Are Exclusive Contracts Anticompetitive?[*]

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1 Introduction

While antitrust law is often hostile of exclusive contracts that say "you agree not to purchase this product from anyone besides me", economic theory so far has provided only partial support for such a hostility.

The first analysis of exclusive contracts emanated from the "Chicago school". It came to the conclusion that whenever such contracts are observed, their rationale must be the (socially desirable) protection of upstream firms against free-riding or opportunistic behavior by downstream firms, rather than the (socially harmful) protection or extension of market power. The argument was simply that expanding or protecting market power by imposing exclusivity clauses could not constitute a profitable strategy, because, if such exclusion were socially inefficient, the transfer from the excluding firm to consumers should exceed the incumbent firm's gain from deterring entry or inducing exit[1].

This view has been challenged on several grounds, and economic theory has identified several circumstances under which socially harmful exclusive contracts may arise.

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[1]This argument has been made in particular by Posner, 1976 (p.212) and Bork, 1978 (p.309). Theories of exclusive contracts as a way to align the incentives of an upstream firm and retailers selling its good have been developed, among others, by Marvel, 1982, and Segal and Whinston, 2000b.

On the one hand, Matthewson and Winter (1987) showed that a manufacturer may profitably use impose exclusivity to a local retailer in order to foreclose a rival in a local market, and that this outcome may be (but need not be) socially harmful.[2] But, as O'Brien and Shaffer (1997) argued, this result is true only if nonlinear pricing is not available: otherwise, instead of requiring exclusivity, the manufacturer could earn the same profits by offering a nonlinear contract specifying the same quantity and price, without any further restrictions.

On the other hand, several authors have shown that exclusivity clauses may facilitate profitable entry deterrence or competitors' eviction. The common feature of these various models is that, although exclusivity is inefficient, it may occur because one of the affected parties is absent at the contracting stage.

For example, in Aghion and Bolton (1987), an exclusive contract may allow an incumbent firm and its consumer(s) to jointly extract rents from a potential entrant whose costs are uncertain. In their model, only partial exclusion happens: entry must take place with some probability if rents are to be extracted from the potential entrant. Such rent extraction is possible because consumers can escape the exclusionary clause by paying liquidated damages. While this provision deters entry in some cases (when the entrant is only slightly more efficient than the incumbent), its other effect is that it induces very efficient entrants to offer lower prices than they would have absent any exclusive contract. This allows to extract some of the entrant's rents, making the partially exclusive contract jointly efficient for the incumbent and its consumers.

Both Aghion and Bolton's (1987) assumptions - uncertainty about the potential entrant's costs, the presence of a "liquidated damages" clause - and the result that profitable exclusion must be partial limit the scope of their model. In contrast, other papers have established that, if increasing returns make a minimum scale of operation necessary for profitable activity, full exclusion can happen if an incumbent exploits the lack of buyers' coordination, or if it can discriminate between buyers. The idea in Rasmusen et al. (1991) is that even if buyers as a whole lose if entry is deterred, discriminatory offers can make entry deterrence profitable because it allows the excluding firms to "buy off" the consent of the smallest number of buyers needed to deter entry. Coordination failure may lead to the same result:

[2] See also Comanor and Frech (1985) for a related analysis.

each buyer may agree to sign an exclusive contract against a low monetary transfer if it believes that its agreement is not pivotal in inducing exclusion.[3] Similarly, Bernheim and Whinston (1998, section IV) showed that a firm can use exclusive contracts to profitably evict a rival if this reduces competition in a future, "noncoincident" market.

This paper's contribution

What has not been shown, so far, is the possibility of socially harmful exclusive contracts arising in a simple setup where all firms and consumers are present at the contracting stage while nonlinear pricing is feasible.[4] This is a serious lacuna from the point of view of antitrust policy: one of the most famous cases involving exclusive contracts, the *Lorain Journal* case, was indeed a particular instance where exclusive dealing contracts occurring in such a setup were challenged. In that case, a local newspaper was accused of requiring exclusivity from the firms to which it sold advertising space (these firms can be considered as final consumers of advertising space, because they did not resell this product). It was not accused of attempting to prevent entry by other newspapers, of discriminating across buyers of advertising space, and nonlinear pricing is commonplace in newspaper advertising. As explained above, current theory cannot explain why exclusivity requirements could be undesirable in such a context.

