

# Patents, Standards, and Antitrust

F. Lévêque

Max Planck Institute

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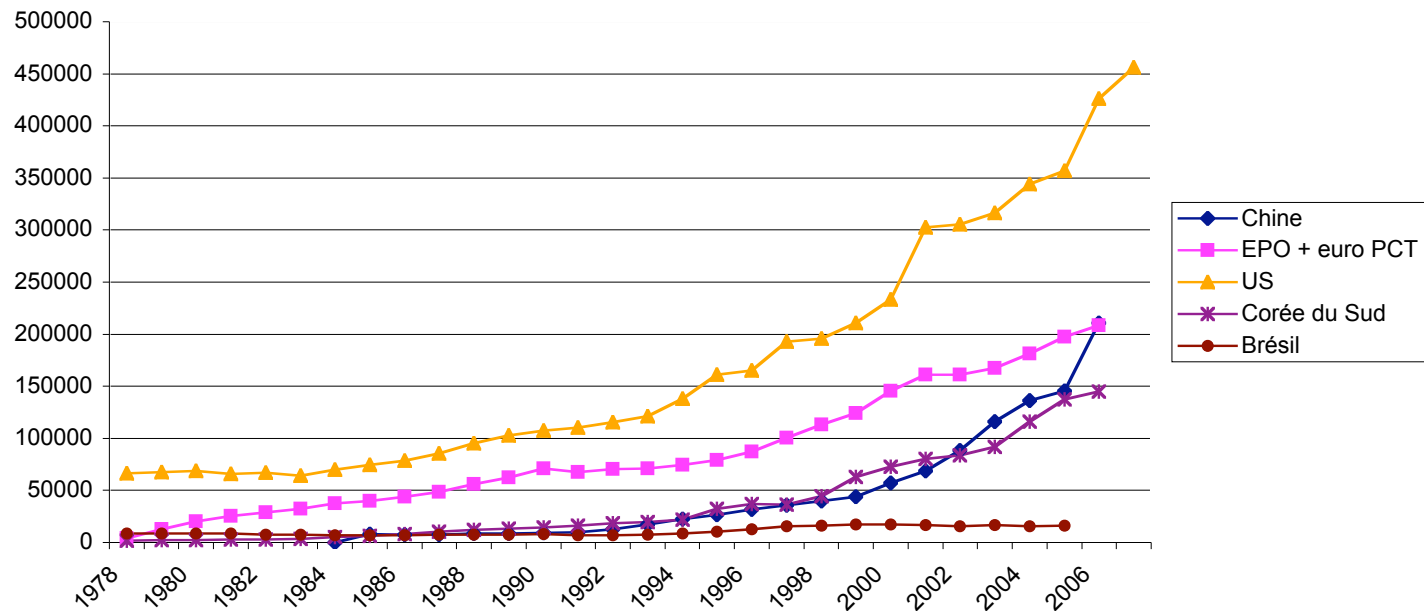


# References

- F. Lévêque and Y. Ménière, Early commitments help the formation of patent pool, Cerna Working Paper, April 2008  
([http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1121256](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1121256))
- F. Lévêque and Y. Ménière, Technology standards, patents and antitrust, forthcoming *Competition and Regulation in Network Industries*, 9(1) 29-41, 2008
- F. Lévêque and Y. Ménière, Licensing commitments in Standard Setting Organizations, Cerna Working Paper, Nov. 2007  
([http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1030520](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1030520))

