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**Exclusionary Conduct in Multi-Sided Markets - Note by Michael Katz**

**Hearing on Re-thinking the use of traditional antitrust enforcement tools in multi-sided markets**

**21-23 June 2017**

This paper by Michael Katz was submitted as background material for Item 8 at the 127th meeting of OECD Competition Committee on 21-23 June 2017. This is the final version. The author(s) were given an opportunity to review and finalise the paper after the discussion.

The opinions expressed and arguments employed herein do not necessarily reflect the official views of the Organisation or of the governments of its member countries. More documents related to this discussion can be found at [www.oecd.org/daf/competition/rethinking-antitrust-enforcement-tools-in-multi-sided-markets.htm](http://www.oecd.org/daf/competition/rethinking-antitrust-enforcement-tools-in-multi-sided-markets.htm).

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*Table of contents*

<b>Exclusionary Conduct in Multi-sided Markets.....</b>	<b>3</b>
<b>1. Introduction .....</b>	<b>3</b>
<b>2. Conceptions of Exclusionary Behaviour .....</b>	<b>5</b>
2.1. Harm to Social Welfare due to Harm to Competition .....	5
2.2. Equally-Efficient-Rival Test.....	6
2.3. The No-Economic-Sense Test .....	7
<b>3. Predatory Pricing in a Multi-Sided Market.....</b>	<b>8</b>
3.1. Pricing Below Some Measure of Cost .....	9
3.2. Recoupment as a Test of Exclusionary Behaviour .....	14
3.3. One Price or Two? .....	16
<b>4. Creating Barriers to Multi-homing.....</b>	<b>17</b>
4.1. (Non-Platform) Theories of Exclusionary Exclusivity .....	18
4.2. Applicability to Platforms.....	21
4.3. Implications for Enforcement .....	24
<b>5. Conclusion.....</b>	<b>26</b>
References.....	27
Appendix.....	29

## *Exclusionary Conduct in Multi-sided Markets*

Note by Michael L. Katz\*

### 1. Introduction

1. The topic of this paper lies at the intersection of two concepts: multi-sided markets and exclusionary behaviour. This is a challenging topic for at least two reasons. First, there is a lack of consensus as to what constitutes a multi-sided market. Second, there is considerable disagreement about what constitutes exclusionary behaviour — whether or not one is examining a multi-sided market.

2. The lack of a consensus definition of multi-sided markets is somewhat easier to address (or, at least, to hold to one side). Suppliers in multi-sided markets are often referred to as “platforms” because they serve as bases on which users from different sides of the markets can interact with one another. For antitrust purposes, a useful definition of a multi-sided market is that there are cross-platform network effects (i.e. the presence of members of group *A* as users on one side of the platform makes the platform more attractive to members of group *B* on the other side) in at least one direction for a platform that facilitates interactions between two or more groups of users, can set distinct prices to different user groups, and has market power with respect to those groups.<sup>1</sup> This definition captures the sorts of situations that are commonly labelled as platforms or multi-sided markets in recent antitrust litigation.

3. The lack of agreement regarding what constitutes exclusionary behaviour is more problematical. There is a broad consensus that conduct is exclusionary when it harms the competitive process by weakening the ability of rival firms to compete and the conduct does not constitute competing on the merits. However, there is considerable disagreement regarding what it means to “harm competition” or to fail to “compete on the merits”. Consequently, the discussion below begins, in Section 2, with an examination of broad conceptions of exclusion, without focusing specifically on multi-sided markets.

4. The paper then turns to the question: How should antitrust enforcers and the courts identify whether the conduct of a firm operating in a multi-sided market is exclusionary?<sup>2</sup> As Rochet and Tirole (2006, p. 646) have observed, multi-sided markets combine elements of multi-product pricing and network effects. As a result, the issues are

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<sup>1</sup> This is similar to the definition suggested by Weyl (2010). For a discussion of issues concerning the definition of multi-sided platforms and markets, see Hermalin and Katz (forthcoming).

<sup>2</sup> Given space constraints, this paper does not address issues of market definition and the assessment of market power, which are often critical in litigation and the determination of whether the defendant’s conduct can cause material harm. These issues are addressed by other contributions to this workshop. That said, there is a risk of error when making this separation because the various issues interact with one another and should be addressed in an integrated analysis. For example, market definition is not an end in itself, and it should be closely tied to the specific questions at hand with respect to the conduct at issue.

not entirely new or unique, but they are challenging nonetheless. Specifically, multi-product pricing and network effects raise several issues for competition policy's treatment of exclusionary behaviour:

- By giving rise to demand-side economies of scale, network effects can create mechanisms by which a supplier can successfully weaken or eliminate rival suppliers through conduct that denies them scale. Indeed, at least in theory, a weakened rival may enter a “death spiral,” whereby it loses users, which then triggers the loss of more users due to the loss of network effects, which then leads to the loss of still more users, which then... Thus, the existence of network effects may heighten concerns regarding the possibility of exclusionary behaviour.
  - In the presence of demand-side economies of scale, “innocent” competitive conduct intended to improve a supplier's ability to create value for its users may also weaken or even eliminate rivals, which can greatly complicate the identification of exclusionary behaviour. The potentially critical role of users' expectations -which can be hard to measure and predict- further complicates the analysis.
  - Cross-platform network effects raise the danger of examining effects too narrowly. One possible error from an overly-narrow analysis is that important feedback loops among different sides of the platform may be missed.
  - In the presence of network effects, the linkage between competition and economic welfare can be complex. For example, entry by an incompatible platform may splinter users and lead to a loss of realized network effects, lowering total surplus.
  - The linkage between competition and economic welfare can also be complex when suppliers produce multiple products at least some of which are subject to joint production, as is often the case with platforms that facilitate transactions among users. In the presence of joint production, changes in the nature of competition to serve one group of users can affect the economic welfare of other groups of users.
  - The combination of multi-product pricing and cross-platform network effects can give rise to situations in which certain forms of platform conduct or changes in the nature of competition can benefit some user groups while harming others. The possibility of differential effects on different user groups makes it necessary to have a more refined sense of the overall policy objective than is often the case.
5. In order to sharpen the discussion of the implications of these facts for competition policy, the paper addresses these issues in the context of specific types of potentially exclusionary conduct. One can categorize exclusionary conduct generally as falling into one of two categories<sup>3</sup>:
- *Predation*. Under a predatory strategy, a seller offers buyers excessively good deals in order to deny business to rivals and weaken their abilities to compete.
  - *Raising Rivals' Costs*. Under a raising-rivals' costs strategy, a seller takes actions to make it more costly for rival sellers to serve buyers, thus weakening the rivals' abilities to compete.

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<sup>3</sup> The distinction between the two concepts is not an entirely sharp one. For example, in markets with learning-by-doing, predatory pricing may raise rivals' costs by denying them sales that would have otherwise led to learning and lower costs. Similarly, in markets with network effects, predatory pricing can result in rival platforms' having fewer users and—because network benefits are reduced—higher costs of providing any given level of user benefits.

6. One example of each type of behaviour is examined below. Section 3 considers predatory pricing and identifies several potential pitfalls in relying on bright-line price-cost tests to identify predatory pricing. It also discusses the importance of understanding the specific mechanism by which a firm recoups its investment in below-cost prices rather than focusing solely on whether the firm rationally anticipated recouping its investment. Section 4 examines conduct that directly or indirectly limits a user’s ability to participate on multiple platforms simultaneously (a practice known as “multi-homing”). It is shown that, in the presence of certain asymmetries, this conduct can weaken competition. The paper closes with a few broad observations on competition policy in multi-sided markets.

## 2. Conceptions of Exclusionary Behaviour

7. Several approaches to distinguishing exclusionary behaviour from competitive behaviour have been proposed and applied. This section briefly describes and assesses three leading approaches in turn.

### 2.1. Harm to Social Welfare due to Harm to Competition

8. One approach is to label conduct as exclusionary if it both: (a) harms competition, and (b) reduces some measure of social welfare (e.g. consumer surplus or total surplus) relative to a baseline in which the conduct is not undertaken.<sup>4</sup> An appealing feature of the test is that it can be directly linked to the ultimate objective of competition policy, either consumer surplus or some broader measure of economic welfare. However, this test also has several weaknesses.<sup>5</sup>

9. One weakness is that the test relies on the (undefined) notion of harming competition. In the case of a merger, there may appear to be natural sense in which competition is reduced, but in many other cases there is not. In a predatory pricing case, for example, the plaintiff will allege that competition is being harmed while the defendant will argue that it is simply “competing on the merits.” By failing to define harm to competition, this standard ducks one of the most critical issues.

10. One might attempt to argue that problem would go away if one eliminated prong (a) of the standard or, equivalently, defined any conduct that reduces social welfare to be exclusionary. However, such an approach would be inconsistent with U.S. law<sup>6</sup> and, more broadly, would equate competition policy with regulation. Attempting to regulate a firm’s conduct to ensure that it maximizes some measure of social welfare -particularly if it is a

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<sup>4</sup> Various forms of this test have been advocated by Steven Salop. (See, e.g., Salop (2006).)

<sup>5</sup> For a discussion of other problems, see Melamed (2005) and references therein.

