VERTICAL INTEGRATION AND HOLD UP

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based on joint work with
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HOLD-UP CONCERNS

Classic hold-up problem

Hold-up concerns yield under-investment when (part of) the return on an investment is appropriated by a trading partner.

Key ingredients

- Incomplete contracts
- Investment (on one side)
- Bargaining power (on the other side)
  - Market power
  - Relationship-specific investment
VERTICAL INTEGRATION & HOLD-UP

● Economics literature: Vertical integration as a solution
  ● Klein et al. (1978), Williamson (1979)
  ● Grossman and Hart (1986): Residual control rights to investor

● Antitrust: Vertical integration as a source of hold-up
  ● Vertical integration may foster hold-up problems... for rivals
  ● EC guidelines on vertical mergers (protection of investment)

● Illustration: Merger wave in the GPS industry
  ● TomTom / Tele Atlas (EC decision, COMP/M.4854 - 14/05/2008)
  ● Nokia / Navteq (EC decision, COMP/M.4942 - 02/07/2008)
THE GPS INDUSTRY

Background

- Upstream: navigable digital map databases
- Downstream: various types of GPS devices

vertical integration and hold up
UPSTREAM: NAVIGABLE DIGITAL DATABASES

**Content**
- Satellite photography
- Aerial Photography
- Mapping vans
- Government agencies

**Duopoly**
- Tele Atlas and Navteq
- Only ones offering similar coverage and functionalities
Different types

- In-dash navigation
- PNDs
- Smart phones
- PDAs

Two segments affected

- PNDs and Smart phones
- Considered distinct at that time, but convergence likely
STATED MERGER RATIONALES

● **TomTom / Tele Atlas**
  Improve Tele Atlas’ maps using TomTom’s customer base
  ● TomTom collects error reports from users
  ● TomTom keeps track of its customers’ travels

● **Nokia / Navteq**
  ● Development of new GPS features in smartphones
  ● Development of mobile online services (OVI portal)

● **Compatible with “VI as a solution to hold-up”**
COMPETITION CONCERNS

“Standard” foreclosure

- Refusal to deal, price increase, quality degradation
- Usual caveats: Incentives? Commitment? Efficient contracts?

Abuse of confidential information

- Suppliers have access to sensitive information about downstream customers (innovation, new business models)
- Compatible with “VI as a source of hold-up”
  - Makes integrated supplier less reliable
  - Puts customer at the mercy of other supplier
THEORY: ROADMAP

- **Framework: Successive duopoly**

- **Ex ante incentives to create hold-up problems**
  - Simple model: Commitment to appropriating profit
  - Sabotage: Commitment to dissipating profit
    - Example: Degrading the quality of their support

- **Ex post scope for hold-up problems**
  - Unverifiable quality: Degrading the quality supplied to a firm ... reduces its profit, but *increases* that of its rival

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Vertical integration and hold up
Successive duopoly

- Downstream firms invest (R&D or design stage)
- Upstream firms provide support (implementation stage)
To be successful, $D_i$ needs two types of "contribution":

- Downstream investment, $I_i$
- Support from one supplier, $U_A$ or $U_B$

**Incomplete contracts**

- No contract ex ante (before investments decisions)
  - Suppliers may appropriate *ex post* some of the return
- Concern however limited here by upstream competition
**EX ANTE PERSPECTIVE: PROFIT APPROPRIATION**

- **Competition “game”**
  - Suppliers may pre-commit themselves to being “greedy”
    - Limiting freedom of actions, delegating decision power
    - Illustration: "patent trolls"
  - Downstream firms decide whether / how much to invest
    - Investing is costly
    - Generates a return that decreases with rival’s investment
  - Bargaining
    - Suppliers offer a profit-sharing rule (subject to pre-commitment)
    - Downstream firms then choose their suppliers
**EX ANTE PERSPECTIVE: PROFIT APPROPRIATION**

**Vertical separation**
- Independent suppliers never pre-commit themselves
- Supply competition ensures that downstream firms obtain the full benefit from their investments

