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## *Market definition in multi-sided markets*

Note by Sebastian Wismer & Arno Rasek\*

### 1. Introduction

#### 1.1. One-sided vs. multi-sided markets

1. During the last one and a half decades, multi-sided markets have been a highly debated topic among both researchers and practitioners.<sup>1</sup> A large part of the debate on this type of markets has been focused on internet platforms and the digital economy. However, multi-sidedness is not only an “online” phenomenon. Several traditional “offline” markets such as markets for newspapers or magazines as well as payment card markets have been identified to be multi-sided.<sup>2</sup>

2. Although the question whether a market is one-sided or multi-sided sometimes is difficult to answer, distinguishing between one-sided and multi-sided markets is a useful conceptual approach: traditional “one-sided” logic may fail if firms simultaneously serve different customer groups with interdependent demand, in particular if indirect network effects are present.<sup>3</sup> There is, however, no consensus on which characteristics a market must have to be defined as a multi-sided market.<sup>4</sup> While a firm that is active in a multi-sided market generally must serve at least two distinct customer groups (which constitute the different “sides” of the market), most definitions stipulate that there are indirect network effects between these two or more customer groups. The presence of indirect

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<sup>1</sup> Cf. e.g. Evans and Schmalensee, ‘The Antitrust Analysis of Multi-Sided Platform Businesses’ in Blair and Sokol (eds), *The Oxford Handbook of International Antitrust Economics*, vol. 1 (New York, Oxford University Press 2015), and OECD, ‘Two-Sided Markets’ (2009) Best Practice Roundtables on Competition Policy.

<sup>2</sup> Cf. e.g. *Funke/Springer Programmzeitschriften* (Case B6-98/13) Bundeskartellamt Decision 25 April 2014, para 138; *Zeitungsverlag Schwäbisch Hall* (Case B6-150/08) Bundeskartellamt Decision 21 April 2009, para 33; *Visa MIF* (Case AT.39398) Commission Decision 26 February 2014 OJ C 168, para 16.

<sup>3</sup> Cf. e.g. Wright, ‘One-sided logic in two-sided markets’ (2004) 3:1 *Review of Network Economics*; Schiff, ‘The ‘waterbed’ effect and price regulation’ (2008) 7:3 *Review of Network Economics*; King, ‘Two-sided markets’ (2013) 46:2 *The Australian Economic Review* 247-258.

<sup>4</sup> Cf. e.g. Hagiu and Wright, ‘Multi-sided platforms’ (2015) 43 *International Journal of Industrial Organization* 162-174.

network effects between market sides affects the price setting mechanism and the competitive interaction in these markets.

3. It is worth noting that multi-sidedness is not strictly a “binary” but rather a gradual phenomenon. While conceptually the discussion often revolves around an adequate definition of multi-sidedness and, subsequently, whether certain types of markets or businesses are multi-sided, in practice the question of how important multi-sided issues are in a certain market seems more relevant.<sup>5</sup> Thus, even if indirect network effects may be present in many markets, it should be investigated case by case to what extent they influence firms’ behavior and market outcomes.

## 1.2. The role of market definition

4. Due to indirect network effects, the antitrust assessment is typically more complex in multi-sided markets. This is also true for market definition. To tackle the specific challenges of market definition in multi-sided markets, it is helpful to recall the role of market definition as part of the case analysis.

5. While economists often abstract from market definition within their theoretical models, practitioners need to get at least some notion about the definition of the relevant market. Market definition helps to identify customer demand and relevant competitors.<sup>6</sup> Market definition should inform the competitive assessment and organize it. However, market definition should not be seen as an end in itself, but a first important step that helps to assess competitive constraints, market power, and the effects of the behavior at stake.<sup>7</sup> Economists often struggle with the binary nature of market definition and the impact it can have on the antitrust analysis, in particular as the level of certain market power indicators depends on market definition. Thus the binary concept has been enriched by more nuanced concepts such as closeness of competition. In general, the competitive assessment in a certain case and the definition of the relevant market(s) can be seen as “communicating vessels”.<sup>8</sup> In principle, a narrow market definition often goes along with an indication of substantial market power, e.g. a high market share, while a wide market definition tends to suggest little market power. However, such indications should always be put into perspective and may in certain cases also be refuted or confirmed by other circumstances, for instance a detailed analysis of closeness of competition, potential competition or imperfect (fringe) substitution.<sup>9</sup>

6. As multi-sided markets involve distinct groups of customers which may or may not be attributed to distinct (but interdependent) markets, these principles on the role of market definition often become even more important in multi-sided markets. In particular, due to interdependencies between markets, the (stand-alone) value of market definition may even be more limited than in one-sided markets.

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<sup>5</sup> Also cf. Rysman, ‘The Economics of Two-Sided Markets’ (2009) 23:3 Journal of Economic Perspectives 125-143.

