Notes on Naked Exclusion and Private Offers

Eric Rasmusen, November 21, 2015

In 2000, Segal and Whinston published a paper correcting errors in the 1991 Naked Exclusion paper, but leaving the result pretty much unchanged (except that we said discriminatory offers wouldn't matter, which is wrong). They showed that discriminatory offers, in which the incumbent makes generous offers to some buyers and stingy ones to others, would make a big difference– that then ONLY exclusion is an equilibrium. It turns out that's only true if the offers are publicly observable, which seems unlikely, or, at least, is easily observable by antitrust authorities. Miklos-Thal and Shaffer (2015 working paper [2017 note: Published in 2016 in AEJ-Micro–see references at the end of this]) show that.

The first three propositions of Segal and Whinston are:

Proposition 1: The Rasmusen-Ramseyer-Wiley proposition.

Proposition 2: If the buyers can coordinate, there is no exclusion (another RRW result).

Prop. 3: If the incumbent can make different offers to different buyers, sometimes ONLY exclusion is an equilibrium.

Then they say,

"Finally, we note that the results of Proposition 3 change very little when a buyer does not observe other buyers' offers: the only alterations are that we must have xi = 0 for all i in Cases A(i) and B(i). The formal analysis of this case can be found in our working paper [Segal and Whinston (1996)]."

But in fact the results in Proposition change completely, unless highly contrived assumptions are made on out-of-equilibrium beliefs. The problem is that if offers are private and the incumbent is supposed to make generous offers to some buyers in an equilibrium, the incumbent can profitably deviate by making stingier offers to them.

Knowing this, the buyers will not sign up and exclusion will fail, under reasonable buyer beliefs for what's going on when they unexpectedly see a stingy offer.

There do exist out-of-equilibrium beliefs for which the Proposition 3 result does survive even if offers are private, but they are contrived.

For example, suppose there are 100 buyers, a rival seller needs at least 15 buyers to survive, the monopoly profit per consumer is $2 and the lost consumer surplus is $4. There are two coordination equilibria, both with offers of $0 to each buyer. In one, each buyer believes all the others will accept the $0 offer, so he might as well accept too. In the other, each buyer believes every other buyer will reject, so he will too.

A divide-and-conquer unique equilibrium in the Segal-Whinston style would be for the excluder to offer $4 each to 16 of 100 buyers for exclusive-dealing contracts when the monopolist's profits would be 84 (4) - 16(4-2) = 336-32 = 304.

Think about what happens if the offers are private. The excluder will want to deviate by offering nothing to the formerly lucky 16 buyers and offering $1 to 16 formerly unlucky buyers. Consider the out-of-equilibrium beliefs of one of the buyers receiving an offer of $1, instead of the $0 he expected. If he thinks that all of the other buyers received offers of $0 and will turn them down, then he will turn down his offer too, and we do get an exclusion equilibrium. But why should he believe that? It's hard to justify an equilibrium refinement that says that if a buyer gets an unexpected offer of X he believes the excluder must have made out-of-equilibrium offers of Y to other buyers, at least when this intricate sender behavior ends up reducing the sender's payoff. That fits neither an "accidental move" theory of out-of-equilibrium beliefs or a "sender trying to change beliefs" theory.

An example of an accidental-move theory is passive conjectures. Under passive conjectures, the buyer thinks the offer to himself is a mistake, and he accepts it since he thinks the 16 lucky buyers are still getting their offers of $4 and will accept them.

An example of a sender-trying-to-change-beliefs theory (in the style of the intuitive criterion) would be if the buyer thinks the excluder offered him $1 instead of $0 because he had a clever scheme to reduce his contract-purchase costs which he wouldn't have started except that he knew it would work. For example, the buyer might think that himself getting $1 meant that 16 of the other buyers (not 15, or he wouldn't accept!) were also getting offers of $1 and would accept because of similar reasoning.

Thus, neither style of equilibrium refinement gets us out-of-equilibrium beliefs that would maintain an equilibrium with payments of above zero to buyers.

On the other hand, some reasonable choices of out-of-equilibrium beliefs will rule out the coordination no-exclusion equilibrium. In that equilibrium, each buyer gets an offer of $0 and rejects, believing all the other buyers will reject. Under passive conjectures, the excluder could deviate by offering 16 of them $4, and each would accept, believing that nobody else will accept but willing to take $4 to be the lone captured buyer. Under a sender-trying-to-change-beliefs theory, the same deviation would work, as would offering 17 of them $1 each.

THis is quite important, because one feature of the original Ramseyer-Rasmusen-Whinston paper that raised objections was that it had two equilibria, based on expectations, and one equilibrium— the no-exclusion one—was superior for the buyers. If offers are private, however, it seems that the no-exclusion equilibrium vanishes, at least for some cases. (It would remain under passive conjectures if the cost of buying out 17 at $4 was greater than the profit from the remaining 83 customers.)

