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Naked Exclusion

By Eric B. Rasmusen, J. Mark Ramseyer, and John S. Wiley, Jr.*

Ordinarily, a monopoly cannot increase its profits by asking customers to sign agreements not to deal with potential competitors. If, however, there are 100 customers and the minimum efficient scale requires serving 15, the monopoly need only lock up 86 customers to forestall entry. If each customer believes that the others will sign, each also believes that no rival seller will enter. Hence, an individual customer loses nothing by signing the exclusionary agreement and will indeed sign. Thus, naked exclusion can be profitable. (*JEL* L12, L42)

Antitrust law bans exclusionary agreements: contracts that say, "You agree not to purchase from anyone besides me." No one, however, has explained convincingly how such contracts could be both profitable and pernicious. We adopt a new approach: under plausible assumptions, monopolists may be able to exploit customer disorganization so as to exclude potential rivals.

We focus on exclusionary conduct that is "naked": conduct unabashedly meant to exclude rivals, for which no one offers any efficiency justification. Court records reveal various examples that judges considered exclusionary. Alcoa had electrical companies promise not to supply rival aluminum makers; the newspaper *Lorain Journal* refused to print advertisements by those who patronized its rival; the United Shoe Machinery Corporation used leases that the court believed prevented customers from leasing rival machines.[1]

Skeptics have responded to the case law by arguing that this conduct actually is efficient,[2] for otherwise it could not be profitable. Aaron Director and Edward H. Levi (1956) launched the Chicago School attack by arguing that a seller (the "excluding firm") could not induce buyers to accept such a contract unless it compensated them for the customer surplus they could obtain by buying from the rival. Because the lost customer surplus would exceed the monopoly profits, such exclusion would be prohibitively costly. Richard Posner (1976 p. 212) and Robert Bork (1978 p. 309) continued that analysis and concluded that antitrust law ought simply to ignore apparently exclusionary contracts.

Other scholars have countered this skepticism about naked exclusion with theories about how it might really work. So far, none is robust and widely applicable. William S. Comanor and H. E. Frech (1985) proposed a way for a dominant firm to raise rivals' costs but concede in response to Marius Schwartz (1987) that they did not describe a subgame-perfect equilibrium (Comanor and Frech, 1987 p. 1070).

Steven C. Salop and David T. Scheffman (1983, 1987) argue that dominant firms can succeed in inducing suppliers to cut off or discriminate against rivals. They argue that a dominant firm can profit through a strategy that raises its rivals' marginal costs so that the dominant firm's residual demand

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[1] *United States* v. *Aluminum Co. of America*, 148 F.2d 416 (2d Cir. 1945); *Lorain Journal Co.* v. *U.S.*, 342 U.S. 143 (1951); *United Shoe Machinery Corp.* v. *U.S.*, 258 U.S. 451, 458 (1922).

[2] For recent representative discussions, see Stanley Ornstein (1989) and Wiley et al. (1990).

increases more than its own average costs. One way a cost-increasing strategy might have this key differential effect is that the rivals, but not the excluding firm, might be using a production technology vulnerable for its special reliance upon some sharply inelastic input. Then the excluding firm can profit by "overbuying" and pushing up the price of the key input. A second way is that the dominant firm might be vertically integrated into a low-cost supply of the key input, in which case Salop and Scheffman (1983, 1987) claim that the dominant firm could profitably overbuy the input on the open market to drive up its rivals' costs. Thomas G. Krattenmaker and Steven Salop (1986a, b) suggest that this same analysis would imply that the excluding firm could use a long-term contract or superior bargaining ability to tie up input suppliers and raise rivals' costs. This approach combines horizontal restraints with vertical restraints, and the suppliers of the crucial and potentially cartelized input must agree to forgo the profit that goes to the excluding firm (see Timothy Brennan, 1988).

Philippe Aghion and Patrick Bolton (1987 pp. 396–8) show how exclusionary agreements might raise profits even without acquiring market power over some necessary input. In their model, two buyers agree to sign the agreement despite jointly preferring to refuse. Their model is based on three assumptions that will be absent in the present paper. First, the excluding firm can commit to a future price level, which can be conditional on how many customers sign the exclusionary agreement, and each customer can escape the contract by paying liquidated damages. Second, the incumbent has a constant marginal cost, but the rival's cost is unknown and might be either higher or lower; as a result, the more efficient producer will earn positive profits even under Bertrand competition. Third, active producers incur a fixed cost, so if the rival attracts fewer customers, its average cost rises.