<sup>6</sup> Also cf. OECD, ‘Market Definition’ (2012) Best Practice Roundtables on Competition Policy.

<sup>7</sup> Cf. e.g. ICN Merger Guidelines Workbook, April 2006, p. 15.

<sup>8</sup> Cf. e.g. Ewald, ‘Der SIEC-Test im deutschen Recht: Grundansatz, materielle Detailfragen und praktische Auswirkungen aus ökonomischer Sicht’ (2014) 3 Wirtschaft und Wettbewerb 261-281.

<sup>9</sup> Also cf. Bundeskartellamt, ‘Guidance on Substantive Merger Control’ (2012) paras 77-78.

### 1.3. Structure of the paper

7. In line with the request of the Chairman of the Competition Committee, we will focus on practical proposals on how agencies might deal with market definition in multi-sided markets rather than on theoretical questions or policy issues. In the following, we will first discuss the two approaches to capture the structure of multi-sided markets: defining separate markets for each market side or defining a single market encompassing all customer groups of a platform. Second, we will briefly explain how multi-homing or single-homing can affect market definition. Third, we will deal with some further challenges when applying traditional methods for market definition to multi-sided markets. Finally, we will present some concluding remarks.

8. Throughout this paper (and also in most of the literature on multi-sided markets) firms that are active in multi-sided markets are called ‘platforms’. It should be noted that the term ‘platform’ in this sense also includes offline firms.

## 2. One single market vs. separate markets for distinct market sides

9. As multi-sided markets involve distinct groups of customers, there are in principle two alternative approaches to capture their specific structure: defining separate markets for each customer group or defining a single market encompassing all customer groups.

### 2.1. Pros and cons of the two alternatives

10. Both approaches have their strengths and weaknesses, which in particular depend on the individual circumstances of a sector and the nature of the services at hand.

11. Defining separate markets can be done straightforward by capturing the competitive landscape on each ‘side’ of the market one after the other. In comparing the competitive forces identified within these separate markets, it is easy to identify whether the set of relevant product substitutes/competitors or the geographic scope differ across markets. In particular, the analysis may illustrate that a platform operator is dominant, but possibly not on all market ‘sides’. For example, if one customer group predominantly practices single-homing while another one practices multi-homing, there might be fierce competition to attract customers from the single-homing group, but little competition for customers from the multi-homing group.<sup>10</sup> Overall, with separate markets, it seems relatively unlikely that the analysis will miss any competition issue that evolves on one of the ‘sides’ of the market.

12. However, defining separate markets for each customer group may be inappropriate if the different groups are inseparably linked by a platform interaction, in particular if a platform’s service necessarily involves all customer groups. Furthermore, the competitive analysis may be done repeatedly without gaining additional insights if the set and the relevance of competitors as well as the geographic scope do not differ across market ‘sides’. Moreover, the risk of missing relevant effects driven by interdependencies between different customer groups such as indirect network effects seems higher with

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<sup>10</sup> Cf. e.g. Armstrong, ‘Competition in two-sided markets’ (2006) 37:3 RAND Journal of Economics 680.

separate markets. These aspects militate in favour of defining a single market encompassing all customer groups.<sup>11</sup>

13. In principle, both approaches seem to be in line with the concept of demand-side substitutability; in particular, defining one single market does not conflict with this concept as a platform can be understood as a provider of an intermediation service, serving linked user groups with essentially the same service. All in all, and given the role of market definition as a tool that supports competitive analysis, neither of the two approaches seems right or wrong in absolute terms as long as the analysis appropriately accounts for interdependencies –such as indirect network effects– and for all competitive forces on each ‘side’ of the market.

## 2.2. Types of platforms and types of network effects as potential guidelines

14. While all multi-sided markets are characterized by the presence of several groups of customers among which a certain kind of interaction takes place, the interaction’s type and objective as well as the role of the platform operator can differ. The following characteristics can serve as guidelines when choosing how to capture the actual market structure.

15. One distinction may be drawn between transaction platforms and non-transaction platforms.<sup>12</sup> A *transaction platform* can be defined as an intermediary whose aim is to enable direct (observable)<sup>13</sup> transactions between two distinct customer groups. Both groups share the same objective, i.e. to conduct a transaction (such as the trading of a product) with the respective other side. There are positive bilateral indirect network effects between the two groups that are internalised by the transaction platform. One side by itself would not be sufficient for the service offered by the platform, i.e. multi-sidedness is not a non-mandatory option but an essential part of the service. In contrast, *non-transaction platforms* mediate a different kind of interaction and do not necessarily exhibit bilateral positive network effects. Enabling interactions is not always an integral part of their service. In particular, some non-transaction platforms may be launched with one side only, and the second side may be added at a later stage. A media platform, such as a newspaper, for example, is able to generate a wide readership by providing editorial contents, and later offer the platform to advertising companies for their purposes. In this case, the readers are interested in the editorial contents of a newspaper, while the advertisers want to attract the readers’ attention. Consequently, it is not always necessary for non-transaction platforms to bring both groups of users on board, as some of these platforms could also exist without one of the two groups. Establishing such non-transaction platforms can therefore be understood as a strategic business decision of a