This paper is an attempt to fill this gap. I consider a simple model with two firms and two identical consumers, and I assume that fixed costs prevent either firm from profitably operating in the market if it prevented from selling to either of the two consumers. The central result of this paper is that if discrimination across consumers is allowed and there is enough asymmetry between firms, then a firm may profitably enter into an exclusive agreement with one of the consumers, in order to exclude the rival firm and thus exert increased market power vis-à-vis the other consumer. The intuition is close to that of Rasmusen et al. (1991), because it relies on discriminating across consumers in order to deny a rival the minimum required scale. But the result

[3] On Rasmusen et al.'s (1991) result, see Segal and Whinston's (2000a) criticism.

[4] This statement applies to models focusing on the relationship between firms and final consumers (like Aghion and Bolton, 1987; Rasmusen et al., 1991; and Bernheim and Whinson, 1998). It would not be true if applied to models analyzing the relationship between manufacturers and their local retailers, since several papers (Lin, 1990; O'Brien and Shaffer, 1993) have concluded that exclusive dealing may be profitable because of its impact on the nature of downstream competition.

proved below is stronger than theirs, because the assumptions are, a priori, less conducive to exclusive contracts: I consider two firms simultaneously competing (so that the excluded firm can "respond" to the excluding firm), while they assume that the excluded firm is a potential entrant which cannot react when exclusive contracts are offered to its potential customers in order to deter it from entering.

2 The model

2.1 Technology and preferences

There are two firms and two consumers. Firms are (in general) different, while consumers are characterized by identical preferences.

Preferences

Both consumers (labeled a and b) have identical preferences. The quantity of good i (i=1,2) that a consumer can consume is either 0 or 1. Each consumer's utility is given by

$$\begin{aligned} U(0,0,y) &= y \\ U(1,0,y) &= U_1 + y \\ U(0,1,y) &= U_2 + y \\ U(1,1,y) &= U^* + y, \end{aligned}$$

where y is the numéraire. Goods 1 and 2 are substitutes, in the sense that

$$U_1 + U_2 > U^* > Max(U_1, U_2) \geq Min(U_1, U_2) > 0. \tag{1}$$

Technology

Both firms' marginal costs are zero, but firm i incurs a fixed cost F_i if it decides at some stage to stay in the market (see the description of the games below).

Remarks.

1. Nonlinear and linear contracts are the same when consumption of any good can be either zero or one. Therefore, a result showing that exclusive contracts may be used in equilibrium cannot be subject to O'Brien and Shaffer's (1997) critique of Matthewson and Winter's (1985) result: if exclusive contracts are found to arise in equilibrium, the reason cannot be the lack of nonlinear pricing.

2. The model can be interpreted as the reduced form of a more general case, where any quantity of either good can be consumed, consumers' utility functions take a general form $U(x_1, x_2)$, both firms face constant marginal costs c_1, c_2 (on top of fixed costs), and

$$\begin{aligned} U_1 &= Max(U(x,0) - c_1 x), \\ U_2 &= Max(U(0,x) - c_2 x), \\ U^* &= Max(U(x_1,x_2) - c_1 x_1 - c_2 x_2). \end{aligned}$$

2.2 Institutional setup

The various games considered below all share have the following structure:

- In the first stage, firms offer contracts, specifying a price and, possibly, an exclusionary clause. The details of this stage (which contracts can be offered, whether all contracts are offered simultaneously or not, whether discrimination between the two consumers is allowed) will vary according to the versions analyzed below. At the end of this stage, each consumer is facing a set of contracts.

- In the second stage, each consumer chooses between the contracts possibly offered to them (it is possible that no contract at all was offered, or that a consumer chooses no contract). Of course, choosing an exclusive contract offered by a firm prevents from also choosing a contract offered by the other firm.

