Exclusive dealing with commitment problem

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Exclusive dealing

Exclusive dealing refers to contracts that require to purchase products or services for a period of time exclusively from one retailer.

- Exclusive dealing can have anti-competitive effect. It allows dominant firm to deter efficient entry (foreclosure practice).
- There can be also efficiency gains.
  - It protects specific investment against opportunistic behaviour (Segal, Whinston 2000).
  - Stimulate investment into retailers services (Besanko, Perry 1993)

The ability of an incumbent to deter entry by writing exclusionary contracts with customers has been subject of contention in the antitrust literature.

Chicago school argument

1. In order to sign an exclusive contract a buyer has to be compensated for the loss it suffers.
2. This loss amounts to the difference between consumer surplus under competitive price and consumer surplus under monopoly price.
3. This equals monopoly profit plus the deadweight loss.

Conclusion:

The incumbent cannot profitably use exclusive contacts to deter entry. Efficiency considerations explain the use of exclusive contracts.

Literature review

- Segal, Whinston (1996). Entrant needs to supply minimum number of buyers to cover its fixed costs. Incumbent can exploit buyers' lack of coordination and deter entry.
- Fumagalli, Motta (2004). Exclusive contract do not involve final consumers but firms. Anticompetitive effect of exclusive contacts depends on the intensity of competition in the downstream market.
- Abito, Wright (2008). Exclusive contacts deter entry when markets are more competitive under linear pricing. Exclusive contacts deter entry regardless of the extent of competition under two-part tariff.

Abito, Wright (2008)

Assumptions:

1. Incumbent proposes exclusive contact to the two retailers.
2. Entrant enjoys lower marginal costs.
3. The manufacturers make offers to available retailers. The contracts are secret and retailers conjectures are symmetric. It excludes commitment problem from their model.
4. Degree of competition between retailers is parameterized.

Conclusions

1. Under linear prices exclusive dealing causes foreclosure regardless of entry costs if degree of competition is high.
2. Under two-part tariff exclusive dealing causes foreclosure regardless of entry costs and degree of competition.

Commitment problem

Manufacturer faces a commitment problem when dealing with retailer.

Consider a case of one manufacturer and two retailers. Contracts specifying quantity and price are publicly observed. Manufacturer credibly offers contract

$$(q_1, T_1) = (q_2, T_2) = (\frac{q^M}{2}, \frac{p^M q^M}{2})$$

Sticking to this contract is not credible if contracts are secret. Manufacturer has an incentive to offer more than $q^M/2$.

Conjecture assumption

- Symmetric conjectures. Retailers assume that manufacturer makes the same offer to them. This assumptin solves the commitment problem. It is credible to offer

$$(q_1, T_1) = (q_2, T_2) = (\frac{q^M}{2}, \frac{p^M q^M}{2})$$

  This assumption is not very realistic (Rey, Tirole 2007).
- Passive conjectures. Each retailer keeps assuming that the manufacturer offers the equilibrium offer to its rival. This assumption creates commitment problem.
- Warry conjectures (Rey, Verge (2004)). Retailer anticipates that manufacturer offers contract that is best for manufacturer.

Model

- Consumers
  - Consumers have quadratic utility function
  - Demand function $Q_i = \frac{1-\beta-p_i+\beta p_j}{1-\beta^2}$
  - Inverse demand function $P_i = 1 - q_i - \beta q_j$
- Firms
  - Incumbent manufacturer (I) produces a good at a constant marginal cost c_I
  - A potential entrant (E) has lower marginal cost $c_E < c_I$. Entrant faces fixed cost of entry equal to $F > 0$
  - The good is used by two retailers as input to produce a final good. The only retailers' cost is the wholesale price w_i

Competition

The degree of competition is measured by parameter $\beta \in [0, 1)$. As $\beta \to 1$, product differentiation disappears.

Cournot competition reflects a situation in which the manufacturer produce before the final consumers formulate their demand. The downstream firms are capacity constrained.

Bertrand competition reflects a situation in which the manufacturer produce after the final consumers formulate their demand.

Timing

1. Incumbent offers exclusive contract which involves fixed compenstaion x
2. Entrant makes entry decision
3. Manufacturers offer contract specifying w_i under linear wholesale contract or (w_i, T_i) under two-part tariff.
4. Retailers compete for cosumers by setting prices p_i or quantities q_i

Passive conjectures

Price contracts are secret and retailers have passive conjectures, when receiving out-of-equilibrium offer. Retailers do not revise their beliefs.