<sup>11</sup> Also cf. Evans and Noel, ‘The analysis of mergers that involve multisided platform businesses’ (2008) 4:3 *Journal of Competition Law and Economics* 674, and Monopolies Commission, ‘Competition policy: The challenge of digital markets’ (2015), Special Report No 68, para 58.

<sup>12</sup> Filistrucchi, Geradin, van Damme and Affeldt, ‘Market definition in two-sided markets: Theory and practice’ (2014) 10:2 *Journal of Competition Law and Economics* 293-339; Luchetta, ‘Is the Google platform a two-sided market’ (2014) 10:1 *Journal of Competition Law and Economics* 185-207.

<sup>13</sup> Observability (or, more precisely, verifiability) facilitates the platform charging transaction-based tariffs, extending the space of feasible contracts.

firm that would also serve its purpose with only one of the customer groups.<sup>14</sup> All in all, this suggests defining one single market in the case of a transaction platform while defining distinct markets in the case of a non-transaction platform.<sup>15</sup>

16. Another similar distinction may be made between “matching platforms” and “audience providing/advertising platforms”.<sup>16</sup> A *matching platform* can be described by its objective to enable the best possible match between different user groups. This objective is shared by all user groups involved. Although this characterization partly overlaps with the definition of a transaction platform, a matching platform may also enable interactions which do not necessarily imply a subsequent (observable) transaction between user groups. One example of this type are dating platforms. Although certain matching platforms also exhibit (negative) *direct* network effects,<sup>17</sup> they always have positive bilateral indirect network effects. Hence, transaction platforms can be seen as a sub-category of matching platforms. In contrast, *audience providing platforms* or *advertising platforms* provide one user group, e.g. advertisers, with the audience or attention of another user group, e.g. readers. The platform facilitates an interaction between users and advertisers in the form of a subsequent contact resulting from users reacting to the advertisement (for instance, by clicking on the ad). Although there might be a certain matching process involved, the characteristic indirect network effect is unidirectional, benefiting the advertisers. All in all, this suggests defining one single market in the case of a matching platform while defining distinct markets in the other cases.

17. Along with these potential guidelines, it can be useful to investigate the role of the platform in detail –notably, the extent to which the platform is involved in the interaction that it enables. On the one hand, this may involve legal questions such as whether the operator acts as a commission agent or trade representative or bears a substantial part of specific risks; under certain circumstances these issues are connected with further questions as to the applicability of specific competition law provisions or, in particular, the Vertical Block Exemption Regulation.<sup>18</sup> On the other hand, this may lead to conceptual questions such as whether it is more appropriate to interpret certain market structures as vertical (upstream and downstream market) rather than two sides of a platform.<sup>19</sup> However, certain aspects arising in vertical structures, e.g. demand for a wide

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<sup>14</sup> Luchetta, ‘Is the Google platform a two-sided market?’ (2014) 10:1 Journal of Competition Law and Economics 192.

<sup>15</sup> One may also argue that a distinction based on the platforms’ actual tariff system(s) should be made; in the case of purely transaction-based fees, defining separate markets might be less reasonable than defining a single market, cf. Wright, ‘One-sided logic in two-sided markets’ (2004) 3:1 Review of Network Economics 62.

<sup>16</sup> Cf. Bundeskartellamt, B6-113/15, Working Paper – The Market Power of Platforms and Networks, June 2016.

<sup>17</sup> Cf. e.g. Goos, van Cayseele and Willekens, ‘Platform pricing in matching markets’ (2013) 12:4 Review of Network Economics 437-457.

<sup>18</sup> Cf. e.g. *CTS Eventim/FKP Scorpio* (Case B6-53/16) Bundeskartellamt Decision 3 January 2017, paras 101-122.

<sup>19</sup> Cf. Hagiu and Wright, ‘Multi-sided platforms’ (2015) International Journal of Industrial Organization 43 162-174, and Hagiu and Wright, ‘Marketplace or reseller?’ (2015) 61:1 Management Science 184-203.

range of products within wholesale or retail markets, can have similar implications as indirect network effects have within multi-sided markets.