- Firms which are not bound by contract to provide the good may decide to exit. If firm i decides not to exit, it incurs the cost F_i.

- Contracts offered by firms in stage 1 and chosen by consumers in stage 2 are implemented. In addition, each firm bargains with the consumer(s) with whom it is not bound by contract. Each firm's bargaining power is α: the surplus from the relationship between a firm and a consumer not bound to it by contract is divided according to the proportions α, $1-\alpha$.

2.3 Assumptions about parameters

A1. $2\alpha(U^* - U_1) > F_2$ and $2\alpha(U^* - U_2) > F_1$.

This assumption simply means that if no contracts are signed at the end of the second stage, then both firms choose to stay in the market: the profits they earn as a result of the bargaining process exceed their fixed costs of staying. In other words, I am considering situations where, absent exclusive contracts, both firms would be active.

Remark. Assumption (A1) implies that exclusion of either firm is socially inefficient.

A2. For $i = 1, 2$, $U_i < F_i$.

This assumption implies that conditional on a consumer signing an exclusive contract with firm j, total welfare is greater if firm i leaves the market than if it stays.

Notations.

I define the following magnitudes:

$J_{i,excl}$ = joint surplus of firm i and consumer a when firm j is not present in the market and firm i bargains with consumer b.

$J_{i,no\ excl}$ =joint surplus of firm i and consumer a when firm j is present in the market and bargains with both consumers.

U = utility of a consumer when it bargains with both firms.

π_i =firm $i's$ revenues when both firms bargain with both consumers.

They are given by:

$$\begin{aligned} J_{i,excl} &= U_i + \alpha U_i = (1+\alpha)U_i, \\ J_{i,no\ excl} &= U^* - \alpha(U^* - U_i) + \alpha(U^* - U_j) = U^* + \alpha(U_i - U_j), \\ U &= U^* - \alpha(U^* - U_1 + U^* - U_2) = \alpha(U_1 + U_2) + (1-2\alpha)U^*, \text{ and} \\ \pi_i &= 2\alpha(U^* - U_j). \end{aligned}$$

Remarks.

1. All the games studies below are characterized by multiple equilibria. The expression "weakly-undominated", hereafter, is going to be used with respect to the two firms (not taking consumers into account): an equilibrium E is weakly-undominated if in every equilibrium, each firm's profit is no greater than in equilibrium E.

2. If $J_{i,excl} > J_{i,no\ excl}$, and if only firm i could offer contracts in Stage 1, firm i could increase its profits relative to the situation where both firms bargain with consumers (i.e. relative to the situation where no contracts are signed in Stage 2), by offering one consumer (say, consumer a) a contract leaving it with the same utility level U : doing so would increase firm i's profits by $J_{i,excl} - J_{i,no\ excl}$. Of course, there is no reason to assume such asymmetry between firms: on the contrary, the goal of this paper is to allow for full symmetry (in terms of the possibilities of offering contracts), as opposed to the many papers mentioned in the introduction, which model how an incumbent firm may use exclusive contracts in order to deter a potential entrant.

2.4 Game 1

I first investigate the following possibility: Stage 1 comprises only one period, in which both firms can offer only exclusive contracts. This means that the only way to "respond" to an exclusive contract is to offer another one. Discrimination across consumers is feasible.

Proposition 1 *Two cases must be distinguished.*

(i) If it is the case that no firm would like to offer exclusive contracts even if its rival offered no contract (i.e. $J_{i,excl} \leq J_{i,no\ excl}$ *for* $i = 1$ *and* $i = 2$*), then*

a) there exists an equilibrium in which no exclusive contracts are signed and both firms are active in equilibrium.

b) If (for example) $J_{i,excl} - F_i > J_{j,excl} - F_j$, there also exists a continuum of equilibria in which firm j exits the market. In such equilibria, firm i's profit can take any value in the interval [0,$J_{i,excl} - F_i + Max(U, J_{j,excl} - F_j)$].

c) All weakly-undominated equilibria yield the same payoff and do not involve either firm's exit.

