Chiara Fumagalli and Massimo Motta's Reply to
"Exclusive dealing and entry, when buyers compete: Comment",
by John Simpson and Abraham L. Wickelgren

J. Simpson and A.L. Wickelgren are circulating a Comment to our paper "Exclusive dealing and entry, when buyers compete" (AER, June 2006) in which they claim that our results are not robust. In this Reply we explain why we reject their claims. (This Reply was requested by the Editor of the AER, to which Simpson and Wickelgren sent their Comment. Their Comment was not accepted for publication in the AER.)

1 Summary

Simpson and Wickelgren's Comment (SW from now on) argues that the results obtained in our paper "Exclusive dealing and entry, when buyers compete" are not robust. According to the authors of the Comment, any of a number of small modifications would dramatically modify the outcome of the game we analyze.

The Comment can be separated into two parts. The first part deals with the case of linear pricing: in it, the authors argue that our analysis is technically correct, but suggest that small modifications of the game analyzed would lead to different conclusions. The second part deals with the case of non-linear pricing. First, the authors point out that there is a mistake in our solution of the game; then, they offer their solution to the game, arguing that at what they think it is the correct equilibrium exclusion cannot be avoided in a number of circumstances; finally, they analyze a different game (where contingent price offers and contingent contracts are possible) and find that in this variant of the game exclusion of entry is achieved by the incumbent offering arbitrarily small compensations to the buyers.

Let us say upfront that we are glad that our paper has attracted the attention of the authors. We believe this is an interesting topic, and we are certainly happy if there is going to be more discussion on it. At the same time, though, we would like our work not to be misrepresented, and the discussion to be substantiated by rigorous analysis.

In what follows, we comment separately upon each of these two parts. As for the linear pricing case, we argue that the authors do not add much to our analysis of the issue. First of all, in our paper we had already qualified our argument that downstream competition could make exclusion less likely, and spelled out situations where our argument would not apply. Second, some of the claims made by the authors of the Comment are either incorrect or not proved. Third, some of the modifications proposed by the authors are not interesting.

As for the non-linear pricing case, the authors are right that there was a mistake in our analysis for a subset of parameters' values, and more precisely in the subgame occurring when both buyers reject the exclusive contract and

enter (under Bertrand competition). However: firstly, the solution they propose is not the correct equilibrium of the game either, and at the correct equilibrium we now identify the results are qualitative the same (and indeed very similar) to the incorrect ones we had found in our paper. The printed version of our article contains the correct equilibrium result and prrof, so this issue is hardly a relevant one anyhow. Secondly, even if the solution they propose were correct (which is not), the consequences would be quite different from the ones suggested by the authors (they would just require a redefinition of the interval of the admissible fixed costs for the entrant). Thirdly, the authors' variant of the game where contracts and price offers are contingent is a different game that has little to do with our paper and the related literature.

2 Linear pricing

First of all, in order to avoid misunderstandings, we should stress that in our paper we do not say that "an incumbent firm *cannot* use exclusive contracts to deter entry when buyers are vigorous competitors" (SW, page 1 - the italics is ours), but rather we *identify the conditions* under which the incumbent cannot use exclusive contracts to deter entry under vigorous competition. Indeed, Section III of our paper also mentions circumstances where the incumbent is able to deter entry (see also below).

Therefore, our paper *does not* ignore that intense downstream competition may reduce the benefit a buyer obtains from securing a lower input price (as SW state on page 2). Even though our paper points out that vigorous competition can boost the profitability of being more efficient than rivals (and identifies the conditions under which this is the case), it clearly acknowledges that intense competition may exert the opposite effect (see the discussion in Section III of our paper).

After this initial but necessary clarification, let us now go more in the details of SW's arguments.

- Page 4 (last paragraph): SW write that our "result relies crucially on the finding that a free buyer obtains monopoly profits in the downstream market if the other buyer signs".

  This statement is not correct: as Section III of our paper says (the proof is in appendix E to our paper and in Fumagalli and Motta, 2002, both of which are known to SW), the same result is also obtained in a Cournot model, namely a model where a free buyer facing a signer is not able to obtain monopoly profits.