# The Patent Surge

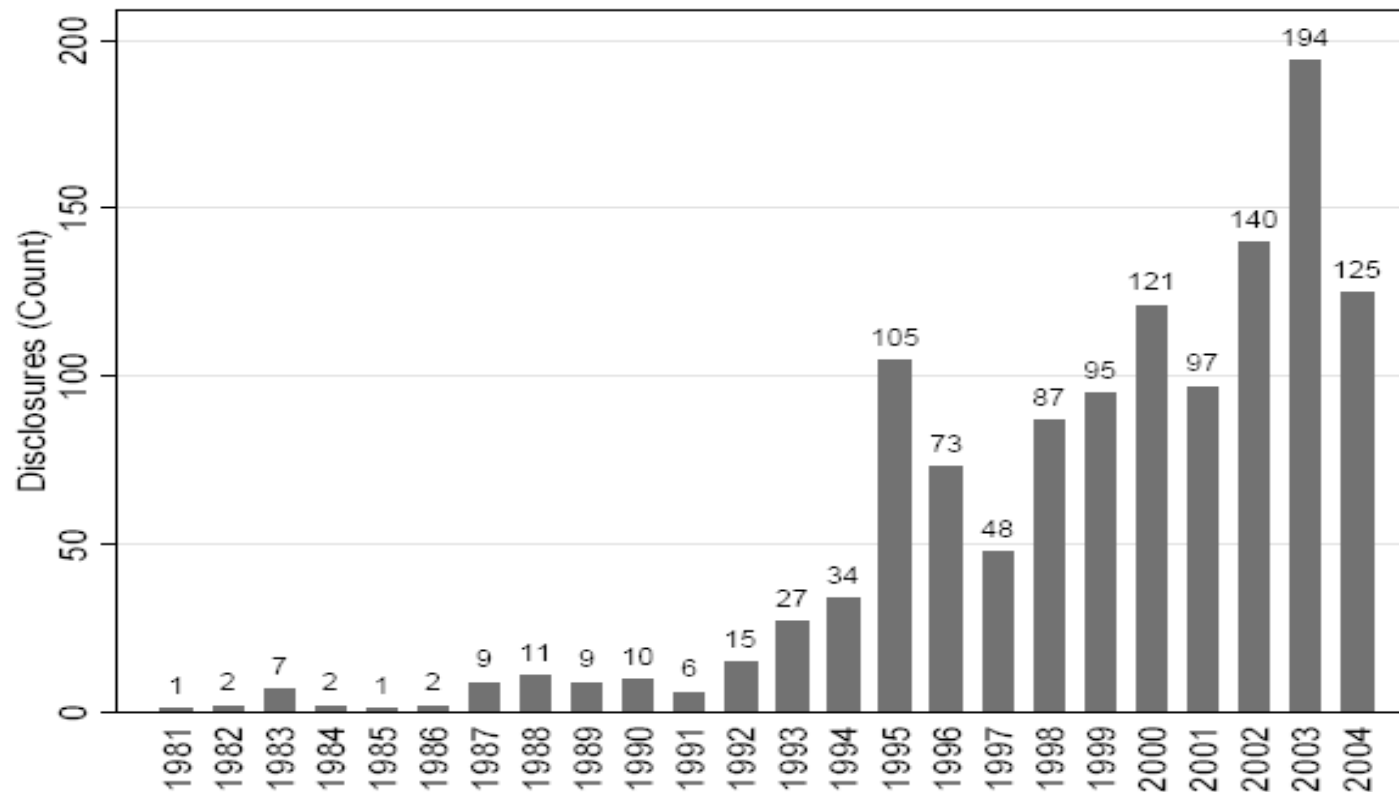
Number of applications



# Patents reading on standards

The number of patents incorporated in standards has strongly increased during the 1990s

Total IPR disclosures in: ANSI, ATIS, ETSI, IEEE, IETF, ITU, OMA, TIA  
(source: Simcoe, 2005).



# MPEG-2

MPEG LA®

INTRO

PATENT LIST

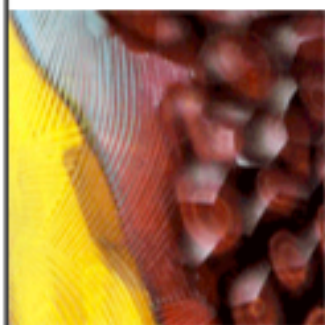
ESSENTIALITY

LICENSORS

LICENSEES

AGREEMENT

FAQ



## INTRODUCTION

MPEG LA's MPEG-2 Patent Portfolio License provides fair, reasonable, nondiscriminatory access to essential MPEG-2 Video and Systems patents owned by many patent holders as an alternative to negotiating separate licenses.

The License includes essential patents owned by Alcatel Lucent, British Telecommunications plc, Canon, Inc., CIF Licensing, LLC, Columbia University, France Télécom (CNET)\*\*, Fujitsu, General Instrument Corp.\*, GE Technology Development, Inc., Hitachi, Ltd., KDDI Corporation (KDDI), LG Electronics Inc., Matsushita, Mitsubishi, Nippon Telegraph and Telephone Corporation (NTT), Philips, Robert Bosch GmbH\*\*\*, Samsung, Sanyo Electric Co., Ltd., Scientific-Atlanta, Sharp, Sony, Thomson Licensing, Toshiba, and Victor Company of Japan, Limited (JVC). MPEG LA's goal is to provide worldwide access to as much MPEG-2 essential intellectual property as possible; new Licensors and essential patents may be added at no additional royalty during the current term.