(ii) If it is the case that at least one of the firms would like to offer an exclusive contract if the other did not, and if (for example) $J_{i,excl} - F_i > J_{j,excl} - F_j$, then

a) There is a continuum of equilibria. In all these equilibria, firm j exits.

b) The set of possible profit levels for firm i is the interval $[0, J_{i,excl} - F_i - Max(U, J_{j,excl} - F_j)]$.

c) In any weakly-undominated equilibrium, firm j exits and firm i earns profits equal to $J_{i,excl} - F_i - Max(U, J_{j,excl} - F_j)$.

Corollary 2 *(i) If it is the case that at least one of the firms would like to offer an exclusive contract if the other did not, and if [$(J_{i,excl} - F_i > J_{j,excl} - F_j)$ and $(J_{i,excl} - Max(U, J_{j,excl} - F_j) < \pi_i)$] (or the converse), then in any equilibrium, both firms are worse off than they would be if exclusive contracts were not allowed. This is the case, in particular, if preferences are symmetric across goods and firms hold all the bargaining power ($\alpha = 1$). If in addition both firms have the same fixed cost, each of them earns zero profits in any equilibrium.*

(ii) There exist parameter values satisfying all the above assumptions and such that in the only undominated equilibrium, the excluding firm is better off than it would be if exclusive contracts were not allowed. This is the case if $J_{i,excl} - Max(U, J_{j,excl} - F_j) > \pi_i$.

Notice first that the multiplicity of equilibria in a general result when exclusive contracts are allowed. This is because they correspond to a multiplicity of contracts offered by the excluded firm, which knows that the contracts it offers will not be picked by consumers, although they affect the other firm's contract offerings.[5] The remainder of this paper focuses on weakly-undominated equilibria.

The possibility for both firms to be worse off than they would be if exclusive contracts were not feasible can be interpreted as follows: if exclusive

[5] See, for example, Bernheim and Whinston (1998) and O'Brien and Shaffer (1997).

contracts were infeasible, then each firm would earn the profits induced by its bargaining power, i.e. $2\alpha(U - U_j)$ for firm i. But the possibility to compete in Stage 1 by offering exclusive contracts introduces a "price competition" dimension: when firms compete for the right to exclude (which occurs if exclusion if efficient from the point of view of a pair comprising one firm and one consumer), the logic of price competition applies, and the profits of the excluding firm is only a function of the differential efficiency between firms (where efficiency is defined with respect to the pair comprising one firm and one consumer), so that if preferences and costs are symmetric and exclusion occurs, competition for exclusivity drives both firms' profits down to zero.

2.5 Game 2

In Game 1, a firm may want to exclude its rival simply because this is the only way to avoid being excluded. This explains why the excluding firm may end up being worse off than it would be if exclusion were not allowed. This result seems to come from the assumption that the only possible contracts are exclusionary. It is more realistic to consider the possibility that both exclusive and non-exclusive contracts are feasible, so that a "response" to an exclusive contract need not be an exclusive contract. I investigate this possibility by analyzing Game 2, simply defined as being identical to Game 1 except that in Stage 1, each firm can offer each consumer a contract which can involve an exclusionary clause, or not (for simplicity, a firm cannot offer more than one contract per consumer).

Proposition 3 *(i) If it is the case that no firm would like to offer exclusive contracts even if its rival offered no contract (i.e. $J_{i,excl} \leq J_{i,no\ excl}$ for $i = 1$ and $i = 2$), then no exclusive contracts are signed in a weakly-undominated equilibrium.*

(ii) If it is the case that each firm would like to offer an exclusive contract if the other did not ($J_{i,excl} > J_{i,no\ excl}$ for $i = 1$ and $i = 2$), and (for example) $J_{i,excl} - F_i > J_{j,excl} - F_j$, then, in any undominated equilibrium, firm j exits and firm i earns profits equal to $J_{i,excl} - F_i - J_{j,excl} + F_j$. This is the case, in particular, if preferences are symmetric across goods and firms hold all the bargaining power ($\alpha = 1$).