We will restrict the exclusionary contract to take a very simple form: an agreement not to buy from the rival. We will not rely on precommitment to future prices, conditional offers, or liquidated damages. The rival's cost function will be identical to the excluding firm's, and entry will be certain in the absence of exclusionary tactics. Although we will assume a minimum efficient scale of production, all scale economies will end beyond this modest scale, so exclusion will not be a result of natural monopoly.

I. The Model

Our discussion proceeds from the following model. There are two periods and no discounting. Each of N identical customers has the individual demand function $q(P)$ in each period, where $q' < 0$. The cost function obeys the following assumptions:

(i) average cost $C(Q)$ is such that $C' < 0$ for $Q < Q^*$ and $C(Q) = \overline{C}$ for $Q \geq Q^*$ (average cost falls until output reaches the minimum efficient scale of Q^* and is constant thereafter);
(ii) $Q^* > q(\overline{C})$ (the rival firm must serve more than one customer); and
(iii) $Q^* \leq Nq(\overline{C})/2$ (no natural monopoly).

If $Q^* > 0$, these assumptions say that a firm needs to reach a certain scale to produce at minimum average cost, but there is room for at least two firms in the industry, and two firms can serve the market at the same cost as one. Assumption (i) gives the same result as the standard U-shaped cost curve, but without a knife-edge optimal scale of production and the need to worry about the difference between one and a large number of potential rivals. Let us assume that the free customers divide themselves equally between two firms charging equal prices, in which case the marginal cost of the excluding firm will always equal $\overline{C}$, because the excluding firm will always sell at least Q^*.

We denote the simple monopoly price by P_m, each individual's one-period customer surplus at price P by $CS(P)$, the number of customers who sign the exclusionary agreement by N_s, and the monopoly profit per customer per period by π. Figure 1 illustrates the notation. X^* will be the amount of customer surplus that a customer loses per period from monopoly pricing: $X^* = CS(\overline{C}) - CS(P_m)$. Finally, we assume that

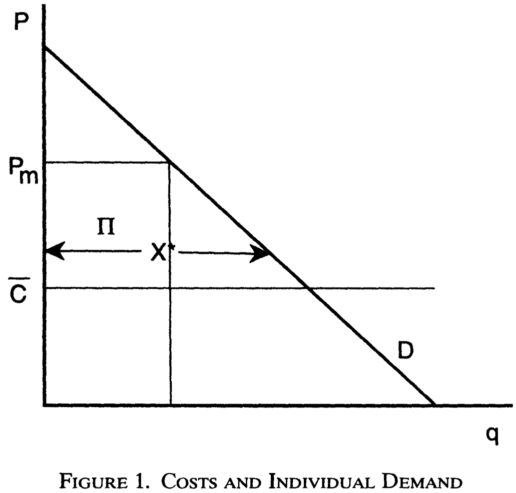

FIGURE 1. COSTS AND INDIVIDUAL DEMAND

customers are price-takers and split evenly between sellers charging the same price.

The excluding firm initially monopolizes the market and must decide whether to pay buyers to sign an exclusionary contract, an agreement not to trade with the excluding firm's rival. All players know that a potential entrant will appear in the second period and that if entry does occur the result will be continued monopoly for the signing customers and vigorous competition for the "free" customers. We use the following order of play. First, the excluding firm sells in period 1 at price P_1, and offers a bonus of X to any customer who signs an exclusionary agreement. Second, customers simultaneously decide how much to buy and whether to sign. Third, the rival decides whether to enter and chooses price P_r if it has entered. Fourth, the excluding firm chooses price P_s for customers who signed the exclusionary agreement and price P_f for the free customers.[3] The free customers then buy from the rival or the excluding firm, and the customers who signed buy from the excluding firm.

[3]It is inessential to the argument that the rival chooses a price before the excluding firm does, rather than at the same time or after. If prices were chosen simultaneously, the nonconstant costs might lead to mixed-strategy Bertrand equilibria off the equilibrium path. It also is inessential that the excluding firm can price-discriminate; for a discussion see Rasmusen et al. (1990).

The optimal choices of the second-period prices are simple. The excluding firm will set P_s equal to the monopoly price. It will set P_f equal to the monopoly price if there is no entry. If there is entry, then both P_f and P_r are set equal to $\overline{C}$, because otherwise the firm with the higher price would not operate at the minimum efficient scale.

