Antitrust in two-sided markets: Is competition always desirable?

The case of a satellite broadcasting network with monopoly power

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Abstract

The main objective of antitrust interventions is to assure competition in markets to benefit consumers. This paper challenges this common approach by examining the case of a satellite broadcasting network with monopoly power. First, Satellite TV is identified as a two-sided market. It is then analyzed in the framework of the canonical model for two-sided markets developed by Rochet & Tirole (2004). The main finding is that the satellite network maximizes his profits by choosing a price formation which maximizes the overall welfare of all market participants. Even if the satellite network uses his monopoly power to introduce a fee to receive satellite TV, it would do so only until the semi-elasticity of the amount of consumers in regard to the per-interaction-price equals the one of the TV stations – exactly the point where welfare is maximized. It is therefore concluded that antitrust cases have to take a more in-depth look at two-sided markets before deciding that competition is best for consumers.

Keywords: Antitrust, two-sided markets, broadcasting, welfare.

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1. Introduction

The main focus of antitrust interventions is on the likely effect on competition and the main goal is to sustain competitive markets.[1] However, a subset of markets exists where competition is not always beneficial to welfare: two-sided markets. A two sided market emerges when there is demand for transactions between two groups of people but they cannot interact with each other. It is characterized by the necessity of an intermediary between the groups of end users.

The optimal prices in two sided markets do not necessarily equal marginal costs as the Lerner condition states (Lerner, 1934; Evans, 2003, p.193). Hence, an intermediary with monopoly power does not inevitably lead to a reduction in welfare. For example, Rochet & Tirole (2003) show the price structure of a platform with monopoly power facing linear demand curves in a two-sided market is identical to that of a benevolent “Ramsey”.

This paper examines the case of a satellite broadcasting network with monopoly power in the framework of a two-sided market and argues that it will not use this power to the disadvantage of consumers as his profits and overall welfare is maximized at the same point: when the semi-elasticity of the amount of consumers in regard to the per-interaction-price equals that of the TV stations. An antitrust authority should take this finding into account when evaluating the potential introduction of a fee to receive TV via satellite as was planned (but not accomplished) in 2006 in Germany.

Section 2 of this paper points out the main characteristics of two-sided markets and introduces the canonical model of two-sided markets developed by Rochet & Tirole (2004). Section 3 identifies the market for TV broadcasting as a two-sided market and adopts the canonical model to deduce the price structure which maximizes profits for a platform with monopoly power and shows that it equals the welfare optimal price structure. Section 4 highlights the limitations of the analysis and concludes that antitrust cases in two-sided markets should take a more in-depth look at the effect of market power before deciding that competition is always best for consumers.

[1] See for example the horizontal merger guidelines of the U.S. Department of Justice and Federal Trade Commission (DOJ & FTC, 1997).

2. The Framework of Two-Sided Markets

Research regarding two-sided markets is relatively young but emerging (for example: Armstrong 2006; Evans, 2003, 2006; Kohlschein 2005; Parker & Alstyne, 2005; Reisinger, 2004; Rochet & Tirole, 2002, 2003, 2004, 2006; Schmidtke, 2006). Thematically, the literature is closely related to the literature branch of networks and network externalities[2] and to the literature of price formation (Rochet & Tirole, 2004, p. 3). In the theory regarding the network externalities (e.g. Katz & Shapiro, 1985), the price structure is abstracted from the analysis (Rochet & Tirole, 2003, p. 993), because it is irrelevant for profits and market efficiency under the assumptions of the Coase theorem (Rochet & Tirole, 2004, p. 1). In the theory of price formation, externalities are disregarded. Two-sided markets lie between these two strands of literature and connect them with each other (Rochet & Tirole, 2003, p.993).

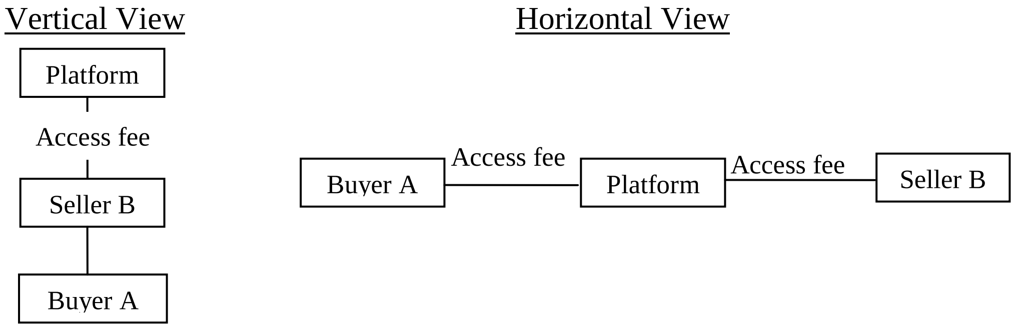
This section first characterizes and defines two-sided markets. Afterwards, the canonical model of two-sided markets, developed by Rochet & Tirole (2004), will be introduced and then gets applied to the market of TV broadcasting in section 3.

