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## News sources and media bias

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## News Sources and Media Bias

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# News Sources and Media Bias

## Abstract

In this paper we investigate the relationship between news sources and media firms. Although empirically important, this channel for supply-driven media bias has not previously been analyzed in economics literature. We model the relationship as an informal contract based on trust and punishment, where a news source decides if and how much information to provide to a media firm. Strategic interactions between these agents may have a significant impact on the level of media bias in the market. In particular, we show that in some cases the news source provides information if and only if there is competition in the media market, while in other cases competition between media firms reduces the amount of information that is made available to the audience.

JEL-Code: L140, L820.

Keywords: news sources, media bias, informal contracts.

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# 1 Introduction

Private firms, government agencies and different types of interest groups often try to persuade media firms to withhold information which is to their disadvantage. If successful, this implies that media firms deliberately provide the public with biased information. The reward to profit-maximizing media firms for engaging in such behavior ranges from pure monetary grants and purchase of advertising space to more indirect benefits like access to commercially valuable news stories.<sup>1</sup> The existing literature on media economics shows that competition might reduce such media bias.<sup>2</sup> Apparently, this is quite obvious. While a media firm with monopoly power may have little to lose from holding back information, competition induces business-stealing effects which could make such a strategy unprofitable. Washington Post might for instance capture readers from New York Times (NYT) if they report information which is highly appreciated by the public, but lose readers if the information instead is published by NYT.

Political scientists estimate that between half and three-quarters of political news originate from news sources (Sigal, 1999, and Manning, 2001).<sup>3</sup> However, the media economics literature has barely analyzed the importance of news sources at all. The purpose of the present article is to open up this research field. We show that incorporating news sources in formal analysis sheds new light on why news is published and how much information is withheld, and that some conclusions in the existing literature are reversed. For example, we find that competition may increase media bias.<sup>4</sup>

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<sup>1</sup>See e.g. Besley and Prat (2006) for a discussion of persuasive tools used by governments, and see Ellman and Germano (2009) for examples of how advertisers might influence media bias in advertising-financed media firms. For empirical evidence, see for instance Strömberg (2001, 2004a,b) and George and Waldfogel (2003).

<sup>2</sup>We focus on supply-driven forces. The supply side channels rest on the journalists' private information (Baron, 2006), media capture by interest groups (Besley and Prat, 2006) and advertisers' pressure (Gabszewicz et al., 2001). In all these cases, competition reduces media bias.

<sup>3</sup>This dependence seems to have increased over the last years, since crises in the media sector have forced staff cuts in news organizations and a reduction in the time and money allocated to investigative reporting (Gans, 1999; Manning, 2001; Berkowitz, 2009; Dinan and Miller, 2009; Entman et al., 2009; Couldry, 2010 and Phillips, 2010).

<sup>4</sup>Note that we focus on the supply side, and do not investigate the media bias that is demand-driven and based on the consumers' prior beliefs. As shown in Mullainathan and Shleifer (2005), competition in such a setting can lead to a larger media bias. The idea is that if consumers incur a disutility cost if they read news that goes against their

Building on a framework developed by Klein and Leffler (1981), we model the relationship between media firms and news sources as tacit contracts in a repeated game. This seems like a reasonable approach, since the relationship between input suppliers and producers in the news market is usually based on informal agreements and unwritten rules. For instance, Gans (1999) describes the interaction between news sources and journalists as a "tug of war". According to him, "while news sources try to 'manage' the news, putting the best light on themselves, journalists concurrently 'manage' the sources in order to extract the information they want".

In the same vein, Manning (2001) describes the relation between spin doctors - public relation officers hired by e.g. political organizations - and journalists in the following way:<sup>5</sup> "the crucial art for a spin doctor is to understand how to bargain with information: how much to release, when it should be released to optimize its value and what can be secured in return for the release of information. Journalists will value those press officers whom they come to trust sufficiently to bounce ideas off or "try out" new interpretations of developments. Although there are never any guarantees, spin doctors may hope that if journalists come to regard them as useful sources of 'insider' information, in return journalists may acknowledge certain obligations regarding the way in which they construct their copy". For this reason Sigelman (1999) also argues that the key to understanding media bias, in what concerns news sources and media firms, lies "not in conspiracies but in cooperation and shared satisfaction".

In our model we have a news source which might supply information to a media firm, but the source has a strong opinion about how much and what kind of information that should be published. The media firm is aware of this, and knows that if it publishes something that the news source dislikes, then the source might stop supplying information. If the media firm adjusts to the preferences of the news source, on the other hand, it expects to receive valuable information in the future. We assume that both parties involved

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prior beliefs, then news firms have incentives to slant news to consumers' ideological preferences. By reporting news that is more extreme than the preferences of the audience, they differentiate themselves from the rivals and thereby dampen competition. See also discussions in Gentzkow and Shapiro (2006, 2008).

<sup>5</sup>Spin doctors are a special type of news sources, who develop spin for the clients they represent. Spin is a form of propaganda campaign in the media developed with the objective to persuade public opinion. Governments, private firms and other organizations or public figures are usually represented in the media by spin doctors.

in the relationship (the news source and the media firm) are aware of this informal agreement. This captures what Gans (1999) characterized as a 'tug of war' between news sources and media firms, and it is also perfectly in line with the spin doctor story discussed by Manning (2001).

We start out by considering a news source that can provide information to a monopoly media firm. Since the news source is the one that decides to reveal information, it is natural to assume that it can also propose how much information the media firm should publish. However, once the media firm gets a lead, it will have access to information such that it has the option to publish more than the source prefers. We assume that the media consumers are news hungry. Thus, the more information the media firm publishes, the more it will enlarge the size of the market, and the greater will the size of its audience be. Profit-maximizing media firms consequently face a trade-off between supplying more information than the source prefers in the present period *versus* receiving a flow of news from the source in the future. The source is aware of this trade-off, and knows that if the media firm is allowed to publish a sufficiently large amount of information, then it will not have incentives to deviate. The problem is that the critical amount of information which prevents the media firm from deviating might be so large that the source is better off if no information is published at all. If this is the case, no information will be revealed in equilibrium. Otherwise there will exist a collaborative equilibrium, where the published information on average is favorable for the source.

