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The Effect of Entertainment in Newspaper and Television News Coverage

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Abstract

In this paper, we analyze the equilibrium amount of entertainment in news coverage of newspapers and television stations. We find that a shift in the inclination to read, expressed by a shift in the (psychological) distance costs, induces both media outlets to incorporate more entertaining elements in news coverage. The introduction of commercial television, however, which leads to a unilateral fall in the distance costs to the television broadcast, yields different results. It induces a negative effect on the profits of both media outlets, and increases price competition. Furthermore, the newspaper offers less while the television channel offers more entertainment. Overall, this leads to a marginalization of informational content, as the television channel gains market shares at the expense of the newspaper.

JEL Classification: D72, L13, L82

1 Introduction

Media use has increased substantially in the past decades. Although individuals devote more of their time budget to media use, traditional media like newspapers have to compete harder for the attention of the consumers. Moreover, with respect to contents, news coverage has to compete with entertainment formats that satisfy the need of consumers for leisure and fun. Journalists often quote the saying "if it bleeds, it leads", which implies that a piece of news has to be sensational in order to become a lead article or broadcast, as pure and objective information is uninteresting to most consumers.[2]

With the introduction of commercial television, the media market faced structural changes that increased the number of platforms on the market, which means that the number of alternatives to informational contents has also increased. It is conventional wisdom that media coverage in general became more sensational and entertainment-oriented in the wake of this process. The question is whether this also holds true for news coverage.

The focus of this paper is twofold: In the benchmark case of our model, we take a look at the competition between different media types by analyzing the strategic interaction of a newspaper and a television station when it comes to incorporating entertaining elements in news coverage. In the comparative statics part of the model we investigate how two different exogenous shocks affect the equilibrium outcome of the model.

First, we take a look at a shift in consumer preferences such that audio-visual media become more popular relative to print media. This shock is modelled as a shift in the psychological per unit distance costs a consumer has to incur when choosing a medium that does not exactly meet his preferences with respect to the desired amount of entertainment in news coverage. We assume that the decrease in distance costs to the audio-visual medium equals the increase in distance costs to the print medium such that the average distance costs remain the same. This shift in preferences can be interpreted as a declining inclination to read, and we find that it leads to both media outlets incorporating more entertaining elements into news coverage. The prices as well as the market shares and profits of the newspaper decrease, whereas prices, market shares and profits of the television station increase.

The second scenario investigates whether a unilateral fall in the distance costs to the television station that decreases the average distance costs induces news coverage in news-

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[2]Among others, Östgaard (1965) shows that negativity and entertainment value are the most prominent news factors that guarantee that a piece of information makes it to the news. A similar argument is made in psychology studies, like in the one of Baumeister et al. (2001), who show why individuals are more interested in negative than in positive information.

1

papers and television broadcasts to provide more entertaining elements. This may be interpreted as the effect of the introduction of commercial television. In contrast to the previous scenario, we find that the newspaper specializes in objective news coverage, and serves the smaller part of the market, whereas the television broadcast becomes more entertainment-biased, serving the larger part of the market. However, price competition increases, which leads to declining profits of both media outlets.

The media economics literature has so far focussed mainly on political economy issues, showing that a deviation from neutral and truthful media coverage, or over-representation of certain groups or opinions may distort political outcomes. Besley and Prat (2006) analyze the effects of direct political control of media coverage, and Djankov et al. (2003) show that there is a positive relation between state owned media and poor government performance. Furthermore, there is a positive correlation between market power of a media outlet, and its impact on public opinion (Corneo (2006)). With respect to public spending, Strömberg (2001) and Besley and Burgess (2002) show that groups that are politically important or valuable to advertisers are favoured by politicians due to their being over-represented in media coverage or media exposure.

In contrast to the papers mentioned above, media bias has also been modelled explicitly.[3] There are two ways of influencing public opinion via biased coverage: One way is to slant news in a certain direction as shown by DellaVigna and Kaplan (2007), but there is also the possibility of biasing news by selecting certain topics as in the work of George and Waldfogel (2006).

We, in contrast, consider the possibility that media outlets deviate from neutral coverage just because consumers reward entertainment in news coverage. We do not consider the effects on public decision making and the political dimension. Therefore, we use an industrial organization framework to model competition between media outlets. The literature we are building on dates back to the seminal model by Hotelling (1929) that analyzes spacial competition between two firms. He describes a two stage game, where both a location and a pricing decision are made.

Various authors have modified this framework in order to generalize the assumptions. D'Aspremont, Gabszewicz, and Thisse (1979) found that the linear cost function Hotelling was using does not necessarily yield a solution in the pricing subgame, and introduced a quadratic cost function. This opened up many possibilities to extend the framework for instance by introducing more firms (Anderson et al. (1995), Economides (1993)), a non-uniform distribution of consumers over the characteristics space (Tabuchi and Thisse (1995)), or vertical instead of horizontal product differentiation (Mussa and Rosen (1986)).

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[3] See for instance Mullainathan and Shleifer (2005), Gentzkow and Shapiro (2006).