2.1 Characteristics of Two-Sided Markets

On the one hand, two-sided markets (and multi-sided markets respectively) are characterized by an intermediary, whose platform is necessary for transactions between different groups of end users, for example buyers and sellers (Evans 2003). The end users do not have direct contact and therefore cannot bargain with each other. The intermediary interacts with both parties and is situated between them. The conveyed transactions raise the utility of the end users and the intermediary gets paid for enabling them.[3] Contrary to the common vertical view on market, in which the platform is only in contact with one side, a horizontal view of the market evolves (see figure 1).

[2] The origin of the term „network externality“ lies in the telecommunications industry and describes advantages of compatibility of the users of one network, for example the telecommunication network, which depend considerably on the amount of other users in the network (Adams, 2004).
[3] The reservation utility of the end users is zero, so their utility in using the platform has to be higher than the demanded fee by the intermediary.

Figure 1: Vertical and Horizontal View on a Market with a Platform



Source:On the basis of Rochet & Tirole, 2004, p.5, and 37

On the other hand, a two sided market is characterized by the attempt of the intermediary to get both sides "on board" by optimizing the structure of the access fees. The attribute "optimal" implies, that the breakup of the fees between the end users is not neutral to the result as the Coase theorem suggests. This non-validity of the Coase theorem is given, when the end users cannot allocate the resources efficiently through bargaining (Rochet & Tirole, 2004, p. 14), for example because of missing bargaining options (they do not have contact with each other as the market is anonymous), information asymmetries, or transaction costs. It is a necessary, but not sufficient, condition for a two sided market (Rochet & Tirole, 2004, p. 10).

In two-sided markets the network effects and therefore the utility of a member of one side of the market depends on how many users act on the other side of the platform (Armstrong, 2006). Hence, network effects do not (only) occur in between the members of one group of end users but (also) between the different groups of end users. Thus, two sided markets are characterized by *indirect* network effects (Evans, 2003, p. 192). These indirect network externalities would not be (completely) internalized without an intermediary (Rochet & Tirole, 2004, p. 3). Two-sided markets therefore differ from the traditional view of classic microeconomics (Rochet & Tirole, 2003, p. 991), in which externalities are internalized by the end users.

In combination with the non-neutral effect of (re)allocation of resources, the internalization of the externalities between the groups of end users accounts for the main task of the intermediary: The formation of prices for the different user groups.[4] This task consists of the definition of the profit mechanism[5] for both sides of the market. That means configuring the fraction and the extent of a fixed, z^f, and a variable fee, z^v, for both groups of end users. It is important to note that the fees for both sides of the market can differ. In an extreme case, it could even be beneficial to charge a negative fee for one side of the market, meaning to subsidize it.[6]

2.2 Definition of two sided-markets

A market is two-sided, if a platform is necessary for transactions between market participants and the volume of conducted transactions between the market participants depend on the price structure for using the platform. Technically, let T be the amount of transactions between two groups of market participants and z the total of charged fees for using the platform. For z holds: $z \equiv z^A + z^B = const.$ Let A and B describe two different groups of market participants and T be a function of z: $T \equiv f(z)$.

A market then is one-sided, if:

$$\frac{\partial T}{\partial z^A} = 0 \text{ and } \frac{\partial T}{\partial z^B} = 0$$

and two-sided, if:

$$\frac{\partial T}{\partial z^A} \neq 0 \text{ and } \frac{\partial T}{\partial z^B} \neq 0$$

In the following, the canonical model of Rochet & Tirole (2004) is introduced. It provides the framework for the analysis of the broadcasting market in section 3.

[4] If the end users could internalize these indirect network effects on their own, the intermediary would not be necessary.
[5] For the term profit mechanism, or „Ertragsmechanik“, see Knyphausen-Aufseß & Meinhardt, 2002, p.76.
[6] One example is the market for credit cards, in which the users have to pay a fixed fee for their credit card, but get a variable bonus or payback for using the card.

