Resale price maintenance and up-front payments:

Achieving horizontal control under seller and buyer power.

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Resale price maintenance (RPM)

- The practice that a producer restricts the resale price of a distributor
- Several forms:
  - maximum resale price
  - minimum resale price
  - fixed resale price
- Legal development
  - Min and fixed RPM: "hard core" infringement of competition law
  - US: recently more lenient (Leegin)
  - EU: still hard-core, but a real efficiency defence
- RPM has spurred a lot of attention in the IO literature recently

General topic

- Long tradition in IO-literature: Use of vertical restraints to monopolize markets
- Here: Specific restraints considered:
  - Two-part tariffs
  - RPM
  - Quantity ceilings
  - Up-front payments (slotting fees)
- Also a lot of attention is devoted to the effect of buyer-induced restraints (buyer power).

Setting

- One upstream dominant manufacturer, denoted by A, with marginal cost c
- A competitive fringe of suppliers that supply a differentiated product B at marginal cost c
- Two downstream retailers that are horisontally differentiated

Two contracting games

- Offer game (seller power):
  - Manufacturer A makes simultaneous observable offers (take-it-or-leave-it) to the two retailers
  - Retailers observe contract terms, accept or reject offers from A, after which they compete in prices downstream.

- Bidding game (buyer power):
  - The two retailers make simultaneous offers to manufacturer A
  - A accepts or rejects each offer, after which retailers compete in prices downstream

- Contracts are own-sale contracts in both games (i.e. excludes market share contracts as in Inderst and Shaffer (2010).
- Contingent contracts (contingent on exclusivity).

Main results

- Offer game (seller power):
  - A may induce both retailers to set monopoly prices on both A and B by offering each retailer a contract with a two-part tariff coupled with a minimum RPM provision, possibly coupled with a maximum quantity that each retailer may buy.
- Bidding game (buyer power):
  - Retailers may achieve monopoly prices on both A and B by offering the manufacturer contracts with a two-part tariff coupled with a minimum RPM provision and an up-front payment from A to each retailer.

Related literature

The article is related to several strands of the literature:

- Buyer power and exclusion: Marx and Shaffer (RAND 2007), Miklós-Thal, Rey and Verge (JEEA 2011), Gabrielsen and Johansen (WP 2012)
- RPM: Jullien and Rey (RAND 2007), Dobson and Waterson (IJIO 2007), Rey and Verge (JIE 2010), Innes and Hamilton (RAND 2009)
- These papers all study the performance of different vertical restraints in different structures:
  - All have a competitive retail sector with differentiated retailers
  - Monopoly upstream (Marx and Shaffer (2007), Miklós-Thal et al (2011))
  - Dominant supplier with a competitive fringe upstream (Gabrielsen and Johansen (2012); Innes and Hamilton (2009), Inderst and Shaffer (2010))
  - Several strategic suppliers upstream (Jullien and Rey (2007); Dobson and Waterson (2007); Rey and Verge (2010)

Related literature: Buyer power

Papers: Marx and Shaffer (2007), Miklós-Thal et al (2011); Gabrielsen and Johansen (2012)

- Monopoly upstream:
  - MS: a strong retailer may use slotting allowances (up-front payments) and this will lead to exclusion of the rival downstream retailer.
  - Miklos-Thal et al: If contracts can be contingent of exclusion or not: No exclusion, but monopoly prices.
  - Conclusion: Buyer power with contingent contracts may lead to monopoly prices or exclusion.
- Dominant brand + competitive fringe upstream
  - GJ: Exclusion will occur when competition at either level is hard. More exclusion and higher prices under seller power than buyer power.
  - Conclusion: Buyer power is good because of less exclusion and lower prices.

Related literature: RPM

Papers: Jullien and Rey (2007), Dobson and Waterson (2007), Rey and Verge (2010), Innes and Hamilton (2009)

- JR: RPM makes collusion easier because it makes retail prices more uniform and less responsive to local shocks
- DW: Industry-wide RPM with linear contracts and bargaining. RPM is procompetitive when retailers are weak and differentiated. Reason: RPM eliminates double marginalisation.
- RV: With 2pT and RPM interlocking relationship may generate monopoly prices. With competitive retailers $w = c$ and $p = p^M$.
- IH: Assume one-stop shopping: 2pT and RPM will monopolize market. Equilibrium structure of contracts very different from us. Do not consider buyer power.