  Related to this, SW state that, to get our result, we must assume that a signer exits the market when competing with a free buyer (page 11, last paragraph of Section I). The discussion in Section III of our paper shows that this statement is not correct.

- Once said so, we are also very much aware that *if* the free buyer and the captive buyer obtain the input at the same price, then exclusion could take place (which is what SW say on page 5). Indeed, on page 9, second column,[1] after giving an example of a situation where exclusion may occur despite fierce competition, we write: "More generally, tough downstream competition **may result in the incumbent and the entrant choosing linear prices close to each other**, and may therefore erode the profits a deviant buyer makes when it competes with a buyer which is committed to buy from the incumbent". The emphasis is not added, but is in the original paper, to show we did not intend this point to pass unnoticed!

  As an example of a situation where a free buyer and a signer would buy at identical prices, we explicitly mention (page 9, second column) situations where the incumbent could engage in contingent contracts ("In the same vein, if the incumbent could resort to more sophisticated contracts that allow it to commit to sell cheaply to a signer whenever it competes with a buyer which has not signed exclusivity, thereby reducing the profits that the deviant buyer would expect to make, exclusion would be achieved more easily". See also foonote 14.)

  Therefore, we certainly do not contest the argument made by SW (page 5) that contingent contracts (a particular form of which are meeting-competition clauses) would allow exclusion also in situations of fierce downstream competition. Indeed, we have made ourselves the same point. Furthermore, it is well known that contingent contracts would facilitate exclusion, and it is for this reason that the literature on exclusive dealing assumes away the possibility for the incumbent to engage in such contracts.

- Page 5-6. SW claim that in some cases (they mention constant elasticity of downstream demand or inelastic demand) the entrant would have the incentive to set a wholesale price to the free buyer at the same level as the price set by the incumbent to the signer. We believe this is potentially a very interesting point, and would like to see a formal proof of this claim. Unlike the authors, we do not have the intuition that departing from linear demand one would find qualitatively different results, and we believe that the mechanism we have identified is robust to changes in the specification of demand and cost functions (in the first draft of our paper, we resorted to general demand functions rather than specific examples). Admittedly, though, a proof that under different demand functions the results change qualitatively would be an interesting addition to the literature. But the authors should prove their claim.

- Page 6. SW claim that our result does not hold when buyers can participate in the downstream market without paying a fixed cost.

[1] All page numbers refer to the final version of our paper, as posted at www.eui.eu/Personal/Motta.

In Section III of our paper we discuss how the results would look like if the fixed costs of operating downstream were exactly zero, and we show that a multiplicity of equilibria arises. Some equilibria involve exclusion, others do not.

To understand this case, it is crucial to study what happens in the subgame where there are a free buyer and a captive buyer. Recall that at t_2 the incumbent chooses one input price for the signer (w_I^s) and one for the free buyer (w_I^f), while the entrant makes offers only to the free buyer (w_E^f). We say in our paper that at equilibrium the entrant captures the free buyer offering a price $w_E^f = c_I$ (or a shade below it) while the incumbent offers $w_I^f = c_I$ to the free buyer and is indifferent between any price $w_I^s \geq c_I$ for the signer. Indeed, the incumbent and the entrant play the usual Bertrand game *for the free buyer*: there is no doubt that the only equilibrium (excluding of course weakly dominated strategies) is that the incumbent sets $w_I^f = c_I$ and the entrant $w_E^f = c_I - epsilon$. But then the free buyer will be served by the entrant at a price which is lower than the lowest possible price that the incumbent could make to the signer. Therefore, at whatever price $w_I^s \geq c_I$ the incumbent offers to the signer, the signer will not be able to win orders in the downstream market, resulting in zero quantities sold at equilibrium, and zero profits for the incumbent itself. Any price w_I^s equal or higher than c_I gives the incumbent the same payoff. There is therefore a continuum of equilibria in this subgame, leading to quite different types of equilibria of the whole game (see page 9, first column).