Anderson et al. (1997) show that the assumption of a uniform distribution of consumers over the characteristics space does not alter the results qualitatively. An extension of the standard horizontal differentiation setting that is similar to what we do in the comparative statics sections of our paper is the model by Nilssen (1997), who analyzes the effect of asymmetric transportation costs on equilibrium locations.

In this paper, the two strands of media economics and product differentiation literature are combined such that an industrial organization model is applied to model the competition between two media outlets. In contrast to the standard product diffentiation models mentioned above, we interpret the location of firms not in the spacial dimesion, but as the share of entertainment in news coverage. We adapt the sequence of the standard price-location game by letting both media outlets choose the optimal amount of entertainment in the first stage of the game, and prices in the second stage. Furthermore, we introduce asymmetric per unit distance costs of the consumers in order to model the accessability of the two media types.

The outline of the paper is as follows: Section 2 describes the model setup and the necessary assumptions. In Section 3 we analyze the equilibrium of the model with the symmetric benchmark in Section 3.1, the preference shifting effect in Section 3.2, and the unilateral decrease of the distance costs to the television channel in Section 3.3. Section 4 discusses the results, and Section 5 concludes.

2 Model setup

Two media outlets - a newspaper, indexed by N, and a television channel, indexed by T - compete by selling news coverage in the form of newspapers or television broadcasts to a continuum of n consumers. News can be purely objective or purely entertaining. Any mixture between these two extreme positions is feasible. The consumers are uniformly distributed on the interval $[0, 1]$ with unit density, and differ with respect to their preferences for the proportion of visual or emotional components, relative to cognitive or informative elements in news coverage.[4]

For simplicity, we subsume visual and emotional coverage under the term "entertainment". The degree of entertainment is defined by the number of news stories that feature entertaining elements of visualization and emotionalization relative to the total number of news stories, and is denoted by θ_i, $i \in \{N, T\}$, which can take any value of $\theta_i \in [0, 1]$. Both media outlets choose θ_i, which is defined as the distance to the left end of the market.

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[4]Roughly speaking, visualization is a means of entertainment that is often used by newspapers, whereas television broadcasts, being visual by nature, rather employ the means of emotionalization.

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Both media outlets have to choose whether they want to present news in a rather neutral or in an entertaining way, with $\theta_i = 0$ indicating completely neutral coverage without any entertaining elements, and $\theta_i = 1$ standing for the maximum amount of entertainment. Moreover, both media outlets compete in prices.

The game is modelled in two stages, where the choice of the amount of entertainment occurs in the first stage, and the Bertrand competition for prices takes place in the second stage of the game.

We first take a look at the equilibrium prices and the equilibrium amount of entertainment in news coverage, and whether both media outlets choose to specialize in entertaining news coverage versus neutral coverage, or if they choose an intermediate reporting strategy that pleases the pivotal consumer (Section 3.1). Our basic setup follows the model of spatial competition in a duopoly market à la Hotelling.

The newspaper as well as the television station are assumed to have no more than one platform on the market. This simplifying assumption is necessary in order to keep the analysis tractable.
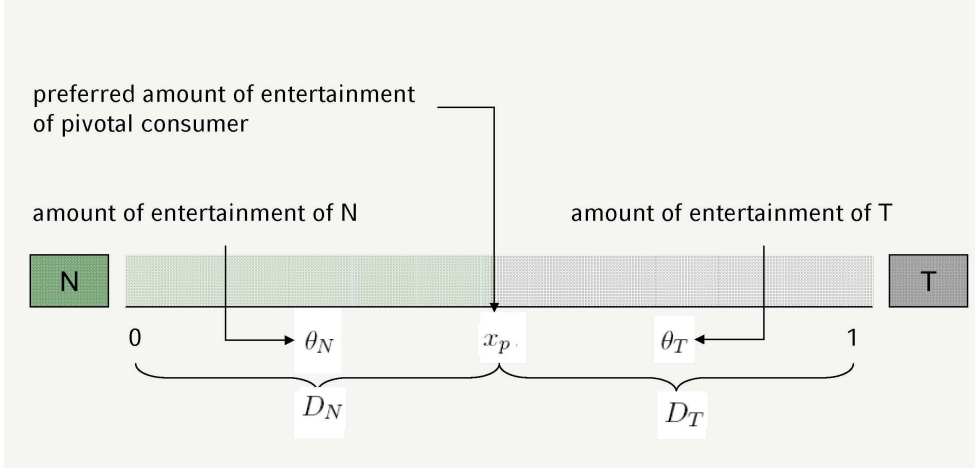
It is assumed that every individual buys precisely one unit. The utility of a consumer of type n consuming medium i is defined by

$$U_i^n = \bar{u} - k_i \left| x^n - \theta_i \right| - p_i \qquad \forall\, n, i \tag{1}$$

where $\bar{u}$ denotes the reservation utility of being informed about recent events, which is reduced by the price p_i, and by the distance between the amount of entertainment θ_i of medium i, and the preferred amount x_n of entertainment of consumer n, multiplied by the medium-specific distance cost parameter k_i.

The reservation utility $\bar{u}$ is the same for all individuals because neither newspaper readers nor television viewers consider themselves being less informed than their counterpart as each medium claims to inform consumers about the relevant news of the day.

