INTRODUCTION (1/3)

**Commercial cooperation**
- Joint ventures
- Marketing alliances, co-branding
- Patent pools, ...

**Regulatory oversight**
- Substitutes: cartels are undesirable
  - Short-term: too high prices / too little usage
  - Long-term: too little investment (*quiet life*)
- Complements: cooperation is socially desirable
  - “Cournot effect:” avoiding double marginalization
  - Patents: royalty stacking
  - More generally, cooperation is called for: standards
**Issue: complements or substitutes?**

- GrandMet/Guinness merger (portfolios of alcoholic beverages)
  Is vodka a complement or a substitute to whisky?
  - For a small party ("one bottle"): substitutes
  - For a larger party ("two bottles"): complements

- Patent pools
  - Patents relating to alternative technologies
  - Patents relating to key ingredients of the same technology
  - Standard essential patents: *ex ante vs. ex post*

- Moving target
  - Evolves over time
  - Endogenous: price level
Industry oversight

- Sector-specific regulators
  - Detailed knowledge, on-going supervision
  - *Ex ante* intervention: regulations, data collection

- Competition agencies
  - Across-the-board, mostly *ex post* intervention
  - Reluctance to let firms discuss prices
  - Few patent pools nowadays
  - Huge legal disputes: ("[F]RAND")

- Calls for information-free screens
  - Rules on governance of Joint Marketing Alliances (JMAs)
  - Screening out bad JMAs, screening in good ones
**SUBSTITUTES OR COMPLEMENTS? (1/2)**

- **Nested demand model** for technology, in which Users
  - Pick which elements to select within technological class (substitutability)
  - Decide whether to adopt the technology at all (complementarity)

- **Applies to technology & IP, but also more generally**
  - Online platforms
  - Content carried by cable operators
  - Payment systems used by merchants
  - Providers included in health insurance network (Katz 2011)
  - Music performance rights licensed by Pandora
  - Product portfolios (e.g., alcoholic beverages in *GrandMet*)
Two symmetric firms 1 and 2, each one endowed with one patent (extension to n > 2, asymmetry)

The technology brings value
- V if developed with both patents
- V − e if developed with one patent (either one)

Users’ adoption cost c distributed according to F(c) on [0, V]
- Demand for bundle \( D(P) \equiv F(V − P) \)
- Demand for incomplete technology \( D(p + e) = F(V − e − p) \)

Simple set-up
- All users pick the same basket if they adopt the technology
- Menus do not increase profit under joint marketing
IS COORDINATION GOOD OR BAD?

Static Nash

\[ r(p_j) = \arg \max_p \{ p \cdot D(p + p_j) \} \]
IS COORDINATION GOOD OR BAD?

- Static Nash

\[ r(p_j) = \arg \max_p \{ p \cdot D(p + p_j) \} \]
**Static Nash**

Monopoly price

\[ D(2p^m) + 2p^mD'(2p^m) = 0 \rightarrow \hat{p} > p^m \] (double marginalization)
IS COORDINATION GOOD OR BAD?

- Impact of coordination

\[ p \]

\[ 2p^m \]

\[ \hat{p} \]

\[ 0 \]

\[ p^m \]

\[ \hat{p} \]

\[ V \]

Rivalry

Complementors

weak

strong
**REGULATORY OVERSIGHT**

**Problem: which scenario is the relevant one?**

Requires detailed knowledge about users’ preferences:
- Degree of «essentiality» of the patents
- Distribution of technology adoption cost (demand elasticity)

**Information-free screen: independent licensing**

- Lerner & Tirole *AER* 2004; Guidelines: US, Europe, Japan, ...
- Does not affect welfare-enhancing pools \( (p^N > p^m) \)
- Restores competition when welfare-decreasing pools \( (p^N = e < p^m) \)
  - undercutting the pool is profitable: \( (2p^m - e)D(2p^m) > p^m D(2p^m) \)

**Issues**

- Multiple equilibria \( (n > 2) \): Aleksandra Boutin (2014)
- Coordinated effects?
<table>
<thead>
<tr>
<th>Rivalry</th>
<th>Must sustain price $p &gt; e \Rightarrow$ incomplete technology</th>
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<tbody>
<tr>
<td>$(e \leq p^m)$ Sustain $p &gt; p^N = e$</td>
<td>$\frac{\tilde{\pi}(p)}{2} \geq (1 - \delta)\tilde{\pi}(p) + \delta\pi(e)$</td>
</tr>
<tr>
<td>Weak complementors</td>
<td>Deviation: would like to charge above $\hat{p}$ (impossible) $\Rightarrow$ charges $e$</td>
</tr>
<tr>
<td>$(p^m &lt; e \leq \hat{p})$ Sustain $p &lt; p^N = e$</td>
<td>$\pi(p) \geq eD(p + e) + \delta\pi(e)$</td>
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<tr>
<td>Strong complementors</td>
<td>Issue: optimal punishments (Abreu’s codes)</td>
</tr>
<tr>
<td>$(p^m &lt; \hat{p} \leq e)$ Sustain $p &lt; p^N = \hat{p}$</td>
<td>$\pi(p) \geq (1 - \delta) \max_{\tilde{p} \leq e} \tilde{p}D(p + \tilde{p}) + \delta\pi^p$</td>
</tr>
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TACIT COORDINATION (2/2)

Rivalry

Collusion at $p^u$

No collusion or cooperation

Complementors

Weak

Cooperation at $p^m$

Strong

Limited cooperation

Figure 1: Most profitable equilibrium
Joint Marketing & Independent Licensing (1/2)

Modeling

- At $t=0$, pool sets price $P$ for the bundle (and possibly prices for individual patents), as well as the revenue sharing rule.
- At $t=1,2,...$, firms set prices non-cooperatively for their individual offerings.

