Upfront Payment, Renegotiation and (Mis)coordination in Multilateral Vertical Contracting

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Upfront Payment

Manufacturer

Payment before any purchase

Retailer

Payment per unit of purchase

Key features

- Paid at signature of contract
- Not related to volume of purchases (lump-sum)
- Term: slotting allowances

Examples

- Grocery stores
- Drug stores
- Book stores, record stores
Upfront Payment

Why do manufacturers (unwillingly) pay slotting fees?

- To get access to retailers’ (limited) shelf space
  - just placement on shelves
  - premium placements (eye-level shelves, special displays)
- To have new products introduced in their stores
- To stay in retailer’s list of potential suppliers
Upfront Payment

Main issues to address

- If retailers are capable to demand slotting fees, why don’t they ask for lower wholesale prices instead?

- Why do manufacturers agree (perhaps unwillingly) to pay slotting fees?

- What is the impact of slotting fees on prices, and how do they affect market structure?
Intra-brand competition only

\[ \text{M}_A \]
\[ R_1 \quad R_2 \]

Miklos-Thal et al. 2010, Bedre 2009:
1. There always exist CA equilibrium
2. Monopoly prices are sustained

Marx and Shaffer 2008:
3. Exclusion of less efficient R is always equilibrium
4. Prices are still at monopoly levels

Inter-brand competition only

\[ \text{M}_A \]
\[ \text{M}_B \]
\[ R_1 \]

Caprice and Schlippenbach 2010 (consumer shopping costs):
1. There always exist CA-SPNE
2. No marginal cost pricing
Aim of paper

Question

*Do we obtain the same results in a situation where *oligopolistic* competition exists both upstream and downstream?*
Set up

One link is missing; technical but

- R₂ delist M₂ and launch its own-label imitation
- entry of R₂ was initiated by M₂ provided exclusivity
- negotiations between M₂ and R₂ ended in break-down
- Toy R Us Inc. v. FTC (1996)

Key features

- intra-brand competition
- inter-brand competition
- *inter-brand competition between retailers*

Remark

- No asymmetry of information
- No shopping costs
Main Findings

1. In all equilibria firms fail to sustain industry-wide monopoly profit

2. Use of slotting fees in equilibrium
   - $M_B$ may use them to dampen intra-brand competition
   - $M_A$ may use them to compensate for negative impact of sales of its product on total profits from selling product B

3. There do not always exist equilibria in which retailers carry products of all their respective suppliers
Modeling Assumptions

A1 Each pair Mk-Ri negotiates three-part tariffs contract

\[ T_{ki}(q_{ki}) = \begin{cases} 
  w_{ki}q_{ki} + F_{ki} + S_{ki} & \text{for } q_{ki} > 0 \\
  S_{ki} & \text{for } q_{ki} = 0 
\end{cases} \]

where

- \( w_{ki} \) is price per unit of good purchased by Ri
- \( F_{ki} \) is conditional fee related to volume of purchases by Ri
- \( S_{ki} \) is unconditional fee (slotting fee, if negative) unrelated to volume of purchases by Ri
Modeling Assumptions

A2 Both manufacturers and retailers have differentiated and balanced bargaining power

A3 Negotiation in each pair Mk-Ri is alternating-offer bargaining game à la Binmore et al. (1986)

\[
\text{Max} \left( u^{M_k}(C_{ki}) - d^{M_k|R_i} \right)^{1-\lambda ki} \left( u^{R_i}(C_{ki}) - d^{R_i|M_k} \right)^{\lambda ki} C_{ki}
\]

where \( C_{ki} \equiv (w_{ki}, F_{ki}, S_{ki}) \)

\[
d^{M_k|R_i} \quad \text{and} \quad d^{R_i|M_k} \text{ are disagreement payoffs} \]
Modeling Assumptions

**A4** Disagreement payoffs are obtained using approach of Stole and Zwiebel (1996)

- if Mk and Ri fail negotiations, they cannot renegotiate at another time
- all contracts signed earlier are renegotiated from scratch

**Motivation**

- Firms can renegotiate contracts at any time before retail competition
- Renegotiation in case of material change of circumstances

**Implication** \( d^M_k \mid R_i \) and \( d^R_i \mid M_k \) do not depend on \( C_{ki} \)
Order of Negotiations

Stage 1 $M_A$ and $R_1$ negotiate

Stage 2 $M_B$ and $R_1$ negotiate

Stage 3 $M_B$ and $R_2$ negotiate

If all negotiations succeeded, then

Stage 4
- Each $R_i$ decides on quantities to purchase from $M_k$
- Retail competition takes place
- All payoffs are realized

If negotiations in some $M_k$-$R_i$ fail, then

Stage 4’
- $M_k$ and $R_i$ will never renegotiate
  - Negotiations start from beginning preserving same order
First Result

In any SPNE in which all links are active, firms fail to implement monopoly outcome.