As visualisation is a central means of entertainment in news coverage, and newspapers have more text than pictures while a television broadcast consists of visual contents by design, it is assumed that television broadcasts ceteris paribus tend to have a larger amount of entertainment than newspaper articles. Therefore, we can assume that $\theta_N \leq \theta_T$.

preferred amount of entertainment
of pivotal consumer

amount of entertainment of N   amount of entertainment of T

N $\quad\quad$ 0 $\quad\quad\quad$ θ_N $\quad\quad\quad$ x_p $\quad\quad\quad$ θ_T $\quad\quad$ 1 $\quad\quad$ T

$$D_N \quad\quad\quad\quad D_T$$

The variable $k_i \in (0,1]$ indicates that the cost of deviation per unit of distance may vary between both media which will be relevant for the comparative statics part of our model (Sections 3.2 and 3.3). The variable k_i represents the importance for consumers to consume a medium that offers an amount of entertainment close to their own preferences.

The comparative static analyses in the following sections show how two possible exogeneous shocks mirroring recent developments on the media market affect the choice of the amount of entertainment of the newspaper and the television channel. We first analyze the preference effect triggered by a shift of the distance costs (Section 3.2), and turn then to the unilateral fall of the distance costs to the television station that does not affect the distance costs to the newspaper (Section 3.3).

In our model, this is represented by comparative statics with respect to the distance cost parameter. We model the distance costs such that the distance between the preferred amount of entertainment of each consumer, and the amount of entertainment of the closest medium is weighed with a medium-specific factor k_i, that attributes weights to the distance. If, for instance, k_i is close to zero, the distance to the preferred amount of entertainment of a consumer has practically no influence on his utility, and thus on his decision which medium to choose. Therefore, the price is the only decisive variable.

In order to distinguish the two exogeneous shocks, we introduce the parameter e that either reduces the distance cost parameter to the television station, and is added to the distance costs to the newspaper (Section 3.2), or just reduces the distance costs to the television station without affecting the distance costs to the newspaper (Section 3.3). We then analyze how in either scenario the optimal amount of entertainment in news coverage of the two media outlets change, and how the corresponding prices, quantities, and profits react.

For instance, the cost of the deviation from the preferred amount of entertainment of

5

an individual with a small x^n can be interpreted as the cost of figuring out the objective pieces of news while non-objective news that might be appealing to entertainment oriented individuals is nothing but nuisance to him. On the contrary, an individual with a high x^n finds it costly to endure lengthy and detailed explanations instead of having a gripping headline associated with illustrative footage. These distance costs are the equivalent to the transportation costs in the standard Hotelling setting.

We now take a look at the decision of the pivotal consumer, indexed by p, whose utility from consuming either of the media can be found by substituting x^p into (1). The pivotal consumer is indifferent, if the utility from reading the newspaper equals the utility from watching news on television $\left(U_N^p = U_T^p\right)$:

$$\bar{u} - k_N \left(x^p - \theta_N\right) - p_N = \bar{u} - k_T \left(\theta_T - x^p\right) - p_T \tag{2}$$

Since each consumer buys exactly one media product, all consumers with a preferred amount of entertainment that is smaller than the preferred amount x^p of the pivotal consumer choose the newspaper. Solving this equation for x^p yields the demand for the newspaper:[5]

$$D_N \left(p_N, p_T\right) = \frac{k_N \theta_N + k_T \theta_T - p_N + p_T}{k_N + k_T} \tag{3}$$

Hence, the demand for the television channel is

$$D_T \left(p_N, p_T\right) = 1 - D_N \left(p_N, p_T\right) \tag{4}$$

Both media outlets maximize profits, given by

$$\Pi_i = D_i p_i - C \left(\theta_i\right) \tag{5}$$

where $C \left(\theta_i\right)$ denote the costs. The costs do not depend on the sold copies but only on the amount of entertainment. Hence we assume that the marginal costs of reaching one additional consumer are zero for both television channel and newspaper. The cost functions take the form of $C_N = a\theta_N^2$, and $C_T = a \left(1 - \theta_T\right)^2$, where $a \geq 1$, and can be interpreted as adjustment costs.

The newspaper has a comparative advantage when it comes to objective coverage, and has to incur costs when adding entertaining elements to news coverage. If we take the example of visualization, we can observe that this is costly as it requires the newspaper to

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[5]Non-existence of an equilibrium as in the original Hotelling model with linear utility in the characteristics space is not a problem in this model, as there are no discontinuous jumps in the demand function in the relevant parameter range of the distance cost parameter k_i.

send journalists on site in order to take pictures, or the newspaper has to buy pictures from a news agency. Either way, the costs are higher than in the case without visualization. Neutral news, on the contrary, do not require on-site material other than footage provided by news agencies.[6]

However, with respect to entertaining elements, the television station has a comparative advantage over the newspaper, and the costs of the television station increase when news become more objective and thus less entertaining. News broadcasts are typically very short. Therefore, it is costly to provide thorough and comprehensive background footage in order to make the broadcast informative and objective. Take, for instance, the example of expert knowledge as a means of objectivity: Experts statements might even be useless for a short broadcast due to their complexity. Lay people, however, typically may speak the same tongue as the general public, but are less qualified to talk about complicated issues. However, their statements may be very entertaining, despite being unobjective and most likely not neutral.

