

Can price fixing improve welfare?

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Price fixing

- Price fixing occurs when firms agree on which prices consumers should be faced with

Basically two types of price fixing:

- Horizontal price fixing: when competitors agree (implicitly or explicitly) on the price that should be charged to their customers.
 - ▶ If successful this would normally increase prices to consumers and induce a welfare loss.
- Vertical price fixing: When for instance a producer puts restrictions on the price that a retailer should charge its customers
 - ▶ More controversial.
 - ▶ Could consumer prices be increased?
 - ▶ Could this lead to lower consumer prices?
 - ▶ Could vertical price restrictions lead to positive effects that offset any eventual negative effects from increased prices?

Vertical price fixing = Resale Price Maintenance (RPM)

- Three types:
 - ▶ Maximum RPM: A restriction that prohibits the retailer to charge a higher price. Legal
 - ▶ Minimum RPM: A restriction that prohibits the retailer to charge a lower price. Illegal.
 - ▶ Fixed RPM: A restriction that locks the retail price. Illegal.
- The very nature of current competition policy suggests that RPM is detrimental to welfare due to a danger of a price increasing effect.
- Is this regime sensible?
- This talk is based on: Gabrielsen, T.S and B.O. Johansen: Resale Pricee Maintenance with Secret Contracts and Retail Service Externalities.

Resale price maintenance

- Policy debate is US following the Leegin-case: Long standing per se prohibition on minimum and fixed RPM lifted
- Policy debate in EU: Taking off RPM of the "hard-core" list. Giving RPM a "real" efficiency defense
- Long lasting academic debate. Lots of recent papers suggesting consumer detriment of different types of RPM
- Norway: A long debate of RPM in the book market, and whether publishers should be allowed to fix retail prices for books.
 - ▶ Many arguments, but one central alleged positive effect of fixed prices was that this would enable publishers to give retailers incentives to provide in-store service to customers, e.g. advice on which book to buy etc.

Observations

- In real life markets retailers make a myriad of decisions; price, advertising, point-of-sale services: nice and tidy shops, sufficient inventory and personnel, be nice to customers etc. etc.
- All of these decisions are important for retail demand.
- Hard to come by a single example where these services are of no importance whatsoever.
- There may be spillover effects from these decisions to other retailers (positive or negative).
- Retail service effort may be non-contractible, or at least imperfectly contractible.
- Katz (1991) argues that retail contracts mostly are secret, i.e. only observable only to the contracting parties.
- A reasonable model should therefore include these features.

The literature

- As usual with vertical restraints there are conflicting arguments
 - ▶ RPM may enhance efficiency because it may stimulate retail sales effort (Telser [1960], Mathewson and Winter [1984])
 - ▶ RPM can be anti-competitive by raising prices to consumers (O'Brien and Shaffer [1992], Rey & Vergé [2004, 2010], Montez [2012], Innes and Hamilton [2009] and more)
- These models and results are developed within different frameworks
 - ▶ Observable contracts (MW, IH, RV-2010)
 - ▶ Secret contracts (OS, RV-2004, M)
 - ▶ Retail decisions:
 - ★ retail price only (OS, RV, M, IH)
 - ★ retail price and sales effort (MW)
- Surprisingly, no paper that we are aware of, has studied RPM in markets with secret contracts and non-contractible retail service effort.

An 'opportunism problem': secret contracting

- If the monopolist cannot commit to a set of public contracts, prices and therefore profits may end up well below the monopoly level
 - ▶ Hart and Tirole [1990]: Cournot competition - the monopolist obtains the standard Cournot outcome
 - ▶ O'Brien and Shaffer [1992]: Price competition - the monopolist obtains the standard Bertrand outcome
 - ▶ (See also McAfee and Schwartz [1994], Rey and Vergé [2004], Montez [2012] and others)
- Consider the following example:

The basic idea

- Consider an upstream monopolist selling to two differentiated downstream retailers
- Assume that the monopolist offers the retailers non-linear contracts (e.g. two-part tariffs) that will induce them to set the monopoly price to consumers.
- The marginal price in the contracts should increase as the retailers become closer substitutes.
- Once a retailer accepts the contract and pays the fixed fee, he knows that the monopolist will have incentives to offer the rival retailer a lower marginal price.
- The rival retailer will therefore be able to set a lower price, and induce a loss on the retailer that accepted the contract.
- Hence no retailer will accept any contract that has marginal prices higher than the monopolist's marginal cost.
- The monopolist ends up losing its monopoly power.
- He is unable to commit not to secretly renegotiate - similar to the durable good monopolist.