The model

- A supplier-retailer framework with dominant manufacturer A, producing at $c > 0$ and selling its brand through two differentiated retailers, 1 and 2.
- The retailers also sell a second brand, denoted B, which is assumed to be an imperfect substitute for the manufacturer's brand.
- Brand B is assumed to be competitively supplied to the retailers at $w = c$.
- There are no fixed costs.
- A set Ω of four different "products", $\Omega = (A-1, B-1, A-2, B-2)$, where $\{A-1, B-1\}$ are distributed by retailer 1 and $\{A-2, B-2\}$ are distributed by retailer 2.
- $q_h^i(\mathbf{p}) = q_h^i\left(p_h^i, p_k^i, p_h^j, p_k^j\right)$ *is demand for brand h at retailer i.* $q_h^i(\mathbf{p})$ *is continuously differentiable, with* $\partial q_h^i / \partial p_h^i < 0$, $\partial q_h^i / \partial p_h^j > 0$, $\partial q_h^i / \partial p_k^i > 0$, $\partial q_h^i / \partial p_k^j > 0$.

A benchmark: The fully integrated (collusive) outcome

- Overall industry profit can be written as

$$\Pi(\mathbf{p}) = \sum_{ij \in \Omega} (p_{ij} - c)\, Q_{ij}$$

where $\Omega = (A1, B1, A2, B2)$.

- Reaches its maximum, Π^M, for symmetric prices $\mathbf{p}^M = (p^M ..)$
- FOCs for products A1 and B1 (evaluated at the optimum)

$$\left(p^M - c\right)\left[\sum_{ij \in \Omega} \frac{\partial Q_{ij}}{\partial p_{A1}}\right] + Q_{A1}\left(\mathbf{p}^M\right) = 0 \qquad (1)$$

$$\left(p^M - c\right)\left[\sum_{ij \in \Omega} \frac{\partial Q_{ij}}{\partial p_{B1}}\right] + Q_{B1}\left(\mathbf{p}^M\right) = 0 \qquad (2)$$

Symmetric for A2 and B2

Offer game - contracts

- Unrestricted two-part tariff:

$$T^i\left(q_A^i\right) = w^i q_A^i + F^i$$

- Restricted two-part tariff:

$$T^i\left(q_A^i, p_A^i\right) = \begin{cases} w^i q_A^i + F^i & \text{if} \quad p_A^i \geq \underline{p}^i \\ \infty & \text{otherwise} \end{cases}$$

- Contracts are contingent on whether the rival retailer sells A or not, and we assume that exclusive contract offers are renegotiation proof.

Exclusivity subgames

- What happens if negotioations between a retailer and the manufacturer breaks down?
- We let π_U^d and π_R^d denote the profit of a retailer when not reaching an agreement with A (but when the other retailer does) under unrestricted (U) and restricted (R) contracts.
- We let $\underline{\pi}$ denote the profit of a retailer when no retailer sells A.
- These values will determine whether all products will be sold in our equilibria, i.e. that no one deviates to exclusivity.

Offer game: 2pT

- Any retailer that rejects an offer from A will earn π_U^d and π_R^d depending on whether RPM is in use or not
- Given that A wants both to accept, he should ensure that fixed fees are such that each retailer earns no more and no less than this.
- This means that, in every equilibrium with all products sold, the manufacturer's maximization problem can be written

$$\max_{w^i, w^j} \Pi_{U2}\left(w^i, w^j\right) - 2\pi_U^d$$

without price restraints, or

$$\max_{w^i, w^j, \underline{p}^i, \underline{p}^j} \Pi_{R2}\left(\underline{p}^i, w^i, \underline{p}^j, w^j\right) - 2\pi_R^d$$

with RPM.

- Hence, the manufacturer will seek to maximize industry profit given the available contracts.

