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Exclusive Contracting and Loyalty Discounts

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Naked Exclusion by an Input Supplier: Exclusive Contracting and Loyalty Discounts

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Recent literature has shown that an incumbent can use exclusive contracts to maintain supra-competitive prices, but only if he completely prevents a more efficient potential entrant from entering, and if the entrant is exogenously prevented from making exclusive offers. Such models cannot explain how exclusive arrangements can lower welfare when they do not completely foreclose a small rival, when the rival can make exclusive offe 4rival

The intuition above indicates how a dominant supplier can use exclusives to completely exclude sales by the small rival. But, in many instances authorities have challenged so called market share or other loyalty based discounts, under which downstream firms agree to use the dominant supplier's input in a large share of their output, but not exclusively. This allows downstream firms to sell some units using the small rival's inputs. Markets in which exclusionary behavior occurs when a small rival operates and will continue to operate constitute an important set of cases. Many private antitrust actions that challenge exclusive dealing or

entry of an entrant[4] (or driving a competitor out of the market) leading some to believe that exclusives can only create harm by completely eliminating a competitor.[5] My results show that exclusive or near exclusive arrangements can lower welfare even if the rival remains in the market and is profitable.

The current literature is limited because it relies on two artificial assumptions. First, only the incumbent can offer exclusive contracts. Second, the small rival is an entrant that can be prevented from sinking a fixed cost and entering. My model replaces these assumptions with a formal model of dominance of an input supplier.

My model assumes inelastic market demand, and competing homogeneous downstream manufacturers. This structure has two important properties. First because demand in each segment is perfectly inelastic, each input supplier can extract its full incremental value with linear prices. Consequently extracting uncaptured quasi-rents is not a motivation for exclusivity as it is in earlier literature.[6] This implies that allowing suppliers to use two part tariffs yields the same equilibrium that occurs under linear prices.

Second, manufacturers earn no quasi-rents when competing against other manufacturers using the same input. This eliminates the possibility of "punishment strategies" on the part of the dominant supplier. That is if a manufacturer were earning quasi-rents by using the dominant supplier's inputs, the dominant supplier could.1 Tm[m[.898

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Eliminating the quasi-rents eliminates such strategies and allows the model to focus on explicit payments in exchange for exclusivity.[7]

Briefly, the contributions of this paper include:

These papers trace their origins in two earlier papers, Rasmusen, Ramseyer and Wiley (1991), (RRW-SW) [11] and Aghion and Bolton (1987) (AB), which considered buyers who were end users.[12]

downstream firms obtain from buying a low priced input from the entrant, because downstream competition will pass most of this savings on to end users in the form of lower prices. Thus, unlike Fumagalli and Motta they find that

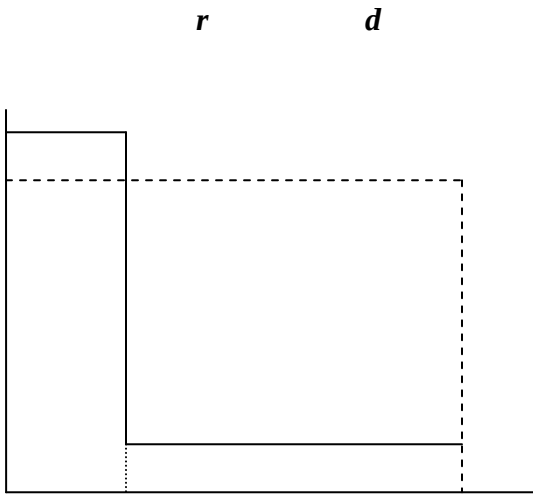
increase prices. As the disparity in demand gets even

A recent paper that departs from this progression is Ordover and Shaffer (2007). It

users will pay significantly more for a -based unit than an -based unit. ∈{ } indexes the segment. Figure 1 presents a graph of the market demand induced by these preferences.[19]

There are manufacturers who can use to produce a final good. ≤ of these manufacturers can also use to produce the final good. Manufacturers are indexed by ∈{ ,..., }.

Supplier sells his input by setting a manufacturer and segment specific per unit transfer price, .[20] That is, suppliers can offer a different price for units used in final goods sold to the contestable segment and to the non-contestable segment. (I discuss how this is done institutionally in Section 4.) Given that manufacturers have zero production costs, each manufacturer's marginal cost is equal to the price he pays for the input. He can thus have different marginal costs depending on which end users he serves and which inputs he uses. Manufacturers can price discriminate between segments. Let be manufacturer 's price for a good to customers in segment using input



customers as being in one segment or the other, it is quite possible that for some applications a customer might be in one segment and for other applications he might be in the other.