### 2.3. Case examples

18. In Germany, the Bundeskartellamt has identified newspapers as well as magazines as platforms, i.e. firms that operate in a multi-sided market. However, it has defined two distinct antitrust markets for readers and advertisers.<sup>20</sup> This seems reasonable since newspapers and magazines usually do not enable a direct transaction between readers and advertisers, as they do not necessarily need to get advertisers ‘on board’ to serve readers, and as the products considered as substitutes usually differ between readers and advertisers. In contrast, in the case of a merger of two online real estate platforms, the Bundeskartellamt tended towards defining a single market including both customer groups, although it ultimately left the market definition open.<sup>21</sup> In a merger decision concerning online dating platforms, the Bundeskartellamt explicitly defined a common market including both user groups that are matched by a dating platform.<sup>22</sup> In its decision on a merger involving a supplier of ticketing solutions and a concert promoter, the Bundeskartellamt identified the market for ticketing systems to be multi-sided, but considered the supply of a ticketing system towards event promoters as an upstream market and the supply of a ticketing system towards ticket agencies as a downstream market. Accordingly, it defined two separate markets, in particular to account for the commissioning activities provided by the ticketing system supplier.<sup>23</sup>

19. It seems that the European Commission in most cases did not explicitly address the question whether one single market including several groups of customers should be defined in cases concerning multi-sided markets.<sup>24</sup> However, in the merger case *Travelport/Worldspan* the Commission intensively assessed multi-sidedness, and in particular indirect network effects, in “Global Distribution Services” (“GDS”). The Commission seemed to apply a single market definition. However, the Commission considered both market sides to be in a vertical relationship – an *upstream* market for flight and travel service providers and a *downstream* market for travel agents. The Commission did not consider the intermediary service as a product, i.e., matching by the GDS platform was not considered in the context of market definition.<sup>25</sup>

<sup>20</sup> See fn. 2.

<sup>21</sup> *Immonet/Immowelt* (Case B6-39/15) Bundeskartellamt Decision 20 April 2015, case summary available at [www.bundeskartellamt.de](http://www.bundeskartellamt.de).

<sup>22</sup> *Parship/Elitepartner* (Case B6-57/15) Bundeskartellamt Decision 22 October 2015, paras 71-79.

<sup>23</sup> *CTS Eventim/FKP Scorpio* (Case B6-53/16) Bundeskartellamt Decision 3 January 2017, paras 101-122.

<sup>24</sup> *Google/DoubleClick* (Case COMP/M.4731) Commission Decision 11 March 2008 OJ C 184; *Microsoft/Yahoo* (Case COMP/M.5727) Commission Decision 18 February 2010 OJ C 020; *Microsoft/Skype* (Case COMP/M.6281) Commission Decision 7 October 2011 OJ C 341; *Google/Motorola Mobility* (Case COMP/M.6381) Commission Decision 13 February 2012 OJ C 75; *Facebook/WhatsApp* (Case COMP/M.7217) Commission Decision 3 October 2014 OJ C 417.

<sup>25</sup> *Travelport/Worldspan* (Case COMP/M.4523) Commission Decision 21 August 2007 OJ L 314.

## 2.4. Free-of-charge services

20. In multi-sided markets it can be frequently observed that the platform operator charges only one customer group while the service is offered for free to another customer group. There has been some debate as to whether free-of-charge antitrust markets should be defined. In Germany, the Düsseldorf Higher Regional Court even held that such markets cannot ‘exist’ in antitrust terms<sup>26</sup> which caused a legislative clarification.<sup>27</sup> It is true that where there are payments between a supplier and a customer there always exists an antitrust market. But the inverse conclusion should not be drawn.

21. Irrespective of whether one single market or separate markets are defined, services offered free of charge should be considered as (part of) an antitrust market if there exist indirect network effects between the group that is served without being charged and another group that is charged.<sup>28</sup> When ignoring one side of a multi-sided market, important competitive aspects might be missed, as there usually is competition for customers no matter whether they are paying customers or not. In fact, a customer group being not charged might be due to intense competition for these customers. However, the fact that a service is offered free of charge on its own should not justify the definition of a separate market, in particular as the (zero) pricing decision may reflect both competition and network effects, and, hence, may be associated with the strategic pricing decision towards other customer groups. Consequently, when both paid and free-of-charge services are offered in parallel, it seems reasonable to consider free-of-charge services as competing services instead of ignoring them.

22. The approach proposed here also offers a straight-forward answer to the currently intensely debated question of whether data should be viewed as a ‘currency’ in the context of internet platforms:<sup>29</sup> for a free-of-charge antitrust market to ‘exist’ it should not be a requirement that it must essentially be a bundle that comprises a good with a positive value for the customers (i.e. the platform service) and a good with a negative value for the customers (i.e. ads, use of their data) which can be viewed akin to a ‘payment’ for the platform service. The reason is that in multi-sided markets, setting a price of zero for one customer group may make perfect sense for the platform provider also if the service does not come along with any negative good tied to it. Instead, the relevant question for the platform provider is to what extent he can monetize the presence of these customers on other market sides. For the purposes of market definition for internet platforms, there should thus be no need for the agency to establish that providing data is of negative value to customers or to even quantify this negative value. As free-of-charge markets may be

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For further case examples, see e.g. Filistrucchi, Geradin, van Damme and Affeldt, ‘Market definition in two-sided markets: Theory and practice’ (2014) 10:2 *Journal of Competition Law and Economics* 293-339.