2.3 The canonical model of two-sided markets

After defining two sided markets and highlighting their characteristics in the last subsection, now the mathematical, so called "canonical", model of two sided markets by Rochet & Tirole (2004) is introduced.[7] This model is afterwards used to picture the market for broadcasting and evaluating the effect of market power.

To begin with, consider a single platform, *P*, which connects both sides, $i \in [A, B]$, of a market and has monopoly power. Payments between the end users are not possible. Per member of each market side, *i*, *P* incurs fixed costs in extent of F^i and per transaction variable costs in extent of V^i. The members of both sides of the market are heterogeneous regarding their average variable utility of transaction, u_v^i, *a*nd their fixed utility, U_f^i, which represents the costs of accessing the platform and, hence, is negative.[8]

The end users pay a fixed membership fee, z_f^i, as well as a variable user fee, z_v^i. For simplification, assume that the sum of the transactions equals the product of the amount of members of both sides of the market: $T = N^A * N^B$. The utility of a member of one side of the market is then:

$$(1)\ U^i = (u_v^i - z_v^i)\, N^j + U_f^i - z_f^i\,,$$

whereat N^j describes the amount of users of the other side of the market. The amount of users on side i is:

$$(2)\ N^i = Pr(U^i \geq 0)\,,$$

Let the per-interaction-price be defined as:

[7] Most of this subsection referst to Rochet & Tirole (2004), pp. 20-26.
[8] It would be possible to add a positive component to the fixed utility, representing, for example, the positive feeling of belonging to a group. But this would be irrelevant to the results of the model, and, hence, such a positive fixed utility is disregarded in this framework.

$$(3)\ \ p^i \equiv z_v^i + \frac{z_f^i - F^i}{N^j}.$$

After inserting (3) into (1) and transforming[9], the demand function for N^i is the following:

$$(4)\ N^i = Pr(u^i + \frac{U_f^i - F^i}{N^j} \geq p^i) \equiv D^i(p^i, N^j)\ .$$

Note that the demand function only depends on the amount of members on the other side of the market, N^j, and the per-interaction price, p^i. The solution of equation (4) in equilibrium is characterized by the amount of members of both groups, N^A and N^B, as functions of p^A, p^B: $N^A = n^A(p^A, p^B)$ *and* $N^B = n^B(p^A, p^B)$.

The profit of the platform, π, is derived by the following function:

$$(5)\ \ \pi = (z_f^A - F^i)N^A + (z_f^B - F^B)N^B + (z_v^A + z_v^B - V)N^A N^B$$

and can be transformed to:

$$(6)\ \ \pi = (p^A + p^B - V)n^A(p^A, p^B)n^B(p^A, p^B)$$

The all round price, $p = p^A + p^B$, is given, so that the optimal price structure can be derived by maximizing the volume of transactions, T:

$$T(p) = \max\{n^A(p^A, p^B)n^B(p^A, p^B)\}; \text{ under condition } p = p^A + p^B$$

The total price is set by the standard Lerner formula:

$$(7)\ \ \frac{p - V}{p} = \frac{1}{\eta},$$

whereat $\eta \equiv -\frac{pT'(p)}{T(p)}$ is the price elasticity of the transaction volume. The *optimal price structure* is obtained, when the derivations of the transaction volume with re-

9 $p^i \equiv z_v^i + \frac{z_f^i - F^i}{N^j} \iff z_v^i = p^i - \frac{z_f^i - F^i}{N^j}$ inserted in (1) yields: $U^i = (u^i - p^i + \frac{z_f^i - F^i}{N^j})*N^j + U_f^i - z_f^i \geq 0 \iff u^i - p^i + \frac{U_f^i - F^i}{´N^j} \geq 0$ $\iff u^i + \frac{U_f^i - F^i}{´N^j} \geq p^i$.

spect to the prices for both sides of the market equal[10]:

$$(8)\quad -\frac{1}{p-V}=\frac{\frac{\partial n^A}{\partial p^A}}{n^A}+\frac{\frac{\partial n^B}{\partial p^A}}{n^B}=\frac{\frac{\partial n^B}{\partial p^B}}{n^B}+\frac{\frac{\partial n^A}{\partial p^B}}{n^A}$$