<sup>6</sup> For example, the U.S. Supreme Court has stated that:

The mere possession of monopoly power, and the concomitant charging of monopoly prices, is not only not unlawful; it is an important element of the free-market system. The opportunity to charge monopoly prices—at least for a short period—is what attracts “business acumen” in the first place; it induces risk taking that produces innovation and economic growth. To safeguard the incentive to innovate, the possession of monopoly power will not be found unlawful unless it is accompanied by an element of anticompetitive *conduct*. [Emphasis in original.]

(Verizon Communications Inc. v. Law Offices of Curtis V. Trinko, LLP, 540 U.S. 398, 407 (2004).)

long-run, forward-looking measure- imposes very strong informational and computational demands on the regulator, which is one of the reasons why modern market economies generally limit pervasive regulation to a relatively small subset of markets. A harm-to-competition screen serves to limit the set of circumstances in which the difficulties of determining welfare effects have to be confronted.

11. Of course, even with a screen in place, these difficulties will have to be confronted in some cases. Hence, a second weakness of a social-welfare test is that it can be difficult to administer and can distort the behaviour of both potential excluders and their targets. Melamed (2005, p. 1254) argues that, at the time it is choosing its course of conduct, a potential defendant would lack the information necessary to make a reliable prediction of the effects of its actions on a social welfare measure based on consumer surplus and/or the profits of rival suppliers. The potential defendant's uncertainty could create a status-quo bias because conduct that led to significant changes in the market outcome might be more likely to be found to be exclusionary. Moreover, what is ostensibly a total-surplus standard could, in practice, become a competitor-surplus standard because a seller might be concerned that its behaviour would generate complaints from rivals when the firm's conduct lowered their profits and they perceived a chance of prevailing under this standard.<sup>7</sup> Melamed (2005, p. 1254) also argues that the test could create economically perverse incentives for the defendant's rivals to refrain from competing vigorously in order to enhance their claims that the defendant's conduct had harmed consumers and/or the rivals.

## 2.2. Equally-Efficient-Rival Test

12. A second test asks whether an equally efficient rival could compete successfully in the presence of the challenged conduct. If the answer is yes, then by this test the conduct is not exclusionary.<sup>8</sup> This test builds on an intuitive notion of harming competition under which, if a firm is competing on the merits, then an equally matched rival should find itself capable of competing successfully as well. Unfortunately, this approach suffers from both practical and conceptual shortcomings.

13. A severe practical shortcoming is that, in actual markets, it can be very difficult to determine what it means to be an equally efficient rival. When each supplier offers a single product that is undifferentiated from those of its rivals, the determination is straightforward: a rival offering the same product to consumers is equally efficient if it has costs lower or equal to those of the firm in question. However, when products are differentiated, it is necessary to account for the differences. It can be extremely difficult to determine whether a competitor is equally efficient when product characteristics and business strategies are multidimensional and vary across firms. For example, given the many differences in their business models, it might be very difficult to assess whether American Express and MasterCard are equally efficient credit and charge card platforms.

14. In markets with network effects, additional issues arise. Should the size of a rival's installed base be taken into account in defining what it means to be equally efficient? If it is, then there may be a risk that this test will become extremely weak

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<sup>7</sup> See Appendix.

<sup>8</sup> This test is generally associated with Judge Richard Posner. (See, e.g., Posner, 2001, pp. 94–95.) For a particular application of this logic to develop a cost test for predatory pricing, see Baumol (1996).

because it would find any conduct that leveraged a dominant firm's installed base advantage to be non-exclusionary regardless of how it affected competition and consumer welfare. However, not taking installed bases into account might have the effect of forcing a firm with a large installed base to refrain from competing vigorously with a smaller rival.

15. In summary, the equally-efficient-rival test can be very hard for the courts to apply, and it can thus create uncertainty for potential defendants and lead to some of the problems associated with application of a social-welfare standard as discussed above.

16. An even deeper shortcoming of the equally-efficient rival test is that its focus on an as-efficient competitor lacks a sound grounding in economics. Specifically, there is not a tight linkage between: (a) the consumer and total-welfare effects of competition between two firms, and (b) whether the two firms are equally efficient suppliers. For example, in the presence of production economies of scale, the entry of an equally efficient rival can lead to higher industry costs to produce a given amount of output, and - from the perspective of total surplus- these higher costs may dominate any benefits of the additional competition due to entry. A similar problem can arise with network effects, which give rise to demand-side economies of scale. In the other direction, consumer surplus will often rise following entry even if the entrant is less efficient than the incumbent. Indeed, given the effects on prices and consumption, entry by an inefficient entrant can raise total surplus in some instances.

17. The equally-efficient-rival test broadly underlies the European Commission's assessment of price-based exclusionary behaviour and whether it might give rise to consumer harm.<sup>9</sup> However, the Commission recognizes that excluding a less efficient competitor can harm competition in some circumstances.<sup>10</sup> The Commission also recognizes that, in the presence of network effects, a rival's efficiency can be affected by exclusionary conduct.<sup>11</sup>

### 2.3. The No-Economic-Sense Test

18. A third, widely proposed test for exclusionary behaviour is the no-economic-sense test. In broad strokes, the no-economic-sense test limits the concept of exclusion to conduct that makes no economic or business sense but for the likelihood of harming competition.<sup>12</sup> The U.S. Department of Justice has used this test in several cases alleging exclusionary behaviour.<sup>13</sup>

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<sup>9</sup> European Commission (2009), ¶¶ 23 and 67. In assessing predatory pricing, the Commission also examines whether the alleged predator is engaged in short-run profit sacrifice, a variant of the next standard for exclusionary behaviour discussed below. (*Id.*, ¶63.)

<sup>10</sup> *Id.*, ¶ 24.

<sup>11</sup> *Id.*

<sup>12</sup> See, e.g., Werden (2006). Ordover, J. A., and Willig, R. D. (1981) advocate a definition of predatory behaviour along similar lines but focused on exit rather than considering all degrees of harm to competition.

<sup>13</sup> See, e.g., Brief of the Appellees United States and the State Plaintiffs at 48, *United States v. Microsoft Corp.*, 253 F.3d 34 (D.C. Cir. 2001) (Nos. 00-5212, 00-5213); Brief for Appellant United States at 2, 30, *United States v. AMR Corp.*, 335 F.3d 1109 (10th Cir. 2003) (No. 01-3202)

19. The no-economic-sense test is related to what is sometimes referred to as a profit-sacrifice test.<sup>14</sup> Although there does not appear to be complete agreement on the definition of a profit-sacrifice test, one form considers the conduct in question to be exclusionary only if it involves a short-run profit sacrifice in order to obtain long-run benefits from the weakening of competition.

20. Melamed (2005, p. 1255) argues that, because the no-economic-sense test focuses on the economic welfare of the potential defendant, it does not suffer from some of the problems associated with tests based in whole or part on consumer or rival welfare. It is plausible that a potential defendant will better be able to predict how its actions will affect its own profits rather than consumer or competitor welfare. However, one should not minimize the difficulties of making the relevant determinations. A critical element of applying the no-economic-sense test is to estimate the “but-for world” (i.e. what would happen absent the challenged conduct). This counterfactual situation serves as the benchmark for whether the challenged conduct would be profitable if it had no effect on the strength of competition. Estimating the but-for world can be very difficult. For example, it can necessitate estimating the future effects of alleged predatory pricing or determining what the market equilibrium would have looked like had rivals not been weakened by the imposition of exclusivity requirements.

21. Lastly, it should be noted that reliance on the no-economic-sense test is not equivalent to requiring the firm to maximize either consumer or total surplus. For example, for a firm that faces no competition, charging profit-maximizing, monopoly prices makes economic sense even though charging prices closer to marginal cost would raise both consumer and total surplus. And there can be situations in which entry reduces total economic surplus but the dominant incumbent supplier will find it profitable to undertake conduct that excludes the entrant only if the incumbent can count as profits the benefits of eliminating competition. However, the no-economic-sense test would not allow the use of such benefits as a justification for the (welfare-improving) conduct.

### 3. Predatory Pricing in a Multi-Sided Market

22. Next consider the definition of exclusion for the specific practice of predatory pricing. Following the U.S. Supreme Court in *Brooke Group*, U.S. courts apply a two-part test for predation. “First, a plaintiff seeking to establish competitive injury resulting from a rival’s low prices must prove that the prices complained of are below an appropriate measure of its rival’s costs.”<sup>15</sup> “The second prerequisite to holding a competitor liable under the antitrust laws for charging low prices is a demonstration that the competitor had a reasonable prospect, or ... dangerous probability, of recouping its investment in below cost prices.”<sup>16</sup> The European Union standard has a multi-band price-cost prong: (a) if price is below average variable costs, then there is a presumption of predatory pricing that

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(public redacted version); Brief for Appellant United States at 28, *United States v. Dentsply Int’l, Inc.*, 399 F.3d 181 (3d Cir. 2005) (No. 03-4097) (public redacted version).

<sup>14</sup> See, e.g., Melamed (2006).

<sup>15</sup> *Brooke Group, Ltd. v. Brown & Williamson Tobacco Corporation*, 509 U.S. 209, 222 (1993). Many other national competition authorities consider price-cost tests as well. For a survey of practices, see Unilateral Conduct Working Group (2008), § II.1.