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 - ▶ Provides an incentive for the manufacturer and a retailer to secretly deviate and freeride on rival retailers' margins
- The monopolist may use RPM to eliminate quasi-rents entirely and fully restore its market power
 - ▶ Individual **price ceilings** + high marginal transfer prices ('squeezing' the retailers' downstream margins)
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- If the monopolist can commit to a common RPM level for all retailers, then a **price floor** will also work.
- Challenges the prevailing antitrust policy, which tends to focus solely on fixed and minimum RPM

We combine two strands of the literature

- One strand suggests that RPM is good because it encourages different types of pre-sale services that consumers find valuable
 - ▶ Mathewson and Winter [1984]
 - ★ Observable contracts, freeriding and service externalities
 - ⇒ fixed or min RPM to restore first-best for the monopolist
- Another strand suggests that RPM may be bad because it may help the monopolist overcome opportunism
 - ▶ O'Brien and Shaffer [1992],
 - ★ Unobservable contracts and opportunism
 - ⇒ Individually negotiated fixed or max RPM may restore first-best for the monopolist,
 - ⇒ or min RPM (if the monopolist can commit to a common min price throughout the market)

We combine two strands of the literature

- We assume that retailer's provide (non-contractible) sales effort
- A retailer's sales effort may have positive or negative spillovers
- Each retailer's contract terms are unobservable to the rival
- We assume price competition and use 'contract equilibria' as our solution concept

Main results

- When retailers exert sales effort, we get MC wholesale prices and thus the 'standard Bertrand' outcome whether or not individually negotiated RPM is allowed
 - ▶ Hence, the proposed solution that price ceilings can be used to alleviate opportunism, breaks down.

Main results

- Even though there is freeriding among retailers as they provide valuable services to customers, a commitment to fixed or minimum industry-wide prices may harm consumers (given that the wholesale terms are otherwise unobservable)
 - ▶ MC wholesale pricing in all equilibria \Rightarrow manufacturer distorts retail prices upwards (bad for consumers) in order to encourage effort
 - ▶ Unlike what is reported e.g. in Motta [2004, p. 326-331] with observable wholesale terms

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- Own effect dominates cross effects, $\frac{\partial D_i}{\partial e_i} > \left| \frac{\partial D_i}{\partial e_k} \right|$, and $\frac{\partial D_i}{\partial p_i} > \left| \frac{\partial D_i}{\partial p_k} \right|$ for all $i = 1, 2$ and all $k \neq j = 1, 2$

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- Costs of service: $C_i = C(e_i)$, $C(0) = 0$, $C' > 0$ and $C'' > 0$
 - ▶ Let $\mu_i := C_i/D_i$ denote R_i 's effort cost per unit sold

Contract equilibrium:

Let \mathbf{A} be the set of allowable contracts and $\mathbf{s} = (s_i)$ be the vector of retailers strategies in the downstream market. A contract equilibrium with unobservable contracts is then a vector of supply contracts $\mathbf{T}^* \in \mathbf{A}$, and Nash equilibrium \mathbf{s}^* induced by these contracts, such that $\forall i$ and $\forall T_i \in \mathbf{A}$, T_i^* is the contract that maximizes the bilateral joint profit of M and R_i , taking (T_j^*, s_j^*) as given.

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- A tractable and intuitively appealing solution concept
- Similar to a 'passive beliefs equilibrium'; a 'passive beliefs equilibrium' is also a 'contract equilibrium'
 - ▶ However, a 'contract equilibrium' may not be a 'passive beliefs equilibrium' (Rey and Vergé [2004])!
- May be justified by the manufacturer using agents

Two benchmarks

The 'standard Bertrand' outcome

We let p^B and e^B be the price and effort for each retailer that simultaneously solves

$$\pi^B = \max_{p_i, e_i} (p_i - c - \mu_i) D_i, \text{ for } i \in \{1, 2\}$$

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The fully integrated outcome

We let p^I and e^I be the price and effort for each retailer that solves

$$\Pi^I = \max_{\mathbf{p}, \mathbf{e}} \sum_i (p_i - c - \mu_i) D_i$$

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Analysis: general

Lemma:

In all 'contract equilibria' $(\mathbf{T}^*, \mathbf{s}^*)$ with (industry-wide) RPM, the supply contract T_i^* is continuously differentiable at the equilibrium quantity D_i^* induced by \mathbf{T}^*

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- An extension of *Lemma 1* in OS [1992]
- Applies for both positive and negative effort spillovers
- If T_j^* was not continuous, then either a) $M - R_i$ could secretly induce a small change in e_i that would cause T_j^* to jump up, or b) R_j could make a small change in e_j that would cause T_j^* to jump down
- The result places an important restriction on the type of contracts we will observe 'in equilibrium'
 - ▶ E.g., no retroactive discounts or 'sales forcing' at the equilibrium level

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- First we show that a strategy of squeezing the retailers' margins, cannot be part of any equilibrium:
- If the margins are squeezed then either:
 - ▶ the retailers will exert zero effort, or
 - ▶ the retailers would adjust their effort to some level where the margin becomes positive

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- We may then note that $e_i^* = 0$ cannot be part of any equilibrium...
- The reason is that the monopolist and any retailer could appropriate all of the gain to the overall profit from inducing a positive effort by the retailer.
- This means that a discount on the marginal price to the retailer would be jointly profitable.

