Deal or No Deal: Licensing Negotiations By Standard Development Organizations

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Pros and Cons of Standard-Setting  
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Mitigation of Standard-Related Market Power

• Fair, Reasonable, and Non-Discriminatory Royalties (FRAND)

• What is FRAND?
  – The Georgia-Pacific factors for determining a reasonable royalty?
    • Do not address lock-in
  – Auction outcomes (Baumol-Swanson)?
    • Complications with complementary patents
  – Any outcome from arms-length bargaining?
FRAND Alternatives

• Ex ante joint negotiation of license terms
  – Business review letters to VITA and IEEE; DOJ/FTC/EU guidance re rule of reason for ex ante joint negotiations

• Bilateral negotiations between rights holders and potential licensees

• Ex ante bilateral negotiations with non-discrimination requirement
Ex Ante Joint Negotiation

• SDO acts as agent for licensees
• Patented technology allows production at $MC_1$
• Next-best substitute: $MC_2 > MC_1$
• Opportunity cost of the licensor: $R_0$
  – The royalty that the licensor could earn by licensing the patent for use with an alternative technology
  – The royalty that the licensor could earn by licensing the patent for use by different licensee (or by setting a differential price for the licensee)
• Ex ante: zero costs to switch to next-best substitute
• Ex post: switching cost = $S$ (per unit)
Ex Ante Joint Negotiation

• Reservation values
  - Licensor \( R_0 = 0 \)
  - SDO \( V - MC_2 \)

• Value of license = \( V - MC_1 \)

• Gains from trade = \( MC_2 - MC_1 - R_0 \)

• Payment to Licensor

\[
R = R_0 + \theta^J(MC_2 - MC_1 - R_0) \\
\cong \theta^J(MC_2 - MC_1)
\]
Ex Ante Joint Negotiation

Demand

$\text{MC}_2$

$\text{MC}_1 + \text{R}_J$

$\text{MC}_1$

Ex ante joint negotiation

P

Q
Ex Post Bilateral Bargaining

- Two identical potential licensees: A, B
- Licensor can sign exclusive license
- Reservation values
  - Licensor = $R_0$
  - Licensee = max [$V_0 - MC_2 - S; 0$] (assume $V_0 - MC_2 - S > 0$)
- Value of license to A = $V^A - MC_1 - R^A$
- Gains from trade = $V^A - V_0 + MC_2 - MC_1 + S - R_0$
- $R_0$ is the opportunity cost of a license to B
Ex Post Bilateral Bargaining

If potential licensees are identical

\[ R_0 = (1-\theta)R_0 + \theta(V^A - V_0 + MC_2 - MC_1 + S). \]

Hence

\[ R^A = V^A - V_0 + MC_2 - MC_1 + S. \]

Exclusivity allows the patentee to capture all of the net gain from an exclusive license when the potential licensees are identical. This is also the outcome of a hypothetical auction market in which licensees bid for an exclusive license.
Ex Post Bilateral Negotiation with Exclusive Dealing

\[ MC_2 + V^A - V_0 + S. \]
Ex Ante Bilateral Bargaining with Non-Discrimination

• Reservation values
  – Licensor \( R_0 \equiv 0 \) (non-exclusive)
  – Licensee \[ \max [V_0 - MC_2; 0] \]
    Assume \( V_0 - MC_2 > 0 \)

• Value of license = \( \frac{V^{AB}}{MC_1} \)

• \( V^{AB} \) = per-unit value when both A and B have license

• Gains from trade = \( V^{AB} - V_0 + MC_2 - MC_1 - R_0 \)
Ex Ante Bilateral Bargaining with Non-Discrimination

• Royalty $R^B = (1-\theta^{ND})R_0 + \theta^{ND}(V^{AB} - V_0 + MC_2 - MC_1 - R_0)$
  \[ \approx \theta^{ND}(V^{AB} - V_0 + MC_2 - MC_1) \]

• Generally $V^{AB} \geq V_0$

• A’s average revenue is lower when B has license and A does not than when both have license
  – E.g., Nash-Cournot competition with different marginal costs
  – If $m_2 > m_1$
    \[ \pi^A(m_1,m_1) > \pi^A(m_2,m_1) + q^A(m_2,m_1)(m_2-m_1) \]
Ex Ante Bilateral Bargaining with Non-Discrimination

\[ \theta^{ND} (V^{AB} - V_0 + MC_2 - MC_1) \]
Ex Ante Bilateral Bargaining With Non-Discrimination (BBND)

• Is BBND more or less effective than ex ante joint negotiation in limiting ex post opportunism?
  – If pivotal licensee, expect $\theta^{ND} = \theta^J$. (Layne-Farrar, Llobet, & Padilla (2009) and Segal & Whinston (2000)).
  – But it is unlikely that a licensee will be pivotal or, if it is pivotal, that it will know its role with certainty.
  – Furthermore, royalty with BBND includes the additional term $V^{AB} - V_0$
## Some Comparisons

<table>
<thead>
<tr>
<th>Conduct</th>
<th>Ex Ante BBND versus Ex Ante Joint Negotiation</th>
<th>Ex Ante BBND versus Ex Post Bilateral Bargaining</th>
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</thead>
<tbody>
<tr>
<td>Threat by licensor to license exclusively within the technology</td>
<td>No effect (no exclusive licensing with joint negotiation or with BBND)</td>
<td>BBND lowers $R_0$ because cannot threaten to license exclusively</td>
</tr>
<tr>
<td>Threat by licensee to license an alternative technology</td>
<td>With BBND, more difficult to misrepresent alternatives =&gt; higher $R$</td>
<td>No switching costs with ex ante BBND =&gt; lower $R$</td>
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<tr>
<td>Effect on bargaining power</td>
<td>Depends on likelihood of pivotal licensee</td>
<td>BBND likely increases bargaining power as with most-favored customer provision =&gt; higher $R$</td>
</tr>
<tr>
<td>Effect on potential holdup</td>
<td>Holdup is unlikely with ex ante joint negotiation</td>
<td>May depend on ability to commit to licensing terms over time with BBND</td>
</tr>
<tr>
<td>OVERALL EFFECT ON $R$</td>
<td>Likely higher $R$ with BBND</td>
<td>Likely lower $R$ with BBND</td>
</tr>
</tbody>
</table>
Illustrative Bargaining Outcomes

- **MAC**
- **P**
- **Q**

Bilateral Bargaining with Exclusive Dealing
BBND
Ex Ante Joint Negotiation

**MC**

- **MC₁**
- **MC₂**
Some Concluding Remarks

• Ex ante BBND has benefits v. FRAND
  – ND component of FRAND already exists but is sometimes overlooked
  – FR component of FRAND is unworkable
    • BBND drops the FR component of FRAND, but relies on ex ante v. ex post bargaining

• Some rather obvious complications with BBND
  – E.g., economics change over time

• Ex ante bargaining may be appropriate in some circumstances
  – But rule of reason analysis must consider potential benefits and potential costs
Royalties Ex Ante and Ex Post
Net Benefits Likely from Ex Ante Joint Negotiation

ex ante competitive royalty

$1

ex post royalty

Hold-up

$11
Royalties Ex Ante and Ex Post
Net Costs Likely from Ex Ante Joint Negotiation

ex ante competitive royalty

ex post royalty

Hold-up

$10

$11