Downstream Competition, Exclusive Dealing and Upstream Collusion

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Exclusive Dealing and Competition Authorities

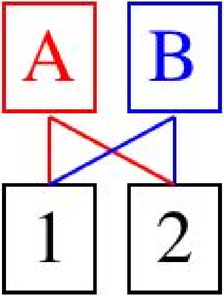
Guidelines on Vertical Restraints, European Commission (2000)

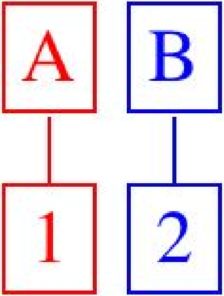
One of the "negative effects that may result from vertical restraints which EC competition law aims at preventing" is the "reduction of inter-brand competition between companies operating on a market, including facilitation of collusion amongst suppliers or buyers."

"The possible competition risks [of single branding] are foreclosure [...], **facilitation of collusion between suppliers** in case of cumulative use and [...] a loss of in-store inter-brand competition."

Our main question

What is the effect of the vertical structure on upstream firms' collusion?





Our purpose

Basic framework:

- Upstream and Downstream competition;
- Possible interlocking relationships
- Infinitely repeated interactions.

We study the impact of exclusive dealing on upstream collusion:
Assume producers may offer exclusive dealing contracts:

- Effect on the scope for collusion?
- Price and welfare effects?

Literature

Vertical relationships and upstream collusion:

- *Effect of buyer power on upstream collusion:* Snyder (RAND, 1996) analyses the impact of retailers' size, on upstream collusion.
- *Vertical restraints and upstream collusion:*
  - Jullien & Rey (RAND, 2007): RPM can facilitate collusion when demand is uncertain.
  - Nocke & White (AER, 2007): Vertical Integration can facilitate collusion by lowering deviation profits for unintegrated firms.

Anti-competitive effects of vertical restraints:

- *Resale price maintenance:* Rey & Vergé (2004), Allain & Chambolle (2007).
- *Exclusive Dealing:* ED contracts may harm consumers by dampening competition: Lin (1990), O'Brien & Shaffer (1993), Besanko & Perry (1994).

But not analysed in a repeated framework.

Our results

Incentives for collusion

When goods are differentiated enough, allowing for exclusive dealing contracts increases the scope for collusion.
On the contrary, *when goods are close enough substitutes*, allowing for exclusive dealing contracts reduces the scope for collusion.

Consequences for Welfare:

- *When goods are differentiated enough*, allowing for exclusive dealing contracts harms consumers because it leads to higher prices on the market, and collusion happens more often.
- *When goods are close enough substitutes*, allowing for exclusive dealing contracts may benefit consumers, because collusive prices with interlocking relationships are higher than competitive prices with exclusive dealing.

Outline

Outline

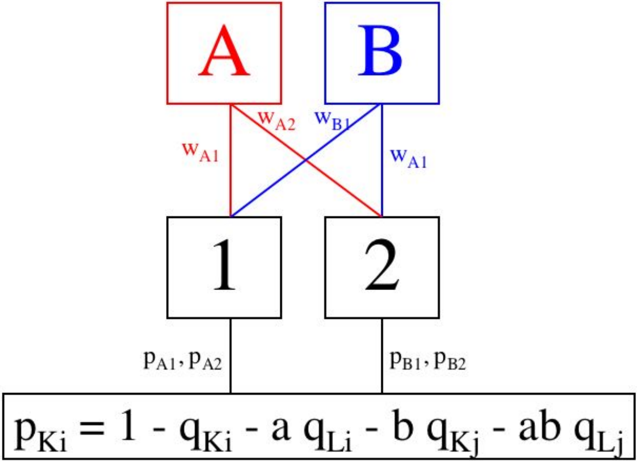
The Model

- Two producers, A and B, produce differentiated goods.
- Two retailers, 1 and 2, can buy these goods and sell them on the final market.
- There can be four goods available on the market.
- The inverse demand function for good $A1$ is:

$$p_{A1}(q_{A1}, q_{A2}, q_{B1}, q_{B2}) = 1 - q_{A1} - aq_{B1} - bq_{A2} - cq_{B2}$$

  Goods are imperfect substitutes: $0 < a < 1$,
  Retailers are imperfect substitutes: $0 < b < 1$.
  $c = ab$ measures substitutability between two different goods sold by two different retailers.
- Production and retailing costs are normalized to 0.

Market structure if the four goods are carried



Timing: One period of the game

1. **Choice of the Market Structure:** Producers wishing to use exclusive dealing contracts (if available) simultaneously and secretly offer exclusive clauses to one or two retailers. A retailer that receives such an offer accepts or rejects it.
2. **Upstream Offers:** ED contracts are made public. Producers make take-it-or-leave-it offers to the retailers who:
   - Do not have any ED-contract with their rival;
   - Accepted the ED clause if it was offered in stage 1.