<sup>16</sup> *Id.* at 224.

the defendant can then attempt to rebut, and (b) if price is above average variable cost but below average total cost, then the plaintiff must establish that the pricing is intended to eliminate competitors.<sup>17</sup> The European Union standard does not have a required recoupment prong<sup>18</sup>, although the European Commission sometimes considers recoupment.<sup>19</sup> Moreover, the Commission examines whether market conditions are such that predation could successfully harm competition, which entails looking at many of the same factors as would a recoupment analysis (e.g. entry and re-entry barriers).<sup>20</sup> Indeed, one interpretation of the recoupment prong is that it is a test of whether the allegedly predatory pricing would significantly harm competition.

### 3.1. Pricing Below Some Measure of Cost

23. The leading variant of the price-cost prong of the Brooke Group approach -the Areeda-Turner rule- compares price to marginal cost or to average variable cost as a proxy.<sup>21</sup> Average variable cost also plays a central role in the European Union's analysis. There are, however, several issues regarding use of this comparison as part of a test for predation that arise even when it is applied to markets that do not entail the complications of a multi-sided platform.

24. A first issue is that, under the no-economic-sense test, pricing above cost can be exclusionary. Under this test (or even a short-run profit sacrifice test), one should compare marginal revenue (MR) with marginal cost (MC). If  $MR < MC$ , then the firm is not charging a profit-maximizing price. For firms of interest to competition policy authorities, firm-specific demand curves are downward sloping and marginal revenue is less than price (p). Consequently, there is a range of prices for which  $MR < MC < p$ . Depending on the overall fact pattern, such prices could be predatory in that they make sense only because they weaken future competition.

25. Observe that the possibility of such above-cost predation is not unique to markets with network effects, cross-platform or otherwise. What is necessary is that there be some mechanism such that the firm's lowering its price weakens competition. Although network effects provide one such mechanism (i.e. lower prices can reduce the user bases of rival platforms, thus reducing their ability to offer users value), there are others. Whatever the mechanism, the predator weighs the reduction in its profits due to low current prices -which occurs for any price such that  $MR < MC$ - with the gains from weakening rivals. Stated in terms of the no-economic-sense test, the incumbent is engaged in predation if it would have priced even higher if not for the value of weakening its rivals.

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<sup>17</sup> Case C-62/86 *AKZO Chemie v Commission*, [1991] ECR I-3359; Case C-333/94 *P Tetra Pak International v. Commission* [1996] ECR I-5951. The cost concepts are stated for a single-product firm. For the corresponding multi-product concepts, see European Commission (2009), ¶ 26.

<sup>18</sup> Case C-333/94 *P Tetra Pak International v Commission*, [1996] ECR I-5951; Case C-202/07 *P France Télécom SA v Commission of the European Communities*, [2009] ECJ First Chamber.

<sup>19</sup> Unilateral Conduct Working Group (2008), § II.2.A and B. The treatment of recoupment varies among national competition authorities within the European Union, as well as among the authorities of other nations. For a survey of individual countries' practices, see *id.*, § II.2.

<sup>20</sup> European Commission (2009), ¶¶ 20 and 68-71.

<sup>21</sup> Areeda and Turner (1975).

26. Even though above-cost pricing can be deemed predatory in some circumstances, this approach has been rejected by some of the antitrust literature as undesirable because such a rule would be hard to implement and could be subject to high rates of error.<sup>22</sup>

27. A second issue with the Areeda-Turner test is that, under the no-economic-sense standard, pricing below marginal cost can constitute competition on the merits. In non-network, non-platform markets, such competition can take the form of temporary, “introductory” offers or the permanent offering of menus, where a free version is offered as a “gateway” to paid versions (known as a freemium model)<sup>23</sup>.

28. Network effects can also provide a mechanism for below-cost competition on the merits.<sup>24</sup> To see why, consider a market in which there are network effects with only a single type of user (as can arise, for example, with a communication network in which everyone both sends and receives messages) but different user cohorts over time. A supplier may find it profitable to charge lower prices early on in the product’s life in order to build up its installed base, which then makes its network more attractive to future user cohorts and, thus, allows the supplier to charge higher prices. This type of initial below-cost pricing can be profitable even for a monopolist facing no threat of entry, which demonstrates that such pricing can be motivated by considerations other than exclusion. In addition to benefiting the supplier, this type of pricing can benefit consumers by internalizing what would otherwise be externalities across user cohorts (i.e. early users do not take into account the benefits of a larger network size that their purchases confer on later user cohorts). However, as discussed above, a supplier can also be motivated by an exclusionary desire to deny its rivals the benefits of increasing their own installed bases. Indeed, both types of incentives can be present simultaneously.<sup>25</sup>

29. The fact that above-cost prices are predatory in some circumstances, and below-cost prices constitute competition on the merits in others, strongly suggest that there is no good price-cost test in the presence of network effects. Using a formal model of same-side network effects with two user cohorts, Farrell and Katz (2005) have shown that price floors that fully promote total surplus would have to depend on user expectation and coordination processes that are unlikely to be observable in practice. In many respects, the two user cohorts in a two-period model of same-side network effects play the same role as the two user groups on opposite side of a platform.<sup>26</sup> Hence, these results strongly suggest that price-cost test is problematical when applied to a multi-sided platform.

30. Suppose that, despite the issues inherent in the use of marginal cost as a bright line for identifying predatory pricing, one attempts to extend the Areeda-Turner price-cost test to multi-sided markets. Consider a platform that facilitates exchanges between

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<sup>22</sup> For a discussion of the debate, see Elhaage (2003).

<sup>23</sup> Although many commentators prefer to focus on two-sided platform issues, the use of the freemium model appears to have played a central role in a recent case brought against Google regarding the pricing of its mapping application. (*Bottin Cartographes v. Google France*, Cour d’appel, Paris Pôle 5, Chamber 4, 25 November 2015.)

<sup>24</sup> For an early formal model of network competition with below-cost pricing, see Katz and Shapiro (1986).

<sup>25</sup> Similar issues arise with learning by doing. See Cabral and Riordan (1994 and 1997).

<sup>26</sup> Vasconcelos (2015) extends some of Farrell and Katz’s (2005) results to platforms with one- and two-sided cross-platform network effects.

members of user group *A* and user group *B*. A naive application of the Areeda-Turner test might focus on the pricing to users on one side of the platform, say side *A*, in isolation. That is, the price-cost prong would examine whether  $p_A$  is less than  $c_A$ , where  $p_A$  is the price charged to members of user group *A*, and  $c_A$  is the marginal cost of providing a unit of platform services to a member of user group *A*.

31. As has long been emphasized by contributors to the academic literature on multi-sided platforms, this naive approach can be highly misleading.<sup>27</sup> To see why, consider a platform that: (a) facilitates one-to-one transactions; (b) charges fees to users solely on a per-transaction basis (i.e. it does not charge subscription fees); and (c) incurs only fixed costs or per-transaction costs (i.e. there are no marginal costs associated with changes in the number of platform subscribers if one holds the total number of transactions fixed). Let  $x_J$  denote quantity of platform services consumed by users on side *J*. For such platforms,  $x_A \equiv x_B$  and there may be no sound basis for assigning costs to one side or other. Let  $c_T$  denote the total marginal costs associated with a transaction. Because costs are associated with transactions -not one side of the market or the other- and because transactions only occur if both sides participate, it also makes sense to think of revenues at the transaction level. That is, the firm earns  $p_A + p_B$  per transaction. Applied at the transaction level, the two-sided market version of the Areeda-Turner test compares  $p_A + p_B$  with  $c_T$ .

32. This comparison highlights the fact that a simple, one-sided price can be misleading. Under the naive approach, policy enforcers would have to assign some share of the total transactions costs to one side of the market. Let  $\lambda$  denote the percentage of the cost of a transaction allocated by the competition authority to side *A*. It could well be the case that the naive, one-sided version of the test indicates below-cost pricing (i.e.  $p_A - \lambda c_T < 0$ ) while the two-sided version does not (i.e.  $p_A + p_B - c_T > 0$ ). Because the one-sided version would rely on arbitrary allocations of costs and revenues, it is difficult to see why it would be preferred to the two-sided version, which examines costs and revenues at the transaction level.

33. Another way to see the dangers of focusing solely on one side of a multi-sided market is to recognize that there is an important sense in which a multi-sided market is no different than any other -in each case, it is necessary to compare prices and costs. For some purposes, it is not too much of a stretch to consider any firm as a platform that facilitates transactions between input suppliers and output buyers, where the input suppliers pay negative prices to participate on the platform. From this perspective, looking at the price paid by buyers minus the price paid to input owners amounts to taking both sides of the market into account at once. Moreover, in the presence of network effects, users on one side of platform can be viewed as inputs to the supply of services to users on the other side, and the cost of that input has to be taken into account.

34. Behringer and Filistrucchi (2015) derive the two-sided analog of the Areeda-Turner test for platforms that are not pure transaction facilitators. One example of this type of platform is a media company that sells subscriptions to households and advertising to firms seeking to reach households. A critical point of distinction from the pure-transactions situation discussed above is that the platform's unit sales to the two sides of the market need not be equal to one another (i.e. it may be the case that  $x_A \neq x_B$ ). Although they need not be equal, the unit sales on the two sides of the market will affect

<sup>27</sup> See, e.g., Wright (2004).

one another when there are cross-platform network effects. It is thus necessary to account for the fact that an increase in sales on one side of the platform generates costs and benefits on the other side of the platform.