We apply our model to investigate the consequences of competition between media firms, let us say two newspapers. In contrast to the existing literature, we find that competition can lead to more media bias. To understand why, consider the case where the news source finds it beneficial to provide information to a monopoly newspaper, but must allow it to publish more than the source's first-best choice. Suppose now that there is a change from monopoly to duopoly in the media market. Then the opportunity cost for the earlier monopoly media firm of not publishing the story might increase. This is so for two reasons. First, by publishing the story, it can capture readers from its rival in addition to enlarging the size of the market. Second, if it does not publish the story, then the rival might do it. If so, it will lose some of its existing readers, particularly if the readers perceive the newspapers as relatively close substitutes. The news source can exploit these business-stealing effects, and request that the earlier monopolist publishes less information than it would do if the rival had not entered the market.

Thus, media bias has increased due to competition in the newspaper market. Note that the strategic behavior of the news source is decisive for this result: with a passive news source we would have the standard result described in the example above, where competition between NYT and Washington Post reduces media bias.

The rest of the paper is organized as follows. In the next section, we review the related literature on media sources, media bias and media plurality. In section 3, we introduce the basic model. In section 4 we analyze the market outcome with monopoly in the media market, while we in section 5 analyze the market outcome with a duopoly in the media market. We offer some concluding remarks in Section 6.

## 2 Related Literature

While the economics literature on media bias has largely ignored the importance of news sources, they have received a lot of attention in political science. The main idea that comes from political science literature is that news sources and newspapers are tied together by informal contracts. This is so since the relation between media sources and newspapers tends to be based on the grounds of exchange and negotiation (Ericson et al., 1999 and Manning, 2001), trust (Golding and Elliot, 1999 and Schlesinger, 1999), punishment and threats (Molotch and Lester, 1999) and confidentiality and secrecy (Ericson et al., 1999). We review these arguments next.

The relationship between news sources and journalists is described by political scientists as a non-economic "exchange relationship", because each side recognizes certain (unwritten) rights and obligations (Manning, 2001). For instance, journalists expect that news sources "understand the criteria defining 'good copy', the importance of speed and accuracy in responding to inquiries, the value of an 'exclusive' to individual journalists and the nature of intelligence or 'contextual information'". Trust plays an important role, and a newspaper that publishes untruthful news loses credibility, and this can reduce the newspaper circulation (Soloski, 1999). In other words, media organizations prefer to work with sources that guarantee communication of true facts on a regular basis. In return, news sources expect that journalists "will write balanced accounts which at least acknowledge their point of view" and "listen to suggestions put to them for particular news items or features".

Since informal contracts agreed between news sources and journalists are

wide-spread, political scientists argue that punishments and threats play a central role in maintaining the relationship. Evidence shows that when a news source proves not to be trustful and provides too inaccurate, false or uninteresting information, the newspaper tends to drop this informant (Manning, 2001). Similarly, when a journalist or a newspaper constantly gives a non-favorable view of a given source, the source will also tend to stop passing information to the newspaper (Gans, 1999 and Manning, 2001). Even when the rupture is not at sight, powerful sources try to influence journalists' coverage with threats (see Molotch and Lester, 1999). Some of these sanctions are direct (like advertising boycotts or anti-trust suits) some are more subtle (like journalism awards or leaks that reward collaboration).<sup>6</sup>

Another argument that surfaces in the political science literature, is that since journalists have the right to protect the identity of their sources, the problem of media bias may become much more blurred than one would otherwise expect. In fact, even in court a journalist can deny to disclose information provided by sources, due to professional confidentiality issues. The most well-known example involving the secrecy of news sources is the anonymous source for the Watergate scandal (nicknamed Deep Throat). Only in 2005 (thirty years after the scandal surfaced), the source was revealed as William Mark Felt, Sr., the former Deputy Director of the FBI.

Contrary to the political science literature, the economics literature is sparse on the role of news sources and media bias. Three notable exceptions are the theoretical works of Baron (2005) and Ellman and Germano (2009), and the empirical exercise of Dyck and Zingales (2003).

In Baron (2005) two media sources (activists and industry) compete to have their views passed on to the public via newspapers. In this sense, the media sources can be seen as interest groups. The two interest groups/media sources have opposing views: activists are in favor of regulation of an externality and industry is against it. Therefore, the sources have incentives to conceal information that goes against their views. Knowing this, media firms can also undertake private investigation to obtain more information. At the heart of Baron's (2005) approach is an issue of journalists' private information (see also Baron, 2006). Since the function of the media sector is to serve the public, he assumes that the news firms tend to favor the views

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<sup>6</sup>For instance, Molotch and Lester (1999) point out that all television networks in the US have abandoned the custom of 'instant analysis' of presidential speeches after pressure from the White House.



of the activists. As a result, only the activists conceal information.

Ellman and Germano (2009) model a two-sided market where media firms are advertising-financed. They show that a monopoly media firm will tend to under-report news that reduces advertisers' profit. With competing newspapers, they find that increasing the role of advertising will eventually induce maximal accuracy. In line with our approach, they allow the advertisers to withdraw advertising from papers that report too accurately on sensitive topics. They show that such a strategy might restore the media bias, but it will never lead to more media bias than with a monopoly media firm. In contrast, we find that competition between media firms might lead to a larger media bias than with a monopoly media firm. The difference stems from the way we model the news provided by the news source. We assume that the news source offers a scoop that may increase the circulation of the media firm's product (say newspaper), and thereby reduce the circulation of the rival media firms' product. In this respect our model is more suited for analyzing the role as such of a genuine news source's provision of information, for example a police department that can provide a steady stream of information, while Ellman and Germano (2009) are more suited for analyzing how advertisers' threat of withdrawal of advertising can influence the news coverage as such.

