Mergers in Two-Sided Markets
- A Report to the NMa

Jointly written by:

       Tilburg Law and Economics Center (TILEC) at Tilburg University, Tilburg

       Howrey LLP, Brussels

Preface

In the call for tenders n.6779 of 19 December 2009 the NMa asked for a study into the role of two-sidedness in a market and, more specifically, into what two-sidedness would entail in the case of the Dutch newspaper market.

According to the NMa, the study's objectives were threefold. First, the study was to provide an overview of the relevant literature and of merger control decisions regarding the effects of the two-sided nature of a market. Such an overview should result in the development of guidelines that the NMa would be able to use in its assessments of concentrations in two-sided markets. Second, the study should examine the possible consequences that would result if a market's two-sided character were not taken into account in the assessment of a concentration. Third, the study should test the usefulness of the proposed guidelines by directly applying them to an actual case in the Dutch (paid) newspaper market.

Ideally, the NMA would want the study to answer the following research questions:

Theory

> 1) What are the current schools of thought in the economic and legal literature regarding two-sided markets and what does the literature say about them?

Practice

> 2) In practice, what methods can be used to determine:

> > a. whether, and if so, to what extent, a certain market has a two-sided character?

> > b. what the effects on the two-sided nature of a given market are on the level of competition in this market?

> 3) If a market's two-sided character is not taken into account when assessing concentrations in that market, to what extent could this lead to a different outcome of the assessment?

> 4) What are the effects of a market's two-sidedness on the competition situation in an actual case (the assessment of a concentration in the Dutch (paid) newspaper market)?

The first research question aimed at gaining more knowledge of the current views on two-sided markets, which would also serve as a first step towards a general analytic model for assessing concentrations in two-sided markets.

The answer to the second research question would ideally result in a framework that the NMa could use in determining the relevance of, as well as the effects of, two-sidedness.

The third question was included to determine the importance of the effect of two-sidedness in a specific concentration assessment.

In answering the final question, the reliability and applicability of the suggested methods would be tested. In addition, the answer to this question would provide more insight into the (paid) newspaper market, such as the competitive situation there as well as the functioning of the market in general.

The study conducted by TILEC and Howrey aimed at answering all the questions above. In particular, in their offer of 30 November 2010 TILEC and Howrey promised to deliver a study in two parts in which the following topics would be covered:

Part I:
- An overview of recent economic literature on two-sided markets (answering question 1);

- An overview of recent legal literature on two-sided markets (answering question 1);

- An overview of concentration decisions of the European Commission and other competition authorities regarding two-sided platforms (answering question 1);

- An evaluation of the fallacies due to the use of traditional one-sided methods in the assessment of concentrations in two-sided markets and, where applicable, a proposal of alternative methods, specific to two-sided markets, in particular with regard to market definition, measurement of market power and merger evaluation; an excel file implementing the formula's to perform a SSNIP test in a two-sided market will also be included; (answering questions 2 and 3)

Part II
- An analysis of the two-sided character of the Dutch newspaper market (including the estimation of a two-sided model of demand), an exemplification of the fallacies of a single-sided approach, and an application of the proposed alternative methods to the Dutch newspaper market; (answering question 4)

Following consultations with the NMa held during the course of the work, it was decided that the survey of the legal and economics literature would be merged. In addition, the NMA asked for the bibliography of the various chapters to be merged and included at the end of the report.

It also requested the code in Stata and Matlab used to perform the empirical analysis in part II and a copy of the dataset[1].

This report was written by the Tilburg Law and Economics Centre (TILEC) in collaboration with the law firm Howrey.

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[1] We would like however to make the NMa aware that there might be issues with regards to the use of the data acquired by TILEC from Nielsen Media Research and NOM if the NMa were to use them for another scope than the replication of the empirical analysis in the current report. We attach the licence agreements signed by TILEC to this regard.

The project was coordinated by Dr. Lapo Filistrucchi (TILEC). Different people however worked on the different chapters:

- Chapter 1:   Dr. Lapo Filistrucchi (TILEC), Prof. Dr. Damien Geradin (HOWREY), Simone Keunen,M.Sc. (TILEC), John Wileur,M.Jur. (HOWREY), Prof. Dr. Eric van Damme (TILEC)

- Chapter 2:   Dr. Lapo Filistrucchi (TILEC), Prof. Dr. Damien Geradin (HOWREY), Simone Keunen,M.Sc. (TILEC), John Wileur,M.Jur (HOWREY), Prof. Dr. Eric van Damme (TILEC). Antonio Laurenco,M.Sc (UvT) and Consuelo Silva Buston,M.Sc. (UvT) provided precious help in reviewing the Portuguese and Spanish cases respectively.

- Chapter 3: Dr. Lapo Filistrucchi (TILEC), Prof. Dr. Damien Geradin (HOWREY), Prof. Dr. Eric van Damme (TILEC). Prof. Dr. Jan Boone (TILEC) provided some very useful comments on this chapter.

- Chapter 4: Dr. Lapo Filistrucchi (TILEC), Dr. Tobias Klein (TILEC), Thomas Michielsen,M.Sc. (TILEC)

The formulas to perform the SSNIP test in a two-sided market according to the extension proposed in Filistrucchi (2008) were developed with the help of Consuelo Silva Buston,M.Sc. (UvT). Thomas Michielsen,M.Sc. (TILEC) wrote the code.

Useful feedback was also received from Freek Bruggert, Ron Kemp, Bastiaan Overvest, Tjarda van der Vijver and Björn Vroomen.of the NMa at different stages of the work.

Finally we would like to thank Ansa Brink (UvT) and Justine Barnard (UvT) for their proof-reading of the report.

Introduction

1.   The term "two-sided market"[2] may seem quite odd to the uninitiated. All markets would at first sight appear to have two sides, namely buyers and sellers. In fact, the term "two-sided-market" refers to a specific type of market.

2.   Put simply, a two-sided market is a market in which a firm sells two distinct products or services to two different groups of consumers and knows that the more products it sells to one group the higher the demand from the other group.

3.   Thus, a firm in a two-sided market acts as a platform[3] and tries to get both sides on board. Indeed, it needs both sides to do business or, as Evans and Schmalensee (2005) put it, in a two-sided market "it takes two to tango".

4.   Not all markets are two-sided, but two-sided markets are everywhere: when you read a newspaper, you watch TV or listen to the radio, you are a consumer in a two-sided market; when you pay to enter a disco, you are in fact paying to join a two-sided platform; when you shop in a mall you use a two-sided platform, and when you use a debit card to pay for your shopping in a supermarket, you are buying products in a two-sided market and using the service of another two-sided platform.

5.   You might wonder why it matters to competition policy whether the market is two-sided or not. The answer is that many traditional results of economic analysis that lie at the basis of competition policy do not hold. For example, selling a product for free can be a profit maximising strategy rather than an attempt to predate. Or, more importantly for merger analysis, a merger to monopoly might raise welfare even in the absence of efficiency gains.

6.   The aim of this report is to explain which markets are two-sided, what the two-sided nature of the market implies for competition policy according to the literature, how competition authorities have dealt with mergers among two-sided platforms and how we believe they should deal with them.

7.   This report is organized as follows. Chapter 1 reviews the economic and legal literature on two-sided markets; the objective is to summarise what two-sided markets are and what should be the implications for competition policy. Chapter 2 presents a survey of merger cases in two-sided markets; its objective is to assess to what extent the two-sided market literature has so far influenced merger control. Based on results from the previous two chapters, Chapter 3 provides suggestions on how to assess mergers in two-sided markets. Chapter 4 reports an empirical analysis of the Dutch newspaper market, as an example of a merger simulation exercise in a two-sided market.

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[2]   This report discusses "two-sided markets", Most of the discussion extends however to the more general case of "multi-sided markets".

[3]   A "two-sided platform" is therefore a firm active in a "two-sided market". Again, we refer to "two-sided platforms" but the analysis can be extended to "multi-sided platforms".

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Chapter 1

A Survey of the Literature

by Dr. Lapo Filistrucchi, Prof. Dr. Damien Geradin,

Prof. Dr. Eric van Damme, Simone Keunen,M.Sc., John Wileur M.Jur.

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4   TWO-SIDED MARKETS

This section discusses the growing theoretical literature on two-sided markets.

8.   Although studies on the media market, which is by now recognised to be a two-sided market, date back as far as Corden (1953), Reddaway (1963) and Rosse (1967)[4], the literature on two-sided markets itself has developed only in the last ten years, as economists became aware of the fact that other, apparently very different, markets share some basic features with media markets.

9.   The seminal papers in the field are those by Caillaud and Jullien (2001, 2003), Rochet and Tirole (2002, 2003, 2006), Evans (2003), Parker and Van Alstyne (2005), and Armstrong (2006). In particular, whereas Caillaud and Jullien (2001,2003) and Parker and Van Alstyne (2005) respectively talk about indirect network effects and two-sided network effects, the term two-sided market appears to have been used first by Rochet and Tirole (2002, 2003, 2006) as well as Armstrong (2006)[5]. Evans (2003) instead, preferred to talk about markets with two-sided platforms.

10.   The growth of the two-sided markets literature has followed the spread of Internet and the appearance of online intermediation service providers (e.g. Caillaud and Julien (2001, 2003)) and the flourishing of antitrust and regulation cases regarding the payment cards market (e.g. Rochet and Tirole (2002), Guthrie and Wright (2007)).

11.   However, it has provided additional impetus to the economic analysis of media. Anderson and Gabszewicz (2005) provide a good overview of the results on the analysis of media as two-sided platforms, but this subfield is still growing too.

Although studies on the media market date back as far as 60 years, the literature on two-sided markets developed only in the last decade.

4.1   Definitions

This sub-section discusses when, according to the literature, a market is two-sided.

12.   Although there appears to be no single well-established definition, to summarise one could say that, according to the literature, a two-sided market is a market in which a firm acts as a platform: it sells two different products to two groups of consumers, while recognising that the demand from one group of consumers depends on the demand from the other group and *vice versa*. In other words the demands on the two sides of the market are linked by *indirect network effects*[6] and the firm recognises the existence of (i.e. *internalises*) these indirect network effects. The buyers of the two products instead, do not internalise these effects which are therefore to this regard called *externalities*. Note that, as recognised also by Rochet and Tirole (2003), this makes a two-sided market different from the well-known case of complementary products where both products are

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[4]   Rosse devoted a lot of attention to the newspaper market. See also Rosse (1970), Rosse (1975), Rosse (1977), Rosse (1978) and Rosse (1980).

[5]   In the media literature, Chaudhri (1998) talks about "duality in the product space" of a newspaper publisher, as the publisher serves both advertisers and readers. Gabszewicz *et al* (2001, 2002) discuss instead cross-market network effects when analysing pricing and political differentiation in the newspapers market.

[6]   Demand is characterized by a direct network effect when consumers willingness to pay for a product depends on the number of other consumers (or the quantity bought) of the same product; it is instead characterised by an indirect network effect when consumers' willingness to pay for a product depends on the number of consumers (or the quantity bought) of another product.

bought by the same buyer, who, in his buying decision, can therefore be expected to take into account both prices.

13.   While typical examples of complement products are the inkjet printer and the ink cartridge or the razor and the razor blades, as already mentioned above, prominent examples of two-sided markets include (i) media markets, where firms sell content and advertising space, (ii) payment cards markets, where firms sell the use of a card to buyers and that of a point-of-sale terminal to shops, or (iii) online intermediaries, which sell their services to buyers and sellers. Yet there are many more. Exactly how many markets are two-sided is to some extent a matter of debate, and also a question to be addressed empirically.[7]

14.   Although in principle a firm in a two-sided market sets a price for the product it sells on each side, it might well be the case that on one of the two sides, the product is given away for free, as in the case of free newspapers or phone directories, in order to stimulate demand on the other side of the market.

15.   The literature shows that in a two-sided market, firms profits, consumer welfare and total welfare are determined by both the price level (roughly, the sum of the prices paid by the two sides) and the price structure (roughly, the ratio of the prices paid by the two-sides).

16.   Indeed, Rochet and Tirole (2006) go as far as defining two-sided markets as follows:

>   "*A market is two-sided if the platform can affect the volume of transactions by charging more to one side of the market and reducing the price paid by the other side by an equal amount; in other words, the price structure matters, and the platforms must design it so as to bring both sides on board*".

17.   Evans (2003) summarizes the necessary conditions for the existence of a two-sided platform market as follows:

■   Firstly, a two-sided market requires *two or more distinct groups of customers*. For example, a producer of video-game consoles sells consoles to users and both license the right to develop software[8] and sell software development kits to video game developers.

■   Secondly, a two-sided market exhibits *externalities* which are associated with two or more groups of customers being connected or coordinated in some fashion. It is not necessary for the existence of a two-sided market that two indirect network effects be present, in fact, one suffices. Positive externalities or positive indirect network effects occur when the value obtained by one group of customers increases with the number of customers of the other group. Negative ones in the opposite case. For example, video-game developers value video-game consoles more when they have more users; and users value consoles that have more games.

■   Lastly, for a two-sided market to exist, an intermediary is required in order to internalise the externalities created by one group for the other group(s).

18.   The two definitions are not perfectly identical. For the price level to be non-neutral it is necessary that it is impossible for the side that pays more to pass through the difference in his cost of

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[7]   We will deal with the latter issue in the next sections and chapters.
[8]   Indeed, producers of video-game consoles receive per-unit royalties on games from game developers.

interacting to the other side. The latter could indeed be the case if there were a transaction between customers on the two sides of the market. Indeed, Rochet and Tirole (2006) explain that the failure of the Coase theorem[9] is a necessary, albeit not sufficient, condition for the existence of a two-sided market.

19.   In fact, it would seem that the definition proposed by Evans (2003) better adapts to two-sided markets of the "media type" (or two-sided non-transaction markets), whereas the one proposed by Rochet and Tirole (2006) comes from the analysis of a two-sided market of the "payment cards type" (or two-sided transaction markets). We will come back to this distinction in the next section as we discuss different types of two-sided markets.

20.   Rochet and Tirole (2006) states that "factors making a market two-sided include a) transaction costs among end-users or, more generally, the absence of, or limits on the bilateral setting of prices between buyer and seller b) platform-imposed constraints on pricing between end-users c) membership fixed costs or fixed fees".

21.   In particular, Rochet and Tirole (2003) identify three types of transaction costs in this setting. A first type of transaction cost is associated with thinking, writing, advertising and enforcing the pass-through in the transaction. Indeed, although it may become substantial over a large number of transactions, for an individual transaction this cost can be higher than the difference in price to be passed through to the other side. A second type of transaction cost is due to the absence of a low-cost billing system. A third type of transaction cost is the impossibility of monitoring or recording the actual transaction or interaction.

22.   The latter case is indeed the case of markets of the "media type"[10] (or non-transaction markets), which shows that the definition of Rochet and Tirole (2003, 2006) is broader than the one of Evans (2003).

23.   Whereas transaction costs are independent of its will, the platform can strategically affect the pass-through by imposing constraints on pricing between end-users[11]. In fact, in doing so, it makes the market two-sided.

24.   Interestingly, Rochet and Tirole (2003) also point out that, if the two sides can coordinate their purchases from the platform, then the market ceases to be two-sided. In such a case, where the end-users internalise the indirect network externality, in practice, what fails is the first condition proposed by Evans (2003), namely the presence of two groups of customers. Indeed, when the two sides can coordinate to internalise the indirect network effect, then the latter ceases to be an externality and the case is reduced to the well-known one of a firm selling complement goods.

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[9]   See Coase (1960). As reminded by Rochet & Tirole (2006) "the Coase Theorem states that if property rights are clearly established and tradable, and if there are no transaction costs nor asymmetric information between the two parties, the outcome of the negotiation between two (or several) parties will be Pareto efficient, even in the presence of externalities". Asymmetric information refers to a situation where one of the parties has more information than the other(s). A market situation is instead efficient, according to Pareto if there is no other situation which would make at least one of the parties better off and the other parties not worse off.

[10]   Note that in most traditional media it was not possible to charge the advertisers based on the number of people who were hit by an advertisement. Only recently, on the internet, this has become in part possible as it is possible to record clicks on ads.

[11]   It is the case for instance of the no-discrimination adopted by credit cards MasterCard, Visa and American Express. The rule usually takes the form of a contractual prohibition to the merchant to ask a higher price to buyers paying by card. Competition authorities in some countries have forced payment cards to abolish that rule.

25.   As transaction costs similar to those described above appear to be relatively common, Rochet (2003) claim that "many (probably most) markets with network externalities are two- (multiple-) sided markets".

26.   In fact, this observation seems to suggest that the distinction between the definitions of Evans (2003) and Rochet and Tirole (2006) might not be that relevant in practice. Yet, as recently discussed by Weyl (2010), understanding the role of the pass-through is crucial in the analysis of a two-sided market.

27.   At this point, one could get the idea that all intermediaries, if not all firms, are two-sided platforms. After all, they connect producers to consumers.

28.   Hagiu (2007) highlights the difference between the two polar strategies for market intermediation: the "merchant mode" and the "two-sided platform mode". In the latter case, the intermediary simply facilitates the transaction between the buyer and the seller. It does not alleviate the risk of either of the two sides caused by the transaction not taking place. In the former case instead, the merchant buys the product from the producer and sells the product to the consumer. Once the product is bought by the intermediary, the seller is no longer interested in the number of buyers the intermediary has on the other side. Moreover, the intermediary is not offering anymore a service to the seller. It is selling only one product to the buyer. Thus the merchant mode implies that there are no indirect network effects.

29.   As discussed in Armstrong (2006) a particular case is that of supermarkets. Arguably, people who shop value a supermarket more the higher the number of products on stock. In addition, a supermarket often sells shelf space and visibility to producers. For that reason, as discussed in Armstrong (2006), a supermarket may be regarded as a two-sided platform.[12]

30.   However, as recognised by Hagiu (2007), the "merchant mode" and the "two-sided platform mode" are two extreme cases. A variety of contract arrangements between the intermediary and the two parties lie in the middle. To some extent, one can therefore say that not all intermediaries are two-sided platforms, but indeed they could be. Hagiu (2007) also discusses when each of the two modes is more profitable for the intermediary and should therefore be expected to be observed.

31.   It is then an empirical issue which of the two modes prevails. This will in the end depend on the presence and size of the indirect network effects.

32.   According to the definition of Rochet and Tirole (2003), many markets are two-sided. Yet Rochet and Tirole (2006) themselves recognise that in some cases, although the market is two-sided in theory, in practice the two-sided nature of the market might be irrelevant. Also, Evans and Schmalensee (2007) agree that two-sidedness is a matter of degree.

33.   In our opinion, although there is still some debate on the exact definition of a two-sided market, the different definitions proposed appear consistent enough to allow the practical identification of two-sided markets. We will provide some suggestions in this regard in Chapter 3 of the current report.

For all practical purposes, the literature has provided a consistent and unambiguous definition

of a two-sided market.

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[12]   Indeed, Armstrong (2006) uses the supermarket case to bring an example of competitive bottleneck See section 2.6.4.

4.2   Types

This sub-section discusses the different types of two-sided markets identified in the literature.

34.   In an attempt to provide a classification, Evans (2003) identifies three main types of two-sided markets:

   ■   *Market-Makers*. These two-sided markets enable different groups to transact with each other. Examples include shopping malls, eBay, etc.

   ■   *Audience-Makers*. Audience makers match advertisers to audiences. This is the case, for instance, of newspapers, television, Google, etc.

   ■   *Demand-Coordinators*. Demand coordinators are two-sided platforms which provide goods or services that generate indirect network effects across two or more groups. In this respect, Evans (2003) mentions software platforms such as Windows and payment card systems such as credit cards.

35.   More important for the economic analysis and the application of competition policy is the distinction proposed by Filistrucchi (2008) between two-sided markets of "the media type" and two-sided markets of "the payment cards type". The distinction is practice equivalent to that between the membership model proposed by Armstrong (2006) and the usage model proposed by Rochet and Tirole (2003, 2006) The markets of the "media type" are indeed characterised by the absence of a transaction between the two sides of the market and, even though an interaction is present, it is usually not observable, so that a per-transaction fee or per-interaction fee or a two-part tariff is not possible. The markets of the "payment cards type", which also include virtual marketplaces, auction houses and operating systems, are instead characterised by the presence and observability of a transaction among the two groups of platform users. As a result, not only the platform is able to charge a price for joining the platform but also one for using it, i.e. it can ask a two-part tariff.

36.   In the current study, we will refer to two-sided markets of the "payment cards type" as two-sided transaction markets, whereas we will refer to two-sided markets of the "media type" as two-sided non-transaction markets. We will argue in our suggestions in Chapter 3 that the distinction is crucial for the definition of the relevant market.

There are two main types of two-sided markets: transaction and non-transaction markets.

4.3   Pricing

This section describes what characterises pricing decisions by two-sided platforms according to the literature.

37.   Much of the success of the two-sided markets literature is due to its finding that pricing decisions of profit-maximizing platforms may be quite different from those of firms in traditional one-sided markets.

38.   For instance, Parker and Van Alstyne (2005) highlight that "in a market characterised by two-sided network effects, even in the absence of competition, a firm can rationally invest in a product it intends to give away into perpetuity". Indeed one observes that in many two-sided markets one of the two-sides does not pay for the product.

39.   More generally, the literature shows that in a two-sided market it might be the case that one product is given away at a price below marginal cost even in case of a monopoly. It is the so-called "divide-and-conquer" strategy identified by Caillaud and Jullien (2003), by which "one side of the market is subsidised and profits are made on the other side". We will come back to this when discussing predatory pricing in two-sided markets.

40.   Indeed, the most important result regarding pricing in a two-sided market is that the standard one-sided mark-up formula (the so-called Lerner index) is not valid in a two-sided market. Indeed, Rochet and Tirole (2006) explain that "because pricing on one-side is designed with an eye on externalities on the other side, the standard Lerner pricing formula must be reinterpreted".

41.   In fact, Rochet and Tirole (2003, 2006) show that in a two-sided transaction the per-transaction mark-up over the total marginal cost[13] is determined by the elasticity of transactions with respect to the price level according to the standard Lerner formula, but they also point out that on each side of the platform the per-transaction mark-up is determined by the elasticity of transactions with respect to the price charged to that side only if one reinterprets the marginal cost

42.   In particular, one should consider the marginal cost of one additional seller as the marginal cost faced by the platform to serve that seller minus the price paid by the buyer to transact with the seller. As Rochet and Tirole (2006) put it, one should replace the marginal "cost" by the marginal "opportunity cost". A similar result, though not exactly identical, is found in Armstrong (2006) for a non-transaction market.

43.   In fact, Rochet and Tirole (2006) argue that in order to get a better intuition on the platforms behaviour, one can decompose the choice of prices by a two-sided platform in two stages: it first chooses the profit maximizing price level, then it chooses the price structure that maximises volume given the chosen price level.

44.   In addition, Rochet and Tirole (2003) point out that the profit maximizing price structure depends on the ratio of the elasticities and not on the inverse ratio of the elasticity. So that, contrary to the well-known result, the side which has the higher elasticity of transactions with respect to price is charged more. This effect is due to the presence of the indirect network externalities.

45.   Rochet and Tirole (2003) argue that in practice, monopoly and competitive platforms design their price structure so as to get both sides on board; they provide evidence of this by discussing seven "mini case studies": credit and debit cards, internet, portals and media, video games, streaming media technology, operating systems and text processing.

46.   To summarise the role of externalities, one could say that, as claimed by Armstrong (2006), "unless they act to tip the industry to monopoly, positive cross-group externalities act to intensify competition and reduce platform profits"[14].

47.   According to the literature, in addition to the network effects, among the factors which affect the pricing decision of two-sided platforms are the presence of single-homing or multi-homing, the presence of marquee customers and that of captive customers.

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[13]   This would be the marginal cost of a transaction.

[14]   If instead the market tips to monopoly, then the incumbent's profits rise with the size of the network effects, as the higher the network effects are, the more difficult entry will be. We come back to the issues of concentration and entry barriers in the next section.

48.   Single-homing takes place when customers choose only one platform. When customers choose more than one they are said to multi-home. Rochet and Tirole (2006) argue that an increase in the multi-homing on one side facilitates "steering" of customers on the other side, i.e. induces customers to opt out of the competing platforms.

49.   Armstrong (2006) analyses the role of multi-homing on one side when the other side single-homes. He argues that in such a situation, the platform has monopoly power over providing the multi-homing side with access to the single-homing customers. As a result, the multi-homing side will face high prices. Prices on the multi-homing side will be higher as the single-homing side benefits less from the presence of a higher number of customers on the multi-homing side. "By contrast, platforms do have to compete for the single-homing agents and high-profits generated from the multi-homing side are to a large extent passed on to the single-homing side in the form of low prices (or even zero prices)".

50.   His analysis is based on the assumption that the benefit from being in contact with the highest number of single-homing customers for the side which multi-homes is always higher than the cost of joining the platform. Therefore, customers on the multi-homing side always join all platforms and, consequently, there is no competition between platforms to attract customers on that side.

51.   In addition, Rochet and Tirole (2006) show that "the presence of marquee buyers (buyers generating a high surplus on the seller side) raises the seller price and (in the absence of price discrimination on the buyers side) lowers the buyer price", while the presence of captive buyers (i.e. buyers who will surely join the platform[15]) "tilt the price structure to the benefit of sellers".

52.   As discussed in Caillaud and Jullien (2003), when a transaction or interaction takes place between end users and is observable, platforms may adopt different pricing schemes, such as a flat price, a per-transaction price or a mixture of both (i.e. a two-part tariff). Often the models in the literature differ in that respect. Whereas in Armstrong (2006) platforms charge fixed fees to customers, in Rochet and Tirole (2003, 2006) they can also charge a per transaction fee to the parties. Armstrong (2006) argues that, even in the absence of a transaction, a platform may not charge a fixed price but a price which depends on the number of customers on the other side. If that is the case, he argues that the cross-group externalities are weakened with such prices, the reason being that "if a customer pays a platform only in the event of a successful interaction, then the customer does not need to worry about how well the platform does in its dealing with the other side. That is, to attract the other side of the market, it is not so important that the platform first gets the other side on board". The argument would seem to rest on the fact that the customer faces no loss if the interaction does not take place as she does not pay. Whether this is indeed the case, should be debated, as one could argue that the customer, particularly if single-homing, could face an opportunity loss by not interacting (satisfactorily) on any platform.

53.   The idea of platforms being able to charge a price on one side which depends on the quantity of customers on the other side is however taken up again by Weyl (2010). In a recent paper, the author shows how monopolist platforms, in theory, could charge insulating tariffs to avoid potential coordination failures and, in so doing, achieve any desired allocation of customers on the two-sides. While Weyl is currently extending his monopoly model to an oligopolistic setting, whether firms in practice do behave like that is an open issue.

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[15]   This could be the case for instance if some buyers already chose the platform in the previous period and as a result face high costs of switching in the current period to another platform.

54.   Given the above results on pricing, a crucial issue is to what extent the privately optimal prices differ from the socially optimal ones. More precisely, the question is whether it still holds true, as in a single-sided market that more competition leads to more efficient, more balanced and to more cost reflective prices.

55.   Rochet and Tirole (2006) analyse optimal Ramsey prices[16] in a two-sided market and show that the Ramsey price structure does not correspond to a fair allocation of prices on the two-sides. "Rather, like private business models, Ramsey prices aim at getting both sides on board". In order to do so, socially optimal prices do not reflect relative costs nor is the price ratio necessarily balanced. Prices are instead once again determined to a large extent by the indirect network externalities. As a result, they find that "private business models do not exhibit any obvious price structure bias".

56.   An interesting summary of the results of the two-sided markets literature with regard to pricing is found in Odale and Wang (2004). They explain that the pricing structure of two-sided markets is determined by three factors: indirect network externalities, elasticities of demand and multi-homing.

    ■   *Indirect networks externalities*: as a rule, the side that benefits more from the indirect network effects pays more.

    ■   *Elasticities of demand*: the prices also depend on the relative sensitivity to price variations of the different sides; as in a traditional single-sided market, customers whose demand is inelastic are likely to pay more.

    ■   *Multi-homing*: in general the side that single-homes pays less than that the side that multi-homes.

57.   They also point out the fact that in two-sided markets, prices bear little relation to any "cost causation" approach to allocating prices between the different sides of the market. They accept that it is difficult to evaluate the impact of the pricing structures in two-sided markets on consumer welfare, but they warn that by requiring prices to be cost-reflective, regulators could create inefficiencies and force platforms to exit the market. Indeed, a two-sided platform needs to bring all sides on board and this may require the adoption of a skewed pricing structure which is not necessarily cost-reflective.

58.   Waverman (2007) considers the pricing structure in the telecommunications market. He argues that it is important to understand the multi-sided nature of the telecommunications market in order to allocate costs across all sides in a manner that maximises network effects for all. Waverman (2007) maintains that the pricing structures and not just the level of prices are important in two-sided markets. In this respect, he argues that it may be assumed due to the fact that the calling party decides to make a phone call, it always benefits from this call. Moreover, he considers that, in general, the receiving party also benefits from a phone call. Therefore, he concludes that having the caller bear all the costs of a call would appear to be sub-optimal because in such a case the caller is often subsidising the receiver's benefit, resulting in the caller undertaking too few calls. Waverman (2007) refers to the fact that it is often argued that the sharing of costs in the United States and Canada lowered the desirability of owning a mobile phone in these countries. The argument is that

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16   Ramsey prices are those prices that maximize welfare (consumer surplus + producer surplus) under the constraint that firms profits are nonnegative. The concept was first put forward by Ramsey (1927) studying optimal taxation and was applied to the regulation of monopoly by Boiteux (1956).

in the United States both the caller and the receiver pay part of the call costs and thus it is conjectured that receiving parties kept their mobile phones turned off in the United States, diminishing the externality value of cell phones, hence limiting adoption. Waverman (2007) alleges, however, that the limited adoption of cell phones in the United States may be explained by different circumstances in the United States and in Europe. For instance, he refers to the fact that fixed local fees are free in the United States.

59.   Waverman (2007) explains that the pricing structure applicable to fixed line calls has had unintended consequences on a complementary product, namely the mobile phone market. In fixed-line calling, the charging model has always been that the calling party pays all costs. For historical reasons, in much of the United Stated local fixed calls are free (i.e., bundled with the access subscription). This impacted mobile networks. Because of the charging model for fixed lines, using a mobile for a local call was costly compared to free fixed-line calls. Mobile networks thus started to adopt a fixed-fee option to pay for access, as well as for all calls incoming and outgoing, local and national. This bundle effectively priced incoming terminating and outgoing local and national calls at zero within the bundle, effectively matching the zero price for fixed-line outgoing local calls, and for all incoming fixed-line calls. Waverman (2007) argues that, given the importance of the pricing structure in two-sided markets, such unintended consequences need to be recognised and dealt with.

60.   Budzinski and Satzer (2009) provide an interesting example which shows that indirect network externalities may not only influence the price structure but also the level of prices. They refer to the example of the sale of broadcasting rights by the DFL (Deutsche Fussball Liga). In 2005, the DFL sold broadcasting rights to the pay TV channel Arena for 240 million Euros per year although the competing pay TV channel Premiere offered 300 million Euros. According to Budzinski and Satzer (2009), this apparently incoherent decision is in reality perfectly understandable if one adopts a two-sided market approach. Premiere's 300 million Euro bid restricted the free channels to begin broadcasting summaries of the matches before 10 p.m. whereas Arena authorised for broadcasts starting at 6 p.m.. Budzinski and Satzer (2009) explain that free accessibility of a TV summary in due course represents an important asset for arena visitors and, furthermore, contributes significantly to audience building (attracting new fans). Budzinski and Satzer (2009) thus argue that it can be a profit-maximising strategy to reinforce the positive externality between TV broadcasts and attendees. Interestingly, Budzinski and Satzer (2009) note that in 2008 the negotiations for the follow-up contract brought very different results. The DFL chose the highest offer that included the abolishment of early summaries on free TV. Budzinski and Satzer (2009) argue that from a two-sided market perspective, an explanation could be that the World Cup in Germany in 2006 and the European Championship in Austria in 2008 caused a boom in the popularity of soccer, with the consequence that the positive externality between close-to-the-matches free TV summary broadcast and attendees might have been alleviated to some extent.

Pricing decisions of platforms may be quite different from those of firms in one-sided markets. This is due to the fact that profit-maximising platforms will take into account indirect network effects between demands on the two-sides of the market. Indeed, also socially optimal prices should take these effects into account. As a result, socially optimal prices need not be balanced between the two-sides.

4.4   Concentration

This section discusses whether there is a tendency towards concentration in two-sided markets, according to the literature.

61.   Evans and Schmalensee (2007) explain that five fundamental factors have a bearing on the size of two-sided platforms and on market structure. They explain that indirect network effects and economies of scale are likely to lead to large platforms and a concentrated market; whereas congestion, platform differentiation and multi-homing have the opposite effect on platform size and market concentration.

   ■   *Indirect Network Effects.* Indirect network effects between the different sides promote larger and fewer platforms. In the absence of countervailing factors, two-sided platforms would compete *for* the market more often than *in* the market. In this respect the first movers have an enormous advantage and other two-sided platforms can compete with this advantage only if they manage to offer consumers on all sides something that offsets the first mover's advantage. To this respect two-sided market may "tip" as antitrust authorities often say.[17]

   ■   *Economies of Scale.* Most two-sided platforms incur significant fixed costs and low marginal costs, the consequence of which is that these platforms benefit from economies of scale as the output increases. For instance, it is the case of payment cards where the costs of allowing one more transaction is low but there are huge fixed costs in setting up the network. However, scale economies may mainly operate on one side. For example, there are scale economies in providing newspapers to readers but none in providing advertising space to advertisers.

   ■   *Congestion.* At a given size, expanding the number of customers on a platform may lead to congestion. For example, given the existing network a payment cards system might have a maximum amount of transactions that can take place at a given point in time[18]. Congestion may occur only on one side. For instance, increasing the amount of advertising in a newspaper may have a negative impact on readers.

   ■   *Platform Differentiation.* Platforms can and do differentiate themselves by choosing particular levels of quality (vertical differentiation), particular features (horizontal differentiation) or prices. For instance, a newspaper might decide to send reporters to cover specific events or investigate specific issues or might simply rely on news transmitted by agencies such as Reuters. Alternatively, a newspaper could specialise in sport, while another in politics.[19]

   ■   *Multi-Homing.* Differentiation may lead to a situation where customers use several platforms. This phenomenon is referred to as multi-homing. Multi-homing can occur on both sides of the market or only on one side.

62.   Evans I (2008) makes the observation that the web industry in particular has seen the emergence of multi-sided platforms that have substantial shares in their category (social networking, portals, etc.). According to Evans I and II (2008), web-based multi-sided platforms may secure large market shares on a national and global basis for several reasons. First, they enjoy significant indirect network effects. Second, these positive feedback effects are sometimes global in nature. Third, web-

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17   Tipping refers to the fact that in a market with network externalities it is difficult for several producers to coexist profitably and a firm with even a small edge over its rivals (e.g. only a first-mover advantage) stands a good chance to take the entire market.

18   Indeed, this seems to be the case in some countries in the days just before Christmas when a particularly high number of transactions by card take place.

19   The first is the case of so called "quality" newspapers as the New York Times, the second is instead the case of the "free press".

based multi-sided platforms often have substantial fixed costs, with the consequence that there are substantial economies of scale. Moreover, they can average those costs over a worldwide customer base. Fourth, there are "endogenous sunk costs" – investments in improving quality whose returns increase with size and which constitute an entry barrier. Last, they may be economies from learning by doing.

63.   Evans (2008-I, 2008-II) insist, however, that the web economy is still young compared to other industries. Therefore, it remains to be seen whether platforms like Google for example are capable of maintaining their leadership and the extent to which other platforms, through differentiation, can survive. Evans refers in this respect to eBay and Yahoo who have lost their once apparent impregnability. Evans I (2008) notes that the evolution of the web economy thus far is consistent with the evolution of other industries where it takes time for the winners to emerge. He maintains, however, that the web economy encompasses some distinct features, which are (i) the speed at which it is developing, (ii) the complexity of multi-sided businesses and (iii) the fact that the web industry is highly interconnected.

According to the literature, there can indeed be a tendency towards concentration in two-sided markets due to the network effects.

5   ANTITRUST ISSUES IN TWO-SIDED INDUSTRIES

This section discusses competition policy issues in two-sided markets as highlighted by the literature.

64.   Following the burgeoning theoretical work on two-sided markets, a growing number of papers, such as Evans (2003), Wright (2004) and Evans and Schmalensee (2005), have focused on competition policy in two-sided markets.

65.   They have pointed out for instance that, due to the presence of indirect network externalities, the efficient price structure does not reflect the ratio of marginal costs on the two sides of the market and, more generally, that increased competition does not necessarily lead to a more balanced price structure or to a more efficient one.

66.   In particular Wright (2004) identifies the following eight fallacies of a one-sided approach to competition policy in two-sided markets: (i) "an efficient price structure should be set to reflect relative costs (user-pays)" (ii) "a high price-cost margin indicates market power" (iii) "a price below marginal cost indicates predation" (iv) "an increase in competition necessarily results in a more efficient structure of prices" (v) "an increase in competition necessarily leads to a more balanced price structure" (vi) "in mature markets (or networks), price structures that do not reflect costs are no longer justified." (vii) "where one side of a two-sided market receives services below marginal cost, it must be receiving a cross-subsidy from users on the other side"[20] (viii) "regulating prices set by a platform in a two-sided market is competitively neutral".

67.   Yet, as in Wright (2004), most policy contributions so far have mainly criticised the application of standard competition policy to two-sided markets rather than suggested an alternative approach.

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20   Note that the two-sided market literature does not unanimously avoid the use of the terms cross-subsidy or cross-subsidisation. The reason is a different interpretation of the word subsidy. Whereas others, as for instance Rochet and Tirole (2003), use these terms to indicate that one side is paying for the other side to join the platform, Wright (2004) points out that the side which is often said to subsidise the other would not be better off if it were to stop paying as it benefits from the presence of the other side.

From the practical point of view, these papers argued against existing practice rather than providing new methods to practitioners.

68.   Exceptions in this regard are the numerous papers by Evans and co-authors, e.g. Evans (2003, 2009), Evans and Noel (2005, 2008) and Evans and Schmalensee (2008). We will discuss their contributions at length in the following sections.

69.   In general however, despite the rich literature on two-sided markets, only a few papers have dealt with market definition, measurement of market power and merger evaluation. Even fewer papers have tackled issues related to collusion incentives and cartels' sustainability. Thus, while some results appear well established, although not necessarily unambiguous, others are still preliminary.

70.   Also most of the empirical work on two-sided markets does not provide direct guidance to practitioners on how to empirically assess different competition policy issues in two-sided markets. It mainly focuses on (i) testing for the presence of indirect network effects, e.g. Rysman (2004, 2007), Kaiser and Wright (2006) and Kaiser and Song (2009), (ii) evaluating its consequences for the pricing decision of platforms and for consumers' and social welfare, e.g. Rysman (2004), Kaiser and Wright (2006) and Chandra and Collard-Wexler (2009). Exceptions are Argentesi and Filistrucchi (2007) who develop a structural econometric model to test for collusion in the daily newspapers market, Evans and Noel (2007) who discuss market definition using data from the Google-DoubleClick case[21] and Fan (2009) who proposes a structural model of demand to analyse mergers among US newspapers.

71.   Most of the literature agrees that standard results derived from industrial organisation models of single-sided markets do not necessarily hold in a two-sided market, so that competition policy rules designed with single-sided markets in mind may indeed lead to decisions which decrease social and even consumers' welfare.

72.   However, as recognised by Evans and Schmalensee (2007), this literature also accepts that two-sidedness is a matter of degree. Sometimes the two-sided nature of the business will be critical for the analysis, whereas other times it will not be determinative. Evans and Schmalensee (2007) note that in certain cases the two-sided aspects may even be too insignificant to matter at all.

73.   Very few, such as Ordover (2007), are not convinced that the extent of needed reassessment of competition policy is as profound as, for example, the developments in economics of vertical relationships in production and distribution. He maintains that, like free-riding or network effects were before, two-sided platforms may be a passing concept which calls for analytical vigilance but does not require a policy revolution.

74.   In our opinion, the literature on two-sided platforms has indeed managed to shed new light on the functioning of many old and new product markets. It has convincingly pointed out that standard competition policy results may not hold and may lead to competition authorities adopting decisions which hurt consumers or social welfare. Although in some cases, the two-sided nature of the market may not be relevant, this cannot be *a priori* established. At the least, the literature calls for an assessment of the relevance and extent of the two-sided nature of a market.

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[21]   See Chapter 2 for a discussion of the case.

The literature shows that standard competition policy results may not hold in two-sided markets and may lead to competition authorities adopting decisions which hurt consumers or social welfare. Suggestions on how to proceed in practice are to some extent lagging behind.

5.1   Market Definition

This sub-section summarises the findings of the papers which have dealt with market definition.

75.   Evans (2009) and Hesse (2007) warn against the application of a one-sided SSNIP test[22] in defining markets when two-sided platforms are involved. The indirect network effects between the different sides of the platform reduce the profitability of any price increase. A price increase deemed profitable under the one-sided SSNIP test may turn out to be unprofitable under the two-sided SSNIP test. Therefore, by applying a standard SSNIP test, the market could be drawn too narrowly.

76.   In a traditional one-sided market, an increase in price on side A reduces the demand of side A. In the case of two-sided platforms, in the presence of positive indirect network effects, the reduction of the demand of side A has the effect of reducing the demand of side B. The smaller side B reduces in turn the demand of side A. And so on. Evans and Noel (2005) explain that there are two effects that increase the losses caused by a price increase. Firstly, there is a multiplier effect, and secondly, in addition to losses on side A, there are losses on side B, which are also subject to a multiplier effect.

77.   Another issue raised by Evans and Noel (2008) is whether one should include both sides of a two-sided platform in the market definition or just one side. They consider that if the two sides are very highly complementary and closely linked – for example, if the multi-sided platform facilitates transactions between groups that occur in fixed proportions – and multi-sided platforms in an industry all tend to serve the same two sides, then it may be reasonable to include both sides in the market definition and the "transaction" as the product. When these conditions are not met, it may be necessary to define the relevant market on the basis of one of the sides only, but with the critical understanding that the other side exerts an important constraint.

78.   Rooney and Park (2007) note in this respect, although courts and agencies typically include in a relevant market products that are substitutes for one another, cluster markets have been defined to include complementary products that respond to linked consumer demands and offer sellers economies of scale. Yet, as discussed above, the case of complement products is different from that of two-sided platforms.

79.   Evans and Noel (2008) note that a market definition which excludes one side of a multi-sided platform may lead to a more profound mistake than just defining the market too narrowly. The purpose of market definition is, at least partly, to help focus the economic analysis on a finite set of products and competitive relationships. On this basis they argue that failing to consider all sides of a multi-sided platform may result, when multi-sided effects are strong, in the failure to consider multi-sided strategies and market linkages, which may cause type I and type II errors. Finally, they provide formulas to perform Critical Loss Analysis[23] (in short CLA) in a two-sided market when one wants to define two interrelated markets.

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[22]   SSNIP test stands for "Small Significant Non-Transitory Increase in Price" test. We discuss the test in more detail in Chapter 2 and 3. See also Werden (1998, 2002-I,2002-II,2002-III).

[23]   Critical Loss Analysis in which practitioners often perform numerically a SSNIP test. See Werden (2002-I) for the formulas, derived under different assumptions on demand and cost functions.

80.   Emch and Thomson (2006) instead discuss market definition in the payment card industry, and claim that the SSNIP test should be performed considering the price of the transaction. While their analysis extends to any two-sided transaction market, they unfortunately do not provide formulas to perform CLA in such a market.

81.   An additional issue raised in the literature is whether the hypothetical monopolist should be allowed to optimally adjust the price structure when it is asked to raise the price on one side or the price of the transaction. Both Emch and Thomson (2006) and Filistrucchi (2008) claim that indeed one should. They point out that a real monopolist would indeed adjust the price structure when asked to raise the price, so that if one wants to know whether a hypothetical monopolist in the market would find it optimal to raise prices by a given amount, then one should allow it to optimally adjust the price structure. In addition, Filistrucchi (2008) highlights that in the EU the logic behind the traditional SSNIP test is to define a market as the smallest set of substitute products on which a monopolist would find it profitable (or profit maximising such as in the US) to increase prices by a small-but-significant amount, and therefore to make sure that the market is designed in such a way that a monopolist has market power, which is a basic requirement of economic theory. In order to maintain the same rationale when dealing with two-sided markets one should allow the monopolist to optimally adjust the price structure. Filistrucchi (2008) also provides some formulas to perform the SSNIP test in a two-sided non transaction markets. He then argues that, while using the standard single-sided CLA formulas would lead to the definition of a relevant market which is too narrow, adopting the formulas proposed by Evans and Noel (2008) would lead to the definition of a market which is too large.

82.   All in all, we believe that there is consensus in the economic literature on the fact that the two-sided nature of the market should play a role when defining the relevant market, so that indirect network effects should be considered and one should take both sides of the market into account. Whereas in a two-sided non transaction market one should define two interrelated markets, in a-two sided non transaction market one should define a single market. While the literature agrees that the single-sided SSNIP test and the corresponding formulas would lead to the definition of a market which is too narrow, there is instead some debate as to which would be the right formulas for a two-sided market.

There is consensus in the literature that the two-sided nature of the market should play a role when defining the relevant market.

5.2   Market Power

This sub-section discusses the results in the literature with regard to the assessment of market power.

83.   Evans (2003) maintains that market share as a proxy for market power is problematic in many circumstances, but is especially for those firms that compete in multi-sided platform markets. This is because the economic models which imply that the equilibrium prices depend on some function of market shares do not apply when looking at just one side of a multi-sided platform.