The convexity of the cost function comes from the fact that the accessability of footage is not constant for either medium. Taking again the example of visualization, for the newspaper, the costs of publishing an exclusive shot of a prominent politician is higher than the costs of photos of a local event. For the television station, the costs of covering a topic in an objective way increases with the complexity of the respective issue. The convexity of the adjustment costs results from the fact that each media outlet covers the pieces of news that are more accessible given its comparative advantage.[7]

We now analyze the equilibrium amount of entertainment of both media outlets as well as the corresponding prices, quantities and profits by solving the two stage game via backwards induction.

3 Model solution

3.1 The symmetric benchmark

In our benchmark case, we assume that $k_N = k_T = k$ with $k \in (0, 1]$. This implies that the consumers have equal per unit distance costs when choosing either of the media.

In the second stage, both media outlets simultaneously maximize profits (5) with respect to their respective prices, which yields the equilibrium prices as a function of θ_i. In

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[6]However, one could argue that neutral coverage requires more skilled journalists with higher wages. As these costs do not increase per article, we treat them as sunk costs. Therefore they do not enter our analysis.

[7]Note that the amount of entertainment is defined as the share of visual or emotional contents relative to objective and neutral contents.

order to solve the first stage of the game, we plug this result again into (5) and maximize the profits with respect to θ_i.

Substituting the optimal θ_i's into the reaction functions of the prices of the second stage of the game, and into (3) and (4), we obtain the following equilibrium prices and demands, with S indicating the symmetric equilibrium:

$$p_N^S = p_T^S = k \tag{6}$$

$$D_N^S = D_T^S = \frac{1}{2} \tag{7}$$

The equilibrium amounts of entertainment are

$$\theta_N^S = \frac{k}{6a} \qquad and \qquad \theta_T^S = 1 - \frac{k}{6a} \tag{8}$$

Substituting our result with respect to the prices and optimal amounts of entertainment into the profit function (5), we obtain

$$\Pi_N^S = \Pi_T^S = \frac{k}{2} - \frac{1}{a}\left(\frac{k}{6}\right)^2 \tag{9}$$

This yields

Proposition 1. *The prices as well as the profits of both media outlets increase if the distance cost parameter k becomes larger. The newspaper's amount of entertainment is negatively correlated with the adjustment cost parameter a, and positively correlated with the distance costs k. The reverse correlations hold for the television channel. Furthermore, an increase in the adjustment cost parameter a increases the profits of both media outlets.*

Proof: Follows from differentiating (6), 8), and (9) with respect to a and k, respectively.

An increase in the distance costs k makes the consumers' choices less elastic, and allows both media outlets to charge higher prices. This induces both media outlets to compete harder in the other dimension by moving to the center of the distribution, and thus decreasing product differentiation. As the distance costs increase, consumers have an increased preference for proximity, and the relative importance of price setting decreases. So both media outlets move to the center of the distribution until the incentive of the respective competitor to move towards the center and steal market shares is compensated for by the cost increase. As both media outlets behave symmetrically, they share the market equally.

The level a of the adjustment costs of the media outlets as such does not have direct effects on prices. This result may appear puzzling as an increase in a indicates higher costs per unit of distance for the media outlets. As the costs of moving towards the center of the distribution increase, both media outlets stay close to the endpoints, which implies that the degree of product differentiation increases.

As the profits of both media outlets increase, as the consumers' choices become less elastic (k increases), the effect of decreased price competition can dominate the cost increase due to decreased product differentiation. However, given that consumers become more indifferent with respect to their choice of medium, which can be expressed by a decrease of k, the reverse holds.[8]

As an increase in a leads to increased product differentiation without affecting price competition (see equation 6), both media outlets move away from the center of the distribution. This saves costs, which, in turn, leads to higher profits.

The main result of this simple analysis is that high distance costs of consumers increase the profits in the media industry. However, the elasticity of consumers may be different between newspaper and television, when we take the recent structural changes in the media market into account. In the following sections we analyze how our model reacts to exogenous shocks altering the general conditions on the media market.

3.2 The effects of a bilateral shift in consumer preferences

For this part of the analysis we drop the assumption of the distance costs being equal for both media outlets, and allow for different distance costs.[9] We analyze the changes induced by a shift in consumer preferences such that the distance cost parameter of the television channel k_T decreases by the amount e, with $k_T = k - e$, and $0 < e < k$. The distance cost parameter of the newspaper, however, increases by the same amount, which yields $k_N = k + e$. Thus, the average distance costs remain the same as in the symmetric benchmark.

One could for instance imagine that such a shift in consumer preferences is triggered by a decreasing inclination to read, which is met by an increased preference for watching television. For instance, the Audit Bureau of Circulation finds that, in 2009, the newspaper

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[8]Dropping the assumptions of $a \geq 1$ and $k \in (0, 1]$, we obtain the following results: The effect of an increase of k on profits is positive, as long as $k < 9a$. Note that there only exists an interior solution as long as $k < 3a$. Therefore, given that an interior solution exists, the effect of an increase of k on profits is positive.

