SSOs, who participates in them, how they decide on standards,

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<sup>26</sup> See, e.g., EC, Horizontal Merger Guidelines ¶ 268 (stating that “standardisation may lead to anti-competitive results . . . . If a company is either completely prevented from obtaining access to the result of the standard, or is only granted access on prohibitive or discriminatory terms”).

and what investments are made? Wouldn't an "involuntary FRAND" regime give SSOs an "eminent domain" power over IPR? If the voluntary consent of patentees is no longer necessary, won't implementers simply take over the standards-setting process? These seem to me to be very big questions with enormous policy implications; I have not seen them discussed, much less honored with disciplined economic analysis.

E. Hold-Up and Royalty Stacking.

The first question concerns royalty stacking. The FTC, echoing a number of commentators, has expressed concern that individual SEP holders, each exploiting "hold-up" power in its individual self-interest, will extract royalties that cumulatively "stack" to a level of total royalties (on cellular devices, in the most frequent example) that is unmanageable, economically excessive, and harmful to consumers.<sup>27</sup>

No sophisticated economic theory is necessary to say that "high" cumulative royalties are not necessarily inappropriate, particularly in an industry in which manufacturing marginal costs may be relatively low, while the scale of R&D investment necessary to create enabling IPR may be high. That needs to be said in the policy debate, but it isn't interesting here.

What may be interesting is the fact that, despite the existence of literally thousands of SEPs reading on the LTE standard, objectively problematic royalty stacking has not been identified; I think it has not occurred. Let me review a little history. When I was first drawn into the world of cellular licensing in 2007, the 3G standard was still new, licensing disputes were raging, and voices were warning that—absent judicial or

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<sup>27</sup> "Indeed, IT products are often surrounded by 'patent thickets'—densely overlapping patent rights held by multiple patent owners." FTC Evolving IP Marketplace Report, *supra* note 1, at 56. See also Shapiro, *Navigating the Patent Thicket*, *supra* note 18, 121-22; Lemley, *Patent Holdup and Royalty Stacking*, *supra* note 1, at 1994 (asserting that "evidence suggests that there are indeed very real problems associated with royalty stacking").

regulatory intervention of some sort—the greatly increased number of SEPs and SEP-holders relating to 3G as compared to 2G standards would result in crippling cumulative royalties.

That didn't happen. In fact, when I pulled the facts together for litigation purposes several years ago, the (admittedly limited) information available suggested that cumulative royalties for new entrants (as opposed to patent-rich incumbents that could obtain extensive royalty-free cross licenses) have actually proven to be *lower* for 3G handsets than for handsets introduced under the 2G GSM standard. Cumulative royalties to SEP owners remain a modest percentage of wholesale 3G handset prices—to say nothing of the revenues earned by network operators through those handsets. It is under the existing 3G license and royalty burden environment that new entrants with little to trade have been able to enter, flourish, and indeed turn the market upside down, as illustrated in my opening chart.

More recently, I encounter warnings that the LTE standard, which is subject to more SEPs than are the 3G standards, is at risk of crippling patent stacking . . . absent judicial or regulatory intervention to redefine FRAND to limit cumulative royalties.<sup>28</sup> But I have seen neither royalty figures nor signs of trouble in the pattern of adoption of 4G to substantiate those fears. On the contrary, we have seen rapid growth in LTE adoption. Quite simply, royalty stacking is a shoe that keeps on not dropping.

Why haven't those fears and projections been realized? If there are many more SEPs and many more SEP holders, each armed with hold-up power, why haven't cumulative royalty burdens sky-rocketed?

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<sup>28</sup> See, e.g., Comments of Cisco Systems and Research in Motion, June 17, 2011, FTC Workshop at 4 & n.11.

I do not know. But in a world filled with policy prescriptions driven by fear of excessive and escalating royalty burdens, I will again beg for some informed brainstorming, followed by some disciplined theorizing, by those with the horsepower to do so.