<sup>26</sup> *HRS* (Case VI Kart 1/14 (V)), Düsseldorf Higher Regional Court 9 January 2015, para 43.

<sup>27</sup> In March 2017, the German Parliament passed the Federal Government Bill on the Ninth Amendment of the German Competition Act; § 18 para. 2a of this Bill explicitly clarifies that services’ being offered free-of-charge does not conflict with defining an antitrust market.

<sup>28</sup> This approach is also in line with the practice of the European Commission that dealt with several markets including services without charge, cf. fn. 24.

<sup>29</sup> Cf. e.g. Schepp and Wambach, ‘On big data and its relevance for market power assessment’ (2016) *Journal of European Competition Law and Practice* 7:2 120-124; Körber, ‘Analoges Kartellrecht für digitale Märkte?’ (2015) 2 *Wirtschaft und Wettbewerb* 120-133.

defined due to the existence of a different customer group being charged, there is no need to find a ‘currency’ from the viewpoint of the customers that are not being charged.

## 2.5. Summarising remarks

23. Defining one single market seems reasonable for services which mainly aim at enabling a direct (observable) transaction between different groups, e.g. in the case of a trading platform that brings together sellers and buyers. In particular, this approach seems feasible if (i) a firm’s service necessarily involves all groups and (ii) the set of substitutes and their respective relevance from the perspective of each customer group does not differ significantly across groups. Otherwise, in particular if the products or services considered as substitutes (and, hence, competition conditions) differ substantially across groups, defining a separate market for each distinct customer group seems more appropriate; in these cases, the resulting markets usually differ in product and/or geographic scope. These constellations are more likely to exist in cases with non-transaction or audience providing/advertising platforms. However, market definition and the choice between the two approaches need to be done on a case-by-case basis.

## 3. Product market definition with multi-homing and single-homing

24. While the previous section focused on the question of whether separate antitrust markets should be defined for different sides of a multi-sided market, the following section deals with the question of whether two platforms belong to the same product market(s) or not.

25. In principle, the factors relevant for product market definition in single-sided markets equally apply to multi-sided markets. However, there is a specific phenomenon (more) frequently found in multi-sided markets that may have significant impact on the antitrust analysis. In multi-sided markets, pricing and market outcomes depend, among other things, on whether customers choose a single platform (single-homing) or use more than one platform simultaneously (multi-homing). In particular, a relatively high degree of multi-homing within a group of customers may indicate a low level of competition for these customers, while a relatively high degree of single-homing within a customer group may indicate intense competition for those customers.<sup>30</sup>

### 3.1. Multi-homing: Substitute or non-substitute use of different platforms

26. In general, there can be different reasons for customers’ multi-homing.<sup>31</sup> The most evident reason seems to be product differentiation, i.e. differences between the platforms’ services, e.g. in terms of functionalities. Similar as in one-sided markets, depending on the degree of these differences and customers’ preferences towards them, two platforms may be attributed to different markets. However, even platforms that offer similar services/functionalities may differ in terms of customers’ usage behaviour. Furthermore,

<sup>30</sup> Cf. e.g. Rochet and Tirole, ‘Two-sided markets: a progress report’ (2006) 37:3 *RAND Journal of Economics* 645-667, or Armstrong, ‘Competition in two-sided markets’ (2006) 37:3 *RAND Journal of Economics* 668-691.

<sup>31</sup> Cf. e.g. *Travelport/Worldspan* (Case COMP/M.4523) Commission Decision 21 August 2007 OJ L 314 para 13-20.

even if platforms do not differ in their customers' usage behaviour, "endogenous" differentiation may evolve, induced by the composition of their customers. Both kinds of differentiation can rationalise customers' decisions on multi-homing and may justify defining narrow product markets.

27. In some cases multi-homing can indicate that customers use different platforms in parallel to cover different needs, even though the platforms' services may be similar at first view. For example, in its decision concerning the merger of Microsoft and LinkedIn, the European Commission distinguished between professional and personal social networks, in particular because they are used for different purposes and in different ways, although the technical functionalities of both types of social networks feature several similarities.<sup>32</sup>

28. In practice, it is often possible for a competition agency to gain insights on the extent of multi-homing. However, it might be challenging to interpret this information. Multi-homing may be a factor mitigating the probability of 'tipping' if the two platforms are substitutes. Multi-homing also tends to reduce the relevance of indirect network effects: if all customers of one group are present on all platforms, the number of these customers does not affect the choice between platforms made by members of other groups.<sup>33</sup> Multi-homing may, however, also indicate that the platforms are not (direct) competitors, while multi-homing figures alone do not tell us anything about substitutability.