- Reaction function under Cournot competition

$$Q_i(w_i) = argmax(P_i(q_i, q_j^e) - w_i)q_i$$

- Reaction function under Bertrand competition

$$P_i(w_i) = argmax(p_i - w_i)D(p_i, p_j^e)$$

Quantity sold by retailer is

$$q_i = D_i(P_1(w_1), P_2(w_2))$$

Cournot with linear wholesale prices

- Wholesale contract determines linear wholesale price w_1 and w_2
- Retailers compete by setting quantity q_1 and q_2

What happens in each of possible subgames following exclusive contracts being signed?

Let S denote the number of retailers that sign the contract.

Cournot with linear wholesale prices, S=2

- With passive conjectures, each retailer anitcipates that its rival receives the equilibrium offer and puts equilibrium quantity q_j^e on the market. Its best repsonse function is

$$q_i(w_i) = \frac{1 - w_i - \beta q_j^e}{2}$$

- Incumbent then chooses wholesale prices w_1 and w_2 to maximize $\Pi_I = (w_1 - c_I)q(w_1) + (w_2 - c_I)q(w_2)$
- It holds for the compesation fees that $x_1 + x_2 \leq \Pi_I$
- $\Pi^{max} = \Pi_R + \Pi_I/2$ denotes maximum retailer's profit including the compensation fee x under the condition that other retaler obtains the same profit.

$$\Pi^{max}_{S=2} = \frac{(1-c)^2(3-2\beta)^2}{(4-\beta)^2}$$

Cournot with linear wholesale prices, S=1

1. Entrant does not enter. The situation is the same as before. Retailer which does not signed an exclusive contract (R2) does not obtain compensation.
2. Entrant enters.
   - Entrant sell through R2 with wholesale price $w_2 = c_I$. w_1 is given by maximizing $(w_1 - c_I)q_1(w_1)$
   - Compensation fee $x \leq \Pi_I$. R1's maximum profit including compesation fee is $\Pi_{S=1}^{exc} = \frac{(1-c)^2 3(2-\beta)^2}{(8-\beta^2)^2}$
   - R2's profit is $\Pi_{S=1}^{free} = \frac{(1-c)^2(4-\beta)^2}{(8-\beta^2)^2}$.
   - It holds that $\Pi_{S=1}^{exc} < \Pi_{S=1}^{free}$

Cournot with linear wholesale prices, S=0

- Both retailers buy through E at a common price $w_1 = w_2 = c_I$. Otherwise I could profitably attract retailers.
- Both retailers obtain profit

$$\Pi_{S=0} = \frac{(2-\beta)^2(1-c)^2}{(4-\beta)^2}$$

Cournot with linear wholesale prices

Suppose that entrant's fixed costs are low enough.

$$F \leq \frac{(c_E - c_I)(1 - c_I)(4 - \beta)^2}{(8 - \beta^2)}$$

This implies that E enters in case $S = 1$.

	exclusive	free
exclusive	$\Pi^{max}_{S=2}, \Pi^{max}_{S=2}$	$\Pi^{exc}_{S=1}, \Pi^{free}_{S=1}$
free	$\Pi^{free}_{S=1}, \Pi^{exc}_{S=1}$	$\Pi_{S=0}, \Pi_{S=0}$

Table: Exclusive contract

It holds $\Pi^{free}_{S=1} > \Pi_{S=0} > \Pi^{max}_{S=2} > \Pi^{exc}_{S=1}$

Cournot with linear wholesale prices

Suppose that entrant's fixed costs are high.

$$F > \frac{(c_E - c_I)(1 - c_I)(4 - \beta)^2}{(8 - \beta^2)}$$

This implies that E does not enter in case $S = 1$.

	exclusive	free
exclusive	$\Pi^{ret}_{S=2} + x, \Pi^{ret}_{S=2} + x$	$\Pi^{ret}_{S=2} + x, \Pi^{ret}_{S=2}$
free	$\Pi^{ret}_{S=2}, \Pi^{ret}_{S=2} + x$	$\Pi_{S=0}, \Pi_{S=0}$

Table: Exclusive contract

For any given $x > 0$, there is an equilibrium where both retailers sign exclusive contract. There is no entry equilibrium because incumbent can offer contract to retailer such that $\Pi^{ret}_{S=2} + x > \Pi_{S=0}$.

Cournot with two-part tariff

- Two-part tarrif contract determines linear wholesale price w_1 and w_2 and fixed fee T_1 and T_2
- Retailers compete by setting quantity q_1 and q_2

What happens in each of possible subgames following exclusive contracts being signed?

