Economics of Standards and Standard Setting Organizations

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Antitrust & Intellectual Property: Standard Setting Organizations
SSO Basics

- **Standard Setting Organization** is usually a non-profit association of companies and other entities that devise technical standards and include horizontal competitors and potential implementors of the technology.

- Members include:
  - Producers of technology
  - Potential licensees
Sources of Standards

• Government
  – Gasoline additives
  – Building codes – *e.g.*, wire conduit for fire codes

• Private Consortia
  – Phillips and Sony for Compact Discs
  – SanDisk, Toshiba, Panasonic for SD Cards

• Industry Groups:
  – 3GPP/ETSI – WCDMA/UMTS standards
  – JEDEC – Semiconductors
SSOs and Contracts

• SSO by-laws create contractual duties
• Participants in a standards typically group must:
  – Disclose IP *asserted* as essential to implement a technology under consideration as a standard.
  – Disclose whether IP will be licensed for implementation of the standard on reasonable and nondiscriminatory grounds (RAND or FRAND).
  – Commitments made to standards groups are binding contractual commitments.
Benefits of Standards

• Create interoperability – effects magnified in networks (e.g. credit cards, phones)
• Standards benefit consumers and producers by promoting the adoption and implementation of technologies
Potential Antitrust Issues with Standards

Standards can potentially contribute to the acquisition or creation of market power:

- Patent holdup
- Collusion
- Exclusion of rivals (licensing, refusal to supply)

We’re going to focus on patent holdup, which has been a hot topic of late.
Preliminaries

• **Standard Essential Patent** is a patent that claims an invention that must be used to comply with a technical standard generally enunciated by an SSO. There could be hundreds, maybe thousands, of these for a standard.

• **FRAND**: SSOs often require that members agree to disclose patents on technologies to be included in a standard and agree to license those patents on “fair, reasonable, and non-discriminatory terms.” Some SSOs do not include the word “fair” in which case there are RAND obligations.
“ETSI's purpose is to produce and perform the maintenance of the technical standards and other deliverables which are required by its members (Article 2 of the ETSI Statutes - see ETSI Directives). Like most standards organizations, much of this work is carried out in committees and working groups composed of technical experts from the Institute's member companies and organizations. These committees are often referred to as 'Technical Bodies' (TB), and typically meet between two and six times a year, in the ETSI premises or elsewhere. They also rely heavily on electronic communications to help progress the work, especially in-between meetings.”

“When an ESSENTIAL IPR 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 licences on fair, reasonable and non-discriminatory (“FRAND”) terms and conditions under such IPR...”

“With some 33,000 granted patents, Ericsson is the largest holder of standard-essential patents for mobile communication. Our unrivalled patent portfolio covers 2G, 3G and 4G technologies, and we are a net receiver of licensing royalties with more than 100 patent-licensing agreements in place.”
Sometimes Parties Just Don’t Agree

The mediator sensed that the negotiations were in trouble.
FRAND Disputes

• Potential licensee approaches FRAND holder to secure license which it needs to rely on for standard technology.

• What if the two parties can’t reach an agreement on the FRAND royalty rate?
  – The potential licensee may choose to go without a license and let the patent holder sue. In a patent dispute the court may find the patent isn’t valid or set a royalty less than what the patent holder wanted.
  – The patent holder may seek an injunction which if provided would prevent the licensee from using the technology unless it can find a work around.
When is a Contract Dispute an Antitrust Problem?

• How do we distinguish genuine contractual disputes over licensing from those are antitrust problems?
  – Answer 1: Contract disputes / breaches that create market power that would not exist otherwise?
  – Answer 2: All FRAND disputes that fail?
  – Answer 3: All FRAND disputes that result in higher prices? In prices higher than some benchmark?

Answer 3 requires us to define a benchmark against which to compare the bargained-for royalty rate.
The Hold-up Problem

• Hold-up can occur when parties make investments that are specific to their relationship

• Asset-specificity reduces the value of the assets in alternative uses
  – Which can allow parties to bargain opportunistically to extract a large share of the available surplus
  – Such bargaining can distort prices and investment incentives

See Oliver Williamson & Ben Klein
Holdup in Theory: Ex Post Versus Ex Ante Royalty
Patent Holdup

Patent “hold up”: having gotten its patent incorporated into the technology the patent holder (remember this might be one of hundreds of patents) can prevent firms from participating in the technology and therefore various markets by refusing to license except on very high terms.
Reverse Patent Holdup

- **Reverse patent hold up**: patent holder can’t prevent potential licensee from using the patent except by hiring lawyers and pursuing a court challenge which can be expensive and with uncertain outcomes. And then the potential licensee could also try to pursue antitrust action which raises further risks.
Reverse Hold-Up is Also Inefficient

• From consumer welfare perspective:
  – Allowing the patent holder to collect royalties at sub-competitive rate is akin to imposing a random tax to innovation.
  – The tax would reduce the incentives of R&D firms to enter an industry and invest in innovation.
  – This could in turn dampen innovation and dynamic efficiency resulting in lower consumer surplus.
The Role of Litigation in Negotiations

• Litigation or the threat of one can alter the bargaining landscape
  – Patent holders can seek preliminary injunctions against alleged infringers.
  – Willing licensees can file antitrust suit against patent holders (in particular SEP holders) for abuse of dominance.