Offer game: 2pT

Stage III: The pricing game

- Suppose R1 and R2 accept the contract terms
- R1s profit at stage III (similar for R2)

$$\max_{p_{A1},p_{B1}} \overbrace{(p_{A1} - w_{A1})\, Q_{A1} + (p_{B1} - c)\, Q_{B1}}^{\pi_1(\mathbf{p})} - F_{A1}$$

FOCs

$$(p_{A1} - w_{A1}) \frac{\partial Q_{A1}}{\partial p_{A1}} + (p_{B1} - c) \frac{\partial Q_{B1}}{\partial p_{A1}} + Q_{A1} = 0 \quad (3)$$

$$(p_{A1} - w_{A1}) \frac{\partial Q_{A1}}{\partial p_{B1}} + (p_{B1} - c) \frac{\partial Q_{B1}}{\partial p_{B1}} + Q_{B1} = 0 \quad (4)$$

- R1 internalises the effect of its pricing on its own margins $(p_{A1} - w_{A1})$ and $(p_{B1} - c)$
- Fails to internalise the upstream margins, $(w_{A1} - c)$, $(w_{A2} - c)$, and R2s margins, $(p_{A2} - w_{A2})$, $(p_{B2} - c)$

Offer game: 2pT

- $p_{A1}^* = p^M$ requires (1) aligned with (3), evaluated at $\mathbf{p}^M$

$$\left(p^M - c\right)\left[\sum_{ij\in\Omega} \frac{\partial Q_{ij}}{\partial p_{A1}}\right] + Q_{A1}\left(\mathbf{p}^M\right)$$
$$= \left(p^M - w_{A1}\right)\frac{\partial Q_{A1}}{\partial p_{A1}} + \left(p^M - c\right)\frac{\partial Q_{B1}}{\partial p_{A1}} + Q_{A1}\left(\mathbf{p}^M\right)$$

$$\Updownarrow$$

$$w_{A1} - c = \left(p^M - c\right)\frac{\dfrac{\partial Q_{A2}}{\partial p_{A1}} + \dfrac{\partial Q_{B2}}{\partial p_{A1}}}{-\dfrac{\partial Q_{A1}}{\partial p_{A1}}} > 0$$

- Set $w_{A1} > c$ to dampen downstream competition and induce a higher price for brand A

Offer game: 2pT

- $p_{B1} = p^M$ requires (2) aligned with (4), evaluated at $\mathbf{p}^M$

$$\left(p^M - c\right)\left[\sum_{ij\in\Omega}\frac{\partial Q_{ij}}{\partial p_{A1}}\right] + Q_{B1}\left(\mathbf{p}^M\right)$$
$$= \left(p^M - w_{A1}\right)\frac{\partial Q_{A1}}{\partial p_{B1}} + \left(p^M - c\right)\frac{\partial Q_{B1}}{\partial p_{B1}} + Q_{B1}\left(\mathbf{p}^M\right)$$

$$\Updownarrow$$

$$w_{A1} - c = \left(p^M - c\right)\frac{\frac{\partial Q_{A2}}{\partial p_{B1}} + \frac{\partial Q_{B2}}{\partial p_{B1}}}{-\frac{\partial Q_{A1}}{\partial p_{B1}}} < 0$$

- Set $w_{A1} < c$ to induce retailers to sell less of (set a higher price for) B

Offer game: 2pT

- The manufacturer unable to achieve the first-best with pure 2pT
  - $w > c$ and $w < c$ cannot simultaneously hold
- Prices always "somewhat competitive" in equilibrium (without exclusivity)
- Problem for manufacturer:
  - Retailers fail to internalise upstream margins and rival's margins
  - Retailers set p_{B1} and p_{B2} "too low" (from A's perspective)
  - Manufacturer sets $w < w^M$ to avoid losing too much demand to B. $w^M \implies p_{Ai}(w^M, w^M) = p^M$

Offer game - 2pT + RPM

- Suppose manufacturer A use 2pT + RPM instead
- This contract is sufficiently flexible to fully restore the collusive outcome
- Fix the prices for A (or set a price floor): $p_A^i = p^M$
- Adjust the wholesale price such that

$$w^i - c = \left(p^M - c\right) \frac{\dfrac{\partial Q_{A2}}{\partial p_{B1}} + \dfrac{\partial Q_{B2}}{\partial p_{B1}}}{-\dfrac{\partial Q_{A1}}{\partial p_{B1}}} < 0$$

- Retailers receive a higher margin on A than on B and each of them will wish to sell more of A (less of B)
- Only way is to increase the price of B (cannot reduce p_A below p^M)

Offer game - main result

Proposition 3. *In the offer game with restricted two-part tariffs, the manufacturer is able to induce the fully integrated outcome* Π^M*. The manufacturer may induce this outcome by choosing a wholesale price* $w^I < c$ and fixing the retail price of brand A to p^M and such an equilibrium always exists. *If the degree of interbrand competition is weak, and the unit production cost* c *is sufficiently low, the manufacturer may have to use a quantity ceiling as well as resale price maintenance to induce the integrated outcome.*