Aside from these simple decisions, the strategy of the excluding firm consists of the levels of X and P_1. The strategy of each customer is whether or not to sign the exclusionary agreement conditional upon X. The strategy of the rival is the decision of whether or not to enter conditional upon N_s. Given these strategies, we look for subgame-perfect Nash equilibria.

II. The Triangle-Loss Argument

Let us start by formalizing the argument of Director and Levi that exclusion is sufficiently costly so as to be unprofitable. Assume for this section that $Q^* = 0$, so there is no minimum efficient scale.

Central to our analysis is the familiar result that monopoly is inefficient. The seller's gain from increasing the price from $\overline{C}$ to P_m is less than the buyer's loss: $X^* > \pi$, or stated differently, the triangle $X^* - \pi$ in Figure 1 has positive area. This follows because we have assumed implicitly that the excluding firm does not use perfect price discrimination, and we have assumed explicitly that $q' > 0$, in which case $q(\overline{C}) > q(P_m)$ and the triangle loss is strictly positive.

When customer surplus exceeds monopoly profits, the excluding firm will refuse to pay what the customers demand in exchange for signing the agreement. We summarize this "triangle-loss argument" in Proposition 1.

PROPOSITION 1: *With no minimum efficient scale, in equilibrium $P_1 = P_m$, no customer signs the exclusionary agreement, and entry occurs.*

PROOF:

Under the assumption of constant costs, the rival firm can maintain zero profits at

$P_r = \overline{C}$, so it enters if there is even one free customer. Each customer thus has the power to ensure entry in period 2, and the second-period price will be $P_f = P_r = \overline{C}$ if at least one customer does not sign. A customer who does sign the exclusionary agreement therefore loses X^* in second-period surplus and will sign only if $X \geq X^*$. The gain to the excluding firm from a single exclusionary agreement is π, so it offers $X \leq \pi$. Because monopoly is inefficient, $X^* > \pi$, so no customer signs the offered agreement. The excluding firm merely maximizes first-period profits, which results in $P_1 = P_m$.

III. The Coordination Argument: Simultaneous Moves

In a market with a minimum efficient scale ($Q^* > 0$), a monopolist may be able to induce its customers to sign exclusionary agreements for very small payments by exploiting their lack of coordination. First, a lemma will be useful.

LEMMA 1: *Entry is deterred if $N_s \geq N^*$, where N^* is defined to be the lowest integer such that*

$$N^* > N - \frac{2Q^*}{q(\overline{C})}. \tag{1}$$

PROOF:

Equation (1) can be rewritten as

$$Q^* > \frac{[N - N^*]q(\overline{C})}{2}. \tag{2}$$

The right-hand side of (2) is the market share of the rival if $P_f = P_s = \overline{C}$. Because that market share is less than Q^*, the rival's average cost must be greater than $\overline{C}$, which would be unprofitable. The rival cannot make nonnegative profits at that price because the excluding firm will be willing to match the rival when $P_r = \overline{C}$. Neither can the rival make nonnegative profits at $P_r > \overline{C}$, because the excluding firm would undercut that price, or at $P_r < \overline{C}$, because that is a price below average cost.

Our main result is the following proposition.

PROPOSITION 2: *If there is a minimum efficient scale and customers make simultaneous moves, there are the following two possible kinds of pure-strategy equilibria.*

(i) ALL SIGN: $P_1 = P_m, X \in [0, \pi)$, *at least N^* customers sign the exclusionary agreement (all do if $X > 0$), and no entry occurs.*

(ii) NONE SIGNS: $P_1 = P_m$, *no customers sign the exclusionary agreement, and entry occurs.*

ALL SIGN *with $X = 0$ is the only equilibrium if the triangle loss is small relative to the minimum efficient scale; that is, if*

$$\frac{N^*}{N} \leq \frac{\pi}{X^*}. \tag{3}$$

PROOF:

The rival's strategy is given by Lemma 1: enter if and only if $N_s < N^*$ and then charge $P_r = \overline{C}$. Customers' strategies depend somewhat on the equilibrium, but whatever the equilibrium, they will sign if $X \geq X^*$.

If (3) is false, then NONE SIGNS is one of the equilibria. If any customer unilaterally signs, his action has no effect except to cost him X^*. The excluding firm does not want to deviate, because there is no point in offering $X > 0$. Its optimal second-period price is $\overline{C}$, because entry will occur.