SW claim that the only equilibrium of this subgame involves the incumbent charging $w_I^s = c_I$ to the signer: if the incumbent chose $w_I^s = c > c_I$, "then the entrant's best reply would be to offer an input price just below c but greater than c_I" (SW, page 6).

This claim is not correct, as an input price just below c but greater than c_I is not the entrant's best reply. Consider a candidate equilibrium where the entrant and the incumbent offer to the free buyer the input prices $w_E^f = c_I - epsilon$ and $w_I^f = c_I$ respectively, while the price offered by the incumbent to the signer is $w_I^s = c > c_I$. The free buyer purchases the input from the entrant and captures the entire downstream market; the entrant makes (strictly) positive profits by satisfying the free buyer's input demand. If the entrant offers $w_E^{f\prime}$ just below c but greater than c_I, the free buyer purchases from the incumbent ($w_I^f = c_I < w_E^{f\prime}$). Thus the entrant does not sell anything and it is worse off. The above input prices *do* represent an equilibrium.

SW are wrong because the entire price game at t_2 is not the standard Bertrand game: at this stage, the incumbent has to choose *two different prices*: one for the signer, w_I^s, and one for the free buyer, w_I^f. (Perhaps SW have not noticed that we follow Segal and Whinston, 2000, and we therefore allow the incumbent to price discriminate between a free and a

captive buyer: the assumption is made explicit on page 3, second column.)

Of course *ex-ante* the incumbent would be better off if it were able to commit to sell to the signer at a very low price if the signer faced a free buyer (and this is precisely where contingent contracts would help it achieve exclusion). But at the subgame we are considering (which is off the equilibrium path) the entrant has already entered: by setting $w_I^s = w_I^f = c_I$ the incumbent makes zero profits because the free buyer has a lower cost ($c_I - epsilon$) than the signer, which therefore does not sell anything. By setting $w_I^s > w_I^f = c_I$ the incumbent would also make zero profits. Therefore, any price equal or higher than c_I gives the incumbent the same payoff.

- Page 7. After having claimed that the case of zero fixed cost would result in an exclusionary equilibrium (but we have just seen this is not necessarily the case), the authors maintain that a number of mechanisms would naturally give rise to a situation similar to that of zero fixed costs. We do not think that any of the suggested modifications of the game are particularly compelling or even plausible, but this may well be a matter of tastes. It seems to us, however, that the games they envisage differ substantially from the one analyzed in our paper (the suggested variations would include the entrant paying the fixed costs of buyers or the incumbent paying the fixed costs of the signer): if the authors think such a modification is plausible and realistic, they should analyze it formally, as the game is sufficiently different for the implications of this variation not to be straightforward.

- Page 7 (bottom). The authors claim that under positive fixed costs a small amount of product differentiation would disrupt our results. While we certainly see that one of the possible equilibria of the game under *zero* fixed costs and some product differentiation could be one of exclusion (by applying a continuity argument to the case of homogenous products and zero fixed costs - see discussion above), we do not understand why the authors would obtain exclusion in the case of (small) positive costs of entry downstream. Like for the case of other demand specifications, this could be an interesting result, but one which should be proved formally.

- Page 8. Consider the subgame after one buyer has signed the exclusive contract and the other is free, and the entrant has entered (in the model with positive fixed costs to operate dowsntream). We say in our paper that, at the equilibrium, at t_2 the entrant offers $w_E^f = c_I - epsilon$ to the free buyer, and the incumbent offers $w_I^f = c_I$ to the free buyer and any $w_I^s \geq c_I$ to the signer; at t_3 only the free buyer is active; at t_4 the free buyer purchases from the entrant and monopolises the downstream market.

  SW claim that there exists also an equilibrium where at t_3 the signer is active and the free buyer is not.

This claim is not correct. Consider, for intance, the case where at t_2 upstream firms make the following offers: $w_E^f = c_I - epsilon$, $w_I^s = w_I^f = c_I$ (this is the case SW seem to focus on). If the fixed cost to enter downstream is large enough, it is true that at t_3 there exists also an equilibrium where the signer is active and the free buyer is not. If the free buyer deviated and entered, it would capture the entire market but its margin would not suffice to cover the fixed cost ε. Hence, the free buyer is better off staying out of the market.