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- Let V_{M-R_i} be M and R_i 's joint profit. In a contract equilibrium we have (per definition)

$$\max_{e_i} V_{M-R_i} = \max_{e_i} \{ (p_i^* - \mu_i - c) D_i + T_j^* - cD_j \}$$

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- Gives a first-order condition equal to

$$(p_i^* - T_i^{*'} + T_i^{*'} - c) \frac{\partial D_i}{\partial e_i} - C_i' + (T_j^{*'} - c) \frac{\partial D_j}{\partial e_i} = 0$$



$$\underbrace{(p_i^* - T_i^{*'}) \frac{\partial D_i}{\partial e_i} - C_i'}_{=0} + \left\{ \sum_{k=1}^{N=2} (T_k^{*'} - c) \frac{\partial D_k}{\partial e_i} \right\} = 0$$

Analysis: Bilateral RPM

1st main result

In all 'contract equilibria' $(\mathbf{T}^*, \mathbf{s}^*)$ with (industry-wide) RPM, the marginal transfer prices are the same for each retailer and equal to $T_1^{*'} = T_2^{*'} = c$.

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A strategy of squeezing the retailer's downstream margins is not part of any contract equilibrium. Individually negotiated RPM contracts have no effect. Applies for both positive, negative and no spillovers in sales effort.

Every contract equilibrium therefore has prices and effort levels equal to p^B and e^B

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- This increases the overall profit, and in particular increases the bilateral joint profit $\pi_M + \pi_i$ available to M and R_i
- Hence, because $p_i^* - T_i^{*} > 0$ for both retailers in equilibrium, we have fully opened the door for opportunism again
 - ▶ inducing each pair to deviate on the individually negotiated price restraints as well

Analysis: 'industry-wide' RPM

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 - ▶ Industry-wide price floor,
- May therefore mitigate opportunism in a way contracts with bilateral price restraints cannot
- We show that they often cannot fully solve the problem if marginal transfer prices are unobservable
- Even though retailers provide valuable services in our model, the effect of these restraints for consumers are very different from the effect when contracts are fully observable

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- Previous result implies that $T_1^{*'} = T_2^{*'} = c$ at the second stage
 - The manufacturer will therefore choose the 'semi-collusive' price p^S at the first stage of the game
 - Retailers exert the corresponding level of sales effort e^S at the third stage

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Formally...

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Definition

We define p^S and $e^S := e^*(p^S)$ as the semi-collusive price and effort level respectively, where

$$e^*(p) := \arg \max_{e_i} [p - c - \mu_i] D_i(e_i, e^*(p), p, p)$$

and

$$p^S := \arg \max_p [p - c - \mu(e^*(p))] \sum_k D_k(e^*(p), e^*(p), p, p).$$

Finally, we let Π^S represent the semi-collusive profit,

$$\Pi^S := (p^S - c - \mu(e^S)) \sum_i D_i(e^S, e^S, p^S, p^S)$$

Analysis: 'industry-wide' RPM

- The semi-collusive outcome is not necessarily very attractive for the monopolist
- A higher price may induce retailers to compete more fiercely when exerting sales effort (negative spillovers)
- Always weakly better than 'standard Bertrand', $\Pi^S \geq 2\pi^B$ (can be replicated by setting $p = p^B$)
- $\Pi^S = \Pi^I$ only when there are no spillovers in sales effort
- The marginal transfer price is still equal to marginal cost, hence a price floor is needed to induce a price increase

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$$D_i = \frac{1}{2} \left[v + e_i + \alpha e_j - (1 + \gamma) p_i + \frac{\gamma}{2} (p_1 + p_2) \right], \quad i = 1, 2 \quad (1)$$

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- We have $\alpha \in [0, 1]$ and assume effort costs equal to $C_i(e_i) = \mu e_i^2 / 2$, where $\mu > 1$
- (1) is used in Motta (2004, pp. 326-331) in a setting with fully observable contracts; consumer welfare then always increases with RPM

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 - ▶ We get $p^S > p^I(e^S)$, where $p^I(e^S)$ is the fully integrated monopoly price for a common effort level e^S
- Casts doubt on the relevance of service externalities as an 'efficiency defense' for price floors
- Public price floors may be 'less harmful' for consumers if there are no service externalities

Conclusion

- Horizontal price fixing normally reduces welfare
- What can we say about vertical price fixing?
 - ▶ Largely depends on assumptions:
 - ★ What are the decisions taken by retailers? Price only, or price and effort?
 - ★ Are contracts secret or observable?
- If retailers make many decisions, and some are at least imperfectly contractible, AND contracts are secret, then:
 - ▶ Individual price restraints has no effect whatsoever, and will not be used
 - ▶ Industry-wide price floors will have negative effects
 - ★ It provides more effort, but at the expense of increasing prices too much

Policy implication

- No support for the harsh treatment of bilateral RPM
- Price ceilings seems to be no problem
- Competition policy should focus on industry-wide practices.
- Common retail prices can be facilitated for example by industry trade agreements (book market)
- Service externalities are not necessarily very relevant in an 'efficiency defense' – they may even cause price floors to perform worse for the consumers compared to in a market without these externalities