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Who are the advertisers?

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Who Are the Advertisers?

By
Tore Nilssen and Lars Sørgard

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Department of Economics
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Who Are the Advertisers?[*]

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Abstract:

We seek to explain why TV advertising is dominated by a few product categories. We apply a model of the TV industry that encompasses both the product markets and the market for TV viewers to discuss who will advertise on TV. Under the assumption that viewers dislike advertising, entailing a contagion effect in advertising, we find that less profitable firms not only will advertise less than highly profitable firms but will choose not to advertise at all. (77 words)

*This is a revised version of parts of our previous paper, "TV Advertising, Programming Investments, and Product-Market Oligopoly". We are indebted to Philippe Cyrenne, Ted Frech, Jean Gabszewicz, Laurent Linnemer, and seminar participants at the Universities of Calgary, California-Berkeley, California-Santa Barbara, and Colorado, at Northwestern University and Copenhagen Business School, and at the 2000 meetings of CEA (Vancouver), EEA (Bolzano), and EARIE (Lausanne), for helpful comments. Part of this research is financed by the Norwegian Competition Authority and the Norwegian Ministry of Government Administration through SNF (The Foundation for Research in Economics and Business Administration). Part of Nilssen's research was done during a visit at the Haas School of Business at the University of California, Berkeley. Part of Sørgard's research was done during a visit at the Department of Economics at the University of California, Santa Barbara. The hospitality of the two institutions, as well as travel grants from the Research Council of Norway and the U.S.-Norway Fulbright Foundation for Educational Exchange, are gratefully acknowledged.

1. INTRODUCTION

TV advertising is dominated by only a few product categories.[1] In this paper, we apply a version of the model developed in Nilssen and Sørgard (2001) to discuss why this is so. We find that a dislike among viewers of advertising, entailing a contagion effect of advertising, make advertising disproportionately more interesting for firms in high-profitable industries than for others, to the extent that firms in low-profitable industries abstain from TV advertising altogether.

A basic feature of our model is that viewers are attracted to a TV station that invests in programming, while at the same time they dislike TV advertising. A TV station, on the other hand, earns its revenues by selling advertising slots to producers in the product market and attracts viewers for this advertising by investing in programming. Since an increase in the amount of advertising tends to reduce the number of TV viewers, there are *diminishing returns to TV advertising*. In addition, there is *congestion in TV advertising*: The more one producer advertises its own products on a particular TV channel, the fewer viewers are available there for other producers to advertise to.

The model we present in Nilssen and Sørgard (2001) focuses on the effect a TV station's investments in programming have on its number of viewers: In this respect, the model differs from much of the traditional literature on the TV industry, summarized by Owen and Wildman (1992). This literature views the number of viewers instead as a

[1]In the US in 1999, for example, TV advertising for automobiles accounts for almost one fifth of all advertising on TV. The top six product categories add up to more than half of all TV advertising, according to *Advertising Age* (http://www.adage.com/dataplace/archives/dp394.html). At the firm level, the top 10 advertisers in the US in 1999 accounted for 25% of total advertising on network TV and 16% of the total on spot TV (own calculations based on data available at http://www.adage.com/dataplace/archives/-dp385.html and http://www.adage.com/dataplace/archives/dp386.html). Outside the US, there are cases of even higher concentration in the TV-advertising market. In Norway, for example, two corporations (Orkla and Landbruket, both selling food and other consumer goods) had in 1999 almost half the total advertising on TV2, the dominant TV-advertising channel; see http://www.propaganda-as.no/tekst.cfm?id =9420.

function of the rivaling TV stations' differentiation in their programming.[2] With a few notable exceptions, such as Anderson and Coate (2000), Gabszewicz et al. (2000), and Dukes and Gal-Or (2001), the choice of advertising on TV is not taken into consideration. Closer to our focus on the role of programming investments in determining the number of viewers are Motta and Polo (1997). In contrast to their analysis, however, we examine here, as well as in Nilssen and Sørgard (2001), how product-market competition affects the equilibrium outcome in the market for TV advertising. In the present analysis, we examine in particular the interplay between several different product markets. We find that firms in less profitable product markets not only advertise less but stay away from TV advertising altogether, as a result of the contagion effect of such advertising.

In Section 2 below, we present a version of the model introduced in Nilssen and Sørgard (2001). In this version, two TV stations compete by deciding on their amounts of programming investments and their prices of advertising, while the producers determine their demand for advertising and the product quantities. We observe that advertising in the two TV channels are complementary goods for the advertisers, and that TV channels' prices of advertising are strategic substitutes.