   A contract takes the form of a linear wholesale price w_{Ki} $(K = A, B,\ i = 1, 2)$.
3. **Downstream Competition:** Retailers simultaneously set final prices on the downstream market and goods for which demand is positive are sold.

The choice of linear tariffs:

- With two-part tariffs, there does not always exist a symmetric competitive equilibrium (See Rey & Vergé, 2004).
- This problem is solved with linear tariffs.

The game is infinitely repeated:

- All three stages are repeated at each period;
- The two producers have the same discount factor δ.
- In order to focus on upstream collusion, we assume that retailers change at each period (See Jullien & Rey).

Outline

Benchmark: Exclusive Dealing Contracts Forbidden

When exclusive dealing is not available, firms play a two-stage game at each period:

1. **Upstream Offers:** Producers simultaneously offer each retailer a contract, in the form of a linear wholesale price w_{Ki} ($K = A, B$, $i = 1, 2$).
2. **Downstream Competition:** Retailers simultaneously set final prices on the downstream market and goods for which demand is positive are sold.

They can still offer discriminating tariffs.

One period of the game

The competitive equilibrium

There exists a unique symmetric Nash equilibrium such that:

- All four $U - D$ pairs agree on the same wholesale price w^*;
- Retailers set the same final price for all goods, p^*;
- All four goods are sold.

The wholesale tariff decreases with upstream competition. The final price decreases with upstream and downstream competition.

Upstream Collusion

The collusive wholesale price is the monopoly price: $w^C = 1/2$.

Double Margin $\Rightarrow$ The joint profit of the industry may be lower than in competition. However, producers always get a higher share of this profit.

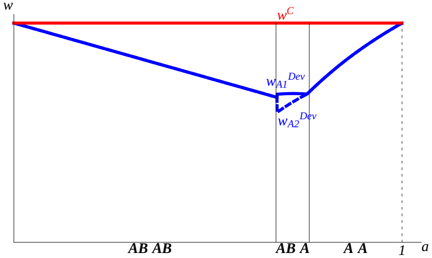
The Stage Game: Deviation from the collusive strategy

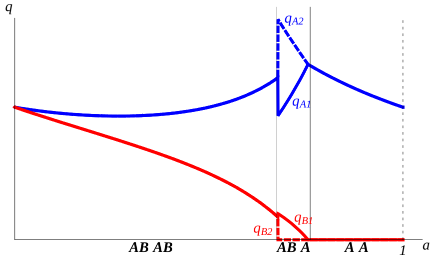
Deviation

A producer's optimal deviation strategy depends on both the goods' and the outlets' degree of substitution:

- When goods are differentiated enough, all goods are carried on the final market, but the deviating retailer gets a higher market share.
- When goods are close enough substitutes, the deviating producer manages to capture the whole demand.
- In between, he may have an incentive to set asymmetric prices such that his rival is excluded from one outlet only.

The deviation strategy: Illustration when $b = 0.9$





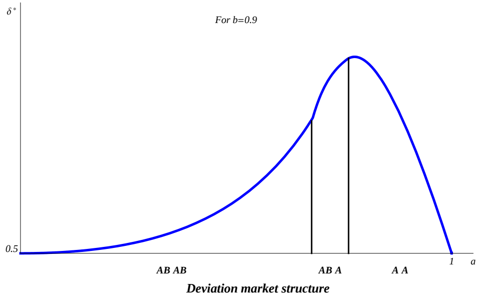
The Repeated Game

Collusion is sustainable if and only if: $\pi_U^{Dev} + \frac{\delta}{1-\delta}\pi_U^* \leq \frac{1}{1-\delta}\pi_U^C$.

Proposition 1: Interlocking Relationships and Collusion Stabiliity

The threshold discount factor, δ^*, is non-monotonous in inter-brand substitutability:

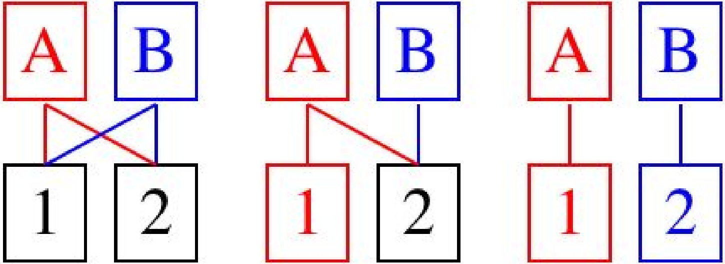
- When goods are differentiated enough, δ^* is increasing in a;
- When goods are close enough substitutes, δ^* is decreasing in a.



Outline

With Exclusive Dealing Contracts

When exclusive dealing is possible, the market structure at the end of stage 1 can be of three types:



One period of the game

The competitive equilibrium

When ED contracts are available, there exists an equilibrium such that each producer signs an exclusive dealing contract with one retailer.

Allowing for ED contracts thus:

- Reduces variety in the final market;
- Softens competition between producers at stage 2 $\Rightarrow$ Increases wholesale tariffs with regards to the no-ED case: $w^*_{ED} > w^*$;
- Softens competition between retailers at stage 3 $\Rightarrow$ Increases final prices with regards to the no-ED case: $p^*_{ED} > p^*$.