Note that only the semi-elasticities are relevant, because the total price is given and only the price structure is of concern. The derivatives of n^A und n^B are given by the total differentials of N^A and N^B in equation (4):

$$(9)\quad \frac{\partial n^A}{\partial p^A}=\frac{\frac{\partial D^A}{\partial p^A}}{1-\frac{\partial D^A}{\partial N^B}\frac{\partial D^B}{\partial N^A}},\ \frac{\partial n^B}{\partial p^A}=\frac{\frac{\partial D^B}{\partial p^B}}{1-\frac{\partial D^B}{\partial N^A}\frac{\partial D^A}{\partial N^B}},$$

whereat the equations for $\frac{\partial n^B}{\partial p^B}$ and $\frac{\partial n^A}{\partial p^B}$ are symmetric. Using equations (8) and (9), and multiplying them with $(1-\frac{\partial D^A}{\partial N^B}\frac{\partial D^B}{\partial N^A})$, yields a direct dependence of the optimal price structure on the demand functions D^A and D^B:

$$(10)\quad -\frac{1-\frac{\partial D^A}{\partial N^B}\frac{\partial D^B}{\partial N^A}}{p-V}=\frac{\frac{\partial D^A}{\partial p^A}}{D^A}+\frac{\frac{\partial D^A}{\partial p^A}\frac{\partial D^B}{\partial p^A}}{D^B}=\frac{\frac{\partial D^B}{\partial p^B}}{D^B}+\frac{\frac{\partial D^B}{\partial p^B}\frac{\partial D^A}{\partial p^B}}{D^A}$$

Equation (10) can be simplified in two special cases: (1) No fixed utitlity/costs exist, technically $U_f^i = F^i = 0$, implying that end users are heterogeneous only in their transaction utility, u_v^i, and (ii) end users of each site only differ in respect to their fixed utility, U_f^i, and are homogeneous in their variable utility of transactions, u_v^i.

Regarding special case (1): Using equation (4) it can be shown that, under the assumption of $U_f^i = F^i = 0$, $\frac{\partial D^i}{\partial N^j}=0$ is true. Equation (10) then can be simplified to:

[10] In Rochet und Tirole (2004) the negative algebraic sign in equation (7) is missing. However, this mistake is rectified in their paper from 2006.

$$(11)\ -\frac{1}{p-V}=\frac{\frac{\partial D^A}{\partial p^A}}{D^A}=\frac{\frac{\partial D^B}{\partial p^B}}{D^B}.$$

With $\eta^i \equiv -\frac{\frac{p\partial D^i(p^i)}{\partial p^i}}{D^i}$ it follows:

$$(12)\ \frac{p^i-V}{p^i}=\frac{1}{\eta^i}.$$

If fixed costs and fixed utility for the end users are absent, the loss of a transaction on side *i* due to an increase in p^i leads to opportunity costs in the extent of $V - p^j$. The optimal price structure is then:

$$(13)\ \frac{p^i-(V-p^j)}{p^i}=\frac{1}{\eta^i}.$$

The optimal price structure of the special case (ii) is for this paper not important enough to offset the complexity of its derivation. Hence, the optimal price structure for homogeneous variable utility of a transaction for all end users is just mentioned at this point[11]:

$$(14)\ \frac{p^i-(-u^j)}{p^i}=\frac{1}{\eta^i}.$$

3. TV Broadcasting as a Two-Sided Market

In section 2 two-sided markets were defined and their major characteristics were presented. In addition the canonical model of two sided markets developed by Rochet und Tirole (2004) was introduced. Building on this preparation, this section focuses on the welfare effect of a fee to receive satellite TV. First, the market of TV broadcasting is identified as a two-sided market and modeled according to the canonical model. With this help, the condition is elaborated under which the introduction of a fee to receive satellite TV is increasing welfare.

[11] For the derivation see Rochet und Tirole (2004) p. 24f.

3.1 Modeling the Market for TV Broadcasting

The market for TV broadcasting persists of the broadcasting networks as platforms, *P*, the TV stations, *TV*, and the consumers, *C*. The broadcasting networks act as an intermediary for the transactions between the TV viewers and the TV stations. The consumers and the TV stations do not interact directly and therefore have no opportunity to balance out potential inefficiencies. Hence, the allocation of resources in form of the price structure is not neutral and plays a major role in this market. Regarding the above definition in section 2.2, the TV broadcasting market is a two-sided market and the canonical model for two-sided markets, introduced in section 2.3, can be applied.

Assume only one satellite broadcasting network, *S*, exists and other broadcasting networks, especially cable networks, can be disregarded. The latter is justified by the high sunk costs in form of installation costs the consumers face when they want to switch platforms, also called switching costs. This gives the satellite network some scope for changing prices without losing customers to cable networks, at least in the short run and/or for small increases in prices. The reason for disregarding other competitors in the submarket of satellite broadcasting is that the model would otherwise get highly complex without deepening the insights as the results are nearly identical (Rochet & Tirole, 2004, p. 998).[12] For an analysis of competing platforms in two-sided markets, see Armstrong (2006), which may be of particular interest for the market of TV broadcasting as it accounts for multi-homing[13].