84.   Evans (2003) also refers to more sophisticated analyses that do not rely on market shares but instead seek to directly determine whether the firm under consideration prices significantly above marginal cost, either through the collection of data on prices and average variable costs or through an econometric exercise by which demand is estimated, its parameters are determined and the mark-ups are recovered under assumptions on the features of competition among platforms.

85.   Evans (2003) and Oldale and Wang (2004) warn that there is not necessarily a relationship between market power and the price-cost margins on one side of a multi-sided market. Evans (2003) argues that this approach should therefore examine whether the total price (i.e., taking all sides into account) significantly exceeds total marginal costs. Indeed, this approach is taken up empirically in Argentesi and Filistrucchi (2007) when assessing market power in the newspaper industry in Italy.

86.   More generally, and consistently with the already discussed findings on privately optimal prices in a two-sided markets, one should use the appropriate formulas for the mark-ups if one were to use an econometric approach, as shown by Evans and Noel (2008).

87.   Evans (2003) also insists on the fact the multi-sided platform markets are often characterised by significant fixed costs and that one should therefore not infer too much competitive significance from the fact that a platform's prices exceed marginal costs.

88.   As an alternative, Evans (2003) considers that one could assess the degree of market power by determining the extent to which incumbents are constrained in their pricing behaviour by the prospect of entry. This involves the determination of the presence of barriers to entry. Because many multi-sided markets are fast moving, Evans (2003) stresses the fact that current market leaders often face competition in the face of potential entrants that strive to displace today's leader.

89.   To sum up, the literature has shown that measuring market shares to assess market power in a two-sided market is even more problematic than in a one-sided market[24]. Particular attention should also be paid when inferring market power from the price-cost margin, as the relevant one is the overall price-cost margin across the two-sides of the market and the formulas for mark-ups in a two-sided market are not the standard ones.

Using market shares to assess market power in two-sided markets is even more problematic than in one-sided markets. Particular care should also be paid when inferring market power from the price-cost margin.

5.3   Barriers to Entry

This sub-section discusses whether, according to the literature, entry barriers are higher in a two-sided market than in a traditional market.

90.   Parker and Van Astyne (2005) discuss the case of a platform entering a one-sided market and argue that two-sided network effects make entry easier, in that, even with an undifferentiated product, an entrant platform can enter in a market where the price is as low as marginal cost using that side to generate profits on another side of the market.

91.   Evans (2003) explains that it may instead be considered hard to enter multi-sided platform markets.

92.   First, entrants may require large sums of capital. This is often not the case during the childhood of multi-sided industries. However, with well-developed capital markets, Evans (2003) argues that it is difficult to see why raising capital should be considered a barrier.

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[24]   See Boone (2008) for a discussion on the problems of using the HHI index and the mark-up to infer the degree of competition in the market and for the proposal of the profit elasticity as an alternative measure. The author has not however extended his work to two-sided markets yet.

93.   Second, new entrants need to solve complex business problems, for example determining the adequate pricing structure. In this respect, however, Evans (2003) notes that entrants have the advantage of being able to look at the practice of successful incumbents.

94.   A third potential barrier to entry is a coordination problem (Evans (2003)) that results from the interdependency of the different sides of a platform and the existence of indirect network effects. As noted first by Caillaud and Jullien (2003) and explained also in Hesse (2007), new multi-sided platforms face some sort of chicken-and-egg problem. They have to simultaneously convince all sides to adhere to the platform. In this respect, Evans (2003) explains that consumers on one side are reluctant to switch unless they expect that some consumers on the other side(s) will also switch. And the latter customers will only switch if at least some of the former switch. Moreover, according to Hesse (2007), because of the existence of indirect network effects, new entrants must overcome the challenge that for many customers, the value of purchasing the product or service from the established platform is likely to be significantly greater than from purchasing from the start-up. Evans (2003) considers that in many ways this issue is analogous to the question of whether network industries exhibit lock-in effects – where consumers may be reluctant to switch to a new network and lose the benefits of network externalities.

95.   Finally, Evans (2003) argues that three factors mitigate the significance of the coordination problem. First, he notes that coordination is not always problematic. In many instances, customers will be willing to switch to another platform because it incorporates different features (it is cheaper for instance). Customers may also want to switch to a smaller new entrant in order, as Evans puts it, "*to take a bigger piece of a smaller pie*". Second, even if one assumes that coordination problems mean that only one platform will be successful, there will still be competition *for* the market. The potential gains from becoming the successful platform can provide incentives to enter and attempt to displace the incumbent. Third, coordination is not an issue in multi-sided platforms where at least one side multi-homes.

According to the literature, there are reasons to believe entry barriers are higher in two-sided markets, but it need not always be the case.

5.4   Unilateral Practices

This sub-section discusses the results in the literature with regard to the unilateral practices traditionally understood as likely to give rise to an abuse of dominance.

5.4.1   *Predatory and Excessive Pricing*

In this sub-section the results in the literature with regard to the assessment of predatory pricing and excessive pricing are discussed.

96.   Parker and Van Alstyne (2005) explain that it may be privately and socially optimal for prices on one side of the market to be below any possible measure of cost on that side.

97.   Evans (2003) and Evans and Schmalensee (2007) consider that two-sided platforms may find it profitable overall to price the product on one side of the platform below average variable cost, or even below zero. Skewed pricing and pricing below cost occur in stable market equilibrium and are therefore not necessarily designed to foreclose rivals.

98.   For this reason, Wright (2004), Evans and Schmalensee (2007) and Fletcher (2007) argue that there should be no assumption that a platform is engaging in anticompetitive predatory pricing because it is pricing below cost on one side of the platform.

99.   This does not mean, however, that predation can never occur in two-sided markets.

100.   Firstly, Evans and Schmalensee (2007) and Fletcher (2007) recognise that a platform may engage in two-sided anticompetitive predatory pricing if it charges below marginal costs overall, i.e., taking revenues and costs of all sides of the platform into account. In such a case, an equally efficient competing platform may be unable to make a positive profit and therefore be excluded from or be forced to exit the market. Indeed, Behringer and Filistrucchi (2009) analyse a price war among UK broadsheet newspapers in the 1990s. They claim that, contrary to a wide-spread view, it is unlikely to have been a case of attempted predation. In fact, whereas the cover prices were set below marginal cost on the readers' side of the market, the per-copy price-cost margin was still positive, reason being the higher per-copy advertising revenues enjoyed due to the higher circulation.

101.   Secondly, Evans and Schmalensee (2007) claim that a two-sided platform may engage in anticompetitive predatory pricing by setting its price on one side of the market so low that it would deny competitors access to that side of the market.

102.   Evans I (2008) notes that multi-sided platforms may crush competitors intentionally, but that this may also happen as a natural by-product of legitimate pricing and design decisions. Multi-sided platforms, in particular web based platforms, give many products or services away, for the purpose of attracting traffic, thereby crushing companies that charge for features and services that they offer for free. Evans I (2008) therefore expects that pricing strategies foreclosing rivals will lead to competition policy investigations and prosecutions.

103.   Fletcher (2007) considers the impact of a skewed pricing structure where the firms are not symmetric. In particular, she notes that some firms may have less ability than the dominant incumbent to turn extra business on the one side of the market into incremental revenues on the other side. Such firms could find it hard to compete against a very asymmetric pricing structure, and therefore may be excluded from both sides of the market.

104.   Similarly, Evans (2008) considers that faced with below costs prices, rivals who lack the money-making side of the platform that subsidises the money-losing product cannot survive. Yet, following the idea of Parker and Van Alstyne (2005) that entry of a two-sided platform in a one-sided market where profits are absent is possible thanks to the possibility to make the other side pay, one could say that the argument brought forward by Evans (2008) is correct only as long as it is not possible to conceive entry of a rival who has an alternative money-making side.

105.   Evans and Schmalensee (2007) note that just as below-cost pricing on the one side can emerge in long-run market equilibrium even in case of a monopoly, so can a very high price cost margin even in the presence of substantial competition on the other side.

106.   Indeed, it can be easily shown that, when one side is charged below marginal cost, the other side can be charged more than it would be by a monopolist who did not recognise the existence of a network effect.

107.   To that extent, although from an economic point of view the concept of excessive prices does not make much sense[25], one could claim that excessive prices are more likely in a two-sided market. Yet one should keep in mind that, although prices might be higher, so would be the valuation of customers. As already mentioned, the end consumers on that side might ultimately face a higher price but enjoy a higher surplus.

Although predation can occur also in two-sided markets, a price below marginal cost on one side of the market cannot be taken as a sign of predatory intent. Only a negative price-cost margin overall, i.e., taking revenues and costs of all sides of the platform into account, would provide evidence of predation.

5.4.2 *Exclusive Dealing*

This sub-section discusses the results in the literature with regard to the effects of exclusive dealing

108.   Evans (2003) claims that a difference between one-sided and two-sided markets could be that there would appear to be more incentives for exclusive contracts on two-sided markets due to the potential for profits on the other side. Evans (2003) recalls that one of the main Chicago School observations regarding exclusive contracts is that a consumer is always free not to agree to exclusivity. It is considered that exclusivity reflects consumers' judgement that the benefits outweigh the costs of only dealing with one firm. Evans (2003) argues that in multi-sided markets, exclusive contracts on one side may help the platform gain market power on another side. He further maintains that the consumer concluding an exclusive contract may gain from exclusivity, but that he does not take into account the costs to consumers on the other sides. This last consideration would not appear to be specific to two-sided markets. It would indeed appear to be the case that consumers never take into account the impact of their actions on other consumers.

109.   As is the case in one-sided markets, Evans (2003) specifies that exclusivity in a two-sided market may only be problematic if one firm has exclusivity over most or all of the market and if the exclusivity is persistent and durable.

110.   Hagiu (2009) examines the factors that drive two-sided platforms' non-price governance rules to restrict access beyond what they can achieve through pricing alone. He argues that firms (operating as platforms) may have incentives to exclude some participants who would be willing to pay the price of admission. Then the need for exclusion (e.g. through enforcing minimum quality standards) stems from a quality-quantity trade-off of indirect network effects. Two-sided platforms are likely to restrict access on one side when at least one side of the market values a quality attribute of the other side.

111.   To conclude, exclusive dealing in two-sided markets may only be detrimental if one firm has exclusivity over most, or all of the market, and if the exclusivity is persistent and durable (Evans, 2003).

5.4.3 *Tying and bundling*

This sub-section discusses the results in the literature with regard to the effects of tying in two-sided markets.

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[25]   See Motta (2004).

112. As explained in Tirole (2005), tying occurs when one product, the tying product is being sold conditional on the purchase of another product, the tied product. Bundling means that two products are sold together. Bundling is said to be pure when the two products are only available as a bundle. If the products are available either as a bundle or on a stand-alone basis bundling is said to be mixed.

113. In a two-sided market, the tied good may be tied to the tying good on one side of the market, but not on the other side. For example, payment systems such as Visa or American Express usually require that merchants accept all cards issued by the system, but do not impose any tie on the consumer side. Another example is newspapers, which are often tied (or bundled) with a magazine on the consumer side on some days of the week, but may be tied (or bundled) also on the advertiser side.

114. According to Tirole (2005), multi-sidedness may make a difference to the ability of competing producers to endure a tie of a tied product with the tying product. Even if these competing producers had difficulties differentiating themselves and competing profitably on the side where tying took place, they might still differentiate themselves and compete effectively on the other side Indeed, these competing platforms could enter into exclusive contracts and tying arrangements on the other side. Some of the users on the first side would then be induced, due to the network effect, to buy not only the tying product but also the competing ones, i.e. to multi-home. Indeed, if the cost of multi-homing for users facing the tie is small, then the tie on that side of the market does not preclude competitors from profitably competing, even when the competitors' product is undifferentiated in their opinion

115. Evans (2003) maintains that most platforms combine things that could, in principle, be sold separately. Evans I (2008) asserts that it is all the more a common business strategy for software platforms to expand by adding features because they face low marginal cost in doing so.

116. Evans and Schmalensee (2007) claim that tying products on one side (A) may produce benefits on the other side (B). This may increase the demand of side B, which may in turn increase the value for side A. Overall, tying could provide a net benefit to side A. According to Evans and Schmalensee (2007) the honour-all-cards rule for payment cards is a possible example. This rule requires that merchants agreeing to accept the system's branded cards agree to accept also all branded cards presented by shoppers. Although at first sight merchants do not benefit from this requirement, in reality they gain from the fact that cardholders benefit from this rule. Cardholders profit from the fact that they have the assurance that their card will be accepted at merchants that display the system's acceptance mark. Therefore, the honour-all-cards rule makes the system's branded card more valuable for cardholders, which may lead to an increase in the number of cardholders, which in turn makes the system's card more valuable for merchants.

117. Evans (2003) warns that one should be careful in applying monopoly leveraging theories to multi-sided platform markets in order to avoid suppressing the development of platforms that improve social welfare by internalising externalities across diverse customer communities.

118. The honour-all-cards (HAC) rule is also studied by Rochet and Tirole (2008). They argue that the HAC rule benefits the multi-card platform and raises social welfare (user surplus and members' profits), due to the rebalancing effect. Rochet and Tirole (2008) define this effect as follows; "when one side of the market faces different bypass opportunities for two different goods, a tie on that side allows the platform to "equalise" the competitive pressure and to rebalance its rates on that side, up for the good facing the most intense competitive pressure and down for the other; the rate

rebalancing on the other side of the market then operates in the opposite direction". This result can be contrasted to the no-HAC-rule benchmark, where the interchange fee on the card is too low from a social perspective. Rochet and Tirole (2008) conclude that the HAC rule can raise social welfare as tying credit and debit card on the merchant side of the payment card market, establishes a more efficient setting of interchange-fees. Since their analysis makes a number of specific assumptions[26] and deals with the payment cards sector exclusively, one cannot generalise their results to describe other markets.

119.   In addition to Rochet and Tirole (2005), Amelio and Jullien (2007) argue that tying could enhance efficiency, by fostering better coordination between the various sides in a multi-sided market. Tying can boost demand on one side to increase profit on the other side of the market. Amelio and Jullien (2007) argue that tying occurs on the side where the platform is subsidising participation. This, in turn, gives a quality advantage to the other market side, leading to a price increase and demand increase, and an increase in the opportunity cost of selling on the profitable side. The latter accounts for the loss generated on the subsidised side, and increases with tying. Thus, tying on one side affects competition on the other side. However, it should be noted that the impact on consumers' surplus and total welfare depends on the extent of asymmetry in externalities between the two sides, with a negative effect if there is little symmetry, and a positive effect with strong asymmetry. Additionally, one may target one side of the market at a specific audience, which can be seen as second-degree price discrimination implemented through tying. Subsequently, Amelio and Jullien (2007) quote Julien (2001) who argues that price discrimination may help a network to coordinate the customers' participation and thereby be welfare improving.

120.   However, in finding a solution for tying, one should account for the fact that a dominant firm may have substitutable strategies in order to serve their predatory tactics. Low prices, investment, and patent accumulation are other examples of such strategies; like tying, these strategies are often motivated by efficiency reasons that also benefit consumers, but they are sometimes misused. If tying is the least costly instrument of predation, then its prohibition may induce the dominant firm to resort to other forms of predation that are both privately and socially more costly.

121.   To enable platforms to get all sides to use the tied products, the firm may charge low or zero prices for the tied product. The tying phenomena that embody such implicit prices are likely to be frequently observed, and are often beneficial. This result holds regardless of whether the firms in an industry with or without market power. For instance, in the Netherlands, the daily newspapers Metro and Spits are provided free of charge to the readers, but not to the advertisers, nevertheless the newspaper market did not tip in favor of these free newspapers. Thus, the existence of free (or even negative) prices on one side of the market need not enable tipping, and is consistent with competition. Moreover, this argument illustrates that one cannot analyse prices by comparing them to marginal costs, because the benchmark may differ from those actual marginal costs. Even if there is no incentive to predate, firms could charge prices below marginal costs in the case of multi-sidedness due to network externalities.

122.   According to Choi (2007,10), tying *de facto* forecloses competitors. Furthermore, he argues that the main impact of the tie and its potential exclusionary impact may be to hurt rival producers in the competitive market, thereby inducing their exit or discouraging their entry (p. 17). The exclusionary strategy may indirectly benefit the integrated firm if, following the tie, the rivals' profit in the market

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[26]   Such as the linearity of payment flows through the platform, meant to reflect the specificities of the payment system industry.

for the consumers who demand only the tied product is no longer sufficient to cover their fixed costs of operation, and, thus, rivals exit the competitive market. This allows the integrated firm to monopolise that market as well (Choi, 2007; 10). However, Choi also argues that the impact of tying on social welfare depends crucially on whether the users of the tying product (e.g. an operating system) are exclusive on the tied product (e.g. a particular media player as Windows MP) or not.

123.   Another insight follows from Li (2009), who finds that a quantity spill-over across the two sides in a market induces a fundamental change of strategic effects. If there is a large network externality, then prices could become strategic substitutes rather than complements, as is the case in traditional markets[27]. Subsequently, tying could be used in an aggressive way that will unambiguously hurt rivals; however it could also be beneficial for the tying firm. Therefore, tying is adopted no matter whether a firm's aim is to deter or to accommodate rivals.

124.   Lastly, Gao (2009) models mixed two-sided markets, where two-sided markets are defined as markets where users of a platform can be present on both sides of the market in different transactions; sellers can be buyers and vice versa. The fact that these markets are mixed, enables platforms to bundle their services originally intended for different sides. She analyses bundling strategies with two-part tariffs and shows that bundling is more likely to dominate separate sales when the market has a higher share of customers appearing on both sides of the market.

125.   Constantine *et al.* (2005) provide an interesting insight into a tying case which involves a merchant class action against Visa and MasterCard, *In re Visa Check/MasterMoney Antitrust Litigation*. In this case, the defendants, Visa and MasterCard, were accused of foreclosing competition through tying arrangements. Their Honour All Cards rules forced merchants to accept Visa/MasterCard signature debit transactions as a condition of accepting Visa/MasterCard dominant credit cards. Since virtually all merchants needed to accept Visa's and MasterCard's dominant credit cards in order to remain competitive, they had no choice but to accept Visa/MasterCard debit transactions instead of allegedly superior and less expensive PIN debit products. The merchants argued that they were harmed by such practice. Visa and MasterCard asserted that this argumentation did not account for the two-sided nature of the payment systems market. They argued that one had to find injury not only on the merchant side but also on the cardholder side. Moreover, according to Visa and MasterCard, it would be inefficient to prevent them from leveraging their installed base of merchants, as that would force them to rebuild a merchant acceptance network each time they introduced a new product. In other words, tying a new product to an existing one is a way of solving the chicken-and-egg problem. The merchants considered that Visa and MasterCard's contention that they ignored the two-sided nature of the market was wrong. Although the merchants asserted that they were affected by massive overcharges, they also referred to the fact that the supra-competitive interchange fees charged by Visa and MasterCard (which were enabled by the tying rules) distorted the introduction of the superior PIN debit product in the United States, thereby harming the issuer/cardholder side which was deprived of the safer, cheaper, and more efficient PIN debit product. The Court eventually found that the merchants had presented a sufficiently compelling theory of damages to warrant a trial on the issue.

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[27]   Though the value of the monopolized tying good was assumed to be exogenous, Li (2009) argues that tying could be welfare-enhancing in two-sided markets because the network effect creates an optimal allocation of consumers on both sides should be asymmetric.

It appears that the two-sided nature of the market may increase the ability of competing producers to successfully react to tying and that tying may not necessarily damage consumers of the tied products.

5.4.4   *Essential Facility*

This sub-section discusses the results of the literature with respect to the duty of dominant two-sided platforms to provide access to information that is essential to compete on the market.

126.   Evans I (2008) discusses the importance of the personal information that is gathered by platforms such as Google in order to achieve better targeted advertising. He contends that one could imagine competitors seeking access to that information under an essential facilities theory under EU law. Evans I (2008) also affirms that the issue of the portability of data could similarly raise competition concerns.

127.   Although Evans I (2008) does not elaborate on this, one could rationalise his claim as follows. Web-based two-sided platforms such as Google mainly[28] gather personal information via the products and/or services that they offer for free to web users (i.e., users of the search engine, of Google Maps, of Google docs). This information is then used to offer a better product to advertisers. The claim would be that this information is necessary for other two-sided platforms to compete with Google not only on the advertising market but also on the markets for search, maps, etc., as a rival platform would need to offer these products and/or services for free too and would thus need to make profits on the advertising side.

128.   Whereas legally it is difficult to predict whether such a claim could have success, from an economic point of view, the argument simply highlights again the possible existence of barriers to entry due to the chicken-and-egg problem.

The literature has only incidentally mentioned the possibility of an essential facility claim being raised in the specific market of web-based two-sided platforms.

5.5   Coordinated Practices

This sub-section summarises the results in the literature with respect to coordinated practices in two-sided markets.

5.5.1   *Cartels*

This sub-section summarises the results in the literature with respect to incentives to collude in two-sided markets.

129.   Theoretical work on incentives to collude and on cartels in two-sided markets is still scarce.

130.   Evans and Schmalensee (2007) claim that to be successful, cartels need to coordinate on all sides. The claim is, according to the authors, justified by the idea that if platforms were to collude on one side the market only, all supra-competitive profits gained on that side would be competed away on the other side due to the network effects. If true, their claim would have the important consequence that, all else equal, it would be harder to form a cartel in a multi-sided industry than in a single-sided one. The authors however do not present nor refer to any economic model justifying their claim. In

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28   In fact, Google also collects information through Doubleclick for instance (See EU Google/DoubleClick case, at paras 258 et seq).

fact, their argument disregards asymmetries between the two sides, whether due to demand characteristics (e.g. the presence of a negative indirect network effect or the lack of on an indirect network effect on one of the two sides) or to market characteristics (e.g. the observable nature of deviations from a collusive agreement).

131.   Indeed Argentesi and Filistrucchi (2007) estimate the demand for daily newspapers in Italy and find that advertising quantity does not affect readers' valuation of a newspaper. They then test for collusion in the market for daily newspapers in Italy using a model *à la* Bertrand with differentiated products and find evidence that newspapers had for some period been colluding on the cover prices but not on the advertising tariffs. They rationalise their finding by observing that collusion on the readers' side is easy while collusion on the advertisers' side is not so easy, since the cover prices are easily observable whereas actual advertising tariffs are often bargained bilaterally and discounts on the listed tariffs are therefore not observable.

132.   Recent work by Ruhmer (2010) uses the single-homing model in Armstrong (2006) as a stage game of an infinitely repeated game in order to analyse collusive incentives in a two-sided market where firms simultaneously choose prices and products are differentiated on both sides. Assuming firms adopt grim trigger strategies she finds that higher network externalities have two opposite effects: on the one hand they tend to raise incentives to collude as they increase the gain from collusion (collusive profits increase and competitive profits decline); whilst on the other hand they tend to lower incentives to collude as they increase the gain from deviation. In her model the latter effect is always found to dominate. As a result, collusion becomes harder to sustain as indirect network effects between the two sides of the market increase. Furthermore, Rhumer (2010) finds that a higher asymmetry in the indirect network effects reduces the incentives to collude.

133.   In conclusion, although the literature on collusion in two-sided markets is still scarce, it is evident that the two-sided nature of the market may affect firms incentive to collude. It would seem that the presence of indirect network effects makes collusion more difficult to sustain, but does not necessarily imply that collusion needs to take place on both sides of the market.

Although the literature on the topic is still scarce, it appears evident that the two-sided nature of the market may affect firms' incentives to collude.

5.5.2   *Efficiencies Resulting from Coordination among Competitors*

This sub-section discusses whether according to the literature there are gains from coordination or cooperation in two-sided markets.

134.   Evans (2002, 2003) insists on the fact that cooperation among competitors is a common feature of multi-sided platform markets. These coordination practices are designed to get all sides on board and increase the attractiveness of the system as a whole. It is the case for instance of the collective setting of interchange fees in the payment card industry.

135.   Indeed, Rochet and Tirole (2002), one of the first papers on two-sided markets, was motivated by the analysis of cooperation inside a payment cards association such as Visa or MasterCard among banks who would compete both in the issuing and in the acquiring markets.

136.   Muris (2005) explains that Visa and MasterCard are joint ventures of thousands of banks that issue credit cards to their customers. Within these systems, issuing banks provide cards to consumers and acquiring banks process payment card transactions for merchants. Muris (2005) further explains that when a consumer uses a card, the merchant transfers the information to the acquirer. The acquirer then contacts the issuer, which pays the acquirer, minus an amount called the interchange fee. This fee is determined by Visa and MasterCard and is thus called a system-determined interchange fee. After having paid the acquirer, the issuer credits the amount to the merchant's account, less another fee for its services. The difference between what the consumer pays and the amount the merchant receives is called the merchant discount. Therefore, as noted by Klein *et al.* (2006), when a system raises interchange fees, merchant discounts increase and this makes the card less attractive for merchants. On the contrary, on the other side of the market, higher interchange fees, to the extent that they are passed through by issuing banks, decrease cardholders' costs and thus make the card more attractive to cardholders.

137.   Rochet and Tirole (2002) show that the interchange fee paid for each transaction, usually by acquirers to issuers, can in fact be designed so as to maximize the volume of transactions which take place though the payment cards. In other words, the interchange fee can be set at a level which allows the payment card association to internalize the indirect network effect among the two-sides of the market. The socially optimal level of interchange fee, which is usually not zero, can however be either lower or higher than the one set by the payment cards association.[29]

138.   Klein *et al.* (2006) criticize the argument that system-determined default interchange fees amount to a collective price fixing agreement. Moreover, they argue that, in any event, system-determined interchange fees are necessary for a system such as Visa or MasterCard to exist and operate efficiently.

139.   Klein *et al.* (2006) examine two alternatives to the system-determined interchange fee. The first alternative is a bilaterally negotiated interchange fee between each issuer and each acquirer. The problem is that this solution entails high transaction costs. Moreover, given that Visa and MasterCard payment card systems have honour-all-cards rules, each issuer negotiating a bilateral fee unconstrained by a default interchange fee would be able to "hold-up" acquirers by demanding an arbitrarily high interchange fee. Because of the honour-all-cards rule, merchants do not have the ability to reject the individual issuer's cards without deciding not to accept all Visa or MasterCard cards. The only possibility would thus be to suppress the honour-all-cards rule but Klein *et al.* (2006) argue that the elimination of guaranteed acceptance would fundamentally undermine the value of payment card systems.

140.   Another alternative is to regulate the interchange fee. In this respect, Klein *et al.* (2006) consider that such regulation would eliminate a payment card system's ability to balance the two sides of the payment card market, in accordance with the economic theory on two-sided markets. More fundamentally, Klein *et al.* (2006) argue that there is no antitrust basis for regulating interchange fees because interchange fees are not an indication or a consequence of payment card system market power. Market power would in principle affect the total price collected by the payment system

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[29]   In fact, there is burgeoning literature on interchange fees in two-sided markets, e.g. Wright (2003) and Guthrie and Wright (2007). We cover it only partially here, as the issues involved are somewhat specific to the market for payment cards and in particular to the four (or five) party system adopted by debit cards and some credit cards. Whereas understanding the functioning of two-sided markets is necessary to understand issues related to interchange fees, the opposite is not true.

from cardholders and merchants. However, in a payment system in which interchange fees are fully passed through by issuers to cardholders (e.g., in the form of lower fees, rewards), interchange fees do not affect the total price collected by the payment system but the relative merchant and cardholder prices. They are merely a transfer from merchants to cardholders. It is argued by some that interchange fees may not be fully passed on because issuers possess market power. Klein *et al.* (2006), however, maintain that the evidence indicates that there is significant competition among issuers for cardholders. Issuers compete through setting cardholder fees, offering cash-back and rewards to cardholders. Higher interchange fees give issuers the incentive to compete for cardholders by offering greater rewards or lower cardholder fees. Klein *et al.* (2006) insist on the fact that the profit-maximising relative prices charged to merchants and cardholders in all payment systems will depend on the relative demand elasticities of merchants and cardholders for a payment card system. Relative prices are invariant to the absolute elasticities of demand on the cardholder and merchant sides.

141.   Muris (2005) argues that regulating interchange fees will have harmful effects as a consequence. Firstly, losing this revenue will force card issuers to decrease their costs, either by reducing card benefits or increasing the revenues that they receive directly from consumers (e.g., higher annual fees, finance charges and penalty fees). Secondly, such increases would likely decrease card ownership, and especially multiple card ownership, which would thereby reduce competition in the payment card market.

In some specific two-sided markets, such as the payment cards one, there appear to be efficiencies resulting from coordination.

5.5.3   *Efficiencies Resulting from Collusion among Competitors*

This sub-section discusses whether according to the literature the welfare effects of collusion in two-sided markets.

142.   Dewenter *et al* (2010) analyse the welfare effects of collusion in a duopoly newspaper market where firms first choose the advertising quantity and then the cover prices. Not only do advertisers value a slot in a newspaper more the more readers the newspaper has, but also readers value positively advertising. Under these assumptions and the additional assumption of a linear demand for differentiated products, they find that collusion on the advertising tariffs may not only lead to an increase in readers' welfare (since it may reduce readers prices more than it reduces the value of the newspaper to the readers by decreasing the quantity of ads) but it can also lead to a higher advertiser welfare (as it increases advertising tariffs less than it increases the newspaper's value to advertisers due to higher circulation).

143.   All in all, it would seem that, as in other network markets, the welfare effects of collusion crucially depend on whether the merger increases the prices less than it allows to internalise the network effects. The issue is however more complex to analyse due to the presence of two groups of consumers and hence two consumers' welfares. The latter are linked but may move in opposite directions. So that in the end the overall welfare effects of collusion depend on the relative size of the price elasticities of demand on the two sides of the market and the sign and size of the two indirect network effects, Clearly, as in both a collusion case and a merger case, economic models usually assume that the colluding or merged firms maximise joint profits, the same result is found when analysing the welfare effects of mergers, as discussed in the next section.

Although the literature is very scarce, it appears that in some cases collusion may increase welfare.

5.6   Mergers

This section discusses what the literature has identified as the effects of mergers in two-sided markets.

144.   In economics, theoretical work on mergers among two-sided platforms is very scarce. Chandra and Collard-Wexler (2009) present an economic model of a two-sided non transaction market which shows that the effects on prices of a merger between two-sided platforms may be ambiguous. Their model is a duopoly model where products are differentiated *à la* Hotelling on both sides of the market, where preferences towards product differentiation are perfectly correlated across customers on the two sides of the market, where one side is assumed to single-home and where there is no direct price competition on the other side but only indirect competition though the number of customers reached on the other side[30].

145.   They find that it is not necessarily the case that a monopolist will choose to set higher prices than competing duopolists on either side of the platform.[31] The reason is that a joint owner internalises the effect that raising its prices will have on both firms. A necessary condition for this result is that indirect network externalities are such that the product is sold at a price below marginal cost on one side of the market. If that is the case, then customers on that side of the market are only valuable to the extent that additional revenues generated on the other side are higher than the cost-price margin. Given the assumption that preferences for variety on the two sides of the market are perfectly correlated, consumers who are indifferent between buying two competing products will turn out to be less valuable to the other side and the additional advertising revenues they provide will be lower than the subsidy they enjoy. Conversely, on the other side, the assumption of no direct effect of the price of the rivals implies that the merger has no direct effect on prices on that side but only an indirect effect through a change in the number of customers on the other side.

146.   Whereas the result depends on the particular assumptions of the model, the fact that such a result is possible in a two-sided market is *per se* important. In addition the authors provide supporting evidence for such a case in the second part of their paper as they evaluate ex-post some mergers among Canadian newspapers.

147.   A recent paper by Leonello (2010) analyses mergers in a similar setting. Her model also has differentiated products *à la* Hotelling on both sides of the market and two oligopolistic platforms merging into a monopoly. She assumes however that post-merger firms offer a bundle of products to each side of the market. In practice, such a case is equivalent to one where the merged firm sells only one product on each side of the market but rules out a loss in consumers' utility due to the loss in variety resulting from a lower number of products. She finds that, even in the absence of efficiency gains, because of the existence of indirect network externalities, merging platforms have the incentive to keep their prices low after the merger at least on one side of the market. Arguably, this might be a more common case than the one identified by Chandra and Collard-Wexler (2009).

148.   These results come from models comparing duopoly and monopoly market structures. At best these models discuss the incentives to merge. To some extent however a similar insight could also be obtained from Armstrong (2006) and Rochet and Tirole (2006).

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[30]   Their model is therefore similar to the competitive bottleneck model of Armstrong (2006) except that not all advertisers necessarily multi-home.

[31]   Note however that they refer to the price per reader not to the price per advertisement.

149.   A merger resulting in a monopoly is an extreme case, however and not a likely merger to be cleared and would therefore not be proposed in practice. It appears that more work is needed to analyse mergers of a subset of oligopoly players in order to be able to take the reaction of rival firms into account when discussing merger effects.

150.   Empirical work on mergers involving two-sided platforms is also scarce. Evans and Noel (2007) point out that, as the Lerner pricing formula does not hold in such markets, traditional merger simulation models are wrongly specified if applied without modifications to two-sided or multi-sided platforms. They also perform an analysis of the merger between Google and DoubleClick (the first empirical analysis in the literature of a merger in a two-sided industry). They show that relying on conventional methods would have led to significantly different results than using methods that explicitly incorporate the two-sided nature of this market. Nevertheless, they only perform a calibration exercise due to lack of data.

151.   Chandra and Collard-Wexler (2009) assess mergers in the Canadian newspaper market, but their analysis is mainly an ex-post merger evaluation exercise; they use a two-sided Hotelling model to explain their finding that greater concentration did not lead to higher prices neither for readers nor to advertisers; yet they do not build and estimate a structural econometric model; their framework therefore, cannot be used to simulate mergers.

152.   While devoid of a competition policy objective and not referring at all to the two-sided markets literature, Fan (2010) does instead present a structural model of demand for newspapers which she uses to assess ex-post some mergers among US newspapers. This model however would also allow performing an ex-ante merger simulation, in addition to accounting for changes in the quality of the newspapers after the merger. This may however be complicated and time-consuming to use in an analysis, because of the need to collect data on quality. Fan (2010) also shows that, ignoring adjustments of product characteristics causes substantial differences in the estimated effects of mergers. Although one would agree with her finding, to the extent that antitrust authorities have so far not been worried about product repositioning when multi-product firms merge.

153.   We will come back to these empirical studies in Chapter 4 as we perform an econometric analysis of the Dutch market for daily newspapers and a merger simulation exercise.

There are only a few studies specifically on mergers in two-sided markets but other insight on the effects of horizontal mergers might be gained from studies comparing market outcome under oligopoly and monopoly. It is found that that a merger may not lead to higher prices on both sides.

5.6.1   *Efficiencies Resulting from Indirect Network Effects*

This sub-section discusses whether according to the literature there are allocative efficiency gains in mergers in two-sided markets.

154.   Evans (2002) recalls that in two-sided markets, due to indirect network effects, the benefit that consumers derive from purchasing a product or service increases with the number of consumers on the other side of the market.

155.   Evans (2002, 2003) claims that the merger of two firms in a multi-sided market is an obvious place in which competition regulators should consider the efficiencies from the merger that are due to the presence of significant indirect network effects.

156.   Durand (2008) confirms this view by stating that even though a merger between two competing platforms might lead to higher prices; it may not harm their customers. This is due to the fact that by combining two platforms into one, the number of users on either side increases, which increases the value of joining the platform.

157.   As already mentioned, this is indeed the case analysed by Leonello (2010). Her model suggests that, even without efficiency gains, a merger in a two-sided market could enhance consumer welfare.

158.   Camesasca *et al.* (2009) argue that the *Truvo Nederland/European Directories* decision is a milestone decision in the sense that it recognises that, in a two-sided market, a larger network may give rise to an intrinsically more valuable product and that, where this is the case, it must be counted as a factor in favour of a transaction.

159.   *The Truvo Nederland/European Directories* case concerned a merger between the only two print directories in the Netherlands. Camesasca *et al.* (2009) note that the NMa adopted a two-sided market analysis and recognised the benefits which an integrated directory would bring to both users and advertisers. The *Truvo Nederland/European Directories* case is considered in more depth in Chapter two.

160.   Camesasca *et al* (2009) consider that this factor should be considered as part of the competitive assessment rather than under an efficiency defense. They argue that not all competition is beneficial to customers and that the competitive assessment should focus on whether the merger will restrict competition from which customers benefit.

Mergers in two-sided markets may lead to higher consumers' welfare even in the absence of productive efficiency gains.

5.6.2   *Inefficiencies Resulting from Indirect Network Effects*

This sub-section discusses whether according to the literature the indirect network effects could indeed be exploited to leverage market power from one side of the market to the other.

161.   In the light of the *Travelport/Worldspan* merger case[32], Rosati (2008) attempts to answer the question whether two-sidedness changes merger assessment.

162.   He argues that in many cases it will not make a substantial difference. This is due to the fact that in many markets the two-sided aspects are not predominant and that the competitive concerns raised by mergers in one-sided markets in general also apply to merger in two-sided markets (e.g., unilateral price increases, elimination of a Maverick, coordinated effects). Moreover, many of the tools applied in the analysis of mergers continue to play an important role in two-sided markets (e.g., evidence on closeness of competition and switching behaviour).

163.   He nevertheless recognises that some specific aspects of two-sided markets are worth noting, for instance the so-called vertical cross-market effects. These effects relate to the ability of the merged platform to leverage its market power on one-side of the market in order to increase prices on the other side.

According to a few studies, indirect network effects could indeed be exploited to leverage market power from one side of the market to the other.

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[32]   See Chapter 2.

5.6.3   *Innovative Two-Sided Markets*

This sub-section discusses whether according to the literature the current merger enforcement policy should be adapted so as to adequately deal with innovative two-sided markets.

164.   Devine (2008) considers that innovative two-sided markets require an adaptation of the current merger enforcement policy.

165.   Referring to the search industry, Devine (2008) argues that innovation is not a by product of competition but the subject of competition. Firms compete to be the first to develop a new product or process that displaces products and processes already available. Firms engaged in competition over innovation are not trying to sell more cheese, or beer, or shoes; they are trying to develop products that will displace cheese, or beer, or shoes. The new products are not substitutes but replacements for older products. Therefore, the critical concern is not price, quality or output as in traditional markets; it is how much a company can innovate, and how quickly.

166.   Devine (2008) thus maintains that companies in the search industry may compete over price to a certain extent (e.g., the company that provides the best conversion rate at the lowest cost per click will certainly have some advantage), but that they mainly seek to provide completely new ways of delivering relevant ads to users as well as to allow advertisers to manage their ad campaigns in the most efficient way possible. In this respect, Devine (2008) is of the opinion that Google's dominance of the search advertising industry is the result of technological and business innovations.

167.   Devine (2008) argues that the definition of an "innovation market", which encompasses the actual and potential competitors in the research and development for a future product, fails to adequately account for competition to displace. She alleges that if two companies operate in different product markets, they are unlikely to be found to be innovating toward the same future product. Moreover, the inability to peer inside the walls of an innovative firm renders any innovation market analysis ineffective.

168.   Devine (2008) also refers to Schumpeterian rivalry, or serial competition, according to which periodic dominance by one firm or a few firms may be symptomatic of healthy innovation-based competition and may be subject to displacement, even when goods with network externalities are at issue. Winners enjoy a period of dominance, during which they receive above cost prices that include the returns necessary to induce risky investment in product innovation, but are subject to being supplanted by rivals in a later innovation cycle. Devine (2008) claims that a successful serially competitive market must allow for new rivals to displace the old dominant firm. Devine (2008) alleges that this mechanism is, however, in tension with the practice of "innovation by acquisition", which consists of absorbing small innovative companies. Devine (2008) considers that a striking example of innovation by acquisition shutting down serial competition is Google's acquisition of DoubleClick.

169.   Devine (2008) argues that the search industry is unlikely to heal itself without judicial, legislative or regulatory intervention. Therefore, she advocates a change in the current merger enforcement policy so as to adequately deal with innovative, two-sided markets.

According to some authors, merger assessment should be adapted so as to adequately deal with the dynamic nature of many two-sided markets.

5.6.4   *Mergers between Competitive Bottlenecks*

This sub-section discusses whether according to the literature a merger between competitive bottlenecks is likely to lessen competition on both sides.

170.   Durand (2008) refers to what Armstrong (2006) calls "competitive bottlenecks". When one side is single-homing and the other one is multi-homing, each platform acts in fact as a bottleneck and therefore holds some sort of monopoly power *vis a vis* multi-homing customers. Because customers that multi-home do not consider the price of other platforms when joining a particular platform, Durand (2008) argues that there is arguably no platform competition on that side. He alleges that the consequence is that a merger between two "competitive bottlenecks" is unlikely to directly lessen competition on the multi-homing side of the platform. Durand (2008) notes that it could, however, do so indirectly, through the impact of the merger on the single-homing side.

171.   Durand (2008) examines the *Archant/Independent News and Media* (2004) case. This merger involved companies in the local weekly newspaper market and is reviewed in Chapter two. Durand (2008) considers that most readers single-home and most advertisers multi-home. According to the competitive bottleneck model, there could be a lessening of competition on the reader side, but little effect on the advertising side. Durand (2008) notes that the UK Competition Commission, however, focused on the effect of the merger on the advertising side and gave very little attention to its potential effects on the reader side. Durand (2008) argues that the fact that the Competition Commission concluded that the merger was not likely to harm advertisers constitutes some sort of validation of the competitive bottleneck model.

172.   Durand (2008) also considers the Future/Highbury House case, which concerns a merger between two consumer magazine publishers. It alleges that readers are generally single-homing and advertisers multi-homing. Durand (2008) argues therefore that, in accordance with the competitive bottleneck model, the merger is unlikely to greatly affect advertising prices. Given that before the merger, there was not much competition between computer magazines for advertisers, there will not be much loss of competition after the merger. Durand (2008) notes that the OFT reached the same conclusion, but by means of a reasoning that had nothing to do with the competitive bottleneck model.

The literature suggests that mergers between competitive bottlenecks are not likely to lessen competition on the side that multi-homes.

5.6.5   *The Application of a One-Sided Approach in Merger Cases*

This sub-section discusses whether according to the literature a one-sided approach was adopted in merger cases by the UK competition authorities and to what extent the literature considers this approach to be warranted.

173.   Durand (2008) reviews a series of UK merger investigations and maintains that in all instances, a one-sided economic logic was applied. Similarly Wotton (2007) reaches a more nuanced conclusion and maintains that the two-sided nature of the market was considered in several cases but that the UK authorities' treatment of apparently comparable cases has been inconsistent. Wotton (2007) notes that in certain recent cases, including *Archant/Independent News and Media* and *Capital Radio/GWR Group* the competition authorities' analysis was confined to the effects on advertisers.

In other, apparently comparable recent cases, however, effects on both sides were considered (e.g., *Future/Highbury House* and *Carlton Communications/Granada*).

174.   Durand (2008) and Wotton (2007) analyse the *Archant/Independent News and Media* case, which relates to a merger between local newspapers and is reviewed in Chapter two. Durand (2008) and Wotton (2007) criticise the fact that in that case the Competition Commission did not expressly consider the effect of the merger on readers.

175.   Wotton (2007) considers the principle of a two-sided market analysis that appears to have been taken into account by the OFT in *Future/Highbury House* (2005). This case related to a merger between two consumer magazine publishers. The OFT was concerned by the fact that the merged entity would have had a very high share of computer games magazines. The OFT considered the relevant advertising and readership markets separately, concluding that there would be no SLC (substantial lessening of competition) in advertising (in particular due to the market power of media buyers), but that there would be a SLC in the readership market. However, Wotton (2007) alleges that although the OFT noted the existence of incumbency advantages and barriers to entry, it made no specific connection between the two-sides of the market and in this respect cannot be said to have fully recognised the principles of two-sided market analysis.

176.   The case *Carlton Communications/Granada* (2003) concerned a merger between two companies which owned most of ITV regional licences within England and Wales. Wotton (2007) observes that the Competition Commission recognised the two-sided nature of the market, in terms of the need for the broadcasters to attract large numbers of consumers in order to sell airtime to advertisers, the competition between broadcasters for audience, and the need to maximise the attractiveness of the audience to advertisers. Wotton (2007) considers that it is instructive to contrast *Carlton Communications/Granada* with *Capital Radio/GWR Group*. The author argues that in *Capital Radio/GWR Group* (2004), a case concerning a proposed merger to create the largest commercial radio broadcaster in the United Kingdom, the OFT applied an SLC test in relation to competition for advertising, but not for audience, and gave no explicit consideration to the interdependence of advertising revenues and audience. He thus maintains that just as with *Archant/Independent News and Media,* two-sided market considerations were wholly absent from the merger review.

177.   Durand (2008) does not appear to entirely agree with Wotton (2007) regarding the extent to which the UK Competition Commission took the two-sided nature of the market into account in *Carlton Communications/Granada.* He explains that on the viewer side, there was no competition between regional ITV licence owners. The Competition Commission therefore did not consider the effect of the merger on that side of the market. The Competition Commission considered that the merger would have an adverse effect on future competition for the sale of advertising. In this respect Durand (2008) notes that the Competition Commission did not assess the extent of the cross-group externality and its effect on viewers. He states that in assuming that viewers dislike TV ads, a reduction of competition on the advertising side could lead to higher prices and thus less advertising. A reduction of competition on the advertising side could thus be beneficial to viewers.

178.   Durand (2008) concludes his survey of UK merger cases by arguing that when it comes to assessing horizontal mergers, the use of a traditional one-sided logic would not appear to be a wrong starting point. He maintains that all else equal, a loss of competition between platforms is likely to lead to higher prices. However, Durand (2008) argues that the analysis should not stop

there. First, the extent of competition on both sides of the market should be examined. And secondly, the effect of the cross-group externality on prices after the merger should be examined.