29. Although the literature on multi-sided markets analyses the impact of multi-homing on platforms' decisions and market outcomes in several facets, there seem to be no contributions that focus on the implications of multi-homing on market definition. Where one or several customer groups practice multi-homing, agencies should try to investigate the customers' multi-homing rationales and consider further splitting of the market, thus segregating platforms that are used for different purposes and, hence, are not direct competitors.

### 3.2. Single-homing and platforms as "bottlenecks"

30. As indicated above, customers' choices between single-homing and multi-homing can affect competition and there can be different reasons for customers' multi-homing. In particular, if one customer group, S, is single-homing, a distinct customer group from another 'side', M, might be interested in interacting with members of group S that are using different platforms, leading to multi-homing by M's members. I.e. customers from group M may value a certain "reach" in order to be able to (potentially) interact with many members of group S; or customers from group M are interested in reaching specific members of group S that are dispersed across several platforms. In these cases, one or more platforms can become "bottlenecks" that provide exclusive access to single-homing

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<sup>32</sup> *Microsoft/LinkedIn* (Case Comp/M.8124) Commission Decision 6 December 2016 para 103-110. However, it seems that the Commission did not consider multi-homing within the context of market definition in its decision.

<sup>33</sup> Cf. *Travelport/Worldspan* (Case COMP/M.4523) Commission Decision 21 August 2007 OJ L 314 para 79-80.

customers.<sup>34</sup> This means that one platform or even several similar platforms may possess market power vis-a-vis customers of group M. Where market power is high it might be reasonable to define a market that comprises only one platform (at least on market side M). For example, in the context of the communications sector, wholesale call termination markets are defined separately for each terminating operator's network as there are no substitutes for terminating a call to a specific subscriber's telephone line that belongs to the network of one single operator.<sup>35</sup> However, if a platform fiercely competes with other platforms for single-homing customers, which limits the platform's market power, it might also be appropriate to include all of these platforms in one market. Similar to cases in which platforms are used for different purposes, it would be advisable to try to investigate the customers' rationale for multi-homing.

### 3.3. Summarising remarks

31. Customers' single-homing and multi-homing behaviour can be relevant for market definition. Much will depend on the underlying rationales. Multi-homing and single-homing may both justify narrowly defined markets, but the rationale for defining markets narrowly is quite different. 'Multi-homing' may reflect product differences, whereas 'single-homing' may indicate that platforms are bottlenecks.

## 4. Further challenges when applying traditional methods for market definition in multi-sided markets

32. In the following, we will illustrate several challenges as well as peculiarities that arise when applying traditional methods for market definition in multi-sided markets. The first part deals with the SSNIP test as a widespread framework which, however, seems difficult to apply in practice in multi-sided markets. The second part covers some other quantitative methods, while the third part addresses the role of qualitative evidence.

### 4.1. SSNIP test

33. One concept that can assist in market definition is the so called SSNIP test. The SSNIP test was originally developed for one-sided markets.<sup>36</sup> However, due to demanding data requirements and serious operationalisation issues, the concept should rather be viewed as an analytical framework as opposed to an easily quantifiable 'test'.

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<sup>34</sup> Also cf. *Travelport/Worldspan* (Case COMP/M.4523) Commission Decision 21 August 2007 OJ L 314 para 77-81, and Armstrong, 'Competition in two-sided markets' (2006) 37:3 RAND Journal of Economics 668-691.

<sup>35</sup> Cf. e.g. European Commission, 'Explanatory Note accompanying the Commission Recommendation on relevant product and service markets within the electronic communications sector' SWD(2014) 298, p.28.

<sup>36</sup> Starting from a very narrow candidate market, the test asks whether a small but significant and non-transitory increase in price ("SSNIP") would be profitable from the perspective of a hypothetical monopolist in the candidate market. If a SSNIP is not profitable, there probably exists at least one further relevant substitute product which has not been taken into account. In this case, it is suggested that the candidate market be expanded until a SSNIP will be profitable from the perspective of a hypothetical monopolist.