The consumers acquire the utility, β, if they watch a TV show. The amount of watched shows depends on the amount of TV stations, N^{TV}, on the platform and therefore on the utility of the TV stations on the other side of the platform. In addition, they pay a fixed z_f^C, and a variable, z_v^C, fee to the platform and also fixed installation- and maintenance costs of their receiver technology in the extent of C^C. According to equation (1) the consumers get a utility of:

[12] Rochet & Tirole even mention: „The following analysis is complex [… and …] can be skipped in a first reading“ (Rochet & Tirole, 2003, p. 1002).

[13] Multi-homing means that one market side is engaged on more or even all platforms and the decision to join one platform is independent on the decision to join another one. This is true for the broadcasting market, as most TV stations can be received via all broadcasting platforms.

$$(15)\ U^C = (\beta - z_v^C) N^{TV} - z_f^C - C^C .$$

The TV stations produce TV shows of any kind with fixed costs in the extent of C^{TV}, send these via the platform to the consumers, and pay the platform a fixed, z_f^A, and a variable fee, z_v^B. For each transaction with a consumer (every time a consumer is watching one of their shows) they receive the advertising income α.[14] This income depends on the amount of consumers, N^B, and therefore on the utility of the consumers on the other side of the platform. According to equation (1) the utility of all TV stations, U^A, amounts to:

$$(16)\ U^{TV} = (\alpha - z_v^{TV}) N^K - z_f^{TV} - C^{TV} .$$

The satellite broadcaster receives the fees from the consumers and the TV stations and has to pay fixed costs to maintain its network in the extent of C^S. Fixed costs per member of the platform as well as variable costs per transaction do not occur ($V = F^i = 0$). Hence, the following utility/profit function for S evolves according to equation (5):

$$(17)\ U^S = z_f^C N^C + z_f^{TV} N^{TV} + (z_v^C + z_v^{TV}) N^C N^{TV} - C^S .$$

The per-interaction-price is defined using an analog approach to equation (3):

$$(18)\ p^C \equiv z_v^C + \frac{z_f^C}{N^{TV}} \text{ und } p^{TV} \equiv z_v^{TV} + \frac{z_f^{TV}}{N^C} .$$

The numbers of consumers and TV stations on the platform derive from equations (2) and (4):

$$(19)\quad \begin{aligned} N^C &= \Pr(U^C \geq 0) = \Pr(\beta + \frac{C^C}{N^{TV}} \geq p^C) \equiv D^C(p^C, N^{TV}) \text{ and} \\ N^{TV} &= \Pr(U^{TV} \geq 0) = \Pr(\alpha + \frac{C^{TV}}{N^C} \geq p^{TV}) \equiv D^{TV}(p^{TV}, N^C) . \end{aligned}$$

The solution of equation (17) is characterized in equilibrium by the number of members on both sides of the market, N^C and N^{TV}, as functions of p^C and p^{TV}:

[14] The assumption of the canonical model is that there are no negotiations and no payments between the end users of a platform. Therefore, pay TV and some kinds of public TV stations, which for example exist in Germany, are out of the scope of the model in this paper.

$N^K = n^K(p^K, p^{TV})$ and $N^{TV} = n^{TV}(p^K, p^{TV})$. The profit of *S* can then be stated analog to equation (6):

$$(20)\ U^S = (p^C + p^{TV})n^C(p^C, p^{TV})n^{TV}(p^C, p^{TV})\,.$$

Using a similar approach as in section 2, the following optimal price structure evolves:

$$(21)\ -\frac{1-\dfrac{\partial D^C}{\partial N^{TV}}\dfrac{\partial D^{TV}}{\partial N^C}}{p} = \frac{\dfrac{\partial D^C}{\partial p^C}}{D^C} + \frac{\dfrac{\partial D^C}{\partial p^C}\dfrac{\partial D^{TV}}{\partial p^C}}{D^{TV}} = \frac{\dfrac{\partial D^{TV}}{\partial p^{TV}}}{D^{TV}} + \frac{\dfrac{\partial D^{TV}}{\partial p^{TV}}\dfrac{\partial D^C}{\partial p^{TV}}}{D^C}$$