In Section 3, we introduce a model of product-market competition in order to see how characteristics of the product markets affect the equilibrium outcome.

In Section 4, we address the main question of this paper: How does the existence of several different product markets affect the TV industry? We analyze a case of two product markets that differ only with respect to the number of firms in each. We find that, in equilibrium, the firms operating in the less concentrated, and thus less profitable,

[2]See also our earlier contribution, Nilssen and Sørgard (1998), where TV stations choose both programs' contents and their time scheduling.

product market find advertising so unprofitable that they choose to abstain from advertising altogether, leaving advertising to the firms in the more profitable one.

In Section 5, we summarize our results and discuss a recent anti-trust case in the Danish TV industry.

2. THE MODEL AND ITS EQUILIBRIUM

Consider n advertising firms and a TV industry with two TV channels, where $n \geq 2$. The n advertising firms do not belong to the same product market. For now, we assume that the product markets are identical, so that firms are symmetric in terms of their gains from advertising; this symmetry assumption is lifted in Section 4.

The sequencing of decisions is straightforward. It is crucial that TV viewers make their decisions knowing the benefit they gain from each TV channel. Thus, TV channels' programming decisions, as well as advertising firms' advertising decisions, are made before TV viewers make their choices in our model. At the same time, the effect of advertising on the product markets is only felt after the advertising has been actually aired and watched by the viewers-consumers. Thus, product-market competition takes place after the TV viewers' decisions are made. Finally, we will assume that the advertising firms make their decisions about how much to advertise on each channel only after the TV channels have committed, not only their programming investments, but also to their prices of advertising. These considerations give rise to the following four-stage game:

Stage 1: Each TV station chooses its price of advertising and its investments in programming.

Stage 2: Each producer determines how much to advertise on each TV station.

Stage 3: Each viewer decides whether or not to watch TV and, if so, which TV station to watch.

Stage 4: The producers compete in the product markets.

As in Nilssen and Sørgard (2001), we represent a TV channel's decision on programming investments by the resulting attractiveness of the channel's programs. We will denote our measure of attractiveness by *quality*, in line with Motta and Polo (1997), despite, in practice, there being only a weak connection between the popularity and the quality of a TV program.

Since we are interested in finding the subgame perfect equilibrium of this game, we proceed by backward induction and start out with describing and analyzing stage 4.

Stage 4: The product market

In Section 3, we will discuss the product market in detail. For the moment, let us simply assume that a firm's profits, gross of advertising costs, are proportional to its level of advertising. Thus, in our model, there are constant returns to scale in advertising when the product market is viewed in isolation. As will be clear shortly, diminishing returns to advertising are introduced through the effect of advertising on TV viewers' behavior.

Let firm i's advertising on channel k be denoted a_{ik}. Define Z_{ik} as firm I's gross profit per viewer of channel k. The assumption we will stick to throughout is that the effect of advertising on profit is multiplicatively separable from other effects. To start with, we also assume that those other effects are the same for all advertising firms. In particular, we assume, for now, that there exists some $K > 0$ such that:

$$Z_{ik} = Ka_{ik}, \qquad (1)$$

While we, in this section, simply assume (1) to hold, we will, in Section 3, present a model of the product markets with the property that (1) holds in equilibrium. Later on, in Section 4, we will allow K to differ across product markets, although not across firms in the same market.

Stage 3: The viewers

At stage 3, viewers decide whether or not to watch a TV station. A typical viewer is attracted by the quality of TV programs but dislikes commercial breaks. In particular, we assume a channel's number of viewers to be increasing (decreasing) in own (rival's) program quality and decreasing (increasing) in own (rival's) number of advertising slots.

Specifically, let q_k denote program quality in channel k and define total advertising on channel k as $\alpha_k := \sum_i a_{ik}$. The *audience function* for TV station k, *i.e.*, the station's number of viewers, is:

$$v_k = [q_k - \alpha_k] - d[q_h - \alpha_h], \;\; d \in (0, 1), \;\; k, h \in \{1, 2\}, k \neq h. \qquad (2)$$

The parameter d captures the extent to which viewers switch TV station because of a difference in net program quality, $q - \alpha$.