Dyck and Zingales (2003) have a different focus, and investigate empirically the connection between journalism and asset prices. In particular, they explain how media bias may stem from the relation between news sources and journalists on reporting assets prices . Their main hypothesis is that in order to induce a source to reveal information, the journalists have incentives to give a positive spin to the source's views. Dyck and Zingales (2003) find evidence that this positive spin tends to be greater when there is a high demand for the information and there are no alternative sources of information. In contrast to Baron and Dyck and Zingales, though, we present a new cause of media bias not yet identified in the economics literature: the informal nature of the relationship between newspapers and news sources.

### 3 The Model

Let us consider a model with three types of agents: media firms, consumers and a news source. In this section we consider a monopoly media firm, and to fix ideas we call it a newspaper. The source has access to information that it can bring forward to the newspaper, and which can be characterized as a

scoop. Let  $\bar{V}$  denote the full set of information behind the scoop, and let the measure of the information set be  $\bar{v}$ . In the same vein, let  $V \subseteq \bar{V}$  denote the set of information that the newspaper actually prints, with measure equal to  $v$ .

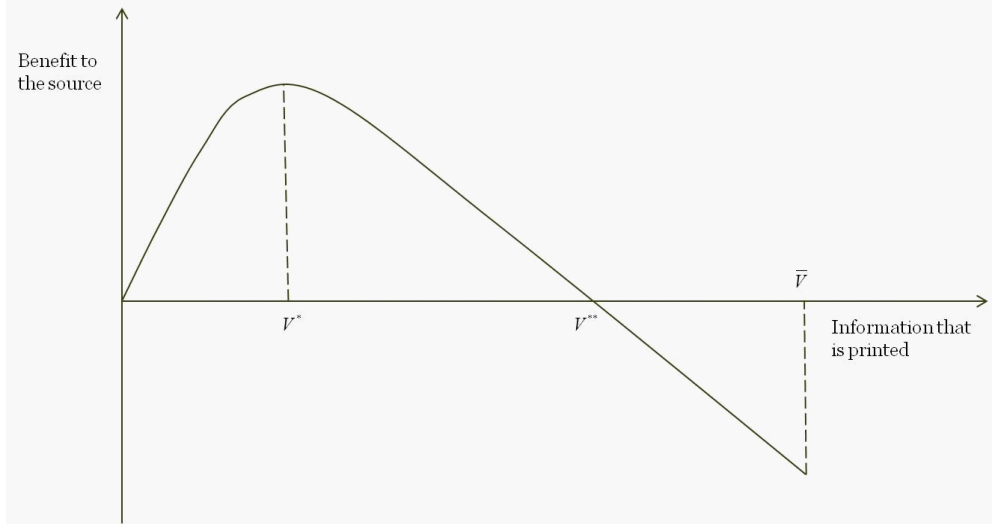
Like Besley and Prat (2006) we assume that only verifiable information can be printed. Thus, it would be useless for the source (or the newspaper) to try to fabricate news. We further follow Besley and Prat in assuming that the source has incentives to manipulate news by concealing part of the information; first-best for the source is that only information which is to the benefit of itself is published. The extent to which it succeeds with this, determines how biased news the readers will be exposed for.

It is useful to order the elements in  $\bar{V}$  such that they are decreasing in the marginal benefit ( $MB$ ) of being published from the source's point of view. Information which the source would like not to be published has  $MB < 0$ . For reasons which will become clear below, we assume that if the newspaper prints only a subset of  $\bar{V}$ , then it prints the information which has the highest  $MB$  for the source.

An example of a relevant information set is illustrated in Figure 1, where  $MB$  is positive until  $V = V^*$ . Here the source's benefit,  $B(V)$ , is maximized. For  $V > V^*$  the source's marginal benefit of seeing more information being published is negative, but the total benefit is still positive in the neighborhood of  $V^*$ . However, if the newspaper prints so much information that  $V > V^{**}$ , then the source would have been better off if no information were published at all ( $B(V^{**}) = 0$ ). The general point is that there must be certain facts that the source does not want to be revealed if it tries to ensure that the newspaper prints less than  $\bar{V}$ . For the sake of the argument we shall assume that the total benefit to the source of publication is negative for sufficiently high values of  $V$ . Like Dyck and Zingales (2003) we label any deviation between  $\bar{V}$  and what is actually published as media bias, with measure equal to  $b = \bar{v} - v$ .<sup>7</sup>

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<sup>7</sup>Implicitly, it is thus assumed that rational consumers get a more unbiased picture the greater the set of (truthful) information they receive. It could be argued that this need not be true, in particular if  $v \in (0, v^*)$ , since the newspaper then prints increasingly more information that is beneficial for the source. Like Dyck and Zingales (2003) we sidestep this issue. This is partly because we want to hold on to the terminology in the established media bias literature, and partly because in equilibrium we always have  $v \in (v^*, \bar{v})$ . For our purpose we might thus say that an increase in  $v$  makes the information picture more "balanced", such that media bias is reduced.