[19] As I discuss later, the discontinuity in types and the constant just simplify exposition and play no substantive role in the results.

[20] The subscript convention is that the first subscript tells who is making the offer, the next subscript indicates to whom the offer is made, and the last, if used, will indicate either "in which market" or "which input is used" if the second subscript already implies "in which market." Thus is set by a supplier, , and offered to manufacturer, , for goods sold to customers in segment .

I assume that end user segment is non-contractible, which means that the parties could never prove to a judge the willingness to pay of a given end user. Thus, they can not write a contract that based ex post payments (i.e., exclusivity payments) on the identities of the customer to whom units are sold. However customer specific rebates can be made at the time of a sale to a customer if both and the manufacturer recognize that they will lose a sale if they don't offer the customer a final good price based on a low input price.

Given this structure I construct the following formal game:

- In stage 1 the suppliers simultaneously offer payments, , to each manufacturer in exchange for exclusivity. Manufacturers state which exclusive offers (if any) they accept.
- In stage 2 suppliers observe who has accepted exclusive offers and set input prices, .
- In stage 3 manufacturers observe prices, and if they accepted an exclusive offer, announce if they intend to breach.[21]
- In stage 4 both suppliers observe if any manufacturers announce they will breach. If a manufacturer breaches, suppliers can offer lower prices, to any manufacturer.[22]
- Manufacturers observe the new prices, and set their final good prices to end users for each segment, .
- End users make their purchases.

I consider only subgame perfect Nash equilibria. Before presenting the main propositions, I provide an observation and two preliminary lemmas. All proofs are in the appendix.

Observation 1. In the subgame beginning in sage 3 in which no manufacturer has accepted exclusivity, the unique equilibrium continuation has setting = 0, and = , setting = - , and = 0 for all . End users buy -based units in the segment at = – and based units at =

Observation 1 just says that with no exclusive contracts the equilibrium is the competitive equilibrium where each segment has the "usual" Bertrand price. This equilibrium maximizes social surplus.

Lemma 1. If (–) > (+)/ then in every subgame perfect continuation in which offers payments for exclusivity, where the sum of the payments is no greater than (+), (which is the maximum monopoly profit can generate) not all manufacturers are exclusive to .

Lemma 1 provides a sufficient condition for to be "dominant." It says that the incremental value generates in the non-contestable segment (LHS) has to be larger than the best payments could make to manufacturers for exclusivity if were a monopolist (RHS). If were excluded he would lose this incremental value. If one manufacturer used , then would capture this value. He would therefore be willing to share enough of these rents with one manufacturer so that the manufacturer could earn more profits selling -based units in the non-contestable segment than the payment that the small rival offered for exclusivity.[23]

Lemma 2 now presents the important implication of lemma 1.

Lemma -based units cannot generate rents in excess of (–) if competes in the segment.

Lemma 2 says if just one manufacturer is not exclusive to in the segment, then the equilibrium is the competitive Bertrand equilibrium outlined in observation 1. In this equilibrium

[23] Some might worry that in a more complex game 's offer of might be subject to opportunistic behavior by in later stages of the game (i.e., different price offers to other manufacturers). This possibility could easily be eliminated by inserting another stage into the game in which once suppliers observe who has accepted exclusivity, a supplier gets to make counter-offers of a payment for exclusivity if all of the manufacturers have agreed to exclusivity with the other supplier. In this case could just offer manufacturer a fixed payment marginally larger than the largest payment could offer in exchange for exclusivity. Such a payment would not be subject to any potential ex-

the highest rent could generate is the difference between the value of his input and the value of 's input in the contestable segment. That is, competition in the contestable segment will drive 's rents down to 's incremental value relative to for segment end users.