However, this *cannot* be an equilibrium of the *entire subgame* starting at t_2. In the suggested equilibrium the entrant makes no sales. It has incentive to deviate and decrese w_E^f till the point where the free buyer covers its fixed cost ε when both firms are active: In the *unique* continuation equilibrium following this deviation, only the free buyer is active and the entrant makes positive profits. The deviation is therefore profitable. The same argument applies for any $w_I^s > c_I$.

(Note that the parallelism suggested by SW between this subgame and the one following both buyers signing the exclusive deal is not correct. In the latter case, buyers are supplied by the same firm. In this subgame, one buyer is supplied by the incumbent, the other by the entrant, which is a more efficient producer. This creates the incentive to deviate, and an equilibrium where the free buyer is not active cannot exist, even though buyers secure very similar input prices.)

Finally, an equilibrium where buyers use mixed strategies at t_3 does not necessarily exist. If buyers randomize, the entrant sells its input only when the free buyer is active. If the probability that the free buyer attaches to entry is not large enough (which depends on the fixed cost ε), the entrant might have incentive to deviate and make an offer such that in the continuation equilibrium the free buyer is active with probability one.

- Page 9-10. The authors claim that the results we obtain in a previous version of our paper (Fumagalli and Motta 2002) depend crucially on a special assumption (page 9, bottom). Since this assumption is not valid under price competition and close enough substitutes, they claim that our results would not hold under strong enough competition and that the effects of downstream competition on the possibility to exclude is non-monotonic : "Fumagalli and Motta (2002) show that for intermediate levels of downstream competition exclusive contracts cannot deter entry, while Simpson and Wickelgren (2004) have shown that for very vigorous competition exclusive contracts can once again deter entry" (page 10).

  First, the assumption we adopted in Fumagalli and Motta (2002) was a sufficient *not necessary* condition for exclusion to be unprofitable. In particular, our result does not collapse whenever that assumption does not hold, as the authors suggest.

  More precisely, the assumption we made requires that the incumbent's monopoly profits are lower than the loss suffered by buyers when they pay

the monopoly price instead of *(all of them)* paying a lower price to the entrant.

The authors are right in pointing out that our assumption does not hold for a strong enough downstream competition as the benefit of all buyers paying a lower input price are passed on to final consumers. For instance, if buyers compete à la Bertrand, their profits are zero both if they all pay the monopoly price and a lower price to the entrant. (We were aware of it, but we made that assumption in order to study the problem under some generality in a tractable model.) However, our assumption being violated when downstream competition is intense does not imply that exclusion is profitable. Indeed, our AER paper shows that in the case of perfect Bertrand competitors exclusion can be unprofitable even though that assumption is violated.

In particular, when downstream competition allows a single buyer to ensure entry, the crucial condition for exclusion to be unprofitable is that the incumbent cannot compensate buyers for the loss suffered from paying the monopoly price instead of being the *unique* buyer to obtain a cheaper input from the entrant. What we point out in our paper is exactly that, when downstream competition is intense, using a cheaper input than rival buyers may provide a strong competitive advantage, and thus the compensation required to sign the exclusive deal may be large enough to make exclusion unprofitable.

Nevertheless, as we discuss both in the paper and in the beginning of this Section, tough downstream competition *may* also erode the profits of the deviant buyer, thereby facilitating exclusion. Hence, the effect of downstream competition on the possibility to exclude *may* well be non-monotonic.

Second, the authors' previous paper - Simpson and Wickelgren (2004) - analyses a model which is quite different from our own model and from Segal and Whinston, 2000. Without entering into the details of the paper, we nevertheless would like to stress that the game they analyze in that paper differs from ours (as well as Segal and Whinston's) in two important respects. First, exclusivity can be breached upon the payment of expectation damages. Second, if entry takes place, the incumbent and the entrant simultaneously choose (linear) prices, but after the breach decision, there is another stage in which the incumbent is allowed to change its price offer again. This feature introduces an important additional strategic asymmetry between the entrant and the incumbent, which makes the model close to a situation where the incumbent can engage into more sophisticated contracts (a meeting competition clause would have similar effects). The plausibility and interest of such a game is probably a matter of personal preferences, but it seems to us that this feature makes Simpson and Wickelgren (2004) quite a different model, not a trivial extension of ours.