[9]To our knowledge, Nilssen (1997) was the first to introduce asymmetric costs into a horizontal differentiation framework. As he considers three firms without costs of locating anywhere on the unit interval, our results are qualitatively different.

circulation in the U.S. has hit its lowest level in seven decades, which equals a loss of roughly 10 million readers since 1940 (Ahrens (2009)). In European countries, we observe a similar development: In Germany, for instance, the number of individuals claiming to read a newspaper on a daily basis dropped by 20 percentage points from 1980 to today (Schneller (2008)). However, Schneller finds that, since 1976, the share of individuals who watch television more than three hours a day rose by 30 percentage points to roughly one half of the total population.

This evidence indicates that there might be a shift in consumer preferences such that audiovisual media become increasingly popular, and the popularity of print media decreases. Given that there is such a shift, we now analyze how the amount of entertainment as well as the prices and profits of both media outlets react.

The solution of the game is as in Section 3.1: In the second stage, both media outlets maximize the profit function (5) with respect to prices. These reaction functions are again plugged into the profit function, which is maximized with respect to the equilibrium amount of entertainment in the first stage. Accordingly, we obtain the following equilibrium prices with the superscript pr denoting the preference effect:

$$p_N^{pr} = \frac{k \left(3a\,(e - 3k) + (e - k)^2\right)}{e^2 + k\,(k - 9a)} \qquad and \qquad p_T^{pr} = \frac{k \left((e + k)^2 - 3a\,(e + 3k)\right)}{e^2 + k\,(k - 9a)} \qquad (10)$$

Comparing these prices, we can see that the television channel charges higher prices than the newspaper. The corresponding amounts of entertainment are

$$\theta_N^{pr} = \frac{(e + k) \left(3a\,(e - 3k) + (e - k)^2\right)}{6a\,(e^2 + k\,(k - 9a))} \qquad (11)$$

$$\theta_T^{pr} = \frac{(e + k)^2\,(e - k) + 3a\left(e^2 + k\,(5 - 2\,(e + 9a))\right)}{6a\,(e^2 + k\,(k - 9a))} \qquad (12)$$

Plugging these results into the demand and profit functions (3, 4, and 5), we obtain the following equilibrium demands:

$$D_N^{pr} = \frac{1}{2} - \frac{e\,(2k - 3a)}{2\,(e^2 + k\,(k - 9a))} \qquad and \qquad D_T^{pr} = \frac{1}{2} + \frac{e\,(2k - 3a)}{2\,(e^2 + k\,(k - 9a))} \qquad (13)$$

with the television channel serving the larger part of the market.

For the equilibrium profits, we obtain:

10

$$\Pi_N^{pr} = \frac{\left(3a\left(e - 3k\right) + \left(e - k\right)^2\right)^2 \left(18ak - \left(e + k\right)^2\right)}{36a\left(e^2 + k\left(k - 9a\right)\right)^2} \tag{14}$$

$$\Pi_T^{pr} = \frac{\left(\left(e + k\right)^2 - 3a\left(e + 3k\right)\right)^2 \left(18ak - \left(e - k\right)^2\right)}{36a\left(e^2 + k\left(k - 9a\right)\right)^2} \tag{15}$$

where the television channel has higher profits than the newspaper.

We now examine what happens if the size of the shock increases, e.g. how the equilibrium outcome changes if e increases. An increase in e makes it c.p. more expensive for consumers to choose the newspaper over the television channel, as the distance costs to the television channel are reduced by e whereas the distance costs to the newspaper increase by e. Thus, we obtain

Proposition 2. *If e increases, both media outlets offer more entertainment. The television channel increases its price whereas the newspaper lowers its price. Nevertheless, the demand for the newspaper decreases, as do the profits. For the television channel, the effects on profits and prices are the reverse.*

Proof: Follows from differentiating (10), (11), (12), (13), (14), and (15) with respect to e, respectively.

The newspaper offers a higher amount of entertainment, thus incurring higher costs, and decreasing the degree of product differentiation, but lowers its price nevertheless. The television channel also offers a higher amount of entertainment, and saves costs by doing so, but increases its price.

As the newspaper has a comparative disadvantage with respect to the distance costs of the consumers due to the shift in preferences, the television channel can set a higher price and reduce its own costs by increasing the amount of entertainment. For the television channel, it is profitable to lose some market shares to the newspaper due to this strategy, as it still serves the larger part of the market despite the higher price. The cost advantage for the television is even large enough that this strategy pays off despite the fact that an increase in the amount of entertainment of the television channel reduces the uncontested hinterland at the right margin of the distribution. As a consequence, the profits of the television channel increase.

The newspaper, however, has to increase the amount of entertainment and lower the price in order to compensate for the fact that consumer have to incur a higher cost per unit of distance when choosing the newspaper over the television channel. By moving towards the center of the distribution, it increases the size of the hinterland at the left margin,

which still does not compensate for the loss of market shares. As the price as well as the demand for the newspaper is lower than before the shock, the profits decrease.