35. Behringer and Filistrucchi (2015) consider a monopolist facing demand  $x_B = x_B(x_A, p_B)$ . In the presence of positive cross-network effects, an increase in  $x_A$  leads to increased demand by side  $B$ , holding the price charged to side  $B$  constant. Behringer and Filistrucchi propose a two-sided test under which a necessary but not sufficient condition for finding predatory pricing is that at least one of the following amounts is negative:

$$(p_A - c_A) + (p_B - c_B) \frac{\partial x_B}{\partial x_A}$$

and

$$(p_A - c_A) \frac{\partial x_A}{\partial x_B} + (p_B - c_B).$$

36. There are several points worth noting about this test. First, as in traditional markets, the Areeda-Turner rule lacks a tight linkage to welfare. Even using Behringer and Filistrucchi's formulas to determine whether prices are above or below costs, there can be above-cost pricing that lowers welfare by weakening rivals and below-cost pricing that raises welfare.

37. Second, these formulas can be interpreted in ways that implement the no-economic sense test of predation. However, one must be careful about the calculation of the margin and demand terms in these formulas in order to ensure that one does not count as benefits any gains that the platform might obtain by reducing the number of users on the other platform or by inducing that platform to raise its prices.

38. In order to understand the need for caution with respect to the demand terms,  $\partial x_B / \partial x_A$  and  $\partial x_A / \partial x_B$  above, it is helpful to expand the notation slightly. Label the platform under scrutiny by  $i$  and a rival platform by  $-i$ . Using notation that accounts for the presence of the competing platform, the demand faced by platform  $i$  can be expressed as  $x_B^i = x_B^i(x_A^i, x_A^{-i}, p_B^i, p_B^{-i})$ . One would expect group- $B$  users' demand for platform  $i$  to fall as either the rival's price falls or its group- $A$  user base rises. The demand of users on the other side of the platform can be defined similarly. The no-economic-sense logic implies that the appropriate value of  $\partial x_B / \partial x_A$  to use for platform  $i$  in the pricing formula above is  $\partial x_B^i / \partial x_A^i$  because this term does not represent any weakening of the rival.

39. It is important to recognize that one cannot estimate  $\partial x_B^i / \partial x_A^i$  simply by looking at how sales to group- $B$  users rise when the platform lowers its price to group- $A$  users and the number of group- $A$  users rises in response. The reason is that the price change will also affect the number of group- $A$  users on platform  $-i$ . Specifically, by making platform  $i$  more attractive to side- $A$  users, lowering  $p_A^i$  will raise  $x_A^i$  and lower  $x_A^{-i}$ . Both of these changes in the numbers of users will raise  $x_B^i$ , but only the first effect should be counted under a no-economic-sense standard; the latter constitutes a weakening of the rival.<sup>28</sup>

<sup>28</sup> Algebraically, the change in  $x_B^i$  equals  $(\partial x_B^i / \partial x_A^i)(dx_A^i / dp_A^i) + (\partial x_B^i / \partial x_A^{-i})(dx_A^{-i} / dp_A^i)$ . The incorrect approach described in the text amounts to assuming that the observed change in  $x_B^i$  equals  $(\partial x_B^i / \partial x_A^i)(dx_A^i / dp_A^i)$ . This approach would thus credit the effects of weakening the rival as benefits realized due to competition on the merits.

40. Another way to see this point is to consider a situation in which there are multiple cohorts of users over time. As discussed above, a network might charge lower prices to early cohorts in order to: (a) build up its own installed base to offer greater network benefits to later cohorts of users, and/or (b) prevent rivals from becoming stronger future competitors by building up their own installed bases. Adopting a multi-sided perspective, one might be tempted to take both types of benefits into account because the core of the approach is to account for the platform's gains and losses associated with all users (here, different cohorts), rather than focusing on one group in isolation. But notice that, the more successful the firm is in weakening rivals (and, thus, generating future sales), the more this form of the test indicates that the firm is not engaged in predation. Intuitively, this form of the price-cost test mistakenly treats recoupment as covering costs.

41. In addition to the demand terms, the price-cost margins must also be interpreted with care. In some circumstances, charging lower prices to the *A* side of a market may weaken competition on the *B* side and, thus, allow the platform to charge higher prices to *B*-side users. Critically, in these circumstances, the higher prices are due to the loss of competition rather than an increase in cross-platform network effects. A naive test would count the elevated prices as offsets to the predatory prices rather than recognizing them as a form of recoupment occurring at the same time as the predatory pricing.

42. A recent case brought by the United Kingdom's Director General of Fair Trading illustrates this issue.<sup>29</sup> Napp Pharmaceutical Holdings Limited and subsidiaries sold oral sustained-release morphine to two market segments: hospital (i.e. patients in hospital) and community (i.e. patients under the care of a general practitioner). The Director found that, due to switching costs and reputational effects, purchase decisions of the community segment were strongly influenced by purchase decisions of the hospital segment. This influence gave rise to form of cross-platform network effect: all else equal, greater hospital sales could be expected to lead to greater community sales. Moreover, a supplier lacking substantial hospital sales would have difficulty effectively competing in the community segment.

43. The Director found, in part, that Napp charged predatory, below-cost prices to the hospital segment in order to prevent entry and weaken competition in the community segment. In its defense, Napp argued that its prices to the hospital segment were not predatory because they generated profitable sales in the community segment. Letting *A* denote the hospital segment and *B* the community segment, Napp's argument can be stated in terms of the formulas above. Napp's position was that, even if  $(p_A - c_A) < 0$ , the prices were justified because

$$(p_A - c_A) + (p_B - c_B) \frac{\partial x_B}{\partial x_A} > 0.$$

44. The Director argued -and the Competition Appeal Tribunal agreed- that Napp earned "high compensating margins in the community segment... precisely because its discount policy in the hospital segment has hindered competition in the community segment."<sup>30</sup> The Tribunal explained that:<sup>31</sup>

<sup>29</sup> This summary of this matter is based on Case 1001/1/1/01 Napp Pharmaceutical Holdings Limited and Subsidiaries v Director General of Fair Trading [2002] CAT 1.

<sup>30</sup> Id., ¶ 51.

<sup>31</sup> Id., ¶ 261.

*the fact that Napp's below-cost pricing in the hospital sector enables it to make money from 'follow-on' sales in the community sector merely signifies that the particular form of 'recoupment' available to Napp is more direct and more immediate than it is in other cases of predatory pricing.*

Stated algebraically, the Tribunal found that the term  $(p_B - c_B) \frac{\partial x_B}{\partial x_A}$ , particularly the size of the margin  $(p_B - c_B)$ , represented successful recoupment and could not be used to justify the fact that  $(p_A - c_A) < 0$ .

45. Some readers might assert that Napp is not a platform because it does not facilitate interactions between the two sides. But whatever label one attaches to it, the logical structure of the analysis is identical to that of a two-sided market. Moreover, this type of effect could arise in settings that are widely agreed to constitute multi-sided markets when platforms have sufficiently different characteristics from one another that the price structure affects the ability of some firms to compete. For example, competing media platforms may have very different business models (e.g. subscriber versus advertising-supported business models), and a dominant firm might deviate from its otherwise optimal business model (say by giving away subscriptions rather than charging for them) precisely to harm rival platforms relying on different business models.<sup>32</sup>

### 3.2. Recoupment as a Test of Exclusionary Behaviour

46. Successfully detecting predation and distinguishing it from beneficial competition is extremely difficult, particularly in markets with network effects. The discussion above suggests that the relying on price-cost tests alone is unlikely to produce reliable results. The economics of network effects indicates that observing two-sided prices below marginal or average variable cost very likely tells us little when platforms are in a growth stage. Moreover, as discussed in the context of Napp, by itself a price-cost test may fail to detect what many would consider to be successful predatory pricing. Can a recoupment test help overcome these difficulties?

47. Some commentators view the question of whether a firm can recoup the losses suffered from below-cost prices as a test of whether predation is rational. Under this view, one asks the following question: Given that one sees the firm pricing below cost in the short run, will its profits be higher in the long run because of the lower short-run prices? A fundamental problem with this view is that, in this form, the recoupment prong is a test that any economically rational investment -predatory or otherwise- would have to meet. Hence, if one observes that a firm is pricing below cost and is expected to recoup its investment in below-cost pricing, the only conclusion that one can reasonably draw from these facts alone is that the firm is economically rational. This naive form of the recoupment test fails to distinguish rational predation from rational competition on the merits. The problem with the naive test is that it does not address differences in the mechanisms by which an investment in below-cost pricing might be recouped.

48. The logic of the no-economic-sense test does address such differences, and it indicates that a pair of different questions should be posed with respect to recoupment: Is below-cost pricing profitable for the platform because it makes the platform a stronger competitor by building up its user base? Or is the below-cost pricing profitable only

<sup>32</sup> Hoernig (2007) examines the potential for a mobile telecommunications provider to use a high differential between off-net and on-net prices to harm competition among asymmetric providers.

because it also weakens competition by preventing rivals from building their own user bases?

