Naked Exclusion with Minimum-Share Requirements

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Introduction

- minimum-share requirements in contracts: what are they?
  - a contract between a buyer and a seller in which the buyer agrees to give the seller some minimum share of its total purchases.
    - you agree to buy at least s% of your purchases from me.
    - exclusive dealing is a special case (in an exclusive-dealing arrangement, you agree not to buy from anyone else besides me).

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    - exclusive dealing is a special case (in an exclusive-dealing arrangement, you agree not to buy from anyone else besides me).
- efficiency rationales/competitive concerns
  - maybe induce more investment, greater service provision
  - but ... might also weaken competitors by foreclosing sales

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  - this begs the question—why would a seller who wants to exclude its rival offer buyers contracts that specify less than a 100% share?

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- partial exclusionary contracts can be more anticompetitive than fully exclusionary contracts —at least in some cases.

Understanding the buyer's incentive is key

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- chicago-school critique: it is not possible for the seller to compensate for the buyer's loss and at the same time make itself better off.

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- an incumbent competes against a potential entrant. The incumbent's marginal cost is c, the entrant's marginal cost is $\underline{c}$. Suppose $c > \underline{c}$. Suppose also that if the entrant comes into the market, competition between the two sellers will result in a per-unit price of c to the buyer.
- can the incumbent profitably exclude the entrant by inducing the buyer to sign an exclusive dealing contract $C = (100\%, x, p)$?

Some background

- Rasmusen, Ramseyer, and Wiley (1991), "Naked Exclusion"
  - suppose the entrant's technology is characterized by economies of scale. Given the right set of beliefs, the incumbent seller may be able to induce buyers to accept its contract with a trivial inducement

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- Segal and Whinston (2000), "Naked Exclusion: Comment"
  - if the buyers could coordinate their decisions, exclusion would not arise (as they would all want to reject the seller's ED contract).

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- can the incumbent profitably exclude the entrant by inducing the buyer to sign a partial exclusionary contract $C = \{s, x, p\}$

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  - x is the inducement needed to get the buyer to accept
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- so, the necessary inducement to get the buyer to accept is
  - $x \geq S(c) - S(p_a) + (1-\alpha_1)(S(p_a) - S(p))$

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- Each buyer receives less than S(c) —- something that can be exploited.

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  - under exclusive dealing, the seller has to compensate each buyer for the full loss in surplus due to the rival's exclusion
  - with partial exclusionary contracts, the seller can exploit externalities across buyers —— exclusion can be 'purchased' relatively cheaply
    - each buyer only has to be compensated for its marginal contribution to the exclusion of the rival seller
    - the negative externalities imposed on it by other buyers accepting the seller's contract are not compensated

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- turns exclusion story from a coordination game to a prisoner's dilemma

The Model

- three kinds of players: an incumbent firm (I), a potential entrant (E), and $N \geq 2$ homogenous and independent buyers
- each buyer has a downward-sloping demand $q(\cdot)$
- I has marginal cost c, E has marginal cost $\underline{c} < c$; the entrant therefore has cost advantage $\delta \equiv c - \underline{c}$
- E must incur fixed cost for entry $f \in (0, N\delta q(c))$, where f has distribution $G(\cdot)$ and density function $g(\cdot)$

Timing of the game

- period 1: I offers each buyer exclusionary contract $C = \{s, x, p\}$, where s the minimum share, p per-unit price, x lump-sum payment
- period 2: Buyers decide whether to accept or reject the offer
- period 3: E learns the value of f and decides whether or not to enter
- period 4: I and E (if active) compete a la Bertrand by setting prices. If a buyer has agreed to I's exclusionary contract, then it must buy at least s share from the incumbent at the price p when entry occurs, but can buy the remaining $1 - s$ share from the entrant at a price c.

