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Concurrences, n°1-2020, 2-7

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The competitive impacts of exclusivity and price transparency in markets with digital platforms

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Two-sided digital platforms not only decide about the price structure, but often have non-price instruments at their disposal. Our objective in this article is to review recent work that aims at better understanding the possible pro- or anti-competitive effects of two specific non-price strategies: exclusivity as the contractual obligation to singlehome and price transparency as the disclosure of information about otherwise unobserved prices paid by users on the other side. Regarding the incentives that platforms may have to restrict users from visiting more than one platform at a time, one finding is that when platforms find it profitable to impose exclusivity on one side, users on the other side always suffer. Regarding price transparency in situations in which users on one side may not observe the prices that platforms set on the other side, we find that a monopoly platform is willing to remedy this problem by being transparent about all prices, whereas competing platforms would in general prefer more opaqueness. From our findings we derive lessons for competition authorities.

I. Introduction

1. Competition authorities are looking into markets with digital platforms. While some of the concern is about tipping and entrenched monopoly positions, there is also a concern in markets with competing platforms about anti-competitive practices including exclusivity and price parity clauses. Prominent cases involve the use of price-parity clauses of Booking and other hotel booking platforms in a number of jurisdictions.

2. To assess those concerns, economists have built up a few workhorse models to test intuitions and provide guidance on possible theories of harm.[1] While these models are necessarily abstractions from reality, they nevertheless help to understand possible pro- and anti-competitive effects.

3. Much of the initial literature focused on pricing strategies; more recently, work has looked into non-price strategies.[2] In this article, we review two recent contributions to this line of research and shed some new light by explicitly addressing how exclusivity and price transparency play out in the market and what are the incentives of platforms regarding these non-price strategies.

II. Competitive bottlenecks

4. In many markets with platforms, users differ in their ability to be active on several platforms at the same time. Usually, this ability to "multihome" depends on which side a user belongs to. Often, one side is able to multihome, while the other is restricted to singlehome. Think, for instance of web mapping services (e.g., Google Maps and Bing Maps): when on the go, viewers tend to use one web mapping service, while advertisers can place ads on multiple services. Game consoles provide another example: most gamers own a console of a single brand,

* Martin Peitz gratefully acknowledges funding by the Deutsche Forschungsgemeinschaft (DFG) through CRC TR 224 (Project B05).

1 For instance, Edelman and Wright (2015), among others, develop a theory of harm regarding wide price parity clauses.

2 For recent surveys, *see* Belleflamme and Peitz (2018) and Jullien and Sand-Zantman (2019).

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while game developers adapt their games to several consoles. In these examples, singlehoming is motivated by indivisibilities (of time and attention) or by limited resources (consoles are costly devices). Singlehoming may also result from contractual restrictions: for example, in the case of game consoles, game developers may have to grant exclusivity to one console.

5. In the next section, we will examine the impacts on such contractual restrictions to multihoming. But, before, we want to sketch a stylized model of competition between two platforms that facilitate the interaction between two groups of users. In each group, there is a fixed number of users. For simplicity, we call these two groups "buyers" and "sellers." We assume that the environment is such that sellers are able to multihome while buyers are not. This situation is identified in the economic literature as "competitive bottlenecks."[3] The analogy with bottlenecks comes from the fact that a seller who wants to interact with a particular buyer has no other way than using the platform on which this singlehoming buyer is active.

6. Let us describe the ingredients of the market. Users are assumed to derive two types of benefits from using a platform: a network benefit and a stand-alone benefit. The network benefit is generated by the interaction with users in the other group. Here, buyers and sellers interact to trade goods and services, and we model trade in a very simple way: we assume that (i) sellers produce totally differentiated products (so that they do not compete with one another), (ii) buyers are willing to buy one unit of each product available on the platform they visit, and (iii) any trade generates a value b for the buyer and a value s for the seller (you can think of the sum $b + s$ as the gains from trade). It follows that if n_b buyers and n_s sellers are present on a platform, the network benefit is equal to $b \times n_s$ for a buyer and to $s \times n_b$ for a seller. In the parlance of the economic theory on two-sided platforms, each side exerts a positive "cross-side network effect" on the other side: the more buyers there are on a platform (the larger n_b), the better off are the sellers when they join this platform (as they have a larger demand for their product); also, the more sellers (the larger n_s), the better off the buyers (as they have access to a wider array of products).