49. In answering these questions, it is important to recognize that, in the presence of network effects, exclusionary behaviour can significantly harm competition and consumer welfare without driving competitors from the market. As illustrated by in the Napp case, weakening a rival can allow a dominant firm to charge higher prices and earn greater profits even if the rival is not driven from the market entirely.<sup>33</sup> One might argue that having a bright-line test based on exit would be useful because it provides greater certainty and is easier to apply. However, the use of a bright line also raises the possibility of gaming: a platform engaging in exclusion may seek to weaken its rivals just up to the point that they are about to exit, while rivals might exit in order to trigger the possibility of receiving damages that would be unavailable to them if they remained in business.

50. It can be very challenging to determine whether below-cost pricing is profitable only because it also weakens competition by preventing rivals from building their own user bases. To do so, one might have to determine whether the firm's conduct would be profitable in a counterfactual world in which competitors were not weakened (i.e. that rivals could continue to offer the same surplus that they otherwise would have). In the presence of inter-temporal network effects, it becomes necessary to project the future industry equilibrium in order to apply the test. Doing so can be very difficult given role of consumer expectations and potentially complex business strategies.

51. Economists frequently assert that effects -rather than intentions- are what matter for welfare and, thus, intentions are irrelevant. However, if one expects business people to know what they are doing, then their views (expressed in ordinary-course-of-business documents) may shed light on facts that are otherwise hard for an outsider to observe (e.g. whether particular conduct made economic sense for non-exclusionary reasons). Of course, there are issues relevant for competition policy that executives may be unqualified to analyze, and there is a risk that companies will create documents solely with potential litigation in mind. Hence, evidence of intention alone is insufficient to establish anticompetitive effect or its absence. But neither is such evidence entirely uninformative.

52. As a general matter, it may be easier to determine when to find that a firm is not liable. For example, it may be possible to rule out predatory pricing when it is clear that there could have been little prospect of significantly weakening rivals (e.g. when rivals have ready access to capital, the costs of multi-homing are low, and users are not locked-in to a platform as the result of platform-specific investments or the inability of users to coordinate on switching to another platform if it would benefit them collectively).

53. It is useful to discuss these issues in the context of an example. The following discussion takes at face value certain claims made by the Initiative for a Competitive Online Marketplace (ICOMP), an organization funded by Microsoft.<sup>34</sup> According to ICOMP, Google France neither charged map users (either consumers or the users of Google's map API) nor sold advertising.<sup>35</sup> Hence, at least according to ICOMP, the issue was not that Google was pursuing a misunderstood two-sided market strategy. Instead,

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<sup>33</sup> See, also, European Commission (2009), ¶ 69.

<sup>34</sup> No representations are being made here regarding the veracity of ICOMP's factual claims.

<sup>35</sup> Initiative for a Competitive Online Marketplace (Undated), p. 10.

Google was allegedly engaged in predation whereby, in the short run, it charged zero prices to both sides of the platform and, in the long run, it would raise prices to both sides once it had weakened or eliminated competition. This is what is known as a “deep pockets” theory of harm: Google had greater financial resources than its rivals and could outlast them in a war of attrition.

54. If these were the facts, then Google would fail the static version of the two-sided Areeda-Turner test described above. However, even accepting these claims regarding pricing as facts, it is not evident that such behaviour is predatory under the no-economic-sense test once one takes into account inter-temporal considerations. Under the no-economic sense test, it is necessary to determine whether zero pricing would make sense as an investment in building an installed base even if it did not weaken Google’s rivals.<sup>36</sup> It is important to observe that the potential error can run in either direction: predatory pricing could mistakenly be identified as an innocent investment in future sales, and below-cost pricing to enhance installed base for innocent reasons could be misdiagnosed as predatory pricing.

55. In the appellate decision regarding a case against Google France brought by a rival map application provider, the court accepted that data for 2007-2009 were not available but that Google might have failed to cover its costs.<sup>37</sup> However, the court reasoned that Google must not have engaged in predation because market conditions were such that Google had no chance of recoupment through the mechanism of driving rivals from the market.<sup>38</sup>

### 3.3. One Price or Two?

56. Although looking solely at one-sided prices and margins in isolation can be misleading, so too can looking at a single, net two-sided price. In thinking about price-cost tests, recoupment, or whether conduct makes economic sense, one should take a comprehensive, multi-sided view of revenues and costs. But there is a tendency among some commentators to do so by focusing solely on net, two-sided prices while ignoring the underlying price structure.<sup>39</sup> Doing so ignores the critical lesson of the research literature that, in multi-sided markets, the price structure, as well as the price levels, matter for competition and welfare. Looking solely at a single, net two-sided price is generally insufficient for assessing predation. First, any attempt to define a single, net two-sided price that is compared to a single measure of cost will fail to yield the same answer as Behringer and Filistrucchi’s (2015) two-part price-cost test in at least some circumstances. And attempts to utilize a single measure of price become even more strained when platforms charge their users both subscription and transaction fees. Second,

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<sup>36</sup> There also was an issue whether the free version served as a promotional tool to induce map users to purchase a paid service. This is not a two-sided issue.

<sup>37</sup> *Bottin Cartographes v. Google France*, Cour d’appel, Paris Pôle 5, Chamber 4, 25 November 2015, p. 8.

<sup>38</sup> *Id.*, pp. 8-9. Recall that, as a general matter, exclusionary conduct that weakens but does not eliminate rivals can also harm competition and consumers.

<sup>39</sup> Using the notation introduced earlier in the text, these commentators would assert that it would sufficient to compare  $p_A + p_B$  with  $c_A + c_B$  to answer any relevant questions regarding market power, profitability, or harm to competition, without regard to the values of the individual prices the make up the sum.

focusing purely on the net, two-sided prices can miss predation by mistaking recoupment for two-sided pricing.

#### 4. Creating Barriers to Multi-homing

57. This section examines the treatment of exclusivity strategies with which a platform with substantial market power seeks to weaken competition by demanding that some or all user groups refrain from patronizing competing platforms.

58. There are several different means by which a platform might limit multi-homing. The most direct means is the imposition of contractual terms that prohibit a user from participating on a platform if the user participates on any competing platform.<sup>40</sup> Exclusivity can also be indirectly induced by utilizing price structures that make it economically unattractive for a platform user to multi-home. Examples include quantity discounts (such as volume-insensitive, or lump-sum, charges for platform use), as well as discounts based on the percentage of a users' patronage that is over a given platform (so-called loyalty discounts).<sup>41</sup> Technological choices can also influence the cost of multi-homing. For instance, a video game console manufacturer might adopt technical standards that make it more costly for games created for one console to be ported to a different brand of console.<sup>42</sup> Lastly, Hermalin and Katz (2006) show that the equilibrium extent of multi-homing can be affected by the allocation of the authority to choose the platform over which a transaction takes place when a pair of users on the two sides of the market are on multiple platforms in common. Specifically, the side that lacks formal authority may single home in order to force the hand of the side with formal authority.

59. As Lee (2013) points out, in order to understand the effects of imposing multi-homing restrictions on users on one side of a platform, it is necessary to account for the reactions of users on the other side of the platform. A reduction in multi-homing by users on one side might lead to greater multi-homing by users on another. For example, if video game developers are blocked from simultaneously offering their games on multiple brands of video game console, then some gamers may respond by purchasing multiple brands of consoles.

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<sup>40</sup> Lee (2013) notes that, in some industries, a platform can impose exclusivity by vertically integrating into one side of the market. For example, video game consoles are platforms that bring together game developers and gamers. An established strategy for console manufacturers is to integrate into the development of games that are offered exclusively on their platforms.

<sup>41</sup> For an analysis of loyalty discounts in "traditional" markets, see Calzolari and Denicolò (2013) and Klein and Lerner (2016). The earlier paper demonstrates that, under some conditions, market-share discounts and exclusivity requirements can have very different competitive effects from one another.

<sup>42</sup> In many settings, blocking multi-homing is not the same as blocking platform compatibility. With compatible platforms, there is a single "network," and users on side *A* of one platform benefit from actions taken by another platform to increase the number of users on its *B* side. Such effects need not arise with incompatible platforms even when there is no prohibition on multi-homing and the act of multi-homing is costless. That said, there are similarities in that a dominant network can have incentives to oppose compatibility in order to weaken rivals. For an insightful early analysis, see Cremer et al. (2000).

60. Before considering the effects of platform exclusivity, several leading theories of harm to competition that have been developed in non-platform settings are reviewed. The application of these theories to platforms and the implications for policy enforcement are then discussed.

#### 4.1. (Non-Platform) Theories of Exclusionary Exclusivity

61. Exclusivity requirements have received considerable attention outside the context of platforms operating in multi-sided markets. In a typical exclusive dealing case, for instance, a plaintiff alleges that a manufacturer possesses substantial market power and - because of some asymmetry relative to other manufacturers- benefits when dealers are forced to choose between distributing that manufacturer's products alone or distributing those of all other manufacturers.<sup>43</sup> For example, the U.S. Department of Justice applied a no-economic sense test and alleged that Dentsply International, Inc. (Dentsply) had violated antitrust laws by refusing to sell its Trubyte brand of artificial teeth to dealers that carried certain lines of competing artificial teeth.<sup>44</sup>

62. Judge Robert Bork, among others, argued that exclusivity provisions must be efficient because otherwise a party seeking exclusivity would not find it profitable to compensate the parties from which it seeks agreement to be exclusive.<sup>45</sup> The fundamental flaw in this argument is that it implicitly assumes there is frictionless, efficient bargaining among all parties affected by the exclusivity agreement -an assumption that is unlikely to be satisfied in practice. There are two broad ways in which the nature of actual negotiations undermines Bork's argument.