**Independent licensing is irrelevant under complementors** ($e > p^m$)

- Pool sets price $P = 2p^m$ (and “high” individual prices), shares $50 - 50$ → not worth undercutting with individual offering ($p + e < 2p^m$): as $e > p^m$,
  \[ (2p^m - e)D(2p^m) < p^mD(2p^m) \]

- Corollary: Pool always welfare beneficial if complementors
  (weakly so if $p^m$ is already sustainable without a pool, strongly so otherwise)

**Rivalry** ($e < p^m$)

- Symmetry facilitates sustainability
- A pool charging $P = 2p$ is stable if:
  \[ \pi(p) \geq (1-\delta)(2p-e)D(2p) + \delta\pi(e) \]
  undercutting
Figure 2: Impact of a pool
(+: beneficial; -: welfare reducing; blank: neutral)
LESSONS SO FAR

**Scope for tacit coordination**
- Coordination easiest for strong substitutes or complements
- This is when uncoordinated pricing most inefficient

**Impact of joint marketing alliances**

*Independent licensing* does a good job
- Does not prevent desirable cooperation
- Can allow for more efficient collusion (socially desirable)

... but is no longer a perfect screen: may allow for collusion that would not be sustainable otherwise
Additional regulatory requirement: Unbundling

- Individualized prices

\[ P^P = S \sum_{i=1,2} p^p_i \]

- No cross-subsidization

  firm i's dividend = pool’s price times i's sales through the pool

→ the pool acts as if setting price caps

Note: Still information-free requirement
Proposition: *Unbundling and independent licensing* make joint marketing always socially desirable:
- still allows perfect cooperation if firms are complementors
- restores no-pool outcome under rivalry

Remarks
- Does not prevent collusion (at $\hat{p}^m$, when $\delta$ large enough)
- Need both requirements (unbundling alone does not suffice to make pool always desirable)
- Boutin (2014): also strengthens Lerner-Tirole’s result for $n > 2$
- Applies to more general frameworks ... given unbundling
- Could do better ... with more information (e.g., more eff. coll.)
INVESTMENT INCENTIVES (1/2)

- Does joint marketing promote the right investment incentives?
  - provide incentives to bring to market value-creating
  - rather than business-stealing innovations

- Suppose that
  - one piece of the technology is initially available
  - another innovator can invest \( I/(1 - \delta) \) to create a second one

- Impact of the pool?
  - *Rivalry region*
    - pool is neutral
    - does not affect investment incentives
  - *Complementors*
    - pool increases profits
    - hence encourages innovation
Caution: For complementors, cannot directly conclude that pool is beneficial, because there can be business stealing:

\[ \tilde{p}^m D(\tilde{p}^m + e) > p^m D(2p^m) \text{ for } e < e^*, \text{ where } p^m < e^* < \hat{p} \]

Yet JMA with unbundling and independent licensing always desirable, as it is neutral for rivalry, and for complementors:
- lowers price
- fosters socially desirable investment
STRATEGIC JMA

- The JMA could also be used to punish deviation
  - E.g., the pool offers the deviator’s IP for free afterwards
  - To avoid this, some restrictions on governance can help
    - Unanimity rule for price changes
    - Making reductions in bundle price irreversible

- Price discussions and information exchanges
  - How do firms reach a tacit « agreement »?
  - Focal points
CONCLUDING REMARKS (1/3)

- Important to understand when commercial cooperation is desirable or not (complements vs. substitutes)
  - relevant for IP rights ("essential" patents)
    • solves royalty stacking problem
    • avoids ex post legal disputes
  - ... but also in many other industries
    • content carried by cable operators
    • payment systems used by merchants
    • providers included in health insurance network (Katz 2011)
    • music performance rights licensed by Pandora
    • product portfolios (e.g., alcoholic beverages in GrandMet)
CONCLUDING REMARKS (2/3)

- [Strategic interactions outside “perfect substitutes” environment]

- Look for requirements that require little or no information
  
  Here: Independent licensing + Unbundling
  
  - Identifies socially desirable function: *price caps*
  
  - Brings JMAs in safer territory
CONCLUDING REMARKS (3/3)

- Alternative to mergers?
- Facilitating practices with arbitrary extent of substitutability/complementarity
  - information exchanges through industry associations
  - advanced price announcements
  - product categorization (reducing number of prices)
  - resale price maintenance
  - ...