Standards and Patent Hold-up

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SSOs' patent policies

- They govern ownership of IPRs
  - 72% have written IP policy (out of 29 studied SSOs mainly involved in ICT, Lemley, *IPRs and SSOs*, 2002)
- 2 key sets of rules
  - Patent disclosure rules *(75%)*
  - Declaration of the licensing terms in advance
    - Reasonable and Non-Discriminatory (RAND, hereafter) conditions *(60%)*
    - Royalty free and no restrictive use *(9%)*
    - Precise amount (a one time fee of X$ or a Y% of the value of standard compliant-products)
  - *Out of 59 studied SSOs, mainly involved in ICT, Ciao, Lerner and Tirole, The rules of SSOs: an empirical analysis, 2007*

Potential antitrust problems

- Standard setting process may facilitate collusion between competitors
  - Users of the standard may use the process to set prices of standard-compliant goods (seller cartel), or to collude against IP owners to lower royalties (buyer cartel)
  - Different but substituable technologies can compete for being incorporated in the standard; SSOs' members may agree on selecting competing, invalid or unecessary patents
- The standard setting process may be manipulated through a firm's unilateral conduct to exclude competitors and to set unfair prices. Very attractive because market power can be very huge:
  - A technology incorporated in a standard will enjoy a larger diffusion and will be indispensable (i.e., substitutive patents have become essential)
  - Users are locked-in by high switching costs (adopting a new standard would mean loosing specific investments and network effects and the delaying of sales)

Antitrust authorities' involvement

- Competition advocacy and soft law
  - DoJ/FTC Antitrust enforcement and IP (*Competition concerns when patents are incorporated into collaboratively set standards*, chapter 2) April 2007
  - Antitrust Modernization Commission (Recommendation 20 on the use of the rule of reason to assess negotiations on royalties in standard setting process)
  - Guidelines on the application of the article 81 of the EC Treaty to technology transfer agreements
- Assessment of private bodies' IP policies
  - SSO's rules: VITA business review letter (DoJ, 2006)
  - Confort letter on 3G (European Commission, 2002)
- Antitrust cases
  - FTC v. Dell; FTC v. Rambus; FTC v. Negotiated Data Solution; Broadcom v. Qualcomm
  - European Commission v. Rambus; Nokia, TI, Broadcom, Ericsson, NEC, Panasonic v. Qualcomm

What is patent hold-up? 1/2

- A company commits to license its patents for a one time fee of 1000 $ if its technology is selected within the standard ; a few years latter, once the standard is adopted, the patent owner asks users to pay a higher royalty (e.g., 5% for each unit of standard-compliant products); it initiates legal action for patent infringement against users who do not accept the new price
- (Bad) surprise + a gun + no other choice than to pay the ransom (high switching costs)
  - "After the standard is set, the owner of a patent essential to that standard identifies a patent, or attempts to impose licensing terms, that SSOs members could not reasonably have anticipated [. Moreover,] it is not a commercially reasonable option to abandon the standard and attempt to create an alternative, due to the cost of the standard setting process itself or the cost of developing products incorporating the alternative standard" (G.F. Masoudi, DoJ, 2007)

What is patent hold-up? 2/2

- The patent owner is able to extract a supra normal royalty because users made sunk investments
- Suppose a user incurs a cost of 40 to use protected technology A and a cost of 50 to use technology B. He is ready to pay a royalty up to 10 to use A
- Suppose now that the user invested 25 (out of 40) and that this investment is specific (zero value if A is not used), her alternative is
  - opting for technology B and facing a cost of 50
  - opting for technology A and facing a cost of 15 (40-25)
  - As a result after the investment, he is ready to pay a royalty up to 35 (50-15), that is 25 more than the royalty he was ready to pay before his sunk investment
  - The patent owner is able to get the royalty corresponding to the incremental value of his invention (i.e., the reward associated with the patent system) + the value of sunk costs incurred by users

Patent ambush

Rambus

- Rambus, a memory technology US company, concealed the existence of patents, instilled the belief to the other SSOs participants it had no patent covering the standard, and worded the claims of its patents in order to make sure that the new standard would infringe them. Once the standard was adopted, Rambus sued the users for violating its patents.
- In August 2006 the U.S. Federal Trade Commission found Rambus guilty of violating Section 2 of Sherman Act
- In April 2008, the District of Columbia Circuit overturned the FTC's decision
- In July 2007, the European Commission sent a statement of objections to Rambus (allegations of EU competition law infringement because of intentional deceptive conduct and unreasonable royalties)