If (3) is true, only ALL SIGN is an equilibrium. If the excluding firm offers $X = X^*$ to N^* customers, entry is deterred, and it can collect π from N customers. This action is profitable if (3) is true, so NONE SIGNS cannot then be an equilibrium. If (3) is true, then the excluder has no incentive to offer more than $X = 0$ to any customer. Each customer knows that the excluder can guarantee success by offering $X = X^*$, so whatever the excluder offers any individual customer, whether it be the equilibrium payment or not, the customer expects exclusion to succeed. Hence, the excluder need offer no more than $X = 0$.

If (3) is false, ALL SIGN is still an equilibrium. No customer could benefit by unilaterally refusing to sign, because if more than N^* still sign, the rival will stay out. Whether the excluder could benefit by deviating is more complicated, because this depends on how the beliefs of customers about each others' decisions change in response to out-of-equilibrium offers of X. Suppose the equilibrium specifies $X = \hat{X}$. It must also specify some out-of-equilibrium belief for each customer such as "if $X \neq \hat{X}$, then all the other customers will refuse to sign, and exclusion will fail." Given this belief, which is self-fulfilling if the offered X indeed fails to equal $\hat{X}$, the excluding firm does not want to deviate by offering $X < \hat{X}$. Because any X up to π yields zero or positive profits, any of those values can be supported by this kind of customer belief. Finally, because there is no entry, the optimal second-period price is P_m.

A continuum of equilibria also exists in mixed strategies, with exclusion payments lying in the range $(0, X^*)$. In each equilibrium, exclusion has some probability of success between 0 and 1, a probability that is greater if X^* is smaller (for elaboration, see Rasmusen et al. [1990]).

The heuristic explanation for exclusion depends on whether or not (3) is true. If (3) is true, exclusion occurs simply because the excluding firm is willing to pay X^* to each of N^* customers. If (3) is false, exclusion occurs because of a coordination problem. If all other customers refuse to sign, customer i should refuse too, because $\mathrm{CS}(P_m) + X^* > \mathrm{CS}(P_m) + X$ if $X < X^*$. If all other customers sign, customer i should sign too, because $\mathrm{CS}(P_m) + X \geq \mathrm{CS}(P_m)$. In this coordination subgame, each customer prefers that all customers refuse, including himself. Unfortunately, if he believes that the others will sign, so will he, and exclusion will occur.

IV. The Coordination Argument: Sequential Moves

Our results can (but do not necessarily) change if the excluding firm confronts customers with its proposed exclusionary contract sequentially rather than simultaneously. The excluder can approach customers sequentially in different ways. The easiest way to analyze the problem is to let the buyers decide whether to sign in turn but without knowing the order in which they are asked or what the previous buyers did. The analysis and results would be identical to the case of simultaneous moves, because the buyers would have the same coarse information as in that game.

Other sequential games are more complex, yet sometimes more determinate. We will analyze the game in which each customer publicly decides sequentially and permanently whether or not to sign.[4]

1.0: The excluding firm announces price P_1, and customers make purchases.
1.1: The excluding firm offers X_1 to customer 1, who signs or refuses.
1.2: The excluding firm offers X_2 to customer 2, who signs or refuses.

...

1.n: The excluding firm offers X_N to customer N, who signs or refuses.
2.1: The rival firm decides whether to enter.
2.2: The rival chooses price P_r if it has entered.
2.3: The excluding firm chooses price P_s for customers who signed the exclusionary agreement and price P_f for free customers.
2.4: Free customers buy from the rival or the excluding firm. The customers who signed buy from the excluding firm.

PROPOSITION 3: *The sequential game with a minimum efficient scale has two possible*

[4]The assumption that the excluding firm can make take-it-or-leave-it offers, which gives the excluding firm all the bargaining power, is important here, unlike in the simultaneous-move model. In the sequential game, relaxing this assumption raises the danger of extortion by the crucial customers, who could demand all of the second-period monopoly profits for an agreement not to patronize the rival.

equilibrium outcomes, depending on the following condition:

$$(4)\qquad \frac{N^*}{N} \leq \left(\frac{\pi}{X^*}\right)\left(2 - \frac{\pi}{X^*}\right).$$

(i) ALL SIGN: *If inequality (4) is true, then all customers sign the exclusionary agreement, and no entry occurs.*
(ii) NONE SIGNS: *If inequality (4) is false, then no customers sign the exclusionary agreement, and entry does occur.*

PROOF:

The rival's strategy is given by Lemma 1: enter if and only if $N_s < N^*$. Call customer i "crucial" if enough customers have refused to sign so that $N_s < N^*$ if i refuses, even if all subsequent customers sign.