• To the extent license fees are a function of units sold, injunctions could hurt both licensees and licensors
Potential Solutions to Holdup

• SSO IPR Policies
  - Disclosure rules
  - Royalty-free licensing
  - RAND and FRAND commitments
  - Joint ex ante negotiations (rule of reason)
• Contract law?
• Antitrust litigation for abuse of standard setting process in the United States, e.g.:
  *Rambus, Broadcom, N-Data, Dell*
Competition Agencies on SSO IPR Policies

Chief economists from the US, DOJ, and EU have argued SSO IPR policies are inadequate to protect against patent holdup and suggest various reforms to SSO contracts and a greater role for antitrust:

“SSOs .... have the responsibility to ensure this market power is constrained” and “many existing SSO policies are not strong or clear enough to achieve the above goals reliably or efficiently.”

(Kuhn, Scott-Morton, and Shelanksi, 2012)
How Frequent is Patent Holdup?
Reverse Patent Holdup?

• Technologies involve hundreds of SEPs and industries can involve multiple standards.

• Yet there are only a small number of patent disputes relative to the total possible and, while one could argue that innovation could be faster, many SEP-heavy industries seem to be growing quickly. But maybe the handful of disputes are very serious.

• Empirical evidence is scarce
What Does Patent Holdup Predict?

• Higher prices (lower output) in SEP industries relative to those where non-SEP industries
• Changes in SSO contracts that favor SEP holders to enable holdup (but see Tsai & Wright)
Figure 3
Relative Prices of Textbook Hold Up Products vs Consumer Products Produced by SEP Industries, and a Consumer Product Produced by a Non-SEP Industry, 1992-2013
Incremental Value Proposition

• Does the SEP holder get to charge more because the patent has been included in a standard? No, that would give every SEP holder the ability to gain up to full return from the standard by blocking anyone from using it.
• “Incremental value” of a given SEP is the difference in royalty rate that SEP could command over the next best alternative technology for a standard.
• That is how much SSO would have agreed to in a hypothetical negotiation.
A Workable Standard For “Fair And Reasonable”? 

• U.S. Federal Trade Commission
  – Courts should cap the royalty at the incremental value of the patented technology over alternatives available at the time the standard was chosen. (FTC, The Evolving IP Marketplace)

• European Commission
  – Assessment of fair and reasonable should be based on “whether the fees bear a reasonable relationship to the economic value” of the IP right. (EC Guidelines on Horizontal Co-operation Agreements)
Antitrust? Contract? Both?

• Use of antitrust to achieve optimal deterrence implies two conditions
  – SSO contracts are inefficiently incomplete and allow patent holders to take advantage of SSO members
  – Antitrust penalties required to get sufficient deterrence

• Both claims in dispute
Are SSO Contracts Inefficient?

If more precise and complete SSO IPR policies would efficiently reduce incentives for patent holdup – why haven’t SSOs adjusted their terms?

– E.g., no SSO prohibits a patent holder from seeking an injunction or defines FRAND

– SSO critics argue collusion or high-pass through rates for technology adopters, but neither is likely to explain persistence of vague contract terms across remarkable diversity of SSOs, industries, and members
Potential Costs of Greater Specificity of SSO IPR Policies

• Flexibility of FRAND commitment may be appropriate in context of uncertain value of patented technologies

• Greater contractual specificity can increase the likelihood of holdup

• Potential for delay in standardization process
Holdup Theories: Deception

Deception-based theories:

1. Defendant commits act of deception that gets it included in standard;
2. Standard confers market power on D that would not have otherwise accrued;
3. Defendant holds up standard and harms consumers as higher royalty rates passed on.

*Rambus, Broadcom.*

*Nynex v. Discon* holds that a lawful monopolist who engages in deceptive conduct (there, fraud on the regulator) and raises prices without exclusion does not violate Section 2.
Example: *FTC v. Dell*


1. IPR disclosure policy.
2. Dell certifies no IP.
3. SDO adopts technology; other options available.
4. Industry builds to standard.
5. Dell asserts patent.
(1) in a consensus-oriented private standard setting environment, (2) a patent holder’s *intentionally false* promise to license essential proprietary technology on FRAND terms, (3) coupled with an [Standard Determining Organization’s] reliance on that promise when including the technology in a standard, and (4) the patent holder’s subsequent breach of that promise, is actionable anticompetitive conduct.