These results show that, given that the comparative disadvantage of one player is high enough, the other player is able to increase his profits by setting his price and the amount of entertainment accordingly. The higher the cost disadvantage with respect to distance costs of one player, the higher the profits of his opponent. However, the results are sensitive to how changes in the distance costs are modelled. An alternative scenario is presented in the following section.

3.3 The effects of unilaterally decreasing distance costs to the television channel

In the last section, we have analyzed the case where the average distance costs are unchanged and increased preferences for audiovisual coverage are met symmetrically by higher distance costs to the print medium. However, it is equally possible to think of situations where reduced distance costs to the television channel have no effect on the preferences for newspapers.

We now have $k_N = k$, and $k_T = k - e$, with $0 < e < k$, which implies that the sum of the distance cost parameters decreases. Therefore, we do not only take a look at a shift in preferences, but consider also the level effect that comes with the decrease of the average distance costs.

A case in point is the introduction of commercial television, where news coverage on television now has to compete directly with entertainment programs offered by the commercial television stations. Note, however, that we continue to assume the market for news coverage to be a duopoly even after commercial television enters the market. We think of commercial television as no news coverage and treat it therefore as entertainment content.[10] As our model is restricted to the market for news coverage, we still have only two players on the relevant market.

The intuition behind our assumption that $k_T < k_N$ is that the introduction of commercial television has changed the viewing habits of consumers such that they use television as a medium of entertainment rather than information, thus making television a more common medium among all groups of consumers. Before the introduction of commercial television, there was only a limited supply of broadcasts, most of which were informative

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[10]When we take a look at the media market in the United States for instance, this assumption is justified, as pay per view-channels and subscription television almost exclusively sell entertainment contents like for instance TV shows, movies, sports, or reality formats. This analysis reflects the U.S. media market rather than the media market in Germany, for instance, where commercial television also provides news coverage.

rather than entertaining. With TV shows, movies, sport games, and talk shows being aired on commercial television, watching television has become a leisure activity.

The reason for the distance costs to the television broadcast to decrease is that it has become cheaper for consumers to switch to a news broadcast before or after an entertainment broadcast on commercial television. In contrast, an increase in density has not occured in the newspaper sector.

We now analyze the optimal amount of entertainment for both media outlets, as well as the corresponding prices, quantities and profits, and repeat the derivation of the equilibrium by solving the game exactly as in the previous sections.[11] The superscript ct stands for the introduction of commercial television.

For the prices, we obtain the following equilibrium results:

$$p_N^{ct} = \frac{(e - 2k)\left(3a\left(3k - 2e\right) + \left(e - k\right)^2\right)}{(9a + e)\left(e - 2k\right) + 2k^2} \tag{16}$$

$$p_T^{ct} = \frac{(e - 2k)\left(3a\left(3k - e\right) + k^2\right)}{(9a + e)\left(e - 2k\right) + 2k^2} \tag{17}$$

As $p_T^{ct} > p_N^{ct} > 0$, the price of the television broadcast is higher than the price of the newspaper, and strictly larger than zero.

The equilibrium results for the amounts of entertainment are:

$$\theta_N^{ct} = \frac{k\left(3a\left(2e - 3k\right) + \left(e - k\right)^2\right)}{3a\left(\left(9a + e\right)\left(e - 2k\right) + 2k^2\right)} \tag{18}$$

$$\theta_T^{ct} = \frac{6a - k}{6a} + \frac{e\left(3a\left(2e - 5k\right) + ek\right)}{a\left(\left(9a + e\right)\left(e - 2k\right) + 2k^2\right)} \tag{19}$$

Also in this scenario, we still obtain an interior solution where $1 > \theta_T^{ct} > \theta_N^{ct} > 0$.

We now analyze how the choice of prices and amounts of entertainment affect the market shares by plugging our results into the demand and profit functions (3, 4, and 5). For the demands, we obtain the following expressions:

$$D_N^{ct} = \frac{3a\left(2e - 3k\right) + \left(e - k\right)^2}{(9a + e)\left(e - 2k\right) + 2k^2} \tag{20}$$

$$D_T^{ct} = \frac{3a\left(e - 3k\right) + k^2}{(9a + e)\left(e - 2k\right) + 2k^2} \tag{21}$$

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[11]Note that $a \geq 1$ just as in the symmetric benchmark. If we set $e = 0$, we obtain the same results as in Section 3.1.

The demands for both media products are strictly larger than zero, and can be added to one, where the television channel serves the larger part of the market than the newspaper $\left(D_T^{ct} - D_N^{ct} > 0\right)$.

We use the results above in order to obtain the following equilibrium profits:

$$\Pi_N^{ct} = \frac{\left(3a\left(2e - 3k\right) + \left(e - k\right)^2\right)^2 \left(9a\left(2k - e\right) + k^2\right)}{9a\left(\left(9a + e\right)\left(e - 2k\right) + 2k^2\right)^2} \tag{22}$$

$$\Pi_T^{ct} = \frac{\left(9a\left(e - 2k\right) + \left(e - k\right)^2\right)\left(3a\left(3k - e\right) + k^2\right)^2}{9a\left(\left(9a + e\right)\left(e - 2k\right) + 2k^2\right)^2} \tag{23}$$

The profits of the television channel are higher than the profits of the newspaper as it serves the larger part of the market at a higher price $\left(\Pi_T^{ct} - \Pi_N^{ct} > 0\right)$.