**Figure 1:** *The source's benefit from published information.*

The newspaper's circulation increases if it prints at least a minimum set of information,  $V_{\min}$  (with measure  $v_{\min}$ ). Let  $D_R$  denote demand for a regular newspaper edition, and let  $D_S > 0$  denote the additional demand that the newspaper observes if it publishes  $v > v_{\min}$ . The consumers prefer more news to less news, such that the more information the newspaper prints from the scoop, the greater the additional demand;  $D'_S(v) > 0$ . For concreteness, we follow Dyck and Zingales (2003) in assuming that the newspaper expects demand to increase by  $\alpha$  copies if the whole set of information is printed ( $\alpha$  represents the intrinsic value of the scoop), but that the demand expansion is reduced by  $\beta > 0$  copies for each unit of information that is concealed. We thus have<sup>8</sup>

$$D_S = \alpha - \beta b > 0 \text{ for } v > v_{\min}, \quad (1)$$

where  $\beta$  is higher the stronger is the readers' demand for information. Other things equal, a given media bias ( $b > 0$ ) will thus dampen newspaper circulation more the higher is  $\beta$ .

If it were costly for the newspaper to uncover the whole truth, it could trivially be true that  $v < \bar{v}$ . To avoid this uninteresting scenario, we assume that once the newspaper has established a relationship with the source, it has

<sup>8</sup>In a similare manner, Mullainathan and Shleifer (2005) assume that a (truth-seeking) reader's utility equals  $\bar{u} > 0$  with unbiased news, but that the utility falls by  $\Psi > 0$  units for each unit increased media bias.

full information about the scoop (so that it is able to publish  $\bar{v}$  if it wants to). The media literature on news sources discusses at least two channels through which this might occur (see Manning, 1999). First, it is quite common that sources reveal more information than what they wish to see printed. This can be so because sources need to signal to newspapers that the information they transmit is truthful, or they need to frame the story to give a full picture of the issues involved. In such cases the source might transmit  $\bar{v}$  to the newspaper, but requests that only  $v < \bar{v}$  is published.<sup>9</sup> Second, journalists can use the information they receive from a source as a lead to collect more information by (for our purpose) costless private investigation. We might then imagine that the source only reveals  $v < \bar{v}$ , but that this gives the newspaper a clue such that it can gather  $\bar{v} > v$ .

We model the relationship between the source and the newspaper as a repeated game, inspired by modelling first introduced in Klein and Leffler (1981). The idea is that when a source and a newspaper collaborate, they act in accordance with an implicit long-term contract. With this informal contract it is common knowledge for the newspaper and the source that the latter collaborates in the future (i.e.: continues to give information) only if the newspaper publishes no more than what the source prefers.

The newspaper does not have any knowledge of the relevant story without any information from the source. We thus assume that the source is the agent that has control over the information. In line with this, we give the source the power at stage 1 of the game to decide whether it should provide information to the newspaper and also to propose how much information the newspaper may publish. If it provides information, it sets  $v = v^S$  as the information the newspaper is asked to publish.<sup>10</sup> At stage 2 the newspaper knows the full information of the scoop, and decides whether it will follow the source's request of publishing  $v^S$  or whether it will deviate. The two-stage game is repeated an infinite number of periods.

We assume that the source uses a trigger strategy in the repeated game.

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<sup>9</sup>In this respect, a press officer of a large union in England is quoted in Manning (1999): "so in order to convince the journalists that they were getting something that was important for them, we provided additional information from other areas as well... and we service the history very thoroughly. Now the unwritten rule is that the person will help me in other stories as well".

<sup>10</sup>Due to the way in which we have ordered the elements in the information set,  $v_S$  is measured from point 0 to point  $V^S$ . Loosely speaking, it is the elements  $\{0, 1, \dots, V^S\}$  that the source asks the newspaper to publish.

If it observes that the newspaper in the previous period published the requested amount of information ( $v^S$ ), it continues to provide the newspaper with information. If it observes that the newspaper deviated in the last period, it stops providing information to the newspaper in this and all future periods.

The relationship between the source and the newspaper is informal. This means that there are no binding agreements; for instance, the source cannot bring the newspaper to court if it publishes more than  $v^S$ . Clearly, the optimal strategy for the newspaper is therefore either to publish exactly the information the source asks it to ( $v^S$ ) or to publish the complete scoop ( $\bar{v}$ ). Publishing the whole truth increases demand in the present period, but at the expense of any further collaboration with the news source in the future.

Without loss of generality, we assume that the newspaper does not incur any marginal or fixed costs of production, and we normalize the price of the newspaper to 1. This means that the newspaper's profit per period if it collaborates with the source is  $\pi_R + \pi_S = D_R + D_S$ , while it is otherwise equal to  $\pi_R = D_R$ .

## 4 Monopoly in the news sector

Using backward induction, we start out by solving the second stage of the game. Given that the newspaper has received information from the source, it must decide how much to publish. One option is to just publish  $v^S$ , exactly what the source has requested. The discounted profits for the newspaper then equal

$$\Pi_{v^S} = \frac{\pi_R + \alpha - \beta b}{1 - \delta}, \quad (2)$$

where  $\delta$  is the discount factor, with  $0 < \delta < 1$ . The second option is to publish the whole set of information (publish  $\bar{v}$ ). We define this as a deviation, since it implies that the newspaper publishes more than the source's proposal. In this case the newspaper's discounted value equals:

$$\Pi_{\bar{v}} = \pi_R + \alpha + \frac{\delta}{1 - \delta} \pi_R. \quad (3)$$

In the period where the newspaper deviates it receives a large payoff, equal to  $\pi_R + \alpha$ , while in all future periods it receives only the payoff from a regular edition,  $\pi_R$ .

It is profitable for the newspaper to publish  $v^S$  instead of  $\bar{v}$  if  $\Pi_{v^S} \geq \Pi_{\bar{v}}$ . Solving this inequality we find that the newspaper must be allowed to print so much information that  $b \leq b_{Mon} \equiv \frac{\alpha}{\beta} \delta$ .