Broadcom Corp. v. Qualcomm Inc., 501 F.3d 297, 314 (3rd Cir. 2007).

**Commitment was allegedly intentionally false at the time it was made.**
Breach of Contract as Holdup: N-Data

*FTC v. N-Data* extends the holdup agenda under FTC Section 5 only to cases where patent holder enters into good faith licensing agreement with SSO and renegotiates 7 years later. Negotiated Data Solutions, FTC No. 051 0094 (Jan. 2008).

Sequence:
1. Licensing offer in SSO for set amount ($1,000).
2. No firm takes license.
3. Rules on modification unclear --- original SSO rules allowed it
4. Several years later, modifies offer; more patents for RAND.
5. Violates Section 5 – unfair competition/ practice (3-2).
Existing U.S. Case Law on FRAND

• Decisions to date:
  – Judge Posner in Apple v. Motorola
  – Judge Robart in Microsoft v. Motorola
  – Judge Holderman in In re Innovatio IP Ventures
  – Judge Whyte in Realtek v. LSI
  – Judge Koh in GPNE v. Apple
Existing U.S. Case Law on FRAND

• Common principles:
  – Reasonable compensation
  – Limited to the economic value of the patented technology itself
  – In determining FRAND, Courts should consider comparable license
Existing U.S. Case Law on FRAND

• Differing principles/open issues:
  – Should methodologies for determining FRAND rates take into account concerns about patent hold-up and royalty stacking? Do implementers need to provide proof of *actual* hold-up or royalty stacking?
  – Incremental value rule;
  – What constitutes a “comparable license”? 
  – Royalty base: “smallest salable patent practicing unit”??
Key Antitrust Issue with FRAND

• Abuse of market power obtained through inclusion in the standard
  – Patent hold-up
  – Royalty stacking

• Should a proper FRAND assessment require proof of actual hold-up or royalty stacking?
  – *E.g.* Judge Robart and Judge Holderman: no.
  – *E.g.* Judge Davis in *Ericsson v. D-Link*: yes.
Methodologies for Computing FRAND

• *Modified* Georgia-Pacific Factors
  – Judge Robart in *Microsoft v. Motorola*
  – Judge Holderman in *Innovatio*
• *Ex ante* benchmarking
  – Judge Posner in *Apple v. Motorola*
  
  • “[t]he proper methodology of computing a FRAND royalty starts with what the cost to the licensee would have been of obtaining, just before the patented invention was declared essential to compliance with the industry standard, a license for the function performed by the patent. That cost would be a measure of the value of the patent... ”
Methodologies for Computing FRAND

• Incremental Value Rule
  – Judge Robart: essentially factor 9 of the GP factors (considers the utility and advantages of the patent property over the old modes or devices, if any, that had been used for working out similar results).
  – Judge Holderman:
    • Rejected the “Bottoms-up Approach”: determine the costs of implementing reasonable alternatives to the patents at issue that could have been adopted into the standard, and dividing that cost by the total number of infringing units to determine the maximum per unit royalty
Methodologies for Computing FRAND

• Incremental Value Rule
  – Judge Holderman Cont’d:
    • Adopted the “Top-down” Approach: starts with the average price of a WiFi chip, calculates the average profit that a chipmaker earns on the sale of each chip (as a means of isolating the portion of the income from the sale of the chip available to the chipmaker to pay royalties on intellectual property). The available profit on a chip is then multiplied by a fraction calculated as a number of the SEPs at issue, divided by the total number of SEP in the standard.
Methodologies for Computing FRAND

• Comparable licenses:
  – Judge Robart: prior agreements, similar agreements and added patent pool rates to the list of comparable licenses.
  – Judge Holderman: problems with using the Via Pool rate as comparable includes the pool not being successful, does not contain high value patents, assigns same rate to all patents regardless of importance
Methodologies for Computing FRAND

• Appropriate base: components v. end products
  – In the FRAND context, disputes over the appropriate base have generally centered around what constitutes the “smallest salable patent practicing unit” (SSPPU)
  – In Innovatio:
    • Innovatio: the system including all of the end-product devices, not just the Wi-Fi chip. Not possible to provide wi-fi functionality with just the chip.
    • Manufacturers: Wi-fi chip. Innovatio didn’t invent the other components.
Methodologies for Computing FRAND

- Appropriate base: components v. end products
  - FTC: “[c]ourts should identify as the appropriate base that which the parties would have chosen in the hypothetical negotiation as best suited for accurately valuing the invention.” (FTC 2011 Report) The focus should be on the basis for determining royalties that the parties would have used.
  - Keep in mind: Using the smallest component as the royalty base may under- or over-value some technology.
  - For some technology it is implemented by a single component part, yet its value may exceed the component itself. In that case using an appropriately apportioned end-user product price as the royalty base may be more accurate.