Contrast with literature

\[ \text{Inter-brand competition only} \quad \text{Intra-brand competition only} \]

Main Result Fully monopoly outcome can be sustained
First Result: Intuition

**MA is inactive**

\[
\begin{align*}
M_B & \quad R_1 \quad R_2 \\
\end{align*}
\]

Variable profits

\[
\pi^M_B(w) = (w_{B1} - c_B)q_{B1}(w) + (w_{B2} - c_B)q_{B2}(w)
\]

\[
\pi^R_i(w) = R_{Bi}(q_{B1}(w), q_{B2}(w)) - w_{Bi}q_{Bi}(w)
\]

Main Results (Bedre, 2009)

- Wholesale prices are set at levels generating *monopoly profits*

\[
(w_{B1}^m, w_{B2}^m) = \arg\max \Pi^m_{B1B2}(w) \equiv \pi^M_B(w) + \pi^R_1(w) + \pi^R_2(w)
\]

- \(M_B\) pays slotting fee to \(R_1\) only

\[
S_{B1} = -\lambda_{B1} \left[ \Pi^m_{B1B2} + \frac{\lambda_{B2}(1 - \lambda_{B1})}{(1 - \lambda_{B2})} \Pi^m_{B1} - \Pi^m_{B2} \right]
\]
First Result: Intuition

- **Intuition**
  - Start with $w_{B1}^m, w_{B2}^m > c_B$
  - Suppose that $MB$ and $R1$ set $w_{B1}^m$
  - $MB$ and $R2$ always wish to free-ride on $w_{B1}^m$

\[ w_{B2}^* = \arg\max_{w_{B2}} \Pi_{B2}(w_{B1}^m, w_{B2}) \equiv \pi^M_B(w_{B1}^m, w_{B2}) + \pi^R_2(w_{B1}^m, w_{B2}) \]

\[ = \arg\max_{w_{B1B2}} \Pi_{B1B2}(w_{B1}^m, w_{B2}) - \pi^R_1(w_{B1}^m, w_{B2}) < w_{B2}^m \]
First Result: Intuition

- **MA is inactive**

- **Intuition**
  - Set wholesale prices at levels $w_{B1}^m, w_{B2}^m$
  - $R_1$ protects itself against opportunistic move of $MB$; gives up all its variable profit

\[ F_{B1} = R_{B1} (q_{B1} (w^m), q_{B2} (w^m)) - w_{B1}^m q_{B1} (w^m) \]

- If $R_2$ and $MB$ decrease $w_{B2}$ then they loose $F_{B1}$ and get

\[ \Pi_{B2}^d = \Pi_{B2}^m < \Pi_{B1B2}^m \]

- $R_1$ gets its share of gains from trade with $MB$ through **slotting fee!**
First Result: Intuition

**MA is active**

**Clear:** Slotting fees and renegotiation imply that in any SPNE MB, R1 and R2 maximize their joint trilateral profits:

\[ (w_{B1}^*, w_{B2}^*) = \text{argmax} \tilde{\Pi}_{B1B2}(w_{A1}, w_{B1}, w_{B2}) \]

but because of MA they do it subject that MB and R2 cannot gain from decreasing \( w_{B2} \):

\[ \tilde{\Pi}_{B1B2}(w_{A1}, w_{B1}, w_{B2}) - \pi_{A1}^R(w_{A1}, \infty, w_{B2}) \geq \Pi_{B2}^d \]
First Result: Intuition

By decreasing \( w_{B2} \), \( M_B \) and \( R2 \) can induce two continuation equilibria:

- **R1 removes only B**
  - **M_A**
  - **M_B**
  - **R_1**
  - **R_2**

- **R1 removes both A and B**
  - **M_A**
  - **M_B**
  - **R_1**
  - **R_2**

Depending on \((w_{A1}, F_{A1})\), joint bilateral profit from deviation is

\[
\Pi^d_{B2} \in [\Pi^l_{B2}, \Pi^m_{B2}] \quad \text{(since A and B are imperfect substitutes)}
\]

**Assumption A5** \( \frac{\partial \tilde{\Pi}_{B1B2}}{\partial w_{B1} \partial w_{B2}} < 0 \) for all \( w_{A1} \)

\( \text{(since B1 and B2 are imperfect substitutes)} \)
First Result: Intuition

**MA is active (continued)**

**Lemma** Suppose that $A5$ holds, then the solution to problem

$$(w_{B1}^*(w_{A1}, \Pi_{B2}^{d}), w_{B2}^*(w_{A1}, \Pi_{B2}^{d})) = \arg\max \tilde{\Pi}_{B1B2}(w_{A1}, w_{B1}, w_{B2})$$

$$(w_{B1}, w_{B2})$$

s.t. $\tilde{\Pi}_{B1B2}(w_{A1}, w_{B1}, w_{B2}) - \pi_{A1}^{R1}(w_{A1}, \infty, w_{B2}) \geq \Pi_{B2}^{d}$

implies $\tilde{w}_{B1}(w_{A1}) \leq w_{B1}^*(w_{A1}, \Pi_{B2}^{d})$ and $w_{B2}^*(w_{A1}, \Pi_{B2}^{d}) \leq \tilde{w}_{B2}(w_{A1})$

**Property** $\tilde{w}_{B1}(w_{A1}^{m}) < w_{B1}^{m}$ and $\tilde{w}_{B2}(w_{A1}^{m}) < w_{B2}^{m}$

**Intuition** $M_B$, $R1$ and $R2$ have incentives to free-ride on $MA$'s margin
Second Result

If intensity of inter-brand rivalry between retailers is sufficiently strong, then MA may need to pay R1 a slotting fee.