Miscellaneous

- $\pi(p) = (p - c)q(p)$ denotes incumbent's profit
- $S(p)$ denotes buyer's surplus
- $D(p) \equiv S(c) - S(p) - \pi(p)$ denotes deadweight loss
- 'free buyer' if buyer has not signed the incumbent's contract
- 'captive' buyer if buyer has signed the incumbent's contract

Pricing game

- no entry: free buyers pay p_m and obtain $S(p_m)$ in surplus
  captive buyers pay p and obtain $S(p) + x$ in surplus.

- with entry: free buyers pay c and obtain $S(c)$ in surplus
  captive buyers pay $p_a = sp + (1 - s)c$ and obtain $S(p_a) + x$ in surplus

Entrant's entry decision

- if E does not enter, then E earns zero.
- if E enters, then E incurs cost f and earns $n\,(1-s)\,\delta q(p_a)$ from captive buyers and $(N-n)\delta q(c)$ from free buyers
- therefore, it is profitable for E to enter if and only if

$$f \;\leq \Pi_E(n,s) \equiv \; n\,(1-s)\,\delta q(p_a) \;+\; (N-n)\,\delta q(c).$$

- the probability of entry is thus $\alpha_n \;= G\left(\Pi_E(n,s)\right)$

Buyers' accept or reject

- if all buyers reject contract offer, then entry occurs with probability one and each buyer earns $S(c)$
- but notice that I can choose x such that each buyer prefers to accept its contract even if all other buyers reject it

$$(1-\alpha_1)S(p)+\alpha_1 S(p_a)+x \;>\; S(c),$$

or in other words, I can always choose $x > x^*(s,p)$, where

$$x^*(s,p) \;\equiv\; S(c)-((1-\alpha_1)S(p)+\alpha_1 S(p_a))$$

Characterization of Equilibria

- with some weak assumptions on the distribution of f, one can show
  - if $x > x^*(s, p)$ then the unique coalition-proof equilibrium is for all buyers to accept the contract
  - if $x < x^*(s, p)$ then the unique coalition-proof equilibrium is for all buyers to reject the contract

Contractual Externalities

- when the incumbent pays $x^*(s,p)$, each captive buyer obtains a surplus strictly lower than $S(c)$:

$$\begin{aligned} U_A(N) &= (1-\alpha_N)S(p) + \alpha_N S(p_a) + x^*(s,p) \\ &= S(c) - (\alpha_1 - \alpha_N)\left(S(p_a) - S(p)\right) \end{aligned}$$

- for each captive buyer, acceptance of contract contributes to partial exclusivity by reducing probability of entry from one to α_1

- whereas acceptance by other $N-1$ buyers imposes negative externalities by reducing likelihood of entry from α_1 to α_N, thereby bringing an expected welfare loss of $(\alpha_1 - \alpha_N)\left(S(p_a) - S(p)\right)$

Contractual Externalities

- each captive buyer is compensated for its own contribution to exclusion, however negative externalities imposed by other buyers are not compensated
- the incumbent can potentially exploit this externality

Main Result

Proposition

There exists a contract offer $C = \{s, x, p\}$ *such that the incumbent earns positive expected payoff in the PCPNE of the continuation game, with* $s \in (0, 1)$, $p > c$, *and* $x > x^*(s, p)$

Entry, Prices, and Welfare

- a distinguishing feature of the model is that entry occurs with positive probability (but less than one) even though the seller engages in exclusionary conduct and would prefer that entry not occur
- the possibility thus arises that the seller and the entrant (or rival seller) may co-exist in the market with each having positive sales, despite the seller's exclusionary conduct
- nevertheless, the exclusionary contracts will still be anticompetitive

Conclusion

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- the paper builds on previous work on naked exclusion by RRW and SW, but differs in finding that minimum-share requirements can be profitable even when fully exclusionary contracts would not be
- a feature of the model is that welfare may be harmed even if exclusionary conduct does not deter entry or raise E's costs
- however interpretation of our results for policy should be tempered. We have only shown that minimum-share requirements can be anticompetitive, not that they actually are in any given setting