Throughout the paper we consider  $\bar{v}$  as fixed, which means that the size of the media bias is monotonically decreasing in the information that is provided to the public ( $db/dv^S < 0$ ). Using that  $b = \bar{v} - v^S$ , it is then instructive to express the condition for a cooperative equilibrium as

$$v^S \geq v_{Mon}^S \equiv \bar{v} - \frac{\alpha \delta}{\beta}. \quad (4)$$

If  $v^S < v_{Mon}^S$ , the monopoly newspaper will find it more profitable to publish all information than to follow the source's request. This will be rationally anticipated by the source, who consequently will not provide any information at all. It is thus only for  $v^S \geq v_{Mon}^S$  that we might have an equilibrium where the newspaper and the source collaborate. Let us first assume that this condition holds with equality:

**Proposition 1** *Suppose that there exists an equilibrium where the monopoly newspaper publishes  $v^S = v_{Mon}^S$ . The set of published information is then*

- (i) *decreasing in the intrinsic value of the news ( $\alpha$ ),*
- (ii) *decreasing in the newspaper's valuation of the future ( $\delta$ ), and*
- (iii) *increasing in the strength of the readers' demand for information ( $\beta$ ).*

The clue to seeing the intuition behind Proposition 1, is to note that the source must allow the newspaper to publish so much information that it will not deviate. If the news that the source can provide each period has a high intrinsic value for the readers (high  $\alpha$ ), the demand expansion will be large. Thus, the newspaper has a lot to gain from a long-lasting relationship with the source, and will each period accept to print a relatively small share of the information. In this sense the media bias will be greater the more commercially valuable the source's information is. In the same manner, the more patient the newspaper (high  $\delta$ ), the less information it will require to publish each period. However, if the readers have a strong demand for information, the newspaper must be allowed to publish much information today. Otherwise, it will have incentives to deviate in order to increase present profits.

Next, let us consider stage 1 of the game. The source must decide whether it will provide information, and if it does, how much information it will ask

the newspaper to publish. Suppose first that  $v_{Mon}^S < v^*$ . In this case the source would actually like the newspaper to publish more information each period than what is required to make the newspaper collaborate. It is then straight forward to see that it will ask the newspaper to publish  $v^*$ , the information that maximizes the source's benefit from a publication (c.f. also Figure 1). If  $v^* < v_{Mon}^S < v^{**}$ , on the other hand, the newspaper must be allowed to publish more information than what is first-best for the source. This is necessary in order to encourage the newspaper not to publish all the information. The optimal strategy will then be to ask the newspaper to publish  $v_{Mon}^S$ . Finally, if  $v^{**} < v_{Mon}^S$ , there is no reason for the source to contact the newspaper at all. The explanation is that to persuade the newspaper not to publish the whole set of information in this case, it would have to allow the newspaper to publish such a large share that the source would be worse off than if no information were published.

We can thus state the following proposition:

**Proposition 2** *The optimal provision of information by the source is given by:*

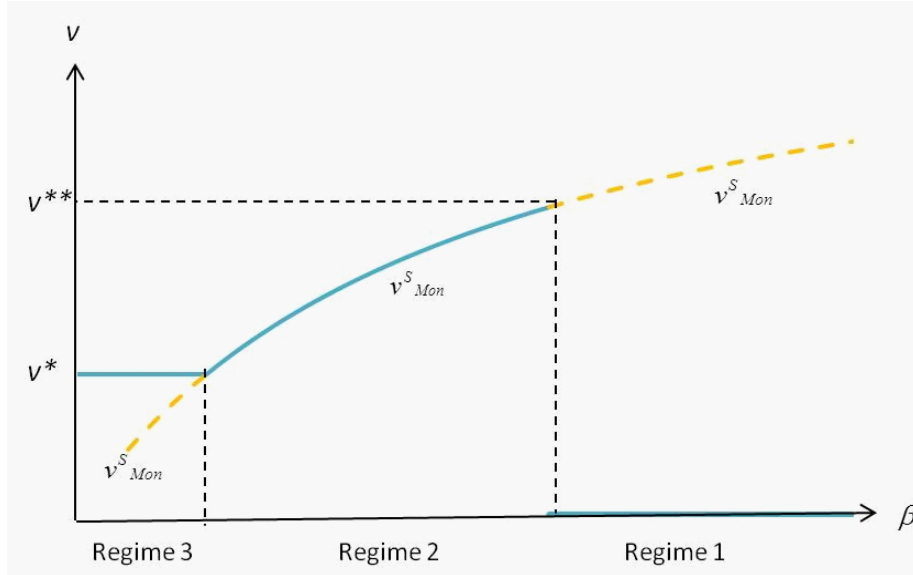
- (i) *Regime 3: If  $v_{Mon}^S \leq v^*$ , the source provides information and the newspaper is asked to publish  $v^*$ .*
- (ii) *Regime 2: If  $v^* < v_{Mon}^S < v^{**}$ , the source provides information and the newspaper is asked to publish  $v_{Mon}^S$ .*
- (iii) *Regime 1: If  $v^{**} < v_{Mon}^S$ , the source decides not to provide any information to the newspaper.*

Note that the results in Proposition 1 relate to Regime 2, where the source provides information and the critical value  $v_{Mon}^S$  is the binding constraint.

Proposition 2 makes it clear that there is a non-monotonic relationship between the critical value  $v_{Mon}^S$  and the amount of information that is published. To see why, assume that initially the critical value is so large that the source prefers not to provide any information (Regime 1). Now, suppose that due to changes in the financial market, the newspaper starts to place a greater value on the future (higher  $\delta$ ). Then Proposition 1 tells us that  $v_{Mon}^S$  is reduced, and if the reduction is sufficiently large, it will suddenly become optimal for the source to provide information to the newspaper (Regime 2). As noted above, the intuition for this is that when the newspaper becomes more patient, it is willing to sacrifice publishing some information today in exchange for receiving news from the source in the future. For the same

reason, though, a reduction in the critical value will lower the set of information being published if initially the newspaper prints a set of information which corresponds to the critical value (i.e. if we are in Regime 2, where  $v^* < v_{Mon}^S < v^{**}$ ).