Cournot with two-part tariff, S=2

- Passive conjectures leads to best repsonse function

$$q_i(w_i) = argmax(P(q_i, q_j^e) - w_i)q_i$$

- Incumbent then chooses wholesale prices w_1 and w_2 to maximize $\Pi_I = (w_1 - c_I)q_1(w_1) + F_1 + (w_2 - c_I)q_{@}(w_2) + F_2$ where F_i is retailer's profit $F_i = (P(q_i(w_i), q_j^e) - w_i)q_i(w_i)$
- Incumbent chooses $w_1 = w_2 = c_I$. Incumbent's profit is equal to the sum of Cournot's profits $\Pi_I = 2\Pi^C(c_I, c_I)$
- Compensaiton fees cannot exceed incumbent's profit $x_1 + x_2 \leq \Pi_I$
- Maximum retailer's profit including the compensation fee x is $\Pi_{S=2}^{max} = \Pi^C(c_I, c_I)$

Cournot with two-part tariff, S=1

1. Entrant does not enter. The situation is the same as before. Retailer which does not signed an exclusive contract (R2) does not obtain compensation.
2. Entrant enters.
    - Entrant sell through R2 with wholesale price $w_2 = c_E$.
    - Incumbent is ready to offer contract characterized by $w_{I,2} = c_I$ and $T = 0$ to R2. Hence, $\Pi^{free}_{S=1} = \Pi^C(c_I, c_I)$
    - Compensation fee $x \leq \Pi_I$. R1's maximum profit including compesation fee is $\Pi^{exc}_{S=1} = \Pi^C(c_I, c_E)$
    - Entrant obtains profit $\Pi^E_{S=1} = \Pi^C(c_E, c_I) - \Pi^C(c_I, c_I)$

Cournot with two-part tariff, S=0

- Both retailers buy through E at a common price $w_1 = w_2 = c_E$.
- Incumbent is ready to offer contract characterized by $w_{I,i} = c_I$ and $T = 0$. Retailer's profit is therefore $\Pi_{S=0} = \Pi^C(c_I, c_E)$.
- Entrant's profit is $\Pi^E_{S=0} = 2(\Pi^C(c_E, c_E) - \Pi^C(c_I, c_E))$.

Cournot with two-part tariff - entry

Compare entrant's profit $\Pi^E_{S=1}$ and $\Pi^E_{S=0}$

$$\Pi^E_{S=0} = \frac{(2-\beta)^2(1-c_E)^2}{(4-\beta^2)} - \frac{(2(1-c_I)-\beta(1-c_E))^2}{(4-\beta^2)}$$

$$\Pi^E_{S=1} = \frac{(2(1-c_E)-\beta(1-c_I))^2}{(4-\beta^2)} - \frac{(2-\beta)^2(1-c_I)^2}{(4-\beta^2)}$$

Because profit function is convex it holds that $\Pi^E_{S=1} > \Pi^E_{S=0}$

It is impossible to deter entry because of lack of coordination

Cournot with two-part tariff

	exclusive	free
exclusive	$\Pi^{max}_{S=2}, \Pi^{max}_{S=2}$	$\Pi^{exc}_{S=1}, \Pi^{free}_{S=1}$
free	$\Pi^{free}_{S=1}, \Pi^{exc}_{S=1}$	$\Pi_{S=0}, \Pi_{S=0}$

Table: Exclusive contract

It holds $\Pi^{free}_{S=1} > \Pi_{S=0} > \Pi^{max}_{S=2} > \Pi^{exc}_{S=1}$

Dominant startegy is to be a free buyer

Conclusions

- Linear wholesale prices
  - There is only entry equilibrium if fixed costs are low enough.
  - There is only exclusion equilibrium if fixed costs are high enough.
  - Entrant's profit is decreasing in β
- Two-part tariff
  - If it is profitable to enter when $S = 0$, it is also profitable to enter when $S = 1$
  - There is only entry equilibrium.
  - It is not possible to deter entry by exclusive dealing.

Conclusions

- Conclusions are different from Abito, Wright (2008)
  - Two-part tariff: Only exclusion equilibria X No exclusion equilibria
  - Linear prices: Only exclusion equilibria if $\beta < 1/2$ X Depends on fixed costs
- Introducing a commitment problem changes the results substantially.
- Incumbent cannot exploit its market power. Compensation fee has to be lower which makes exclusive contract less profitable.

Conclusions

Thank you for your attention.