This audience function introduces diminishing returns to a producer's advertising: The more a firm advertises on a TV station, the fewer viewers the channel has, and the lower gross profits the firm earns. But this feature also creates a congestion effect from advertising: The reduction in the number of viewers caused by one firm's advertising affects negatively not only this firm's but also other firms' advertising on the same TV station.

Stage 2: Producers choose advertising

When the producers in the product markets decide how much to advertise on each TV station, they play a congestion game: When one advertiser increases its advertising on a TV station, the number of viewers on this station is reduced for all its advertisers. Moreover, since viewers may switch between the TV stations as a result of differences in net quality, an advertiser may help its own (and all other advertisers') advertising on one channel by increasing its advertising on the other channel. This causes advertising on the two channels to be complementary goods [see Nilssen and Sørgard (2001, Prop. 1)].

Let r_k denote the price per advertising slot charged by channel k. Producer i has the following maximization problem at stage 2:

$$\underset{a_{i1},a_{i2}}{Max}\ \pi_i = \sum_{k=1}^{2} Z_{ik} v_k - \sum_{k=1}^{2} r_k a_{ik} = \sum_{k=1}^{2} (K v_k - r_k) a_{ik} \tag{3}$$

Total gross profits are the per-capita gross profits times the number of viewers. Producer i's advertising on the two channels is determined by the following first-order conditions:

$$\frac{d\pi_i}{da_{ik}} = K\left[\left(q_k - dq_h\right) - 2\left(a_{ik} - da_{ih}\right) - \left(\alpha_{-i,k} - d\alpha_{-i,h}\right)\right] - r_k = 0,\ k, h \in \{1, 2\},\ k \neq h.$$

where $\alpha_{-i,k} = \sum_{j \neq i} a_{jk}$.

In a symmetric equilibrium, this gives rise to a system of two equations, which we solve for a producer's demand for advertising in each channel:

$$a_k = \frac{1}{n+1}\left[q_k - \frac{r_k + dr_h}{K(1-d^2)}\right],\ k, h \in \{1, 2\}, \tag{4}$$

where a_k denotes a producer's demand for advertising on channel k. From this expression, we see that advertising on one channel is complementary to advertising on the other, and demand is decreasing in the prices.

Total advertising on channel k is simply

$$\alpha_k := na_k,\ k \in \{1, 2\}. \tag{5}$$

To see why advertising in the two channels are complements, note that an increase in the advertising price of one channel will decrease the amount of advertising there. This decrease in advertising makes the channel more attractive for viewers, and some viewers move over from the other channel. This reduction in the number of viewers on the other channel leads to a reduction in advertising in that channel as well.

Stage 1: TV stations choose advertising prices and programming investments

A TV station's profit is the difference between its revenue from advertising and its investments in programming. We model the latter as a cubic function of the program quality. TV station k's problem at Stage 1 is to maximize its profits with respect to its programming and its price of advertising.

As in other cases of price competition with complementary goods [Vives (1999, Sec. 6.3)], prices are strategic substitutes in this model. The profit of TV station k is:

$$H_k = r_k \alpha_k - \frac{q_k^3}{3}, \qquad k \in \{1, 2\}. \tag{6}$$

From (4) and (5), we find TV station k's residual demand for advertising as:

$$\alpha_k = \frac{n}{n+1}\left[q_k - \frac{r_k + dr_h}{K(1-d^2)} \right],\ k, h \in \{1, 2\}.$$

Inserting this into (6) and differentiating, we find that:

$$\frac{\partial^2 H_k}{\partial r_k \partial r_h} = -\frac{nd}{K(n+1)(1-d^2)} < 0.$$

Thus, the TV stations' prices are strategic substitutes.

The equilibrium outcome in a symmetric equilibrium can be found by solving the system of first-order conditions for the two channels. We find:

$$r = \frac{K^2 n(1-d^2)^2}{(n+1)(d+2)^2};$$

$$q = \frac{Kn(1-d^2)}{(n+1)(d+2)};$$

$$\alpha = \frac{n}{n+1}\left[q - \frac{r}{K(1-d)}\right] = \frac{Kn^2(1-d^2)}{(n+1)^2(d+2)^2};$$

$$v = (1-d)(q-\alpha) = \frac{Kn(1-d)^2(d+1)[(d+1)(n+1)+1]}{(n+1)^2(d+2)};$$

$$H = r\alpha - \frac{q^3}{3} = \frac{K^3 n^3 (1-d)^4 (1+d)^3}{3(n+1)^3 (d+2)^4};$$

$$\pi = \frac{\alpha(Kv-r)}{n} = \frac{K^3 n^2 (1-d)^3 (1+d)^2}{(n+1)^4 (d+2)^4}.$$

3. THE PRODUCT MARKETS

We extend the basic model to take into account the rivalry in the product markets. We stick, in this Section, to the assumption that product markets are identical. In the next Section, we relax this assumption by letting product markets differ with respect to the number of firms.