(iii) If firm i would like to offer an exclusive contract in case firm j did not, but the converse is not true ($J_{i,excl} > J_{i,no\ excl}$ and $J_{j,excl} < J_{j,no\ excl}$), then:

a) if $J_{i,excl} < J_{j,no\ excl} - F_j + \pi_i$, then in any undominated equilibrium both firms are active, firm i's profits are $\pi_i - F_i$, and firm j's profits are $J_{j,no\ excl} - F_j + \pi_i - J_{i,excl}$.

b) if $J_{i,excl} > J_{j,no\ excl} - F_j + \pi_i$, then in any undominated equilibrium, firm j exits, and firm i's profits are equal to $J_{i,excl} - F_i - J_{j,no\ excl} + F_j > \pi_i$.

Corollary 4 *1. For some parameter values, exclusion takes place in an undominated equilibrium.*

2. For some parameters values, both firms are worse off in an undominated equilibrium than they would be were exclusive contracts not allowed. This occurs if $J_{i,excl} > J_{i,no\ excl}$ for $i = 1$ and $i = 2$, and (for example) $0 < (J_{i,excl} - F_i) - (J_{j,excl} - F_j) < \pi_i$. This occurs in particular if preferences are symmetric across goods and firms hold all the bargaining power.

3. For some parameters values, exclusion takes place in an undominated equilibrium and the excluding firm is better off than it would be were exclusive contracts not allowed.

4. Exclusion is less likely if nonexclusive contracts can be offered: the set of parameter values inducing exclusionary undominated equilibria in Game 2 is included in, and smaller than, the corresponding set for game 1.

5. Exclusion making both firms worse off than they would be were exclusive contracts not allowed (in an undominated equilibrium) is also less likely.

When firms can offer nonexclusive as well as exclusive contracts, exclusion becomes less likely because in order to avoid being evicted by a rival, a firm can offer consumers transfers through non-exclusive as well as exclusive contracts. This removes the incentive to offer exclusive contracts only in order to avoid being excluded. However, if it is the case that each firm would like to offer an exclusive contract if the other firm offered no contract at all, then exclusion occurs in equilibrium even though it may harm both firms compared to the situation where exclusive contracts are not allowed. This is, again, because competition for the right to exclude brings profits down. In particular, in the fully symmetric model, exclusion takes place and brings both firms' profits to zero.

2.6 Game 3

The above results are not fully satisfactory because one may consider that assumptions inducing unprofitable exclusion in some undominated equilibria are still too "biased" toward exclusive contracts, and one might ask whether exclusive contracts can arise in a world where this cannot happen. In order to address this question, the model should be changed in a way which makes exclusion less likely to occur, by increasing the possibilities of response following an exclusive offer. This can be achieved by assuming that Stage 1 takes the following form:

Step 1. Both firms may offer contracts, which can be exclusive or not. If no contracts are proposed, then stage 1 ends. Otherwise, step 2 takes place.

Step 2. If contracts were offered in step 1, then firms can offer contracts again (without withdrawing contracts offered in Step 1). Then, stage 1 ends.

Intuitively, exclusion should occur less frequently in this game than in Games 1 and 2. Consider a hypothetical situation where $J_{1,excl} > J_{1,no\ excl}$ and firm 2 offers no contract in Step 1. In Games 1 and 2, the inequality $J_{1,excl} > J_{1,no\ excl}$ implied that in such a situation, offering an exclusive contract increased firm 1's profits by $J_{1,excl} - J_{1,no\ excl}$. This is not true anymore in Game 3, because if firm 1 were to offer such a contract in Step 1, it would have to take into account firm 2's future reaction in Step 2. However, as the Proposition below states, even in these circumstances, exclusion can arise in equilibrium and allow a firm to profitably evict a rival.