This yields

Proposition 3. *If the distance costs to the television channel decrease by e, and the distance costs to the newspaper are unaffected, the prices as well as the profits of both media outlets decrease. Product differentiation with respect to the amount of entertainment increases, and the television channel gains market shares at the expense of the newspaper.*

Proof: Follows from differentiating (16), (17), (18), (19), (20), (21), (22), and (23) with respect to e.

The effect of an average reduction of distance costs induces price competition to increase which implies that even the television channel has to cut prices.

The newspaper can either lower its price, or increase the amount of entertainment, in order to compensate for the fact that the television channel has become cheaper for consumers per unit of distance. In contrast to the previous section, where the distance costs of the newspaper increased, the newspaper can choose a dimension in which to increase competition in, and increases in price competition.

Due to the price setting behaviour of the newspaper, the television channel has to engage in price competition up to the point where the increase in market shares is offset by the decrease in prices. This already indicates that the reduction of the distance costs is not necessarily profitable for the television channel, either.

We now analyze whether competition in the other dimension has also increased by taking a look at the optimal amounts of entertainment. Again, the effects on the amount of entertainment in news coverage are qualitatively the same as in the symmetric case. The television channel provides more entertainment, and the newspaper becomes more objective.

14

Both media outlets choose the amount of entertainment such that the effect of the increased competition in prices is mitigated. By moving towards the margins of the distribution, and thus increasing product differentiation, both media outlets save adjustment costs, and reduce the intensity of price competition.

As the newspaper offers less entertainment, it becomes c.p. less attractive for the consumers from the center of the distribution to buy a newspaper. On the one hand, the newspaper has a smaller market share due to the reduction of the size of the hinterland, and on the other hand it is costly for the newspaper to attract consumers from the center of the distribution as this requires further price cuts. This results shows that the reduction in prices does not compensate for the shift towards less entertainment. Therefore the television channel gains market shares at the expense of the newspaper.

Intuitively, one would expect the increase in e to be an advantage for the television channel. In Section 3.2, where the distance costs of the newspaper increased by the same amount as the distance costs of the television channel fell, we found that the profits of the television channel indeed did increase. We now analyze whether this still is the case.

Given that the distance costs decrease bilaterally, or only for the television channel as in this section, both media outlets have to compete harder, and do this typically by increasing price competition, alongside increasing the degree of product differentiation. In this scenario, this results in a decrease of the profits of both media outlets.

The decrease in profits of the newspaper comes from the fact that it serves a smaller part of the market at a lower price. The saved adjustment costs, however, do not compensate for the price and demand reductions. For the television channel, the increase in market shares, and the cost reduction due to the higher amount of entertainment do not compensate for the price reduction. Therefore, the profits of the television channel also decrease.

This result shows that, with competition increasing, the profits of both media outlets are bound to decrease if consumers can substitute more easily between the two media, but also that none of the media outlets profits if the cost differential is small.

In the remaining part of the paper we discuss whether our approach could describe some effects on the media market, and we derive possible structural implications for news markets.

4   Discussion of the results

In the previous sections, we analyzed two scenarios that may be able to describe different shocks on the market for news coverage. While the demand effects are the same, our results with respect to prices, the optimal amount of entertainment and profits differ such that in

the case where the average distance costs decrease (Section 3.3), prices and profits increase while the degree of product differentiation increases with an increase of the cost asymmetry. In the case of equal average distance costs (Section 3.2), the amount of entertainment of both media outlets increase, as well as the prices and profits of the television channel, if the cost asymmetry becomes larger.

Some empirical evidence suggests that, with inter-media competition increasing, the prices of newspapers fall well under marginal costs (Blair and Romano (1993)), which is (at least partly) compensated for by advertising revenue. However, already in the 1980s, Bucklin, Caves and Lo (1989) show that many formerly profitable newspaper are disappearing from the market, which leads to increased market concentration, and the formation of monopolies in the local newspaper market. Alger (1998) argues that consolidation on the media market inevitably leads to more distortions in news coverage, initiating a downward spiral with respect to objectivity and news quality. This evidence supports the view that we might observe decreasing prices and an increased amount of entertainment in news coverage at least for the newspaper.

There is some evidence that different media are affected differently: A variety of empirical studies explore the changes in the way of news coverage in print and broadcasts. For instance, Krueger and Zapf-Schramm (2001) show that news are presented as "infotainment" in order to compete with new entertainment formats. This implies that news have to be simple and unambiguous, as shown by Berg and Ridder (2002). Graber (1984) finds that objective news were largely ignored or given only partial attention. In Graber´s study, individuals only described a piece of news as interesting, if it contained negative and sensational elements. Although not all these studies strictly assign television broadcasts to entertainment, and newspaper coverage to information, the trend towards a marginalization of informational content in print media is visible. This marginalization effect is crucial as it alters the relevance of newspaper news coverage, given that one defines relevance by circulation.