According to previous literature a one-sided approach has often been followed by the UK competition authorities in merger assessment in two-sided markets.

Chapter 2

A Survey of the Cases

By Dr. Lapo Filistrucchi, Prof. Dr. Damien Geradin,

Simone Keunen,M.Sc, Prof. Dr. Eric van Damme, John Wileur,M.Jur.[33]

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1   INTRODUCTION

1.   The term "two-sided market"[34] may seem quite odd to the uninitiated. All markets would at first sight appear to have two sides, namely buyers and sellers. In fact, the term refers to a specific type of market.

2.   A two-sided market is a market in which a firm acts as a platform[35] and somehow connects distinct but interdependent customer groups ("sides") in a way that generates value for at least one of the two customer groups. Typically, these customers cannot obtain such value or at least not to that extent without the platform.

3.   Two-sided markets exhibit indirect network effects between the various groups of customers. Positive indirect network effects occur when the value obtained by one group of customers increases with the number of customers (or, more generally, the demand) of the other group[36]. For instance, video game developers value video game consoles more if there are more video game players and *vice versa*. Similarly for men the value of a heterosexual dating club increases with the number of women in the club and *vice versa*. Cardholders value a payment card more the more merchants have a point-of-sale terminal that accepts that payment card and *vice versa*. Thus the markets for video consoles, heterosexual dating clubs, and payment cards are two-sided markets characterised by two positive indirect network effects.

4.   Negative indirect network effects occur instead when the value obtained by one group of customers decreases with the number of customers (or, more generally, the demand) of the other group[37]. For instance, although advertisers are likely to value a TV channel more the more viewers it has, the viewers are generally annoyed by TV advertising. The TV market is, thus, a two-sided market characterised by one positive and one negative indirect network effect.

5.   It is not necessary for the existence of a two-sided market that two indirect network effects be present. One suffices. There is for instance some evidence that on average readers do not care about advertising on daily newspapers. Yet a daily newspaper is a two-sided platform, as one would find it difficult to argue that advertisers do not care about the number of readers of the newspaper where their ad is going to be displayed.

6.   A crucial feature of two-sided markets is that the two customer groups are not able to incorporate and appropriate these indirect network effects, which are therefore often referred to as externalities, i.e. external to or not accounted for in the individual decision of the customers. For example, when a reader buys a newspaper she does not take into account that by buying the newspaper she will make the newspaper itself more attractive to advertisers and does not care about the price of an ad in that newspaper.

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[34]   This report discusses "two-sided markets". Most of the discussion extends however to the more general case of "multi-sided markets".

[35]   A "two-sided platform" is therefore a firm active in a "two-sided market". Again, we refer to "two-sided platforms" but the analysis can be extended to "multi-sided platforms".

[36]   Direct network effects occur instead when the value obtained by one group of customers changes with the number of customers who buy or use the same product.

[37]   A two-sided market with two negative indirect network effects is not conceivable as it would imply that neither of the two customer groups would be interested in interacting with the other side, hence neither of them would be interested in joining the platform. A multi-sided market will thus be characterized by at least one positive indirect network effect.

7.   To be more precise, economic theory distinguishes between membership externalities and usage externalities. Membership externalities arise from joining the platform (buying a newspaper or placing an ad in a newspaper, holding a payment card or having a point-of-sale terminal, listing your product at an auction or attending an auction), whilst usage externalities arise from using the platform (paying or accepting payment with a card, selling and buying a product at an auction). As the value of joining the platform depends on the number (or more generally the demand) of customers of the other side, the benefit of using the platform, similarly, depends on the demand for usage by the other side. For instance, assuming a customer holds a card and a shop has the corresponding point-of-sale terminal, even if a customer wants to pay by card, the merchant has to be willing to accept that card for that that particular transaction and *vice versa*. Once again these externalities are not internalised by the users of the platform, i.e. the cardholder and the merchant. For instance a cardholder does not care about the unrealised benefit it forces on the merchant when it refuses to pay by card (e.g. direct crediting on the bank account of the money).

8.   In any case, the existence of this interdependency between the two demands makes a two-sided platform a particular type of multi-product firm. The fact that buyers do not take into account the indirect network effect when deciding to join or use the platform distinguishes a two-sided platform from a firm selling complementary goods. Indeed, a firm selling two complementary goods faces two demands but from only one group of potential customers. However, as these customers need to buy both goods, they internalise the link between the two demands and base their buying decision on the prices of both goods. For instance the demand for ink cartridges depends on the number of inkjet printers. A non-naïve customer will also ask the price of the cartridge before buying an inkjet printer.

9.   In a two-sided market the platform typically recognizes this interdependency between the demands it faces from the two groups of customers and has a strong incentive to "internalize" these externalities. Indeed, owing to the interdependency of the sides of a two-sided market, the platform knows that it needs to "get both sides on board" in order to operate. Without one side of the platform, the other side won't join, and conversely. If one takes the example of a heterosexual dating club, no man will join unless women do and *vice versa*. It is also fundamental for the platform to attract the different sides in the right proportion. For example, a heterosexual dating club with too many men and few women will not be successful and *vice versa*. Similarly, a video game console without enough interesting games will not attract players and one without enough players will not attract game developers. One way for the platform to get the balance right is by setting the right prices on the two-sides.

10.   A fundamental feature of a two-sided market is that, even by keeping fixed the sum of the prices charged to the two sides (the so called price level), the platform can indeed affect the volume of interactions (and therefore its profits) by charging more to one side and less to the other, i.e. by adapting the price structure. For instance in an heterosexual disco, for a given price per couple, success and therefore profits depend on the allocation of this price between men and women, i.e. who pays more and by how much between the couple. In a payment cards market, given the price of a transaction between a cardholder and a merchant (i.e. given the price level), the amount of transactions and the profits will depend on the relative size of the prices paid by the two parties for the transaction (i.e. on the price structure)

11.   By lowering the price on one side of the market, demand on that side is likely to increase. In the case of a positive externality, the increase in demand on that side has the effect of increasing

demand, for any given price, on the other side (which may in turn, in the case of a two positive network effects, increase demand on the starting side, and so on). For instance, by lowering the cover price of a newspaper, more readers are likely to buy this newspaper. Because the readership will increase, more companies will be willing to advertise in this newspaper for any given advertising tariff. A newspaper platform may then find it profit maximizing to lower the price charged to readers and increase the price to advertisers. At the extreme a platform might choose not to charge one side of the market and make the other side pay for the interaction. An example of this is the free press. In some cases a platform might even find it optimal to "pay" one of the two-sides to get it on board. It is the case for example of payment cards, when cardholders gain bonus points by using their card[38].

12.   An important characteristic of two-sided markets are the subscription and usage patterns. Customers on each side of the platform may join or use several platforms, known as "to multi-home", alternatively they may join or use one platform only, otherwise known as "to single-home". One can then distinguish single-homing and multi-homing in membership or in use. One card-holder might for instance hold more than one card (i.e. he might be multi-homing in membership), but in practice might decide to use only one of them (i.e. he might be single-homing in use). Clearly, one cannot multi-home in use and single-home in membership[39], but one can multi-home in membership and in use. So that while Simply put, a cardholder who has only one card cannot but use only that card, whereas one who has more cards can use different cards for different transactions.

13.   There are numerous two-sided markets. In addition to the two-sided markets mentioned above (those for video game consoles, heterosexual dating clubs, TVs, payment cards), yellow pages, internet websites and, more generally, all media markets are two-sided markets. Additionally auction houses, virtual marketplaces such as E-bay, firms selling operating systems and stock exchanges are two-sided platforms. The identifying features are the presence of two distinct groups of buyers and the interdependency between their demands.

14.   The identification of the two-sided nature of such platforms, albeit not always easy in practice, is crucial for competition policy in general and merger policy in particular. Indeed, we show in the survey of the economic literature that two-sidedness affects the definition of the relevant market and, even more importantly, the social desirability of a merger. Indeed it affects both the prices charged pre and post merger and the benefit or damage deriving from the merger to the merging parties, their rivals and their customers.

15.   To understand the current stance of international competition authorities on mergers in two-sided markets, we have examined over eighty concentration cases, reviewed over sixty cases and, for reasons of exposition, decided to focus in-depth on a shortlist of eleven cases throughout this paper[40].

16.   Short listed cases include: the *Google/DoubleClick* merger from the perspectives of both the European Commission [41] and the U.S. FTC [42] ; the European Commission cases

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[38]   As discussed in the survey of the literature, ceteris paribus, the side that attaches a higher positive value to the other one is going to pay more. One could argue for instance that this is the reason behind heterosexual night clubs charging a different price to men and women or behind the observations that in most countries merchant pay for card transactions whereas cardholders do not.

[39]   Indeed that cardholders in the US have many cards but use only one is one of the findings of Rysman (2007).

[40]   The full list of cases examined can be found in the appendix.

[41]   Case COMP/M.4731 Google/DoubleClick, Commission Decision C(2008) 927 final of 11 March 2008.

[42]   Statement of the Federal Trade Commission concerning Google/DoubleClick, FTC File No. 071-0170.

Travelport/Worldspan[43] and *GIMD /Socpresse*[44]; the NMa cases *European Directories/Truvo*[45], PCM/ADN/WND[46] and *Bloemveiling Aalsmeer/FloraHolland*[47]; the UK OFT case *Global Radio/GCap Media*[48], the UK Competition Commission case *Archant/Independent News and Media*[49]; the French Competition Commission case *SIPA/Pôle Ouest Socpresse*[50] and the French Minister of Economy case *Spir/Schibsted*[51].

17.   By examining these cases, we aim to provide general insights not only of the current practice in merger policy but also discuss whether and how the two-sided nature of the market affected or should have affected the decisions. The final objective is to derive some suggestions to guide decisions in future competition cases.

18.   This paper is organized as follows. Section 2 examines whether and to what extent competition authorities have recognised the two-sided nature of the market under consideration. Section 3 discusses whether and the extent to which two-sidedness affected the definition of the relevant market. Finally, Section 4 considers whether and the extent to which it affected the evaluation of mergers involving two-sided platforms. Section 5 summarises the conclusions we draw from the survey of the literature.

2   ASSESSMENT OF THE TWO-SIDED NATURE OF THE MARKET

19.   When assessing a merger in a two-sided context the first step should be to identify two-sidedness. Over the last decade, only few cases recognized the two-sided nature of the market under investigation, and the terms "two-sided market" and "two-sided platforms" were used in cases. Nowadays, however, most competition authorities appear to have started referring to two-sided terminology. As it will be shown below that this does not mean that the economic principles underlying the concept of two-sidedness and their policy implications have been fully taken into account in their decisions.

20.   The remainder of this section initially considers cases that refer to two-sided terminology (Section 2.1). It then discusses cases which do not use the two-sided terminology but which identify the two-sided nature of the market under consideration (Section 2.2). Finally, it mentions cases in which two-sided considerations appear to be totally absent (Section 2.3).

2.1   Two-Sided Terminology

This section provides an overview of cases in which the terms "two-sided markets", "two-sided platforms" or "two-sidedness" are employed.

21.   As noted above, the two-sided terminology is now used by many competition authorities.

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[43]   Case COMP/M.4523 Travelport/Worldspan, Commission Decision C(2007) 3938 of 21 August 2007.

[44]   Case COMP/M.3420 GIMD/SOCPRESSE, Commission Decision of 16 June 2004.

[45]   NMa, Case 6246 *European Directories – Truvo Nederland*, Decision of 28 August 2008.

[46]   NMa, Case 6689 *PCM - ADN – WND*, Decision of 17 July 2009.

[47]   NMa, Case 5901 *Bloemenveiling Aalsmeer – FloraHolland*, Decision of 21 August 2007.

[48]   OFT, Case ME/3638/08, Completed Acquisition by Global Radio UK Limited of GCap Media plc, Decision of 8 August 2008.

[49]   UK Competition Commission, A report on the acquisition by Archant Limited of the London Newspapers of Independent News and Media Limited (2004).

[50]   French Competition Council, Opinion n°05-A-18 of 11 October 2005 *SIPA/Pôle Ouest Socpresse*

[51]   French Minister of Economy, Decision C2007-19 of 10 September 2007 *Spir/Schibsted*.

22.   The two-sided terminology is for instance employed by the European Commission in the *Google/Doubleclick* and *Travelport/Worldspan* cases.

23.   The *Google/DoubleClick* case relates to a merger between Google and DoubleClick, two companies active in the online advertising sector. Google is a major provider of online space (on its own website: Google.com) and intermediation services for online advertisements (through AdSense). Intermediation services are provided *inter alia* by ad networks which connect (ipublishers that want to host advertisements to advertisers that want to run ads on those sites. Once the advertising space has been sold, ad serving tools ensure that the correct advertisement is served to the publisher's website at the right place and at the right time. Ad serving tools also measure the performance of the ad placement. DoubleClick is a leading provider of ad serving technology. Intermediation services may be bundled with ad serving (as in AdSense) or sold independently. The European Commission alleges in *Google/DoubleClick* that ad networks constitute "*two-sided platforms*" that serve both publishers and advertisers.[52] All else equal, a website is indeed more likely to choose to sell its advertising space through an ad network that has a higher number of advertisers connected to it and *vice versa*. The Commission explains that "*Ad networks aggregate ad space inventory thus maximizing revenue opportunities and minimizing administrative costs of selling the ad space for the publisher. From an advertiser's point of view, an ad network can be considered as a "single buying point" for online inventory which often also provides handling and performance monitoring of online advertising campaigns. Ad networks generate revenues (paid by advertisers for access to publishers' ad space inventory) that are shared between the network manager (as intermediation fees) and publishers.*"[53]

24.   In the *Travelport/Worldspan* case, the European Commission states that so-called global distribution systems (hereafter "GDS") are two-sided platforms.[54] A GDS is a platform through which travel service providers such as airlines, car rental companies and hotel chains distribute their travel content to travel agents and ultimately to end-consumers. At the same time, travel agents can access and book travel content for end-consumers. The European Commission argues that "*GDS providers act as intermediaries in a market of a two-sided nature, connecting two separate consumer categories.*"[55] The European Commission identifies an "*upstream market*" for travel service providers and a "*downstream market*" for travel agents.[56] It further argues that *"[t]he existence of the GDS platform is justified by the added value it creates. A GDS coordinates the demand of [travel agents], thereby generating a positive network externality which is internalised by the [travel service providers].*"[57] GDSs allow travel service providers to access a broad network of travel agents and they enable a centralized search for fares which is more effective and less time consuming for travel agents than by relying on multi-channel sources from numerous travel service providers-specific sources, so that both sides attach positive value to joining the platform.[58]

25.   The two-sided terminology is also employed by the NMa in amongst others the *European Directories/Truvo, Bloemveiling Aalsmeer/FloraHolland* and *PCM/ADN/WND* cases.

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[52]   Google/DoubleClick, at para 20.
[53]   *Id.*
[54]   Travelport/Worldspan, at para 10.
[55]   *Id*, at para 11.
[56]   *Id.*
[57]   *Id*, at para 12.
[58]   *Id.*

26.   *The European Directories/Truvo case* relates to a merger in the field of classified directories. The NMa notes that two sorts of client can be distinguished: users of directories and companies wishing to advertise in directories.[59] The NMa states that "*the provision of such directories is distinguished by two-sidedness.*"[60] It alleges that *"[t]he success of a directory depends partly on its success in attracting both users and advertisers.*" Furthermore, *"[t]he willingness of advertisers to pay for advertisements in a directory depends partly on the number of users that the directory attracts. At the same time, the use of a directory depends on the directory's information value."*[61] The NMa also considers that it is reasonable to assume that a sharp increase or decrease in use will lead to a response from advertisers.[62]

27.   In the *Bloemveiling Aalsmeer/FloraHolland* case, the merging parties are flower auction houses. These auction houses offer growers and wholesalers a marketplace in which to trade ornamental horticultural products. The NMa argues that this marketplace is a two-sided market.[63] It alleges that "*[a]n important characteristic of a two-sided market is that the two sides of the market interact. The group on the one side of the market is attractive to the other side of the market and vice versa."*[64] The NMa thus notes that *"[t]o be attractive to one side of the market, it is […] necessary for a marketplace to have enough customers on the other side of the market and vice versa.*"[65]

28.   Finally, the two-sided terminology is also used by the French Minister of Economy and the UK Office of Fair Trading (hereafter "OFT") with regard to classified advertising and commercial radio respectively.

29.   The *Spir/Schibsted* case concerns the creation by Spir and Schibsteb of a jointly owned company to take over their activities in the sector of classified advertisements for the sale of second-hand automobiles and boats, published on the internet and on printed press. The French Minister of Economy states that the media sector is characterized by the existence of two-sided markets and thus by the importance of readership for advertising. He points out that the readership determines the advertisers' interest in a media and that commercial advertising leads to a significant share of media operators' revenues.[66]

30.   *Global Radio/GCap Media* case concerns a merger between two UK commercial radio broadcasters. The OFT recognizes that commercial radio is a two-sided market.[67] It alleges that "*the better the quality of the programmes and the offer made to the audience as a whole, the more attractive it becomes for listeners and, in turn, the more attractive it becomes for advertisers seeking to reach them.*"[68] It further explains that *"commercial radio stations earn their revenues principally from the sale of advertising. They compete for advertisers through the size of their total audience, the demographic profile of their listeners, the strength of their brand and through price negotiations.*"[69] Regarding the impact of two-sidedness on merger assessment, the OFT focuses on whether, as a

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[59]   European Directories/Truvo, at para 105.
[60]   *Id*, at para 106
[61]   *Id*, at para 106.
[62]   *Id*, at para 108.
[63]   Bloemveiling Aalsmeer/FloraHolland, at para 27.
[64]   *Id.*
[65]   *Id*
[66]   Spir/Schibsted, page 5.
[67]   Global Radio/GCap Media, at para 22.
[68]   *Id*, at para 22.
[69]   *Id*, at para 23.

result of the merger, advertisers will pay more to reach listeners and/or receive reduced value for the money they spend on adverts.[70] The OFT states that *"while it is self-evident that listeners would not experience a direct adverse price effect in the way advertisers might, a merger could also result in listeners being obliged to pay more for the broadcasting content they seek by being obliged to listen to incrementally more advertising - which can be considered an adverse effect based on the reasonable assumption that listeners do not listen to the radio primarily to hear adverts."*[71] The OFT notes that adverse effects may also affect listeners to the extent that reduced competition could imply that listeners are faced with lower-quality programming or innovation levels, such as less investment in hiring top DJs and presenters, research into play-lists and listeners tastes, and so forth.[72]

The two-sided terminology has now been employed by most competition authorities. This does not mean, however, that the implications of two-sidedness were always fully taken into account.

2.2   Two-Sided Approach

This section brings examples of cases in which the two-sided terminology is not used but which nevertheless identify the two-sided nature of the market under consideration.

31.   In a series of merger cases[73], although the competition authorities do not refer to the terms "two-sided market", they nevertheless recognize the two-sided nature of the market under examination. In the US *Google/DoubleClick* case, for instance, the US Federal Trade Commission (hereafter "FTC") acknowledges that both publishers and advertisers are using intermediation services and it defines the relevant market and assesses the merger from the perspective of both publishers and advertisers.[74] It also recognizes the existence of indirect network effects when analyzing the non-horizontal effects of the merger.

32.   Similarly, in *SIPA/Pôle Ouest Socpresse* and *GIMD/Socpresse*, the French Competition Council and the European Commission consider the various sides of the classified advertisements (readership, advertising and classified ads) and magazines (readership and advertising) respectively. [75] In *SIPA/Pôle Ouest Socpresse*, the French Competition Council also interestingly considers indirect network effects and, in particular, the fact that the latter may constrain the power of the merged entity to raise prices post-merger.[76]

33.   In the *PCM/ADN/WND* case by the NMa, the two-sidedness of the market is recognized in both the definition of the relevant product markets[77], which are separated into the market for "(i) publishing newspapers/daily magazines, (ii) offering advertisement space for these regional advertisements, (iii) offering advertisement space for national advertisements, (iv) offering online advertisements, (v) offering press activities, specifically cold offset printing press."[78]

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70   *Id*, at para 27.
71   *Id*, at para 28.
72   *Id*, at para 29.
73   See the appendix for tables reporting other cases falling into this group.
74   Google/DoubleClick (US), under section I.B. and II.C.1.
75   SIPA/Pôle Ouest Socpresse, at paras 29, 33, 37 and 53 ; GIMD/Socpresse, at paras 12, 17, 31, 34.
76   *Id*, at paras 67-69.
77   Section V A. Paragraph 12-25 distinguishes the product markets,
78   Citing para 12.

In a series of cases, competition authorities did not employ the two-sided terminology but they nevertheless at least partially accounted for the two-sidedness of the markets under consideration.

2.3   One-Sided Approach

This section considers a case in which two-sided considerations appear to be totally absent from the merger analysis.

34.   In some of the cases reviewed,[79] the competition authority in question surprisingly fails to take into account the two-sidedness of the market under consideration. This is the case in *Archant/Independent News and Media*, a merger between weekly local newspapers. The UK Competition Commission ignores one of the sides of the platforms, namely the readers' one, and only looks at the advertising market.[80] The existence of indirect network effects and their implications are therefore not discussed. Yet, as mentioned above, there is hardly any doubt on the fact that a weekly newspaper is a two-sided platform, as the value of placing an ad for an advertiser increases with the number of readers.

In a few cases, the competition authorities completely neglected the two-sided nature of the markets under review.

3   TWO-SIDEDNESS AND MARKET DEFINITION

35.   In merger cases, the main purpose of market definition is to identify the firms which exert competitive pressure on the merging parties and which therefore constrain their power to increase prices post-merger.

36.   Market definition is therefore the attempt to define a group of products which are sufficiently substitutable to each other that the firms producing them can be perceived as competing against in each other.

37.   The next subsection will consider whether competition authorities have chosen to define one or two markets in practice in merger cases involving two-sided markets as well as the arguments they have used in support of their choice (Section 3.1). We also discuss whether they chose to take into account both sides of the market in their assessment of the relevant market(s) (Section 3.2). We then report whether and, if so, how authorities performed the SSNIP test to define the market (Section 3.3.)[81]. Finally, we discuss the practice of certain competition authorities that have bypassed market definition (Section 3.4).

3.1   One vs. two relevant markets

This section considers whether competition authorities define a single market including both sides of a two-sided market or on the contrary whether they prefer to define one market per side.

38.   As discussed above, in a two-sided market the two-sides of the market are by definition linked by the presence of indirect network effects. As a result, firms are platforms which need "to get both sides on board" to be in a position to do business.

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[79]   See the appendix to this chapter for tables reporting other cases falling into this subsection.

[80]   Archant/Independent News and Media, at paras 4.12 and 4.13.

[81]   One issue here is that decisions do not in general report how the test was performed and/or which formulas were used. Indeed, this information is usually contained in preparatory documents.

39.   The question then arises of whether there is only one market or there are two markets to be defined. For instance, when analyzing a merger among newspapers, the question is whether there is a market for newspapers or whether there is a market for advertising (on newspapers) and a market for news. Similarly, analyzing a case involving payment cards, the question is whether there is a market for payment cards services or a market for payment cards services to card-holders and a market for payment cards services to merchants.

40.   The issue of whether there should be only one market or two markets is dealt with by the NMa in the *Bloemveiling Aalsmeer/FloraHolland* case. The NMa states that it is important for the competition law assessment to determine whether the different sides of the market for auction services for ornamental horticultural products constitute separate relevant markets or whether both sides of the market must be assessed together.[82] In this respect, the NMa refers to the European Commission's decision in *Visa-Multilateral Exchange Fee*, where a single market including both the cardholder/issuing bank side and the merchant/acquiring bank side was defined. The NMa thus holds that both the growers' side and the buyers' side of the market must be assessed together. Specifically, the NMa argues that a single market should be defined because "*[a]fter all, if there is no demand from buyers for auction services for ornamental horticultural products, the growers cannot sell ornamental horticultural products and if growers do not wish to supply auction services, buyers cannot purchase such services for ornamental horticultural products*".[83] The fact that without growers, no buyers will use auction services and that conversely, without buyers, no growers will supply auctions is one of the main characteristics of a two-sided market. The NMa's argument would thus mean that for all two-sided markets, a single market encompassing all sides should be defined. This approach, however, was not followed in a series of cases.

41.   In the case of *GIMD/Socpresse* for instance, the European Commission defines distinct markets for magazine readers on the one hand and advertisers on the other.[84] Similarly, in the case of *SIPA/Pôle Ouest Socpresse*[85], which concerned classified advertisements, the French Competition Council distinguishes between markets for readership, advertising and classified ads.

42.   One may wonder why certain cases define a single market, while others consider that the different sides of a platform constitute separate markets. The relevant product market is usually defined as a set of substitutable products[86]. However, the different sides of a two-sided platform are normally not substitutable. The competition authorities would thus appear to consider the fact that when the two-sided platform merely enables two groups of customers to *transact* with each other, the two sides of the platform should be included in the same market and the transaction in itself would appear to be considered to be the relevant product.

43.   For instance, in the *Bloemveiling Aalsmeer/FloraHolland* case, the flower auctions and other sales channels merely provide a platform for growers and buyers to transact. This could explain why the NMa includes both sides in the market and the relevant product market is considered to be that of the trade in ornamental horticultural products (i.e., the transaction). Similarly, in *Travelport/Worldspan*, the European Commission does not define separate markets for travel

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[82]   Bloemveiling Aalsmeer/FloraHolland, at para 28.
[83]   *Id*, at para 29.
[84]   GIMD/Socpresse, at paras 12 and 17..
[85]   SIPA/Pôle Ouest Socpresse, at para 24.
[86]   See, for instance, Commission Notice on the definition of relevant market for the purposes of Community competition law, at para 15.

service providers on the one hand and for travel agents on the other hand. Indeed, just as flower auctions, GDSs are transaction platforms.

44.   On the opposite, the decisions in *GIMD/Socpresse* and *SIPA/Pôle Ouest Socpresse* can be explained by the fact that magazines are not transaction platforms. These multi-sided platforms do not enable different group of customers to transact with each other but aim at building audience in order to maximize advertising revenues.

45.   Although the European Commission does not reach a definitive conclusion as to the exact scope of the relevant market, the *Google/Doubleclick* case is nevertheless interesting because two multi-sided markets would appear to imbricate. First, as stated above, the European Commission identifies the two-sided nature of intermediation services.[87] In considering whether the relevant market is that of online advertising or whether there exists a narrower market for intermediation services, the Commission does not envisage the existence of separate markets for advertisers and publishers but on the contrary assesses the reality of an intermediation market.[88] The definition of a single market in such situation would appear to be correct in the light of the transactional nature of ad networks. However, in defining the market, the European Commission wrongly focuses on the publishers' point of view only.[89] In this respect, the approach followed in the US *Google/DoubleClick* case is preferable as the US Federal Trade Commission (hereafter "FTC") discusses the existence of a market for intermediation services from the perspective of both advertisers and publishers.[90] Another two-sided market is at stake in the *Google/DoubleClick* case. The Commission considers the online advertising market but does not recognize that the websites hosting such advertising are two-sided platforms that cater not only for advertisers but also for website viewers and in some instances for content providers.[91] Arguably, the Commission should have also defined a market for viewers of internet websites (and for content providers if the need arose).

The competition authorities have taken the view that when the two-sided platform merely enables two groups of customers to *transact* with each other, the two sides of the platform should be included in the same market, and the transaction should be considered to be the relevant product.

3.2   Considering both sides of the market

This section reviews whether the competition authorities have correctly realized the need to take into account all sides of the market when defining either only one market or two interrelated markets

46.   Irrespective of whether one defines a single market which includes all sides or two different markets, the issue arises of whether one should look at each side of the market independently or consider them jointly, i.e. if one should consider the role of the indirect network effect when defining the market. For instance, the question is whether one should look at the advertising side when one defines the relevant market for readers in a merger among newspapers and *vice versa*. Or whether one should look at both buyers and merchants when one defines the market for payment cards.

47.   Irrespective of whether they defined only one market or two interrelated markets. Competition authorities have generally considered both sides of the market in question. In the next two

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[87]   Google/DoubleClick, at para 20.
[88]   *Id*, at paras 57 et seq.
[89]   *Id*, at paras 57 et seq.
[90]   Google/DoubleClick (US), under section I.B..
[91]   Google/DoubleClick, at paras 44 et seq.

subsections we report their arguments distinguishing however between those used when they chose to define a single market and those put forward when they chose to define two markets

3.2.1   *Defining a single market including both sides*

Here we discuss whether competition authorities have generally considered both sides of the market when defining a single two-sided market.

48.   A good example of a case in which the competition authority defines a single market for both sides and considers both of these sides is *Travelport/Worldspan.* In defining the market, it examines potential alternatives to GDSs from the perspective of both travel agents and travel service providers.[92]

49.   On the contrary, in *Google/DoubleClick*, as exposed above, the European Commission, defines an intermediation market by referring to the publishers point of view only (and not to the advertisers' point of view).[93]

The competition authorities have not always t both sides of the market under consideration.

3.2.2   *Defining two interrelated markets*

This section reports whether competition authorities have correctly assessed the need to take into account all sides of the market when having to define two interrelated markets.

50.   The European Commission and the French Competition Council take all sides into considerations in *GIMD/Socpresse* and *SIPA/Pôle Ouest Socpresse* by defining several different markets for each side.[94]

51.   Conversely, in the *Google/DoubleClick* cases, neither the European Commission, nor the FTC consider the existence of markets for website viewers and for content providers, besides the market for online advertising,. It is true that the merger between Google and DoubleClick may not have had any direct impact on users of websites or on content providers. However, the merger could have had indirect effects on website viewers and/or content providers. Owing to the existence of indirect network effects, it is indeed always necessary to consider the impact that a lessening of competition on one side may have on the other side(s).

52.   In *Archant/Independent News and Media,* a merger among newspapers, the UK Competition Commission surprisingly does not identify, as the European Commission does in *GIMD/Socpresse*, two distinct markets, namely a readership market and a market for the sale of advertising space. In fact, the Competition Commission does not define any readership market, but rather focuses on defining a market from the perspective of advertisers.[95] The risks of not taking the two-sided nature of the market into account in *Archant* are more important than in *Google/Doubleclick*. Indeed, in the *Archant* case, the merger might have directly lessened competition on the neglected side (i.e., the readership), whereas in *Google/Doubleclick* it could only have done so indirectly, that is to say through the merger's impact on the other side. It is unclear why in *Archant* the Competition

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92   Travelport/Worldspan, at paras 22 et seq.

93   Google/DoubleClick, at paras 57 to 70.

94   GIMD/Socpresse, at paras 12 and 17 ; SIPA/Pôle Ouest Socpresse, at paras 29, 33 and 37.

95   Archant/Independent News and Media, at paras 4.1 and 4.2.

Commission appears to have worked on the assumption that the merger was unlikely to affect readers.

53.   In the area of online classified advertisements, the French Minister of Economy adopts a strange approach in *Spir/Schibsted* by arguing that contrary to the situation in the written press, there is no readership market for the internet. The Minister rightly recognizes that the audience is useful at the stage of the competitive assessment and, in particular, it maintains that the audience is essential in determining the market power of operators on the relevant markets (see below, Section 4.2.1.1). However, with respect to market definition, the Minister holds that there is no audience or readership market for internet websites. The Minister refers to the fact that this is established for free television, "*due to the absence of any commercial relationship between channel editors and viewers*".[96] What this means is unclear but in any event the result is highly unsatisfactory. As in *Archant*, the Competition Authority fails to assess the impact of the merger on readers.

In situations where two interrelated markets should be defined, there is a non-negligible risk that the competition authorities fail to identify one of these markets. This is confirmed by the fact that in several cases the competition authorities have indeed neglected one of the sides of the two-sided market.

3.3   The SSNIP Test in a Two-sided Market

This section considers how the competition authorities addressed the difficulties of applying a SSNIP test to define the relevant market in a two-sided market

54.   A commonly used tool for market definition in a traditional single-sided market is the so-called Small-But-Significant-Non-Transitory Increase-in-Price Test (in short the SSNIP test) which defines the market as the smallest set of substitute products such that a substantial (usually five or ten percent) and non transitory (usually one year) price increase by an hypothetical monopolist would be *profitable*.

55.   In a merger case, starting from a set of candidate products for the relevant market, the SSNIP test is implemented as follows: one simulates *a given price increase* above the current level[97] by a hypothetical monopolist who owns just one product (one of those of the merging parties) and, as long as that leads to estimated losses in profits, progressively increasing the number of products owned by the monopolist. When profits are no longer estimated to decline following a small but significant increase in price by the hypothetical monopolist, the set of products owned by the monopolist in the last simulation constitutes the relevant market.

56.   The procedure described above has been adopted in the EU.[98] In the US,[99] the Hypothetical Monopolist test (in short HM test) relied upon is slightly different: it defines the market as the

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96   Spir/Schibsted, section 3.2.1, pages 9, 10.

97   Indeed the current level is assumed to be competitive. If the current price is not the competitive one the market might be defined too narrow. This is a drawback of the test giving rise to the so-called "cellophane fallacy"., named from the Du Pont case in the US. The issue is well-known in both theory and practice but mainly relevant for market definition in cases of abuse dominance.   Both the EU Commission Notice on the definition of the relevant market for the purposes of Community competition law, at para.19, and the US horizontal Merger Guidelines at para 1.11.5 recognize the issue and suggest that, if there are reasons to believe the price is not competitive, then respectively "the fact that the prevailing market price might already have been substantially increased will be taken into account" and "the Agency will use a price more reflective of the competitive price".

98   See Commission Notice on the definition of the relevant market for the purposes of Community competition law, para.15-17 and 19.

smallest set of substitute products such that a hypothetical monopolist owning them would find it *profit-maximizing* to increase prices substantially (usually five or ten percent) and non-transitorily (usually one year).

57.   Starting from a set of candidate products for the relevant market, the HM test is implemented as follows: one calculates *the optimal price increase* by a hypothetical monopolist who owns just one product (one of those of the merging parties); if the optimal price increase above the current competitive level is small but significant (usually at least 5 or ten per cent), another product is added to the set of those owned by the hypothetical monopolist and the optimal prices of both products are calculated and so on and so forth. When it is found that the profit maximizing hypothetical monopolist would not raise prices by at least a small but significant amount, the set of products owned by the monopolist in that last simulation constitutes the relevant market.

58.   The difference between the SSNIP and the HM test appears at first sight very small. Indeed in theory a difference between the two tests is only noticed when the optimal increase in price would be lower than five percent (so in the HM. test the market would be defined) but still a five percent increase in prices would be profitable (so that in the SSNIP test the market would be defined as wider). It is however debated whether this difference is relevant in practice.[100]

59.   Both in the EU and in the US, the test is often done by Critical Loss Analysis (CLA) or Critical Elasticity Analysis (CEA), for which formulas are derived under the assumptions of constant marginal costs and either linear or constant elasticity demand. Under these assumptions, performing a CLA or a CEA is exactly identical to performing the SSNIP test or the HM test.[101]

60.   Irrespective of whether one uses the SSNIP or the HM test, interesting issues arise when attempting to extend the SSNIP test to a two-sided market:

-    Given that firms set two prices, one on each side of the market, which price should the hypothetical monopolist increase?

-    Given that there are indirect network effects between demand (and therefore profits) on the two-sides, should one consider profits on only one side or on both sides of the market?

61.   In the *Bloemenveiling Aalsmeer/FloraHolland* case, the NMa applies a critical loss analysis.[102] It determines the actual loss by asking questions about the growers' and buyers' intention to switch in the event of a deterioration of various parameters of competition.[103] In defining the relevant market, the NMa accounts for two-sidedness as it considers both the buyers' and the growers' side of the market. The NMa also assessed the impact of indirect network effects on the critical loss analysis. It is indeed plausible that switching by growers will lead to the departure of buyers and *vice versa*. The NMa thus recognizes that the effect of a less attractive situation for growers due to the switching of buyers (and *vice versa*) was not taken into account when calculating the actual loss. This effect is confirmed by the quantitative market research which shows that a fall in demand will result in

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99   See 1992 Horizontal Merger Guidelines as revised in1997 US Horizontal Merger Guidelines, para 1.11.
100   See Werden (2002-I, 2002-II) for a discussion of the difference between the EU and the US tests and Elizalde (2008) for a simulated comparison.
101   Clearly the CEA and CLA formulas are not the same in the EU and in the US, reflecting the difference between the SSNiP test and the HM test. See again Werden (2002-I).
102   As mentioned above, critical loss is a technique for implementing the SSNIP test.
103   Bloemenveiling Aalsmeer – FloraHolland case 5901; para 63-78.

considerable switching by growers/buyers. The NMa correctly concludes that the actual loss is in fact higher than the one which was calculated (which suggests a broader market).

62.   In *Archant* a SSNIP test is used to define the relevant market, but as only the advertising side is analysed, the issue of whether the two-sided nature of the market and in particular the presence of indirect network effects should affect the test was not touched upon[104].

63.   Other decisions, related to SIPA, GIMD, Spir, Travelport, Google/DoubleClick, do not explicitly mention whether a SSNIP test was applied to define the relevant market.

64.   In any case, none of the competition authorities appear to have applied a specific two-sided market formula to perform the test.

None of the competition authorities appears to have applied a specific two-sided market formula to perform the SSNIP test. The NMa, however, acknowledged that a traditional critical loss analysis was likely to overestimate the actual loss and thereby result in the definition of an overly broad market.

3.4   Avoiding the Definition of the Relevant Market

This section considers whether the market definition stage has been bypassed when assessing a merger.

65.   The definition of the relevant market may be a difficult exercise, at least more difficult than in a single-sided market.

66.   Considering the difficulties of defining the relevant market in a two-sided context, it is worth noting that competition authorities have on a number of occasions chosen to focus on direct competitive effects rather than market definition. This is the case for example in the *Global Radio/GCap Media* case where the OFT suggests to test the validity of unilateral effects theories of harm by considering real world evidence relating to direct competitive constraint actually exercised by one party on the other, and removed by the merger, rather than embark upon an analytical exercise featuring hypothetical monopolists.

67.   Similarly, the NMa makes no use in the *European Directories/Truvo* case of the standard market definition framework, but rather bases its assessment on an analysis of effects. In the *European Directories/Truvo* case, the NMa considers that the definition of the relevant market is not an end in itself, but rather a tool for assessing the competitive relationships. As such, the avoidance of defining a market does not have an impact on the assessment of the merger, as long as sufficient information is available to replace market definition by a tool that directly measures competition[105].

In several cases, the competition authorities have avoided defining the relevant market and focused instead on the direct competitive constraint exercised by the merging parties on one another.

4   TWO-SIDEDNESS AND MERGER EVALUATION

68.   The main concern of merger control is whether a proposed merger will increase market power, i.e. whether the proposed merger will lead to higher prices (or lower quality) in the market, and whether it is likely to lead to foreclosure.

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[104]   See Archant/Independent News and Media, at para 4.2.
[105]   See Section 3.5 in Chapter 3 for further discussion on the topic.

69.   The remaining of this section analyzes successively whether competition authorities considered the impact of the merger on both sides of the market or only on one (Section 4.1) and whether they took into account the impact of two-sidedness on the assessment of horizontal mergers (Section 4.2) and on the assessment of vertical mergers (Section 4.3).

4.1   Considering All Sides

70.   *This section reports whether in the cases under consideration competition authorities assessed the impact of a merger on both sides of a two-sided market or only on one side.*

71.   Within the range of merger cases reviewed, a few would appear to have focused on only one of the sides of the platform. This usually follows from failing to take into account the other sides in the market definition phase already. This is the case in *Archant/Independent News and Media* where the UK Competition Commission fails to define a market for readers and subsequently fails to consider the impact of the merger on that side of the platform. The Competition Commission concludes that the merger will not significantly lessen competition in the market for advertising in the areas affected by the takeover and thus decides to clear the acquisition by Archant of Independent News and Media's local weekly newspapers in the London region. Had the Competition Commission accounted for the fact that the merger could have affected the readers' side, the outcome of the case could have been different. Indeed, the merger could very well have diminished the welfare of readers owing to an increase in prices and/or to a decrease in the quality of the editorial content.

In a few cases, the competition authorities have only assessed the impact of the merger on one of the two sides of the market under consideration.

4.2   Horizontal Effects

This section considers whether competition authorities recognized the impact of the two-sided nature of the market on horizontal effects of a merger.

72.   Competition authorities are, as a rule, required to assess whether an horizontal merger is likely to raise concerns with respect to unilateral or non-coordinated effects (i.e. whether the merger might increase the market power of the merging firms) and with respect to coordinated or collusive effects (i.e. whether the merger might make it more likely that collusion takes place in the market).

73.   In order to assess these, a competition authority takes into account any factor that makes more or less likely an increase in market power or factors that facilitate collusion. It therefore considers the role of efficiency gains, of barriers to entry and of countervailing buyer power.

74.   We first address issues that have arisen with respect to non-coordinated effects, then those which have been tackled when assessing coordinated effects.

4.2.1   *Non-coordinated effects*

This section considers whether competition authorities recognized the impact of their two-sided nature when evaluating non-coordinated effects of a merger between platforms.

75.   Similar to all markets characterized by network effects, two-sided markets tend to be rather concentrated. This is due to the fact that the network, and more precisely its size, is valuable to consumers. In this respect, in a market characterized by positive network effects it is not necessarily

the case that a higher concentration is detrimental to consumer welfare. On the one hand it is likely to lead, in the absence of efficiency gains, to a higher price, but on the other it is also likely to correspond to a higher utility derived from the good or service and a higher willingness to pay for the good. As consumer welfare is in economics conceived as dependent on the difference between the willingness to pay of consumers and the actual prices that consumers pay, whether it increases or decreases depends on whether the prices increases more than the willingness to pay or vice versa.

76. In a two-sided market the issue is particularly complex due to the presence of two indirect network externalities that link two distinct demands and that need not necessarily be both positive.

77. The questions arise whether the two-sided nature of the market increases the ability of merging firms to raise prices after the merger and, in an economic approach to competition policy, whether a higher price necessarily leads to a higher loss in consumer welfare and higher allocative inefficiency.

78. Furthermore, given that a two-sided platform generally sets two distinct prices, the issue of what it means to exercise market power arises, i.e. whether it implies raising both prices or just one price.

79. Finally, in a two-sided market there are by definition two groups of consumers. There are therefore two consumers' welfares. The question is then whether an antitrust authority should give the same weight to both of them. The most interesting case in this regard is probably the one of two sided markets characterized by a transaction between end users, such as the auction houses or the payment cards markets. In this case only one of the two sides is a consumer in the market for the good, which is the object of the transaction. The crucial point is then whether this should matter or not for the definition of who the consumers are in a merger between auction houses or payment cards companies.

80. In the following sections we will discuss how, in the cases we surveyed, indirect network effects have been perceived to affect market power (Section 4.2.1). We then consider the relationship between consumer welfare and a higher price (4.2.2) and what the impact is of a larger network effect on total welfare (Section 4.2.3). In addition we report whether competition authorities discussed the role of competitive bottlenecks (Section 4.2.4) and that of barriers to entry (4.2.5). Finally, we analyze whether competition authorities use the SSNIP test to simulate the merger effect on prices and, if they do, we seek to understand whether they took the two-sided market in implementing the test into account.

4.2.1.1 The impact of the externalities on market power

This section envisages whether and the extent to which competition authorities recognized that externalities between the sides of a two-sided market constrain the power of the parties to unilaterally raise prices post-merger.

81. *SIPA/Pôle Ouest Socpresse* is interesting because the French Competition Council considers whether and to what extent competition and/or cross-group externalities constrain the power of the merged entity to raise prices post-merger.

82. In *SIPA/Pôle Ouest Socpresse*, the French Competition Council argues that the merger will lead to a monopoly or quasi-monopoly situation in the markets for readership, advertising and classified advertisements of the regional daily press in several areas. In its assessment of the potential unilateral effects of the merger in the readership market, the Competition Council takes the two-sided nature of the newspaper market into account. It holds that a drop in the readership has an

impact not only on the sales revenues, but also on the advertising revenues, given that the price of advertising space is determined by the penetration rate of the newspaper. The Competition Commission alleges that this limits the incentives of publishers to increase the circulation price of newspapers. It holds that regarding the regional daily press, the possibility of exploiting a monopoly position by increasing price is thus reduced or even inexistent. The French Competition Council notes, however, that SIPA may be able to exploit its monopoly power by affecting the editorial content of the paper. A homogenization of the content of the different papers may result in a loss of diversity for consumers. It is however not clear why in relation to editorial content the Competition Council does not consider the effect of cross-group externalities.

83.   In *European Directories/Truvo*, the NMa stated that owing to the two-sided nature of the market, it was unlikely that the parties would reduce the quality of the directory post-merger. It argued that a reduction of the quality of a directory could trigger a downward trend in the use of the directory, the consequence of which would be to reduce its attractiveness for advertisers.

In a few cases, the competition authorities have accepted the idea that externalities between the sides of a two-sided market constrain the power of the merged entity to unilaterally raise prices post-merger.

4.2.1.2 The impact of a higher price on the other side

This section envisages whether and the extent to which competition authorities recognized that in the presence of a negative network effect a higher post-merger price on one side might increase consumer welfare on the other side.