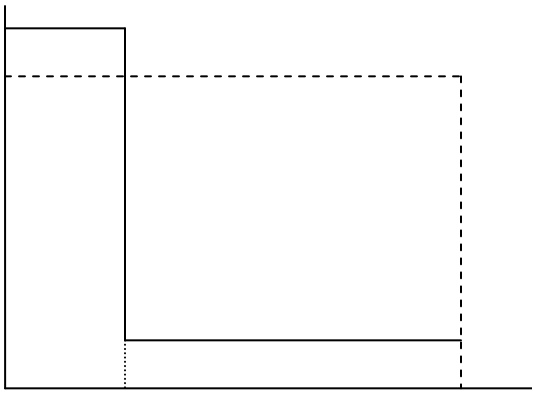
The two lemmas together say that even though he can offer exclusive contracts, cannot monopolize the market by signing up all manufacturers to exclusives. Thus, he will be relegated to fending off 's attempts to monopolize the market, but he has only the difference between his input's value and the dominant supplier's input's value in the contestable segment with which to work. Proposition 1 now states the conditions under which this is not enough.

Proposition 1. If + > (-) and (–) > (+)/

The main intuition behind proposition 1 is that (when the second condition holds) cannot induce all of the manufacturers to be exclusive to himself because can always offer one manufacturer some of his incremental value from the non-contestable segment (which would lose if all manufacturers were exclusive to) to forgo exclusivity to . Thus, will always compete in both segments.

If and compete, then earns only his input's incremental value in the contestable segment and earns only his input's incremental value in the non-contestable segment. If excludes , then earns the monopoly profits from both segments. If the monopoly profits could extract from the contestable segment plus the increased profit he could obtain from the non-contestable segment by excluding is larger than 's incremental value in the non-contestable segment times , the number of manufacturers that can use , then pays each manufacturer for exclusivity, making a monopolist in the entire market.

Figure 2 – demand for -based and -based units



The conditions of proposition 1 have graphical interpretations. In Figure 2 above is the incremental value generates in the contestable segment, is the rent could extract from the contestable segment if he could monopolize it, is the incremental value generates in the non-contestable segment and is the value generates in the non-contestable segment and represents

the addition profit would earn in the non-contestable segment if were excluded. The first condition of proposition 1 says that >

Proposition 2. If

Price discrimination

An important feature of the model is 's ability to price discriminate across segments. This allows him to compete away the benefits of lower input prices from in the contestable segment if manufacturers were to breach exclusivity, while maintaining high prices in the non-contestable segment. As noted in the introduction, the FTC believed that Intel's ability to sell CPUs at low prices when facing competition from AMD and simultaneously at high prices when not facing competition was crucial to the competitive harm from exclusionary arrangements.[28]

In its complaint against Intel the New York State Attorney General explained in some detail how this could be accomplished institutionally.[29] The complaint alleges that when OEMs were responding to requests for proposals (RFPs) from large customers, Intel would work closely with the OEM and collected information on the RFP including whether a non-Intel based PC was being offered by another bidder. If there were, then Intel would issue a discount to the OEM that it believed would be large enough to win the bid. If there were no non-Intel PCs being offered then Intel would not issue a discount. This explanation suggests that exclusives are more likely to be problematic when end users are large customers that

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Exogenously fixed number of manufacturers

I have exogenously fixed and

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arrangement because they receive a payment they would not receive in the benchmark equilibrium. In a punishment model manufacturers would not be better off under exclusivity.

Other assumptions leading to positive sales by R

Proposition 2 presents a model in which all manufacturers reach near exclusive arrangements with . It cannot explain a pattern in which the largest manufacturers reach exclusive arrangements and the rival makes sales through smaller manufacturers. To obtain such a result one could extend the model of proposition 1 to assume that there is a low quality version of the final good produced by some manufacturers who do not produce the high quality good,[33] and that a group of customers have a very low willingness to pay for this final good and are not willing to pay any extra for the higher quality version. Assume also that these customers have a higher willingness to pay for 's good than for 's. For example their willingness to pay for an -based good is –

units to obtain an effective price. The loyalty payment is considered potentially anticompetitive if and only if this effective price is less than the incremental cost of producing these units.

My model shows this test is too restrictive. While there are p

manufacturer's stockholders to induce them to merge. Since the payment is not enough to compensate the manufacturer's stockholders to breech exclusivity as an independent manufacturer, it would not be enough to induce them to cede ownership to the rival instead of accepting an exclusivity payment. Thus, not only can exclusivity payments prevent sales contracts between the small rival and manufacturers, they can also prevent mergers or joint ventures between such parties.

Long term contracts

My results also suggests that exclusive arrangements do not need to be part of long term contracts to be exclusionary. Two features of the model suggest that contract duration is not an element of the equilibrium First the equilibrium does not require any player to commit to a strategy choice that he would prefer not to play when it came time to play. Thus, there is no interpretation in which any player has made a long term commitment. Second, my model does not require agreements to stretch over a period during which a small rival could enter, which often distinguishes short run from long run.