63. First, there often are contractual externalities, whereby the welfare of parties that do not participate in the bargaining over exclusivity are affected by the outcome of the bargaining. For example, consumer interests may not be fully represented when a manufacturer bargains with dealers regarding exclusivity. Similarly, the interests of firms that might later enter the market as manufacturers typically are not represented when an incumbent manufacturer bargains with dealers.<sup>46</sup> Moreover, there can be contractual externalities among dealers. For example, when dealers neither coordinate among themselves nor can easily coordinate with alternative manufacturers, any given dealer may reason that, because its decision with regard to exclusivity will not affect any potential manufacturer's decision whether to enter the industry, the dealer may as well

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<sup>43</sup> Framed in terms of platforms, one could argue that a manufacturer is a platform that facilitates transactions between dealers and consumers. This view is counterintuitive but it speaks to the lack of agreement regarding what constitutes a platform. It is perhaps more intuitive to think of dealers as platforms and a manufacturer as a platform user which is demanding that other potential users be excluded.

<sup>44</sup> Brief for the United States, Redacted -- Public Version, *United States v. Dentsply International, Inc.*, p. 18.

<sup>45</sup> Bork (1978, p. 309). For an excellent survey of the literature responding to this argument, see Rey and Tirole (2007, § 4).

<sup>46</sup> Aghion and Bolton (1987) demonstrate that, by signing a long-term exclusive dealing agreement with penalty clauses, a dealer and incumbent manufacturer can force a manufacturer that later enters the market to compensate the dealer for breaking the long-term agreement. In this way, the dealer and incumbent manufacturer can appropriate some of the benefits of entry for themselves, which can reduce entry and harm consumers as well as the potential entrant.

accept a proposal that harms dealers collectively even if that dealer receives very little compensation for doing so.<sup>47,48</sup> As long as no one buyer is large enough to allow an entrant to achieve a viable scale, a similar pattern can hold with respect to buyers agreeing to exclusive relationships with an incumbent seller.

64. The second way Bork's pay-for-exclusivity argument breaks down is more subtle. Calzolari and Denicolò (2015) demonstrate that, even without contractual externalities, it may be possible to attain exclusivity at no cost. Specifically, they analyze the consequences of the fact that sellers typically face heterogeneous buyers and are unable to engage in perfect price discrimination, so that, even under monopoly pricing, all but the marginal buyers typically earn strictly positive surplus, or information rents. Calzolari and Denicolò (2015, p. 3332) show that there is a sense in which this surplus can be used as payment to buyers for agreeing to be exclusive. Because buyers would have received this surplus in the form of information rents absent exclusivity, the exclusivity is purchased by the seller at no cost.<sup>49</sup>

65. Of course, the absence of a general proof that exclusive dealing is efficient does not prove that exclusive dealing harms competition. There are, however, several theories under which exclusive dealing can harm competition and consumers. All of these theories rely on the existence of some asymmetry among manufacturers, but the nature of those asymmetries, and the mechanisms by which competition is harmed, are very different.

66. The first two theories of harm are based on the assumptions that a manufacturer's profits are an increasing function of its rivals' costs and that exclusivity arrangements can serve as a means of raising those costs. The core difference between these two theories is source of asymmetry among firms and the role of long-term contracts. The first theory relies on temporal asymmetries. Specifically, it applies to situations in which an incumbent supplier can "tie up" dealers or other trading partners (e.g. buyers) before a competing supplier is able to enter the market. The supplier induces the other parties to agree to long-term, exclusive contracts such that, if a competing supplier later entered the market, it would be unable to trade with the parties under contract. If the contracts have staggered expiration/renewal dates, then there will be no date on which an entrant could freely compete for all potential trading partners. In the presence of economies of scale, the entrant's resulting level of activity might be too small to be economically viable even if some trading partners remained available.<sup>50</sup>

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<sup>47</sup> This common intuition is summarized in Katz (1989, p. 708). It is formalized and more fully explored by Rasmussen et al. (1991). Segal and Whinston (2000) correct certain inconsistencies in Rasmussen et al.'s analysis.

<sup>48</sup> Strikingly, as pointed out by Rasmussen et al. (1991, p. 1143), a manufacturer need not have market power prior to the imposition of exclusive dealing in order to be able profitably to sign most or all dealers to exclusive contracts. This finding indicates that, in applying a market-power threshold to screen potential cases, competition policy enforcers should assess what the degree of market power is when exclusivity is in place.

<sup>49</sup> This form of exclusion need not entail any sacrifice of profits. Hence, tests based on evidence of profit sacrifice could fail to detect this type of harm to competition.

<sup>50</sup> In this form of the theory, exclusivity is used to deter entry. As noted above, Aghion and Bolton (1987) show that exclusive contracts can also be used to extract rents from entrants rather than deter entry entirely.

67. The second theory of harm is also based on the assumption that a manufacturer benefits from increases in its rivals' costs. If there are economies of scale and scope in distribution, then a system of exclusive dealers will raise the distribution costs of all manufacturers but will do so more for smaller ones than larger ones. The net effect may be to raise the profits of the largest manufacturer, even though its costs of distribution are raised.<sup>51</sup> Hence, if there is some source of asymmetry that results in one manufacturer's having much larger sales than others, then that manufacturer can have incentives to seek exclusivity. Notice that contracts do not play a commitment role under this theory - dealers can be free to switch to other manufacturers. The relevant asymmetry is with regard to the manufacturers' sizes (and thus their abilities to generate sales to support exclusive dealer networks) rather than the order in which they enter into contractual negotiations with dealers.

68. The third theory is not based on raising rivals' costs through the denial of scale. Calzolari and Denicolò (2015) examine competition between duopolists offering differentiated products, where one of the firms -the "dominant" supplier- has a cost or vertical quality advantage. Because products are differentiated and buyers have a taste for variety, the higher-cost firm can still compete for sales at the margin if buyers are able to patronize both sellers simultaneously. As Calzolari and Denicolò (2015, p. 3322) explain, this fact can create an incentive to impose exclusivity<sup>52</sup>:

[If] exclusive contracts are banned, firms are forced to compete for each *marginal unit* of a buyer's demand. Excluding rivals thus requires a limit pricing strategy, which in turn entails a sacrifice of profits. When exclusive contracts are permitted, on the other hand, firms compete for the *entire volume* demanded by a buyer—i.e., competition is in "utility space." In utility space, the dominant firm can exclude rivals by leveraging on the information rents left on inframarginal units. If the competitive advantage is large, the dominant firm can keep charging monopoly prices and exclude rivals by means of exclusivity clauses only. If the competitive advantage is more limited, exclusive prices cannot be set at the monopoly level, but the discount required to foreclose is smaller than it would be in the absence of exclusive contracts. [Emphasis added, internal footnote omitted.]

69. It is widely recognized that, in addition to harming competition, exclusive arrangements can also create a new dimension of competition: competition for exclusivity. Moreover, Calzolari and Denicolò identify a specific mechanism through which exclusivity can strengthen, rather than weaken competition overall. As Calzolari and Denicolò (2015, p. 3323) explain:

Whereas product differentiation softens competition for marginal units, it does not soften competition in utility space. In utility space, product diversity is in fact irrelevant: all that counts is the amount of rent left to buyers. When firms [have comparable cost or vertical quality levels], this tends to make competition in utility space tougher than competition for marginal units.

<sup>51</sup> Katz and Rosen (1985) and Seade (1985) showed that when marginal costs are increased by some action, even a symmetric (across all manufacturers) cost increase may raise a manufacturer's profits.

<sup>52</sup> In Calzolari and Denicolò's model, the dominant firm offers both exclusive and non-exclusive pricing terms. However, their model can be extended to situations in which the seller must choose one form of pricing or the other.

Thus, when the suppliers are differentiated but have relatively similar costs or (vertical) quality levels, the effect of exclusivity can be to intensify competition by switching it from differentiated competition for marginal units to undifferentiated competition in utility space.

## 4.2. Applicability to Platforms

70. Several features of platform markets make them susceptible to the use of exclusive agreements to harm competition. First, the cross-platform nature of network effects gives rise to the possibility of contractual externalities when there is no mechanism for users on one side of a platform to make financial transfers to users on the other side in order to influence their choice of platform. Absent such mechanisms, a user on one side of a platform might have little concern for the effects of a decision to single-home on the welfare of users on another side of the platform.<sup>53</sup>

71. Second, cross-platform network effects give rise to demand-side economies of scale that allow a platform to benefit if it can use exclusivity as a means of limiting participation on rival platforms and, thus, raising rivals' costs (i.e. weakening their ability to provide user benefits). Moreover, the provision of multi-sided platform services may be subject to strong production economies of scale in addition to demand-side economies of scale, reinforcing these effects. Hence, if there is some initial asymmetry, the leading or dominant platform may be able to benefit from imposing conditions that drive most users in one or more groups to single-home on that platform when they would otherwise have multi-homed. The dominant platform can benefit from increases in its rivals' average costs if the higher costs drive the rivals from the market. And -because the rivals will be weaker competitors- the dominant platform can benefit from increases in its rivals' marginal costs of generating user benefits even if the rivals remain in the market.