Figure 2 makes a graphical illustration of the same underlying mechanisms, but here we consider the consequences of changing the strength of the readers' demand for information ( $\beta$ ). So assume that we are in Regime 1 and that, for whatever reason, the readers' demand for information is weakened (lower  $\beta$ ). Then we move leftward in Figure 2. The Figure illustrates that because a lower  $\beta$  reduces the critical value  $v_{Mon}^S$ , a sufficiently large reduction of  $\beta$  brings us from Regime 1 to the border of Regime 2, where the source finds it profitable to switch from not providing information to providing information. However, a further weakening of the readers' demand for information actually reduces the amount of information that the source requests the newspaper to print in a collaborative equilibrium. This is true until we enter Regime 1, where the value of  $\beta$  is irrelevant for the source's request ( $B(V)$  is maximized at  $V = V^*$ ). We therefore see that the initial situation is crucial for whether changes in the characteristics of the industry lead to more or less published information.



**Figure 2:** *Optimal information provided by the source*

Let us apply our model to consider the ability of media firms to change consumers' appreciation of information, which in turn might change their



views. For instance, Herman and Chomsky (1998) argue that news agencies and news firms are in the business of "manufacturing consent".

To see how manufacturing consent might work when we have a news source, assume that the newspaper is able to add value to the information it provides in such a way that the readers' perceived value of a given set of information increases from  $v$  to  $cv$ , with  $c > 1$  (for instance through the reporting style, see Herman and Chomsky, 1988). For simplicity, but without affecting the qualitative results, we assume that this is costless for the newspaper. The newspaper now finds it profitable to cooperate with the source if

$$\frac{\pi + [\alpha - \beta(\bar{v} - cv^S)]}{1 - \delta} > \pi + \alpha + \frac{\pi\delta}{1 - \delta}. \quad (5)$$

Rearranging equation (5) for  $v^S$ , we find that in a collaborative equilibrium we must have

$$v^S > v_{Cons}^S \equiv \frac{1}{c} \left( \bar{v} - \frac{\alpha\delta}{\beta} \right), \quad (6)$$

where  $v_{Cons}^S$  is the threshold level of information that promotes the newspaper to cooperate with the source. Using equations (4) and (6) show that manufacturing consent reduces the minimum amount of information the newspaper must be allowed to print in a collaborative equilibrium:

$$v_{Mon}^S - v_{Cons}^S = \frac{c - 1}{c} \left( \bar{v} - \frac{\alpha\delta}{\beta} \right) > 0. \quad (7)$$

The intuition is quite straight forward. When the newspaper manipulates the readers' valuation of the information it provides, it will be less profitable for the newspaper to deviate. The news source exploits this by asking the newspaper to publish less information. This has the following implication:

**Proposition 3** *Assume that there is initially no manufacturing consent, and that*

- (i) *the source brings information to the newspaper, which prints  $v_{Mon}^S$ . Then a shift to manufacturing consent increases the media bias.*
- (ii) *the source does not bring information to the newspaper. If  $v_{Mon}^S > v^{**} > v_{Cons}^S$ , a shift to manufacturing consent will reduce media bias;  $v_{Cons}^S > 0$  is being published instead of no information.*

Case (i) in the Proposition is in line with the results found in Herman and Chomsky (1998). If media firms are able to change the readers' perception of the news, media bias tends to be higher. In contrast to Herman and Chomsky, however, we find that the driving force is the news source's response to manufacturing consent. In case (ii) in the Proposition the result is reversed. The starting point is a situation where the source does not find it profitable to provide any information, because the minimum required to ensure cooperation will make the source worse off. If the newspaper can engage in manufacturing consent, this will also benefit the source. The reason is that it enables the source to provide less information than what it would otherwise have to offer. This is exactly the case where the manufacturing consent will change the news source's optimal behavior from not providing to providing information. Paradoxically, the news source decides to reveal information if it knows that the newspaper is able to manipulate the readers' valuation of the information.

## 5 Duopoly in the news sector

Let us now assume that we have two symmetric newspapers (an assumption we shall later relax), and that the source can provide information to at most one of them. The extent of competition between the newspapers depends, inter alia, on how close substitutes the readers perceive them to be. If the readers perceive the newspapers as close substitutes, we might expect a significant demand expansion for a newspaper that publishes a scoop and a demand contraction for the other newspaper. To capture these business stealing effects, let  $D_1$  denote the increase in profits for a scoop-publishing newspaper and  $D_2$  the reduction in profits if instead the rival publishes the scoop. The larger is  $D_i$ ,  $i = 1, 2$ , the closer substitutes the newspapers are from the readers' point of view.

We assume, analogous to the previous section, that at the second stage of the game a newspaper which has been contacted by the source must decide how much information to reveal. If it publishes exactly what the source asks it to publish, the source will continue the collaboration in the future. If instead the newspaper publishes all the information it has about the news scoop, it will not receive any information from the source in the future. On the contrary, the source will then collaborate with the rival from the next period on. We must thus reformulate the newspaper's incentive constraint.

The newspaper that has a relationship with the source in the present period finds it profitable to publish only what the source asks it to do if:

$$\frac{[\pi + \alpha - \beta(\bar{v} - v^S)](1 + D_1)}{1 - \delta} \geq (\pi + \alpha)(1 + D_1) + \frac{\delta}{1 - \delta} \pi (1 - D_2). \quad (8)$$

The left-hand side is the discounted value of collaborating with the source, while the right-hand side is the discounted value of deviating by publishing the whole set of information.