The effect of downstream differentiation

Simpson and Wickelgren (2007a) and Abito and Wright (2008) argue that differentiation among downstream competitors makes exclusion more difficult. I show that this is not a general result. It is simple to introduce a form of differentiation among manufacturers into proposition 1 that makes exclusion easier. Suppose that for each end user in the contestable segment a fraction λ of manufacturers are perfect substitutes, while the other $(1-\lambda)$ are unacceptable, and that which manufacturers are substitutes for a given end user is uniformly distributed across end users.[35] Under this assumption (and continuing the assumption that the dominant supplier can lower prices selectively to customers that are considering a product with a rival's input) the dominant

[35] Let customers and manufacturers be uniformly distributed around a Hotelling Circle of circumference 1. Each customer can travel 1/3 in either direction for free, but can go no further. Then (λ=) 2/3 of the manufacturers would be perfect substitutes and the other 1/3 would not be considered. One could imagine customers who only will deal with manufacturers with whom they had a positive previous experience. Different customers could have different sets of manufacturers with which they had good experiences.

supplier would only have to pay each manufacturer λ instead of to be exclusive, lowering the cost of exclusion and increasing the set of parameters for which exclusion is possible.

Differentiation can have two effects on manufacturers. First it can soften price competition among manufacturers. This increases the benefits from a rival's low input price that downstream manufacturers would keep, which makes paying for exclusion more expensive to the dominant supplier. This is the effect that dominates in the Simpson and Wickelgren, and Abito and Wright papers. A second effect is that differentiation limits the size of the market any one manufacturer could serve, limiting the potential profits he could earn by breaching exclusivity. This limits the payment the dominant supplier must make to induce exclusivity. The extension outlined above has only this second effect and so reduces 's cost of inducing exclusivity.

The recent literature has modeled exclusion in the context of a potential entrant who is more efficient than a monopolist incumbent across the entire market. The incumbent excludes when the entrant is prevented from making exclusive offers. By contrast I present a model in which a small rival, who is already in the market, is more efficient at serving only a small segment of the market. If the dominant supplier has sufficiently large demand from the segment of the market that he serves more efficiently, then he can use exclusive or other loyalty arrangements to exclude the smaller rival. Such exclusivity reduces social and consumer surplus.

The contributions of this model include i) formally modeling dominance of an input supplier competing against a smaller rival and selling to downstream competitors ii) showing conditions under which a dominant supplier has to be sufficiently large to use exclusive contracts to exclude and lower welfare, ii) showing that a dominant supplier's use of market share discounts with threshold levels of less than 100% lowers welfare, even though the rival sells positive amounts of its inputs, iii) showing formally that the so called price cost tests

includes savings from reducing competition in a market segment in which the small rival would not make sales, but would exert competitive pressure, and v) providing some conditions that help determine if increased product differentiation will make exclusion easier or harder.

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Thus, the continuation after all manufacturers accept exclusivity to (where the sum of the payments does not exceed (+)) will have one manufacturer breaching exclusivity and earning a profit selling -based units equal to the maximum payment could offer him for exclusivity.

Proof of Lemma 2

Suppose that sets = 0 for at least one manufacturer. Then, 's best response is to set = – , and 's best response to that is = 0. The equilibrium of this subgame is for manufacturers to set = 0 and = – resulting in total segment sales of (–) .

There is no equilibrium in which sells positive units at any > – for all . If set ' > – for all , then could set > 0 by an arbitrarily small amount and make positive profits while earned 0 in the segment. If set > – for some manufacturers and = – for the rest, then only those manufacturers receiving = – would make sales in equilibrium.

Proof of Proposition 1

In the proposed equilibrium each manufacturer earns a payoff of (-) . receives a payoff of + - (-) . earns a payoff of zero as do all end users.

Suppose one manufacturer deviated by breaching his exclusive contract in response to a price offer between 0 and - from . Then in the proposed equilibrium's continuation would offer = 0 to manufacturers not -exclusive and would still sell at the price that induced the breach. The equilibrium would equal - and would equal 0. The manufacturer that sold the based good could not earn more than (-) , so he could not profit by breaching. could not profit by offering a price less than 0 to induce a breach. Thus, there is no deviation involving a breach that could make the deviating manufacturer and jointly better off.

If one manufacturer

accepts. offers

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