- Page 10. The authors write that "after taking into account renegotiation

or legal rules governing damages for breach of contract, the effect of downstream competition is monotonic in the opposite direction suggested by FM: greater downstream competition facilitates exclusion."

This statement is not correct: If one allows for renegotiation (namely expectation damages) *in our model*, exclusion will neither occur when downstream firms operate in independent markets nor when they compete à la Bertrand (See Appendix C to our paper for a formal proof). Simpson and Wickelgren (2004) find that under expectation damages downstream competition facilitates exclusion through exclusive dealing because they analyze a model which is different from ours. As pointed out above, after wholesale prices have been chosen and the breach decision taken, they introduce an additional stage where the incumbent is allowed to change its price offer again. This is the crucial assumption to their results.

3 Two-part tariff case

Firstly, SW write that we "make several modifications to the linear pricing model to analyze the case where upstream firms can offer non-linear contracts" (page 11, second paragraph of Section II).

This statement is not correct. The unique modification we introduce is that we allow upstream firms to use two-part tariffs.

We do not introduce any new assumptions regarding either conditional price offers or discriminatory price offers. Conditional price offers are never allowed for in the paper. As for discriminatory price offers, we say explicitly that we follow Segal and Whinston's setting, and price discrimination by the incumbent is always possible between a signer and a free buyer (page 3, second column of our paper). Allowing for price discrimination when both buyers purchase either from the incumbent or from the entrant is not necessary as firms have no incentive to engage in it.

We do not arbitrarily change the admissible interval of the fixed cost for the entrant. To make the analysis meaningful, "we assume that F is too large for entry to be profitable if the entrant serves only one buyer when downstream firms are independent monopolists, and that F is small enough for entry to be profitable if the entrant serves both customers" (page 3 of our paper, first column). In other words, the lower bound of F is identified by the payoff earned by the entrant when serving one buyer under independent downstream monopolists; the upper bound of F is identified by the entrant's payoff when serving both buyers. Since these payoffs change when upstream firms use two-part tariffs instead of linear tariffs, then the admissible interval of the fixed cost F must be adjusted accordingly. Therefore, it is identified by (A1) in the case of linear tariffs (page 3 of our paper) and by (A2) in the case of two-part tariffs (page 7 of our paper).

Finally, our focussing on the case of sequential offers is not a restriction. We explicitly remark that we focus on the case of sequential offers because it is the one where exclusion should be easier. Since tough competition prevents

exclusion in that case, a *fortiori* exclusion does not exist under simultaneous offers. (See page 7 of our paper, first paragraph of Section II and footnote 11).

Secondly, SW say in their Comment that the price offers we suggested in an earlier version of our paper in the subgame where both buyers reject the exclusive contract (under Bertrand competition) do not represent a Nash equilibrium, unless the incumbent's cost is high enough. In this, they are absolutely right. Indeed, they find a deviation from our proposed equilibrium that leaves the incumbent better off when its cost is not too large.

However, the solution they propose is not correct either. Furthermore, even if the solution they found were correct, the interpretation they give to our error and to their Proposition 1 is also incorrect. In what follows, we elaborate on both points: in the process, we correct our mistake and find the SPNE of the whole game, which turns out to be *very similar* to the one which incorrectly indicated in our paper. Our results are therefore *not* endangered by the error that we had made. (Note that the final version of our paper, as printed in the AER, contains the correct equilibrium.)

3.1 Solving the game

SW's Proposition 1 has the following problems, in order of increasing importance. Firstly, the solution should be complete, namely it should characterise the equilibrium of the whole game, not only the subgame where both buyers reject the contract.