Wide acceptance of the MPEG-2 Patent Portfolio License is responsible for the worldwide utility of MPEG-2 technology. The Program's Licensees make most MPEG-2 set-top box, professional (e.g., encoders, file servers and multiplexers) consumer electronics (including DVD player and television receiver/decoder), personal computer and packaged medium products in the current world market.

MPEG-2



ATSC



AVC/H.264



VC-1



MPEG-4 VISUAL



C E R N A

centro d' economia industriale

# Consequence n°1: the risk of royalty stacking

- Royalty stacking occurs whenever standard users have to buy a license from each patent owner
  - Multiplication of costs in contracting
    - / one stop shop
  - Multiplication of margins: each patent owners sets a monopoly price
    - For all patents are essential
- As a result, users pay a higher price for the access to the standard; the diffusion of the standard is lower; consumers get standard compliant products latter; and pay them more

# Consequence n°2: the risk of hold-up

- Hold-up happens whenever the owner of a patent reading on a standard claims more money once users have developed products based on the standard
- In fact, it is extremely expensive (or even impossible!) to switch to another standard. So users have no other choice than to accept to pay the ransom
- Hold-up rarely occurs but even when it does not its adverse effects may be huge:
  - The threat to be held-up reduces investments; distorts investment choice; and undermines the diffusion of standards

# Antitrust cases 1/2

- Rambus: patent ambush
  - Rambus, a memory technology US company, took advantage of its involvement in a standard committee to word the claims of its patents in order to make sure that the new standard would infringe them. All the while leading the other members to believe that it had no patent covering the future standard. Then Rambus sued the users of the standard for violating its patents.
  - In August 2006 the U.S. Federal Trade Commission found Rambus guilty of violating Section 5 of the FTC Act
  - In July 2007, the European Commission sent a statement of objection to Rambus (allegations of EU competition law infringement because of intentional deceptive conduct and unreasonable royalties)
- 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 Reasonable 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

# Antitrust cases 2/2

- 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)
- Rembrandt
  - In March 2008, the American Antitrust Institute petitioned the FTC to investigate conduct by Rembrandt, a patent licensing company who brought several patent infringement suits against major television networks and cable systems
  - Rembrandt does not feel bound with ATSC's previous commitment to license its patent for ATSC standard according to reasonable terms

# What do SSOs do to mitigate both risks? 1/2

- Standard Setting Organizations have adopted patent policies that generally
  - ✓ Impose each member to license his patents according to RAND terms
    - ☺ In principle, it addresses both royalty stacking and hold-up (it may decrease the total amount of royalties and dissuade ex post opportunism)
    - ☹ Nowadays it does not seem very effective (e.g., no sanctioning system)
  - ✓ Debate on what “reasonable” would mean
    - The outcome of (hypothetical) “ex ante competition” between technologies (Lemley, 2006; Shapiro, 2006; Swanson & Baumol, 2005)
    - ✘ Swanson and Baumol (2005) suggest auction on merits for inclusion in the standard
      - Ensures the best technology is selected
      - The royalty reflects the relative merit of the technology ( $V1 - V2$ )
- ✘ VITA requires its members to commit on a royalty cap and to announce ex ante the most restrictive conditions of their license. Moreover sanction and arbitration procedures are explicit

# What do SSOs do to mitigate both risks? 2/2

- ✓ Oblige its members to disclose their patent applications or grants (in relation with the discussed standard)
  - ☺ it mitigates patent ambush
  - ☹ but enforcement is not so easy
- ✓ Prohibit members to talk together on royalties
  - ☺ it avoids competition distortions
  - ☹ but prevents the formation of patents pools, a good solution to mitigate the royalty stacking risk

# A better perception of patent pools

- Patent pools = joint licensing of complementary patents (e.g., MPEG2, DVD)
- For a long time, antitrust authorities were suspicious vis-à-vis patent pools
  - They were viewed as a price-fixing agreement between competitors
- But in so far as they only contain essential patents (that is, they cover complementary technologies, not substitutable technologies; they are valid; they are necessary) patent pools are pro-competitive
- Cournot (1838) is back:
  - There is nothing worse than a chain of vertical monopolies; if they merge both shareholders and consumers are better off!