There are a total of m product markets, with f firms in each, $m \geq 1$ and $f \geq 2$, so that the total number of advertisers is: $n = mf$. Furthermore, we assume that the products sold in each market are identical, and we let p denote the price per unit. By way of normalization, we set production costs equal to zero.

An interesting aspect of the model we present here is that a firm's advertising in equilibrium affects its sales only, not the price. Although product prices are not affected by the amount of advertising, they are affected by the number of firms in each market. Let each viewer of TV station k have the following individual inverse demand in each product market:

$$p_k = 1 - \frac{1}{B} \sum_i \left(\frac{y_{ik}}{a_{ik}} \right), \tag{7}$$

where y_{ik} is the per-capita quantity offered by firm i to viewers of TV station k, with $Y_k := \sum_i y_{ik}$ being the total sales in each product market. The parameter B can be interpreted as a scale parameter. Recall that a_{ik} denotes producer I's advertising on channel k.

This formulation allows a firm's advertising to affect demand: The more a producer advertises, the less sensitive is the market price to an increase in its offered quantity. However, despite the heterogeneity created in cases of asymmetric advertising, the product sold in this market is homogeneous, in the sense that there is one price per market segment for all firms. For the sake merely of analytical convenience, we also allow here for product prices to differ according to which TV station the consumers are.

The per-capita gross profits of firm i among the viewers of channel k now amount to [see Nilssen and Sørgard (2001)]:

$$Z_{ik} = K a_{ik} = \frac{B}{(f+1)^2} a_{ik}. \qquad (8)$$

Thus, *K*, the marginal gross profits per viewer with respect to a firm's advertising, is a specific decreasing function of the number of firms in the product market.

We are now in a position to investigate how the equilibrium outcome detailed in Section 2 is affected by a change in the number of advertisers, *n*. This number may increase, either through an increase in the number of firms in each market, *i.e.*, a decrease in market concentration throughout the economy, or through an increase in the number of product markets. By inserting the expression for *K* found in (8) above, we find that the effect of increasing the number of advertisers on the equilibrium outcome depends crucially on which way the increase happens.

$$\frac{\partial x}{\partial f} < 0 < \frac{\partial x}{\partial m}, \quad x \in \{r, q, \alpha, v, H, \pi\}.$$

Total spending on advertising *increases* as a result of a reduction in the number of firms, keeping constant the number of product markets. There are two opposing forces at work here. On the one hand, a reduction in the number of firms makes each remaining firm more concerned about the fact that own advertising tends to reduce the number of viewers. This dampens the incentive for each firm to increase advertising and would, all else equal, result in a reduction in total advertising. On the other hand, fewer firms result in a higher price-cost margin. This encourages firms to advertise more. The latter effect turns out to dominate, and it is reinforced by the TV stations' responses. They invest more in programming, thereby attracting more viewers and even more advertising. The result is that both total advertising and total investment in programming increase following a reduction in the number of firms.

Note also that the total number of viewers increases following a reduction in the number of firms. Since advertising increases as well, which tends to reduce the number of viewers, the driving force behind this result is the TV channel's increased investment in programming. Finally, note that the price per advertising slot also increases. This follows directly from the fact each TV channel's two choice variables mutually reinforce each other [see Nilssen and Sørgard (2001) on this reinforcement property].

However, total spending on advertising can also *increase* as a result of an increase in the number of advertising firms, if this latter increase is solely due to an increase in the number of product markets. In such a case, price-cost margins are unaffected by a change in the number of firms. Now, an increase in the number of firms makes each firm less concerned about own advertising's effect on the number of viewers. This spurs an increase in total advertising. Again, the TV channels' response reinforces the initial effect. They invest more in programming, thereby increasing the total advertising even more.

4. WHO ARE THE ADVERTISERS?

In reality, the product markets that advertising firms operate in differ, particularly with respect to profitability. In order to get an understanding of the importance of this asymmetry, we extend our model further to consider a case of two product markets, with marginal gross profits K_1 and K_2, respectively, and with the numbers of firms equal to f_1 and f_2. The total number of advertising firms is now $n = f_1 + f_2$.