Secondly, they assume that the incumbent can offer exclusive contracts that are contingent on both buyers signing the exclusive contract, thereby making an assumption which is *not included in our game*. The objective should be to find the correct solution for the same game, not of another game.

Thirdly, *SW's Proposition 1 is incorrect*. At their suggested equilibrium, the entrant sets a price $w_E > c_I$ and both buyers buy from it. But in this way, the entrant would not maximize its payoff. Indeed, there would in principle be two ways in which the entrant could maximize the industry's profit, and mimic the outcome of a vertically integrated structure. The first one would be to set the wholesale price at $w_E = 1/2$ and - due to Bertrand competition - implement a final price of the good $p = 1/2$ (the vertically integrated price of a monopolistic firm with cost $c_E = 0$). The second one is to set the wholesale price at marginal cost, $w_E = 0$, and recover profits through a franchise fee. (Notice that the latter strategy makes sense because - as we show below - at equilibrium only one buyer would decide to enter and buy from the entrant: if both did enter and buy from the entrant, Bertrand competition would give them zero gross profits, but they should still pay the franchise fee.) In the earlier version of our paper, we mistakenly thought that the former option was as good as the latter, but as SW showed in the Comment, only under particular circumstances the former option would be an equilibrium, because the incumbent could undercut the entrant and get one buyer (as just seen, two buyers would not accept the offer because they would get zero profits). We now show that the equilibrium

of the subgame where both buyers reject the exclusive contract involves the entrant offering a two-part tariff scheme of the second type.[2]

Lemma 1 *Consider the situation where both buyers have rejected the exclusive deal and the entrant has entered. In the subgame where (i) suppliers make two-part tariff offers, (ii) buyers decide whether to enter or not, and (iii) if active, make orders and set prices in the downstream market, the SPNE is the following:*

$(w_E = 0, \phi_E = \frac{1}{4} - \frac{(1-c_I)^2}{4}); (w_I = c_I, \phi_I = 0);$

B_i *enters and* B_j *stays out;*

B_i *buys from the entrant.*

Proof. *Let us move backwards and consider stage (iii).*

It is easy to see that, if only one buyer has entered at stage (ii), and the suppliers make the offers above, the active buyer choosing the entrant is an equilibrium. If the active buyer buys from E, it gets $\frac{1}{4} - \phi_E - \varepsilon = \frac{(1-c_I)^2}{4} - \varepsilon$; if it buys from the incumbent, it gets again $\frac{(1-c_I)^2}{4} - \varepsilon$. (It is not necessary, but the indifference could be avoided by saying that the entrant offers a fee a shade below $\frac{1}{4} - \frac{(1-c_I)^2}{4}$).

Let us consider also the case where both buyers have entered at stage (ii), and the suppliers make the offers above. We now show that the equilibria at stage (iii) are such that one buyer buys from E and the other from I. (We will use this result below). At the suggested equilibria, the buyer which buys from E earns $c_I(1-c_I) - \left(\frac{1}{4} - \frac{(1-c_I)^2}{4}\right) - \varepsilon$, and the other buyer a payoff of $-\varepsilon$. If the former deviates and purchases from the incumbent, it gets a payoff of $-\varepsilon$. Since $c_I(1-c_I) - \left(\frac{1}{4} - \frac{(1-c_I)^2}{4}\right) > 0$ (recall that $c_I < 1/2$), the deviation is not profitable. If the latter deviates and buys from the entrant, its payoff is $-\phi_E - \varepsilon < -\varepsilon$. Thus the deviation is not profitable. It is easy to see that both buyers buying either from E or from I do not represent equilibria.

Let us now move backwards to stage (ii). Given the price offers made by upstream firms, a situation where both firms are active is not an equilibrium. As shown above, in the continuation game one buyer purchases from the incumbent, does not sell and does not cover its entry costs ε. It has incentive to deviate and stay out of the market. A situation where both buyers decide to stay out is not an equilibrium either. As shown above, if one deviates and enters, it purchases from the entrant and earns a positive payoff. (Note that $\frac{(1-c_I)^2}{4} - \varepsilon > 0$, by assumption. See Appendix A of our paper.) Thus the deviation is profitable. A similar argument shows that a situation where buyer i is active and buyer j stays out represents an equilibrium. Note that it is sustained by the continuation equilibria following the case where both buyers are active being such that buyer j gets a payoff of $-\varepsilon$. Hence, buyer j has no incentive to deviate and enter. Of course, the active buyer has no incentive to deviate and stay out.

