Naked Exclusion with Minimum-Share Requirements

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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).
Introduction

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- **efficiency rationales/competitive concerns**
  - maybe induce more investment, greater service provision
  - but ... might also weaken competitors by foreclosing sales
Competition policy

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  - for other share requirements .... one might be tempted to think of them as a weaker versions of exclusive dealing (if a contract with exclusive dealing would be allowed, then so would contracts with a smaller share requirement; but the latter might be permissable even if ED would not)
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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?
Two main themes of today’s talk

- A seller may prefer to offer partial exclusionary contracts (and by that I mean contracts that specify minimum-share requirements of less than 100%) over fully exclusionary contracts — even when the seller’s intent is to nakedly exclude.
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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

- to get buyers to agree to an exclusionary contract, whether partial or full, a seller will typically have to offer some inducements

- 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.

\[
c > c'
\]

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 \(C = (100\% \cdot x, p)\)?
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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 $C = (100\%, x, p)$?
A + B > A
Some background

  - 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 \( C = \{ s, x, p \} \)
  
  - \( s \) is the minimum share the buyer must purchase from the seller
  
  - \( x \) is the inducement needed to get the buyer to accept
  
  - \( p \) is the per-unit price at which the seller commits to sell
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The average price paid by the buyer under this contract is

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p_a = sp + (1 - s)c \quad \text{(assuming the entrant is not foreclosed)}
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\[ α_1: \text{the probability that entry occurs if only one buyer signs contract} \]
\[ S(p) : \text{the buyer’s surplus as function of the per unit price she pays.} \]

then the expected surplus of the buyer if she agrees to the contract is
\[ α_1 S(p_a) + (1 - α_1)(S(p_a) + S(p)) \]

so, the necessary inducement to get the buyer to accept is
\[ x S(c) + (1 - α_1)(S(p_a) + S(p)) \]
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so, the necessary inducement to get the buyer to accept is

- \( x \geq S(c) - S(p_a) + (1 - \alpha_1)(S(p_a) - S(p)) \)
Understanding the buyer’s incentive is key

- the incumbent will offer the minimum inducement necessary

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- Each buyer receives less than \( S(c) \) —- something that can be exploited.
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  - 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
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 \( c \).
\( \pi(p) = (p - c)q(p) \) 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 $\alpha_n = G(\Pi_E(n, s))$. 

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 $S(c)$:

$$U_A(N) = (1 - \alpha_N)S(p) + \alpha_N S(p_a) + x^*(s, p)$$

$$= S(c) - (\alpha_1 - \alpha_N)(S(p_a) - S(p))$$

- for each captive buyer, acceptance of contract contributes to partial exclusivity by reducing probability of entry from one to $\alpha_1$

- whereas acceptance by other $N - 1$ buyers imposes negative externalities by reducing likelihood of entry from $\alpha_1$ to $\alpha_N$, thereby bringing an expected welfare loss of $(\alpha_1 - \alpha_N)(S(p_a) - S(p))$
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.
Recent years have seen the emergence of minimum-share requirements’ contracts; we show how they can be used by an incumbent seller to inefficiently deter entry in the presence of scale economies.

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. A feature of the model is that welfare may be harmed even if exclusionary conduct does not deter entry or raise firm 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.
Conclusion

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