Negotiated Data Solutions (N-Data)

- N-Data bought patents related to a fast Ethernet standard from Vertical Networks (Nov. 2003) which got them previously from National Semiconductor (June 1998)
- N-Data reneged on the National's commitment for a one-time fee of US$ 1000 and threatened and initiated legal action against users who did not accept the new price
- In January 2008, the US FTC issued a complaint against N-Data for unfair method of competition and unfair conduct (violation to Section 5 of FTC Act) and accepted a settlement

Rambus controversies

- Does the story fit with the facts?
  - The deceptive conduct theory is not supported by substantial evidence (S. M Oliva's Amicus Curiae, VoluntaryTrade.org)
  - No established causal effect between the conduct and the monopolization according to the DC Circuit
    - What would have happened if Rambus had played the rules?
      - Would JEDEC have excluded Rambus patented technologies? Insufficient evidence brought by FTC according to the DC circuit
      - Would JEDEC have required a RAND commitment? Probably, but the loss of opportunity to seek favorable licensing terms is not as such an antitrust harm according to the DC Circuit
- Section 2 of Sherman Act and/or Section 5 of FTC Act?
- Antitrust, contract or patent law ?
- Remedies
  - More stringent SSOs' IP policies? Note that a patent holder who does not participate to the standard setting process can hold-up users without infringing the law
  - What mandatory conditions of licensing? The classical conundrum for an antitrust authority to set the conditions of the forced access (see EU Microsoft case)

Breach of RAND commitments

- Qualcomm: unfair royalties
  - Qualcomm, a Californian company, designs chipset for mobile phones. It owns several patents in 2G and 3G standards
  - It was sued in July 2005 by Broadcom beyond the Federal District Court of New Jersey for various antitrust violations, including a breach in commitment to license its technology according to Reasonnable And Non Discriminatory terms (RAND, hereafter)
  - Nokia and 5 other wireless companies filed a complaint in October 2005 in the European Commission arguing Qualcomm has abused its dominant position in (i) charging excessive royalties and (ii) adopting exclusionary practices
  - The Commission initiated formal proceedings against Qualcomm in October 2007, investigating *inter alia* the imposing of excessive royalties for its patents reading on WCDMA

Mainstream view on RAND

- The rationale for RAND is to mitigate hold-up
  - « [A] mechanism through which the SSOs have endeavored to avoid the hold up problem » Deborah P. Majoras, September 23, 2005 '*Recognizing the procompetitive potential of royalty discussions in standard setting*'
  - Lemley (2003), Farell et alii (2007), …
- R in RAND corresponds with the level of royalty that would result from ex ante competition, that is, the incremental value of the innovation
  - More precisely: θ(V2-V1) - c
  - Swanson and Baumol (2005)

Heterodox view on RAND

- Hold-up is not a significant problem in standard setting
- RAND is « a flexible tool which secures the availability of essential IPR without unduly constraining licensors » D. Geradin and M. Rato (2006), Sidak (2008)
- More precisely, it ensures a safeguard against refusal to deal, including a constructive refusal to deal

Is RAND effective against hold-up?

- Lack of empirical evidence
  - Only a handful of holdups in the course of 600 standards (Telecommunications Industry Association)
  - 5 Holdups that represent 10% of the overall standardization activity (W3C)
- And evidence is hard to get for the main impact of hold-up is invisible: knowing ex ante they might be held-up, manufacturers delay, reduce, or make different, investments
- Anyway, it seems that the RAND contract is loosing its binding force and self-enforcement virtue. There is a growing belief that the 'problem' must be fixed
  - RAND meaning is unclear + weak enforcement system (e.g., no sanctioning mechanism)
  - On-going reform of SSOs' IP policies

New SSOs IP policies

VITA

- VMEbus International Trade Association (computer technology)
- Through its SS committee it is one of the smallest organizations in the powerful ANSI
- Precise disclosure rules
- Obligation to declare in advance the most restrictive terms of licensing
- The declared maximum royalty is irrevocable
- Each member must declare ex ante the maximum royalty rate and license restrictions
- Arbitration procedures for non compliance
- Penalties: royalty free and no restrictions on use

IEEE-SA

- The standards association Institute of Electrical and Electronics Engineers has decided to change its policy
- More than 400 standards in development
- A menu
  - No licensing information
  - Royalty free and no restriction
  - RAND
    - With/out maximum royalty rate or not
    - With/out attaching a sample of licence agreement