# However, patent pools are unstable

- Because of free ridding
  - In staying out of the pool, a patent owner can benefit both from a large diffusion of the standard (thanks to the pool that reduces the cost of licensing for users) and high royalties on her own patents
  - = The so-called patent hold-out problem
- In practice, patent pools often fail to rally all important patent owners
  - 3G (W-CDMA): without Qualcomm, Motorola, Ericsson and Nokia
  - DVD2: 6C + 3C (Sony, Philips, Pioneer) + Thomson
  - Disagreement on the key for sharing royalties can be another factor of failure
- Note that most patent pools are created after the standard was chosen and users have started to invest in manufacturing standard compliant products
  - ➔ What happen if a patent pool is formed and commit on royalty BEFORE the entry of users on the market?

# Early commitments help patent pool formation

Cerna Working Paper, F. Lévêque and Y. Ménière, April 2008  
([http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1121256](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1121256))

- Connects the hold-up and double marginalization problems

- Numerous patent owners

- Joint licensing or not?

- Irreversible cost of standard adoption

- (binding) ex ante commitment or not?

- Key hypotheses

- Ex ante commitments by the pool are binding whereas those by independent licensors are not

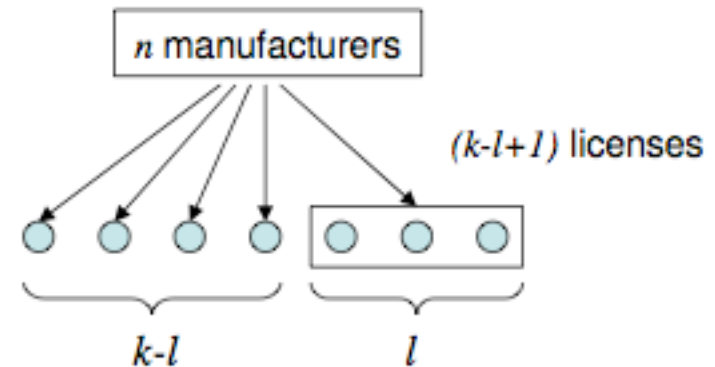
- The pool does not gain more profit than an independent licensor

$$\pi_l^P = \frac{\pi_l^L}{l}$$

# The setting

- Essential patents are licensed...
  - by  $k$  patent owners
  - to a group of  $n$  manufacturers competing on the same market

- manufacturers
  - Cournot competition
  - Incur a unit cost  $c + R$  (where  $R$  stands for the royalty)
  - Incur a fixed (and irreversible) entry cost  $E$
  - Free entry  $\Rightarrow n$  is endogenous