**Vertical integration: Merger between** $U_A$ **and** $D_1$
- the integrated supplier $U_A$ commits to being greedy
- This exposes the downstream rival $D_2$ to being held-up by $U_B$
- Discourages $D_2$’s investment, to the benefit of integrated $D_1$
ICT industries: VI firms have partly delegated the monetization of their patent portfolios to PAEs

- Can be interpreted as a commitment mechanism
- Downstream subsidiary can however still use the patent Royalty-free license, non-asserting agreement

Microsoft / Mosaid (now Conversant)

- MS acquired Nokia's handset business
- Delegated to Mosaid the management of patents for devices
- Prompted claims of "patent trolling" by Google, Huawei, ...
VARIANT: PROFIT DISSIPATION

Alternative scenario

- Suppliers can pre-commit themselves to a degraded support
- Pure “sabotage”: Decreases the return from investment (Need not directly affect rival’s profit)

Similar analysis

- Independent suppliers would never do that
  Line of business at stake; would rather commit to quality
- An integrated supplier can do it for strategic reasons
  o Becomes a less reliable option for independent customers
  o Exposes downstream rival to hold-up by remaining supplier
VARIANT: PROFIT DISSIPATION

Illustrations

- Reverse engineering & Imitation
  TOMTOM / Tele Atlas (Garmin), Nokia / Navteq (Samsung)

- Low priority access to premium resources
  SNCF/ freight operator (French Competition Authority, 2012)

- Exploiting sensitive information
  Acquisition of Blue Square supermarket chain (Israel, 2003)
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EX POST PERSPECTIVE: UNVERIFIABLE QUALITY

- **No pre-commitment**
  - Suppliers choose ex post the quality of their support
  - Degrading the support provided to one firm
    - Reduces the profit of that firm
    - ... but increases the profit of its rival

- **Competition “game”**
  - Downstream firms choose whether to invest
  - Negotiation on choice of supplier and price of support
  - Selected suppliers then choose the quality of their support
**EX POST PERSPECTIVE: UNVERIFIABLE QUALITY**

- **Vertical separation**
  - Suppliers do not have an incentive to strategically degrade *ex post* the quality of their support.
  - Competition among suppliers ensure again that downstream firms obtain the full return on their investments.

- **Vertical integration**
  - Supplier always degrades its support to a downstream rival.
  - Actually willing to *subsidize* the provision of its support...
Vertical integration (cont’d)

- Outcome depends on whether degrading the support provided to one firm … increases or decreases total industry profit
- If it *increases* total industry profit, integrated supplier “bribes” the downstream rival “out” of the market
  - Wins the supply competition with a large enough subsidy
  - Investment incentives are not affected, but consumers suffer
- If instead doing so *decreases* total industry profit
  - The remaining supplier wins the supply competition
  - But appropriates part of the profit from investment: Hold-up…
“Partially contractible” quality

Readily extends to limited verifiability and guarantees

- Quality may only be verified with some probability
- Legal environment limits compensations

expected damage rule, reliance damages rule”

Partial integration

- Applies as well when $U_A$ takes a stake in $D_1$
- Makes “hold-up” outcome more likely than “bribing” one
DISCUSSION (CONT’D)

● **Customer foreclosure**
  - Same analysis applies “upside down”
  - Illustration: Kesko-Tuko (private labels)

● **Market power upstream**
  - Balance between lines of business
  - Motivation pour spin-offs: GM-Delphi, AT&T-Lucent
CONCLUSION

- **New twist on vertical integration and hold-up**
  - Literature emphasizes VI as a *solution*
  - We stress instead that VI fosters hold-up concerns for rivals

- **New twist on raising rivals’ costs and foreclosure**
  - By exposing rivals to greater hold-up concerns ...
  - ... VI weakens rivals to the benefit of the integrated subsidiary
These insights apply

- With ex post efficient tariffs
- Even without pre-commitment (unobservable quality)

Merger policy

Even if “remedies” are available,

... need to be required as commitments