$\Rightarrow$ In the stage game, allowing for ED contracts harms consumers.

$\Rightarrow$ It reduces producers' profits when goods are differentiated enough.

The Stage Game: Joint-profit maximizing

Upstream Collusion

Even when ED-contracts are allowed, all four goods are sold on the final market and the collusive wholesale price remains the monopoly price: $w^C = 1/2$.

When deciding his strategy in stage 1, producer A now considers the two effects of signing an ED contract with retailer 1:

- His own gain from destroying competition in outlet 1;
- The loss that it induces for B

The loss always offsets the gain.

The Stage Game: Deviation from the collusive path

A producer can now deviate either at stage 1 or 2:

- **At stage 2:** A offers no ED contract and sets wholesale tariffs to maximize his individual profit
  $\Rightarrow$ Same deviation as before.
- **At stage 1:** A offers an ED contract to at least one of the retailers.
  $\Rightarrow$ The punishment phase starts immediately at stage 2, and not at the next period.

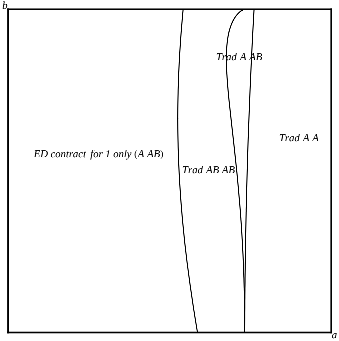
$\Rightarrow$ **A faces a trade-off if he signs an ED contract with one retailer:**

- He does not have to cut prices to exclude B;
- But B detects the deviation sooner and the price setting stage is competitive.

Optimal Deviation with ED contracts

In deviation, a producer offers:

- At least one ED contract when goods are differentiated enough. One of the retailer accepts the ED contract.
- No ED contract when goods are close enough substitutes: deviation then occurs at stage 2 and is the same as in the no-ED case.



The Repeated Game

Proposition 2: Exclusive Dealing and Collusion Stability

- When goods are differentiated enough, allowing for ED contracts facilitates collusion : $\delta^*_{ED} < \delta^*$.
- On the contrary, when goods are close enough substitutes, allowing for ED contracts hinders collusion: $\delta^*_{ED} > \delta^*$.

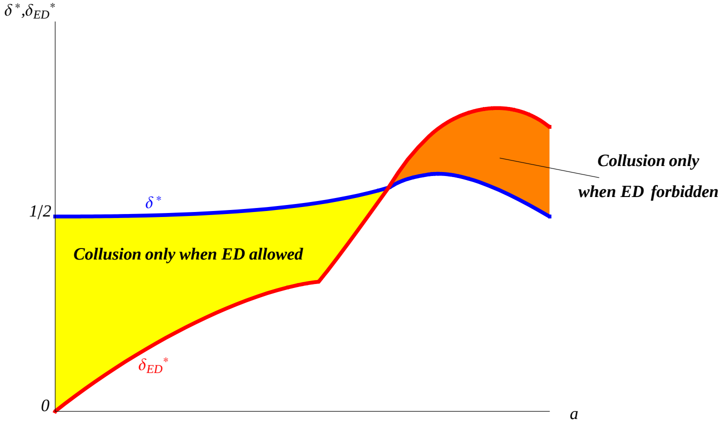
Intuition

The main reason is that when exclusive dealing is allowed, the producers' punishment profits are

- Lower when goods are differentiated enough;
- Higher when goods are close enough substitutes.

This effect completely offsets the positive effect of allowing ED contracts on the deviation profit when goods are differentiated enough.

The Repeated Game: Illustration for $b = 0.9$



Outline

Consequences for Competition policy

When goods are not too close substitutes, then:

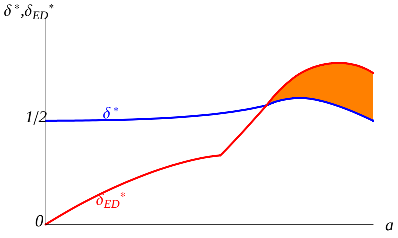
- Competitive prices are higher,
- And collusion is easier to sustain

when firms are allowed to sign ED contracts than when they are not.
$\Rightarrow$ Allowing for ED contracts harms consumers, no matter if collusion is stable.

When goods are close enough substitutes:

- The risk of collusion is higher without ED contracts than with ED contracts;
- Collusive prices without ED contracts are higher than competitive prices with ED contracts.

$\Rightarrow$ **Allowing for exclusive dealing may benefit consumers when upstream competition is fierce.**



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Conclusion

We analyzed the effect of allowing for exclusive dealing agreements between producers and retailers on collusion.

We find that the effect of allowing for ED contracts depends on the level of substitution between goods.
Exclusive dealing contracts harm consumers when inter-brand competition is soft enough.

Extensions

What if ED clauses and wholesale tariffs are determined at the same stage?