72. Shapiro (1999, p. 677) presents a dynamic theory of these effects and argues that multi-homing can serve as a transitional user strategy that facilitates entry by new platforms. The logic of this argument is that, faced with an all-or-nothing choice between an emerging platform and an established one, there are conditions under which users will choose the established platform. However, given the option of multi-homing, some consumers might do so, allowing the emerging platform to begin to build an installed base that will then attract further users. By imposing an exclusivity requirement, an incumbent platform can eliminate this path to entry. Shapiro (1999, pp. 680 and 683) also argues that exclusivity can lead to pessimistic consumer expectations regarding the entrant's prospects, which reinforce this effect.<sup>54</sup>

73. Turning to the sources of asymmetries, platforms may have different production costs, product attributes, or market entry dates. As a result of these differences, platforms may differ in terms of their existing installed bases and/or users' expectations regarding the number of users who will patronize the platforms in the future. There can also be

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<sup>53</sup> As Rochet and Tirole (2006, p. 646) observed, this is an important difference between multi-sided platforms and the sale of complementary goods: unlike the case of buyers who purchase complementary goods (or "systems"), the decision makers on the different sides of a platform generally are not concerned with one another's welfare.

<sup>54</sup> Shapiro (1999) provides a verbal analysis for generic network effects. Doganoglu and Wright (2010) further explore the effects of exclusivity on entry in a formal model that explicitly examines two-sided markets.

feedback effects that reinforce initial asymmetries (e.g. if there are expected to be more side-A users on a platform, then more side-B users are attracted, which then leads more side-A users to patronize the platform and starts a new round of feedback).<sup>55</sup>

74. Four legal cases illustrate how the courts have treated platform exclusivity agreements. These cases also demonstrate that the issues are not new.

75. The earliest of these cases involved media platforms. The Lorain Journal was the only daily newspaper in Lorain, Ohio.<sup>56</sup> In 1948, the radio station WEOL began broadcasting in an area that included the Journal's subscribers. The Journal demanded that advertisers single-home (i.e. it refused to sell advertising to any business that purchased advertising from WEOL). The U.S. Department of Justice alleged (and the Supreme Court agreed) that this conduct was exclusionary and intended to harm competition by driving WEOL out of the local market for advertising. This case fits Calzolari and Denicolò's (2015) theory. The key asymmetry was that, because of the nature of radio advertising and the fact that Journal had a much larger audience than did WEOL, advertisers wanted to use advertising on WEOL only as a supplement to advertising in the Journal.<sup>57</sup> Calzolari and Denicolò's theory indicates that the Lorain Journal was able to weaken competition, which resulted in greater unit sales of advertising by the Journal and higher advertising prices, to advertisers' detriment.

76. The next two cases also build on the idea that, if faced with an all-or-nothing choice, users will choose to patronize the platform with the largest user base but otherwise would multi-home. One case involved floral delivery platforms, which create value by bringing together florists receiving orders for flowers with florists fulfilling orders. Specifically, if a consumer desires to send flowers to someone in another city, the consumer can place an order with a local florist that is a member of a floral-delivery platform and that order will be fulfilled by another platform member that is located near the recipient of the flowers. In the mid-1950s, FTD was by far the largest such platform in the United States and had a policy directly prohibiting its member florists from participating in competing floral platforms.<sup>58</sup> In 1956, the U.S. Department of Justice filed a complaint against FTD alleging that its exclusive membership restriction eliminated competition and preserved FTD's market dominance. FTD and the Department entered into a consent decree enjoining conduct that had the purpose or effect of imposing exclusivity.<sup>59</sup> In 1995, the Department alleged that FTD had violated the consent decree by offering financial rewards to florists that were members of only FTD and that FTD did so in order to weaken rival platforms' ability to compete.<sup>60</sup> FTD agreed

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<sup>55</sup> These asymmetries need not always favor the incumbent. Shapiro (1999, p. 682) observes that an entrant with a sufficiently superior technology might wish to impose exclusivity to hasten users' switching to it. In other words, a technological asymmetry favoring the entrant might outweigh a temporal asymmetry favoring the incumbent.

<sup>56</sup> This case description is based on *Lorain Journal Co. v. United States*, 342 U.S. 143 (1951).

<sup>57</sup> For a range of alternative interpretations, see Lopatka and Kleit (1995).

<sup>58</sup> This case description is based on *United States v. FTD Corp.; Florists' Transworld Delivery, Inc.; FTD Ass'n*, Supplemental to Civil Action No. 56-15748, Memorandum of the United States in Support of Proposed Enforcement Order, July 1, 1995.

<sup>59</sup> *United States v. Florist's Telegraph Delivery Ass'n*, 1956 Trade Cas. (CCH) ¶ 68,367 (E.D. Mich. 1956).

<sup>60</sup> *United States v. FTD Corp.*, 60 Fed. Re. 40,859 (E.D. Mich. 1995).

to cease offering the rewards.<sup>61</sup> The case thus illustrates an asymmetry based on florists' expectations of platform size and the use of both direct and indirect measures to induce single-homing.

77. In the late 1980s, the then-leading video game console manufacturer Nintendo used a direct measure by requiring companies developing games for its Nintendo Entertainment System console to release those games exclusively on that platform for a period of two years. Rival console maker Atari sued Nintendo, alleging that this practice harmed competition and preserved its market position.<sup>62</sup> Although Atari lost the case, Nintendo ceased the practice before the verdict was reached.<sup>63</sup>

78. Lastly, in 2001, the U.S. Department of Justice successfully argued that the MasterCard and Visa credit card networks harmed competition by prohibiting certain forms of multi-homing.<sup>64</sup> MasterCard and Visa both had policies that limited member banks' abilities to issue cards on competing credit and charge card platforms, namely American Express and Discover/NOVUS. Because of asymmetries in coverage and the card products supported by the platforms, banks were reluctant to forego card issuing on MasterCard and Visa entirely in order to issue credit and charge cards on American Express and/or Discover/NOVUS. However, there was evidence that some banks issuing cards on MasterCard and Visa would be interested in issuing cards on the American Express or Discover/NOVUS networks if multi-homing were permitted.<sup>65</sup> American Express's and Discover/NOVUS's inability to attract these card-issuing banks weakened platform competition because the two platforms were less attractive both to cardholders and -on the other side of the platforms- merchants. After the rules were dropped, several banks began issuing cards on the American Express and Discover platforms.

79. In several respects, this case, too, is a good match for Calzolari and Denicolò's (2015) theory. At the time, both American Express and Discover/NOVUS were seen more as niche networks (with American Express supporting cards aimed at high-end consumers and Discover supporting cards aimed at low-end consumers), while MasterCard and Visa supported cards aimed at a broad range of consumers. Hence, American Express and Discover were better positioned to compete for marginal business than compete in utility space.

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<sup>61</sup> Shapiro (1999, p. 677).

<sup>62</sup> Atari Corp. v. Nintendo, No. 89-0824 (N.D.Cal. 1992); Atari Games Corp. and Tengen, Inc. v. Nintendo of America Inc. and Nintendo Co., Ltd., 975 F.2d 832 (Fed. Cir. 1992).

<sup>63</sup> Jonathan Weber, "Jury Sides With Nintendo in Suit Brought by Atari: \* Verdict: Panel exonerates the video game giant of trying to monopolize the market and rules it had not damaged its rival." Los Angeles Times, May 2, 1992

<sup>64</sup> United States v. Visa U.S.A., Inc., 163 F. Supp. 2d 322, 338 (S.D.N.Y. 2001); United States v. Visa U.S.A., Inc., 344 F.3d 229, 238-39 (2d Cir. 2003). I was retained by the U.S. Department of Justice as an economic expert in this matter, and I testified at trial.

<sup>65</sup> There was also a horizontal element of harm. At the time, MasterCard and Visa were associations collectively governed by member card-issuing banks, and the policies at issue restricted the means by which they could compete with one another (i.e. it limited their choices of payment networks on which to rely).

### 4.3. Implications for Enforcement

80. The theories described above have several implications for competition policy.

81. First, a platform seeking exclusive arrangements need not reach them with all -or even most- potential users for such a policy to harm competition. Exclusivity can be used to raise rivals' costs even if there are users that choose to patronize rival platforms: those users may be too few or may lack the necessary characteristics to allow rivals fully to realize network effects and production economies of scale. Moreover, the use of exclusive relationships to eliminate competition at the margin identified by Calzolari and Denicolò (2015) does not rely on denying rivals scale. Instead, exclusivity is used to shift the nature of competition to exploit existing asymmetries among competitors. Hence, enforcement guidelines that focus on the percentage of users that are subject to foreclosure can be misguided.<sup>66</sup>

82. Second, as is also the case with predatory pricing, exclusivity that significantly raises rivals' costs can significantly harm competition even if that conduct does not drive rivals from the market. Moreover, the mechanism of harm identified by Calzolari and Denicolò (2015) relies on shifting the nature of competition rather than eliminating competitors.<sup>67</sup>

83. Third, enforcers should be careful not to place undue weight on contract length. Contractual lock-in is important under a theory of harm in which the asymmetry facilitating the use of exclusivity is temporal and the incumbent uses long-term, staggered contracts signed before the entrant is present to make entry more costly. However, the other theories of harm discussed above do not rely on contracts as commitments and, thus, contract length is unimportant. Instead there has to be an asymmetry among suppliers in terms of costs, product quality, user bases, or user expectations. In the U.S at least, courts have moved away from reliance on contract length. For example, the Dentsply appellate court focused on "the nature of the relevant market and the established effectiveness of the restraint" rather than contract length.<sup>68</sup>

84. Fourth, Calzolari and Denicolò (2015, 3345-46) find that, when exclusivity shifts the market from competition for marginal units to competition for a user's entire volume, it can strengthen or weaken competition, depending on the degree of asymmetry between

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<sup>66</sup> The appellate court in *United States v. Microsoft Corp.* addressed this issue, noting that U.S. courts have "taken care to identify the share of the market foreclosed" (*United States v. Microsoft Corp.*, 253 F.3d 34 (D.C. Cir. 2001) p. 69). While observing that "[b]ecause an exclusive deal affecting a small fraction of a market clearly cannot have the requisite harmful effect upon competition, the requirement of a significant degree of foreclosure serves a useful screening function..." (*id.*), the court went on to state that, "[a]t the same time, however, we agree with plaintiffs that a monopolist's use of exclusive contracts, in certain circumstances, may give rise to a § 2 violation even though the contracts foreclose less than the roughly 40% or 50% share usually required in order to establish a § 1 violation." (*Id.*, p. 70.). The economics of network effects suggests that competition could be harmed by exclusivity involving very substantially less than 40 percent of users.