[2] We are disregarding here, as throughout the paper, equilibria in weakly dominated strategies.

At stage (i), at the suggested equilibrium the entrant makes $\frac{1}{4} - \frac{(1-c_I)^2}{4}$ and the incumbent zero profits. The question is whether any of the two suppliers could make a profitable deviation. Consider first the entrant: clearly, it cannot offer a price schedule which leaves the buyer with less than $\frac{(1-c_I)^2}{4}$; that is, it cannot increase the franchise fee. Otherwise, at stage (iii) the only active buyer would prefer to buy from the incumbent than from the entrant. The entrant has no incentive to leave more surplus to the buyer (that is, to lower the fixed fee) because it would trivially reduce its profits. The same reasoning excludes offering a different variable component of the price schedule ($w_E = 0$ makes the active buyer act as if it were a vertically integrated monopolist).

Consider now the incumbent. Is there any profitable deviation it can make? The answer is negative, because the maximum offer it can make to a buyer is to allow it to have all the profit of the vertically integrated monopolist with a cost c_I, which is precisely what happens already at the candidate equilibrium. Offering more than that would entail having negative payoffs. Suppose for instance the incumbent offers $w_I = c_I$ and a negative fee, $-k < 0$. In this case, at the entry stage both buyers would enter and at least one would buy from the incumbent, because they would expect to earn strictly positive profits. Indeed, if $c_I(1 - c_I) - \left(\frac{1}{4} - \frac{(1-c_I)^2}{4}\right) > k$, a buyer would buy from E and the other from I. If $c_I(1 - c_I) - \left(\frac{1}{4} - \frac{(1-c_I)^2}{4}\right) < k$, both buyers would buy from the incumbent. In the former case, the incumbent would make a profit of $-k$ (its buyer would not sell anything); in the latter, it would have to pay $-2k$ (both buyers make orders to I but I sells at cost, while having to pay the slotting allowance). In both cases, the incumbent would be worse off relative to the equilibrium. Similarly, offering a zero fee and a variable component of the price schedule $w_I < c_I$ would make the incumbent worse off: if any buyer was patronizing I and selling a strictly positive number of units at equilibrium, the incumbent would earn negative profits. ■

By the previous Lemma, if both buyers reject the exclusive deal and the entrant enters the market, it will make a profit $\pi_{E|S=0} = \frac{1}{4} - \frac{(1-c_I)^2}{4} - F$. As discussed at the beginning of this Section, to make the analysis meaningful we assume that entry is profitable when firm E serves both buyers. Hence, it must be that $F < \frac{1}{4} - \frac{(1-c_I)^2}{4}$. Note that $\pi_{E|S=0}$ is the same as in our paper (see the proof of Proposition 2, page 8). Hence, also the admissible interval of the fixed cost F is the same as the one identified by assumption A2.

We can now move to the very first stage and solve the whole game we analyze in our paper. We will show that there exist only "*entry equilibria*" also when our mistake is corrected. Hence, the results are qualitative the same (and indeed very similar) to the ones we had found in our paper.

Let us analyze the second buyer's decision.

The case where *the first buyer signed the deal* is the same as in our paper (see the proof of Proposition 2): The incumbent cannot profitably induce the second buyer to sign. Thus the second buyer rejects the exclusive contract.