At stage 2, solving for the firms' demand for advertising in the two channels, invoking symmetry among firms in each market, involves a system of four equations. Let

now a_{ik} denote the amount of advertising on channel k demanded by each firm in market i, $i, k \in \{1, 2\}$. Under the assumption that all firms advertise in equilibrium, we find:

$$a_{ik} = \frac{1}{f_1 + f_2 + 1}\left[q_k - \frac{K_j\left(f_j + 1\right) - K_i f_j}{K_i K_j\left(1 - d^2\right)}\left[r_k + dr_h\right]\right], \qquad (9)$$

$$i, j \in \{1, 2\},\ i \neq j,\ k, h \in \{1, 2\},\ k \neq h.$$

In the symmetric case of $f_1 = f_2$ and $K_1 = K_2$, we are back to equation (4).

Interestingly, asymmetry may cause firms in one of the markets to have a demand for advertising that is increasing in price. An inspection of the above expression reveals that this happens for firms in market i when

$$\frac{K_i}{K_j} > \frac{f_j + 1}{f_j}.$$

The right-hand side of this condition is greater than 1. Advertising can therefore only increase in price among firms in the more profitable product market, and it will always be decreasing in price in the other market. Thus, the firms in the less profitable product market invariably respond to a price increase with a decrease in their advertising demand. This decrease reduces the congestion of advertising, since the reduced advertising attracts more viewers. If the firms in the more profitable product market have a sufficiently high profitability relative to the other firms, then the negative impact of a price increase is more than compensated by the increased inflow of viewers following the other firms' reduction in advertising.

As the above condition indicates, there does not have to be much asymmetry between the product markets for this phenomenon to occur. In order to be specific, let us

consider the case of Cournot competition, discussed in Sec. 3, in which $K_i = B/(f_i + 1)^2$, $i \in \{1, 2\}$. We have:

Proposition:

Suppose there are two product markets, with f_1 and f_2 firms each, respectively, and Cournot competition in each market. If $f_1 > f_2$, so that market 2 is the more concentrated one, then:

(i) Conditioned on all firms advertising, the demand for advertising is decreasing in price in market 1 but increasing in price in market 2.

(ii) In equilibrium, only firms in the more concentrated market 2 advertise.

Proof: (i) The demand for advertising on channel k from each firm in market i now becomes, from (9):

$$a_{ik} = \frac{1}{f_1 + f_2 + 1}\left\{q_k - \frac{(f_j + 1)\left[(f_i + 1)^2 - f_j(f_j + 1)\right]}{B(1 - d^2)}(r_k + dr_h)\right\}, \qquad (10)$$

$$i, j \in \{1, 2\},\ i \neq j;\ k, h \in \{1, 2\},\ k \neq h.$$

Inspection of the square-bracketed term in this expression reveals that advertising demand among firms in market i is decreasing in price if $f_i \geq f_j$, but is increasing if $f_i < f_j$, $i \neq j$. Of course, f_1 and f_2 can only take integer values. What need to be checked, therefore, is that the expression within square brackets is positive for $f_1 \geq f_2$ but negative for $f_1 \leq f_2 - 1$. As long as there is *any* asymmetry among the two markets, therefore, the firms in the more concentrated market have a demand for advertising that is increasing in price.

(ii) The proof is by contradiction. Suppose that all firms advertise in equilibrium. In stage 1, TV stations determine advertising prices and investments in program quality. Channel k now maximizes

$$r_k\left(f_1 a_{1k} + f_2 a_{2k}\right) - \frac{q_k^3}{3},$$

with a_{1k} and a_{2k} given in (10). Solving for the equilibrium values, still under the assumption that all firms advertise in equilibrium, we have:

$$r = \frac{B^2\left(f_1 + f_2\right)^3\left(1-d^2\right)^2}{\left[f_1\left(f_1+1\right)^2 + f_2\left(f_2+1\right)^2\right]^2\left(f_1+f_2+1\right)\left(d+2\right)^2},$$

$$q = \frac{B\left(f_1 + f_2\right)^2\left(1-d^2\right)}{\left[f_1\left(f_1+1\right)^2 + f_2\left(f_2+1\right)^2\right]\left(f_1+f_2+1\right)\left(d+2\right)}.$$