F. “Incremental Value” Pricing As a Benchmark for Hold-Up.

I mentioned that “hold-up” has been variously defined. As you know, Professors Lemley and Shapiro have suggested that any price for SEPs greater than the “incremental value” of the patented technology over the next best alternative must be the result of “lock in”, and represents hold-up.<sup>29</sup> The FTC has at least made noises suggesting endorsement of that standard.<sup>30</sup> Professors Spulber, Epstein and Kieff have elsewhere criticized the whole concept of “incremental value” as it pertains to patented technologies.<sup>31</sup> I have elsewhere summarized a number of arguments that incremental value does not make sense as a baseline for defining hold-up or FRAND.<sup>32</sup>

For this group, let me just circle back to my plea for serious study of the economics of SSO IPR rules selection: How does an incremental value pricing test intersect with the goals of patent policy? How does it relate to the *ex ante* goals of SSO members as they set their licensing rules when the standard is just a gleam in their eyes? Would they—would any cluster of interests within an SSO—rationally vote for a binding incremental value pricing test if asked at that point in time? If not, what relationship if any does incremental value have to a pricing rule that would make sense *ex ante*?

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<sup>29</sup> Lemley, *Patent Holdup*, *supra* note 1, at 1994-2003.

<sup>30</sup> FTC, *Evolving IP Marketplace Report*, *supra* note 2, at 194.

<sup>31</sup> Epstein, *Hold-Up*, *supra* note 23, at 37-40.

<sup>32</sup> See Roger G. Brooks, *Patent “Hold-Up,” Standards-Setting Organizations, and the FTC’s Campaign Against Innovators*, 39 *AIPLA Q.J.* 435, 467-71 (Fall 2011).

## V. STANDARDIZATION AND ENFORCEMENT MECHANISMS

Let me spend a moment on the mechanisms by which a FRAND commitment can be enforced. In recent actions relating to SEPs, the European Commission has brought<sup>33</sup> (and the FTC has threatened to bring<sup>34</sup>) competition law claims to punish alleged violations of FRAND obligations.

It seems largely undisputed that, if an SEP holder is demanding non-FRAND royalties, an infringer can assert this as a defense in private litigation. If Samsung's request for an injunction is inconsistent with its FRAND obligations, then a defendant can make this argument in private litigation, and a court will deny the injunction. The parties will win or lose that litigation, actual damages, if any, will be assessed, and we are done.

But now we have a regulatory agency seeking not damages, but penalties; not a mere adjudication as to whether FRAND terms have been offered, but a penalty if FRAND terms have not been offered. And this is discussed as if it were simply a natural part of ensuring the proper functioning of SSO FRAND licensing regimes. It seems to me more complicated than that.

Regulatory enforcement is inherently a one-way ratchet. It puts the patentee, but never the infringer, at risk of fines. It imposes costs of defense on patentees, while the cost of enforcement is borne by the public. It may compel a patentee to license for an amount that is less than necessary to provide an adequate return on its

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<sup>33</sup> See, e.g., Press Release, European Comm'n, *Antitrust: Commission opens proceedings against Motorola*, April 3, 2012, available at [europa.eu/rapid/press-release\\_IP-12-345\\_en.htm](http://europa.eu/rapid/press-release_IP-12-345_en.htm).

<sup>34</sup> Statement of the Fed. Trade Comm'n, *In the Matter of Robert Bosch GmbH*, No. 121-0081, at 2 (Nov. 26, 2012) ("Patent holders that seek injunctive relief against willing licensees of their FRAND-encumbered SEPs should understand that in appropriate cases the Commission can and will challenge this conduct as an unfair method of competition under Section 5 of the FTC Act."), available at [www.ftc.gov/os/caselist/1210081/121126boschcommissionstatement.pdf](http://www.ftc.gov/os/caselist/1210081/121126boschcommissionstatement.pdf).

investment, but cannot force an implementer to take a license at a rate that will deny it an appropriate return.