Let us analyze the case where *the first buyer rejected the deal*. If the second buyer signs, we have shown in the paper that entry occurs and the signer is inactive. Thus the second buyer's payoff is $0 + x_2$. If both buyers reject, entry occurs (see the above discussion). By Lemma 1, in the subgame following the rejection of both buyers, one buyer enters the market while the other does not. Let us distinguish the following cases:

Case 1: In the subgame following $S = 0$ *the second buyer is active (and the first one is inactive)*. Therefore, the second buyer earns $\frac{(1-c_I)^2}{4} - \varepsilon$ if it rejects, and requires at least $x_2 = \frac{(1-c_I)^2}{4} - \varepsilon$ to sign. However, the incumbent anticipates that entry would take place anyhow: therefore, it is not willing to offer a strictly positive compensation to the second buyer. Thus the second buyer rejects.

The first buyer anticipates that the second buyer always rejects. Thus, if it signs, entry will occur and it will earn $0 + x_1$. If it rejects, entry will occur and it will be inactive (by Case 1), earning a payoff of 0 again. Hence, it requires at least $x_1 = 0$ to sign. Since entry occurs in both cases, also the incumbent's payoff is 0 anyhow and it does not offer any positive compensation to the first buyer. The indifference of the first buyer implies that there exists a symmetric "*entry equilibrium*" where both buyers reject the contract and an asymmetric "*entry equilibrium*" where the first buyer signs and the second buyer rejects.

Case 2: In the subgame following $S = 0$ *the second buyer is inactive (and the first one is active)*. Therefore, the second buyer earns 0 both if it signs and if it rejects. The incumbent anticipates that entry would take place anyhow and it is not willing to offer a strictly positive compensation to the second buyer. The second buyer is therefore indifferent between accepting and rejecting, if the first buyer rejected the exclusive deal.

Let us move to the first buyer's decision. If it signs, entry will occur, it will be inactive and will earn $0 + x_1$. If it rejects, it will earn $\frac{(1-c_I)^2}{4} - \varepsilon$ no matter if the second buyer rejects (by Case 2 the first buyer will be active) and if the second buyer signs (the first buyer will be the unique free buyer). Hence, it requires at least $x_1 = \frac{(1-c_I)^2}{4} - \varepsilon$ to sign. Since entry occurs anyhow, the incumbent is not willing to offer it and the first buyer rejects the deal. The indifference of the second buyer implies that there exists a symmetric "*entry equilibrium*" where both buyers reject the contract and an asymmetric "*entry equilibrium*" where the first buyer rejects and the second buyer signs.

3.2 Interpretation of SW's Proposition 1

This objection is somewhat redundant (as their proposed equilibrium is incorrect), but note that even if SW's Proposition 1 were correct, the inference one should make is not the one the authors draw.

The subgame at issue is the one where both buyers have rejected the exclusive contract. They identify an equilibrium where the entrant serves both buyers but earns a lower payoff than the one we compute in our paper.

This implies that one should simply adjust the admissible interval of the fixed

cost F (reduce the upper bound) in order to focus on those parameters where entry would occur absent exclusive deals. (See the discussion at the beginning of this Section). Indeed, a meaningful and interesting analysis requires that entry is profitable after both buyers have rejected the contract. Otherwise, entry in this industry would be *blockaded*: it would not be exclusive dealing which block efficient entry, it would be simply that the entrant could not profitably enter the industry even if the incumbent behaved non-strategically. But, if entry would not take place absent exclusive dealing, why should be worried about exclusive dealing?

Once the admissible interval of the fixed cost F is redefined, one would find again that exclusive dealing would not deter entry.

SW instead stick to the admissible interval of the fixed cost F we identify in the paper. Thus they find parameters where entry would not occur absent exclusive deals and they incorrectly conclude that, in those cases, exclusive contracts deter entry.

3.3 Conditional offers

Finally, the authors also analyze a game where suppliers offer two-part tariffs and conditional price offers are possible. This implies that in the subgame where both buyers reject the exclusive deal, the entrant enters the market and buyers earn a payoff of zero. Note that this would not lead to different results with respect to ours: there would exist only (symmetric and asymmetric) *"entry equilibria"*.

However, they also assume that the exclusivity provision is only valid if both buyers agree to it. The two assumptions together imply that exclusion is profitable.

We do not want to discuss the plausibility of these assumptions, but let us stress that this is a very different game than the one analyzed by us (or by the previous literature, such as Segal and Whinston, 2000).