Miklos-Thal and Shaffer obtained a copy of the 1996 Segal-Whinston working paper by interlibrary loan when they couldn't get an email response from the authors. They wrote (2013 version working paper):

"Segal and Whinston (2000, p. 301) state that their results change very little when a buyer does not observe other buyers offers. They refer the reader to their working paper (Segal and Whinston, 1996),

where they show that with private offers a divide-andconquer strategy may still be used to induce exclusion in equilibrium when the buyers out-of-equilibrium beliefs are such that after receiving an unexpected offer, regardless of what that offer is, each buyer believes that every other buyer has received a zero offer from the incumbent (i.e., an offer with no compensation that is expected to be rejected). These out-of-equilibrium beliefs are not particularly attractive, however, because they are tantamount to assuming that after receiving an unexpected offer, regardless of what that offer is, each buyer believes that the incumbent has given up trying to deter the entrant.

http://www.rotman.utoronto.ca/-/media/Files/Programs-and-Areas/BusEcon/files/MiklosThal.pdf

That's from their 2013 working paper. In the 2015 version they just presented at Indiana, they drop "Segal and Whinston (2000, p. 301) state that their results change very little when a buyer does not observe other buyers offers." They also drop the footnote, "Rasmusen et al. (1991) also mention divide-and-conquer as a possible strategy for the incumbent, but conclude incorrectly (as shown by Segal and Whinston, 2000) that it would never arise in equilibrium." http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2433242

Bottom line: The Segal-Winston discriminatory offer modification to Rasmusen-Ramseyer-Wiley depends completely on the assumption that every customer observes every other customer's offer and whether it was accepted. Contrary to what Segal and Whinston said, the observability of the offers makes a tremendous difference to their result.

Some important points for the Miklos-Shaffer paper:

A. Symmetric beliefs need another condition too, to allow divide-and-conquer. Suppose when a buyer gets an out of equilibrium $1 offer, he thinks everybody else got a $1 offer. To support divide-and-conquer, he must also believe that 84 other people who got the $1 offer will reject it.

B. Wary beliefs. These may fail to specify beliefs coherently.

Definition (wary beliefs): We say that buyer i has "wary beliefs" if, after receiving an offer xi from the incumbent, buyer i believes that
1. the incumbent expects it to accept the offer if and only if $xi \in Ai$;
2. the incumbent's offers to the remaining N- 1 buyers are best for the incumbent, given condition 1 and the acceptance sets of the remaining N- 1 buyers;
3. all other buyers reason the same way.

Consider the example game above, and a hypothesize divide-and-conquer equilibrium. What happens if the excluder is supposed to offer $0 to a buyer and he offers $1 instead? The offer is in Ai, so the incumbent expects it to be accepted(condition 1). But what about condition 2? First, suppose the buyer thinks that the exluder made 16 other offers of $1 and no offers of $4. That isn't best for the incumbent given condition 1, because the incumbent doesn't need 17 acceptors, only 16. Second suppose the buyer thinks the excluder made 15 other offers of $1. That isn't best for the excluder either, because now the buyer will say to himself, "By condition 1, I believe the excluder thinks I will accept his offer, but he is wrong. I am pivotal. If I accept, I get $1 but be captured. If I reject, his exclusion scheme fails and I buy from his rival. So I'll reject." No set of wary beliefs exists, I think. So what does the buyer think out of equilibrium if we require wary beliefs?

C. Proposition 3.5 shoudl show that there is no no-exclusion equilibrium if the monopoly profit is big enough relative to the lost consumer consumer surplus, as I explained above. And give more explanation of what happesn to the no-exclusion equilibrium depending on beliefs.

References

"Naked Exclusion with Private Offers," Jeanine Miklos-Thal and Greg Shaffer 2013.

"Naked Exclusion with Private Offers," Jeanine Miklos-Thal and Greg Shaffer, May 2015.

["Naked Exclusion with Private Offers," Jeanine Miklos-Thal and Greg Shaffer,*American Economic Journal: Microeconomics,* Vol. 8 No. 4 November 2016 pp 174-194.]

Posner, E.A, Spier, K. and A. Vermeule, "Divide and Conquer," *Journal of Legal Analysis* Vol. 417 (2010), pp. 417-471.

Rasmusen, E., Ramseyer, J.M, and J. Wiley. "Naked Exclusion,"*American Economic Review,* Vol. 81 (1991), pp. 1137-45.

Segal, I. and M. Whinston."Naked Exclusion and Buyer Coordination," Discussion Paper No. 1780, Harvard Institute of Economics Research, September 1996.

Segal, I. and M. Whinston, "Naked Exclusion: Comment," *American Economic Review,* Vol. 90 (2000), pp. 296-309.