<sup>67</sup> The possibility of using exclusivity to harm platform competition without inducing exit has been recognized by the U.S. courts. For example, in *United States v. Visa U.S.A., Inc.*, 344 F.3d 229 (2d Cir. 2003), cert. denied, 125 S. Ct. 45 (2004), the defendants were found liable even though the targets of exclusion were not forced to exit the market.

<sup>68</sup> *United States v. Dentsply International, Inc.*, 399 F.3d 181, 184 (3d Cir. 2005).

different suppliers. The authors also indicate that exclusives are less likely to harm competition when rivals also impose exclusivity (Id.). This logic suggests that, when platforms are similar and all impose exclusivity, they are doing so for reasons other than harming competition by weakening some firms' abilities to compete relative to others'.<sup>69</sup>

85. Fifth, as discussed above for non-platform markets, exclusivity can create new avenues of competition (e.g. competition for exclusivity), which complicates enforcement. This is also true of platform markets. When users on one side single home and users on the other do not, the single-homing side chooses the platforms over which interactions will occur. Hence, platforms engage in price competition to attract users on the single-homing side, but not users on the multi-homing side. Indeed, each platform has a monopoly for access to its single-homing users.<sup>70</sup> By contrast, when multi-homing is blocked, platforms will compete for users on both sides.

86. Building on this observation, Armstrong and Wright (2007) show that exclusivity requirements can have very strong implications for the distribution of economic surplus between two sides of platform users. Inter alia, Armstrong and Wright analyze a model of competition between two platforms that facilitate interactions between buyers and sellers in which the authors reach the following findings. Platforms compete solely for buyers (who single-home) and extract all of the surplus from sellers (who multi-home) when platforms cannot require sellers to be exclusive. By contrast, platforms compete to attract sellers to exclusive relationships and extract all of the surplus from buyers when exclusive contracts are permitted.

87. The possibility of such dramatic differences in the effects of exclusivity on the welfare of different user groups raises an important question for competition policy. How should the shift in surplus be treated? One view is that a user-welfare standard should weigh all users equally and focus solely on the net effects. An alternative view is that each user group is entitled to the benefits of competition and that harm to one user group due to harm to competition cannot be offset by gains to another user group that are a consequence of the loss of competition. It would be useful to have greater clarity regarding policy objectives.

88. Although the case did not involve exclusivity, recent litigation between the U.S. Department of Justice and American Express has brought this issue to the fore.<sup>71</sup> The Department of Justice argued that American Express's conduct harmed competition in the market for credit and charge card acceptance services sold to merchants and that

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<sup>69</sup> Hermalin and Katz (2013) examine a theoretical model in which exclusivity creates differentiation that relaxes price competition and benefits all suppliers. The authors find that the welfare effects are ambiguous when one accounts for investment competition. Lee (2013) conducts an empirical study of the video game industry and finds evidence that, in that industry for the period he examined, limitations on multi-homing by video game developers benefited the smaller, entrant platforms by allowing them to differentiate themselves from the incumbent with the larger installed base.

<sup>70</sup> In telecommunications, this effect is known as the terminating access monopoly problem. For an early general analysis, see Armstrong (2006).

<sup>71</sup> The description of this case is based on *United States et al. v. American Express Company, MasterCard International Inc, Visa, Inc.*, No. 15-1672 (2d Cir. 2016) reversing 88 F. Supp. 3d 143 (E.D.N.Y. 2015). I was retained in this matter by the U.S. Department of Justice to serve as an economic expert, and I testified at trial. The U.S. Supreme Court has granted certiorari and will review this case in its 2017 term.

demonstrating harm to merchants was sufficient to shift the burden to American Express to show that it had an offsetting, pro-competitive rationale. Although the Department of Justice prevailed at trial, the appellate court overturned on the grounds that the government should have proven that the losses suffered by merchants as a result of American Express's conduct were not outweighed by gains to American Express's card holders.<sup>72</sup>

89. Sixth, as is well known, network effects can give rise to natural monopoly conditions. A potentially challenging question for competition policy enforcers is whether the greater realization of network effects due to the elimination of rival networks and the consequent coalescing of all users on the same network could be considered to be an efficiencies defence. For example, Armstrong and Wright (2007) consider a model of competition between undifferentiated platforms and find that exclusivity can be used to eliminate a rival. However, exclusion is efficient in their model. More generally, exclusion could also occur with a small degree of product differentiation, in which case, it could be inefficient if the loss of differentiation benefits exceeded the costs of multi-homing (which -absent direct or indirect restraints- could serve as a means of fully realizing cross-platform network effects).

90. Seventh, traditional types of efficiencies should also be credited, where valid. For example, translating the leading pro-competitive justification for exclusivity to platforms, a platform might argue that exclusivity increases its willingness to make investments that benefit users. Segal and Whinston (2000) find that exclusivity has this effect only if the platform's investments raise users' value of transacting with rival platforms, so that a commitment from the user is needed to prevent free riding. Thus, a platform would have to demonstrate that it is investing in its users in ways that raise the value those users would generate if they were to patronize a rival platform.

91. Lastly, the lack of an efficiency rationale justifying the imposition of exclusivity can be informative. In the Dentsply, Lorain Journal, and Visa cases, for example, the defendants were unable to produce credible efficiency rationales for their challenged conduct.

## 5. Conclusion

92. Distinguishing exclusionary from competitive behaviour in multi-sided markets can be complicated and difficult. Depending on the circumstances, the practices at issue may raise or lower welfare and may strengthen or weaken competition. This is a reason for caution in assessing potentially exclusionary conduct. But it is not a reason for giving up on competition policy enforcement. Although the issues are particularly difficult, there are also reasons to believe that two-sided markets may be particularly fertile ground for exclusionary behaviour.

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<sup>72</sup> In my opinion, the evidence demonstrated that the harm to merchants and their customers, in fact, outweighed the gains to American Express card holders.

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## Appendix

The following highly stylized model illustrates why what is ostensibly a total-surplus standard could, in practice, become a competitor-surplus standard. Suppose the actual change in total surplus due to certain conduct is:  $\Delta W = \Delta\pi^I + \Delta\pi^R + \Delta S$ , where the three components of the change in welfare are the change in the incumbent's profits, the change in a rival's profits, and the change in consumer surplus, respectively. In addition, suppose both the decision-making firm and its rival know all of the values with certainty but the court observes only  $\Delta W + \varepsilon$ , where  $\varepsilon$  is a random observation error. Let  $\rho(\Delta W) \equiv \text{Prob}\{\Delta W + \varepsilon < 0\}$  denote the probability that firm will be found liable.

Now, consider the rival's incentive to initiate an enforcement action. Suppose that, *conditional* on the defendant's being found guilty, the expected change in the rival's profits is equal to  $\gamma\Delta\pi^R$ , where  $\gamma > 0$  is a factor that accounts for both the expected amount of monetary damages awarded by the court for past harm and the net present value of not being subject to the defendant's adverse conduct in the future. Ignoring any litigation costs, the expected change in the rival's profits is  $\rho(\Delta W)\gamma\Delta\pi^R$ .

The rival will bring a complaint if and only if the expected benefits are greater than the costs. Letting  $L$  denote the rival's cost of litigation, it will bring a complaint if and only if  $\rho(\Delta W)\gamma\Delta\pi^R > L$ . This rule is equivalent to bringing a complaint if and only if  $\Delta\pi^R < 0$  and  $\Delta W < \delta$ , for some constant  $\delta$  which may be greater or less than 0, depending on the values of  $\gamma$  and  $L$  and the distribution of  $\varepsilon$ .

Given this decision rule, the potential defendant has incentives to avoid actions that harm its rivals -whether through exclusion or competition on the merits. Such an implicit rule is not entirely bad if there is a positive correlation between the amount of harm to the rival and the amount of harm to consumers. However, the correlation might well be negative because stronger competition by one supplier typically will benefit consumers but lower the profits of a rival supplier. Indeed, the sign of the correlation might be seen as a measure of whether the harm to rival is the result of competition or exclusion.