84.   In *Global Radio/GCap Media*, the OFT analyzes the indirect network externalities between the different sides of the radio market and, in particular, the impact on listeners of a reduction of competition on the advertising side. The OFT notes that the potential direct adverse effects of a merger on advertisers (e.g., price) and the potential indirect adverse effects on listeners (e.g., programming) are inter-related because of the two-sided nature of radio. The OFT refers to the following example: if listeners switch because they do not like programming then radio is also likely to be less valuable to advertisers, because their message reaches fewer listeners.[106] Conversely, if programming improves then more listeners tune in with the consequence that advertisers are able to reach more listeners and radio is more valuable to them. The OFT points out that in some respects the competitive effects may be inversely related: that is, an increase in prices that harms the advertiser side of the market may actually benefit the listener side of the market if it restricts advertising output (total airtime), to the extent that listeners do not listen to the radio primarily to hear adverts. The OFT notes that in the latter case the inverse relationship between the competitive effects on either side of the market is countervailing and that adverse effects on one side of the market are balanced by benefits on the other to some extent. The OFT considers it appropriate primarily to consider the competitive effects of the merger on advertisers and treat any countervailing benefits to listeners as part of the efficiencies analysis. Absent compelling evidence on efficiencies, the OFT holds that it will proceed on the basis that (i) it is advertisers who will primarily and most directly feel any adverse effects arising from a commercial radio merger and (ii) any possible countervailing effect on this from the listeners side of the market, while theoretically plausible, must meet stringent efficiency evidence requirements rather than merely be assumed to be sufficient.

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106   Paragraphs 77-85 dealt with switching of consumers, i.e. listeners, while 193, 197 and 198 particularly deal with switching of advertisers.

The OFT acknowledged that in the presence of a negative externality, a higher post-merger price on one side may increase consumer welfare on the other side. The OFT, however, required stringent evidence of this beneficial effect.

4.2.1.3 The role of a larger network

This section examines whether the competition authorities discussed the efficiencies which may result from the two-sided platforms.

85.   In *European Directories/Truvo*, the NMa recognizes the benefits of having a larger network (in this case an integrated directory) as a result of the merger. In the *European Directories/Truvo* case, the NMa considered that advertisers would benefit from the combination of the two Dutch directories. The NMa argues that so-called "overlap advertisers" (i.e. companies that advertise in both directories) are likely to benefit from the merger because they will be able to reach all directory users by advertising in a single directory.[107] With respect to "non-overlap advertisers", they are considered to benefit from an increase in usage of the combined directory. In other words, the NMa is acknowledging that a merger may increase the positive externalities between the various sides of the platform. The NMa thus recognizes that the merger benefits (i.e., positive externality) a group of customers on one side of the platform (i.e., advertisers) because it leads to an increase in the size of the other side of the platform (i.e., users). Although it was not explicitly mentioned by the NMa, the combined integrated directory in the European Directories/Truvo case also creates significant efficiencies for users of directories which are able to access information relating to all of the directory advertisers by using a single directory.

86.   A key issue in such cases is to examine the potentially harmful effects of the merger on both sides and to consider whether they are likely to negate the efficiencies resulting from the merger. In this respect, the NMa examines in *European Directories/Truvo* whether the merged entity will be able to increase price or reduce quality such as to neutralise the benefits which result from increased use on both sides. The NMa argues that it is unlikely that users will be required to pay for the directory post-merger owing to the fact that (i) firstly an immense majority of users of directories appear not be ready to pay for the directory (ii) a substantial diminution in the use of the directory would make the product less attractive for advertisers, which in turn could ultimately affect the use of the directory. Similarly, the NMa alleges that the dual nature of the market makes it likely that the parties will have no inventive to (substantially) reduce the quality of the directory. The NMa notes that a reduction in the quality of the directory could negatively affect the use of the directory, the consequence of which would be to reduce the attractiveness of the directory for advertisers.

87.   In the *PCM/ADN/WDN* case, the two-sided nature of the relevant market is recognized, to the extent that separate markets are defined for regional and national paid-for newspapers or daily magazines and for national advertisements. However, the effects of the proposed concentration are not analyzed in terms of externalities. The NMa contends that especially on the regional markets, rather than national markets, competition will be limited because the market shares of PCM would exceed 50%.[108] This would enable a price increase and/or lowering of quality. Nevertheless, the NMa acknowledges that this limited degree of competition in regional markets may be less stringent, due to the fact that newspapers are heterogeneous, which is not necessarily reflected in market

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[107]   Paragraph 86 in the European Directories/Truvo case related to Art. 37.

[108]   Paragraph 28.

shares.[109] Upon investigating the competition in the market, it is argued that readers cancel their subscriptions based on the price, the time available for reading newspapers, the bad delivery services or the content of the papers. If readers would switch to another newspaper, they would switch to "de Telegraaf", regional newspapers or free newspapers, but the newspaper offered by the proposed merging entity was already cheaper than its competitor, de Telegraaf.[110] Due to this extant competition, the NMa does not consider it to be likely that the price of the AD newspaper offered by PCM can be raised, or that its quality could be lowered.[111] However, there is no explanation as to whether lowering quality means that there are relatively more advertisements in the newspaper or that quality purely relates to content. The NMa concludes that the merger is unlikely to create or strengthen a dominant position and that competition on the market for national advertisements is therefore unlikely to be negatively affected.[112]

88.   In *Global Radio/GCap Media*, the OFT holds that merger efficiencies in a two-sided market such as radio may occur as a result of what it calls post-merger product or brand repositioning[113]. The basic proposition is that by changing radio stations format and/or programming post-merger in a way that benefits listeners (that is, by greater demographic specialization by individual radio stations), combined radio stations can achieve a larger and more focused total audience. The resulting airtime is therefore more valuable to advertisers seeking to reach a large, focussed demographic. The OFT notes that this is also known as an indirect network effect or externality. The OFT contends that in general, it is repositioning of substitutable brands and not complementary brands that can efficiently internalize this indirect network externality. The OFT also mentions the fact that, unlike in other contexts, there is no issue in such efficiency claims about whether cost savings will be passed on to customers. Inherent to the proposition of improving the product to listeners and advertisers is that both sides of the two-sided market are direct and simultaneous beneficiaries of the strategy. All three groups (radio providers, listeners and advertisers) are better off if the strategy is successful.

The NMa recognized that a merger may lessen competition while overall benefiting customers on both sides of a two-sided market because these customers profit from a larger network which gives access to a greater number of customers on the other side. The OFT also accepted the idea that a merger may lessen competition and nevertheless benefit customers on both sides if this merger allows the merged entity, via product or brand repositioning, to increase the value of the platform for one of the sides, to the benefit of the other side.

4.2.1.4 The role of competitive bottlenecks

This section considers the role of the so-called competitive bottlenecks according to competition authorities.

89.   In the economic literature, "competitive bottlenecks" refer to situations where multi-homing is prevailing on one side of the platform and single-homing on the other.[114] The consequence of such a model is that each platform acts as a kind of gateway which controls access to a certain number of single-homing customers.

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[109]   Paragraph 30.
[110]   Paragraph 37.
[111]   Paragraph 43.
[112]   Paragraph 47-48.
[113]   Paragraphs 165 - 179
[114]   See Armstrong (2006), "Competition in Two-Sided Markets", *Rand Journal of Economics*, 37 (3), pp.668-691.

90.   The question then arises of whether and to what extent the existence of these "competitive bottlenecks" influences the unilateral effects expected from a merger.

91.   With regards to the impact of a merger between "competitive bottlenecks" on the *multihoming side*, the European Commission considers in the *Travelport/Worldspan* case the possibility that Galileo/Worldspan (i.e., the merged entity) may be able to leverage its post-merger market power *vis à vis* travel agents (i.e., the single-homing side) in a number of national downstream markets in order to strengthen its bargaining power in relation to travel service providers (i.e., the multi-homing side) operating on the downstream EEA market. The European Commission labelled this possibility to leverage market power "vertical cross-market effects".[115] Therefore, although as a matter of principle a merger between competitive bottlenecks is unlikely to directly increase prices on the multi-homing side because there cannot be any significant lessening of competition on that side, the European Commission claims it may do so indirectly by enabling the merged entity to strengthen its bargaining power *vis à vis* multi-homing customers through the leveraging of its increased market power *vis à vis* single-homing customers.

92.   *Travelport/Worldspan* also provides a good illustration of the impact of a merger between "competitive bottlenecks" on the *single-homing side*. In that case, the European Commission holds that the merger is unlikely to harm travel agents (i.e., the single-homing side) because a sufficient number of GDS platforms would remain available to travel agents post-merger. Moreover, the Commission states that the fact that GDS providers need to create and maintain a sufficiently broad network of travel agents in order to generate demand on the travel service provider side (i.e., the multi-homing side) leaves travel agents in a favourable bargaining position *vis à vis* GDS providers even after the elimination of one of them.

93.   Two factors have been perceived likely to impact on the assessment of a merger between competitive bottlenecks: heterogeneity[116] and countervailing bargaining power.

94.   In the *European Directories/Truvo* case, for instance classified directories are found by the NMa not to be pure competitive bottlenecks because there is some degree of heterogeneity in the subscription pattern of advertisers. Indeed, there are both single-homing and multi-homing advertisers. Although the theoretical result of the competitive bottleneck analysis is that there is likely to be no lessening of competition in relation to advertisers, owing to the heterogeneity in the subscription pattern of advertisers, the NMa rightly departs from the theoretical results of the competitive bottleneck theory. In assessing whether the parties are likely to be able to profitably raise advertising prices post-merger, the NMa correctly adopts instead a traditional one-sided approach which consists in of investigating whether much competitive pressure would be lost as a result of the merger. The NMa also considers whether advertisers would switch to other advertising media or whether they would stop advertising in directories in the event of a price increase. It is also interesting to note that in the *Travelport/Worldspan case*, despite the fact that there are exceptions to the competitive bottleneck subscription pattern, the European Commission nevertheless applies a competitive bottleneck analysis due to the fact that the general pattern can still be retained as accurately representing the functioning of the industry. The relevance of the competitive bottleneck therefore depends on the degree of homogeneity within each side. Whereas in *European*

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[115]   See especially section 6.2.1. of the respective decision.

[116]   The term "heterogeneity" refers in this context to the absence of homogeneity in the subscription pattern of a given group of customers. In other words, heterogeneity means that within a group of customers, some customers single-home and others multi-home.

Directories/Truvo there is too much heterogeneity among advertisers for the competitive bottleneck model to be relevant, in *Travelport/Worldspan*, heterogeneity is considered to be marginal and thus the European Commission refers to the competitive bottleneck theory.

95.   A second factor that is worth mentioning is countervailing bargaining power. In *Travelport/Worldspan*, the European Commission argues, as shown above, that the merged entity may be able to leverage its post-merger market power *vis à vis* travel agents (i.e., the single-homing side) in a number of national downstream markets in order to strengthen its bargaining power in relation to travel service providers (i.e., the multi-homing side) operating on the downstream EEA market. Eventually, however, the European Commission reaches the conclusion that this is unlikely because multi-homing customers have some countervailing bargaining power. The Commission observes that travel agents have the capacity to withhold specific content and even to discriminate between GDS providers. This introduces an element of differentiation which may lead agents to switch to another GDS. Moreover, the Commission notes that there are alternative technological platforms which may allow airlines to bypass the GDS and directly access travel agents or even end-consumers. These features are considered by the Commission to have the potential to weaken considerably the position of GDS providers as gatekeepers controlling access to their network of travel agents

Although as a matter of principle a merger between competitive bottlenecks is unlikely to directly increase prices on the multi-homing side because there cannot be any significant lessening of competition on that side, the competition authorities have considered that it could do so indirectly by enabling the merged entity to strengthen its bargaining power *vis à vis* multi-homing customers through the leveraging of its increased market power *vis à vis* single-homing customers.

Where there is heterogeneity in the subscription pattern of the customers on one side of the market, the competition authorities have adopted instead a traditional one-sided approach which consists of investigating whether much competitive pressure would be lost as a result of the merger.

4.2.1.5   Merger simulation and the SSNIP test

This section reviews whether in the decisions surveyed a quantitative merger simulation was attempted, whether a SSNIP test was used to that aim and, if so, whether it was modified to take into account the two-sided nature of the market.

96.   Besides its importance as a tool to define market, the SSNIP test is also often used for the assessment of the merger effects. Although the Critical Loss Analysis ("CLA") and Critical Elasticity Analysis ("CEA") formulas used are the same, the logic is different and the test is therefore implemented in a slightly different way.

97.   In merger evaluation the objective of the test is not, as in market definition, to set an (implicit) benchmark on when substitution across products is sufficient to consider that they are in the same market; rather the test aims at measuring the likelihood of a substantial non transitory increase in price by the merging parties.

98.   In the EU[117], instead of simulating as in market definition *a given price increase* by a hypothetical monopolist above the current (competitive) level, the test seeks to simulate a given price increase

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[117]   Commission Notice on the definition of the relevant market for the purposes of Community competition law, para.17. Also (Werden, 2002-I, 2002-ii)

above the current level[118] by the merging parties, assuming rivals do not change their prices. It then checks whether that price increase is profitable or not. If it is, the finding is interpreted as evidence that the merger might lead to a significant increase in prices.

99.   In the US[119] the test is slightly different as it first calculates *the optimal price increase* above the current level by the merging parties keeping rivals' prices constant and then checks it against the current price. If the increase is at least small but significant, then the finding is interpreted as evidence that the merger might lead to a significant increase in prices.

100.   As for market definition, the difference between the SSNIP and the HM test appears at first sight very small and it a matter of debate whether this difference is from a practical standpoint relevant.

101.   Again, in practice, both in the EU and in the US, the test is often done by using the formulas for Critical Loss Analysis or Critical Elasticity Analysis, which require assuming constant marginal costs and either linear or iso-elastic demand.

102.   From an economic theory point of view, however, using the SSNIP test for the assessment of the unilateral effects of the merger is suboptimal. Whereas in market definition the assumption that rivals do not change their price can be rationalised as trying to avoid supply substitutability when assessing demand substitutability, in merger assessment it is harder to defend why one should look at an unrealistic post-merger situation where rivals' are assumed not to adjust their prices to a price increase. Indeed, the more appropriate test would require to simulate whether a given price raise would be profitable allowing rivals' to optimally adjust their prices in response to the price increase of the merged parties or, even better, to simulate whether it would be profit maximizing to raise the price substantially above the current level for the merged parties when the rivals are also choosing their profit maximizing prices. In practice, the latter would require to simulate the new market equilibrium.

103.   Unfortunately, this cannot be done by using CLA or CEA formulas, even under the usual assumptions of linear demand and linear costs, as they are derived under the assumption that rivals do not react to the price increase. So that simulating the new market equilibrium requires an economic model tailored on the market taken into consideration and therefore time.

104.   In any event, if one wishes to use the SSNIP test to assess the likelihood of a post-merger price increase in a two-sided market, similar issues arise as in the case of a market definition. One indeed needs to decide which price the merged parties should be thought of as raising and whether to assess profitability by taking into account only profits on one side or on both sides of the market.

105.   Nothing indicates that a SSNIP test (or another similar test) was performed to assess potential unilateral effects of the merger in the EU and US *Google/DoubleClick* cases, in *SIPA/Pôle Ouest Socpresse*, *GIMD/SOCPRESSE*, *Spir/Schibsted* and in *Travelport/Worldspan*.

106.   In the *Google/DoubleClick* case the Commission argued that, with respect to unilateral effects, it did not seem likely that Google and DoubleClick were exerting a significant competitive constraint on each other's activities.

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[118]   Note that in a merger assessment whether the starting price is the competitive one or not is irrelevant, as one is interested in establishing whether the merger will lead to substantial price increases

[119]   The US and EU Guidelines do not seem to deal with the application of the SSNIP in the context of the assessment of unilateral effects of mergers.

107.   In the *Travelport/Worldspan* case, no specific tests were performed but the non-coordinated effects of the merger were investigated. First, non-coordinated effects gave bargaining power to the downstream merging undertakings that could increase prices (e.g. "vertical cross market effects"). Second,, the merging parties are not each others' closest competitors, so they could not eliminate Worldspan as the alleged "pricing Maverick" and therefore lead to post-merger price increases. Third, the merger would allow the parties to exploit their post-merger market power where Galileo/Worldspan would have high market shares. Based on these three "theories of harm" of the non-coordinated effects, it is argued that there is insufficient evidence to conclude that Worldspan charges lower prices than its competitors and that it acts as a price maverick. As a result, it is unlikely that the transaction would lead to an increase in Worldspan's prices.

108.   In *Archant*, the Competition Commission holds that many of the considerations discussed in relation to market definition were also relevant to the consideration of competitive effects. Of particular relevance is the fact that the evidence suggests that Archant would not, as a result of the merger, have sufficient market power to raise prices to a level that would cause concern. In this respect, the Competition Commission refers to a survey showing that Archant could not discriminate between its customers effectively enough to sustain an average price rise of 5 percent. As stated above, the Competition Commission did not consider the reader side of the market but focused instead on the advertising side. The Competition Commission therefore does not discuss the impact of two-sidedness and indirect network effects on the application of the SSNIP test.

109.   In *Global Radio/GCap Media*, the OFT analysed potential unilateral effects by referring to margins and diversion ratios.[120] The OFT argues that the combination of high margins and high diversion ratios establishes a rebuttable presumption of unilateral effects.[121]

110.   In *Bloemenveiling Aalsmeer/FloraHolland*, the NMa stated that *"the outcomes of the quantitative market research also showed that the parties will not be able to behave independently in respect of growers, buyers and competitors after the proposed merger. Even if the supposed hypothetical deterioration were to occur, which would result in the lowest actual switching of growers and partners, the actual loss even on the basis of conservative assumptions (10.8% and 13.8% respectively) is greater than the critical loss (10.1%) of the parties. This means that the parties cannot allow the parameters of competition to deteriorate profitably because too many growers and buyers will then switch to alternative channels, including, in particular, direct trade."*[122]

111.   In the *European Directories/Truvo* case, with regards to the potential unilateral effects on the advertising side of the market, the NMa applies a SSNIP test to evaluate the mutual competitive pressure between the merging parties. It notes that only a very small percentage of advertisers said they would switch to the other directory in the event of a relative price increase by the print directory of 5 to 10 percent.[123] Concerning users, the NMa states that it is unlikely that they will be required to pay post-merger. In this regard, the NMa refers to a survey which indicates that a large percentage of users regard the chance that they would purchase a directory if it were to cost EUR 5 to EUR 10 as very small.[124]

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[120]   *Global Radio/GCap Media*, at paras 61 et seq.
[121]   *Id*, at para 63.
[122]   Bloemenveiling Aalsmeer/FloraHolland, at para 111.
[123]   European Directories/Truvo, at para 157.
[124]   *Id*, at para 163.

Only the NMa recognised the impact of two-sidedness on the application of a SSNIP test to assess potential unilateral effects of the merger.

4.2.2   *Coordinated effects*

This section considers whether competition authorities have analysed potential coordinated effects by considering both sides together or whether they examined such effects on each side individually. This section also aims at determining whether the competition authorities consider that, to be successful, coordination must be likely on both sides or whether on the contrary, potential coordination on only one of the two sides is sufficient.

112.   In the *Worldspan/Travelport case*, while as mentioned above before the European Commission defines a single market including both sides, it nevertheless examines potential coordinated effects on each side separately. It starts by examining the potential coordinated effects on the upstream market for the supply of GDSs to travel service providers, and then considers whether coordination is likely to arise on the downstream market which covers the relationship between GDSs and travel agents.[125] Moreover, the Commission does not seem to be of the opinion that coordination may only be successful if coordination occurs on both sides.[126]

The European Commission appears to consider that coordination may be successful even if it does not occur on both sides on a two-sided market.

4.2.3   *The chicken-and-egg problem as a barrier to entry*

This section considers whether in the decisions surveyed it was perceived that two-sided markets raise specific issues in terms of barriers to entry.

113.   The so called chicken-and-egg problem results from the fact that a multi-sided platform has to simultaneously convince all sides to "get on board of" the platform because no customers on either side will join the platform unless customers from the other side also join.

114.   The existence of a chicken-and-egg problem was recognized by the French Competition Council which argues in *SIPA/Pôle Ouest Socpresse* that a new journal has to obtain sufficient audience, and that this is difficult, mainly because of the fact that obtaining audience requires significant advertising revenue and these revenues are directly related to the audience, to the penetration rate of the paper.

The existence of a chicken-and-egg problem in two-sided markets and the fact that it acts as a barrier to entry was recognized by the French Competition Council.

4.3   Non-Horizontal Effects

This section reports whether competition authorities assessed the likelihood of vertical foreclosure effects in a two-sided environment.

115.   When assessing vertical mergers, antitrust authorities are required to assess whether the merger is likely to raise concerns with respect to vertical foreclosure. The issue is then whether indirect network effects enhance the impact and therefore raise the incentives of foreclosure strategies.

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[125]   *Worldspan/Travelport,* at paras 150 and 172.

[126]   *Id*, at para 172.

116.   The *Google/DoubleClick* merger contains interesting vertical aspects. The complainants' main concern in *Google/DoubleClick* is that, post-merger, Google may be able to leverage DoubleClick's leading position in ad serving (i.e., downstream) on the market for online ad intermediation services (i.e., upstream). This theory of harm is based on the fact that Google may be able to engage in various strategies to increase the cost of using DoubleClick's products on networks competing with Google's AdSense. It is thus a situation of input foreclosure in the sale of ad serving tools to ad networks that compete with AdSense.

117.   Of fundamental importance in this context are the indirect network effects: an advertising intermediation network becomes more attractive to advertisers as the number of publishers increases (and *vice versa*). Many complainants argued that, owing to these indirect network effects, the incremental volume Google would gain from the foreclosure strategies mentioned above would be enough to "tip" the ad intermediation market to Google. Indeed, if the AdSense network is able, through those foreclosure strategies, to attract additional publishers (or inventory) it will arguably reach a critical size while denying the necessary scale to competing ad networks.

118.   Both the European Commission and the US FTC reach the conclusion that the ad intermediation market is unlikely to "tip" to Google due, in particular, to the prevalence of multi-homing on both sides of the intermediation market.[127] The prevalence of multi-homing suggests that the participation by a publisher or an advertiser to an ad network does not imply that they are unable or unwilling to participate in another ad network, that is to say their participation to an ad network is not exclusive. Therefore, both the European Commission and the US FTC conclude that any strategy to attract publishers and advertisers to AdSense through input foreclosure is unlikely to be able to foreclose rivals in intermediation markets.

119.   The *Google/DoubleClick* merger is interesting in at least three respects. First, complainants argued that foreclosure practices may lead the market to "tip" in the presence of strong indirect network effects, i.e. the effects of the foreclosure strategies are enhanced by the presence of indirect network effects. Second, the *Google/DoubleClick* merger highlights that indirect network effects may provide incentives to engage in foreclosure strategies as rival networks are more likely to be weakened. Third, it stresses the relevance of the subscription pattern which may neutralize the tipping effect resulting from the presence of strong indirect network effects.

The competition authorities acknowledged that foreclosure strategies are likely to be enhanced by the existence of indirect network effects.

5   CONCLUSION

120.   The European Commission and the Dutch NMa seem to have been at the forefront of the application of economic principles underlying the concept of two-sided market in merger cases such as *Google/DoubleClick*, *Travelport/Worldspan*, *European Directories/Truvo* and *Bloemveiling Aalsmeer/FloraHolland*. Interesting findings were also made by the UK OFT in *Global Radio/GCap Media* as well as by the French Competition Council in *SIPA/Pôle Ouest Socpresse*.

121.   Many competition authorities have now employed the two-sided terminology when controlling mergers in two-sided markets. When this was not the case, most authorities have nevertheless identified the two sides of the market under consideration. In both cases, however, competition

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127   See paragraph 304.

authorities have often not accounted for the interrelations between the two sides of the markets involved.

122.   Regarding market definition, competition authorities have defined separate markets for each side in certain cases, and a single market including all sides in others. Those cases in which a single market was defined related to two-sided markets in which the platforms enable the two sides to transact with each other, as opposed to platforms which aim at building audience to maximize advertising revenues. In the case of transaction platforms, the transaction was considered by the competition authorities to constitute the relevant product market. Both sides were thus included in one and the same relevant market. On the contrary, in cases where the objective was to build audience, the competition authorities have defined distinct markets for each side.

123.   When defining either one or two interrelated markets, competition authorities have usually considered both sides of the two-sided markets at issue. We have, however, provided examples of a few cases in which the merger could have lessened competition on one of the sides, either directly or through its impact on the other side, and where the competition authorities nevertheless neglected this side of the market.

124.   We only found one case, *Bloemveiling Aalsmeer/FloraHolland,* which specifically dealt with the issue of the application of the SSNIP test in a two-sided context and the fact that the indirect network effects between the sides of a two-sided market may lead to a market being defined too narrowly. Despite this recognition no effort was made by the competition authority to apply a modified SSNIP test, arguing that if the merger posed no threat to competition with a narrow market definition *a fortiori* it would not raise concerns under a correct larger market definition. Other cases which applied the test did not instead recognize the necessity to take indirect network effects into account.

125.   Concerning merger assessment, several cases have considered indirect network effects when analyzing the unilateral effects of the merger. In particular, they acknowledged that indirect network effects may constrain the power to raise prices post-merger, that an increase in price on one side may be beneficial to the other side (negative externality) and that both sides may benefit from a merger to monopoly because they profit from a larger network.

126.   The view was also taken that a merger between two competitive bottlenecks may give rise to unilateral effects on both sides. With respect to the multi-homing sides, unilateral effects have been argued to depend on the possibility of the merged entity to strengthen its bargaining power *vis a vis* multi-homing customers through the leveraging of its increased market power *vis a vis* single-homing customers. With regards to the single-homing side, unilateral effects will depend on the remaining competition between platforms post-merger as well as on the importance and nature (positive or negative externality) of the indirect network effects between the sides of the two-sided market in question.

127.   With regards to the merger evaluation, our survey shows that, although the test was not specifically designed for this purpose and although it disregards rivals reactions to a price increase by a merged firm, some authorities use the SSNIP test also to analyse unilateral effects expected from a merger. Yet most of these authorities do not explicitly take into account the role of two-sidedness when running the test.

128.   Finally, some cases have argued that indirect network effects may also be relevant in the evaluation of the non-horizontal effects of mergers. The claim is that foreclosure practices may lead the market to "tip" in the presence of strong indirect network effects.

6   APPENDIX A – LIST OF CASES

List of cases relating to Mergers in Two-Sided Markets considered by separate Competition authorities

6.1   European Union

- Commission Decision of 2 August 1994, Case M.410, Kirch/Richemont/Telepiu. Product; pay-TV.

- Commission Decision of 17 May 1995, Case IV/M.566 CLT/Disney/super RTL. Product; TV broadcasting.

- Commission Decision of 13 November 1995, Case M.655 Canal+/UFA/MDO. Product; TV broadcasting.

- Commission Decision of 1 February 1999, Case No IV/M.1401 Recoletos/Unedisa. Product: publishing newspapers, magazines and books.

- Commission Decision of 24 November 1999, COMP/M.1701 Gruner+Jahr/DEKRA/FairCar. Product; online services in the used car market including third-party advertising on their website.

- Commission Decision of 21 March 2000, Case COMP/JV.37 BSKYB/KIRCH PAY TV. Product: Pay-TV.

- Commission Decision of 20 July 2000, Case COMP/JV.48 Vodafone/Vivendi/Canal+. Product; multi-access Internet portal for all Vodafone, Vivendi and Canal+ telecommunications and pay TV subsidiaries capable of offering Internet connectivity to their customers.

- Commission Decision of 11 October 2000, Case M.1845, AOL/Time Warner. Product; media and entertainment.

- Commission Decision of 29 July 2003, Case COMP/M.3197 CANDOVER/CINVEN/BERTELSMANN-SPRINGER. Product: academic and professional publishing aimed at researchers and academics.

- Commission Decision of 16 June 2004, Case COMP/M.3420 GIMD / SOCPRESSE. Product; written press..

- Commission Decision of 21 August 2007, Case COMP/M.4523 Travelport/Worldspan. Product: electronic travel distribution services through a global distribution system (GDS).

- Commission Decision of 12 September 2007, Case COMP/M.4760. AMADEUS/SABRE/JV. Product: payment processing and clearing systems.

- Commission Decision of 11 March 2008, Case COMP/M.4731 Google/Doubleclick. Product: online advertising and intermediation for online advertisements.

6.2 France

- Avis du Conseil de la Concurrence n°03-A-03 du 20 mars 2003, Comareg/France Antilles. Product: classified advertisements sector.

- Avis du Conseil de la Concurrence n°05-A-18 du 11 octobre 2005, SIPA/Pôle Ouest Socpresse. Product: (regional) newspapers.

- Décision C2007/19 du Ministre de l'Économie du 10 septembre 2007, Spir/Schibsted.. Product: classified advertisements for the sale of second-hand automobiles and boats, published on the internet and printed press.

6.3 Germany

- Bundeskartellamt, B6 - 22121 -U- 98/02 Holtzbrinck – newspapers, 10 December 2002. Product; newspapers.

- Bundeskartellamt, B6 – 119/02. Holtzbrinck – Radio etc. 16 December 2002. Product: radio.

- Bundeskartellamt, Merger between Springer and ProSieben/Sat, 2006. Product: TV advertising market, reader market for over-the-counter newspapers and the national advertising market for newspapers.

6.4 Ireland

- TCA, Determination M/08/038 *Alpha Publications/The Herald*, 22 January 2008. Product: newspapers.

- TCA, Determination M/09/013 *Metro/Herald AM*, 6 November 2009. Product: newspapers.

6.5 Netherlands

- NMa case 1528/ 13 March 2000 Wegener Arcade / VNU Dagbladen Product: newspapers, door-to-door magazines, publishing activities, radio, direct marketing etc.

- NMa case 5901/184 21 August 2007 Bloemenveiling Aalsmeer / FloraHolland. Product: flower auctions.

- NMa case 6114/ 24 October 2007 Mecom / Wegener – Product: newspapers, advertising.

- NMa case 6246/674 28 August 2008 European Directories / Truvo Nederland – Product: classified directories.

- NMa case 6689/40 17 July 2009 PCM/ADN/WND Newspapers – Product: newspapers.

- NMa. case v6802/ 4 December 2009 Jumbo / Super de Boer. Product: supermarkets.

6.6   Spain

- WANADOO / ERESMAS INTERACTIVA N- 275 6 August 2002 – Product: portal services, on-line advertisement, on-line directories services, horizontal and vertical portals, and electronic commerce.

- DINOSOL/ MERCAMAX / MERCAFUSTE / EXPLOTACIONES COMERCIALES DE ANTIGUA, 20 June 2005. Product: supermarket.

- DINOSOL / EROSMER, 29 March 2006. Product: supermarket.

- CONSUM/CAPRABO, 20 March 2007. Product: supermarket.

- EROSKI/CAPRABO, 15 June 2007. Product: supermarket.

- N-07021 UNEDISA / RECOLETOS, 2 March 2007. Product: edition and sale of periodic publications (newspapers and magazines), publications printing, distribution of written media, sales of advertisement spaces (newspaper, radio, television and internet), intermediation of these services, internet services and radio, television and cinematographic production activities.

- DIA/PLUS, 30 October 2007. Product: supermarket.

- DINOSOL/SUPERMERCADOS HERDISA, 6 May 2008. Product: supermarket.

- CARREFOUR/CAPRABO, 19 June 2008. Product: supermarket.

- SABECO/GALERIAS PRIMERO, 22 October 2008. Product: supermarket.

- GRUPO EL ARBOL/GALERIAS PRIMERO, 6 May 2009. Product: supermarket

- EROSKI/SABECO, 2 September 2009. Product: supermarket.

- C/0188/09 RBA/EDIPRESSE, 16 December 2009. Product: magazines and advertisements.

6.7   Portugal

- Case: 47/2003 PTV/ PT conteudo / Sport TV. 08 April 2004. Product; PAY TV; PAY Sports TV channel; Football games TV broadcasting rights and Football games multimedia broadcasting rights (internet).

- Case: 3/2004 Lusomundo/Ocasiao. 19 April 2004. Product; advertising in printed press.

- Case: 17/2005 Controlinveste/Lusomundo Media. 10 August 2005. Product; General daily printed press, General weekly printed press, Specialized printed press, Radio Broadcasting, Publicity on printed press and Publicity on Radio.

- Case: 54/2006 Prisa/Media Capital. 29 December 2006. Product; the radio and open signal television sectors.

- Case: 32/2008 Impresa/Edimpresa. 24 July 2008 Product; General weekly printed press, Specialized printed press and Publicity on printed press.

6.8   United Kingdom

- Competition Commission, *Regional Independent Media Limited and Gannett UK Limited/Johnston Press plc/Guardian Media Group plc,* 4 October 2000. Product: newspapers

- Competition Commission, *Johnston Press Trinity Mirror*, 8 April 2002. Product: (free weekly) newspapers.

- Competition Commission, *Newsquest Ltd/Independent News and Media Plc*, 19 August 2003. Product: newspapers.

- Competition Commission, *Carlton Communications plc and Granada plc,* a report presented to the parliament by the Secretary of State, 21 August 2003. Product: television advertising.

- Competition Commission, *A report on the acquisition by Archant Limited of the London newspapers of Independent News and Media Limited*, 22 September 2004. Product: newspapers.

- OFT's Decision on reference, *Anticipated acquisition by Future plc of Highbury House plc*, 14 April 2005. Product: publishers of consumer magazines.

- Competition Commission, *A report on the acquisition by Somerfield plc of 115 stores from Wm Morrison Supermarkets plc*, 2 September 2005. Product: supermarkets.

- Competition Commission, *Report on the proposed acquisition of London Stock Exchange plc by Deutsche Börse AG or Euronext NV*, 1 November 2005. Product: stock exchange.

- OFT's Decision on reference, *Anticipated acquisition by IPC Media Ltd of Horse Deals Ltd*, 16 August 2006. Product: equestrian magazines.

- Competition Commission, *A Report on the Proposed acquisition of a controlling interest in Academy Music Holdings Limited by Hamsard 2786 Limited*, 23 January 2007. Product: live music promotion services.

- Competition Commission, *Acquisition by British Sky Broadcasting Group plc of 17.9% of the shares of ITV plc,* a report sent to the Secretary of State (BERR), 14 December 2007. Product: Broadcasting.

- OFT Decision ME/3638/08, *Completed acquisition by Global Radio UK Ltd of GCap Media plc*, 8 August 2008. Product: radio.

- Competition Commission, *A report on the completed merger between Ticketmaster Entertainment, Inc and Live Nation, Inc,* 7 May 2010. Product; concert tickets.

6.9   United States

- U.S. Google/DoubleClick, 12 December 2007, FTC File No. 071-0170. Product: online advertising space and intermediation services for online advertisements.

- XM Satellite Radio Holdings Inc/Sirius satellite Radio Inc, 24 March 2008. Product: radio.

- U.S. Live Nation/Ticketmaster. 25 January 2010, Case 1.10-cv-00139. Product: concert tickets.

7   APPENDIX B – SUMMARY TABLES OF CASES

Below are reported a series of tables providing brief summaries of merger cases involving multi-sided platforms. The cases reviewed are categorized according to the authority dealing with the case. The following issues are considered for each case:

1-The product(s) concerned by the merger.

2- Whether two-sidedness was recognized by the Competition Authority.

3- Whether and how two-sidedness affected market definition.

4- Whether and how two-sidedness affected the assessment of the effects of the merger.

7.1   European Union

Case	Authority	Product	Recognition of Two-Sidedness	Two-Sided Terminology	Findings	
					Market Definition	Merger Assessment
Kirch/Richemont/ Telepiu 1994	European Commission	Pay-TV	Yes	No	Market definition is left open. Pay-TV is regarded as a separate market. However, some substitutability exists between pay-TV and free access television, since the value of the former depends directly on the alternative viewing possibilities. The case does not raise competition concerns even in the narrowest possible market.	Checks the market shares that could contribute to the creation of a dominant position.
CLT/Disney/super RTL 1995	European Commission	TV broadcasting	Yes	No	The relevant product market comprises of the market for advertising in television broadcasting and licensing of film rights and TV programmes.	/
Canal+/UFA/MDO, Case 1995	European Commission	TV broadcasting	Yes	No	TV broadcasting does not constitute a market in the strict economic sense because there is no direct trade relationship between broadcasters of "free-tv channels" (as opposed to pay-tv) on the "supply side" and viewers on the "demand side".	/
Recoletos / Unedisa 1999	European Commission	Publishing newspapers, magazines and books	Yes	Yes, but in recognizing the two-sidedness of the market, it must be	Inconclusive market definition because none of the definitions of concentration on the market created or strengthened a dominant position or gave rise to a competition problem.	The market shares of the merging parties were too small to affect

Case	Authority	Product	Recognition of Two-Sidedness	Two-Sided Terminology	Findings	
					Market Definition	Merger Assessment
					noted that the EC did not provide a conclusive definition of the relevant markets.	competition.
Gruner+Jahr/DEKRA/ FairCar 1999	European Commission	Online services (adds) in used car market	No	No	Market is defined as "the advertising for used cars in the online market and the traditional print media". The EC did not consider whether there were two submarkets because this would not have affected the competitive assessment.	SSNIP tests were not performed, because due to the relatively small market shares, the merger would not have led to the establishment of a dominant position or would not have hampered competition.
BSKYB/KIRCH PAY TV 2000	European Commission	Pay-TV	Yes, accounted for the two sided nature of audiovisual services	Yes	Defined the pay-TV market, where there is a trade relationship between the programme supplier and the viewer as subscriber.	The creation or strengthening of KirchPay TV's dominant position due to the influx of resources

Case	Authority	Product	Recognition of Two-Sidedness	Two-Sided Terminology	Findings	
					Market Definition	Merger Assessment
						and know-how is sufficiently compensated for by various commitments made by the merging parties.
Vodafone/Vivendi/Canal+ JV 2000	European Commission	Multi-access Internet portal for all Vodafone, Vivendi and Canal+ telecoms and pay TV subsidiaries capable of offering Internet connectivity to their customers	Yes	No	Pursuant to decisions in Telia/Telenor/ Schibsted and Cegetel/Canal+/AOL/Bertelsmann, the following distinct product markets were identified, based on the assumption that as these different activities earn revenue in different ways from different sources, they reflect differing demands: Internet access, Internet advertising and paid-for content provision.	/
AOL/Time Warner 2000	European Commission	Media and entertainment	Yes.	No	Market definition section is divided into markets on which the joint venture will be active, and into markets on which two or more of the parent companies are or will be active outside of the venture. The distinct product markets include: Internet access, Internet advertising and paid-for content provision. This division was based	/

Case	Authority	Product	Recognition of Two-Sidedness	Two-Sided Terminology	Findings	
					Market Definition	Merger Assessment
					on the assumption that these different activities earn revenue in different ways from different sources, therefore reflecting differing demands.	
CANDOVER/CINVEN/BERTELSMANN-SPRINGER 2003	European Commission	Academic and professional publishing	No	No	The EC argued that it is not true that two distinct products were sold, so one cannot consider this product market to be a two-sided market.	/
GIMD /Socpresse 2004	European Commission	Magazines, written press	Took into account the fact that there are two customer groups but beyond that it did not recognize the two-sided nature of the magazine press.	No	Defined distinct markets for readers on the one hand advertisers and on the other.	/
Travelport/Worldspan 2007	European Commission	Global distribution systems	Yes. It was acknowledged that Global distribution systems are two-sided platforms.	Yes	Defined one market by taking into account the perspective of both travel agents and travel service providers.	The Commission referred to the economic theory on competitive bottlenecks and it considers the impact of bargaining power.
AMADEUS / SABRE / JV	European	Payment	Yes, but the joint	Yes	The two-sided nature of the GDS	The joint

Case	Authority	Product	Recognition of Two-Sidedness	Two-Sided Terminology	Findings	
					Market Definition	Merger Assessment
2007	Commission	processing and clearing systems	venture did not lead to competition concerns under any plausible product market definition, so the EC did not examine "whether payment processing and clearing for the travel industry constitutes a relevant product market distinct from payment processing and clearing in other industries"		market was based on the conclusion derived in Travelport/ Worldspan.	venture would not be used to coordinate competitive behaviour of Amadeus and Sabre. This follows as there is a limited size in relation to the principal activities of the parent-companies, the fact that GDS services are not closely related to payment transaction and clearing services. and provided that the contractual arrangements limiting information flows between the JV and the parent

Case	Authority	Product	Recognition of Two-Sidedness	Two-Sided Terminology	Findings	
					Market Definition	Merger Assessment
						companies are put in place and strictly adhered to.
Google / DoubleClick 2008	European Commission	Online advertising	Yes. Recognizes two-sided nature of intermediation services.	Yes	Defined one market by taking into account the perspective of both publishers and advertisers.	Non-horizontal effects: The Commission considered the possible leveraging of DoubleClick's position in ad serving on the market for online ad intermediation services. In this context, it discussed indirect network effects and the impact of multi-homing.

7.2   France

Case	Authority	Product	Recognition of Two-Sidedness	Two-Sided Terminology	Findings	
					Market Definition	Merger Assessment
Comareg/France Antilles 2003	French Competition Council	Classified ads	Yes. Recognized the multi-sided nature of classified ads.	No	Identified three markets: (i) readership, (ii) advertising and (iii) classified ads.	Considered whether competition and/or cross-group externalities constrain the power of the merged entity to raise prices post-merger.
SIPA/Pôle Ouest Socpresse 2005	French Competition Council	Classified ads	Yes. Recognized the multi-sided nature of classified ads.	No	Defined distinct markets for (i) readership, (ii) advertising and (iii) classified ads.	Cross-group externalities are considered to constrain the power to raise prices post-merger (unilateral effects). Also envisages the chicken and egg problem as a barrier to entry.
Spir/Schibsted 2007	French Minister of Economy	Classified ads	Yes. Recognized the two-sided nature of classified ads.	Yes	Refused to define a readership market for internet websites.	

7.3   Germany

Case	Authority	Product	Recognition of Two-Sidedness	Two-Sided Terminology	Findings	
					Market Definition	Merger Assessment
Holtzbrinck- newspapers 2002	Bundeskartellamt	Newspapers	Yes	Yes, speaking of a "advertisement-edition spiral" 1.2.2.5.	Readers market and advertisers market were defined using market shares and total volume of printed press.	/
Holtzbrinck – Radio 2002	Bundeskartellamt	Radio	Yes, but the two markets are separate to the extent that the content of commercials may be only relevant in a particular region.	Yes,	Examination of the market shares of competitors in the market, the financial capacity and the other enterprises in the market.	/
Springer and *ProSieben/Sat1* 2006	Bundeskartellamt	TV advertising market, reader market for over-the-counter newspapers and the national advertising market for newspapers	Yes	No	Using market shares, the two markets are regarded as separate to the extent that the content of commercials may be only relevant in a particular region.	Merger was allowed if TV station ProSieben, (20% of national TV advertising market) is not taken over by Springer and that the TV advertising time slots are marketed by a company which does not belong to the Springer group

7.4   Ireland

Case	Authority	Product	Recognition of Two-Sidedness	Two-Sided Terminology	Findings	
					Market Definition	Merger Assessment
Alpha Publications/The Herald 2008	TCA	Newspapers	Yes. The TCA noted that newspapers are mainly designed to satisfy the needs of both readers and advertisers. As such, an assessment of the nature of competition requires a consideration of the interaction between advertisers and readers. Newspaper publishers wish to attract advertisers on one side, and readers on the other side, to form an audience for advertisers.	No	/	The Authority considered that the transaction did not raise competition concerns in relation to newspaper publishing due to the very limited geographical overlap in the activities of the parties. It also held that there was no overlap in newspaper advertising, as the newspaper titles of the parties were circulated in different areas.
Metro/Herald AM 2009	TCA	Newspapers	Yes. The TCA held that in a two-sided market, two groups of players interact through a particular medium that enables each group to achieve their inter-related objectives. In this instance, newspapers wish to attract advertisers on one side and readers on the other side to form an audience for advertisers. An advertiser's demand for advertising space in a particular newspaper depends on, amongst other things, the size of the newspaper's readership, its target readers and distribution area.	Yes	Given the two-sided nature of the newspaper industry, the TCA distinguished between a market for readers and a market for advertisers.	/

7.5   Netherlands

Case	Authority	Product	Recognition of two-Sidedness	Two-Sided Terminology	Findings	
					Market Definition	Merger Assessment
Wegener Arcade / VNU Dagbladen 2000	NMa	Newspapers, door-to-door magazines, publishing activities, radio, direct marketing	Yes	No	One side of the market is defined as full-line press services, due to the limited demand substitution between the distinguishable types of press services..	SSNIP test, price elasticity.
Bloemenveiling Aalsmeer / FloraHolland 2007	NMa	Flower auction houses	Yes.	Yes	The NMa considered that in defining the relevant market, the buyers' side and the growers' side of the market must be assessed together. The NMa also assessed the impact of indirect network effects on the critical loss analysis.	/
Mecom / Wegener 2007	NMa	Newspapers, advertising	Yes	No	Overlapping areas: (i) publishing daily magazines, (ii) offering local and regional advertisement space in regional and local newspapers, (iii) publishing activities, i.e. coldset offset.	Critical loss analysis,
European Directories/Truvo 2008	NMa	Classified directories	Yes.	Yes	The NMa made no use of the standard market definition framework, but based its assessment on an analysis of effects.	The NMa recognized the benefits of having a larger network (integrated directory) as a result of the merger.