Now assuming that besides non existing fixed costs per member of the platform, there are no (more) fixed fees for consumers and TV stations to join the platform[15], the end users only differ in regard to their variable utility α and β and the assumptions of special case (i) are met. Analog to section 2, the optimal price structure for the satellite network is then:

$$(22)\ \frac{p^i - (V - p^j)}{p^i} = \frac{1}{\eta^i}, \text{ with } \eta^i \equiv -\frac{\dfrac{p\partial D^i(p^i)}{\partial p^i}}{D^i},$$

whereat $V = 0$ is assumed (see above) so that:

$$(23)\ \frac{p^i - (-p^j)}{p^i} = \frac{1}{\eta^i}\,.$$

3.2 Is Monopoly Power Harmful to Consumers?

The model in this paper examines a market where the satellite broadcasting network has monopoly power: It is the only network in the submarket for satellite broadcasting and the high switching costs to other standards allow him to change prices, at least to some degree, without losing consumers to other platforms like cable TV. [16] From an antitrust perspective it is now interesting if this market power of the satellite broadcasting network is harmful to consumers. This was, for example, the case

[15] Consumers as well as TV stations already have paid there one-time fixed costs to join the platform in form of buying the technical equipment. Hence, in the moment of the analysis this assumption seems to be reasonable as there are no more fixed fees for existing end users.

[16] Fees to receive TV are only possible with digital signals due to the technology of quadrature signals, which are based on the idea of complex numbers (Lyons, 2004). If the signal is analog, no fee can be charged because it is technically not possible to encrypt it.

in 2006 in Germany when the satellite broadcasting network SES Astra tried to introduce a fee to receive TV via satellite (FAZ 2006a). However, they dropped that intention because the German antitrust authority (“Bundeskartellamt”) revealed that it will intervene (FAZ 2006) and the case never went to court.

Until now, people in Germany do not pay fees to receive TV via satellite; technically: $p^C = 0$. This means that everybody watches TV shows as long as his utility of consuming is larger than his opportunity costs[17] and he already owns a TV (which is true for 92% of all households in Germany[18]). The question is, if a satellite broadcasting network with monopoly power would introduce a fee for consumers with the intention to absorb consumer rent and the effect of decreasing the overall welfare. To estimate this, consider the situation of a benevolent legislator, a “Ramsey”, who maximizes the overall welfare, U. [19] U consists of the aggregated utility functions of all involved parties. To aggregate the utility functions of the consumers and the TV stations, equations (15) and (16) have to be multiplied with N^C and N^{TV}, respectively. As the satellite network is the only platform in the model, equation (17) can be employed directly. The overall welfare function is then:

$$(24)\quad U = U^K N^K + U^{TV} N^{TV} + U^S = \beta N^{TV} N^K - C^K N^K + \alpha N^K N^{TV} - C^{TV} N^{TV} - C^S .$$

U has to be maximized in dependence of p^C under the condition of $p = p^K + p^{TV} = const.$ This condition is necessary to implement the canonical model of Rochet and Tirole. However, in an antitrust case the fee introduced for the consumers would not completely passed through to the TV stations as the platform wants to absorb some of the rent. Therefore, as is often the case in complex models, the outcome highly depends on the assumptions. It is suggested that further research modifies the model by implementing a non-constant overall price.

If the condition of constant overall prices, then the introduction of a fee for the con-

[17] Hopefully, everybody is correctly estimating his opportunity costs and also those of his children.

[18] In 2006 35.30 of 38.1 million households (~92%) had access to watching television (ARD, 2009; Bundesinstitut für Bevölkerungsforschung, 2004, p. 69).

[19] The Ramsey approach equals the one of the integrated person in the discipline of law and economics. This is a theoretical construct to help finding the optimal solution (in this case the welfare optimum) in situations where the actions of individuals affect others (externalities). The real situation at hand can then be compared to the optimal solution. If the real situation is suboptimal, the toolbox of law and economics is used to search for legal rules which lead to a situation which is closer to the optimum. For a more in-depth description of the integrated person, see Adams, 2004, p. 66ff. (here in comparison to the costs-by-cause principle).

sumers reduces the fee for the TV stations by the same amount: $\Delta p^{C} = -\Delta p^{TV}$. The condition for an increased welfare by an introduction of a fee to receive satellite TV is correspondingly:

$$(25)\ \frac{\partial U}{\partial p^{C} \partial p^{TV}} = \frac{\beta \partial N^{TV} N^{C}}{\partial p^{C}} + \frac{\alpha \partial N^{TV} N^{C}}{\partial p^{TV}} \geq 0 \text{, or rather:}$$

$$(26)\ -\frac{\beta \partial N^{TV} N^{C}}{\partial p^{C}} \leq \frac{\alpha \partial N^{TV} N^{C}}{\partial p^{TV}}.$$

Equations (25) and (26), respectively, show that welfare is maximized when the transaction volume $T = N^{TV} * N^{C}$ is maximized. The change in T with varying p^{C} and constanttotal price, p, depends on the semi-elasticities of the number of consumers and TV stations in relation to p^{C} und p^{TV}.[20] If the semi-elasticity of the number of consumers with respect to p^{C} is smaller than the one of the TV stations, the introduction (or increase) of a fee to receive satellite TV increases overall welfare. This is true until the semi elasticities equal each other.