By rearranging equation (8) we find that it is profitable for the newspaper to cooperate with the source if

$$v^S \geq v_{Duo}^S \equiv \bar{v} - \left[ \pi \left( 1 - \frac{1 - D_2}{1 + D_1} \right) + \alpha \right] \frac{\delta}{\beta}, \quad (9)$$

where  $v_{Duo}^S$  is the minimum amount of information that the newspaper must be allowed to publish in order to find it profitable to continue cooperating with the source. Note that there is no business stealing effect if  $D_1 = D_2 = 0$ , in which case we have the same condition as in the previous section with a monopoly newspaper.

The higher is  $D_2$  (the loss in sales if the rival publishes information from the source in the future), the more expensive it is for the newspaper to deviate and terminate the collaboration with the source. The critical value  $v_{Duo}^S$  is therefore decreasing in  $D_2$ . The relationship between  $D_1$  and  $v_{Duo}^S$  is less clear-cut; on the one hand, the discounted value of collaborating is increasing in  $D_1$ . This is captured by the left-hand side of (8). However, on the other hand, the demand-expanding effect of deviating is also increasing in  $D_1$ , as is seen from the first term on the right-hand side of (8). Intuitively, we might expect that the latter effect dominates. The reason for this is that an increase in  $D_1$ , similar to an increase in  $D_2$ , should increase the opportunity cost of not collaborating with the source. We therefore find that  $v^S$  is decreasing in both  $D_1$  and  $D_2$ :

$$\frac{dv^S}{dD_1} = -\delta\pi_1 \frac{1 - D_2}{\beta(D_1 + 1)^2} < 0 \text{ and } \frac{dv^S}{dD_2} = -\delta \frac{\pi_1}{\beta(D_1 + 1)} < 0.$$

We then have the following result:

**Proposition 4** *Let us consider a duopoly in the newspaper market. The tougher the competition from the rival newspaper, the less information the source must allow the newspaper to print ( $\partial v_{Duo}^S / \partial D_1 < 0$  and  $\partial v_{Duo}^S / \partial D_2 < 0$ ).*

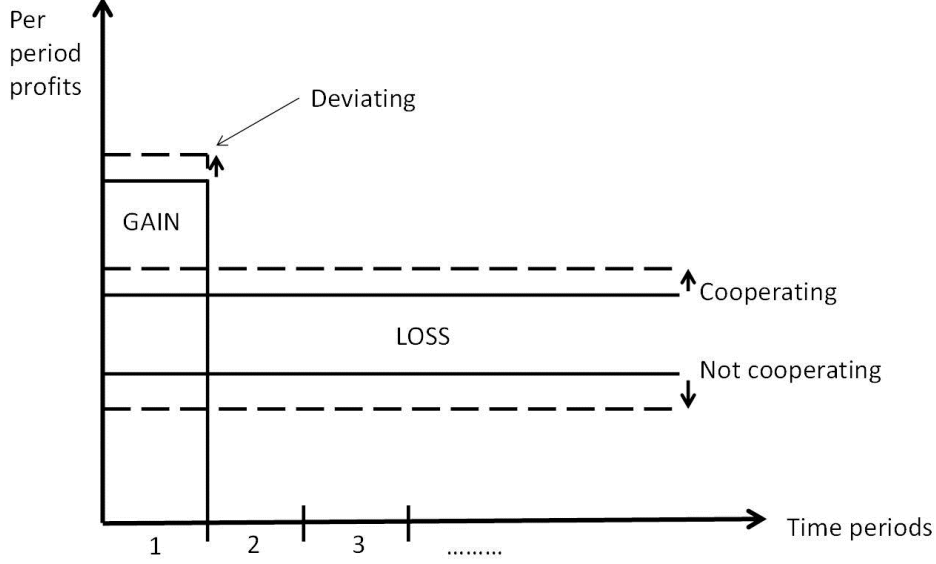
As a corollary we might note that the critical information value is higher under monopoly than under duopoly:

$$v_{Mon}^S - v_{Duo}^S = \left[ \pi \left( 1 - \frac{1 - D_2}{1 + D_1} \right) \right] \frac{\delta}{\beta} > 0. \quad (10)$$

Figure 3 sums up the consequences of competition in the newspaper sector. The solid lines in the Figure illustrate a monopoly newspaper's incentive to deviate from the informal contract with the news source: the benefit in the present period from deviating is given by the area 'GAIN', but profits in the future periods are reduced by the area 'LOSS'.

The dotted lines in the Figure illustrate how the gains and losses change due to competition from a rival newspaper. First, if  $D_1 > 0$ , the newspaper steals business from its rival by receiving and publishing information from the source. This increases both the discounted value of collaborating with the source and the value of deviating by publishing all information today. The net effect is to make it more profitable for the newspaper to cooperate, as seen above.

Second, if  $D_2 > 0$  the newspaper will incur a loss in the future if it does not cooperate, since it will lose some of its baseline sales to the rival. This further increases the newspaper's incentives to cooperate with the source. The source can exploit these stronger incentives by reducing the amount of information that it allows the newspaper to print.



**Figure 3:** *The incentive to deviate.*

At stage 1, the source must decide if and how much information to provide. As in the case of a monopoly newspaper, there will be three different regimes. However, since  $v_{Mon}^S > v_{Duo}^S$  the cutoff values between the regimes will now be different. For example, if  $v_{Mon}^S > v^{**} > v_{Duo}^S$  there will be situations where the source will not provide any information if we have a monopoly newspaper, but will provide it if there is a duopoly. This is due to the business-stealing effect, which means that both the gain from cooperating and the loss from not cooperating could be larger for a duopolist than for a monopolist. In a situation where the source would provide information independent of whether there is competition in the newspaper market, on the other hand, a duopolist would publish less information than a monopolist.