Situation 1.—Suppose that S customers have signed, T remain to be asked, and $T = N^* - S$. No crucial customer will sign for less than X^*. The sunk cost of having signed up the S customers can be ignored, but the larger is S the smaller is the benefit from exclusion, because those S customers are not free to go to the entrant anyway. Hence, the net benefit from signing up the last T customers is

$$(5)\qquad \text{Net benefit} = (N - S)\pi - TX^* = (N - N^* + T)\pi - TX^*.$$

Because $X^* > \pi$, expression (5) is decreasing in T. Therefore, if the net benefit is positive for $T = N^*$, when no customers have signed, it continues to be positive as more sign. From equation (5), the net benefit is zero or positive if $(N - N^* + T)\pi - TX^* \geq 0$, so exclusion succeeds if

$$T \leq (N - N^*)\pi/(X^* - \pi) \equiv T^*.$$

If no more than T^* are left and all T^* are crucial, the excluder is willing to pay them each X^*, and exclusion will succeed. If $T = T^* + 1$ and all are crucial, exclusion will fail.

Situation 2.—Let $T = (N^* - S) + 1$ and $T \leq T^* + 1$. If the first customer refuses to sign, the result is that $T \leq T^*$ and $S + T = N^*$ (situation 1), so exclusion succeeds. The first customer is therefore unimportant, and he will sign for $X = 0$, after which S rises by one, T falls by one, and the game remains in situation 1. Hence, exclusion succeeds at zero cost.

Situation 3.—Let $T = N^* - S + 1$ and $T = T^* + 2$. If the first customer refuses to sign, T falls by one, so $T = T^* + 1$ and $T = N^* - S$, in which case the game is in situation 1 but with a T so large that exclusion fails. Hence, the first customer can block exclusion and will not sign for less than X^*. If he does sign, S rises by 1, T falls by 1, and the game reaches situation 2, so that signing up the remaining customers is possible and costless.

Situation 4.—Similarly, if $T = (N^* - S) + 1$ and $T = T^* + 3$, the first two customers can each prevent exclusion by unilaterally refusing to sign, and each must be paid X^*. The excluder is willing to pay X^* to as many as $N\pi/X^*$ customers. Hence, exclusion succeeds if

$$(6)\quad T \leq \frac{(N - N^*)\pi}{X^* - \pi} + \frac{N\pi}{X^*} + 1 \equiv T^{**}.$$

Situation 5.—Let $S = 0$, $T = N^* + 1$, and $T > T^*$, so N^* customers must be signed, which is profitable only if it can be done at a cost of less than $N\pi$. It has been shown (situation 4) that this can be done if $T \leq T^{**}$. This implies, given that $T = N^* + 1$, that exclusion is profitable if $N^* \leq T^{**} - 1$ or, using (6), if

$$(7)\qquad N^* \leq \frac{(N - N^*)\pi}{X^* - \pi} + \frac{N\pi}{X^*}.$$

Inequality (7) can be rewritten as condition (4):

$$(8)\qquad \frac{N^*}{N} \leq \left(\frac{\pi}{X^*}\right)\left(2 - \frac{\pi}{X^*}\right).$$

If $T > (N^* - S) + 1$, then exclusion succeeds *a fortiori*, because if the first customers refuse (shrinking T), eventually $T = (N^* - S) + 1$.

Situation 6.—If inequality (4) is violated, exclusion fails. Then, if $T=(N^*-S)+1$, the excluder is unwilling to pay the first customer X^*, because too many customers would have to be paid a positive amount before the monopoly profits would recoup the expense. The first customers are safe in refusing to sign, because their refusal shrinks T to $T=(N^*-S)+1$, and exclusion fails.

A numerical example may be clearer than the proof. Suppose that $N=100$, $N^*=90$, $\pi^*=10$, and $X^*=14$. Exclusion could be ensured by simply paying $N^*X^*=1{,}260$, but the cost would be too high, because the profits would be $N\pi^*=1{,}000$. Exclusion is not profitable if more than 71 consumers have to be paid X^*, which would cost 994. Condition (4) is satisfied, however, because

$$\frac{90}{100}\leq\left(\frac{10}{14}\right)\left(2-\frac{10}{14}\right)=0.714(1.286)$$
$$=0.918.$$

Suppose that the excluder goes ahead and signs up 70 consumers at 14 each, costing 980. This cost being sunk, the excluder would be willing to sign up as many as 21 more consumers, at a cost of 294, in order to earn further profits of 300, 10 each from the 30 remaining consumers. Because it is clear that the excluder is willing to do this, the excluder can offer $X=0$ to the next 10 consumers, and they will accept, because they know that if they refuse, the excluder will be willing to pay $X=14$ to the last 20 consumers, and exclusion will succeed anyway. Hence, the excluder can offer $X=0$ to all the remaining 30 consumers. In fact, the excluder can offer $X=0$ even to the first 70 consumers, once it is clear that exclusion will succeed even if individual consumers refuse to sign.