7. As for the stand-alone benefits, users enjoy them, as their name indicates, independently of the presence of the other group. For instance, the platform may offer its own products to buyers, and provide extra services to sellers (this applies for instance if the platform contains some vertically integrated content or is useful for other purposes).[4] To simplify the setting, these stand-alone benefits are large enough to guarantee that all buyers and sellers decide to participate.

8. Platforms set membership (or subscription) fees. Through these fees (which are paid once or renewed on a regular basis), platforms regulate the size and composition of the groups of users that interact on the platform during a given period of time. To regulate the activity on the platform, platforms could also set transaction (or usage) fees, which are paid per effective transaction, either as a fixed fee or as a proportion of the transaction price (commission). It is assumed here that platforms refrain from setting transaction fees; this is generally the case when it is hard to monitor transactions or when it is easy for users to bypass the platform to finalize transactions.[5]

9. Users perceive the two platforms as differentiated along some dimension that matters to them on top of the benefits they receive and the fees they pay. For instance, platforms may differ in the way they display products on their website or on the type of product-related information that they provide. If only this dimension is considered (i.e., if platforms offer the same benefits and set the same fees), some users will prefer one platform while others will prefer the other.

10. In sum, the model analyzes the following sequence of decisions. First, the two platforms set the membership fees that they charge to buyers and to sellers. Second, after observing all fees (we return to this assumption in Section IV), users decide which platform(s) to visit: a unique platform for buyers (who are restricted to singlehome) and possibly both platforms for sellers (as they have the possibility to multihome). The tools of game theory are used to derive a reasonable prediction of the decisions that platforms, buyers and sellers will take. In particular, decisions at each stage must constitute a Nash equilibrium: each "player" does the best it can (i.e., platforms maximize their profit, buyers and sellers maximize their net benefits) given that the other players also do the best they can. Noteworthy is the fact that, in this model, it is not just the platforms that "play a game" (price competition): users are also in a game situation, as the network benefits they obtain depend on what users of the other group decide.

11. We can now highlight the main results of this model. First, the equilibrium may be such that all buyers and all sellers choose to visit the same platform. It is then said that the market "tips," as one platform survives while the other disappears. The main force behind this "winner-take-all" situation is the positive feedback loop resulting from the positive cross-side network effect that each group exerts on the other: more buyers attract more sellers, who attract more buyers and so on so forth.

12. Yet, the equilibrium may also be such that both platforms manage to attract a share of users in both groups. For this to happen, the platforms must be sufficiently differentiated in the users' eyes. Platform differentiation drives users to split across platforms and, thereby, counteracts the positive feedback loop that brings all users on one platform.

3 This term has been coined by Mark Armstrong (*see* Armstrong, 2006).

4 For example, a buyer may want to use a web mapping service to select a restaurant, but also for general orientation.

5 In reality, many platforms have overcome this problem and moved to charging transaction fees or a combination of listing fees and transaction fees on the seller side.

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13. When platforms coexist at equilibrium, they adjust their fees downward in response to larger cross-side network effects. To see this, imagine the benchmark situation in which network effects would play no role (interaction does not generate value). Platforms would then treat each group of users separately; they would set a monopoly fee on the seller side (because the outside option for a multihoming seller of visiting a platform is not to visit any platform) and a competitive fee on the buyers side (because the outside option for a singlehoming buyer of visiting some platform is to visit the other platform). Now, introduce the positive cross-side network effects, which make the decisions of buyers and sellers interdependent. In particular, if more buyers decide to visit the platform, more sellers are willing to do so as well, and vice versa. Platforms have thus an incentive to set lower fees than in the benchmark case because attracting more users on one side does not only generate profits on that side but also on the other side. The incentive to lower the fee for buyers is all the more important that sellers value the interaction with buyers; in the model, the larger s the lower the buyer fee at equilibrium; the same logic applies to the equilibrium seller fee, which decreases with b.