From the perspective of the satellite broadcasting network, the optimal structure of the fees is reached, as shown in equation (21), when the semi-elasticities equal each other – exactly the point where the transaction volume and welfare are maximized. This can also be illustrated graphically (see figure 2). In conclusion: No matter how much market power a satellite broadcasting network has, it would not choose a price structure which is not optimal to welfare. This holds true for the assumption that the total price for all end users is constant ($p = p^{C} + p^{TV} = const.$). The economic reason behind is that platforms have an incentive to internalize all (indirect) network externalities. This incentive is also an argument to maximize the transaction volume even if the platform could increase prices for one side without passing them through to the other side ($p \neq const.$).

If there is competition in the market, the outcome could be different. One idea to implement competition is to incorporate a hotelling procedure (Hotelling, 1931) with high address costs into the model. However, this is beyond the scope of this

[20] The advertising income of the TV stations per consumer, α, is here assumed to be constant. However, this is not quite correct, as the marginal advertising revenues often depend on the number of viewers. But the assumptions seems to be reasonable, as in praxis α is most often fixed over an interval.

paper and it is recommended that future research addresses this issue.

Figure 2: The effect of a fee to receive satellite TV on the number of consumers and TV stations on a satellite network

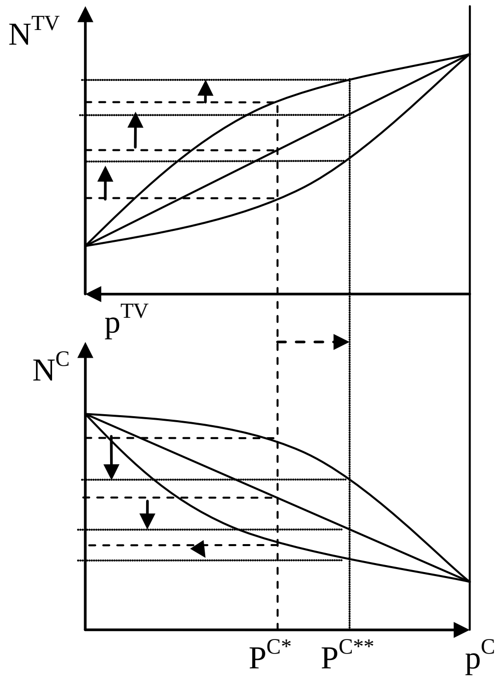


Figure 2 shows different effects of an increase in the fee to receive satellite TV from p^{C*} to p^{C**} on the number if consumers and TV stations using the platform (satellite network) in relation to their price elasticity. Note that not the sum but the product of the number of consumers, N^C, and TV stations, N^{TV}, matters for the overall welfare, U.

U is maximized when the semi-elasticities equal each other. This corresponds to the profit maximum of the satellite network as shown in equation (21).

Assumption: $p = p^C + p^{TV} = const.$

4. Conclusion

This paper challenges the common assumption of antitrust law that competition is always beneficial for consumers and overall welfare. Its focus is on two sided markets and, in particular, on a satellite broadcasting network with monopoly power. The framework of analysis is the canonical model for two-sided market, developed by Rochet & Tirole (2004).

After identifying the market for television broadcasting as a two-sided market with consumers on one side and TV stations on the other, it is shown that a satellite broadcasting network maximizes his profits by choosing a price structure where the semi-elasticity of the amount of consumers in regard to the per-interaction-price equals that of the TV stations. This is exactly the point where the transaction volume and overall welfare is maximized. Thus, even a platform with high monopoly power would not deviate from the welfare optimal price structure. However, this result might change if competition is introduced and should be investigated in further research.

The assumption, and correspondingly the limitation, of this analysis is a constant total price. This means that the platform can only shift fees from one side of the market to the other but cannot increase the sum of the prices. Therefore, it cannot be stated that monopoly power in two-sided markets is always beneficial. However, it can be concluded that market power in two-sided market is not (always) harmful and competition not (always) the preferred option. Hence, antitrust cases in two-sided markets should take a more in-depth look at the effect of market power before deciding that competition is always best for consumers and should be backed by all means.