# Scenarios

## Scenario 1: Ex post pool

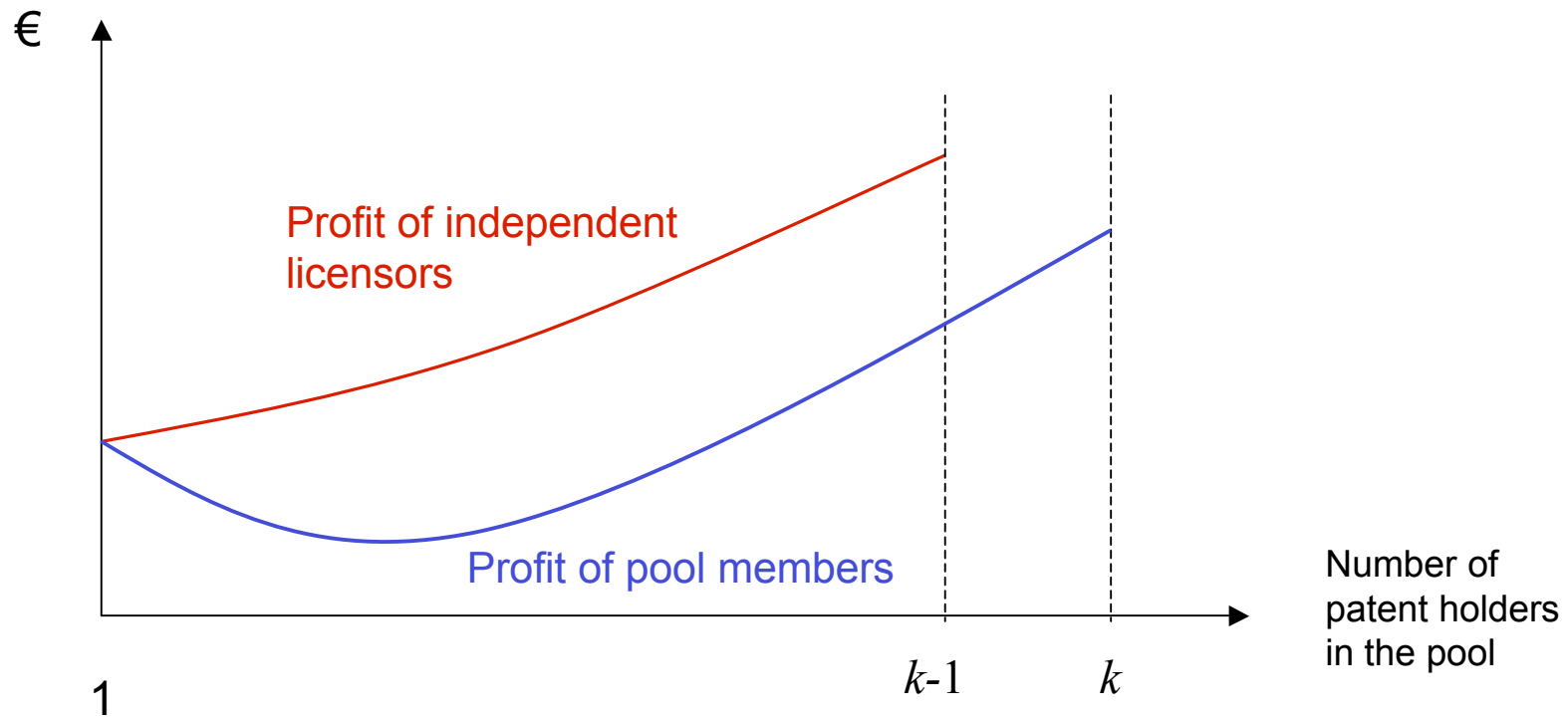
1. Manufacturers enter the market
2. Patent owners decide to join or not a patent pool
3. The patent pool and independent licensors fix royalties

## Scenario 2: Ex ante pool

1. Patent owners decide to join or not the patent pool
2. The pool commits on a royalty
3. Manufacturers enter the market
4. Independent licensors fix royalties