34. The original SSNIP test does not account for interdependencies between distinct customer groups. In a two-sided market, for example, a price increase for one customer group (side A) leads to changes in demand not only on this side, A, but also on the other side, B. Ignoring such volume changes that emanate from indirect network effects may distort the result of the SSNIP test.<sup>37</sup> In case of multilateral positive indirect network effects the profitability of a price increase would be overestimated, suggesting ‘too narrow’ markets. Furthermore, even when accounting for volume changes caused by indirect network effects, the profitability of a (unilateral) price increase also depends on whether prices for other customer groups can be adjusted.<sup>38</sup>

35. Although approaches to modify the SSNIP test to account for indirect network effects can be found in the literature,<sup>39</sup> the concept remains difficult to use in multi-sided markets.<sup>40</sup> In practice, the main issues include the lack of proper data on a specific industry (while data requirements are higher in multi-sided markets), handling of free-of-charge services as well as the identification and operationalisation of competitive dimensions besides the price (which might be even more relevant in multi-sided markets). In particular, modelling and measuring network effects is a non-trivial task, but it is crucial for the analysis of the SSNIP test as a platform’s pricing leeway may be limited by multilateral positive network effects or increased by negative network effects. While the sign (positive or negative) can typically be established, possibly by using qualitative evidence, the strength as well as the shape of network effects seem difficult to quantify. Furthermore, multi-sided markets may be especially prone to a “cellophane fallacy” due to concentration tendencies that multi-sided markets may exhibit. Given these problems, it is not surprising that so far competition authorities do not seem to have applied a modified version of the SSNIP test that accounts for multi-sidedness.<sup>41</sup>

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<sup>37</sup> Cf. e.g. Evans and Noel, ‘The analysis of mergers that involve multisided platform businesses’ (2008) 4:3 *Journal of Competition Law and Economics* 663-695, Evans and Noel, ‘Defining Antitrust Markets When Firms Operate Two-Sided Platforms’ (2005) 3 *Columbia Business Law Review* 667-702.

<sup>38</sup> Cf. Filistrucchi, Klein & Michielsen, ‘Assessing unilateral merger effects in a two-sided market: an application to the Dutch daily newspaper market’ (2012) 8:2 *Journal of Competition Law and Economics* 322, for an exemplary (numerical) illustration of the application of different modified versions of the SSNIP test with and without optimal adjustment of the two-sided pricing structure.

<sup>39</sup> Cf. Filistrucchi, Geradin, van Damme and Affeldt, ‘Market definition in two-sided markets: Theory and practice’ (2014) 10:2 *Journal of Competition Law and Economics* 293-339, and Evans and Noel, ‘The analysis of mergers that involve multisided platform businesses’ (2008) 4:3 *Journal of Competition Law and Economics* 663-695.

<sup>40</sup> Cf. e.g. Dewenter, Rösch and Terschüren, ‘Abgrenzung zweiseitiger Märkte am Beispiel von Internetsuchmaschinen’ (2014) 2 *NZKart Neue Zeitschrift für Kartellrecht* 387-394, Kehder, ‘Konzepte und Methoden der Marktabgrenzung und ihre Anwendung auf zweiseitige Märkte’ (Nomos, Baden-Baden 2013), and Haucap and Stühmeier, ‘Competition and antitrust in Internet markets’ in Bauer and Latzer (eds), *Handbook on the Economics of the Internet* (Cheltenham, Edward Elgar Publishing 2016).

<sup>41</sup> Also cf. Filistrucchi, Geradin, van Damme and Affeldt, ‘Market definition in two-sided markets: Theory and practice’ (2014) 10:2 *Journal of Competition Law and Economics* 339, and Kehder, ‘Konzepte und Methoden der Marktabgrenzung und ihre Anwendung auf zweiseitige Märkte’ (Nomos, Baden-Baden 2013) 85-86.

## 4.2. Other quantitative methods

36. Other quantitative methods such as the estimation of demand functions, elasticities or diversion ratios may involve similar issues. When explaining changes in demand triggered by variations in price or other strategic variables, indirect network effects should be accounted for. In particular, if multilateral positive indirect network effects are present, but not taken into account in the estimation of (long-run) demand reactions, the direct effect of a variation of a strategic variable on the respective firm's demand is likely to be overestimated, as part of the demand reaction is driven by a feedback effect.<sup>42</sup> However, disentangling these effects in a robust way seems difficult in practice, if proper data are available at all. Data retrievable for the specific market under review will typically not contain sufficient (observable) variation with regard to the presence of indirect network effects that would allow for an econometric quantification of indirect network effects.

37. Less complex methods that abstract from modelling demand, such as price correlation analyses, seem to be more easily applicable. However, multi-sidedness may complicate the interpretation of calculated substitutability indicators, e.g. correlations, as additional indirect network effects interfere with substitution as a (direct) reaction on a certain variation, e.g. a price change. Furthermore, the amount of time until indirect network effects fully unfold a feedback effect may vary, so the analysis may need to comprise (different) time lags.