Bidding game - contracts

- Unrestricted two-part tariff
- Restricted two-part tariff
- Unrestricted three-part tariff

$$G^i\left(q_A^i\right) = \begin{cases} S^i & \text{if} \quad q_A^i = 0 \\ S^i + T^i\left(q_A^i\right) & \text{if} \quad q_A^i > 0 \end{cases}$$

- Restricted three-part tariff:

$$G^i\left(q_A^i, p_A^i\right) = \begin{cases} S^i & \text{if} \quad q_A^i = 0 \\ S^i + T^i\left(q_A^i\right) & \text{if} \quad q_A^i > 0 \wedge p_A^i \geq \underline{p}^i \\ \infty & \text{if} \quad q_A^i > 0 \wedge p_A^i < \underline{p}^i \end{cases}$$

Bidding game: 2pT

- After the retailers have made their offers, A can accept both, the best exclusive offer or reject both.
- Let $\overline{\theta}_{U2}$ denote $A's$ profit from the best exclusive offer without RPM and let $\overline{\theta}_{R2}$ his profit from the best exclusive offer with RPM. Then each retailer solves

$$\max_{w^i} \left\{ \Pi_{U2}\left(w^i, w^j\right) - \widehat{\pi}_r^j\left(w^j, w^i\right) \right\} + F^j - \overline{\theta}_{U2}, \tag{5}$$

with no RPM, and

$$\max_{w^i, \underline{p}^i} \left\{ \Pi_{R2}\left(\underline{p}^i, w^i, \underline{p}^j, w^j\right) - \widetilde{\pi}_r^j\left(\underline{p}^j, w^j, \underline{p}^i, w^i\right) \right\} + F^j - \overline{\theta}_{R2} \tag{6}$$

with RPM

- Each retailer maximizes the overall industry profit minus the downstream (variable) profit earned by her rival. I.e., each retailer maximizes *her joint profit with the manufacturer*.

Bidding game: 2pT

- Result: The retailers are unable to monopolize the market
- Similar to Miklós-Thal et al but here extended to a competitive upstream sector
- Intuition:
  - Each retailer sets his wholesale price to maximize her joint profit with A, and ignores the downstream margins earned by its rival
  - Each retailer will have an incentive to free-ride on the rival's downstream margins, hence monopoly prices cannot be achieved

Bidding game: 2pT + RPM

- Result: The retailers are still unable to monopolize the market
- In contrast to what is claimed by Innes and Hamilton (2009)
- Intuition:
  - Suppose contracts are designed as in the Offer game, i.e. $p_A^i = p_A^j = p^M$ and $w^i = w^j = w^I < c$ resulting in $p_B^i = p_B^j = p^M$
  - Because $w^I < c$ each retailer earns substantial variable profits
  - Hence, there is an incentive for each retailer to free-ride on the rival's margins
  - Increase $w^i \implies p_B^i < p^M$ or choose $p_A^i < p^M$

Bidding game: 3pT

- Result: With 3pT only, the retailers are still unable to monopolize the market
- Hence with a competitive upstream sector the result of Miklós-Thal et. al does not hold anymore, i.e. contingent contracts are not enough to induce p^M.
- Intuition:
  - With 2pT retailers earned variable profits that created an incentive to free-ride by cutting prices.
  - With a 3pT each retailer can protect himself from such deviations as the contract allows her to waive the fixed fee if the rival retailer should deviate in such a way.
  - In this way prices will be increased, but not to such an extent that monopoly prices can be sustained.
  - We know that monopoly pricing on brand B requires $w^i = w^I < c$ and then the price on brand A would be too low.
  - It then follows directly that 3pT with RPM are sufficient to induce monopoly prices on both brands.

Summary

- With seller power monopoly prices can be sustained with simple 2pT + RPM (min) even where a producer always supplies at cost
- With buyer power 3pT + RPM is needed to sustain the same outcome
- Shows that RPM can be very detrimental for welfare even in seemingly competitive situations
- Suggest that under buyer power: slotting fees and RPM may be detrimental
- As noted by Miklós-Thal et al. up-front payments (slotting fees) is just an example of a VR that will do the job. What is needed is a drastic response to deviations from a rival retailer.