Proposition 5 *1. If parameters are such that exclusion is not the outcome of an undominated equilibrium of Game 2, then it is not the outcome of an undominated equilibrium of Game 3 either.*

2. If parameters are such that exclusion of firm j is the outcome of an undominated equilibrium of Game 2, then:

a) If firm i's profit in this equilibrium of Game 2 exceeds $\pi_i - F_i$ (i.e. if $J_{i,excl} - Max(J_{j,excl}, J_{j,no\ excl}) + F_j > \pi_i$), then the set of undominated equilibria of Game 2 (which all yield the same profits for firm i) coincides with the corresponding set for Game 3. In this case, exclusion occurs in all equilibria of Game 3, and firm i is better off in any undominated equilibrium than it would be if exclusive contracts were not allowed.

b) If on the contrary $J_{i,excl} - Max(J_{j,excl}, J_{j,no\ excl}) + F_j < \pi_i$, then in any undominated equilibrium of Game 3, no exclusive contracts are signed and both firms are active. Both firms are then better off than in any undominated equilibrium of Game 2.

Corollary 6 *1. For some parameter values, exclusion occurs in an undominated equilibrium.*

2 If exclusion occurs in an undominated equilibrium, the excluding firm is better off than it would be if exclusive contracts were not allowed.

3. If preferences are symmetric across goods, then exclusion does not occur in any undominated equilibrium.

4. If firms have maximal bargaining power, then exclusion does not occur in any weakly-undominated equilibrium.

Proof. Part 3. is obvious: if preferences are symmetric, then $J_{i,excl} = J_{j,excl}$ so that $J_{i,excl} - Max(J_{j,excl}, J_{j,no\ excl}) + F_j \leq F_j \leq \pi_j = \pi_i$.

In order to prove part 1, notice that the conditions for exclusion of firm j to occur in an undominated equilibrium of Game 3 are:

$$\begin{aligned} J_{i,excl} &> J_{i,no\ excl} \text{ and} \\ J_{i,excl} - Max(J_{j,excl}, J_{j,no\ excl}) + F_j &> \pi_i, \end{aligned}$$

which are equivalent to

$$\begin{aligned} (1+\alpha)U_i &> U^* + \alpha(U_i - U_j), \\ (1+\alpha)(U_i - U_j) + F_j - 2\alpha(U^* - U_j) &> 0, \text{ and} \\ (1+\alpha)U_i - U^* - \alpha(U_j - U_i) - 2\alpha(U^* - U_j) + F_j &> 0, \end{aligned}$$

or

$$\begin{aligned} U^* &< (1+\alpha)U_i + \alpha U_j, && \text{(C1)} \\ F_j &> 2\alpha U^* - (1+\alpha)U_i + (1-\alpha)U_j, \text{ and} && \text{(C2)} \\ F_j &> (2\alpha+1)(U^* - U_i) - \alpha U_j. && \text{(C3)} \end{aligned}$$

In order to prove that parameters can be such that (1), (A1), (A2), and (C1)-(C3) simultaneously hold, it is only necessary to show that U_1, U_2, U^*, and α can be found satisfying

$$\left\{ \begin{array}{c} 2\alpha(U^* - U_1) > U_2 \\ 2\alpha(U^* - U_2) > U_1 \\ U_1 + U_2 > U^* \\ U^* < (1+\alpha)U_1 + \alpha U_2 \\ 2\alpha U^* - (1+\alpha)U_1 + (1-\alpha)U_2 < 2\alpha(U^* - U_1) \\ (2\alpha+1)(U^* - U_1) - \alpha U_2 < 2\alpha(U^* - U_1), \end{array} \right.$$

or

$$\begin{cases} 2\alpha(U^* - U_1) > U_2 \\ 2\alpha(U^* - U_2) > U_1 \\ U_1 + U_2 > U^* \\ U^* < (1+\alpha)U_1 + \alpha U_2 \\ U_1 > U_2 \\ U^* < U_1 + \alpha U_2. \\ \alpha < 1 \end{cases}$$

These conditions are satisfied for example if

$$\begin{array}{c} Max(U_1 + \frac{U_2}{2}, U_2 + \frac{U_1}{2}) < U^* < U_1 + U_2, \\ U_1 > U_2, \end{array}$$

and α is close enough to 1. ■

This result shows that exclusion may occur even when the firm targeted by an exclusive contract can respond by offering exclusive as well as non-exclusive contracts, and even when the excluding firm realizes it could avoid "retaliation" by not offering any exclusive contract to start with. Contrary to Games 1 and 2, exclusion cannot occur if preferences are symmetric: this is reminiscent of Matthewson and Winter's (1985) conclusion.