III. Who benefits from multihoming?

14. In the market environment with competitive bottlenecks, platforms compete for buyers (who are restricted to singlehome) but do not compete for sellers (who have the freedom to multihome). If sellers are restricted to singlehome as well, then platforms compete on both sides of the market. Then, comparing the latter environment (called "two-sided singlehoming") with the former gives insights about the impacts that multihoming can have on prices, platforms' profits and users' surplus.

15. These insights are highly relevant for antitrust authorities because they may have to evaluate the effects of actions taken to prevent or enable multihoming for some platform users. Platforms may indeed impose exclusivity agreements upon some users, thereby forcing them to singlehome. A case in point is the so-called "radius clause," whereby shopping malls prevent retail chains from opening another outlet in a competing shopping mall located within an agreed radius. The opposite may also happen: Aggregators combining the functionalities and listings by several platforms may make multihoming feasible. For instance, although the ride-hailing companies Uber and Lyft have designed their application to make it difficult, if not impossible, for drivers to multihome (i.e., to compare ride offers from the two companies), third-party applications now exist that present offers from Uber and Lyft to drivers on a single screen, thereby facilitating multihoming.

16. As platforms compete for both buyers and sellers under two-sided singlehoming, but only for buyers under competitive bottlenecks, one may be tempted to conclude that, when moving from two-sided singlehoming to competitive bottlenecks, sellers face higher prices and obtain a lower surplus, while buyers face lower prices and obtain a higher surplus. Also, one may expect platforms to achieve higher profits due to the reduced competition on the seller side. This is indeed the view expressed in a number of reports. For instance, the German Cartel Office wrote the following:[6] "*In* [the competitive bottleneck] *scenario, the platforms were competing for users on the single-homing side. Accordingly, on the multi-homing side, platforms provided monopolistic access to single-homing users who were members of the platform. Regarding the framework of the model reviewed, this led to a monopolistic price on the multi-homing side, while the price on the single-homing side would be fairly low as a result of platforms competing for users on this side. In this respect, this may result in an inefficient price structure despite potentially intensive platform competition (on the single-homing side).*"

17. Yet, we show in a recent article that the effects of forcing one side to singlehome instead of letting it multihome (or the other way around) are less straightforward than what may be perceived in general.[7] While it is true that platforms exert monopoly power over the multihoming side, users on this side may actually benefit from multihoming. In addition, platforms may find the two-sided singlehoming environment more profitable than the competitive bottlenecks.

18. The key intuition behind these results is that sellers (the users who could multihome) may pay a low price to start with in the competitive bottleneck case. This seems counterintuitive as we expect a monopolist (as each platform is vis-à-vis sellers in the competitive bottleneck case) to set higher prices than do competing duopolists (as platforms are vis-à-vis sellers under two-sided singlehoming). However, the economic literature has explained why the reverse may happen.[8] Two economic effects are at work: the market share effect drives duopolists to set a price below the monopoly price because, at this price, they sell to fewer consumers than the monopolist; the price sensitivity effect works in the opposite direction, as it incentivizes duopolists to raise price above the monopoly level because they face a steeper demand curve. In the present setting, the latter effect outweighs the former in the absence of cross-side networks effects.

19. In sum, the move from two-sided singlehoming to competitive bottlenecks induces two contrasting effects on the seller fee. First, as just explained, letting sellers multihome drives platforms to reduce the price they charge to sellers in the absence of network effects. But, on the other hand, when buyers derive benefits from interacting with sellers, platforms have an incentive to raise the sellers' fee when sellers can multihome. The reason is that an additional multihoming seller is less valuable regarding competition on the buyer side than

6 *See* Bundeskartellamt (2016, p. 58).

7 *See* Belleflamme and Peitz (2019a).

8 *See* Chen and Riordan (2008).

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an additional singlehoming seller, as the latter—but not the former—is attracted at the expense of the competing platform.

20. The interplay between these conflicting forces is key to our findings. We summarize here the main findings that emerge from the comparison of the two market environments.