Inserting these back into the expression in (10) for advertising by each firm in market i, we obtain (dropping the subscript k because of symmetry):

$$a_i = \frac{B\left(f_1 + f_2\right)^2\left(1-d^2\right)\left[f_1\left(f_1+1\right)^2 + f_2\left(f_2+1\right)^2 + f_j\left(f_j - f_i\right)\left(f_1+f_2+1\right)\left(f_1+f_2+2\right)\left(d+1\right)\right]}{\left[f_1\left(f_1+1\right)^2 + f_2\left(f_2+1\right)^2\right]^2\left(f_1+f_2+1\right)^2\left(d+2\right)^2} \tag{11}$$

We can again make use of f_1 and f_2 being integers: While the above expression is clearly positive if $f_j \geq f_i$, it is negative for any combination of fs such that $f_j \leq f_i - 1$. To verify this, it suffices to show that the expression is negative for $f_1 = f$ and $f_2 = f - 1$. Substituting this into the crucial square-bracketed term in the numerator of the expression in (11), we find that the latter now equals $-f[f(2f + 1)(2d + 1) - 1]$, which is negative for any $f \geq 1$. Since advertising cannot be negative, the above cannot be an equilibrium, except in the symmetric case. *QED.*

The firms in the product market with many firms choose not to advertise in equilibrium. The driving force is that the product price is lower in the market with many firms, and those firms generate a lower revenue from advertising on TV than what is the case for the firms in the product market with few firms. The firms in the market with many firms respond to an increase in the price of advertising by reducing their demand for advertising. This reduces the congestion of advertising on TV and attracts new viewers. More viewers induce the firms in the market with few firms to advertise more. The TV stations exploit the 'perverse' demand curve of those firms by increasing their prices of advertising. In equilibrium, the price of advertising is set so high that the firms in the market with many firms decide not to advertise at all.

The result highlights an important aspect of the link between the market for viewers, the market for TV advertising, and the product markets: When viewers dislike advertising, there are negative externalities among advertisers. These negative externalities may magnify even small asymmetries among advertisers to such an extent that only the more profitable ones find it in their interest to do any advertising.

5. CONCLUDING REMARKS

The economic literature on advertising has been slow on modeling the market for advertising. The present contribution aims at filling this gap, by presenting a model of the market for advertising that incorporates some crucial features of the TV industry, the main provider of advertising space.

Most importantly, we assume that viewers are attracted by TV channels' investments in programming but dislike their advertising. Combining this model of the TV industry with a model of product-market competition with advertising, we are able to discuss how asymmetries between various product markets affect the equilibrium outcome. We find that even small asymmetries have dramatic effects. In the case of two product markets where one product market has more firms than the other, but where the markets otherwise are identical, the firms in the product market with many firms choose not to advertise.

The crucial feature of our model producing this result is TV viewers' dislike for advertising, entailing congestion among advertisers. At an increase in the price of advertising, the firms in the market with many firms would, as expected, reduce their demand for advertising. This would, in turn, reduce the congestion of advertising on TV and thereby attract more viewers. The firms in the market with few firms would respond to an increase in the number of viewers by increasing their demand for advertising, despite the price of advertising having increased. The TV stations exploit those firms' 'perverse' demand by increasing their price so that, in equilibrium, the firms in the market with many firms decide not to advertise at all on TV.

Let us apply the insight we have gained from our model to discuss a recent antitrust case in Denmark. The antitrust authorities in Denmark (Konkurrence Styrelsen) decided in November 2000 that TV2, a large TV station financed by advertising, had to change its pricing policy on TV advertising.[3] Until then, TV2 had quantity discounts on TV advertising. The antitrust authorities argued that this led to an unequal treatment of small and large advertisers on TV, where small advertisers were treated less favorable

than large advertisers. We have argued that it would be in the interest of each TV channel to end up with a few, large advertisers. One way to achieve such an outcome would be to do exactly as TV2 has done. It has implemented a price system that makes it very difficult for small advertisers to find advertising on TV profitable. However, our model suggests that such an outcome would prevail even with a ban on quantity discounts. So even if we can understand that TV2 would prefer to practice a pricing system that with certainty leads to few advertisers on TV, we predict that the initial outcome – with few advertisers – would also prevail in a non-discriminatory price system.

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[3]See http://www.ks.dk/konkuromr/afg/2000/11-29/tv2-cf.htm.