Carry this fact back into the license negotiation room. A great deal of theoretical work has been done modeling how parties arrive at a price through negotiation. Now, add to the mix the fact that we cannot know with any confidence what price a regulator may *later* determine to be the “FRAND price”. If I the patentee am “too successful” in our negotiation and we agree on a price that is later deemed “too high”, I may be slammed with very large penalties. If you the licensee are “too successful” and we agree on a price that is “too low” by some criterion, you simply laugh all the way to the bank. If we fail to agree on terms, you can complain about my demands to the regulator, and the public will bear the cost of proving your case against me. I, the patentee, by contrast, have no recourse but private litigation to force you to take a license. No one will pay my legal fees, and apparently even the act of trying to enforce my patent rights by “seeking” an injunction can put me at further risk of regulatory penalties.

Let us suppose that everyone in the negotiation room is aware of all those dynamics, as they surely are. How will this affect the negotiating positions of the two sides? What will the effect be on average “freely negotiated” royalty rates? What are the implications for returns on IPR, and for incentives in the whole standardization and standards-exploitation process? In sum, is regulatory enforcement just “one more means” of ensuring FRAND compliance, or does the presence of this new player on the field fundamentally change the game and thus the value of SEPs?

I am obliged to state my questions in the layman’s language of common sense. I suspect there are more intelligent and precise questions to be asked and analyses to be done.

## VI. PORTFOLIO LICENSING

I have saved for last a question that seems to me particularly difficult.

With extremely limited exceptions, the formal modeling I have seen relating to patent licensing concerns negotiations over the licensing of “a patent”. Academics and regulators bandy about models of negotiation and pricing that involve consideration of the probability of validity, comparison of the patented technology to alternative technologies, and the cost of “working around” the patent.

Meanwhile, it is a frequent complaint that important standardized industries are “patent thickets”,<sup>35</sup> in which an implementer must obtain rights to innumerable patents. Surely the task of evaluating and obtaining licenses to all these patents becomes overwhelming, and extremely costly to participants? Well, yes and no. Yes, attempting any sort of individualized evaluation and negotiation for all those patents would be overwhelmingly costly. But no, this proves not to be a crisis in the real world. The solution is that those individualized evaluations and negotiations simply are not done. Instead, the important negotiations are for undifferentiated rights to large portfolios, each portfolio implicating a diverse array of specific technologies, and including patents ranging from the very strong to the very weak. Any sort of “incremental value” analysis against alternative technologies is conceptually almost meaningless in this context of portfolio licensing and is almost certainly impossible. In fact, it is never attempted. Empirically, I will suggest that the so-called “patent thicket” problem may even be self-correcting: at some tipping point, industry participants deal with all those difficult patent-by-patent questions by not dealing with them, by negotiating licenses based on a different model.

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<sup>35</sup> See generally Shapiro, *Navigating the Patent Thicket*, *supra* note 18.

So the difficult questions: Do single-patent negotiation models bear any resemblance at all to, or cast any light at all on, portfolio licensing within patent-thick standardized industries? And, can economists develop models that describe the negotiation of portfolio licenses? And finally, can we bring such models into the discussion of the licensing of SEPs and the meaning and enforcement of FRAND obligations?

### **Conclusion**

I have offered what seem to me to be a number of serious and I hope interesting economic questions stirred up by real-world conflicts, practices, and incentives. Based on the abstracts, I am confident that the papers that will be presented at the upcoming Roundtable will provide some important new insights concerning the dynamics of standardization and the licensing of standardized technologies. But beyond these papers, I am hopeful that one of the *most* important results of this gathering will be more questions. Questions clearly stated, that tempt the wider academic community to bring the firepower of theoretically rigorous economic analysis to a debate that has been too heavily dependent on ends-oriented lawyers' arguments.