- When moving from one environment to the other, prices on both sides of the platforms always move in opposite directions. Either sellers pay a higher fee and buyers a lower fee or exactly the opposite occurs.
- Platforms prefer to impose exclusivity to sellers (i.e., to prevent their multihoming) if the sellers' intrinsic value (the difference between a seller's stand-alone benefit and the marginal cost of accommodating a seller) is not too large. There exist configurations of parameters for which this condition is always satisfied, and others for which it is never satisfied.
- Buyers are better off in the competitive bottleneck case in some markets. However, it may also happen that platforms charge higher fees to buyers when sellers multihome than when they singlehome, and that the corresponding negative effect on surplus outweighs the positive effect from more sellers participating. Then buyers do prefer the two-sided singlehoming environment.
- As for sellers, if they perceive the two platforms as more differentiated and if they exert weaker cross-side network effects on buyers, then they tend to be better off in the competitive bottleneck case.

21. From these findings, we can draw three important lessons.

- It is well possible that buyers, sellers and platforms are all better off when sellers are allowed to multihome.
- Whenever platforms benefit from imposing exclusivity, doing so may benefit or hurt sellers, but definitely hurts buyers; that is, the situation may arise that the side which is subject to a contractual restriction benefits from this restriction, but that the other side suffers. As a result, in an environment with potential seller multihoming, an agency should prohibit the use of exclusivity on the seller side if its aim is to maximize buyer surplus.
- Whenever buyers suffer from seller multihoming, platforms and sellers benefit from it.

IV. Do platforms want to disclose unobserved prices?

22. Our analysis so far was based on the assumption that users observe all membership fees before deciding which platform(s) to visit. That is, buyers were assumed to observe not only the fees that the two platforms charge on their side, but also the fees that platforms charge on the seller side.

23. What is the scope of this assumption? In markets with two-sided platforms, cross-side network effects make the individually optimal participation decision on one side dependent on how many users are active on the other. When there is a lot of turnover of market participants, this decision has to be based on expected participation on the other side. The level of expected participation depends on market characteristics and, if observable, on the actions of platform providers—in particular, their pricing decisions. In particular, when a user, say a buyer, observes that a platform lowers its fee for sellers, she expects seller participation to rise, which makes the platform more attractive for her.

24. Yet, there are many environments in which prices on the other side are hardly observable. Think, for instance, of videogame consoles, which intermediate between game developers ("sellers") and gamers ("buyers"). While game developers are aware of what gamers pay, gamers, on the other hand, are in general ignorant of what the console provider (the platform) charges (or pays to) game developers.

25. This lack of information about prices on the other side has the following implication. If, say, buyers are not informed about the price charged to sellers, they cannot infer the intensity of seller participation from the observation of actual prices. Instead, buyers have to form expectations about seller participation without knowing the prices that platforms charge on that side. We assume that these expectations are passive and thus do not depend on the price on the own side. This makes the buyer demand less price elastic.[9]

26. Against this backdrop, the question is whether platforms have an incentive to disclose price information to their users. Anecdotal evidence from the game console market reveals that platforms do sometimes reveal information about price changes: in 2009, Sony informed the public that it had reduced the price of the development kit for the PS3 from US$10,000 to US$2,000. This announcement arguably affected the information available to gamers and, therefore, their expectation about the availability of games on the platform.

9 Jullien and Sand-Zantman (2019, pp. 28–29) discuss the importance of expectations about participation in markets with platforms.

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27. In another recent paper, we formally investigate platforms' incentives to disclose price information to the other side of the market.[10] We revisit the two-sided singlehoming and competitive bottleneck models of competition between two-sided platforms to obtain predictions on the pricing behavior for given disclosure rules and then, we consider the disclosure decision, which platforms make prior to their pricing decisions. We also perform the same analysis when there is a single platform on the market. Here is a summary of our findings.

28. A platform in a monopoly position chooses to fully disclose prices. This is so because if users do not observe the price on the other side, the platform is tempted to raise this price too much for its own good. It prefers then to "discipline" itself by revealing all information about its prices. This yields higher profits but also higher surpluses for all users.[11]

29. However, competition dramatically changes the picture. Now, higher prices may benefit both platforms. As a consequence, full disclosure does not necessarily obtain. In particular, under two-sided singlehoming, platforms do not disclose any information to users on one side about the price they charge to the other side.