Recapitulating results

The table below summarizes the description of undominated equilibria in Games 1-3.

Assumptions about Stage 1	**Outcome: exclusion occurs in undominated equilibria if...**
Firms simultaneously decide whether to offer exclusive contracts.	$J_{1,excl} > J_{1,no\ excl}$ or $J_{2,excl} > J_{2,no\ excl}$
Firms simultaneously decide whether to offer contracts, exclusive or not.	$J_{1,excl} > J_{1,no\ excl}$ and $J_{2,excl} > J_{2,no\ excl}$ or $J_{i,excl} > J_{i,no\ excl}$ and $J_{j,excl} < J_{j,no\ excl}$ and firm i can increase its profit when countering firm j's best non-exclusive offer, i.e. $J_{i,excl} - (J_{j,no\ excl} - F_j) > \pi_i$.
1. Firms simultaneously decide whether to offer contracts. 2. If contracts were offered, a new round of contract proposals takes place.	Firm i can increase its profit when countering firm j's best offer, i.e. $J_{i,excl} - Max(J_{j,excl}, J_{j,no\ excl}) + F_j > \pi_i$.

2.7 Role of the various assumptions

Proposition 7 *1. Assume that firms cannot discriminate across consumers. Then in any undominated equilibrium of any of the three games defined above, exclusive contracts are not signed and both firms are active.*

2. Assume that firms' fixed costs are zero. Then in any undominated equilibrium of any of the three games defined above, exclusive contracts are not signed and both firms are active.

This Proposition illustrates the relationship between the above results and Rasmusen et al. (1991): exclusion arises only because by offering an exclusive contract to one of the two consumers, a firm can induce its rival to leave the market (because fixed costs make profitable operation impossible if it can sell to only one consumer) and thus exert market power at the expense of the other consumer, who did not sign an exclusive agreement. The results stated above extend Rasmusen et al. (1991) by showing that such a strategy can be used to evict a current rival (which is also able to offer exclusive or non exclusive contracts), and not only to deter entry.

3 Exclusive contracts and asymmetric information

Matthewson and Winter [1985] showed that exclusive contracts may serve as a substitute for nonlinear pricing. In this section, I present an example showing that exclusive contracts can complement nonlinear pricing in situations of asymmetric information - without inducing the eviction of any rival firm.

The example

There are two products. Product 1 is produced by firm 1 only, at zero cost. Product 2 is elastically supplied at zero price by competitive firms.

There are two consumers. Consumer 1 can consume only one or zero unit of product 1, and derives no utility from product 2. His utility when consuming one unit of product 1 is $\varepsilon > 0$.

Consumer 2 derives utility only by consuming exactly 2 units of product 1, or 1 unit of each product:

$$\begin{aligned} U(2,0) &= A \\ U(1,1) &= B. \end{aligned}$$

Firm 1 knows the distribution of preferences but is unable to identify a specific consumer's preferences. The following assumptions are made:

A'1. $A > B$.
A'2. $Max(B, 2(A-B)) > 3\varepsilon$.

Proposition 8 *1. If neither exclusive contracts nor nonlinear pricing are allowed, then*

(i) if $A > \frac{3}{2}B$*, firm 1 sets a price of* $A - B$ *and consumer 2 buys two units from firm 1. The equilibrium is not efficient because consumer 1 does not consume.*

(ii) if $A < \frac{3}{2}B$*, firm 1 sets a price of* B *and consumer 2 buys only one unit from firm 1. Consumer 2's consumption is not efficient.*

2. If nonlinear pricing is allowed but exclusive contracts are not, then firm 1 only offers to sell two units of the good, for a total price A. This is not efficient because consumer 1 does not consume, but consumer 2's consumption is efficient.

3. If both nonlinear pricing and exclusive contracts are allowed, then firm 1 offers the following nonlinear contract: it sells 1 unit at price ε*, 2 units at price A, and imposes exclusivity (at least to consumers buying one unit). The resulting allocation is efficient.*

4 Conclusion

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