The excluding firm may be able to structure the game to its advantage. In the simultaneous model, exclusion is the unique equilibrium outcome under certain parameters, but under other parameters both exclusion and no-exclusion constitute equilibria. By contrast, the equilibrium in this particular sequential model is always unique: depending on the parameters of the model, either ALL SIGN is the only equilibrium or NONE SIGNS is—but never both. This result is not surprising, because the sequential game is a game of perfect information: at each node the moving player can choose his best alternative without the need to guess at past or concurrent moves by the other players.

V. Predicting Conduct With Multiple Equilibria

Careful readers will notice that the coordination argument did not hinge on the excluding firm having a monopoly on anything. In theory, a firm could enter a competitive market and use exclusionary agreements to drive out existing rivals; exclusion and no-exclusion are both Nash equilibria even if the rival has sales in the first period. Yet most readers will probably also consider exclusion more plausible when the excluding firm is an incumbent monopolist. This difference in intuitions helps focus attention on the issue of how one selects among the multiple equilibria.

Our assumptions have ruled out two situations in which the exclusionary equilibrium will not arise: if demand is perfectly elastic (how can one sign up an infinite number of potential customers?) and if no minimum efficient scale exists (how can one keep out a rival who would enter to serve even one customer?). Here we consider several other factors that affect the plausibility of successful exclusion, which also illuminate why an incumbent monopolist might exclude more successfully than a new entrant.

(i) As the initiator of action, the excluding firm often controls the order of play and other important details. If possible, it will try to structure the order of play to its advantage. It can, for example, present proposals for exclusionary agreements as sudden exploding offers to forestall communication or make the game sequential instead of simultaneous.

(ii) The excluding firm generally moves first, and its move may affect the beliefs customers hold about which equilibrium is being played out. Each customer knows that the excluding firm gains nothing from offering the exclusionary agreement if the offer does not lead to exclusion. Perverse as it may seem, each customer may thus deduce that the excluding firm's offer itself signals that the signing equilibrium will ensue.[5]

(iii) Existing customers may consider it a focal point to stay with the incumbent seller. The focal character of the market's history helps the incumbent monopolist and hampers the new entrant.

(iv) Transaction costs generally hamper entrants' efforts to use exclusionary agreements. So long as first-period customers constitute a large percentage of the second-period customers, a monopolistic firm can exclude rivals simply by signing up its existing customers. By contrast, the predatory entrant will generally have little information about the customers whom it must induce to sign.

On the other hand, exclusion is unlikely if customers can communicate easily. Each customer prefers that he and the others all refuse to sign the agreement. The coordination argument works only because they cannot tell each other of their intended actions and coordinate to arrive at their preferred subgame equilibrium.

VI. Summary

For more than a decade, Chicago School scholars have urged courts to ignore contracts in which customers agree not to buy from an incumbent monopolist's rivals. Customers will not sign the agreements, they argue, unless compensated for a sum exceeding the value of exclusion to the monopolist. This article has shown how exclusionary agreements can enable an incumbent monopolist to exclude its rivals cheaply. We used a model that demands no assumptions more unusual than a minimum efficient scale requiring a seller to serve at least two customers. We then showed how in such markets a monopolist may be able to exclude rivals cheaply by exploiting its customers' inability to coordinate their actions. We found two pure-strategy Nash equilibria: (a) enough customers sign the exclusionary agreement to deter entry, and (b) no customers sign the agreements. Because the argument does not depend on the excluding firm being a monopoly, the agreement is not just a way to extend existing market power. Rather, it is a way that an excluding firm can take advantage of its unity and the customers' disunity. The argument is simple and extends beyond the particular example we have chosen. Our working paper (Rasmusen et al., 1990) applies it to tie-in sales and intermediate-goods customers, and Rasmusen (1989) applies it to exclusion agreements with input suppliers.

One cannot claim that exclusionary agreements will always work. Neither, however, can one claim that they will never work. Whenever a monopolist can convince its customers that most other customers will sign an exclusionary agreement, it can obtain the agreements cheaply.

[5]If offering the agreement is costly, this is an example of "forward induction." See, for example, Eric van Damme (1989).

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