Case	Authority	Product	Recognition of two-Sidedness	Two-Sided Terminology	Findings	
					Market Definition	Merger Assessment
PCM/ADN/WND 2009	NMa	Newspapers	Yes	No	Regional and national newspapers and magazines.	Critical loss analysis.
Jumbo / Super de Boer 2009	NMa	Supermarkets[128]	No	No	Regarding the relevant product markets, the NMa distinguished the activities of the parties as overlapping in the three following areas: (i) the sales of daily consumption goods through supermarkets, (ii) the purchase of daily consumption goods through retail, (iii) offering of franchise services in the area of the supermarkets (para 11). Following previous decisions, the NMa regarded these areas as separate markets.	The NMa investigated the level of competition in local areas and concluded that there were plenty of choices available for consumers to shop in different stores within a 15 minutes radius. Regarding point (ii), the parties wanted to establish a new purchasing organization and the NMa held that due to the limited market share of the parties (10-20%) on the possible national market for purchasing daily consumption goods for sale through

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[128] A supermarket may be viewed as a two-sided platform given that it connects two groups of customers ("sides"), namely (i) shoppers and (ii) suppliers, and that the value of the platform for each side is linked to the number of customers on the other side (i.e., positive externalities in both directions).

Case	Authority	Product	Recognition of two-Sidedness	Two-Sided Terminology	Findings	
					Market Definition	Merger Assessment
						retail, there was no reason to presume that an economic dominant position would be created or strengthened.

7.6   Spain

Case	Authority	Product	Recognition of Two-Sidedness	Two-Sided Terminology	Findings	
					Market Definition	Merger Assessment
WANADOO / ERESMAS INTERACTIVA 2002						
DINOSOL/ MERCAMAX / MERCAFUSTE / EXPLOTACIONES COMERCIALES DE ANTIGUA 2005	CNC	Supermarket	No	No	Not recognize the (impact of) the two sidedness of the markets, and cross-sides externalities.	
DINOSOL / EROSMER 2006	CNC	Supermarket	No	No	Not recognize the (impact of) the two sidedness of the markets, and cross-sides externalities.	
CONSUM/CAPRABO 2007	CNC	Supermarket	No	No	Not recognize the (impact of) the two sidedness of the markets, and cross-sides externalities.	
EROSKI/CAPRABO 2007	CNC	Supermarket	No	No	Not recognize the (impact of) the two sidedness of the markets, and cross-sides externalities.	

Case	Authority	Product	Recognition of Two-Sidedness	Two-Sided Terminology	Findings	
					Market Definition	Merger Assessment
UNEDISA / RECOLETOS 2007	CNC	Edition and sale of periodic publications (newspapers and magazines), publications printing, distribution of written media, sales of advertisement spaces (newspaper, radio, television and internet), intermediation of these services, internet services and radio, television and cinematographic production activities.	No	No	The CNC has defined various markets separately, but did not consider the two sided nature of these markets to define them.	/
DIA/PLUS 2007	CNC	Supermarket	No	No	Not recognized the (impact of) the two sidedness of the markets, and cross-sides externalities.	
DINOSOL/SUPERMERCADOS HERDISA 2008	CNC	Supermarket	No	No	Not recognized the (impact of) the two sidedness of the markets, and cross-sides externalities.	
CARREFOUR/CAPRABO 2008	CNC	Supermarket	No	No	Not recognized the (impact of) the two sidedness of the markets, and cross-sides externalities.	
SABECO/GALERIAS PRIMERO 2008	CNC	Supermarket	No	No	Not recognized the (impact of) the two sidedness of the markets, and cross-sides externalities.	
GRUPO EL ARBOL/GALERIAS PRIMERO 2008	CNC	Supermarket	No	No	Not recognized the (impact of) the two sidedness of the markets, and cross-sides externalities	
EROSKI/SABECO	CNC	Supermarket	No	No	Not recognized the (impact of) the two sidedness of the markets, and cross-	

Case	Authority	Product	Recognition of Two-Sidedness	Two-Sided Terminology	Findings	
					Market Definition	Merger Assessment
2009					sides externalities.	
RBA/EDIPRESSE 2009	CNC	Magazines and advertisements	No	No, the EC recognized the different markets in which this merger is involved.	However, it does not explicitly consider the cross-sides externalities between the markets of sale of magazines for readers and sales of advertisement spaces, they do consider these markets as different markets.	It does not recognize the impact of two-sidedness, neither on market definition, nor on the assessment of the merger.

7.7   Portugal

Case	Authority	Product	Recognition of Two-Sidedness	Two-Sided Terminology	Findings	
					Market Definition	Merger Assessment
PPTV/ PT conteudo / Sport TV. 2003	Autoridade Da Concorrência	Pay TV; sports TV channel	No; but would not have changed the decision	No	PAY TV; PAY Sports TV channel; Football games TV broadcasting rights and Football games multimedia broadcasting rights (internet). Had the competition authority considered the two-sidedness of the market, the relevant product market should maybe include the advertising slots.	Case concerned an acquisition, not a merger. The two sidedness of the market was not taken into account when assessing the effects of this acquisition.
Lusomundo/Ocasiao 2004	Autoridade Da Concorrência	Advertising in printed press	Yes, based on the business model of Ocasiao	Yes	The market for advertising spots on printed press. CA uses the characteristics of the product (advertising spots) and the preferences of the consumers (advertisers).	Mainly looked into unilateral effects. Concentration, market shares and barriers to entry were analyzed. The nonexistence of barriers to entry would not allow for either predatory pricing or any abusive conduct.
Controlinveste/Lusomundo Media 2005	Autoridade Da Concorrência	(Publicity on) printed press and radio	Yes	Yes, implicitly, by defining two different product markets connected with the same product, the two-sidedness of this case is taken into account	Both Controlinveste and Lusomundo have control over more than one type of press, several product markets apply, but in all of them the CA recognizes the importance of publicity and	The CA took both a unilateral and vertical perspective and concluded that future competition from new forms of printed press would provide enough disincentives to conduct bundling

Case	Authority	Product	Recognition of Two-Sidedness	Two-Sided Terminology	Findings	
					Market Definition	Merger Assessment
					advertising in all of them sees a product market itself. Despite this multiplicity of business sectors involved, only two raise concerns for the competitive environment.	practices.
Prisa/Media Capital 2006	Autoridade Da Concorrência	Radio and open signal television sectors	No	No	The two entities were not present in each other's geographic markets, nor were their products in any way substitutable, because of cultural (language) differences. CA analyzed this case mainly through the publicity side, not from the advertisement side. Had the two-sidedness of the market been recognized, this would probably include Open signal television and Radio broadcast.	The merger was assessed from both a horizontal and vertical perspective on the publicity industry of radio and television broadcasting.
Impresa/Edimpresa 2008	Autoridade Da Concorrência	(Publicity on) printed press and radio	Yes, analyzed from both readers and advertisers. Yet, it did not always use the same criteria when	Yes	The CA recognized the limited degree of substitutability between general and specialized publications.	Unilateral effects were taken into account.

Case	Authority	Product	Recognition of Two-Sidedness	Two-Sided Terminology	Findings	
					Market Definition	Merger Assessment
			defining the relevant product market, approaching the publicity side in a broader sense and the reader's side in a more segmented one.			

7.8   United Kingdom

Case	Authority	Product	Recognition of Two-Sidedness	Two-Sided Terminology	Findings	
					Market Definition	Merger Assessment
Gannett/RIM 2000	UK Competition Commission	Newspapers	Yes. The Competition Commission did not consider the two-sided nature of the market as such, but looked at markets both in terms of competition for readers and competition for advertising. The Competition Commission pointed out that newspapers are heavily dependent on advertising.	No	The Competition Commission contended itself to referring to previous inquiries which had distinguished between national, regional and local newspapers, and which looked at markets both in terms of competition for readers and competition for advertising.	The Competition Commission held that it was unlikely that any of the proposed transfers would lead to increases in cover prices or to a reduction in the range and quality of editorial content. With respect to advertisers, the Competition Commission weighed the risk that the reduction in competition could lead to the possibility of higher prices or less choice for advertisers against the possible advantages to advertisers from the titles being part of larger groups.
Johnston/Trinity Mirror 2002	UK Competition Commission	Newspapers	Yes. The Competition Commission considered the impact of the merger on both sides but beyond that it did not consider the two-sidedness of the market.	No	The Competition Commission defined the market from the perspective of both readers and advertisers. From the perspective of readers, it held that other media could provide good substitutes for some elements of the editorial content of local newspapers. In general, however, the other sources were not considered to represent close substitutes for	The Competition Commission considered that it was unlikely that the merger would have adverse effects on readers because of the likely effects on diversity of view and quality of editorial material. As regards advertisers, the OFT alleged that is not probable that Johnston would be able, post-merger, to profitably raise advertising rates for a

Case	Authority	Product	Recognition of Two-Sidedness	Two-Sided Terminology	Findings	
					Market Definition	Merger Assessment
					readers of local newspapers, whether it was because they were less local, less accessible or less convenient. For many advertisers, no alternative was considered to be a close substitute for local newspapers. This is because these advertisers are likely to have to use several alternative media at the same time in order to achieve an effect similar to advertising in a local newspaper, and this may not be practicable at all for small advertisers.	significant period of time, by a material amount to a significant proportion of advertisers.
Newsquest/ Independent News and Media 2003	UK Competition Commission	Newspapers	Both readers and advertisers were considered but beyond that the two-sidedness of the market was not considered.	No	The Competition Commission considered that there were several factors distinguishing local newspapers from other printed and non-printed media and which thereby limit the extent to which they can be regarded as effective substitutes by readers and advertisers. Moreover, the Competition Commission held that there was significant substitutability between free and paid-for newspapers, for both readers and advertisers, and therefore did not believe it was appropriate to distinguish between them.	The Competition Commission considered that, since there were overlaps only in the area of free weekly publications, there was no effect on competition for readers, and that their concern would thus primarily be on competition for advertisers. The Competition Commission did, however, envisage the effect of the transfers on readers when considering editorial issues.
Carlton/Granada	UK Competition	TV	Yes. The	No	The UK Competition	The Competition Commission

Case	Authority	Product	Recognition of Two-Sidedness	Two-Sided Terminology	Findings	
					Market Definition	Merger Assessment
2003	Commission	broadcasting	Competition Commission alleged that commercial broadcasters had to consider two main categories of customers: viewers and advertisers. It noted that although viewers make little direct financial contribution to broadcasters, it is being able to attract them that enable broadcasters to sell airtime to advertisers.		Commission noted that on the viewers' side, there was no competition between regional ITV license owners and it therefore focused on the sale of advertising airtime.	concluded that the proposed merger would have an adverse effect on future competition for the sale of advertising airtime and so might be expected to operate against the public interest. This adverse effect would centre on the enhanced market position of a merged Carlton/Granada. The Competition Commission did not mention the possibility that a reduction of competition on the advertising side could be beneficial to viewers.
Archant 2004	UK Competition Commission	Newspapers	No	No	Focused solely on the advertising side.	
Future/Highbury House 2005	OFT	Magazines	The OFT examined the two sides of the market but it did not specifically connect the two sides of the market.	No	The OFT defined the market from the perspective of both readers and advertisers. Given the mixed and inconclusive nature of the evidence, the OFT decided not to determine the precise boundaries of the market	The OFT examined the effects of the merger on both advertisers and readers but it did not consider the cross-externalities between readers and advertisers. With regards to the readers, in the absence of sufficient competition, it considered that the merged firm would have the ability to

Case	Authority	Product	Recognition of Two-Sidedness	Two-Sided Terminology	Findings	
					Market Definition	Merger Assessment
						raise cover prices of magazines or lessen quality.
Somerfield/Morrison 2005	UK Competition Commission	Supermarkets	No	No	The UK Competition Commission applied a SSNIP test in defining the relevant market. The market was defined by reference to shoppers only.	The UK Competition Commission was concerned by potential unilateral effects. It argued that the combination of a high diversion ratio and high margins could indicate a loss of competition.
LSE/Deutsche Börse/Euronext 2005	UK Competition Commission	Stock Exchanges	Yes. The Competition Commission noted that there were indirect network effects between listing and trading services.	No	The UK Competition Commission considered that there were network effects between listing and trading services, because companies are seeking to list where there is a concentration of traders, and more traders in turn are being attracted by the opportunity to trade in new equities. The Competition Commission, however, considered that the existence of these externalities does not in itself warrant inclusion of these two services in the same market. The Competition Commission reached the conclusion that trading and listing services are in a separate market for two reasons. First, there was no evidence that listing and trading fees are jointly determined because of this externality. And second, it is not necessary for an exchange to provide both	/

Case	Authority	Product	Recognition of Two-Sidedness	Two-Sided Terminology	Findings	
					Market Definition	Merger Assessment
					listing and trading services.	
IPC Media/Horse Deals 2006	OFT	Magazines	Yes. The OFT recognized that equestrian magazines operated in a two-sided market in which readers and advertisers are closely inter-linked.	Yes	The OFT considered that the product frame of reference encompassed the sale of advertising space in equestrian magazines, the sale of magazines containing such advertising, as well as the wider market for equestrian publications. The exact product frame of reference was left open.	The OFT did not consider the effect of the merger on the readers' side because "Horse Deals" was essentially an advertising publication with little editorial content and, as such, the OFT was of the opinion that the merger would not have an impact on the cover price of quality of the relevant titles. Regarding the sale of advertising space, the OFT considered that IPC and Horse Deals were each other's closest competitors in advertising in equestrian magazines. It did not believe that there would remain sufficient competition post-merger to constrain the parties from exercising market power by raising advertising prices, lowering quality of service or lowering levels of innovation.
Hamsard/Academy Music 2007	UK Competition Commission	Live music venues	No	No	The Competition Commission did not conclude on the precise boundaries of the market for live music venues.	The Competition Commission looked at the competitive constraints from other venues on each of venue owned by the parties. It concluded that the merger would lead to a loss of rivalry. In making such assessment, it used gross margins and diversion ratios.
BSkyB/ITV	UK Competition	TV	Yes	Yes	The UK Competition	The UK Competition

Case	Authority	Product	Recognition of Two-Sidedness	Two-Sided Terminology	Findings	
					Market Definition	Merger Assessment
2007	Commission	broadcasting			Commission highlighted the fact that the market was two-sided which in turen affected market definition. It noted in this respect that price differences are not necessarily an indication of a lack of substitutability. Indeed, in two-sided markets, suppliers can compete with one another at different price points, given the ability to generate revenues in two-separate markets. However, despite the fact that BSkyB argued that the two-sidedness of the market posed some difficulties in applying a standard SSNIP test using specific quantitative data, the Competition Commission decided to use the conceptual framework of the SSNIP test and to rely on a variety of qualitative and quantitative evidence to inform the market definition.	Commission argued that the merger was likely to lessen competition for both viewers and advertisers on the 'all TV' market, but it did not envisage externalities between the sides.
Global Radio/GCap Media 2008	OFT	Commercial radio	Yes. The OFT recognized the two-sided nature of commercial radio. It noted that the better the quality of the programmes and the offer made to the audience as a	Yes	The OFT suggested to test the validity of unilateral effects theories of harm by considering real world evidence relating to direct competitive constraint actually exercised by one party on the other, and removed by the merger, rather than embark upon an analytical exercise featuring hypothetical	The OFT analyzed the indirect network externalities between the different sides of the radio market and, in particular, the impact on listeners of a reduction of competition on the advertising side. The OFT considered it appropriate primarily to consider the competitive effects of the

Case	Authority	Product	Recognition of Two-Sidedness	Two-Sided Terminology	Findings	
					Market Definition	Merger Assessment
			whole, the more attractive it becomes for listeners and, in turn, the more attractive it becomes for advertisers seeking to reach them.		monopolists in an effort precisely to define what may be fuzzy market boundaries through conventional SSNIP-test analysis.	merger on advertisers and treat any countervailing benefits to listeners as part of the efficiencies analysis. Absent compelling evidence on efficiencies, the OFT held that it would proceed on the basis that (i) it is advertisers who will primarily and most directly feel any adverse effects arising from a commercial radio merger and (ii) any possible countervailing effect on this from the listeners side of the market, while theoretically plausible, must meet stringent efficiency evidence requirements rather than merely be assumed to be sufficient.
Live Nation/Ticketmaster 2010	UK Competition Commission	Concert tickets	Yes. The Competition Commission stated that in order to attract consumers, a new ticket agent needed access to tickets to offer for sale.	Yes	The Competition Commission held that the two-sidedness of the market did not appear to be, of itself, a significant barrier to entry, and hence that there was not a significant 'chicken and egg' problem.	

7.9   United States

Case	Authority	Product	Recognition of Two-Sidedness	Two-Sided Terminology	Findings	
					Market Definition	Merger Assessment
Google / DoubleClick 2007	US FTC	Online advertising	Yes. The two-sided nature of intermediation services was implicitly taken into account.	No	Defined one market by taking into account the perspective of both publishers and advertisers.	Non-horizontal effects: The FTC considered the possible leveraging of DoubleClick's position in ad serving on the market for intermediation services. In this context it discussed indirect network effects and whether the market is likely to tip.
XM/Sirius Satellite Radios 2008	US DOJ	Satellite radios	No	No	Focused solely on subscribers.	
U.S. Live Nation/Ticketmaster 2010	US DOJ	Concert tickets	Yes	No	/	Used HHI to verify market concentration.

Chapter 3

Assessing Mergers

in Two-Sided Markets:

Some Suggestions

by Dr. Lapo Filistrucchi, Prof. Dr. Damien Geradin,

Prof. Dr. Eric van Damme

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1   INTRODUCTION

1.   The term "two-sided market"[129] may seem quite odd to the uninitiated. All markets would at first sight appear to have two sides, namely buyers and sellers. In fact, the term refers to a specific type of market.

2.   A two-sided market is a market in which a firm acts as a platform[130] and somehow connects distinct but interdependent customer groups ("sides") in a way that generates value for at least one of the two customer groups. Typically, these customers cannot obtain such value or at least not to that extent without the platform.

3.   Two-sided markets exhibit indirect network effects between the various groups of customers. Positive indirect network effects occur when the value obtained by one group of customers increases with the number of customers (or, more generally, the demand) of the other group[131]. For instance, video game developers value video game consoles more if there are more video game players and *vice versa*. Similarly for men the value of a heterosexual dating club increases with the number of women in the club and *vice versa*. Cardholders value a payment card more the more merchants have a point-of-sale terminal that accepts that payment card and *vice versa*. Thus the markets for video consoles, heterosexual dating clubs, and payment cards are two-sided markets characterised by two positive indirect network effects.

4.   Negative indirect network effects occur instead when the value obtained by one group of customers decreases with the number of customers (or, more generally, the demand) of the other group[132]. For instance, although advertisers are likely to value a TV channel more the more viewers it has, the viewers are generally annoyed by TV advertising. The TV market is, thus, a two-sided market characterised by one positive and one negative indirect network effect.

5.   It is not necessary for the existence of a two-sided market that two indirect network effects be present. One suffices. There is for instance some evidence that on average readers do not care about advertising on daily newspapers. Yet a daily newspaper is a two-sided platform, as one would find it difficult to argue that advertisers do not care about the number of readers of the newspaper where their ad is going to be displayed.

6.   A crucial feature of two-sided markets is that the two customer groups are not able to incorporate and appropriate these indirect network effects, which are therefore often referred to as externalities, i.e. external to or not accounted for in the individual decision of the customers. For example, when a reader buys a newspaper she does not take into account that by buying the newspaper she will make the newspaper itself more attractive to advertisers and does not care about the price of an ad in that newspaper.

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[129]   This report discusses "two-sided markets". Most of the discussion extends however to the more general case of "multi-sided markets".

[130]   A "two-sided platform" is therefore a firm active in a "two-sided market". Again, we refer to "two-sided platforms" but the analysis can be extended to "multi-sided platforms".

[131]   Direct network effects occur instead when the value obtained by one group of customers changes with the number of customers who buy or use the same product.

[132]   A two-sided market with two negative indirect network effects is not conceivable as it would imply that neither of the two customer groups would be interested in interacting with the other side, hence neither of them would be interested in joining the platform. A multi-sided market will thus be characterized by at least one positive indirect network effect.

7. To be more precise, economic theory distinguishes between membership externalities and usage externalities. Membership externalities arise from joining the platform (buying a newspaper or placing an ad in a newspaper, holding a payment card or having a point-of-sale terminal, listing your product at an auction or attending an auction), whilst usage externalities arise from using the platform (paying or accepting payment with a card, selling and buying a product at an auction). As the value of joining the platform depends on the number (or more generally the demand) of customers of the other side, the benefit of using the platform, similarly, depends on the demand for usage by the other side. For instance, assuming a customer holds a card and a shop has the corresponding point-of-sale terminal, even if a customer wants to pay by card, the merchant has to be willing to accept that card for that that particular transaction and *vice versa*. Once again these externalities are not internalised by the users of the platform, i.e. the cardholder and the merchant. For instance a cardholder does not care about the unrealised benefit it forces on the merchant when it refuses to pay by card (e.g. direct crediting on the bank account of the money).

8. In any case, the existence of this interdependency between the two demands makes a two-sided platform a particular type of multi-product firm. The fact that buyers do not take into account the indirect network effect when deciding to join or use the platform distinguishes a two-sided platform from a firm selling complementary goods. Indeed, a firm selling two complementary goods faces two demands but from only one group of potential customers. However, as these customers need to buy both goods, they internalise the link between the two demands and base their buying decision on the prices of both goods. For instance the demand for ink cartridges depends on the number of inkjet printers. A nonnaïve customer will also ask the price of the cartridge before buying an inkjet printer.

9. In a two-sided market the platform typically recognizes this interdependency between the demands it faces from the two groups of customers and has a strong incentive to "internalize" these externalities. Indeed, owing to the interdependency of the sides of a two-sided market, the platform knows that it needs to "get both sides on board" in order to operate. Without one side of the platform, the other side won't join, and conversely. If one takes the example of a heterosexual dating club, no man will join unless women do and *vice versa*. It is also fundamental for the platform to attract the different sides in the right proportion. For example, a heterosexual dating club with too many men and few women will not be successful and *vice versa*. Similarly, a video game console without enough interesting games will not attract players and one without enough players will not attract game developers. One way for the platform to get the balance right is by setting the right prices on the two-sides.

10. A fundamental feature of a two-sided market is that, even by keeping fixed the sum of the prices charged to the two sides (the so called price level), the platform can indeed affect the volume of interactions (and therefore its profits) by charging more to one side and less to the other, i.e. by adapting the price structure. For instance in an heterosexual disco, for a given price per couple, success and therefore profits depend on the allocation of this price between men and women, i.e. who pays more and by how much between the couple. In a payment cards market, given the price of a transaction between a cardholder and a merchant (i.e. given the price level), the amount of transactions and the profits will depend on the relative size of the prices paid by the two parties for the transaction (i.e. on the price structure)

11. By lowering the price on one side of the market, demand on that side is likely to increase. In the case of a positive externality, the increase in demand on that side has the effect of increasing

demand, for any given price, on the other side (which may in turn, in the case of a two positive network effects, increase demand on the starting side, and so on). For instance, by lowering the cover price of a newspaper, more readers are likely to buy this newspaper. Because the readership will increase, more companies will be willing to advertise in this newspaper for any given advertising tariff. A newspaper platform may then find it profit maximizing to lower the price charged to readers and increase the price to advertisers. At the extreme a platform might choose not to charge one side of the market and make the other side pay for the interaction. An example of this is the free press. In some cases a platform might even find it optimal to "pay" one of the two-sides to get it on board. It is the case for example of payment cards, when cardholders gain bonus points by using their card[133].

12.   An important characteristic of two-sided markets are the subscription and usage patterns. Customers on each side of the platform may join or use several platforms, known as "to multi-home", alternatively they may join or use one platform only, otherwise known as "to single-home". One can then distinguish single-homing and multi-homing in membership or in use. One card-holder might for instance hold more than one card (i.e. he might be multi-homing in membership), but in practice might decide to use only one of them (i.e. he might be single-homing in use). Clearly, one cannot multi-home in use and single-home in membership[134], but one can multi-home in membership and in use. So that while Simply put, a cardholder who has only one card cannot but use only that card, whereas one who has more cards can use different cards for different transactions.

13.   There are numerous two-sided markets. In addition to the two-sided markets mentioned above (those for video game consoles, heterosexual dating clubs, TVs, payment cards), yellow pages, internet websites and, more generally, all media markets are two-sided markets. Additionally auction houses, virtual marketplaces such as E-bay, firms selling operating systems and stock exchanges are two-sided platforms. The identifying features are the presence of two distinct groups of buyers and the interdependency between their demands.

14.   The identification of the two-sided nature of such platforms, albeit not always easy in practice, is crucial for competition policy in general and merger policy in particular. Indeed, we show in the survey of the economic literature that two-sidedness affects the definition of the relevant market and, even more importantly, the social desirability of a merger. Indeed it affects both the prices charged pre and post merger and the benefit or damage deriving from the merger to the merging parties, their rivals and their customers.

15.   The purpose of this chapter is to provide suggestions for the assessment of mergers in two-sided markets.

16.   These suggestions are organized as follows. Section 2 explains how competition authorities should decide whether a market is two-sided or not. Section 3 discusses whether and to what extent the two-sided nature of the market should affect the definition of the relevant market. Eventually, Section 4 explains whether and to what extent it should affect the evaluation of unilateral (or non-coordinated) effects of mergers. Section 5 concludes.

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[133]   As discussed in the survey of the literature, ceteris paribus, the side that attaches a higher positive value to the other one is going to pay more. One could argue for instance that this is the reason behind heterosexual night clubs charging a different price to men and women or behind the observations that in most countries merchant pay for card transactions whereas cardholders do not.

[134]   Indeed that cardholders in the US have many cards but use only one is one of the findings of Rysman (2007).

8   ASSESSMENT OF THE TWO-SIDED NATURE OF THE MARKET

This section discusses how a competition authority may proceed in order to identify the two-sided nature of the market.

17.   In order to assess the two-sided nature of the market it is crucial to identify and characterize the indirect network effects which link the demands on the two-sides of the market. One might therefore ask whether such indirect network effects exist, whether they are one or two, whether they are both positive, or one is positive and one negative and, finally, how significant they are.

18.   For instance, when analyzing a merger in the TV market, one might want to know whether a larger audience of a TV channel *ceteris paribus* (i.e. holding constant also prices) implies a higher demand to advertise on that channel, whether viewers dislike advertising and, if so, whether advertisers like viewers more than viewers dislike advertising.

19.   If a market is a non-transaction market, looking at externalities is sufficient. If instead the market is a transaction market, then one should also check if there are transaction costs or more generally, limits to the bilateral setting of prices among buyers and sellers or if there are platform constraints on pricing between customers on the two-sides. If these constraints exist then the market is two-sided, because only in such cases the side charged the higher price would be unable to pass on perfectly the difference in prices to the other side, so that only then the price structure would not be neutral.

20.   Indeed, the lower the pass-through among the parties which transact, the more important the two-sided nature of the market[135].

21.   Different approaches to the assessment of the two-sided nature of the market are possible. They are to some extent substitutes, but they can also be conceived as complements, as discussed in the next sections.

8.1   The qualitative approach

This section discusses the first step that a competition authority may take to assess the two-sided nature of the market.

22.   A qualitative approach to the assessment of the two-sided nature of the market would focus on checking whether there are indirect network effects and, if so, what their sign is, i.e. whether these effects are both positive or one is negative. For instance, one might want to know not only whether advertisers decide on which newspaper to place their ad based on the number of readers and if indeed they attach positive value to a higher readership, but also whether readers like, dislike or are indifferent to advertising.

23.   This qualitative approach is often relatively easy and not particularly time consuming, but is unable to produce any conclusion on the size of the indirect network effects.

24.   Given these features, a qualitative approach might be preferred in the first phase of the analysis of a merger. The aim would then be to check whether indirect network effects are present or not.

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[135]   In fact, non-transaction markets could be seen as a market where the pass through among the two sides is zero.

25.   If they are not present, one could then proceed to clear the merger if the usual conditions for proceeding to phase two in a single-sided market are met.

26.   If instead two indirect network effects are present, it would, in general, seem necessary to proceed to measure them.

27.   However, if the market is a transaction one, one could first check to what extent transaction costs or constraints set by the platform limit the possibility of pass-through between the two sides. If there is scope to believe that the pass-through is high, then one could come to the conclusion, that although the market is two-sided, the two-sided nature of the market might not play a great role in practice.

28.   Clearly, in the case of a non-transaction market, the pass-through is by definition zero, so that one has no other option than to try and measure the size of the indirect network effects.

29.   In the case in which only one indirect network effect is present, then it would appear that the two-sided nature of the market plays a role only to some extent. For instance, as we will discuss in more detail below, market definition on the side that does not exert an externality on the other one, could be performed disregarding the other side.

30.   We now discuss two different qualitative approaches: the deductive approach and the interview approach.

8.1.1   The deductive approach

This section discusses how a competition authority may use logical arguments to assess the two-sided nature of the market.

31.   The simplest way to assess the two-sided nature of a market could in some cases be a logical argument. For instance, in the case of newspapers it would appear evident even at first sight that advertisers value positively the number of readers of a newspaper. Indeed, the only reason advertisers advertise in a newspaper is that they aim to reach readers of the newspaper with their message.

32.   Unfortunately this approach cannot always be followed, as in some cases it is not clear whether one side cares about the other and *a fortiori* whether it values the other side positively or negatively. For instance, it is not clear at all what the attitude of readers is towards advertising in a newspaper.[136]

33.   What's more, as any qualitative approach, the deductive one does not allow one to say anything about the size of the indirect network effects. Yet the latter is crucial for market definition and for merger assessment, as we will argue below.

8.1.2   The interview approach

This section discusses how a competition authority may interview or survey market participants to establish whether a market is two-sided or not.

34.   A slightly more refined way to assess the two-sided nature of a market could be interviewing agents in the market (i.e. business people but also consumers) or making them fill in a questionnaire with

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[136]   For instance, while Argentesi and Filistrucchi (2007) and Fan(2009) find no effect of advertising on the number of readers of daily newspapers in Italy and in the US, Kaiser and Wright (2006) and Kaiser and Song (2009) find that advertising increases readers' demand for magazines in Germany.

the aim of assessing whether they value, positively or negatively, the presence of more customers on the other side.

35.   For instance, in the case of newspapers, one could ask advertisers whether they value the number of readers of a newspaper on which they place an ad. One could also ask readers whether they like advertising on the newspaper, whether they are annoyed by it or whether they are indifferent to it.

36.   In some cases such surveys might indeed already exist. This is the case in many countries where surveys are run by communication or social scholars with regards to the use and the perception of media[137].

37.   Again, being a qualitative approach, by definition the interview approach does not allow one to say anything about the size of the indirect network effects.

8.2   The quantitative approach

This section discusses how a competition authority may measure whether a market is two-sided or not and measure the extent of two-sidedness.

38.   A quantitative approach to the assessment of the two-sided nature of the market would focus on checking not only whether there are indirect network effects and whether they are positive or negative but also on measuring their size. For instance, in a case involving newspapers, one might want to know how much advertisers value an additional reader or, in a case involving payment cards, one might want to check whether merchants care more about one additional cardholder than a cardholder cares about one additional merchant having a point of sale terminal.

39.   In order to answer these questions one can follow two different qualitative approaches: the stated preference one and the revealed preference one.

40.   Both are often more time consuming than a qualitative one as they require the collection and analysis of data. They would thus seem more applicable in a second phase of analysis.

41.   In fact, having already identified two-sidedness using a qualitative approach might help in figuring out which are the relevant questions to formulate and the relevant data to collect.

8.2.1   *The stated preferences approach*

This section discusses how a competition authority may measure the indirect network effects by way of a survey of market participants.

42.   A stated preferences approach to assessing the two-sided nature of a market would imply surveying agents in the market (i.e. business people but also consumers), interviewing them in person, by phone or through the internet, with the aim of assessing not only whether they value, positively or negatively, the presence of more customers on the other side but also how much they value them.

43.   Clearly, the design of the survey and, in particular, the formulation of the questions is crucial to the quality of the data.

44.   More precisely, in addition to measuring how demand reacts to changes in prices, one should aim at measuring how demand on one side depends on the number of customers (or more generally,

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[137]   See for instance for Italy the "Rapporto sulla Comunicazione in Italia" published by the research Institute Censis.

demand) on the other side, keeping all else, including prices, equal. Hence, when asking whether one would buy the product if customers on the other side diminished by some percentage, one should be clear in saying that the price of the product on the side of the respondent should be thought of as fixed. For instance, when asking advertisers who advertise in a phone directory whether they would still place an ad in a directory if the number of users dropped by 5%, one should be clear that the price of placing the ad in the directory would not be changing.

45.   In this regard, conjoint analysis[138] can be a good instrument as it considers respondents with the hypothetical choice among differentiated products, which are carefully made different on specific aspects keeping constant the others, in turn. For instance, a conjoint analysis might ask advertisers which phone directory they would choose if faced with two phone directories with the same advertising price but a different number of users or when faced with two phone directories with the same number of users but a different price.

46.   One has to be careful however in that conjoint analysis does not allow dealing with respondents with too many different situations, while indeed in a two-sided market more comparisons might be necessary than in a single-sided market. That is because in a single-sided market conjoint analysis could for instance be used to estimate the responsiveness of demand to prices, here it should be also be used to measure responsiveness of demand on one side to changes in demand on the other side. A careful selection of the relevant variables which are designed to change from one product to another is therefore necessary. These would include the price faced by the customers, the number of customers on the other side of the market and the most (other) relevant elements of product differentiation. For advertisers in a newspaper not only the number of readers might for instance be relevant, but also the percentage of readers in a socio-demographic group, as these readers are more likely to buy the product once they have seen the ad (either because they are more interested or because they are more easily persuaded).

47.   A drawback of the survey approach is that many papers in social sciences have shown that people might not state their true preferences and in addition these stated preferences might not correspond to actual behaviour when the hypothetical situation becomes real. One should note that, although this is a general finding, the bias, i.e. the distance between stated preferences and the actual behaviour, often depends on the type of question and on whether the survey is undertaken by interviewing in person, on the phone or on the internet.

48.   For these reasons one might prefer to follow the revealed preferences approach.

8.2.2   *The revealed preferences approach*

This section discusses how a competition authority may measure the indirect network effects by analyzing data describing actual behaviour of market participants.

49.   The data approach (or revealed preference) approach would require the collection of data on the actual behaviour of market participants as well as the estimation of demand for the two-sides of the market[139]. The data could be market level data and/or consumer level data.

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[138]   Conjoint analysis is particularly popular in marketing. The seminal papers for conjoint analysis are Green and Srinivasan, (1978) and Green Carroll and Goldberg (1981). For a recent explanation, see Orme (2005).

[139]   As done for instance by Rysman (2004) and Kaiser and Wright(2006)

50.   Market level data are sales, prices and characteristics of products on each side of the market. In a case regarding newspapers, on the readers' side of the market, one would need to collect data on the number of readers or copies sold of a given newspaper, the cover or subscription price and characteristics such as the owner, the editor, percentage of space dedicated to the different types of content, including the percentage of space devoted to advertising; on the advertisers side one would need to collect data on the quantity of advertising, on advertising rates and on demographic characteristics of readers for each newspaper[140]. In the case of two-sided markets where a transaction among end users of the platform is present, one should also collect market level data on the number of transactions, characteristics of the transactions and the prices charged for the transaction by the platform to the two-sides. In the case of payment cards one should not only be interested in the number of cardholders and shops with a POS terminals as well as the annual fees of each payment card but also in the number of transactions, the objects and value of the goods sold and in the fees paid per transaction. Similarly for auction houses.

51.   Consumer level data would provide a record of the individuals' actual choices. For instance it would provide information on which newspapers a given person buys or reads. They would therefore allow the choices of products to be related to the individual characteristics of the market agents. For example, such data would allow one to determine whether readers with a higher education tend to be less inclined to read free newspapers or tend to buy more than one newspaper.

52.   Although more rare than market level data, consumer level data are becoming more and more available thanks to technological progress.

53.   By allowing individual characteristics to be related to choices, consumer level data would allow the estimation of different indirect network effects based on the characteristics of the individual. For instance, the data would make it possible to say whether people with a higher education are more annoyed by advertising than less educated people or whether small shops advertising in a directory value additional users less than large stores.

54.   This could turn useful later when evaluating the merger as one could assess its impact on the different subgroups of customers on each side. One might for instance assess whether the merger among phone directories would hurt small shops while it would benefit bigger ones.

55.   Recent econometric models would also allow one to estimate individual specific indirect network effects using market level data[141]. As the models exploit variation across markets in the socio-demographic characteristics of potential customers, their use thus requires that one would be able to collect market level data and socio-demographic characteristics for many different markets. In addition, the estimation procedure is quite complex and time consuming, although advances in computing are making it increasingly feasible as time passes[142].

56.   Whether one is using market level or consumer level data, whenever possible, one should aim to collect these data for several periods in time. This would allow better control of unobserved product or individual characteristics in the estimation. This is important because it is unlikely that a researcher will be able to collect data on all the factors which affect the choice of a given product by an individual.

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[140]   This is done for instance in Argentesi and Filistrucchi (2007) and also in Chapter 4 in the current report.

[141]   See Ackerberg et al (2007).

[142]   See Nevo (2000-II) for a basic explanation of the estimation procedure.

57.   Indeed, this is one of the advantages of the revealed preference approach with respect to the survey approach, at least in as much as data on past behaviour can be collected more easily than surveyed.

58.   The other main advantage is that it enables the measurement of the size of the actual indirect network effects, rather than not measuring it as in the case of a qualitative approach or just measuring the size of hypothetical indirect network effects as in the survey approach.

59.   However, a drawback of the data approach is that it requires running an econometric analysis on the data in order to identify the presence, sign and size of the network effects. Although a carefully designed econometric analysis may indeed provide fundamental answers, specifying and estimating the correct econometric model of demand for membership or transactions on the two sides may be particularly time consuming, as the econometric model needs to be fit to the market. Moreover, it might be the case that the best econometric model would require data that are not available. In both cases, simplifications are possible in as much as one can convincingly justify the assumptions made.

60.   Given its characteristics, using a revealed preference approach for the assessment of the two-sided nature of the market is probably most useful in a second phase of the analysis. The estimated size of the network effect can then be used to estimate the relevant market or the unilateral effects to be expected from the merger.

61.   An application of this approach to the assessment of the two-sided nature of the newspaper market is discussed in the document "Mergers in Two-Sided Markets: An Application to the Dutch Newspaper Market"

9   TWO-SIDEDNESS AND MARKET DEFINITION

This section discusses how a competition authority should proceed to define the relevant market in a two-sided setting.

62.   In merger cases, the main purpose of market definition is to identify the firms which exert competitive pressure on the merging parties and which therefore constrain the merged firm power to increase prices post-merger.

63.   Market definition is therefore the attempt to define a group of products which are substitutable to the extent that the firms producing them can be perceived as competing against each other.

64.   The next subsection will consider whether in merger cases involving two-sided markets competition authorities should define one or two markets and why (Section 3.1). We also explain why, in a merger case, they should take into account both sides of the market in assessment of the relevant market (Section 3.2). We then discuss whether and how authorities should perform the SSNIP test to define the market (Section 3.3.) [143]. Finally, we discuss the difficulties inherent to market definition and the extent to which Competition Authorities may bypass market definition (Section 3.4).

9.1   One vs two Markets

This section discusses whether a competition authority should define one or two markets when analyzing a merger in a two-sided market

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[143]   One issue here is that decisions do not in general report how the test was performed and/or which formulas were used. Indeed, this information is usually contained in preparatory documents.

65. As discussed above, in a two-sided market the two-sides of the market are by definition linked by the presence of indirect network effects. As a result, firms are platforms which need "to get both sides on board" in order to do business.

66. The question then arises whether there is only one or two markets to be defined. For instance, when analyzing a merger among newspapers, the question is whether there is a market for newspapers, a market for advertising (on newspapers), and/or a market for the dissemination of content. Similarly, in a case involving payment cards, the question is whether there is a market for payment cards services, a market for payment cards services to card-holders and/or a market for payment cards services to merchants.

67. One of the consequences of defining only one market is that a firm would be either on both sides of the market or on none. Defining instead two interrelated markets would allow a platform to be on one side of the market but not on the other. Whether one or the other outcome is to be preferred might indeed depend on the type of two-sided market under consideration.

68. Everyone would probably agree that a payment card company such as American express is either on the market on both sides or none, for the reason that either the card transaction between the buyer and the merchant takes place using American Express services on both sides, or it does not take place through American Express. The analysis of a merger between two payment card platforms should then consider whether cash transactions or Paypal exert competitive pressure on payment cards companies on both sides.

69. However, it might be the case that a firm is on the market for newspapers on the advertising side but not on the readers' side.[144] For instance, suppose that people do not regard TV and newspapers as substitutes because they read the latter on the metro going to work and watch TV at home in the evening Assuming that advertisers are interested in reaching each person only once during a day, they will tend to regard TV and newspapers as substitutes. TV would then be in the same relevant market as newspapers on the advertising side but not on the readers' side. The analysis of a merger between newspapers should then consider that TV exerts competitive pressure on newspapers in the market for advertising but not in the one for content.

70. The crucial element that distinguishes a newspaper market from a payment cards market is that in the latter a transaction is present between so-called end users, i.e. between the customers on the two-sides of the market.

71. Indeed, more generally whether one should define a single market or two interrelated markets depends on whether we are dealing with a two-sided transaction market and two-sided non-transaction market[145].

72. Among two-sided transaction markets are those for cards services, auction houses, video game consoles and operating systems. Media markets on the other hand are two-sided non-transaction markets.

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144 See Evans and Noel (2005).
145 See Filistrucchi (2008).

9.2   Considering both sides of the market

This section explains why, irrespective of whether it needs to define one or two separate markets, a competition authority should consider both sides of the market.

73.   In merger cases, the main purpose of market definition is to identify the firms which exert competitive pressure on the merging parties and in so doing constrain their power to increase prices post-merger.

74.   Market definition is therefore an attempt to define a group of products which are near enough substitutes so that the firms producing them can be perceived as competing against in each other.

75.   Irrespective of whether one defines a single market which includes all sides or two different markets, the issue arises of whether one should look at each side of the market independently or jointly, i.e. if one should consider the role of the indirect network effects when defining the market. For instance, the question is whether one should look at the advertising side when one defines the relevant market for readers in a merger among newspapers and *vice versa*. Otherwise, whether one should look at both buyers and merchants when one defines the market for payment cards.

76.   We argue that it is necessary to consider all the sides of the platform under consideration. A platform in a two-sided market needs both sides on board and is therefore competing for customers on both sides. How much competition it faces in getting customers on one side also depends on its competitive position on the other and *vice versa*.

77.   More precisely, on each side of the market, the degree of competition faced by a given platform might depend on the degree of vertical and horizontal product differentiation. As an example, how much competition a newspaper faces on the advertising side depends *inter alia* on how many readers it has compared to other newspapers. For any given decrease in the advertising price of a rival, the effect on its profits is likely to depend on how many readers the newspaper has with respect to the rival. One can argue that from the advertisers' point of view newspapers are vertically differentiated in the number of readers.

78.   Moreover,, how much competition a newspaper faces on the advertising side is also likely to depend *ceteris paribus* on the demographic composition of its readers with respect to that of the readers of rival newspapers. Different advertisers might value different demographic groups of readers more. In the extreme case, if the newspaper under consideration had all the "valuable readers" for some advertisers and the rival had no "valuable readers", a given price decrease for advertising on the rival newspaper would have no effect. In as much as some advertisers value particular readers more than others, newspapers can also be perceived as horizontally differentiated on the advertising side.

79.   Both forms of differentiation should therefore be taken into account when looking for the set of firms that exert competitive pressure on the merging parties. Since vertical product differentiation on one side depends on prices on the other side and horizontal product differentiation on one side is linked to horizontal product differentiation on the other side, the competitive constraints faced by a platform can be assessed only by taking into account both sides when defining the relevant market.

80.   The risk of neglecting one side of a two-sided market is particularly important when the product of the overlooked side is priced at zero. In such a case one may have the tendency to think that firms are not competing on that side. For instance, one often thinks of shopping malls as renting space to

retailers, failing to see that they also compete for shoppers against other malls. Yet if a shopping mall experienced a drop in the number of shoppers, it is likely that this will lead to a drop in demand for space from the shops. The mall might then be forced to lower the price charged to shops and/or experience a decrease in the number of shops

81.   Similarly, one might think that phone directories compete only on the advertising side. But if a phone directory experienced a drop in advertisers it is likely to undergo not only a direct drop in profits but also an indirect drop in usage due to people finding less information on the directory. The latter is due to the directories competing against each other for usage. This effect is even more pronounced if the publisher raises the price of advertising on a phone directory.

82.   By failing to consider all sides in the definition of the relevant market one would then ignore the real competitive pressure faced by the merging firms before and after the merger. This may result in a flawed market definition and ultimately in a mistaken decision on whether to block or clear the merger.

83.   Only, in the particular case of a two-sided non-transaction market with only one externality, one could safely perform a market definition exercise on that side of the market.

84.   For example, if one finds that advertising has no effect on the readers' side of the market, one can safely define the advertising market irrespectively of the readers' side of the market.

85.   To be precise, it is therefore necessary to consider both sides in a transaction market; it is instead not always necessary to consider both sides when defining the relevant market in the case of a two-sided non-transaction market. In fact, in the latter case it is only necessary to consider all the other sides towards which the side under consideration exerts an externality, either directly or indirectly[146].

9.3   The SSNIP-test and the HM-test in general

This section discusses the so-called SSNIP test and how to define the relevant market(s) in cases involving two-sided platforms.

86.   A commonly used tool for market definition in a traditional single-sided market is the so-called Small-But-Significant-Non-Transitory Increase-in-Price Test (in short the SSNIP test), which defines the market as the smallest set of substitute products such that a substantial (usually 5 or 10%) and non transitory (usually one year) price increase by a hypothetical monopolist would be *profitable*.