References:

Adams, M. (2004): *Ökonomische Theorie des Rechts: Konzepte und Anwendungen*, 2. Aufl., Frankfurt.

Anderson, S.P. & Coate, S. (2005): *Market Provison of Braodcasting: A Welfare Analysis*, Review of Economic Studies, Vol. 72, pp. 947-972.

ARD (2009): *Medien Basisdaten*, http://www.ard.de/intern/basisdaten/empfangssituation/technische_20reichweiten/-/id=54848/1hwge2l/index.html, 10/19/2010.

Armstrong, M. (2006): *Competition in Two-Sided Markets*, RAND Journal of Economics, Vol. 37, No. 3, pp. 668–691.

Bundesinstitut für Bevölkerungsforschung (2004), *Bevölkerung*, Wiesbaden.

Coase, R. H. (1960): The *Problem of Social Cost*, Journal of Law and Economics Vol. 3, pp. 1–44.

DOJ & FTC (1997), 1992 Horizontal Merger Guidelines, by the U.S. Department of Justice and Federal Trade Commission, http://www.ftc.gov/bc/docs/horizmer.shtm, 10/19/2010.

Evans, D. S. (2003): *Some Empirical Aspects of Multi-sided Platform Industries*, Review of Network Economics, Vol. 3 (2), pp. 191-209.

Evans, D. S. (2006): *Two Sided Platforms and Analysis of Single-Firm Conduct*, http://www.ftc.gov/os/comments/section2hearings/522292-00012.pdf, 10/19/2010.

FAZ (2006a): *Satellitenfernsehen soll von 2007 an Geld kosten. SES Astra plant Verschlüsselung im Digitalfersehen / ARD und ZDF ziehen nicht mit*, in: Frankfurter Allgemeine Zeitung, No. 51, 03/01/2006, p. 13.

FAZ (2006) *Pro Sieben gibt Satellitengebühr auf. Widerstand des Kartellamts / Zukunft des Projekts fraglich*, in Frankfurter Allgemeine Zeitung, No. 284, 12/06/2006, p. 16.

Hotelling, H. (1931): *The Economics of Exhaustible Resources*, Journal of Political Economy, Vol. 39, pp 137-175.

Katz, L., und Shapiro, C. (1985), *Network Externalities, Competition, and Compability,* American Economic Review, 75 (3), pp. 424-440.

Knyphausen-Aufseß, D. zu, und Meinhardt, Y. (2002): *Revisiting Strategy: Ein Ansatz zur Systematisierung von Geschäftsmodellen,* in Bieger, T. et al. (ed.), Zukünftige Geschäftsmodelle: Konzepte und Anwendungen in der Netzökonomie, Berlin, pp. 63-89.

Kohlschein, I. (2004): *Economic Distortions Caused by Public Funding of Broadcasting in Europe,* http://www.fep.up.pt/conferences/earie2005/cd_rom/Session%20II/II.M/_financing.pdf , 10/19/2010

Lerner, A. (1934): *The Concept of Monopoly and the Measurement of Monopoly Power,* Review of Economic Studies, Vol. 1, pp. 157-175.

Lyons, R. G. (2004): *Understanding digital signalling Processing*, New Jersey.

Parker, G. G., und Alstyne, M. W. V. (2005): *Two Sided Network Effects: A Theory of Information Product Design*, Management Science, Vol. 51 (10), pp. 1494-1504.

Reisinger, M. (2004): *Two-Sided Markets with Negative Externalities,* Münchener Wirtschaftswissenschaftliche Beiträge, Vol. 2004-27.

Rochet, J.-C., und Tirole, J. (2002): *Cooperation among competitors: some economics of payment card associations*, Rand Journal of Economics, Vol. 33 (4), pp. 549-570.

Rochet, J.-C., und Tirole, J. (2003): *Platform Competition in Two-Sided Markets*, Journal of the European Economic Association, Vol. 1 (4), pp. 990-1029.

Rochet, J.-C., und Tirole, J. (2004): *Two-Sided Markets: An Overview*, https://noppa.tkk.fi/noppa/kurssi/s-38.4043/luennot/S-38_4043_prexam_article.pdf, 10/19/2010.

Rochet, J.-C., und Tirole, J. (2006): *Two-Sided Markets: A Progress Report*, The RAND Journal of Economics, Vol. 37, No. 3, pp. 645-667.

Schmidtke, R. (2006): *Two-Sided Markets with Pecuniary and Participation Externalities*, CESifo Working Paper No. 1776.