30. To understand this result, note that the logic that we described in the monopoly case still applies: by disclosing information to more users on one side, a platform increases the leverage it can gain on this side by lowering its fee on the other side. Now, start from a situation in which both platforms disclose the same amount of information. Does it pay for any platform to deviate by disclosing more information than its rival on a given side? If it does so, the platform will obtain a larger market share on this side. Such a deviation tends to be profit-increasing, taking ensuing prices under symmetric disclosure policies as given. However, since the competing platform reacts optimally in its pricing, more disclosure heats up competition and, therefore, a platform may not have an incentive to further disclose information. In this setting, with singlehoming and full participation on both sides, competition is particularly intense because of positive feedback loops. What we show is that this competition effect is so strong that platforms decide not to disclose any information.

31. Results are more nuanced in the competitive bottleneck environment. The analysis also becomes more involved. We therefore focus on situations in which users on one side are fully informed; platforms must then decide the extent to which they want to inform users on the other side. Here are our main findings in this setting.

- When singlehomers are fully informed, no disclosure is an equilibrium for a large range of parameters; yet, full disclosure is an equilibrium if the horizontal differentiation between the platform is very low and if multihomers exert stronger cross-side network effects than singlehomers (in other words, singlehomers value more the interaction than multihomers do).
- When it is multihomers that are fully informed, the information that platforms give to singlehomers depends again on the parameters of the model. If multihomers exert sufficiently larger cross-side network effects than singlehomers, then platforms find it optimal to inform a fraction of the singlehomers, or even all of them (if multihomers exert even proportionately larger network effects and platforms are not too differentiated); otherwise, no disclosure is again the equilibrium. Note that if platforms could coordinate their disclosure decision, platform competition would always feature no disclosure.

32. In a nutshell, our findings illustrate once more how markets with platforms may turn conventional wisdom on its head. We usually expect competition to induce firms to disclose more information. Yet, we show that the reverse is often happening in a platform context: while a monopoly platform opts for transparency (which benefits users), competing platforms often choose opaqueness (which hurts users).

V. Conclusion

33. Our objective in this article was to understand the possible pro- or anti-competitive effects of two specific non-price strategies that digital platforms may adopt: exclusivity (contractual obligation to singlehome) and price transparency (disclosure of information about otherwise unobserved prices).

34. To this end, we first outlined two workhorse models that economists built to analyze competition among platforms. We then examined the incentives that platforms may have to restrict users from visiting more than one platform at a time. We stressed, among other findings, that when platforms find it profitable to impose exclusivity on one side, users on the other side always suffer. Finally, we addressed price transparency by looking at situations in which users on one side may not observe the prices that platforms set on the other side. We showed that a monopoly platform is willing to remedy this problem by being transparent about all prices, whereas competing platforms would in general prefer more opaqueness.

10 *See* Belleflamme and Peitz (2019b).

11 In a related setting, Hagiu and Halaburda (2018) obtained the same result.

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35. Although we focused on contexts in which competing platforms coexist in the market, our analysis also allows us to gauge the extent to which exclusivity and price transparency are conducive to the emergence of tipping and entrenched monopoly positions. Recall that in the workhorse models we used, tipping occurs when the positive feedback loop resulting from the cross-side network effects outweighs the differentiation between the platforms. As restrictions to multihoming and price disclosure affect the strength of the cross-side network effects, they also affect the probability of tipping.

36. So, as a final note, we mention our main results regarding tipping.

- Preventing users in one group from multihoming (i.e., moving from competitive bottlenecks to two-sided singlehoming) makes tipping more likely. This suggests that platforms could use exclusivity to try and take the whole market.
- As far as price disclosure is concerned, we find that in the two-sided singlehoming environment, more information disclosure makes tipping more likely. As no disclosure obtains at equilibrium, we conjecture that the emergence of entrenched monopoly positions is less likely when information disclosure is endogenized.[12] In the competitive bottleneck setting, the probability of market tipping also increases with the amount of information that the platforms disclose. ■

12 Yet, a platform may want to increase price disclosure if this allows it to take the whole market. We did not examine this possible strategic move.

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