87.   In a merger case, starting from a set of candidate products for the relevant market, the SSNIP test is implemented by first simulating *a given price increase* by a hypothetical monopolist above the current level[147] who owns just one product (one of those of the merging parties) and, as long as that leads to estimated losses in profits, progressively increasing the number of products owned by the

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[146]   Indeed, in a multi-sided platform, side A could exert an externality on side B when customers on side B value more customers on side A, but it could also exert an externality on side B when customers on side B care about customers on side C and customers on side C care about customers on side A. We refer here to a two-sided market. If one were to analyze a mergers in market with more than two sides both cases above would lead to equivalent suggestions with respect to market definition.

[147]   Indeed the current level is assumed to be competitive. This is a drawback of the test giving rise to the so-called "cellophane fallacy" named from the Du Pont case in the US. The issue is well-known in both theory and practice but mainly relevant for market definition in cases of abuse dominance. Both the EU Commission Notice on the definition of the relevant market for the purposes of Community competition law, at para.19, and the US horizontal Merger Guidelines sat para 1.11 comma 5 recognize the issue and suggest that, if there are reasons to believe the price is not competitive, then respectively "the fact that the prevailing market price might already have been substantially increased will be taken into account" and "the Agency will use a price more reflective of the competitive price. See also Motta (2004).

monopolist. When profits are not estimated to decline following a small but significant increase in price by the hypothetical monopolist, the set of products owned by the monopolist in the last simulation constitutes the relevant market.

88.   The one just described above is the procedure in the EU[148]. In the US[149] the test is called the Hypothetical Monopolist test (in short the HM test) which is slightly different as it defines the market as the smallest set of substitute products such that an hypothetical monopolist owning them would find it *profit-maximizing* to increase prices substantially (usually 5 or 10%) and non transitorily (usually one year).

89.   In a merger case starting from a set of candidate products for the relevant market, the HM test is implemented by first calculating *the optimal price increase* above the current competitive level by a hypothetical monopolist who owns just one product (one of those of the merging parties) and, as long as this price increase is at least a small but significant non transitory increase, progressively raising the number of products owned by the monopolist. When the profit maximizing hypothetical monopolist will not raise prices by at least a small but significant non transitory increase, the set of products owned by the monopolist in the last simulation constitutes the relevant market.

90.   The difference between the SSNIP and the HM test appears to be very small at first sight and it is a matter of debate whether this difference is in practice relevant or irrelevant.[150]

91.   Both in the EU and in the US, the test is often done by Critical Loss Analysis (CLA) or Critical Elasticity Analysis (CEA), for which formulas are derived under the assumptions of constant marginal costs and either linear or constant elasticity demand. Under these assumptions, performing a CLA or a CEA is exactly identical to performing the SSNIP test or the HM test[151].

9.4   The SSNIP-test and the HM-test in a Two-sided Market

This section discusses whether and how a competition authority may use the so-called SSNIP test or HM-test to define the relevant market(s) in cases involving two-sided platforms.

92.   Irrespective of whether one uses the SSNIP or the HM test, interesting issues arise when attempting to extend the SSNIP test to a two-sided market. Firstly, given that in a two sided market firms set two prices, one on each side of the market, the question is which price the hypothetical monopolist should be raising. Secondly, given that in a two-sided market there are indirect network effects between demands (and therefore profits) on the two-sides, the issue is whether one should consider profits on only one side or on both sides of the market.

93.   In a two-sided market the traditional SSNIP test cannot be applied as it is usually conceived. The first reason is, as already discussed, that the market definition should account for both sides of the market, in order to correctly assess the competitive constraints faced by firms. The logic of the SSNIP test should be extended (and therefore the formulas for CLA and CEA modified) in order to

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148   Commission Notice on the definition of the relevant market for the purposes of Community competition law, para.17. Also Werden (2002-I,2002-II).

149   See 1992 Horizontal Merger Guidelines as revised in1997 US Horizontal Merger Guidelines, at para 1.11. Also Werden, (2002-I,2002-II).

150   See for instance Elizalde (2010).

151   Clearly the CEA and CLA formulas are different in the EU and in the US, reflecting the difference between the SSNIP test and the US test. See Werden (2002-I,2002-II).

account for the indirect network effects between the two-sides of the market when judging the profitability of a price increase.

94.   Therefore, considering a two-sided platform with sides A and B, the application of a one-sided SSNIP test on side A would only account for the direct effect that a price increase will have on the demand of side A. It will not account for the fact that a reduction of the number of customers on side A is likely to lead to a reduction of the number of customers on side B. It would also not envisage the fact that the smaller number of customers on side B will in turn reduce the demand of side A, and so on.

95.   Indeed, positive indirect network effects between the different sides of the platform reduce the profitability of any price increase. As there is always at least one positive indirect network effect, the risk of applying a standard SSNIP test, which does not account for feedback effects, is that in such cases the market will be defined too narrowly.

96.   The second reason is that, if one wants to use a SSNIP test (or CLA or CEA) in a two-sided market, one should follow the original rationale of the test: defining the market as the smallest set of products on which a monopoly would find it profitable (or profit maximizing) to exercise market power by non temporarily raising the price above the current competitive level (at least) by a small but significant percentage[152].

97.   In order to ensure the test is based on the same rationale, the SSNIP test in a two-sided market should take into account the changes in profits on both sides of the market and all feedbacks between demands on the two sides of the market following the hypothetical monopolist raise in price.

98.   In addition, in a market characterised by a transaction between end users (e.g. in the payment card market), the SSNIP test should be implemented by raising the price level (i.e. the price of the transaction), allowing the monopolist to optimally adjust the price structure (i.e. the ratio between the prices paid for a given transaction by the two sides)[153].

99.   In a market without a transaction among end users (e.g. in a media market), it should instead be implemented by raising first the price on one side of the market then the price on the other side of the market, each time allowing the hypothetical monopolist to optimally adjust the price structure.[154] Only if the market were found to be characterized by a single externality, then the traditional SSNIP test and single-sided formulas for CLA and CEA could be applied to define the market on the side which does not exert an externality on the other.

100.   Note that whereas there is consensus in the literature on the fact that one should take into account changes in profits on both sides of the market and all feedbacks between demands on the two sides, it is by contrast subject to debate whether the hypothetical monopolist should be allowed to optimally adjust the price structure.[155] Yet, if one wants to follow the rationale behind the traditional SSNIP test, one should allow the hypothetical monopolist to adjust the price on the other side of the market when it increases price on a given side. The reason is that one wants to make sure that the relevant market is defined in such a way that a monopolist would find it profitable to exercise market

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[152]   See Werden (2002-III) for a discussion of the rationale of the HM test.

[153]   See Emch and Thomson (2006).

[154]   See Filistrucchi (2008) for more detailed discussions of the SSNIP test in two-sided markets.

[155]   See Emch & Thomson (2006) for the same view and Evans and Noel (2008) for a different view.

power and in fact a monopolist on the relevant market would exercise market power by changing both the price level and the price structure.

101.   As a result, if one were to perform a SSNIP test for two-sided markets (or use CLA and CEA formulas) which takes profits on both sides of the market into account but does not allow the price structure to be adjusted optimally, then the market would be defined too widely, as an adjustment will tend to reduce the loss in profits due to the increase in prices.

102.   Whether a relevant market defined too widely or too narrowly leads to the wrong decision about a merger would then depend on the decision itself.

103.   If a given merger is found not to raise competitive concerns in a market defined according to the single-sided formula, *a fortiori,* it would not be found to raise competitive concerns in the larger market defined according to the right two-sided formula.

104.   Similarly if a given merger is found to raise competitive concerns in a market defined according to a two-sided formula which does not allow the monopolist to adjust the price structure, *a fortiori,* it would be found to raise competitive concerns in the larger market defined according to the right two-sided formula.

105.   In the other cases, i.e. when a merger is blocked in a market which has been defined too narrowly or a merger is cleared in a market which has been defined too widely, a wrong market definition might indeed lead to the wrong decision.

9.5   Avoiding the Definition of the Relevant Market

This section discusses whether there is any particular reason to skip the definition of the relevant market in a merger case involving two-sided platforms.

106.   Any economic model used to analyze the merger, irrespective of the degree of competition, would need to start from a given set of competitors among which some decide to merge. Given the market definition and the pre-merger situation in the market, one is then able, under the assumption of the model, to make predictions on the post-merger market situation. Analyzing the effects of a merger would therefore require to have previously defined the set of competitors in the market, i.e. to have previously defined the relevant market.

107.   The definition of the relevant market may be a difficult exercise. This is true of a traditional market and, as shown above, it is all the more true when multi-sided platforms are involved.

108.   In practice an option might be, as in a single-sided market, to skip the definition of the relevant market and proceed directly to the assessment of the merger effects.[156]

109.   Certainly, this is possible but, as in a single-sided market the risk is that, not having defined the set of competitors, one is not able to properly specify what the extent of the competitive constraint faced by the merged firm would be, i.e. indeed one would not be able to correctly discuss whether the merged firm is likely to increase prices post-merger.

110.   The reason is that a firm's ability to raise the prices post merger depends, amongst other things on the availability of competing products to those of the merged firms and on the reaction of the rivals

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[156]   See Farrell & Shapiro (2008).

to price increase. Likewise, whether the merged firm and all or some of the rivals are more likely to collude after the merger depends on who the rivals are and what their incentives are.

111.   However, one can argue that, once the relevant elasticities among candidate products have been correctly estimated, instead of performing a SSNIP test to define the relevant market, one could use these elasticities to perform a merger simulation taking into account all candidate competing products rather than only those which would constitute a relevant market.

112.   Similarly elasticities can be used to perform a merger simulation in a two-sided market. The market definition exercise and the merger simulation exercise are simply both more complex.. Consequentially, if one believes it is possible to skip the market definition exercise when analyzing a merger in a traditional market, then the definition of the relevant market might as well be skipped when assessing a merger in a two-sided market.

113.   In any case, although the current proposal to review the US merger guidelines moves in that direction[157], market definition still remains a fundamental step in merger assessment in the EU.

10   TWO-SIDEDNESS AND MERGER EVALUATION

This section discusses how the two-sided nature of the market should affect the evaluation of mergers in two-sided markets.

114.   The main rationale of merger control is to assess the horizontal effects and vertical effects of a merger.

115.   Horizontal effects refer to whether a proposed merger is likely to increase market power, i.e. whether the proposed merger is likely to lead to higher prices (or lower quality) in the market. Vertical effects relate to whether the merger is likely to lead to foreclosure of competitors by the merged firm.

116.   Horizontal effects arise to the extent that the merging firms are active at the same level of the production process (i.e. produce substitute products) whereas vertical effects arise when the merging firms are active at different stages of the production chain (i.e. when one of them produces an input which is used by the other in its production).

117.   The next sections explain why a competition authority should take into account both sides of the market when assessing the effects of a merger (Section 4.1), how the two-sided nature of the market should be taken into account in discussing the horizontal effects (Section 4.2) and the vertical effects of a merger (Section 4.3).

10.1   Considering All Sides of the Market

This section explains why a competition authority should take into account all sides of the merger when assessing its effects.

118.   Even more than in the case of the market definition it appears fundamental, in the assessment of a merger among two-sided platforms, to consider the impact of the merger on both sides of the market.

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[157]   See the joint FTC/Department of Justice proposal for revised Horizontal Merger Guidelines released on April 20, 2010, available at http://www.ftc.gov/os/2010/04/100420hmg.pdf.

119.   Indeed, by failing to consider both sides and the indirect network effects that link them, a competition authority basically ignores the functioning of a two-sided market and risks taking decisions based on an inappropriate model of the market.

120.   This may result in decisions that do not properly assess the impact of the merger on prices (or quality) and therefore on welfare in general as well as consumer welfare in particular. It might also result in a decision that does not correctly assess the incentives of the merged firms to foreclose competitors.

121.   Only in two-sided non-transaction markets one can separately identify and discuss the merger effects on the side of the market which does not exert an externality on the other one. Yet, in order to assess the overall merger effects along with the effects on the other side, considering all sides of the market is again necessary.

122.   In the next sections, we will discuss how the two-sided nature of the market affects the incentives of the merged firms to raise prices unilaterally, to collude with its rivals and to foreclose a competitor. We will also analyze how two-sidedness changes the way in which a price increase affects consumers' welfare.

10.2   Market power in a two-sided market

This section discusses the concept of market power in a two-sided market.

123.   Given that a two-sided platform in general sets two distinct prices, the issue arises of what exactly market power is in a two-sided market.

124.   In a traditional market, market power is either defined as the ability to raise price above marginal costs[158] (then most firms have some market power and competition policy should only be concerned about substantial market power) or as the ability to raise price above the appropriate competitive level[159] (then competition policy can be concerned with any level of market power).

125.   Irrespective of the chosen definition, in a two-sided market, the issue arises of whether market power is the ability to raise the price on one side or the ability to raise the price on both sides.

126.   As already mentioned, in a two-sided market one can distinguish a price level from a price structure. According to economic models, a merged firm might raise both prices or raise one price only whilst maybe lowering the other price. In any event, absent efficiency gains a merged firm will in general[160] tend to increase the price level.

127.   Market power should then be defined either as the ability to raise the price level above the competitive level or the ability to raise the price level above the overall marginal cost.

128.   The price level and the overall marginal costs are simpler to define in a transaction market as they are then the sum of the prices paid to the platform by the two parties for a transaction and the marginal cost is the one born by the platform for the transaction. In two-sided markets where a

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[158]   See Motta (2004).

[159]   See Bishop and Walker (1999).

[160]   See Chandra and Collard-Wexler (2009) for a model (and an empirical validation in the case of Canadian newspaper mergers) where neither of the two prices increases after the merger. They also claim that in their model both the readers' and the advertiser price can decrease. However, it must be noted that their model is specific to a competitive bottleneck situation and that their result refers to the per reader advertising tariff.

transaction is not present, the price level and the overall marginal costs can instead be defined respectively as the sum of the two prices and the sum of the two marginal costs per unit of quantity on one side. In the case of a newspaper market, the price level is the sum of the cover price and the per copy revenues from advertising (or the sum of the advertising price and the per ad revenues from sales to readers). Similarly the overall marginal cost is the sum of the marginal cost of a newspaper's copy and the per copy marginal cost of advertising (or the sum of the marginal cost of advertising and the per ad marginal cost of a newspaper's copy).

129.   Indeed, what indicates market power is not the price cost margins on each side but the overall price cost margin across the two sides. This is the difference between the price level and the overall marginal cost we just defined.

10.3   Consumer welfare in a two-sided market

This section discusses the concept of consumer welfare in a two-sided market.

130.   In general, in a two-sided market there are by definition two groups of customers of the platform. There are therefore two consumers' welfares. The question is then whether an antitrust authority should give the same weight to both of them, i.e. whether it should consider only overall consumer welfare defined as the sum of the two or whether it should favour the welfare of one of the two sides over the other.

131.   Whereas in a heterosexual dating club we would not expect someone to claim that the welfare of one side should be viewed more favourably than the welfare of the other side, in other non-transaction markets we might expect the issue to be raised.

132.   For example, in a media market, one might wonder whether readers' surplus should be given priority over advertisers surplus. After all, advertisers are usually firms and it is found that competition authorities in many jurisdictions have adopted a consumer welfare standard.

133.   Although advertisers are indeed firms, they are however not the producers in the platform market under consideration. Indeed, the producers are the newspaper publishers. Advertisers are producers in their respective product markets. One should not make the mistake of considering advertisers' welfare as if it were producers' surplus in a single-sided market.

134.   If one really wanted to take into account the fact that advertisers are firms and consider only final consumers' surplus, then one would need to consider to what extent the prices in the media market affect consumers' welfare in the market for the product advertisers produce. In fact this might turn out to be too difficult, since it would involve considering a huge number of product markets (all those whose firms may advertise on the media)

135.   The most interesting case in this regard is however the one of a two sided market characterized by a transaction between end users, such as the auction houses or the payment cards markets.

136.   In such a case, only one of the two sides is a consumer in the market for the good which is the object of the transaction. For instance, it is the cardholder who is buying a good from the shop which has adopted a point-of-sale terminal.

137.   The crucial point is then whether this should matter or not for the definition of who the consumers are, e.g. in a merger between auction houses or payment cards companies.

138.   The question is somewhat similar, though not identical, to the question of whether a consumer welfare or a total welfare standard should be preferred.

139.   Different competition and regulatory authorities have taken different stances on this. We do not wish to give a normative answer to the question, but we do stress that the question should be posed in the proper way.

10.4   Horizontal Effects

This section explains which features of a two-sided market should play a role in the assessment of the horizontal effects of mergers in two-sided markets.

140.   Competition authorities are, as a rule, required to assess whether a horizontal merger is likely to raise concerns with respect to unilateral or non-coordinated effects (i.e. whether the merger might increase the market power of the merging firms) and with respect to coordinated or collusive effects (i.e. whether the merger might make it more likely that collusion takes place in the market).

141.   In order to assess these, a competition authority takes into account any factor that makes an increase in market power more or less likely, or that facilitate collusion. Among the factors which increase market power and which also facilitate collusion is the presence of entry barriers.

142.   The next sections discuss non-coordinated (or unilateral) effects (Section 4.2.1), coordinated (or pro-collusive) effects (Section 4.2.2) and barriers to entry (Section 4.2.3).

10.4.1   *Non-coordinated effects*

This section discusses the impact of the two-sided nature of the market on the ability of firms to raise prices and on the efficiency losses due to higher prices.

143.   Like all markets characterized by network effects, two-sided markets tend to be rather concentrated. This is due to the fact that the network, and more precisely its size, is valuable to consumers. In this respect in a market characterized by positive network effects, it is not necessarily the case that a higher concentration will be detrimental to consumer welfare. On the one hand higher concentration is likely to lead, in the absence of efficiency gains, to a higher price; on the other hand it is also likely to correspond to a higher utility derived from the good and a higher willingness to pay for the good. As consumer welfare is usually conceived as dependent on the difference between the willingness to pay of consumers and the price they pay, an increase or decrease will depend on whether the price increases more than the willingness to pay or *vice versa*.

144.   In a two-sided market the issue is more complex than in a market with only a direct network effect due to the presence of (often) two indirect network externalities that link two distinct demands and that need not necessarily both be positive.

145.   The questions arise whether the two-sided nature of the market increases the ability of merging firms to raise prices after the merger and, in an economic approach to competition policy, whether a higher price necessarily leads to a higher loss in consumer welfare and in turn higher allocative inefficiency.

146.   We now discuss how indirect network effects should be perceived to affect market power (Section 4.2.1.1), why a higher price on one side might increase consumers' surplus on the other side (4.2.1.1) and why, even if the price increases on one side after a merger, consumer surplus on that

side might increase due to the indirect network effect (Section 4.2.1.3). We then discuss what the role of competitive bottle-necks should be (Section 4.2.1.4). Last, we explain whether and how competition authorities should take the two-sided nature of the market into account when attempting to predict the unilateral effects of a merger (4.2.1.5).

10.4.1.1   Impact of Externalities on Market Power

This section discusses how indirect network effects are likely to affect the market power of the merged firms.

147.   In a two-sided market a merged firm will tend to raise the price level but is also likely to change the price structure. Indeed, as discussed in the survey of the literature, economic theory defines a two-sided market as one where not only the price level but also the price structure matters for the profits of the firm.

148.   What's more, according to economic theory, it is not only the price level but also the price structure that determines consumer welfare and more generally total welfare.

149.   The survey of the literature shows that more concentration in general leads to a less efficient price level, but not necessarily a less efficient price structure.

150.   As a result, it is not clear whether higher concentration and more market power lead to a welfare loss, not even for consumers.

151.   The next two sessions provide a more in depth discussion on why consumer welfare might increase even if the price level increases.

10.4.1.2   Higher consumer welfare from a higher price

This section discusses how a higher price on one side might lead to higher consumer surplus on the other side.

152.   Some two sided markets are characterized by one positive and one negative indirect network effect. It is probably the case of the TV market, in that viewers are likely to be annoyed by advertising.

153.   In such a case, an increase in the price of advertising following a merger, will likely decrease the quantity of advertising on TV and in turn increase viewers' welfare. In fact, whether the quantity of advertising indeed decreases following the merger will depend on the extent to which viewers dislike advertising, as the original decline in advertising will trigger an increase in the number of viewers which in turn will lead to a positive effect on advertisers' demand and so on. Yet the possibility that viewers welfare increases as advertising price increases exists. In an occurrence such as this however, advertisers' surplus is likely to decrease.

154.   As discussed above, to what extent, if at all, a competition authority should be interested in viewers welfare as opposed to advertisers' welfare is a matter of choice similar to the choice between a consumers' welfare versus a total welfare standard and might depend on the reasons why a competition authority prefers one over the other.

155.   Nevertheless, one should not make the mistake of considering advertisers' welfare as if it were producers' surplus in a single-sided market, both because advertisers are also customers of the platform and because viewers do not (want to) buy advertising from advertisers, so that there is no

transaction between customers of the platform. One cannot therefore simply say that advertisers are firms and therefore producers.

10.4.1.3   *Efficiencies resulting from a larger network*

This section discusses when and how a merger between two-platforms may increase consumer welfare even if consumers pay a higher price.

156.   As we have seen, the presence of a positive indirect network effect lowers the profitability of any price increase with respect to a single-sided market. So that to that extent a merger in a two-sided market would tend to raise market power less than in a single-sided market.

157.   However a merged firm in as much as it manages to pool customers on a unique platform will exploit the indirect network externality more; it will thus offer a more valuable product to its customers and will to that extent be allowed to increase prices.

158.   So that, if two publishers of phone directories merge and decide to offer one phone directory only and do not to loose users by doing so, then a more valuable phone directory will be offered to advertisers and a higher price can be charged.

159.   Unless the increase in price due to the lower number of competitors and the higher network effect due to the pooling is so high that it offsets this higher benefit from the network effect, the welfare of advertisers is going to rise.

160.   Indeed whether customers can be pooled or not is crucial. If two firms merge but still produce two distinct products, the customers are not necessarily going to enjoy a higher utility due to the indirect network effects.

161.   For instance, in a TV market, if two channels are joined under the same ownership, it is not the case that by placing an ad on one of them an advertiser will be able to reach more potential consumers than he would have been able to reach with the same ad on the same channel before the merger.

162.   In such a situation, in the absence of efficiency gains, a merger in a two-sided market might still lead to an increase in prices though less than in a single-sided market.

163.   All in all, a gain in allocative efficiency on side A is therefore more likely to arise when customers on side B can be pooled so that they can be reached together and the platform offers only one product after the merger to side A..

164.   Yet, whenever product variety on the pooled side is valued by consumers, there might be an efficiency loss on that side due to the reduction in the number of products. In the TV example, if the two TV channels were broadcasting different programs and one of them stopped broadcasting, or if two newspapers had different political positions and one of them stopped being published, readers/viewers welfare might indeed be reduced.

165.   To this regard one should therefore assess whether the merger is likely to lead to the disappearance of one of the two products, to what extent the merging products were horizontally differentiated before the merger and to what extent consumers cared about the differentiation.

166.   Although when one of the merging products stops being produced and the loss in variety is clear, the effect might be negligible. For instance, having only one phone directory might not imply a big loss in variety for users.

167.   To sum up, on the one hand offering only one product might tend to increase allocative efficiency, on the other hand, the loss in variety might tend to lower it

168.   Which effect prevails might depend on the market under consideration. Whereas the loss in variety from having only one type of card might be low (e.g. think of every MasterCard card becoming a Visa card), having only one operating system might have a higher negative impact on one set of computers (e.g. think of Apple users being forced to use Windows).

169.   Even when product variety is so important that offering only one product would decrease consumers' welfare, a merger might still turn out to be beneficial to consumers due to the presence of the indirect network effects. This might be the case if the merged firm decided to offer its products as a bundle.

170.   In the example above, the owner of the two TV channels could bundle advertising on the two channels. Indeed, in case pure bundling[161] is adopted, advertisers would be able to reach more people with the same ad.

171.   If they had already been advertising on both channels, they could be asked to pay a higher price only to the extent that competition has declined. If instead they had been advertising on one channel only, on the one hand they will enjoy the benefit of reaching more viewers, whilst on the other hand they could be asked to pay a higher price, both because of the decline in competitive pressure from rivals as well as the higher value of the product.

172.   Once again, which of the two effects prevails in the latter case is going to determine whether the welfare of advertisers increases or decreases following the merger.

173.   A merged firm in a two-sided market might therefore choose to bundle on at least one side the products previously sold separately.

174.   Interestingly, for bundling to be profitable for the platform (and therefore adopted), it must be the case that buyers on the side where the product is bundled have heterogeneous preferences over the bundled products. This might be the case when the potential buyers of the bundle differ in their valuation of the customers on the other side.

175.   In the TV example it would be the case if advertisers were heterogeneous in their valuation of the different sets of viewers of the two TV channels. A necessary condition is therefore that the two TV channels are differentiated horizontally in the eyes of viewers, i.e. that they offer different types of shows, and that viewers have different tastes with respect to shows[162].

176.   Last but not least, one should note that, even when present, the efficiency resulting from a larger network is not exactly equivalent to an efficiency gain. The reason is that it does not counterbalance

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[161]   Pure bundling takes place when a firm sells two products only as a bundle, mixed bundling instead when the firm sells both products together and at least one of them also alone.

[162]   See Leonello (2010) for a model with differentiated products on both sides, where a merger leading to bundling of the products on both sides can be welfare enhancing. The model is summarized in Chapter 1 Section 2.6.

the tendency of the merged firm to increase prices, thus leading to a lower price. On the contrary, it tends to offset the negative effect of the price increase on consumer welfare.

10.4.1.4   *The role of competitive bottlenecks*

This section discusses how the existence of so-called "competitive bottlenecks" influences the unilateral effects expected from a merger.

177.   In the economic literature, "competitive bottlenecks" refer to situations where multi-homing is prevailing on one side of the platform and single-homing on the other.[163] The consequence of such model is that each platform acts as a kind of gateway which controls access to a certain number of single-homing customers.

178.   For instance, consider a newspaper market in which advertisers advertise in all newspapers (i.e. multi-home), while readers are single-home (i.e. buy only one newspaper). Then each newspaper enjoys monopoly power on access to its readers.

179.   The question then arises of whether and to what extent the existence of these "competitive bottlenecks" influences the unilateral effects expected from a merger.

180.   The monopoly power enjoyed on the single-homers allows competitive bottlenecks to extract rents from multi-homing customers. In the example above, newspapers can therefore charge high prices to advertisers.

181.   With respect to the multi-homing side, it is argued in the economic literature that a merger between two competitive bottlenecks is unlikely to greatly affect prices on that side.[164] This is because there is little platform competition to attract multi-homing customers and there will not be much loss of competition after the merger. In the example above, a merger between newspapers is not likely to lead to a substantial increase in the price charged to advertisers.

182.   Although this claim appears to be correct, one has to be cautious not to conclude too quickly that in practice the merger will have no impact on the multi-homing side.

183.   First, multi-homing should be considered as endogenous, not exogenous, i.e. multi-homing is the outcome of a choice of consumers. As the price charged for an ad increases advertisers might switch from multi-homing to single-homing when the benefit of reaching the additional readers falls below the price charged to them. Then the effect of the merger will depend on where the switching point is.

184.   Second, there is often a certain degree of heterogeneity in how much different customers value a given set of customers on the other side of the market. For instance, one firm that advertises in newspapers might value female readers more than male readers while for another advertiser the opposite might be true. So that, a sport newspaper, which is likely to enjoy a higher share of male readers, is more valuable to some advertisers and less to others.

185.   As a result, in reality, a platform might only have some degree of monopoly power in relation to multi-homing customers that need to reach the single-homing customers, as it is not necessarily the

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[163]   See Armstrong (2006), "Competition in Two-Sided Markets", *Rand Journal of Economics*, 37 (3), pp.668-691.

[164]   Durand, "Two-sided markets: Yin and Yang – A Review of recent UK mergers", Concurrences, N°2-2008, p.3-4.

case that the multi-homers multi-home on exactly all platforms. For instance an advertiser might want to advertise in more than one newspaper but not necessarily in all of them.

186.   Also, to the extent that customers on one side are heterogeneous with respect to their valuation of the customers on the other side, it might be the case that, in the absence of the possibility to discriminate in prices, a platform is not able to extract all rents. For instance, a newspaper might not be able to extract all rents from advertisers without price discriminating among them as different advertisers might value different sets of readers differently.

187.   In addition, as a result of heterogeneity, multi-homing and single-homing often coexist on both sides. The more the actual subscription pattern differs from the competitive bottleneck model (full multi-homing on one side and full single-homing on the other side), the less the competitive bottleneck model explained above is relevant.

188.   When two competitive bottlenecks merge, the share of single-homing customers whose access is controlled by the merged entity increases significantly, with the consequence that the merged entity's bargaining power in relation to multi-homing customers is strengthened. In the example above, as the merged newspapers control access to more readers, it is more likely that advertisers need to advertise on one of them and, if the newspaper sells advertising space on both of them jointly, the merged newspapers will be able to extract more rent from advertisers.

189.   This is due to the presence of an indirect network effect, such that a higher number of customers on one side increase the willingness to pay on the other side. In our example, all depends on advertisers caring about the number of readers of the newspaper on which they place an ad.

190.   With regards to the single-homing side, the capacity of the merged entity to increase prices post-merger depends on the elasticity of the single-homing side's demand and on competition between platforms, as in a traditional one-sided industry. In addition, it also depends on the indirect network effects between the single-homing and multi-homing sides, which is specific to two-sided industries.

191.   Finally, if the merged platform raises prices on the single-homing side, there will be lower sales on that side of the market and therefore an effect on the multi-homing side of the market, which in turn might feed back into the singe-homing side of the market and so forth. If the single-homing side exerts a positive effect on the other side, then lower sales on the single-homing side will tend to lower sales and/or lower prices on the multi-homing side of the market. For instance, if a merged newspaper charges a higher price, it is likely to lose some readers and therefore lose advertising. As advertising declines, depending on whether readers like or dislike advertising, there might be respectively an additional loss or a partial regain in readers, *et cetera*.

192.   To conclude, the competitive bottleneck model appears to be a useful benchmark for an analysis in practice, but is not likely to perfectly match the actual situation in a real market. Conclusions drawn from such a model should be discussed in light of actual characteristics of the market under consideration and might help to shed light on the forces at play in determining the unilateral effects of a merger.

10.4.1.5   *Merger simulation in general*

This section discusses whether and how one should perform merger simulation in a traditional market. It also explains why using Critical Elasticity Analysis and Critical Loss Analysis to assess the unilateral effects of a merger is not fully correct.

193.   From the point of view of economics, the correct way to evaluate whether a merger is likely to lead to higher prices would be to specify a model of the market in question, estimate demand in order to recover values for the parameters of the model and then use the models and the estimated parameters to predict the price chosen by the firms after the merger. One can then compare the prices, consumer surplus and/or total welfare in the new equilibrium with those in the old equilibrium. It is quite rigorous in that, if correctly undertaken, it requires the specification of all the assumptions underlying the model, all the limitations of the data and therefore the evaluation of the robustness of the results[165]. It can often be very time consuming. As a result, in practice it is often not performed.

194.   In fact, it is often the case that the CLA and CEA formulas are also used to predict the effect of a merger, although they are used in a slightly different way than in the definition of the relevant market.

195.   In merger evaluation, the formulas are not used, as in market definition, to set an (implicit) benchmark on when substitution across products is enough to consider that they are in the same relevant market, but instead to measure the likelihood of a substantial non transitory increase in price by the merging parties.

196.   Instead of simulating as in market definition, *a given price increase* by a hypothetical monopolist above the current (competitive) level, practitioners simulate a given price increase above the current level[166] by the merging parties, assuming rivals do not change their prices and checks whether that price increase is profitable or not.

197.   The one just described above is the test in the EU. In the US[167] the formulas are often used to calculate *the optimal price increase* above the current level by the merging parties keeping rivals' prices constant. As with market definition, the difference between the SSNIP and the HM test appears to be very small at first sight and it is a matter of debate whether this difference is in practice relevant or not. Again, in practice, both in the EU and in the US, the formulas for Critical Loss Analysis (CLA) or Critical Elasticity Analysis (CEA) assume constant marginal costs and either linear or iso-elastic demand.

198.   From the point of view of economic theory, however, using the SSNIP test for the assessment of the unilateral effects of the merger is at best an approximation. At worst it might lead to substantial mistakes. Whereas in market definition the assumption that rivals do not change their price can be rationalised as trying to avoid supply substitutability when assessing demand substitutability, in merger assessment it is harder to defend why one should look at an unrealistic post-merger situation where rivals' are assumed not to adjust their prices to a price increase.

199.   Indeed, the more appropriate test would require to simulate whether a given price raise would be profitable allowing rivals' to optimally adjust their prices in response to the price increase of the merged parties or, even better, as argued above, to simulate whether it would be profit maximizing to raise the price substantially above the current level for the merged parties when the rivals are also choosing their profit maximizing prices. In practice, the latter would require the simulation of the new market equilibrium. Simulating the new market equilibrium requires an economic model tailored to the market taken into consideration and therefore time.

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[165]   Results are said to be robust when they are not sensitive to the assumptions made, particularly to those which are perceived to be weaker.

[166]   Note that in merger assessment whether the starting price is the competitive one or not is irrelevant, as one is interested in establishing whether the merger will lead to a substantial lessening o competition with respect to the current situation.

[167]   See Werden (2002-I,2002-II) for an in depth discussion of the EU test versus the US one.

10.4.1.6   Merger simulation in a two-sided market

This section discusses whether and how one should perform merger simulation in a two-sided market. It also explains to which extent and how one could use Critical Loss Analysis and Critical Elasticity Analysis to assess the unilateral effects of a merger.

200.   Also in a two-sided market, from an economic point of view, the correct way to evaluate the price effects of a merger would be to specify a model of the market in question, estimate demand in order to recover values for the parameters of the model and then use the models and the estimated parameters to predict the price chosen by the firms after the merger.

201.   Such a full simulation approach in a two-sided market is even more complex and time consuming than in a traditional market. The reason is that in order to recover the parameters one needs to estimate two demands, collect more data, find more instruments and in order to calculate the new market equilibrium, one needs to solve a more complex supply model

202.   To provide some guidance on the procedure, a full simulation of a hypothetical merger in the newspaper market is discussed in the document chapter four.

203.   As this exercise, albeit quite rigorous, can often be very time consuming, one might be even more tempted than in a traditional market to use the SSNIP approach to assess the likelihood of a price increase post-merger in a two-sided market. Similar issues arise for market definition, as one needs to decide which price the merged parties should be raising and whether to assess profitability by taking into account only profits on one side or on both sides of the market.

204.   Again, in a two-sided market, one should take into account both sides of the market in order to correctly assess the competitive constraints faced by the merged firm and therefore the profitability of a price increase. The formulas for CLA and CEA should be modified in order to account for the indirect network effects between the two-sides of the market which, as already discussed, affect the profitability of any given merger.

205.   Considering for instance a merger between two newspapers, even assuming readers are not affected by the quantity of advertising, it might be the case that raising the cover price will not lead to a substantial loss in demand for copies so that profits on the readers' side do not drop significantly, but still, depending on how much advertisers care about the number of readers, the small loss in circulation may lead to a substantial loss in advertising demand and therefore in an overall loss in profits due to the rise in cover price.

206.   Even more, in an auction house market, it might be the case that raising the fee for buyers will not lead to a substantial loss in demand for auction participation from buyers so that profits made on the buyers' side will not drop, but still, depending on how much sellers value one more potential buyer, the small loss in the number of buyers may lead to a substantial loss in the number of sellers, which will lead to an additional loss in demand on the buyers side and so on and so forth. In the end there might be a substantial loss in overall profits (and maybe even in profits made on the buyers' side), such that the original rise in price by the merging parties would be unprofitable.

207.   Indeed, positive indirect network effects between the different sides of the platform reduce the profitability of any price increase. The risk of applying standard CLA and CEA formulas which do not account for feedback effects is that in such cases the merger will be found to be anticompetitive even if, according to the same standards used in a single-sided market, it should not.

208.   As discussed above, the goal of using the SSNIP test in merger analysis is to evaluate the unilateral effects of the merger. Subsequently, as in the case of market definition, in a two-sided market the test should take into account changes in profits and all feedbacks between demands on both sides of the market, following the hypothetical rise in price by the merged firm.

209.   In addition, in a transaction market (e.g. in the payment card market), it should be implemented by raising the price level (i.e. the price of the transaction). In a non-transaction market (e.g. in a media market), it should instead be implemented by first raising the price on one side of the market then the price on the other side of the market.[168]

210.   Whereas in the case of market definition, we argued that the test should have been conducted by allowing the monopolist to optimally adjust the price structure, on the contrary, in the assessment of the merger effects the issue is somewhat minor from a theoretical point of view. The reason is that in a two-sided market, the SSNIP test suffers from the same restrictive assumptions regarding rivals behaviour that we already highlighted for a single-sided market. Therefore, we see no reason to press for the merged firms to optimally adjust the price structure. As a result, one could perform a SSNIP test for two-sided markets as well (or use CLA and CEA formulas), which takes profits on both sides of the market into account but does not allow the price structure to be adjusted optimally.[169]

211.   From a practical point of view, if one does not allow the merged firm to optimally adjust the price structure, then the profitability of the rise in prices decreases, as any adjustment will tend to reduce the loss in profits due to the increase in prices, but not accounting for rivals reactions will in general tend to increase the profitability of the rise in prices. Which of the two effects prevails and therefore whether one is going to block a merger that should be cleared or to clear one that should be blocked will depend on the case considered and, in particular, on the degree of competition in the market versus the size of the indirect network effects.

10.4.2   *Coordinated effects*

This section discusses the impact of indirect network externalities on the likelihood of collusion post-merger.

212.   We have shown above that less competition might not necessarily be welfare detrimental. Nonetheless, cartels are undoubtedly illegal.

213.   Ideally, one would want to know whether the two-sided nature of the market makes it more or less likely that collusion takes place. One would expect indirect network effects to play a central role here.

214.   Unfortunately, as shown in the survey of the literature, theoretical work on, and therefore economists understanding of incentives to collude in two-sided markets is still scarce.

215.   The first economic articles on the topic would seem to suggest that the presence of indirect network effects makes collusion more difficult to sustain, but does not necessarily imply that collusion needs to take place on both sides of the market.

216.   Little is yet known about how factors traditionally believed to favour collusion interact with the presence of indirect network externalities.

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[168]   See Filistrucchi (2008) for more detailed discussions of the SSNIP test in two-sided markets.
[169]   See Evans and Noel (2007) for such formulas.

217.   It is therefore hard to provide any specific suggestions with regard to the assessment of non-coordinated effects in mergers among two-sided platforms.

10.4.3   *The chicken-and-egg problem as a barrier to entry*

This section discusses how the so-called chicken-and-egg problem can be seen as a barrier to entry in a two-sided market

218.   The so called chicken-and-egg problem results from the fact that a multi-sided platform has to simultaneously convince all sides to "get on board" the platform because no customers on either side will join the platform unless customers from the other side also join.

219.   In fact, this chicken-and-egg problem acts as a barrier to entry. [170] In order to enter on both sides of the market an entrant is forced to offer a very good deal to one of the two sides. Indeed, a typical entry strategy in a two-sided market involves giving the product away for free on one side in order to be able to sell the product on the other side.

220.   As a result an entrant not only potentially bears the fixed costs of entry on each side of the market but also the additional costs due to giving the product away for free to one side. Depending on the level of competition on the market where it plans to sell the product and on how much the paying side cares about the non paying one, these additional costs might be in part recouped by charging a high price on the paying side of the market. The more competition the firm faces on the paying side and the less that side values the non-paying one, the higher *ceteris paribus* the additional entry costs due to the two-sided nature of the market. Even if these additional entry costs were in fact zero, because the entrant were able to recoup all losses on one side from the other side, entry costs would still be higher due to summation of the fixed costs on the two-sides. Unless expected profitability is also higher, then entry in a two-sided market is more difficult than in a single-sided market.

221.   One could however argue that in a dynamic market the chicken-and-egg problem is somewhat mitigated. Indeed, whereas taking the two-sides as given, entry in a two-sided market is probably more difficult, if one allows for the existence of a third side (even as an alternative to tone of the previous ones), then entry on one side of the market .is easier than in one sided markets. The reason is that, if the entrant enjoys a product innovation and a first mover advantage, or a patent on the third side, it can more aggressively price on the side among the original ones where it aims to enter.[171]

222.   As this argument relies on the possibility for a firm to enter a two-sided market on only one side of a two-sided market, once again a distinction between a transaction market and a non-transaction market must be made. Indeed, as the concept of entering on only one side of a transaction market makes no sense, then entry can be easier in dynamic markets only if the market to be entered is a transaction market.

223.   All in all, one could then probably conclude that, whereas entry in a two-sided transaction market is made more difficult by the chicken-and-egg problem, entry in a two-sided non–transaction market

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[170]   See Hesse (2007).

[171]   Note that this is the case also when a two-sided platform tries to enter a one-sided market. This is a result first mentioned by Parker and Van Alstyne (2005). In fact, it would suggest that there could be a tendency for platforms as a business model to expand as much as possible.

might be easier in the presence of innovations that create additional or alternative sides of the market.

10.5 Non-Horizontal Effects

This section discusses whether a competition authority should take into account the two-sided nature of the market when assessing its vertical effects.

224. When assessing vertical mergers, antitrust authorities are also required to assess whether the merger is likely to raise concerns with respect to vertical foreclosure. The issue is then whether indirect network effects enhance the impact and therefore raise the incentives of foreclosure strategies.

225. Unfortunately, theoretical work on, and therefore economists understanding of incentives to foreclose in two-sided markets is in practice non-existent.

226. In fact, the issue has been raised in the Google-DoubleClick merger, when analysed by DG-Competition, as shown in the review of cases. However, no theoretical paper appears to have dealt with it yet.

227. Little is yet known about how factors traditionally believed to favour foreclosure interact with the presence of indirect network externalities.

228. It is therefore hard to provide any specific suggestions with regard to the assessment of non-coordinated effects in mergers among two-sided platforms.

11 CONCLUSIONS

This section summarizes our suggestions on the assessment of mergers in two-sided markets.

229. The assessment of a merger in a two-sided market should start from the assessment of the two-sided nature of the market. The objective is to identify whether there are indirect network externalities and at least their sign. This can be done using one of the qualitative approaches discussed above.

230. In most cases however, knowing that one or more network effects exist as well their sign would not be enough to derive conclusions on the effects of the merger. In this case a quantitative approach which allows the measurement of the size of these externalities is crucial. Such an approach should also allow the measurement of the price elasticities on each side of the market.

231. Once the two-sided nature of the market has been established, the indirect network effects at play identified and their sign is known, the next step should be the definition of the relevant market.

232. In some cases using the single-sided formulas for Critical Loss Analysis or Critical Elasticity Analysis might be enough, as one can define a market which is known to be too narrow and if concern arises, then one knows that *a fortiori* it would not arise in the correct larger market.

233. In most cases however the formulas of CLA and CEA should be modified in order to take into account the two-sided nature of the market. Although these formulas are more complex and the information requirement to implement them are higher than in the single-sided case, they exist and

can be implemented easily with any computer. However, it is then crucial to have measured the size of the indirect network effects in addition to the size of the price elasticities and the mark-ups or profit margins on each side of the market.

234.   In any case, at the market definition stage, one needs to proceed differently depending on whether the market is a two-sided transaction market or a two-sided non-transaction market, i.e. depending on whether there is a transaction between end users.

235.   In a transaction market, a single market needs to be defined. Subsequently, any product in the relevant market necessarily competes with the products of the merging platforms on both sides of the market.

236.   In a non-transaction market, two separate but interrelated markets need to be defined. As a consequence, one should consider that a product may be competing with those of the merging firms on one side of the market but not on the other.

237.   Irrespective of whether one needs to define a single market or two interrelated markets, one should take into accounts both sides of the market in order to correctly identify the competitive constraints faced by firms.

238.   Unfortunately, given the state of the art in economic analysis, not much guidance can be provided on the assessment of coordinated effects of mergers involving two-sided platforms. More suggestions can instead be made with regard to the assessment of unilateral effects of such mergers.

239.   When assessing horizontal merger effects, one should first realize that in such a market there will be a producer surplus (that of the platforms) and two consumers surpluses (those of the two customer groups).

240.   It might often be the case that one of the two customer groups is in fact constituted by firms or, even more, that one of the two customer groups is constituted by firms selling to the customer group on the other side.

241.   An antitrust authority should therefore decide not only whether it wants to protect consumer welfare or total welfare, but, in case it chooses consumer welfare, whether it wants to protect overall consumers welfare or only the welfare of one of the two groups of customers (arguable the one of those customers buying the good).

242.   In any case, when simulating the horizontal effects of a merger, one should take into account both sides of the market. The sign and size of the indirect network effects is going to play a central role here.

243.   To this respect one should consider that, in general, a merger in a two-sided market is likely to lead to a higher price level but is also likely to change the price structure. As a result, consumers on one side might lose while consumers on the other side might gain.

244.   If the indirect network effects are strong enough, it might indeed be the case that the post-merger price on one side is going to be higher but that consumers on that side are better off.

245.   It is crucial to this regard to note that the resulting allocative efficiency does not have the same effect as the productive efficiency gains in traditional merger analysis. Whereas the latter

counterbalance the tendency of the merged firm to raise prices, the former counterbalances the negative effect on consumer and total welfare of an increase in prices.

246.   An increase in consumer welfare coupled with an increase in price is to some extent more likely if the firms produce a single product after the merger rather than simply coordinate their pricing decisions, at least in as much as product variety is valued little by consumers.

247.   From an economic point of view one would then wish to clear a merger which leads to higher concentration, higher prices and higher consumer welfare.