MA pays upfront to compensate for negative impact of A on total sales of B

MB pays upfront to suppress intra-brand competition between R1 and R2

Remark

Slotting fees are irrelevant
Second Result: Intuition

Negotiations between $MA$ and $R_1$ imply

$$\max \Pi (w_{A1}, w_{B1}, w_{B2})$$

subject to following constraints

1. $MB$, $R_1$ and $R_2$ cannot jointly gain from excluding $MA$

$$F_{A1} \leq \Pi_{B1B2} (R_1 \text{ carries } A) - \Pi_{B1B2} (R_1 \text{ removes } A)$$

Implication $F_{A1}$ should be lower

2. Impact of $(w_{A1}, F_{A1})$ on $w_{B1}$ and $w_{B2}$ in continuation equilibrium

$$(w_{A1}, F_{A1}) \rightarrow \Pi_{B2}^d \rightarrow w_{B1}^* \text{ and } w_{B2}^* \rightarrow \Pi (w_{A1}, w_{B1}, w_{B2})$$
Second Result: Intuition

Key points
- $w_{A1}$ and $w_{B1}$ are strategic complements
- $w_{A1}$ and $w_{B2}$ are strategic substitutes
  (from point of view of maximizing total profits)

Implication $MA$ and $R1$ jointly prefer for $MB$ and $R2$ to set higher $w_{B2}$

Gain for $MA$
- reduce competitive pressure on its product

Gain for $R1$
- reduce incentives of $MB$ to free-ride on its contract with $R1
Second Result: Intuition

**Result** When intensity of inter-brand rivalry between retailers is strong, it is optimal to set \( F_{A1} = 0 \)

- this relaxes constraint
  \[
  F_{A1} \leq \tilde{\Pi}_{B1B2}(R_1 \text{ carries } A) - \Pi_{B1B2}(R_1 \text{ removes } A)
  \]

**Implication** Exclusion of \( MA \) is no longer possible

- this reduces joint profits of \( MB \) and \( R_2 \) from deviating

\( R_1 \text{ removes only } B \)

\( \Pi^d_{B2} \) is lower

- The effect is stronger, the stronger \( A \) and \( B \) compete at \( R1 \) and \( R2 \)
Second Result: Intuition

☞ When $F_{A1} = 0$, then $S_{A1}$ is used to redistribute gains from trade between $MA$ and $R1$

$$S_{A1} = (1 - \lambda_{A1}) \, GT_{A1} - \pi^M_A$$

if $GT_{A1}$ is large

or

$$S_{A1} = \left[ GT_{A1} - \frac{u^{R_1|R_2} - u^{R_1|M_A}}{\lambda_{B1}} \right] - \pi^M_A$$

if $GT_{A1}$ is low

where

$$GT_{A1} = \Pi(w_{A1}, w_{B1}, w_{B2}) - d$$

gains from trade between $MA$ and $R1$

$$d = \left[ u^{R_1|M_B} + \frac{u^{R_1|M_A} - u^{R_1|M_B}}{\lambda_{B1}} \right] + \left[ u^{M_B|R_2} + \frac{u^{M_B|R_1} - u^{M_B|R_2}}{(1 - \lambda_{B2})} \right]$$
Second Result: Intuition

Implication $S_{A1}$ can be negative

$$S_{A1} = (1 - \lambda_{A1}) GT_{A1} - \pi^{MA} < 0 \quad \text{if } MA \text{ has weak bargaining power (unsurprising)}$$

$$S_{A1} = \left[ GT_{A1} - \frac{u^{R_1 | R_2} - u^{R_1 | MA}}{\lambda_{B1}} \right] - \pi^{MA}$$

$$= \tilde{\Pi}_{B1B2} - \left[ d + \frac{u^{R_1 | R_2} - u^{R_1 | MA}}{\lambda_{B1}} \right] < 0 \text{ if } A \text{ sufficiently reduces total sales of } B$$

Result $MA$ may pay slotting fee to compensate for negative impact of sales of its product on total sales of $B$. 
Third Result

In a framework of sequential contracting, there do not always exist SPNE in which retailers carry the products of all their respective suppliers.

Contrast with literature

Inter-brand competition only

Intra-brand competition only

Main Result There always exist CA-SPNE with all links being active
Third Result: Intuition

- A party negotiating with two counterparties cannot fully appropriate benefits of individual trade with each of them.

- This effectively increases that party's outside option of failing some negotiation.

- This makes it difficult to sustain equilibrium with all trading links.

Formal Condition: \( GT_{A1} \geq \max \left( 0, \frac{u^{R_1|R_2} - u^{R_1|M_A}}{\lambda_{B1}} \right) \)
Policy Implications

Impact of slotting fees (on prices) may be less anticompetitive when competition exists at both levels (monopoly outcome is not sustained).

Slotting fees may be used to ensure that retailer does not remove manufacturer's product from its store.