The paper

F. Lévêque and Y. Ménière, Licensing commitments in Standard Setting Organizations, Cerna Working Paper, Nov. 2007

- Motivations
  - Assessing the royalty cap innovation in SSOs IP policy
  - Assessing the effects of different meanings of RAND on IP owners as a whole
- Main assumptions:
  - A single patent owner (or a patent pool gathering all the patent owners)
  - Manufacturers enter until the profit is zero (i.e., they only recover their fixed cost). Less manufacturers enter if the royalty is set ex post (i.e., the under investment relating to hold-up) instead of ex ante
  - The patent owner only knows ex post the size of the market of standard compliant products
- Therefore, the patent owner faces a tradeoff between attracting more manufacturers and knowing better the demand
- The patent owner may
  - (i) declare the royalty in advance
  - or (ii) declare the maximum royalty in advance
  - or (iii) sets the royalty after manufacturers entered
- Note that if the ex ante commitment is not credible (i) = (ii) = (iii), for instance a non binding RAND commitment, or an unclear RAND commitment wherein users do not know whether it means a specific level of royalty, or a not to exceed royalty, or anything else (cheap talk).

Ex ante v. Ex post (α =1, c= 0)

Ex post

1. Nature decides the level of demand
2. Manufacturers enter the market
3. The licensor sets the royalty

$$P_i = x - \sum_{j=1}^{n} q_j \qquad F(x) \text{ on } [\underline{x}, \overline{x}]$$

$$n(R) = 1 + \frac{x - R - 2\sqrt{I}}{\sqrt{I}} \qquad q = \sqrt{I}$$

Ex ante

1. The licensor announces the royalty he will charge
2. Nature decides the level of demand
3. Manufacturers enter the market

Licensor's profit	$\tilde{\pi}_L^a(R^a) - \tilde{\pi}_L^p(R^p)$	$= \frac{1}{4}[I - V(x)]$
Product prices	$E(P^a) - E(P^p)$	$= -\frac{1}{2}\left[E(x) + \sqrt{I}\right]$

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Royalty Cap

1. The licensor announces a royalty cap
2. Nature decides the level of demand
3. Manufacturers enter the market
4. The licensor downgrades the royalty or not
    1. If demand is close to x_{min}, the licensor is better off in asking a smaller royalty than the cap
    2. If x is close to x_{max} it would have been better for the licensor to ask for a higher royalty, but he can no longer set a royalty higher than the cap

Proposition 3 *If $E(x)-\underline{x} < \sqrt{I}$, the licensor will define a pure ex ante royalty. If $E(x)-\underline{x} \geq \sqrt{I}$, the licensor will define a royalty cap ex ante. In this case the royalty cap is defined by:*

$$R^c = \frac{E\left(x \mid x \geq \hat{x}\left(R^c\right)\right) - \sqrt{I}}{2}$$

Main findings

- Unsurprisingly, consumers are better off with ex ante announcement
- The patent owner is also better off with ex ante announcement wherein uncertainty on demand is low and fixed cost is high
- Moreover, the royalty cap is always better for the patent owner than the ex post setting of royalty
- Introducing a royalty cap improves consumers' welfare wherein uncertainty on demand is high and fixed cost is low
- Making RAND clearer or more binding increases both consumers' and patent owner's welfare (because non credible RAND is similar to an ex post royalty setting)

	High uncertainty on demand and low fixed costs	Medium	High fixed costs and low uncertainty on demand
	$I \leq Var(x)$	$Var(x) < I \leq [E(x) - x]^2$	$[E(x) - x]^2 < I$
Patent owner	RC >*ExPost*>**ExAnte**	RC>**ExAnte**>*ExPost*	**ExAnte**>RC>*ExPost*
Consumers	**ExAnte**>RC>*ExPost*	**ExAnte**>RC>*ExPost*	**ExAnte**>RC>*ExPost*

Policy Implications

- In so far as trust between members of SSOs has been weakened (more litigation, more differences between patent owners reading on standards) ex ante RAND commitments are becoming ineffective to prevent hold-up
- Explicit mechanisms to make ex ante commitments binding may be provided through
  - Self-regulation (e.g., more detailed disclosure rules, introducing a sanctioning system); however, tightening SSOs' IP policies may delay the standard setting process and dissuade some companies to join it
  - And/or public regulation: antitrust authorities can help to enforce SSO's IP rules, but is it the role of antitrust?
- In addition, such mechanisms facilitate patent pool formation and therefore mitigate the royalty stacking problem (next lecture…)