248.   From a legal point of view this might not be easy as such a merger might indeed seem to lead to less competition.

The EU merger regulation and the EU merger guidelines, although not written with two-sided markets in mind, would seem however to leave room to take these type of efficiency into account as indeed it might be considered that they "counteract the effects on competition, and in particular the potential harm to consumers",

249.

Chapter 4

An Empirical Analysis

of the Dutch Daily Newspaper Market,

with a Focus on Merger Assessment

by Dr. Lapo Filistrucchi, Dr. Tobias Klein,

Thomas Michielsen, M.Sc.

Table of contents

1   THE NEWSPAPER MARKET AS A TWO-SIDED MARKET

This chapter analyses the Dutch market for daily newspapers. The objective is to provide an example of how our suggestions for the assessment of concentrations should be implemented. First, we will take a quantitative econometric approach and measure the sign and size of the indirect network effects between the two-sides of the market and in particular whether and to what extent advertising affects the behaviour of readers. Then, we will use different combinations of parameter values to make predictions on the effects of a hypothetical merger in the Dutch daily newspaper market. Finally, some caveats with regard to the analysis will be discussed.

1.   A newspaper publisher typically operates in a two-sided market as it sells content to readers and advertising space to advertisers. The publisher knows that the number (and characteristics) of the readers influence the demand for advertising space while, conversely, the number (or concentration) of advertising on a newspaper might influence the demand from readers.

2.   Although one would expect demand for advertising slots in a newspaper to increase as the number of readers of that newspaper increases, it is not *a priori* clear whether readers of a newspaper value advertising positively or negatively or are indifferent towards it. Yet, the evidence on consumers' attitudes toward advertising is crucial for market definition, assessment of market power and merger evaluation of the two-sided newspaper market.

3.   We have seen that the policy conclusions drawn from theoretical models will not only depend on the absolute and relative size of all demand parameters, i.e. not only depend on the own- and cross-price elasticities of demand on both sides of the market, but also on the own- and cross-elasticities of demand on one side with respect to demand on the other side, a feature that is specific to two-sided markets. In the newspaper market these additional demand elasticities measure how advertisers' demand for slots in a newspaper reacts to an increase in the circulation of that newspaper and of other newspapers, in addition to how readers' demand for a newspaper depends on advertising (concentration) in that newspaper and in other newspapers.

4.   Moreover, empirical analyses show that there might be differences among different printed media in different countries[172]. For instance, although Argentesi and Filistrucchi (2007) find no effect of advertising on the number of readers of daily newspapers in Italy, Kaiser and Wright (2006) and Kaiser and Song (2009) find that advertising increases readers demand for magazines in Germany.

2   DEMAND ESTIMATION

Key inputs into the economic analysis are estimates of the responsiveness of readership demand with respect to newspaper prices and the percentage advertising and the responsiveness of advertising demand with respect to advertising prices and the number of readers of a newspaper. In this section, we discuss how demand and marginal costs can be estimated using market level data.

5.   There are many possibilities to model readership demand and the demand for advertising.[173] In this study, we are constrained to using market level data as micro data are not available. Market level data are available at the national and at the regional level, so an important question is whether we define the whole country as one market, or as a collection of many regional markets. This is an important question because the estimation procedure will relate market shares to newspaper

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[172]   See also Sonnac (2000).

[173]   A demand system relates demands for all goods to prices for all goods. See Ackerberg *et al* (2007) for a comprehensive introduction and an overview over the methods. See also; Anderson *et al* (1992) and Train (1993, 2003).

characteristics and prices, and if there are regional newspapers the market share will be big if the market is a particular region and small if it is the whole country. Again, we are constrained by data availability since circulation data for free newspapers are only available at the national level. We will therefore obtain our main results using national level data, but compare parts of them to results obtained using regional level data.

6.   A second less important question is whether a product (here a newspaper or one advertising spot) is seen as a bundle of characteristics, or not. This is an important question in a conceptual and less so in a practical sense. In particular, seeing a product as a bundle of characteristics is not restrictive *per se*, as long as we observe enough characteristics, or characteristics do not change too much over time once we allow for newspaper fixed effects. Here, we will follow this approach because it will allow us to reduce the dimensionality of the estimation problem.[174] In particular, we closely follow Berry (1994) and specify a multinomial logit model on the individual level and then estimate the unknown parameters from market level data. This approach is standard. We nevertheless present it here and point out, in the present context, whether the assumptions we have to make are strong or not.

11.1   Readership demand

This sub-section introduces a model of readers' demand for daily newspapers and discusses the underlying assumptions.

7.   Each consumer buys at most one newspaper. The utility from buying a newspaper depends, among other things, on the price of that newspaper and the percentage advertising in that newspaper. Formally, the utility of consumer i from buying newspaper j in t is given by[175]

$$u_{ijt}^n = \alpha p_{jt}^n + \beta q_{jt}^a + \xi_{jt}^n + \varepsilon_{ijt}^n.$$

8.   Throughout, the superscript "n" stands for "newspaper" (as in utility derived by readers of that newspaper or price of that newspaper) and the superscript "a" stands for "advertisement" (as in utility of placing a particular advertisement or the price of an advertisement). In the above utility function, $\alpha p_{jt}^n + \beta q_{jt}^a$ is the part of the utility that stems from the two observed characteristics price, p_{jt}^n, and advertising, q_{jt}^a. ξ_{jt}^n is the part of the utility that stems from unobserved characteristics, and finally ε_{ijt}^n is the part of the utility derived from buying newspaper j that is specific to individual i at time t. Assume that ε_{ijt}^n is distributed according to the type I extreme value distribution independently across j and t and introduce the outside good j = 0, buying no newspaper, that yields average utility 0, i.e. $u_{i0t}^n = \varepsilon_{0t}$.

9.   To determine the market shares we need to define the market size, which we will denote by M^n. In our case, the market size for readership demand is the population, implicitly assuming that every individual buys at most one newspaper.

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[174]   Otherwise, if there are J newspapers we would have to regress demand for each newspaper on J prices. This is typically not a successful strategy when J is big, as it is here with J = 20.

[175]   Sometimes, utility is stated as depending on a choice-specific constant. Here, the mean of ξ_{jt}^n over time, later denoted as α_j^n, serves the same purpose.

10. Define the vectors p_t^n, q_t^a and ξ_t^n, which contain the prices, amounts of advertising, and unobserved characteristics of all newspapers, respectively. We assume that consumers buy the one newspaper, or none, that yields the highest utility. Then, we have that

$$\Pr(n = j | p_t^n, q_t^a, \xi_t^n) = \frac{\exp\left(\alpha p_{jt}^n + \beta q_{jt}^a + \xi_{jt}^n\right)}{1 + \sum_{l=1}^{J} \exp\left(\alpha p_{lt}^n + \beta q_{lt}^a + \xi_{lt}^n\right)}.$$

11. This is the probability that newspaper j is chosen. It depends on the observed and unobserved characteristics of all newspapers in period t. Likewise, for the outside good we have

$$\Pr(n = 0 | p_t^n, q_t^a, \xi_t^n) = \frac{1}{1 + \sum_{l=1}^{J} \exp\left(\alpha p_{lt}^n + \beta q_{lt}^a + \xi_{lt}^n\right)}.$$

12. Notice that all of the above is still formulated on the individual level. However, the probability to buy newspaper j at time t is the same for all consumers, and is equal to the observed market share of that product, which we will denote by s_{jt}^n.[176] The market share for the outside good is denoted by s_{0t}^n. A well-known result that is commonly associated with Berry (1994), the so-called "Berry-inversion", is that

$$\ln\left(s_{jt}^n\right) - \ln(s_{0t}^n) = \alpha p_{jt}^n + \beta q_{jt}^a + \xi_{jt}^n,$$

i.e., the difference between the natural logarithm of the market share of good j and the natural logarithm of the market share of the outside good is equal to the utility from observed characteristics p_{jt}^n, q_{jt}^a, and the unobserved characteristic ξ_{jt}^n. Importantly, the left hand side of this equation is observed because s_j and s_0 are observed. In practice, we often face the problem that some of the aggregate demand data or some of the explanatory variables are not available for all newspapers. The estimation sample will in such case not contain observations for all newspapers. This is also the case for our study. In order to make as much use as possible from the available data, it is advisable to calculate the market shares s_{jt}^n before dropping observations with missing information on observable newspaper characteristics because otherwise the log-difference on the left hand side of the estimation equation is wrongly measured.

13. If we now assume that the unobserved characteristics ξ_{jt}^n are uncorrelated with the observed characteristics p_{jt}^n and q_{jt}^a, then we can estimate α and β by regressing the so-called log-difference, $\ln\left(s_{jt}^n\right) - \ln(s_{0t}^n)$, on p_{jt}^n and q_{jt}^a. However, this ignores the issue that prices and advertising quantities are endogenous. This is because newspapers, which are highly valuable to consumers in the sense of having a high value of ξ_{jt}^n, are likely to set higher prices or increase the amount of advertising.

14. A common advice in this situation is to use instrumental variables. These instrumental variables need to be correlated with p_{jt}^n and q_{jt}^a, but uncorrelated with ξ_{jt}^n. Typically, other observed newspaper characteristics are available in the data, and are assumed to be uncorrelated with the utility from unobserved characteristics, ξ_{jt}^n. Under this assumption, they are included as additional regressors and functions of characteristics of other newspapers can be used as instruments, such as the average characteristics of other newspapers and the sum of characteristics of other newspapers (see, for instance Berry *et al.* 1995). The idea is that newspaper j's prices are set in light of the

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[176] It is the same for all consumers because we do not incorporate consumer characteristics, so in that sense this is a property of our model formulation. If we were incorporate them, then this probability would be the same for all consumers with the same characteristics.

characteristics of the other newspapers. However, it is not clear whether the no-correlation assumption is reasonable. On top of this, we lack information on newspaper characteristics in the present context.

15.   Another way to proceed is to assume that

$$\xi_{jt}^n = \alpha_j^n + \alpha_t^n.$$

16.   This means that there is a newspaper fixed effect α_j^n and a time fixed effect α_t^n. Under this assumption, we can estimate α and β by regressing $\ln(s_{jt}^n) - \ln(s_{0t}^n)$ on p_{jt}^n and a_{jt}^n once we use the within group estimator, where the observational unit is a newspaper, and additionally control for time fixed effects that are the same across all newspapers.[177] We can control for time fixed effects by including a full set of time dummies as additional regressors. This is a suitable procedure to control for endogeneity of prices if the endogeneity arises due to unobserved differences across newspapers that stay the same over time. This assumption is arguably plausible as no newspaper has fundamentally changed its content over time.

17.   Now, having obtained estimates of α and β, using the observed market shares, we can calculate the responsiveness of readership demand with respect to own prices,

$$\frac{\partial s_{jt}^n}{\partial p_{jt}^n} = s_{jt}^n(1 - s_{jt}^n)\alpha,$$

other prices,

$$\frac{\partial s_{jt}^n}{\partial p_{kt}^n} = -s_{jt}^n s_{kt}^n \alpha,$$

own advertising,

$$\frac{\partial s_{jt}^n}{\partial q_{jt}^a} = s_{jt}^n(1 - s_{jt}^n)\beta,$$

and advertising in other newspapers,

$$\frac{\partial s_{jt}^n}{\partial q_{kt}^a} = -s_{jt}^n s_{kt}^n \beta.$$

11.2   Advertising demand

This sub-section introduces a model of advertisers' demand for advertising slots on daily newspapers and discusses the underlying assumptions.

18.   The same logic as above applies analogously to advertising demand. Here, the utility from placing ad i into newspaper j at time t is

$$u_{ijt}^a = \gamma p_{jt}^a + \delta q_{jt}^n + \xi_{jt}^a + \varepsilon_{ijt}^a.$$

19.   The market size M^a is the total amount of advertising in all print media. The characteristics are the price of advertising, p_{jt}^a, and the number of readers, q_{jt}^n. We also assume that ε_{ijt}^a follows a type I extreme value distribution and that

$$\xi_{jt}^a = \alpha_j^a + \alpha_t^a.$$

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[177]   This estimator is sometimes also referred to as the fixed effects estimator and we can instead also use the ordinary least squares estimator once we include a full set of newspaper dummies in addition to the time dummies.

20. Then, we can estimate γ and δ by regressing $\ln(s_{jt}^a) - \ln(s_{0t}^a)$ on p_{jt}^a and q_{jt}^n using the within-group estimator once we also control for time fixed effects.

21. As for readership demand we can calculate the responsiveness of advertising demand with respect to own prices, $\partial s_{jt}^a / \partial p_{jt}^a$, other prices, $\partial s_{jt}^a / \partial p_{kt}^a$, own readership, $\partial s_{jt}^a / \partial q_{jt}^n$, and readership in other newspapers, $\partial s_{jt}^a / \partial q_{kt}^n$.

3   MARKUPS AND MARGINAL COSTS

This section shows how estimates of mark-ups and marginal costs can be obtained from estimated demand parameters.

22. When data on marginal costs are not available, it is possible to recover estimates thereof from the estimated demand parameters and an appropriate model for the supply side of the market. For this we assume that firms f maximize profits by choosing advertising prices p_{jt}^a and subscription prices p_{jt}^n for all newspapers j in their newspaper portfolio $\mathcal{F}_f$. Assuming constant marginal costs[178], mc_{jt}^a and mc_{jt}^n, their profit function for variable profits is[179]

$$\Pi_{ft} = \sum_{l \in \mathcal{F}_f} \{(p_{lt}^a - mc_{lt}^a) M_t^a s_{lt}^a + (p_{lt}^n - mc_{lt}^n) M^n s_{lt}^n\}.$$

23. The first term in the equation is the contribution of advertising profits in newspaper j' and is given by the mark-up times the advertising quantity $M_t^a s_{j't}^a(p_t^a, q_t^n)$, which itself is given by the market size times the market share. The market share depends on the vector of all advertising prices, p_t^a, and the vector of all readership demands, denoted by q_t^n. Similarly, the second term is the contribution of subscription profits. Here, the number of subscriptions depends on the market share in the subscriptions market, which itself depends on the vector of all subscription prices, p_t^n, and all advertising quantities, q_t^a.

24. Assuming the existence of a pure-strategy Nash equilibrium in prices with strictly positive prices we have that the prices p_{jt}^a and p_{jt}^n satisfy the first-order conditions

$$\frac{\partial \Pi_{ft}}{\partial p_{jt}^a} = 0$$

and

$$\frac{\partial \Pi_{ft}}{\partial p_{jt}^n} = 0.$$

It is important at this point to realize that we have

$$q_t^n = M_t^n s_t^n(p_t^n, q_t^a)$$

25. and

$$q_t^a = M_t^a s_t^a(p_t^a, q_t^n).$$

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[178] Whereas the assumption of constant marginal costs is not necessary to estimate mark-ups or recover marginal costs, it is instead necessary for the merger simulation. An alternative would be the specification and estimation of a cost function together with the demand. As in the case of daily newspapers the assumption of constant marginal costs is more than reasonable, and estimating a cost function requires data on factors affecting the cost structure, we do not follow the alternative here.

[179] We assume throughout that $\mathcal{F}_f$ does not change over time. Then, fixed costs are irrelevant to the firm's maximization problem.

26.   This is a nonlinear system of $2J$ equations with $2J$ unknowns, and therefore we cannot obtain the first-order conditions by simply calculating first derivatives. However, we show in the Appendix to this chapter that we can instead use the implicit function theorem to obtain the first-order conditions.

27.   In this study, we take another approach, namely to make the simplifying assumption that readership demand does not depend on the advertising quantity (as in Argentesi and Filistrucchi, forthcoming). This assumption can be tested by letting demand depend on the advertising intensity, which is supported by our empirical results that we report below.

28.   Notice that

$$\frac{\partial q_{jt}^a}{\partial p_{kt}^a} = M^a \cdot \frac{\partial s_{jt}^a}{\partial p_{kt}^a}$$

and

$$\frac{\partial q_{jt}^n}{\partial p_{kt}^n} = M^n \cdot \frac{\partial s_{jt}^n}{\partial p_{kt}^n}.$$

29.   Using this we have the first-order conditions

$$M^a s_{jt}^a + \sum_{l \in \mathcal{F}_f} \left\{ (p_{lt}^a - mc_{lt}^a) M^a \frac{\partial s_{j't}^a}{\partial p_{jt}^a} \right\} = 0$$

30.   and

$$M^n s_{jt}^n + \sum_{l \in \mathcal{F}_f} \left\{ (p_{lt}^n - mc_{lt}^n) M^n \frac{\partial s_{lt}^n}{\partial p_{jt}^n} + \sum_k (p_{lt}^a - mc_{lt}^a) M^a \frac{\partial s_{lt}^a}{\partial q_{kt}^n} \cdot M^n \cdot \frac{\partial s_{kt}^n}{\partial p_{jt}^n} \right\} = 0$$

31.   for $= 1, \ldots, J$. These are obtained as derivatives of the profit function with respect to the prices. Generally, a marginal price increase has three effects. The first effect is that profits increase because the margin increases. This effect is associated with the term $M^a s_{jt}^a$ in the first one of these two equations, and $M^n s_{jt}^n$ in the second one. Secondly, a price increase, say for advertising in newspaper j, affects advertising demand for all newspapers because a particular advertisement is placed in only one newspaper, or in none. This effect is associated with the term $(p_{lt}^a - mc_{lt}^a) M^a \partial s_{lt}^a / \partial p_{jt}^a$, representing the mark-up times the effect of the price change on the advertising quantity $M^a s_{lt}^a$ for newspaper l. This effect is taken into account by the firm for all newspapers it owns, hence we sum over $l \in \mathcal{F}_f$. A similar argument holds for a change in the subscription price.

32.   Finally, there are network effects that define the two-sidedness of the market. In general, a price increase affects subscription revenues because it affects advertising demand, and readership demand depends on the amount of adverting in the newspaper. Here, we assume that this network effect is not present. However, we allow advertising demand to depend on readership so that a subscription price increase will affect advertising demand in all newspapers, denoted as k, and not only on the ones that are owned by the firm. This will in turn have an effect on advertising revenues. So, $\sum_k (p_{lt}^a - mc_{lt}^a) M^a (\partial s_{lt}^a / \partial q_{kt}^n) \cdot M^n \cdot (\partial s_{kt}^n / \partial p_{jt}^n)$ is the effect of a change in p_{jt}^n on advertising profits in newspaper l. To obtain the effect on firm profits we sum over $l \in \mathcal{F}_f$.

33.   There are J newspapers and two prices for each newspaper. Hence, there are $2J$ first-order conditions with $2J$ unknown variables, namely the marginal costs of an advertisement and the

production and delivery of a newspaper. It is convenient to express this system of equations in a compact way.

34.   Thus we define the following $J \times J$ matrices. A Nevo (2001)-type ownership matrix Ω^*, a matrix of marginal effects of advertising prices on advertising demand S^a, a matrix of marginal effects of subscription prices on newspaper demand S^n, a matrix of network effects, N^n, and interactions between those matrices and the ownership matrix, Ω^{S^a}, Ω^{S^n}, and Ω^{N^a}. In particular, let

$$\Omega_{jr}^* = 1 \text{ if products } j \text{ and } r \text{ are owned by the same firm, } 0 \text{ otherwise,}$$

$$S_{jr}^a = \frac{\partial s_{rt}^a}{\partial p_{jt}^a}, \ \Omega_{jr}^{S^a} = \Omega_{jr}^* \cdot S_{jr}^a$$

$$S_{jr}^n = \frac{\partial s_{rt}^n}{\partial p_{jt}^n}, \ \Omega_{jr}^{S^n} = \Omega_{jr}^* \cdot S_{jr}^n$$

$$N_{jr}^a = \sum_k \frac{\partial s_{rt}^a}{\partial q_{kt}^n} \cdot \frac{\partial s_{kt}^n}{\partial p_{jt}^n}, \ \Omega_{jr}^{N^a} = \Omega_{jr}^* \cdot N_{jr}^a.$$

35.   Then, we have the first-order conditions

$$s_t^a + \Omega^{S^a}(p_t^a - mc_t^a) = 0$$

36.   and

$$s_t^n + \Omega^{S^n}(p_t^n - mc_t^n) + M^a \Omega^{N^a}(p_t^a - mc_t^a) = 0,$$

37.   where $s_t^a, s_t^n, p_t^a, p_t^n, mc_t^a,$ and mc_t^n are now all $J \times 1$ vectors of market shares, prices, and marginal costs for advertisements and newspapers, respectively.

38.   To solve this system of equations for the unknown $(p_t^a - mc_t^a)$ and $(p_t^n - mc_t^n)$ we define

$$\Omega = \begin{pmatrix} \Omega^{S^a} & 0 \\ \Omega^{S^n} & M^a \Omega^{N^a} \end{pmatrix},$$

$$s_t = \begin{pmatrix} s_t^a \\ s_t^n \end{pmatrix}$$

39.   and

$$(p_t - mc_t) = \begin{pmatrix} p_t^a - mc_t^a \\ p_t^n - mc_t^n \end{pmatrix}.$$

40.   Using this we can write the first-order conditions as

$$s_t + \Omega \cdot (p_t - mc_t) = 0$$

41.   and solve for

$$(p_t - mc_t) = -\Omega^{-1} s_t,$$

42.   which shows that it is possible to recover an estimate of the mark-ups based on additional appropriate assumptions on firms' behaviour in the market, from the observed market shares, the ownership structure and the estimated parameters of demand.

43.   Using these estimated mark-ups one can then obtain marginal costs by subtracting the estimated mark-ups from the observed prices, as

$$mc_t = p_t - (p_t - mc_t).$$

4   SIMULATION OF UNILATERAL EFFECTS

11.3   The SSNIP Test

We explain how the SSNIP test can be implemented when used to assess unilateral effects from a merger.

44.   The SSNIP test determines whether an increase of the subscription prices by two merging parties of 5% is profitable. For this we need to determine optimal advertising prices as a function of subscription prices. The associated first-order condition for firm f is, as stated already above,[180]

$$M^a s_{jt}^a + \sum_{l \in \mathcal{F}_f} \left\{ (p_{lt}^a - mc_{lt}^a) M^a \frac{\partial s_{lt}^a}{\partial p_{jt}^a} \right\} = 0.$$

45.   Importantly, s_{jt}^a depends on $q^n = M^n s_t^n(p_t^n, q_t^a)$, which will change due to the increase in the subscription price. Moreover, we have shown above that $\partial s_{j't}^a / \partial p_{jt}^a$ depends on $s_t^a(p_t^a, q_t^n)$, and hence on $s_t^n(p_t^n, q_t^a)$. These two market shares can be calculated using the logit formulas

$$s_t^a(p_t^a, q_t^n), = \frac{\exp\left(\gamma p_{jt}^a + \delta q_{jt}^n + \xi_{jt}^a\right)}{1 + \sum_{l=1}^J \exp(\gamma p_{lt}^a + \delta q_{lt}^n + \xi_{lt}^a)}$$

46.   for the advertising side and

$$s_t^n(p_t^n, q_t^a) = \frac{\exp\left(\alpha p_{jt}^n + \xi_{jt}^n\right)}{1 + \sum_{l=1}^J \exp(\alpha p_{lt}^n + \xi_{lt}^n)}$$

47.   for the readership side, now already imposing $\beta = 0$. For this, we need to calculate, using the Berry-inversion formula,

$$\xi_{jt}^a = \ln\left(s_{jt}^a\right) - \ln(s_{0t}^a) - \gamma p_{jt}^a - \delta q_{jt}^a$$

48.   and

$$\xi_{jt}^n = \ln\left(s_{jt}^n\right) - \ln(s_{0t}^n) - \alpha p_{jt}^n$$

49.   which are expressed in terms of the observed market shares, prices, and quantities. Next, we can solve the first-order conditions for the adjusted prices p_{jt}^{a*} using the estimates of the marginal costs that were obtained before. This is done only for the merging parties using the adjusted ownership matrix. These prices, together with the new quantities and the new subscription prices, are then used to calculate the change in profits. Notice that here we do not solve for the new equilibrium because we exogenously rise the subscription prices of the merging parties by 5%, while keeping the other prices constant.

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[180]   Recall that we have made the simplifying assumption that readership demand does not depend on the advertising quantity.

11.4   Full simulation and welfare analysis

We explain how a full simulation of the unilateral effects of a merger can be performed.

50.   For a full welfare analysis we need to solve the $2J$ first-order conditions for the new optimal subscription prices after the parties have merged. From these first-order conditions we have

$$p_t^{PM} = -\Omega^{-1}(p_t^{PM})s_t(p_t^{PM}) + mc_t.$$

51.   Note that in this case both the matrix Ω and the market shares S are those corresponding to the optimal post-merger prices. It is generally difficult to solve explicitly for the optimal post merger prices as a function of estimated parameters. However, we can solve for them numerically. Therefore, it is possible to evaluate whether and to what extent prices would be raised on each side of the market as a result of the merger in the absence of efficiency gains.

52.   Readers' welfare can be calculated using the standard welfare formula for the multinomial logit model,

$$W(p_t^n) = \ln\left(1 + \sum_{l=1}^{J} \exp(\alpha p_{lt}^n + \xi_{lt}^n)\right).$$

53.   Using this equation we can evaluate both consumers welfare using the initially observed prices and the prices in the new optimum and evaluate the welfare change due to the change in prices.

54.   Similarly, advertisers welfare can be calculated as

$$W(p_t^a) = \ln\left(1 + \sum_{l=1}^{J} \exp(\alpha p_{lt}^a + \xi_{lt}^a)\right).$$

55.   It is also possible to calculate the change in firm profits due to the merger, under the assumption that fixed costs are unchanged. However, as surely a merger would eliminate duplication of some of these fixed costs, the change of producer profits would then be underestimated. Nevertheless, since the merger assessment in the EU follows a consumers' welfare standard and not a total welfare standard, this is arguably less of an issue in the present context.

5   DATA

In this section, we explain how we constructed the data set for demand estimation and describe the data we collected.

56.   In the previous section, we have explained how to estimate the parameters of interest using market level data. For this, we need data on newspaper circulation, newspaper prices, the amount of advertising in the respective newspapers, newspaper specific advertising prices, and the market size for the market for newspapers and advertising. In principle, it could be useful to have data on additional newspaper characteristics. However, these data are only of value if there is variation in those variables over time, as we control for time invariant heterogeneity through α_j^n and α_j^a, and any characteristic that is observable but time invariant is thus already controlled for. An additional benefit of having access to such data is that we can use it to construct instrumental variables from the characteristics of the other newspapers. However, as already pointed out above, these are only

useful under the strong assumption that newspaper characteristics are not chosen in light of variation of unobserved characteristics that influence advertising and newspaper demand.

57.   Our view is that it is generally very hard to find credible instruments, and for the present study we face the typical situation that we have to draw conclusions without having access to those. This may not be a problem if a reasonable number of different scenarios is discussed, based on the estimates that are obtained without having access to instrumental variables.

58.   In our main specifications, we use quarterly newspaper circulation data from HOI (Het Oplage Instituut), in particular, we use data on the total circulation, including the free copies. The vast majority of the circulation for the non-free newspapers, 91% in our data, is paid circulation. We also use annual circulation data on the regional level in a set of robustness checks. These data, however, lack information for the free newspapers. In addition, we use quarterly newspaper subscription prices. This is reasonable because the vast majority of the circulation consists of subscriptions.

59.   For advertising quantities and spending we use Nielsen data. These data contain quantity measures in pages and column millimetres, as well as the total advertising spending and the total number of pages of the respective newspapers. We use the data on the total number of pages of advertising and the total number of pages to calculate the percentage advertising in that newspaper. At any given point in time and per newspaper, the number of pages and the number of column millimetres are directly related. We use column millimetres when estimating advertising demand because this is the industry standard when it comes to describing advertising quantities. Finally, from the total spending on advertising and the total number of column millimetres we can calculate the average price that was spent on a column millimetre of advertising. This is common practice, but there are several points worth mentioning. Firstly, total spending is actually generated by Nielsen from list prices. This means that we abstract from price discounts here. Secondly, the average price that was actually paid is generally not the same as the price for an average hypothetical advertisement in a newspaper.

60.   Advertising demand is allowed to depend on the characteristics of the readers of a newspaper, which we extract from the NOM print monitors. Characteristics are gender, age, wealth, region, how many readers are bread winners, and how many readers shop for groceries.

61.   In addition, we use three time series, for the total population, the number of households, and the consumer price index. All three are obtained from CBS (Statistics Netherlands). The price index is used to deflate prices because only real prices are of interest for readership and advertising demand. Thus, all prices are deflated by the consumer price index and expressed in Euros of the third quarter of 1999. The quarterly time series with the population data is used as a measure of market size. The idea is that every member of the population buys at most one newspaper. This is an approximation as, kids are not expected to buy any newspapers. Therefore, we also use the number of households in a robustness check. For this, only yearly data are available.

6   DESCRIPTIVE ANALYSIS

We provide descriptive statistics on the readership and advertising markets to put the structural analysis into perspective. In particular, we document that newspaper prices have increased more than production costs, that readership demand has decreased most likely due to the availability of high speed internet access, that the total amount spent on advertising has remained constant, and that free newspapers have become a serious competitor to traditional for-pay newspapers.

11.5 Economic environment

62.   The following figure shows that the population and the number of households have been slightly growing over the study period. The average number of household members has slightly decreased from 2.36 to 2.26.
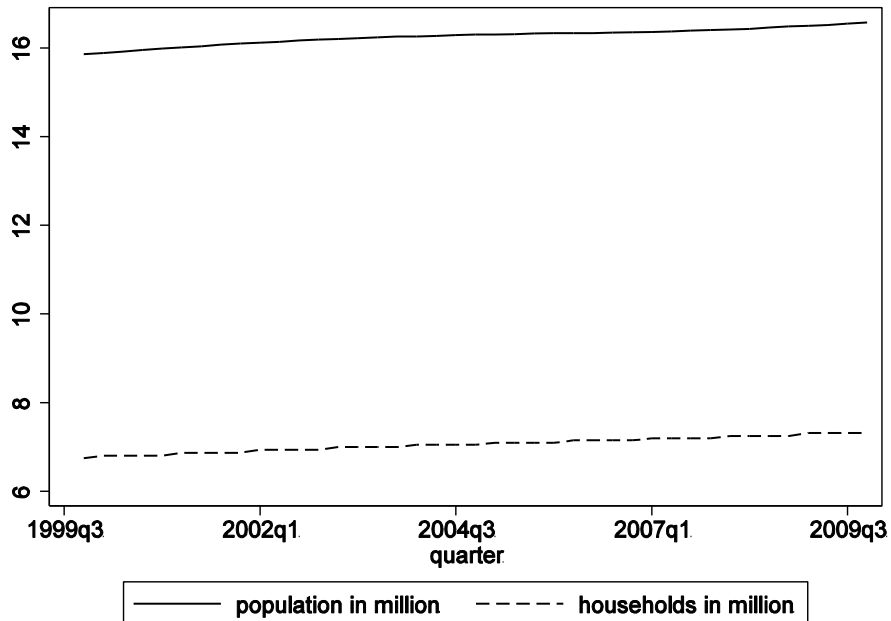
63.   Consumer prices have also been rising. It is interesting to compare the evolution of the consumer price index to the evolution of a price index for newspapers and magazines that was also obtained from CBS. This shows that newspaper and magazine prices have been rising more than twice as much as consumer prices.
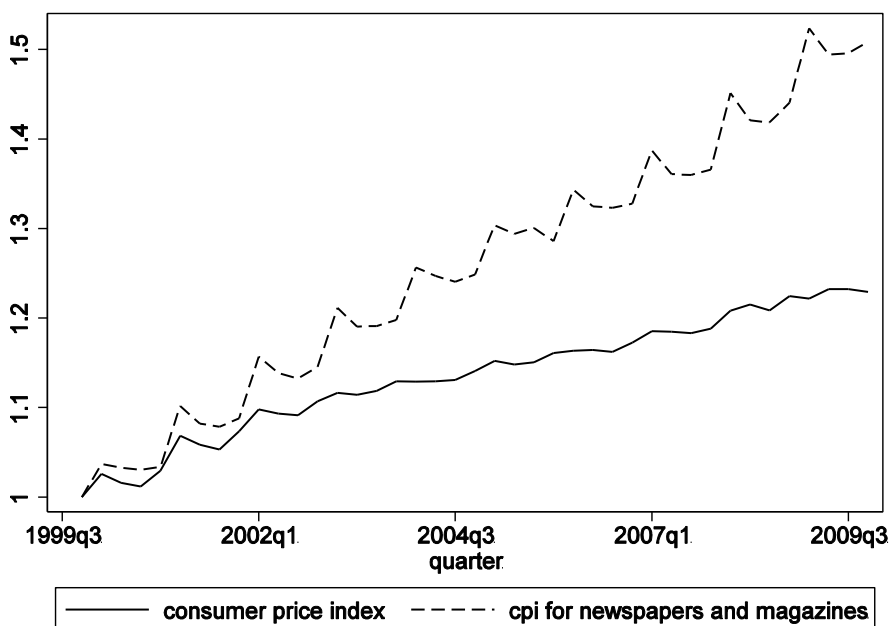
64.   The next figure shows how newsprint costs evolved until 2007. Unfortunately, these data were not available for the Netherlands, and therefore we show the FOEX cost measure for Europe, and the corresponding Italian newsprint costs.[181] The figure suggests that the increase in newsprint prices as reflected in the previously shown price index for newspapers and magazines was not driven by increases in printing cost. It also suggests that movements in those costs do not differ greatly across countries as the Italian index moves in the same way as the European one, although there is a difference in the levels.

In Euro/ton.
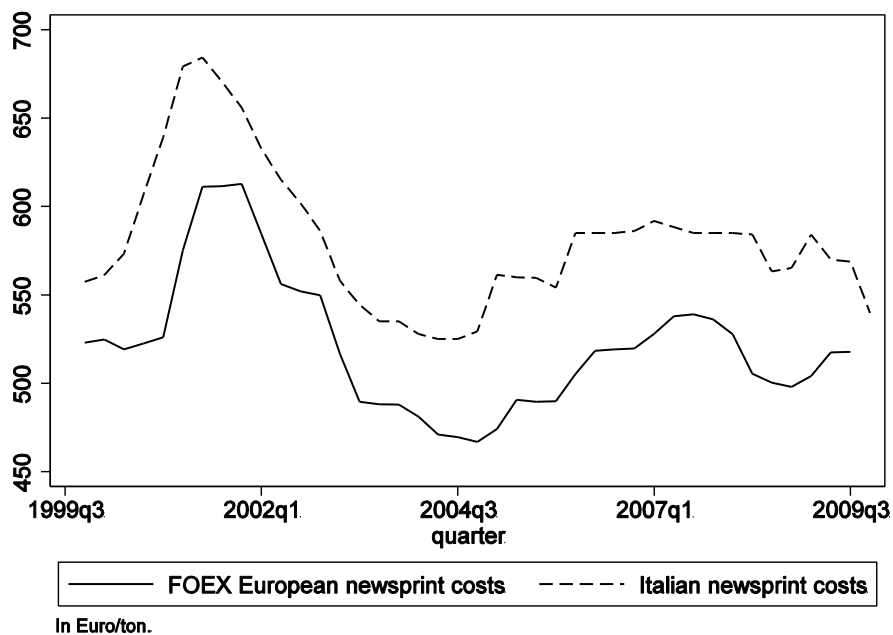
65.   The next figure shows indices that are related to cost components, in particular wages and wood prices. These have been deflated by the consumer price index and normalized to 1 in 2000q1. We use 2000q1 as the base quarter because this is the first year in which the collective labour agreement (CAO) wage index for graphic media is available.[182] The figure suggests that neither wages nor wood prices caused the high costs around 2001.

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[181]   We show the Italian index to assess whether it differs from the European one. We do not mean to suggest that the Italian index is representative for the Netherlands.

[182]   The CAO wage index is from CBS, the wood price index is the soft wood index for the US and from the IMF, and the minimum wage is from the Ministry of Social Affairs.
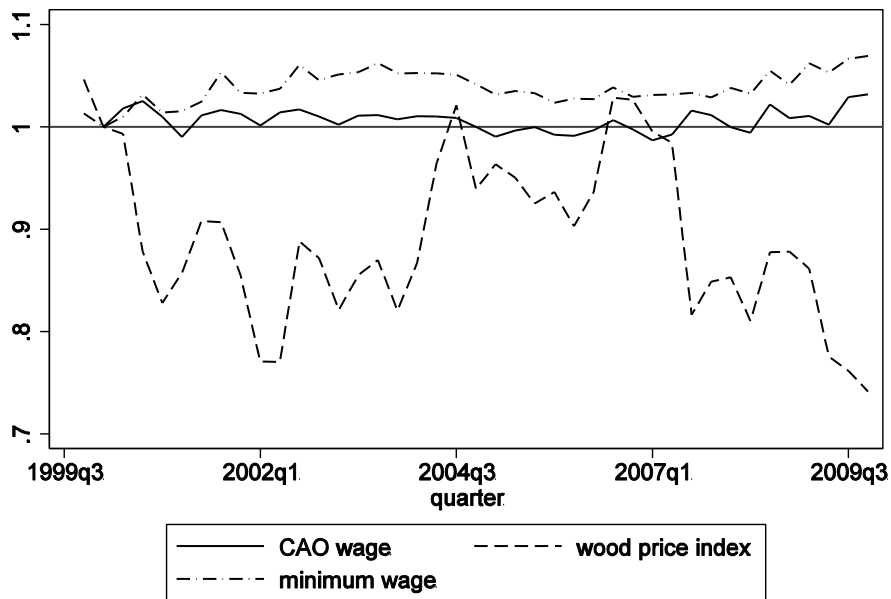
Deflated by consumer price index, normalized to 1 in 2000q1.

66.   An important development for newspapers is that the internet has become more and more important as a competitor. This is due to the attractiveness of reading news online and is related to the availability of websites and of high speed internet access. The following figure shows the percentage of households that had a high speed internet connection in the Netherlands.[183]

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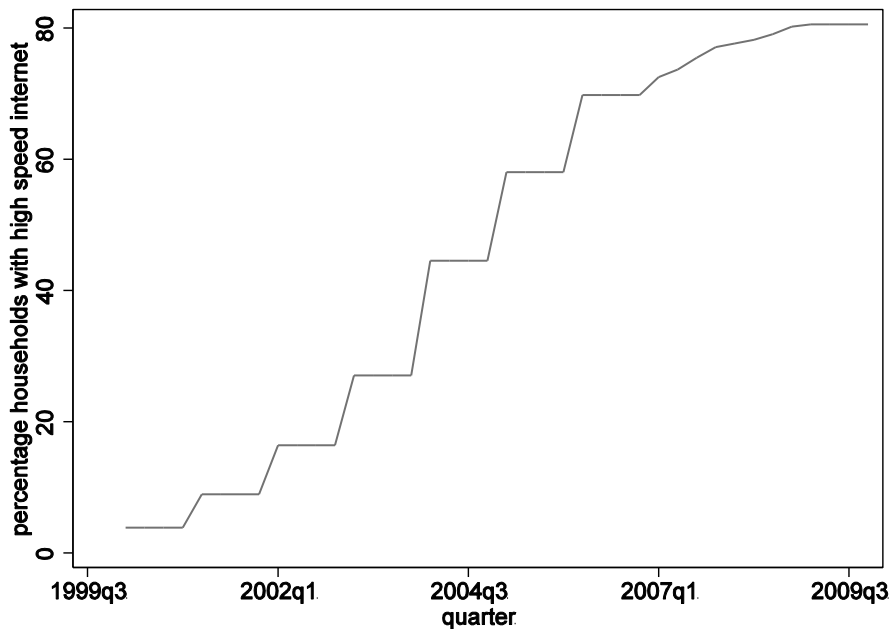
[183]   The data on the number of households with high speed internet connection are from the ICT research department of the Netherlands Organisation for Applied Scientific Research (TNO). They are yearly until the end of 2006, and quarterly thereafter, and are combined with yearly data on the number of households from CBS.

11.6   Readership and advertising

67.   The next figure shows how newspaper circulation changed over time. The top line shows the total circulation for all newspapers which have circulation data available. These data have been used to calculate market shares s_{jt}^n and the share of the outside good, as advised above. The two lines below that show total circulation for our sample of newspapers. The sample covers considerably less of the market in terms of circulation because of either missing information on advertisements or subscription prices. Here, we make an additional distinction between free newspapers and non-free newspapers to show that the combined market share for paid newspapers has actually been declining, at least in our estimation sample.

circulation is measured in million
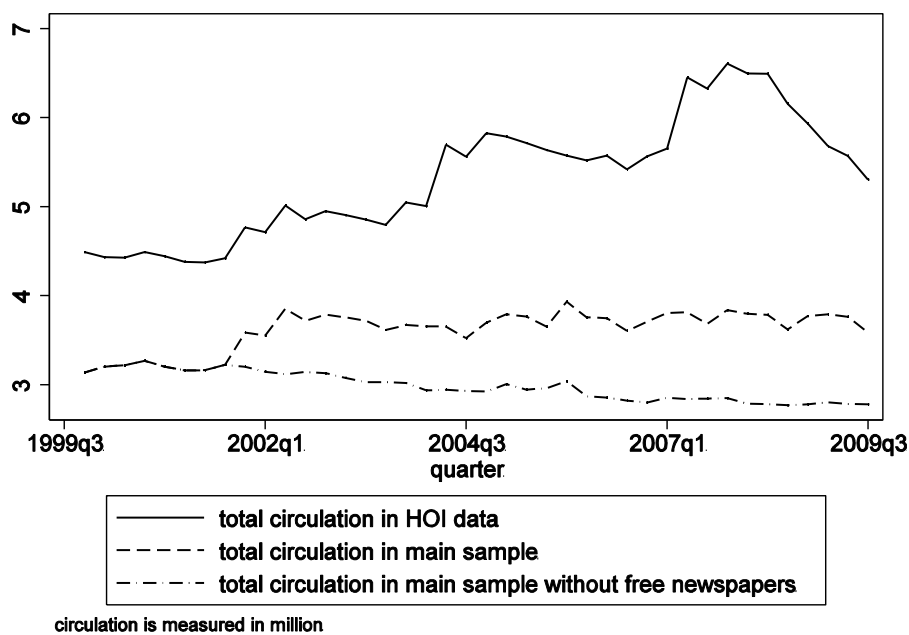
68.   The next figure shows that the total amount spent on advertisements in daily newspapers actually increased over the study period. This time series is from Nielsen and amounts are in thousands of (real 3rd quarter of 1999) Euros.
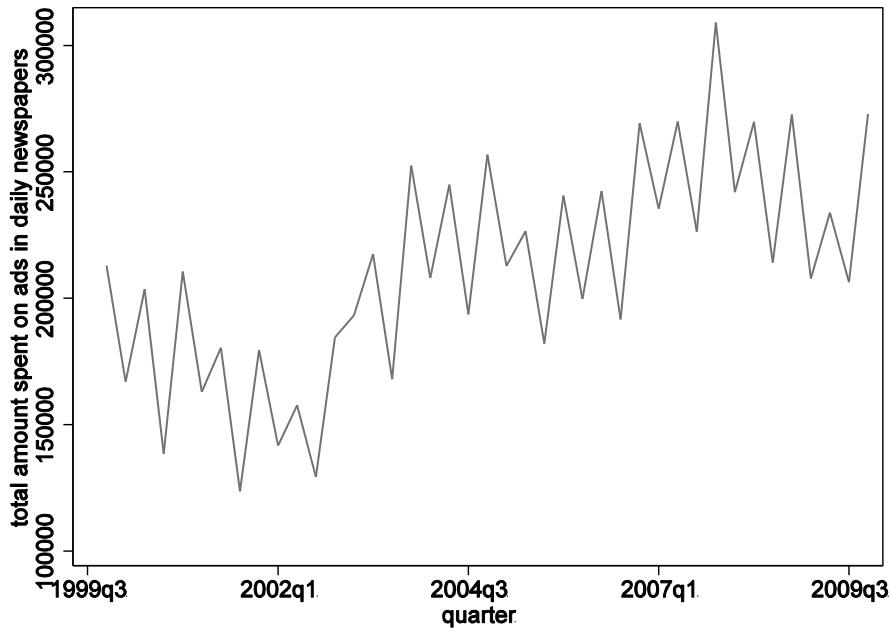
69.   Finally, we look at the evolution of average advertising quantities and prices for our estimation sample. Advertising prices are per column millimeter and divided by circulation in millions. It is meaningful to look at advertising prices per reader once newspapers merge. In the study period, there has been a big merger between the Algemeene Dagblad and Rijn en Gouwe, De Dordtenaar, Rotterdams Dagblad, Haagsche Courant, Utrechts Nieuwsblad, Goudsche Courant and Amersfoortse Courant in September 2005. The following figure shows that advertising quantities have stayed roughly the same, while average prices (deflated by the consumer price index) increased throughout. Here, we calculate a weighted average, where the weights are proportional to circulation. The vertical line indicates the time of the merger (4th quarter of 2005).
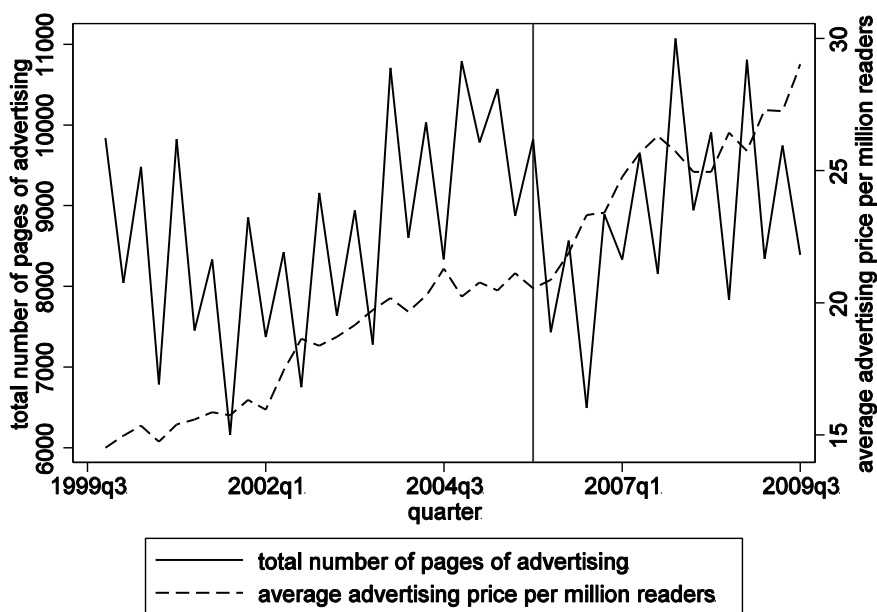
Calculated for main sample.