38. Beyond econometric analyses, it is often useful to apply descriptive quantitative methods. For example, the matching of customer lists of different platforms can be used to determine the degree and importance of multi-homing or to identify common customers and their characteristics. Furthermore, it can be helpful to examine the size of customer groups and the volume of new subscribers/customers over several periods, in particular if a party submits that pronounced switching has occurred between certain platforms, as this may also be reflected in the customer structure or group sizes. In addition, similar as in one-sided markets, determining catchment areas on the basis of customer locations can be meaningful when defining the geographic market; however, in multi-sided markets additional insights can be gained from analysing whether indirect network effects depend on the location of customers from other groups. If advertisers, for example, are predominantly interested in targeting customers of a platform who are resident in a certain region, this may lead to a corresponding segmentation of the market by regions, even if the advertisers themselves may be based in different regions or countries. Results of such descriptive methods are often helpful, especially when they complement qualitative evidence.

## 4.3. Qualitative evidence

39. Qualitative evidence is (more) frequently used by competition authorities. In particular, tools such as market studies or an assessment of the consumers' and other

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<sup>42</sup> Cf. Argentesi and Ivaldi, 'Market Definition in Printed Media Industry: Theory and Practice' (2005) CEPR

Discussion Paper No. 5096, for an exemplary indication of a bias that may arise from ignoring two-sidedness when estimating own-price elasticities.

competitors' points of view can be rather helpful for defining the relevant market(s).<sup>43</sup> Moreover, surveys and internal documents can often be helpful, e.g. in understanding firms' rationales behind certain strategic (re)actions or identifying the set of competitors that a firm perceives and monitors.

40. Customer surveys in one-sided markets involve well-known problems, e.g. answers to certain questions from competition authorities might sometimes be biased strategically, and stated preferences might differ from real reactions.<sup>44</sup> In multi-sided markets additional issues may arise. When investigating stated preferences, in particular, an implicit or explicit assumption on "other things being equal" might be misleading, as the choice between alternative offers in presence of network effects also depends on the choices of other customers. For example, when asking customers about their hypothetical reaction to a price increase, they may respond to such a question under the (wrong) implicit assumption that the price increase will not induce any other customer to leave the platform. Hence, on the one hand it can be useful to assess how important network effects are for the choices of each customer group, but on the other hand questions concerning the (hypothetical) substitutability of offers become complicated when both product characteristics (including price) and network effects drive respondents' real choices.

#### 4.4. Summarising remarks

41. Competition authorities frequently face the challenge of choosing among investigation tools which exhibit different strengths and weaknesses and differ in their resource requirements as well as their reliability. In many cases, authorities refrain from applying complex econometric methods, in particular due to time constraints, lack of proper data or methodical complexity which often comes along with limited robustness and difficulties in interpreting and communicating results.

42. In multi-sided markets, the analytical complexity is higher if compared to markets without network effects. Consequently, it seems natural to lean towards simple tools with a lower degree of complexity. The extent and impact of network effects on both platforms and their customers should be assessed (at least) qualitatively, in particular to mitigate the risk of misinterpreting results from established 'one-sided' tools.

## 5. Conclusion

43. Although there seems to be no clear-cut distinction between one-sided and multi-sided markets, some specific features of multi-sided markets, especially indirect network effects, require special attention.

44. As in one-sided markets, market definition and the further competitive assessment can be seen as 'communicating vessels'.<sup>45</sup> This metaphor works very well for the different sides of a multi-sided market, too, where the interdependencies between market

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<sup>43</sup> Cf. Judgment of the General Court, *Topps Europe v Commission*, 11 January 2017, T-699/14, EU:T:2017:2, para 82.

<sup>44</sup> Cf. e.g. Davis and Garcés, '*Quantitative Techniques for Competition and Antitrust Analysis*' (Princeton, Princeton University Press, 2009) 193ff.

<sup>45</sup> Also cf. fn. 8.

sides ('vessels') can be understood as a 'communicating' element.<sup>46</sup> Consequently, just as the market definition analysis should be closely linked with the further competitive assessment, the different sides of a multi-sided market should also be analysed in close relation to one another, especially when defining separate markets for different market sides.

45. Defining one single market or defining separate markets for distinct market sides are both viable and "correct" approaches as long as the further analysis appropriately accounts for interdependencies between different sides, and also for all relevant competitive forces on each side of the market.

46. Beyond this decision, customers' multi-homing behaviour can be relevant for market definition. Depending on the underlying rationales, both multi-homing and single-homing may justify defining narrow markets.

47. When applying traditional methods for market definition in multi-sided markets, further challenges may arise, especially with advanced quantitative (econometric) methods. Given the analytical complexity of multi-sidedness, a holistic look at market circumstances seems even more important in multi-sided markets than in one-sided markets.

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<sup>46</sup> Also cf. Ducci, 'Out-of-market efficiencies, two-sided platforms, and consumer welfare: a legal and economic analysis' (2016) 12:3 *Journal of Competition Law and Economics* 610.