The demand effect is qualitatively the same in the scenarios of Sections 3.2 and 3.3, and is supported by some stylized facts. According to a study of the Pew Research Center (2004), almost 60 % of the American population claim to learn news about political and public affairs exclusively from local television. In 2008, even 70 % of the US citizens claimed local television to be their primary source of news (Pew Research Center (2009)). This shows that recent developments on the media market lead to an increase of market shares of television.

Furthermore, the studies of the Pew Research provide some evidence for two main assumptions of our model: Commercial television channels does not enter the market for

news, and exerts its influence only via affecting the other media indirectly. Moreover, the results strongly suggest that the introduction of commercial television affected viewership behaviour such that entertaining contents became more desirable (which is reflected by a decrease in the distance costs to the television channel).

In our model, we assume that market abstention is not allowed for. A study by the Veronis Suhler Stevenson institute (2003) shows that there is hardly any individual without media exposure, as, due to various media channels coming at a subscription fee or free of cost, most individuals watch the news or read a newspaper on a regular basis. In 2003, the average US citizen watched television 282 minutes a day, and read the newspapers for 47 minutes. The total amount of money US citizens spent on media use in 2003 was 178 billion US $ (Veronis Suhler Stevenson (2003)).

However, if we allow for market abstention, such that the individuals with a preference for entertainment that is lower or higher, respectively, than the amount of entertainment of the newspaper, or the television channel, can drop out of the market, the results of our comparative statics section are qualitatively the same, and we can distinguish between the two scenarios established in Sections 3.2 and 3.3.

As there is some evidence for both scenarios, we now attempt to find out which scenario is most likely to describe recent developments on the media market.

The main results of the preference effect (Section 3.2) are that both media outlets increase the amount of entertainment, which leads to an increase in profits of the television channel, and a loss of the newspaper. The price as well as the market shares of the television station increase, whereas both price and market shares of the newspaper decrease. However, these results build on the rather strong assumption that the distance costs to the television channel decrease by the same amount by which the distance costs to the newspaper increase.

In contrast, the main results of the decrease in average distance costs described in Section 3.3, which can be interpreted as the introduction of commercial television, leads to an increase of product differentiation such that each medium specializes in its core competences. For television channels, this is entertainment, whereas newspapers originally focus on transmission of information. The already more objective newspaper decreases the amount of entertainment even further, and, as the television station serves the larger part of the market, the majority of individuals watch entertainment-biased news on television. Thus, objective news coverage becomes more of special interest contents. The second result that deviates from the results of Section 3.2 is that we can observe a decrease in the profits on the entire market for news coverage, as the distance costs to the television broadcast decrease.

17

We suppose that the shift in preferences, that was modelled in Section 3.2, was triggered by an exogenous shock. Therefore, we consider the possibility that the introduction of commercial television was such a shock, that eventually led to a declining inclination to read, and the resulting effects.

This view is supported by empirical evidence of some communication studies: For instance, Brosius (1998) shows that the greater the variety of accessible media, for example through the introduction of commercial television, the lower the demand for neutral coverage, as individuals on average prefer entertainment over pure information, which is reflected by the choice of medium such that visual media are chosen over print media. Therefore, we favor the scenario of Section 3.3, which implies that preferring news on television over newspapers simply is an adjustment reaction of consumers to the changes in the accessible options rather than a shift in preferences.

5   Conclusions

If our interpretations of the exogenous shocks are valid, and the decrease of the average distance costs associated with a unilateral decrease of the distance costs to the television broadcast can in fact describe the effects triggered by the introduction of commercial television, we may derive the following conclusions from our model: Even though one might suspect that the television channel may reap the benefits from the disadvantage of the newspaper, the profits of both media outlets decrease. We find that competition increases, although there are no additional players entering the market for news coverage. This results in lower prices of both media outlets, and a lower amount of entertainment of the newspaper. The television broadcast, which reaches the majority of consumers, becomes more entertaining.

Our paper attempts to provide a theoretical framework that allows us to make predictions on how the media market will react to the structural changes that are yet to come. The question how news are covered in different media might be today even more relevant than in the early 1980s when commercial television and subscription television was introduced in Europe and the US, as the competitive environment has grown much more intense nowadays. Due to the introduction of digital television, there will be many more TV channels on the market in the years to come.[12]

As the time budget of consumers hence has to be allocated to more possible options on the media market, inter-media competition between newspapers and television channels

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[12]The switch from analogue technology to digital television took place in 2009 in the US. Most EU countries and Japan will follow until 2012. As digital channels require less bandwidth, broadcasters can provide more channels in the same space.

becomes more intense, too. In terms of our model, this development implies that the distance costs to the television channel decrease even more, thus decreasing the profits of at least the newspaper or both media outlets, and leading to more extreme positions at least with respect to the amount of entertainment of the television channel.

Although we present two different scenarios in our model, we obtain unambiguous results with respect to the amount of entertainment of the television channel and the distribution of market shares, that seem to be supported by the empirical evidence quoted above. The majority of consumers watches television, which is increasingly biased towards predominantly entertaining contents.

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