70.   To further investigate the effects of the merger, we now plot the weighted average advertising price and the weighted average number of pages of advertising against time. This is done for the group of newspapers merging in 2005. Weights are again proportional to circulation. This shows that the average price of advertising has increased at the time of the merger.
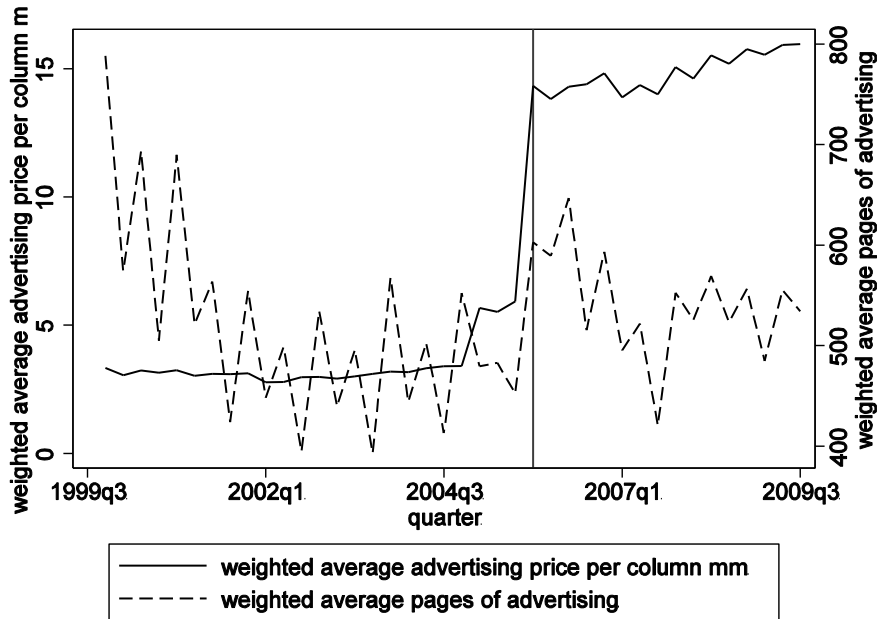
Calculated for group of newspapers merging in 2005q3.

71.   The following figure shows that at the same time and for the same group, both circulation and advertising revenues have decreased over time. However, when interpreting these figures one should keep in mind that these are data on list prices, and in principle it could be that advertising revenues have increased because the increased market power of this group of newspapers allows them to negotiate higher actual prices through lower discounts.
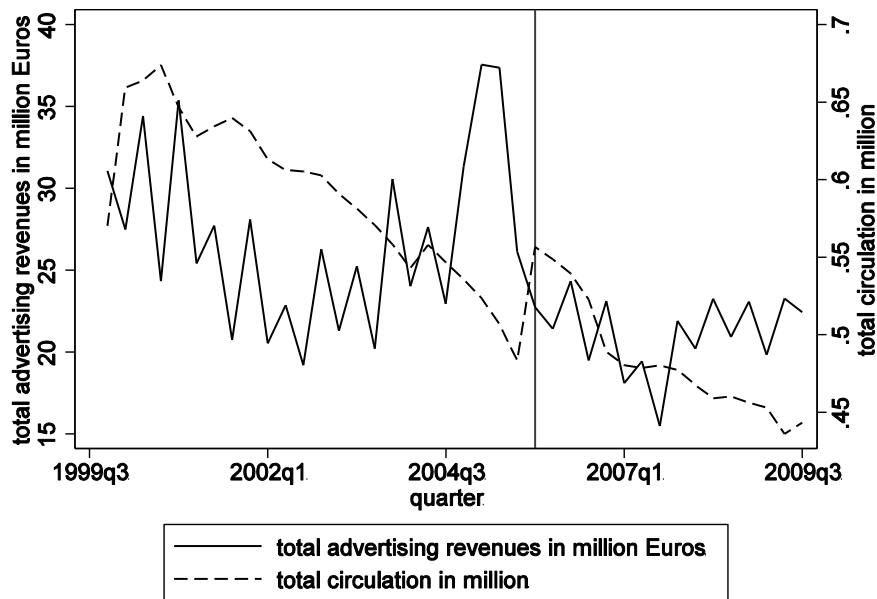
Calculated for group of newspapers merging in 2005q3.

12   ESTIMATION RESULTS

12.1   Readership Demand

Readership demand estimates are presented and discussed.

72.   Table 1 presents readership demand estimates.[184] In our baseline specification, (1), we specify the mean utility from buying a newspaper to depend on the subscription price, the advertising intensity, and the total number of pages. In addition, we include a linear time trend.

73.   We find the price to have a negative impact on utility. This is reassuring because, as intuitive as it may sound, it is often not found, implying that the assumptions that have been made do not hold. As for advertising, we find that the effect of an increase in advertising intensity does not significantly affect utility, a common finding in this literature (Argentesi and Filistrucchi, forthcoming, e.g.). However, readers value the amount of content as measured by the number of pages.

74.   To assess how robust these results are we first use a more flexible time trend in specification (2) and additionally allow the impact of price to change over time. In particular, we control for a full set of interactions between newspaper type and quarter dummies. Using this specification, utility is estimated to depend on price in a positive way.[185] This shows that such a specification is arguably too flexible. The reason for this is that variation in the price of a given newspaper is used to estimate the dependence of readers' utility on price, and there is only little such variation once we control for a flexible time trend and a dependence of price effects on time.

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[184]   Throughout, the number of observations across newspapers and quarters is 775.

[185]   This also holds for the majority of the quarters when we use a simpler linear time trend instead, but allow for the effect of price on utility to depend on time. The reason is that the coefficient on price is then positive but the coefficient on the interaction term is negative.

75.   Another concern may be that even after controlling for fixed effects and time trends preference shocks ε_{ijt}^n are correlated between newspapers of the same type. We therefore estimate a nested logit model (see Berry, 1994, for details) by including the log of the within group market share as additional regressors. The results show that this concern is valid as the coefficient on this additional variable is significantly different from 1 (it is 1 in the standard multinomial logit model).[186] Still, coefficient estimates are similar.

76.   Next, we assess whether our results are sensitive to the choice of the market size. We address this by using, in specification (4), the number of households instead of the total population as the measure for the market size. The magnitude of the price coefficient is similar to the one in the other specifications, but the standard error is bigger so that the estimate is no longer significantly different from zero. Apart from that, the effects of the percentage advertising and the number of pages are higher, and the effect of advertising is now significantly different from zero. From this we conclude that our results are indeed somewhat sensitive to the choice of the market size.

77.   Finally, in specification (5) we assess whether results change when we use total paid circulation instead of total circulation to construct the market share. Obviously, here we have to exclude the free newspapers. It can be expected that the magnitudes of the effects change since price is evidently more predictive of paid circulation than it is of total circulation. This is found here for national newspapers. However, results are unreasonable as price effects are estimated to be positive (although the effect is only significant at the 10 % level).

78.   Table 2 contains demand estimates that were obtained using regional level data. Here, we estimate the model on first-differenced data on the regional- and national newspaper level. This means that we regress changes in the dependent variable for each newspaper within each region on changes in the explanatory variables. For this we sort the data by region, newspaper, and year, and then regress changes in the log-difference on changes in the observed characteristics, respectively. Using these data, the price effect is again estimated to be negative for national newspapers and positive for regional newspapers. We find a negative dependence of the price effect on time. Here, we are able to include additional interaction terms between the type of newspaper because the sample size is bigger. However, we only have circulation data for national and regional newspapers, therefore the results should be compared to specification (5) in Table 1. Throughout, the percentage advertising has no significant effect on demand and the estimated coefficients are similar.

79.   From these estimates, elasticities of readership demand with respect to changes in price and advertising intensity can be calculated for each newspaper in each quarter. The distribution of own price elasticities that are calculated from specification (1) in Table 1 is shown in Figure 1. Figure 2 shows the distribution of own advertising intensity elasticities. These figures show that price elasticities are estimated to be between -0.3 and -0.6, which is very low in comparison to the literature (Argentesi and Filistrucchi, forthcoming, e.g.). Since the coefficient on the percentage advertising is not significantly different from zero, and the estimated elasticities are small, we can arguably assume that we can deduce network effect from this.

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[186]   The coefficient estimate is 0.004 with a standard error of 0.021.

12.2   Advertising Demand

80.   Table 3 contains the results for advertising demand. Our baseline specification relates the utility of the advertisers to the price of advertising, the circulation, and a linear time trend. We find negative price effects and positive effects of a higher circulation.

81.   To assess the robustness of these estimates, in specification (2) we additionally control for reader characteristics.[187] In specification (3) we allow the price effect to depend on time and additionally control for flexible newspaper type specific time trends. Generally, unlike with newspaper demand, we don't find evidence for changing price sensitivity over time. Specification (4) is again a nested logit specification, where the nests are once more national, regional, and free newspapers. The coefficients on the log of the within group share is 0.766 and the price coefficient is smaller in terms of magnitude.

82.   Overall, price effects differ again across specifications. We picked (1) as our baseline specification because it is the simplest one that generates the main predictions that are shared by the other specifications. However, we will, as for the readership demand estimates, use a range of plausible values for the implied elasticities in the economic analysis. Figure 3 shows the distribution of own advertising price elasticities across newspapers and quarters, and Figure 4 shows the distribution of own circulation elasticities.

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[187]   The number of observations in specification (1) is 775. Due to missing data on reader characteristics it is 582 in specification (2) through (4).

Table 1: Readership demand parameters (quarterly national level data)

	(1)	(2)	(3)	(4) households	(5) paid circulation
subscription price per quarter in Euros of 1999Q4	-.00804473***	.00004173	-.00803837***	-.00975216	.00271742*
interacted with linear time trend		.00007212*			
percentage advertising	.00014852	-.00023369	.00014918	.00093102*	-.00009771
total number of pages	.01874337**	.01382039*	.01858579**	.12869453***	.01058924*
linear time trend	.00071884		.00074595	.01830889***	-.01078501***
quarter dummies fully interacted with free/regional	no	yes	no	no	no
log of the within group share			.00389189		

1 to 3 stars denote significance at the 5, 1, and 0.1 level, respectively.

Notes: This table shows readership demand parameters that were obtained by regressing the difference between the log of the market share and the log of the market share of the outside good on the explanatory variables in the first column of this table. We also control for newspaper fixed effects. Specification (1) through (3) use total circulation and the market size is given by the total population. Specification (4) instead uses the number of households as the market size. In specification (5), we use paid circulation, and the market size is again given by the total population.

Table 2: Readership demand parameters (yearly regional level data)

	(1)	(2)	(3)
subscription price per quarter in Euros of 2000	-.01377033***	-.00635731	-.02037003
interacted with linear time trend	-.00242847***	-.00247141***	-.00262318***
interacted with indicator for regional newspaper		.04223737	.06104784
percentage advertising	.00007554	.00008385	-.00013486
interacted with indicator for regional newspaper		-.00066263	-.00011817
total number of pages in thousands	.03689737***	.03837949***	.04044864***
interacted with indicator for regional newspaper	-.04928149***	-.04778169*	-.05136854*
linear time trend		-.00910125	
interacted with indicator for regional newspaper		-.0547944	
quarter dummies fully interacted with free/regional	no	no	yes

1 to 3 stars denote significance at the 5, 1, and 0.1 level, respectively.

Notes: This table shows readership demand parameters that were obtained by regressing the difference between the log of the market share and the log of the market share of the outside good on the explanatory variables in the first column of this table. We also control for newspaper fixed effects. We use total circulation, and the market size is given by the total population.

Table 3: Advertising demand parameters (quarterly national level data)

	(1)	(2)	(3)	(4)
advertising price per column millimeter	-.02109908	-.01418761	.00223756	-.00094349
interacted with linear time trend			.00005125	
circulation in million	1.4079054***	1.4001053***	-.63536502	1.3084028***
linear time trend	.00691174***	.00490422*		.00107462
percentage male		-.34853751	.61748767	-.96418029**
percentage bread winner		.22283096	-.11061814	.36703078
percentage grocery shopper population		-.13726338	.48378657	-.1494132
percentage three biggest cities		1.4330467***	.98748822**	.55192105
percentage North		-1.4684984	-2.519561***	-.97898382
percentage East		-.51603964	-.23225476	-.18463349
percentage South		-1.1714999	-2.7776828***	.12077974
percentage age 35-49		-.00048669	-.46316518	.72672485*
percentage age 50-64		1.1356761**	.59822425	.85338151**
percentage age 60+		-.34952494	-1.3083404**	.35165916
percentage wealth class 2 and 3		-.43679923	-.88684576***	-.00299449
percentage wealth class 4 and 5		-.34826247	.24492609	-.26313755
quarter dummies fully interacted with free/regional	no	no	yes	no
log of the within group share				.76551338***

1 to 3 stars denote significance at the 5, 1, and 0.1 level, respectively.

Notes: This table shows advertising demand parameters that were obtained by regressing the difference between the log of the market share and the log of the market share of the outside good on the explanatory variables in the first column of this table. We also control for newspaper fixed effects. The market share is given by the number of column millimetres of advertising in particular divided by the total number of column millimetres in all print media, which defines the market size.
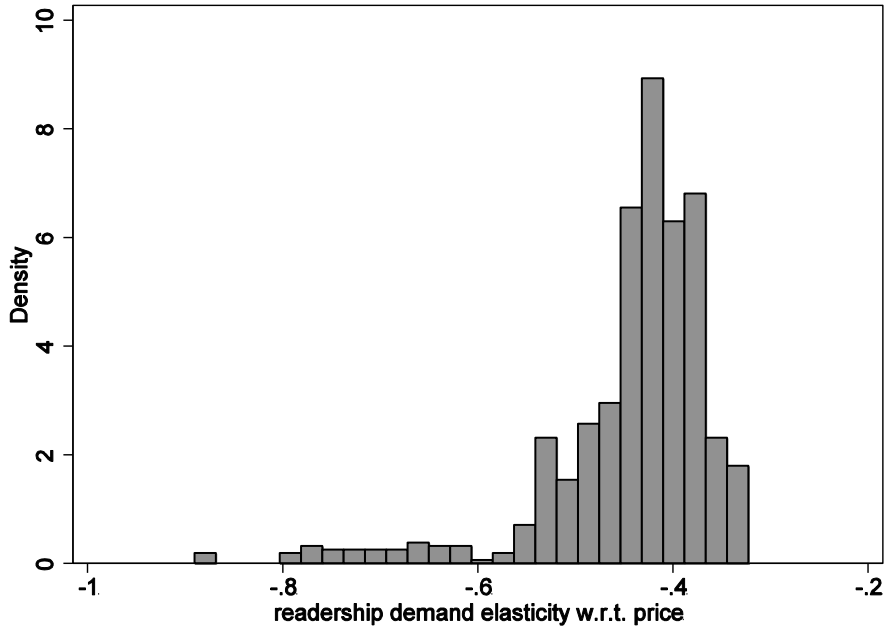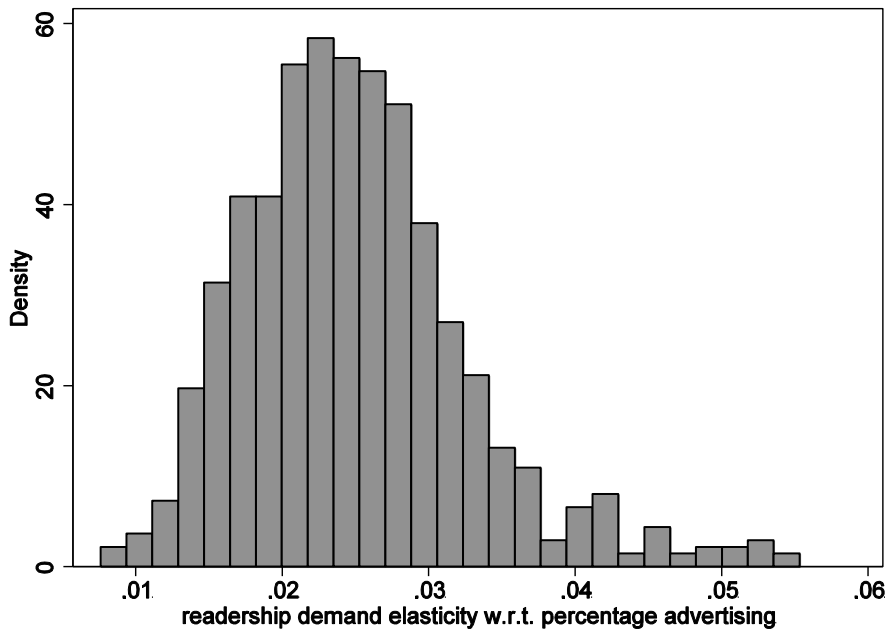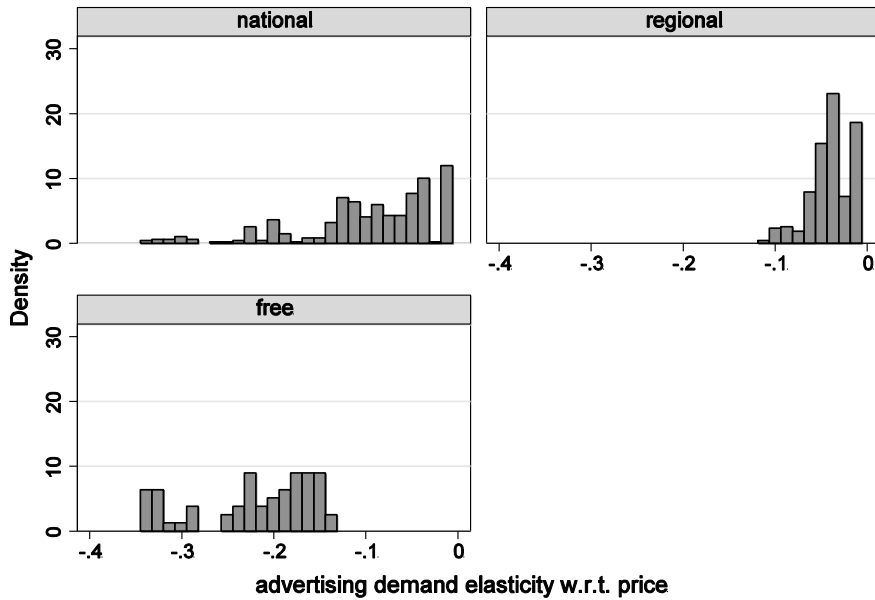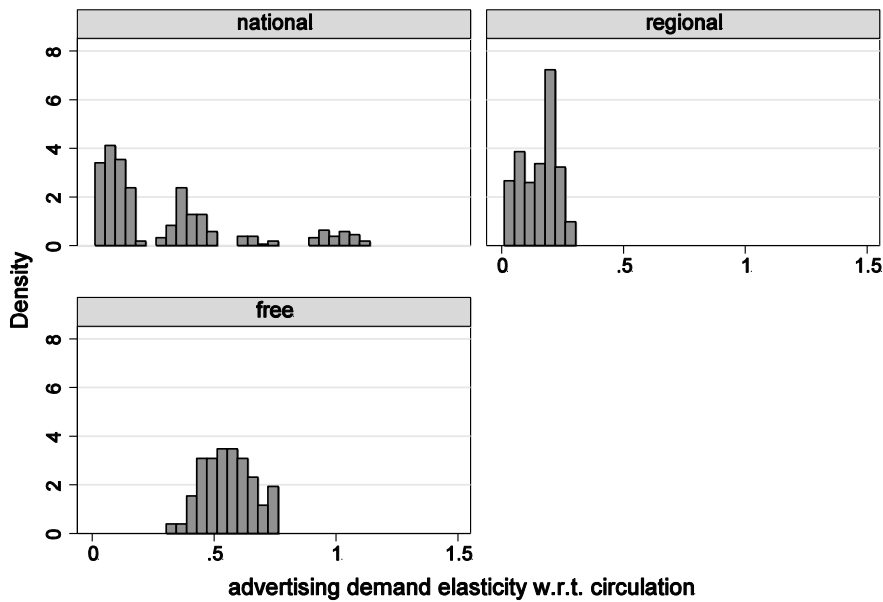
Figure 1

Figure 2

Figure 3

Graphs by type

Figure 4

Graphs by type

13   MERGER SIMULATION: AN EXAMPLE

For illustration purposes, we analyse the effects of a hypothetical merger between NRC Handelsblad, NRC.next, De Telegraaf, Gooi- en Eemlander, Noordhollands Dagblad, and Sp!ts.

13.1   Specification

83.   Throughout, we use the value $\delta = 1.4079054$ that was obtained in the empirical analysis and, also based on the empirical results, impose $\beta = 0$. We perform the SSNIP test for different cominations of α and γ. We set $\alpha = 0$ and $p_{jt}^n = 0$ for the free newspapers, i.e. they are assumed to remain free. Besides, we use the market shares, market sizes, prices and ownership structure of the last quarter of 2009 as the initial situation. Marginal costs are recovered from the first-order conditions, as described above.

13.2   SSNIP test

We perform a SSNIP test.

84.   Between the last period in our data, the fourth quarter of 2009, and the time of the hypothetical merger, PCM (currently De Persgroep Nederland) had to sell NRC Handelsblad and NRC.next. For the SSNIP test we need to use an observed state with observed prices and quantities as the initial situation. Therefore, we implement the SSNIP test for a change in the ownership structure from the situation in the fourth quarter of 2009 to the new situation after the aforementioned newspapers have been sold and NRC Handelsblad and NRC.next have merged with De Telegraaf, Gooi- en Eemlander, Noordhollands Dagblad, and Sp!ts.

85.   Results of the SSNIP test are going to depend on the parameters α and γ. To show which combinations of those parameters are reasonable, Table 5 shows inferred average marginal costs across products divided by the average subscription price. For this we have calculated marginal costs from the first-order conditions in the usual way, for each newspaper. Subsequently, we calculated the average across newspapers. The relative marginal costs are reported for different combinations of the two parameters α (the coefficient on the subscription price) and γ (the coefficient on the advertising price). The inferred marginal cost for the advertising side does not depend on the parameter on the reader side because readership demand does not depend on the amount of advertising (hence we report this in one row entitled "corresponding ad MC/price"). Technically speaking α does not enter the corresponding first-order condition. For example, consider the highlighted number 0.606. It means that for $\gamma = 0.5$ the marginal costs of an advertisment amount to 60.6 % of the price of that ad.

86.   The inferred marginal cost of producing the newspaper depends on the advertising side parameter γ, as advertising demand depends on the number of subscriptions. The highlighted number 0.217 means that for $\alpha = -0.017$ and $\gamma = -0.500$ the marginal cost amounts to 21.7 % of the subscription price of a newspaper. The corresponding price elasticities are -2.587 for advertising demand and -1.099 for readership demand.

87.   This table is useful to determine whether the results that were obtained before are reasonable, and to characterise the set of plausible parameter combinations. For values of γ above -0.2 the marginal costs of an advertisement were negative, which is clearly unreasonable. Likewise, for values of α

above -0.010, the marginal costs of producing and distributing a copy of a newspaper were estimated to be negative.

88.   The threshold value for the mark-up to become negative on the readership side depends on the size of the network effect. In order to quantify the dependence we have tripled the parameter δ, thereby tripling the elasticity of advertising demand with respect to the number of subscriptions. We find that with $\alpha = -0.0125$ some of the marginal cost estimates become negative. However, they are still positive for $\alpha = -0.0167$. This shows that the dependence on the network effect is not too big, justifying the approach we take here, namely to only alter the two parameters α and γ.

Table 5: Marginal costs for producing a newspaper for different parameter combinations

		γ				
		-1.000	-0.500	-0.333	-0.250	-0.200
		corresponding ad price elasticity				
		-5.173	-2.587	-1.724	-1.293	-1.035
		corresponding ad MC/price				
α	subscr. Elasticity	0.803	**0.606**	0.409	0.212	0.015
-0.050	-3.298	0.758	0.784	0.811	0.837	0.864
-0.025	-1.649	0.474	0.500	0.527	0.553	0.58
-0.017	-1.099	0.19	**0.217**	0.243	0.27	0.296
-0.013	-0.824	-0.094	-0.067	-0.041	-0.014	0.012
-0.010	-0.660	-0.377	-0.351	-0.324	-0.298	-0.272

89.   Table 6 shows the results of the SSNIP test. The details on the implementation have been given above. A number in that table is the percentage change in profits due to a 5% increase in the price of the merging parties, with optimal adjustment of the advertising prices only by the merging parties.[188] The table shows that for all reasonable combinations of the parameters, as argued above, a price increase by 5% on the subscriptions market has no economically relevant effect on profits. The reason for this is that advertising prices and market shares in the newspaper market hardly change.

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[188]   Results are very similar when we allow all newspapers to optimally adjust their advertising prices.

Table 6: SSNIP test

		γ				
		-1.000	-0.500	-0.333	-0.250	-0.200
		corresponding ad price elasticity				
		-5.173	-2.587	-1.724	-1.293	-1.035
		corresponding ad MC/price				
α	subscr. Elasticity	0.803	0.606	0.409	0.212	0.015
-0.050	-3.298	-0.009	-0.004	-0.001	0.002	0.004
-0.025	-1.649	-0.002	0.000	0.002	0.003	0.004
-0.017	-1.099	-0.001	0.001	0.002	0.003	0.004
-0.013	-0.824	0.000	0.001	0.002	0.003	0.003
-0.010	-0.660	0.000	0.001	0.002	0.002	0.003

13.3   Full merger simulation

Finally, we perform a full merger simulation.

90.   Table 7 summarizes the effects of the merger on prices, market shares, and profits. This table is for $\alpha = -0.017$ and $\gamma = -0.333$. The second column in that table indicates whether the newspaper was in the product portfolio of one of the merging parties. The main effect of the merger is a price increase in the newspapers owned by the merging parties. However, there is no substantial effect on market shares, and hence not on the advertising market. This is because advertising prices and market shares only depend on the market shares of the newspaper market, but not on subscription prices.

Table 7: Old and new equilibrium

newspaper	merged	p_{jt}^n before	after	s_{jt}^n Before	after	p_{jt}^a before	after	s_{jt}^a before	after	profits before	after
De Telegraaf	yes	66.969	68.463	0.0419	0.0410	11.945	11.965	0.0109	0.0106	45343586	45369030
Gooi- en Eemlander	yes	68.932	70.261	0.0017	0.0016	0.634	0.654	0.0063	0.0063	6482457	6485351
Noordhollands Dagblad	yes	68.943	70.203	0.0084	0.0082	2.552	2.572	0.0074	0.0074	13599035	13609058
NRC Handelsblad	yes	85.164	89.967	0.0129	0.0119	6.399	6.489	0.0052	0.0049	15741387	15718898
NRC.next	yes	51.888	56.310	0.0054	0.0050	3.496	3.586	0.0018	0.0017	6619551	6613221
Sp!ts, F, M	yes	0.000	0.000	0.0207	0.0207	9.255	9.275	0.0049	0.0049	359284	357090
Algemeen Dagblad	no	69.230	69.226	0.0273	0.0273	15.942	15.942	0.0058	0.0058	30277740	30356211
Barneveldse Krant	no	50.402	50.399	0.0007	0.0007	0.361	0.361	0.0041	0.0041	3714741	3718814
Dagblad van het Noorden	no	66.504	66.497	0.0085	0.0085	2.933	2.933	0.0114	0.0114	15848734	15878292
De Gelderlander	no	70.801	70.798	0.0090	0.0090	5.042	5.042	0.0075	0.0075	13873539	13902134
de Volkskrant	no	75.325	75.326	0.0154	0.0155	6.936	6.936	0.0049	0.0049	18613479	18658704
Financieele Dagblad	no	135.751	135.749	0.0038	0.0038	5.871	5.871	0.0022	0.0022	5283726	5294856
Het Parool	no	68.814	68.820	0.0054	0.0055	2.562	2.562	0.0051	0.0051	9067812	9085620
Metro, F	no	0.000	0.000	0.0279	0.0279	16.221	16.221	0.0040	0.0040	-1624025	-1628788
Nederlands Dagblad	no	78.801	78.800	0.0018	0.0018	0.656	0.656	0.0015	0.0015	2827445	2832904
PZC	no	69.248	69.250	0.0033	0.0033	1.708	1.708	0.0080	0.0081	9215325	9229012
Reformatorisch Dagblad	no	72.452	72.449	0.0032	0.0033	0.821	0.821	0.0038	0.0038	5818748	5829291
Stentor	no	70.750	70.749	0.0079	0.0079	4.482	4.482	0.0069	0.0069	12516551	12541844
Trouw	no	81.332	81.339	0.0064	0.0064	3.067	3.067	0.0027	0.0027	8432412	8451431
Twentsche Courant Tubantia	no	68.200	68.199	0.0068	0.0068	2.996	2.996	0.0075	0.0075	11951717	11974528

91.   Table 8 shows the effect of the merger on consumer welfare. This is done for different combinations of the parameters. The numbers are relative changes, so -0.002, e.g., indicates a 0.2 % reduction in welfare. Although the effect on welfare is negative for all combinations of the parameters, and insensitive to the parameters that are chosen, it is small in relative terms. This is compatible with our findings that market shares hardly change.

Table 8: Welfare effects of the merger

γ ad price elasticity	α	subscr. elasticity	-1.000	-0.500	-0.333	-0.250	-0.200
			-5.173	-2.587	-1.724	-1.293	-1.035
	-0.050	-3.298	-0.003	-0.003	-0.003	-0.004	-0.006
	-0.025	-1.649	-0.002	-0.003	-0.003	-0.003	-0.003
	-0.017	-1.099	-0.002	-0.003	-0.003	-0.003	-0.003
	-0.013	-0.824	-0.002	-0.002	-0.003	-0.003	-0.003
	-0.010	-0.660	-0.002	-0.002	-0.003	-0.003	-0.003

92.   Finally, Table 9 shows results from a full merger simulation, now ignoring the network effect, i.e. setting $\delta = 0$, but using again $\alpha = -0.017$ and $\gamma = -0.333$, as for Table 7. Generally, results are similar. If anything, then the projected effects are slightly bigger when the two-sidedness is not taken into account.

Table 9: Old and new equilibrium ignoring the network effect

newspaper	merged	p_{jt}^n		s_{jt}^n		p_{jt}^a		s_{jt}^a		profits	
		before	after	before	after	before	after	before	after	before	after
De Telegraaf	yes	66.940	68.081	0.0420	0.0413	11.945	11.966	0.0109	0.0108	53280376	53319590
Gooi- en Eemlander	yes	68.940	70.081	0.0017	0.0016	0.634	0.655	0.0063	0.0063	6615320	6617701
Noordhollands Dagblad	yes	68.940	70.081	0.0084	0.0082	2.552	2.573	0.0074	0.0074	14654188	14662747
NRC Handelsblad	yes	85.342	90.071	0.0128	0.0119	6.398	6.490	0.0051	0.0049	16792873	16767151
NRC.next	yes	51.792	56.521	0.0054	0.0050	3.495	3.587	0.0018	0.0017	6791660	6780926
Sp!ts, F, M	yes	0.000	0.000	0.0207	0.0207	9.256	9.276	0.0049	0.0049	363476	356040
Algemeen Dagblad	no	69.334	69.343	0.0272	0.0273	15.941	15.941	0.0057	0.0057	32916826	32986332
Barneveldse Krant	no	50.400	50.400	0.0007	0.0007	0.361	0.361	0.0041	0.0041	3764408	3767296
Dagblad van het Noorden	no	66.496	66.501	0.0085	0.0085	2.933	2.933	0.0114	0.0114	17523461	17547766
De Gelderlander	no	70.796	70.801	0.0090	0.0090	5.042	5.042	0.0075	0.0075	15066153	15090471
de Volkskrant	no	75.384	75.393	0.0154	0.0154	6.935	6.935	0.0049	0.0049	19900457	19940336
Financieele Dagblad	no	135.750	135.750	0.0038	0.0038	5.871	5.871	0.0022	0.0022	5430100	5439770
Het Parool	no	68.884	68.893	0.0054	0.0054	2.562	2.562	0.0050	0.0050	9519655	9534743
Metro, F	no	0.000	0.000	0.0279	0.0279	16.221	16.221	0.0040	0.0040	-1619792	-1629518
Nederlands Dagblad	no	78.800	78.800	0.0018	0.0018	0.656	0.656	0.0015	0.0015	2873557	2878224
PZC	no	69.246	69.251	0.0033	0.0033	1.708	1.708	0.0080	0.0081	9665860	9676568
Reformatorisch Dagblad	no	72.450	72.450	0.0032	0.0033	0.821	0.821	0.0038	0.0038	6031000	6039835
Stentor	no	70.746	70.751	0.0079	0.0079	4.482	4.482	0.0069	0.0069	13480567	13502033
Trouw	no	81.334	81.343	0.0064	0.0064	3.066	3.066	0.0027	0.0027	8734671	8751397
Twentsche Courant Tubantia	no	68.196	68.201	0.0068	0.0068	2.996	2.996	0.0075	0.0075	12850145	12869233

14   LIMITATIONS

93.   The empirical analysis that was performed in this chapter of the report is meant to illustrate in which way a hypothetical merger can be analysed using modern techniques. However, the results may suffer from a number of limitations and should thus not be taken at face value.

94.   A first limitation is that our data does not contain newspaper characteristics. Although we control for newspaper fixed effects it could be important to additionally control for changes in those characteristics in order to temper endogeneity problems that are associated with contemporaneous shocks that confound the utility derived by the readers and subscription prices, and the utility derived by the advertisers and advertising prices. These correlations could arise because reader and/or newspaper characteristics change. Then, it is meaningful to control for these. Furthermore, if characteristics were available, functions of characteristics of other newspapers could serve as instruments for prices.

95.   A second limitation is that the specification for the two demand systems is not flexible enough. It would be preferable to use a specification with random coefficients that allows for heterogeneous tastes, as it is done in Berry *et al.* (1995). It is relatively time intensive to estimate such a model. Additionally, newspaper characteristics need to be available for this.

96.   Besides, an open issue is how one should deal with regional newspapers. Here, we have made the simplifying assumption that we can perform the analysis on the national level. Although the fact that results that were obtained using regional level data are similar is reassuring, it would still be good to perform a thorough analysis, carefully taking this into account, but also this is beyond the scope of this report, so the fact that we have not done this can be seen as a third limitation.

97.   Despite all those limitations, the analysis clearly shows that if there is a sizeable number of newspapers, in the likes of 20, and if demands can reasonably be approximated by logit specifications, then the effects of a merger on prices and especially welfare are relatively small. This seems to hold irrespective of the estimated parameter values and is an interesting finding by itself.

15   CONCLUSION

98.   This chapter has shown how an empirical analysis can be conducted in order to assess the effects of a merger in a two-sided market. The analysis consists of two parts, the estimation of demand parameters and the actual assessment of the (in our case purely hypothetical) merger.

99.   Four key parameters needed to be estimated. They are related to the responsiveness of readership demand with respect to subscription prices and the amount of advertising, and the responsiveness of advertising demand with respect to advertising prices and circulation. We have shown how this can be done using logit demand models and have discussed the limitations of the approach we have taken.

100.   The results of the merger simulation indicate that in our case, the projected effects of the merger on prices are generally lower once the two-sidedness of the market is taken into account. Overall, the effects are found to be small.

16   APPENDIX – THE CASE OF TWO INDIRECT NETWORK EFFECTS

101.   In Section 3, we made the simplifying assumption that readers are indifferent with respect to advertising quantity in their newspaper. This is a common assumption that is supported by the empirical literature on daily newspapers and, more importantly, our empirical results. Nevertheless, in this appendix, we show how one can recover marginal costs without making this assumption.

102.   We still assume that firm f maximizes profits by choosing advertising prices p_{jt}^a and subscription prices p_{jt}^n for all newspapers j in their newspaper portfolio $\mathcal{F}_f$. That is, it maximizes

$$\Pi_{ft} = \sum_{l \in \mathcal{F}_f} \{(p_{lt}^a - mc_{lt}^a)M_t^a s_{lt}^a + (p_{lt}^n - mc_{lt}^n)M^n s_{lt}^n\},$$

knowing that

$$q_t^n = M_t^n s_t^n(p_t^n, q_t^a)$$

and

$$q_t^a = M_t^a s_t^a(p_t^a, q_t^n).$$

i.e. knowing how the market share in the advertising market depends on the vector of all advertising prices, p_t^a, and the vector of all readership demands, q_t^n, and how the market share in the subscriptions market depends on the vector of all subscription prices, p_t^n, and all advertising quantities, q_t^a.

103.   As already noted, this is a non-linear system of $2J$ equations in $2J$ unknowns. Were it linear or log-linear we could obtain expressions for the quantities q_t^n and q_t^a as explicit functions of the prices p_t^n and p_t^a:

$$q_t^n = M_t^n \widehat{s_t^n}(p_t^n, p_t^a)$$

$$q_t^a = M_t^a \widehat{s_t^a}(p_t^a, p_t^n).$$

Notice that here; we denote these functions with hats. Using them, one could rewrite the profit function of firm f as

$$\Pi_{ft} = \sum_{l \in \mathcal{F}_f} \{(p_{lt}^a - mc_{lt}^a)M_t^a \widehat{s_t^a}(p_t^a, p_t^n) + (p_{lt}^n - mc_{lt}^n)M^n \widehat{s_t^n}(p_t^n, p_t^a)\}.$$

104.   The first-order conditions

$$\frac{\partial \Pi_{ft}}{\partial p_{jt}^a} = 0$$

and

$$\frac{\partial \Pi_{ft}}{\partial p_{jt}^n} = 0,$$

involve the following derivatives of quantities on the two-sides of the market with respect to prices:

$$\frac{\partial q_{jt}^a}{\partial p_{kt}^a} = M^a \cdot \frac{\partial \widehat{s_{jt}^a}}{\partial p_{kt}^a}$$

$$\frac{\partial q_{jt}^n}{\partial p_{kt}^n} = M^n \cdot \frac{\partial \widehat{s_{jt}^n}}{\partial p_{kt}^n}$$

$$\frac{\partial q_{jt}^a}{\partial p_{kt}^a} = M^a \cdot \frac{\partial \widehat{s_{jt}^a}}{\partial p_{kt}^a}$$

$$\frac{\partial q_{jt}^n}{\partial p_{kt}^n} = M^n \cdot \frac{\partial \widehat{s_{jt}^n}}{\partial p_{kt}^n}.$$

105. Using those, one can write the first-order conditions as

$$M^a s_{jt}^a + \sum_{l \in \mathcal{F}_f} (p_{lt}^a - mc_{lt}^a) M^a \frac{\partial \widehat{s_{lt}^a}}{\partial p_{jt}^a} + \sum_{l \in \mathcal{F}_f} (p_{lt}^n - mc_{lt}^n) M^n \frac{\partial \widehat{s_{lt}^n}}{\partial p_{jt}^a} = 0$$

and

$$M^n s_{jt}^n + \sum_{l \in \mathcal{F}_f} (p_{lt}^n - mc_{lt}^n) M^n \frac{\partial \widehat{s_{lt}^n}}{\partial p_{jt}^n} + \sum_{k \in \mathcal{F}_f} (p_{lt}^a - mc_{lt}^a) M^a \frac{\partial \widehat{s_{lt}^a}}{\partial p_{jt}^n} = 0$$

for $= 1, \dots, J$.

106. The derivatives $\frac{\partial \widehat{s_{jt}^a}}{\partial p_{kt}^a}, \frac{\partial \widehat{s_{jt}^n}}{\partial p_{kt}^n}, \frac{\partial \widehat{s_{jt}^a}}{\partial p_{kt}^a}, \frac{\partial \widehat{s_{jt}^n}}{\partial p_{kt}^n}$ can be obtained using the implicit function theorem. For this, we define the following matrix we wish to obtain

$$\hat{S} = \begin{pmatrix} \hat{S}^{nn} & \hat{S}^{an} \\ \hat{S}^{na} & \hat{S}^{aa} \end{pmatrix},$$

where the block $\hat{S}^{aa}$ is the matrix of marginal effects of advertising prices on advertising demand, $\hat{S}^{an}$ a matrix of marginal effects of advertising prices on newspaper demand, $\hat{S}^{nn}$ is a matrix of marginal effects of subscription prices on newspaper demand, and $\hat{S}^{an}$ .a matrix of marginal effects of subscription prices on newspaper demand, so that

$$\hat{S}_{jk}^{aa} = \frac{\partial \widehat{s_{jt}^a}}{\partial p_{kt}^a}$$

$$\hat{S}_{jk}^{nn} = \frac{\partial \widehat{s_{jt}^n}}{\partial p_{kt}^n}.$$

$$\hat{S}_{jk}^{na} = \frac{\partial \widehat{s_{jt}^a}}{\partial p_{kt}^a}$$

$$\hat{S}_{jk}^{an} = \frac{\partial \widehat{s_{jt}^n}}{\partial p_{kt}^n}$$

107. Define also the matrix

$$B = \begin{pmatrix} -I & N^{an} \\ N^{na} & -I \end{pmatrix},$$

where N^{na} is a matrix of externalities of readership on advertising and N^{an} is a matrix of externalities of advertising on readership (the one we assume to be equal to zero in the main text), such that

$$N_{jk}^{na} = \frac{\partial s_{jt}^{a}}{\partial q_{kt}^{n}}$$

$$N_{jk}^{an} = \frac{\partial s_{jt}^{n}}{\partial q_{kt}^{a}}.$$

108.   Finally, define the matrix

$$S = \begin{pmatrix} S^{n} & 0 \\ 0 & S^{a} \end{pmatrix},$$

where, as in the main text, S^{a}, is a matrix of marginal effects of advertising prices on advertising demand and S^{n} is a matrix of marginal effects of subscription prices on newspaper demand.

109.   By the implicit function theorem

$$\hat{S} = \begin{pmatrix} \hat{S}^{nn} & \hat{S}^{an} \\ \hat{S}^{na} & \hat{S}^{aa} \end{pmatrix} = B^{-1}S = \begin{pmatrix} -I & N^{an} \\ N^{na} & -I \end{pmatrix} \begin{pmatrix} S^{n} & 0 \\ 0 & S^{a} \end{pmatrix},$$

which shows that such derivatives exist if the matrix B is non-singular and therefore invertible.

110.   One can then define, as before, a Nevo (2001)-type ownership matrix Ω^{*}, such that $\Omega_{jr}^{*} = 1$ if products j and r are owned by the same firm, 0 otherwise, and also define interactions between those and the ownership matrix, $\Omega^{S^{na}}$, $\Omega^{S^{an}}$, $\Omega^{S^{aa}}$ and $\Omega^{S^{nn}}$, such that:

$$\widehat{\Omega}_{jr}^{S^{aa}} = \Omega_{jr}^{*} \cdot \hat{S}_{jr}^{aa}$$

$$\widehat{\Omega}_{jr}^{S^{nn}} = \Omega_{jr}^{*} \cdot \hat{S}_{jr}^{nn}$$

$$\widehat{\Omega}_{jr}^{S^{an}} = \Omega_{jr}^{*} \cdot \hat{S}_{jr}^{an}$$

$$\widehat{\Omega}_{jr}^{S^{na}} = \Omega_{jr}^{*} \cdot \hat{S}_{jr}^{na}$$

111.   Using these one can rewrite the first-order conditions as

$$s^{a} + \widehat{\Omega}^{S^{aa}}(p^{a} - mc^{a}) + \widehat{\Omega}^{S^{an}}(p^{n} - mc^{n}) = 0$$

and

$$s^{n} + \widehat{\Omega}^{S^{nn}}(p^{n} - mc^{n}) + \widehat{\Omega}^{S^{na}}(p^{a} - mc^{a}) = 0,$$

where, as before, $s^{a}, s^{n}, p^{n}, p^{a}, mc^{n}$, and mc^{a} are all $J \times 1$ vectors of market shares, prices, and marginal costs for newspapers and advertisements, respectively.

112.   To solve this system of equations for the unknown $(p_{t}^{a} - mc_{t}^{a})$ and $(p_{t}^{n} - mc_{t}^{n})$ define

$$\widehat{\Omega} = \begin{pmatrix} \widehat{\Omega}^{S^{aa}} & \widehat{\Omega}^{S^{an}} \\ \widehat{\Omega}^{S^{na}} & \widehat{\Omega}^{S^{nn}} \end{pmatrix},$$

$$s_t = \begin{pmatrix} s_t^a \\ s_t^n \end{pmatrix}$$

and

$$(p_t - mc_t) = \begin{pmatrix} p_t^a - mc_t^a \\ p_t^n - mc_t^n \end{pmatrix}.$$

113. Using this we can write the first-order conditions as

$$s_t + \widehat{\Omega} \cdot (p_t - mc_t) = 0$$

and solve for

$$(p_t - mc_t) = -\widehat{\Omega}^{-1} s_t.$$

114. Finally, one can obtain marginal costs by subtracting the estimated mark-ups from the observed prices, as

$$mc_t = p_t - (p_t - mc_t).$$

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