VERTICAL INTEGRATION AND HOLD UP

Patrick Rey

based on joint work with

Marie-Laure Allain and Claire Chambolle

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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

    Tele Atlas

    NAVTEQ

  - Downstream: various types of GPS devices

    TomTom

    Garmin, MiTac (Mio Tech & Navman), MEDION, …

    NOKIA Connecting People

    Motorola, Samsung, Sony Ericsson, …

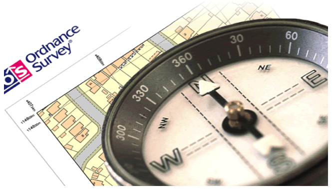
UPSTREAM: NAVIGABLE DIGITAL DATABASES

- Content

Satellite photography

Aerial Photography

Mapping vans



Government agencies

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

DOWNSTREAM: GPS DEVICES

- 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

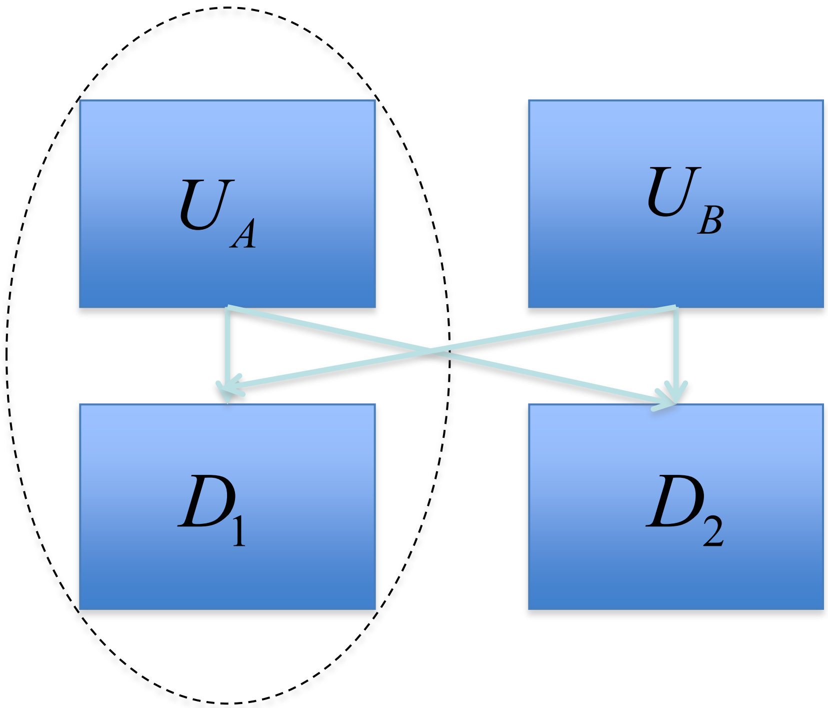
- *Ex post* scope for hold-up problems

  Unverifiable quality: Degrading the quality supplied to a firm

  … reduces its profit, but *increases* that of its rival

FRAMEWORK

- Successive duopoly



- Downstream firms invest (R&D or design stage)
- Upstream firms provide support (implementation stage)

KEY INGREDIENTS

- To be successful, D_i needs two types of "contributions“
  - Downstream investment, I_i
  - Support from one supplier, U_A or U_B

- Incomplete contracts
  - No contract ex ante (before investments decisions)
    $\rightarrow$ 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

  $\rightarrow$ 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

ILLUSTRATION: PATENT TROLLS

- 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, Huawey, ...

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
    - Becomes a less reliable option for independent customers
    - 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…

EX POST PERSPECTIVE: UNVERIFIABLE QUALITY

- 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…

DISCUSSION

- “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

CONCLUSION (CONT'D)

- 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