# Ex post pool and hold-out

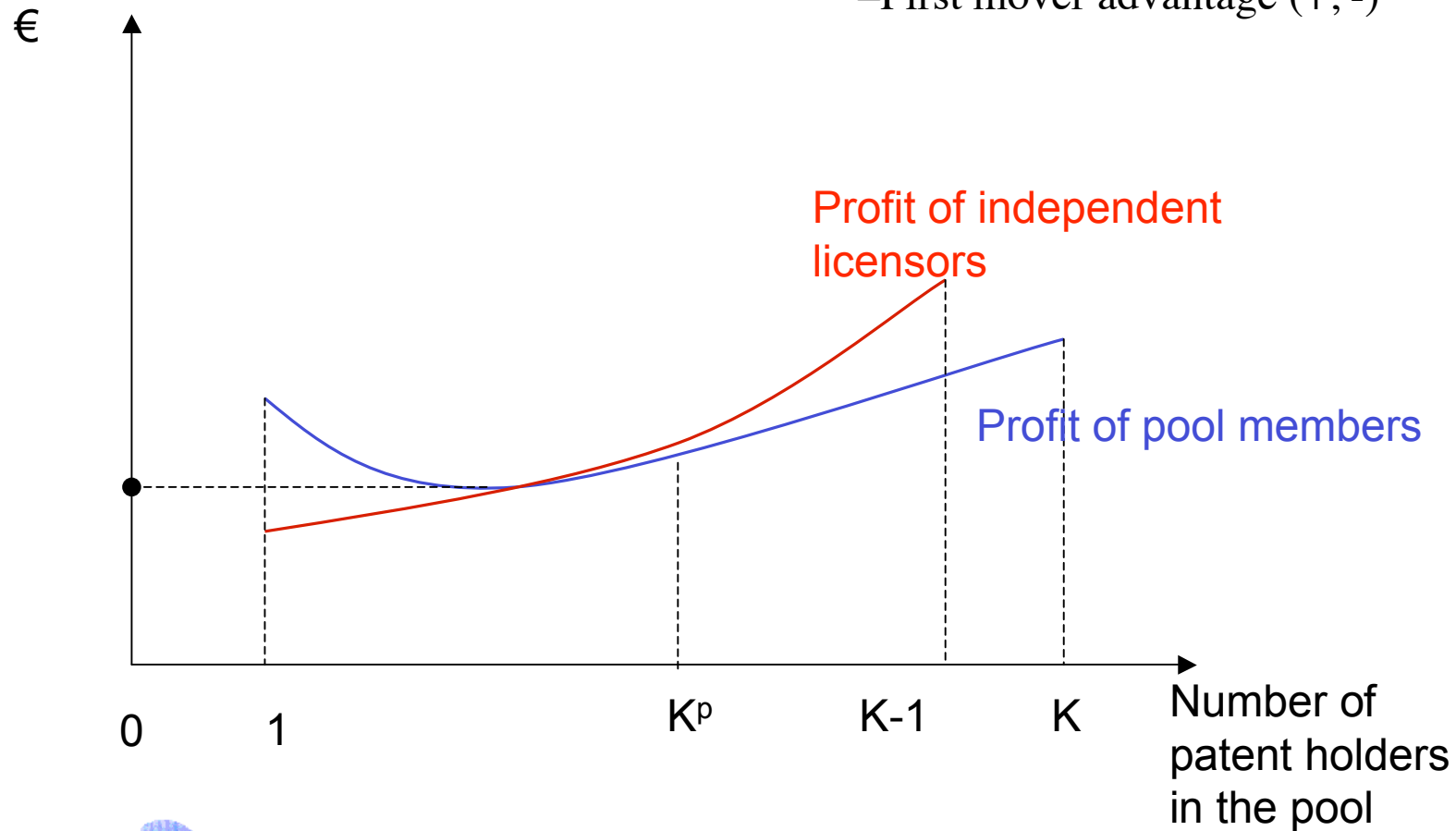
- A pool is stable only if  $k=2$
- Otherwise (if  $k>2$ ), no pool can be stable because of free riding



# Ex ante pool

## 4 effects

- Double marginalization mitigation (+, +)
- Entry promotion (+, +)
- Profit dilution (-, 0)
- First mover advantage (+, -)



# Main result of the model

- Allowing patent owners to opt ex ante for delegating the licensing of their patents to a single body is
  - ✓ Effective in generating stable patent pools
  - ✓ Patent owners and consumers will be better off
- In other words, binding commitments allow the formation of pro-competitive ex ante pools
- Such commitments would require appropriate IP policies in SSOs and the backing of antitrust authorities

# Binding ex ante commitments also mitigate hold-up

- In a simple model where
  - There is a single patent owner (or a patent pool gathering all the patent owners)
  - She can
    - either make a bidding announcement of the royalty ( $R$ ) he will ask to manufacturers before they invest a fixed cost and enter into the market of standard compliant products
    - Or sets  $R$  after manufacturers entered
  - 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 owners faces a tradeoff between attracting more manufacturers and knowing better the demand
- Unsurprisingly, consumers are better off with ex ante announcement of royalty (no surprise, price is lower)
- Interestingly, the patent owner is also better off with ex ante announcement of royalty if uncertainty of demand is low and fixed costs are high

# Ex ante royalty cap

- Moreover, an ex ante royalty cap is always better for the patent owner than the ex post setting of royalty

	High uncertainty on demand and low fixed costs	Medium	High fixed costs and low demand
Patent owner	$RC > ExPost > ExAnte$	$RC > ExAnte > ExPost$	$ExAnte > RC > ExPost$
Consumers	$ExAnte > RC > ExPost$	$ExAnte > RC > ExPost$	$ExAnte > RC > ExPost$

- VITA recently adopted a royalty cap policy
  - Each member must declare ex ante the maximum royalty rate and license restrictions
  - The standard setting body can sanction patent owners that do not respect their commitments
  - a DoJ Business Review Letter was issued October 30, 2006

# Conclusion: 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 have become ineffective to prevent hold-up
- Explicit mechanisms to make ex ante commitments binding are now required through
  - Self-regulation (e.g., introducing a credible sanctioning system in IP policies)
  - And/or public regulation: antitrust authorities can help to enforce SSO's IP rules
- In addition, such mechanisms facilitate patent pool formation and therefore mitigate the royalty stacking problem