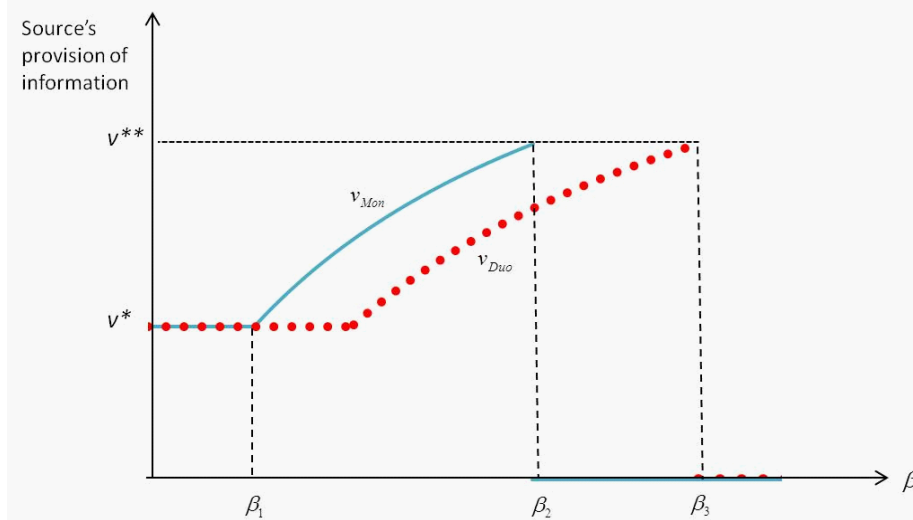
We have the following results:

**Proposition 5** *Let us consider the optimal provision of information by the news source.*

- (i) *If  $v_{Mon}^S > v^{**} > v_{Duo}^S$ , information will be provided if and only if there is competition in the newspaper market*
- (ii) *If  $v^* \leq v_{Duo}^S < v_{Mon}^S \leq v^{**}$  or  $v_{Duo}^S < v^* < v_{Mon}^S \leq v^{**}$ , less information will be provided with than without competition in the newspaper market*

(iii) If  $v_{Du\phi}^S < v_{Mon}^S \leq v^*$  or  $v_{Mon}^S > v_{Du\phi}^S > v^{**}$ , the same amount of information will be provided in duopoly and in monopoly in the newspaper market.

Figure 4 summarizes the discussion so far. If the readers' demand for information is sufficiently strong ( $\beta > \beta_3$ ), the source will not approach any newspaper, because it knows that it cannot prevent the whole story from being published. If the readers are somewhat less news hungry, a newspaper is willing to conceal part of the information if there exists a rival to which the source otherwise will give the information. This is true in the range  $\beta_2 < \beta < \beta_3$ , where we will see information disclosure if and only if there is competition in the newspaper market. This result, which corresponds to Case (i) in Proposition 5, may sound familiar from previous analysis of media economics. However, the mechanisms differ from those in the existing literature. It is not the decision by the newspaper *per se* that is decisive for the media bias, but rather the news source's decision on how much information the newspaper is allowed to publish. This difference in mechanism is underscored by the fact that for even lower values of  $\beta$ , competition might reduce the amount of information which is disclosed. This is the case for  $\beta_1 < \beta < \beta_2$  (case (ii) in Proposition 5). We then see that only if the readers' demand for information is sufficiently weak ( $\beta < \beta_1$ ) or sufficiently strong ( $\beta > \beta_3$ ) is the extent of information disclosure independent of whether there is competition in the newspaper market.



**Figure 4:** A comparison of monopoly and duopoly

Let us now loosen up the assumption that the media firms are symmetric. In general, we will then have to consider how each of the firms' profit will be affected by either own or rival publishing of the scoop. To be specific, assume that the newspapers differ in the size of their circulations, and let  $i = L, M$  represent the large ( $L$ ) and the small ( $M$ ) firm.

Clearly, a scoop publication may affect a large and a small firm very differently. To capture this, let  $D_1^i$  measure the increase in sales for newspaper  $i$  due to own publishing of a scoop, and  $D_2^i$  measure the loss in sales if the scoop instead is published by the rival. Furthermore, let  $v_{D_{uo}}^{SL}$  and  $v_{D_{uo}}^{SM}$  define the critical values concerning provision of information to the large and the small firm, respectively. The following result can now be derived from equation (9):

**Proposition 6** *Assume that the media firms are asymmetric.*

- (i) *If  $\frac{1-D_2^M}{1+D_1^M} > \frac{1-D_2^L}{1+D_1^L}$ , then  $v_{D_{uo}}^{SL} > v_{D_{uo}}^{SM}$  (sufficient and necessary condition)*
- (ii) *If  $D_1^M > D_1^L$  and  $D_2^M > D_2^L$ , then  $v_{D_{uo}}^{SL} > v_{D_{uo}}^{SM}$  (sufficient condition).*

Case (i) in the Proposition shows the necessary and sufficient condition for a lower critical value for the small than for the large newspaper. If this condition is met, it implies that the news source provides less information if it collaborates with a small than with a large newspaper. Case (ii) shows the corresponding sufficient condition. Arguably, this condition may be met in many situations. If the small newspaper publishes the scoop, it might observe a large increase in sales since it has a greater growth potential. The rival, on the other hand, has a large circulation at the outset and might not be able to increase sales as much in relative terms. If this is true, we have  $D_1^M > D_1^L$ .

Moreover, it is natural to expect that if the small firm publishes the scoop, the effect on the large firm's sales will be relatively smaller than vice versa. This follows directly from proportionality; the larger firm is less affected by the small firm than the small from the large. If this is true, we have  $D_2^M > D_2^L$ .

Considering the news source's decision at stage 1, we can now show:

**Proposition 7** *Assume that the sufficient conditions which ensure that  $v_{D_{uo}}^{SL} > v_{D_{uo}}^{SM}$  are fulfilled, and that the news source initially does not provide any information. A sufficiently large increase in the asymmetry will then lead the source to provide information to the small firm.*

Proposition 7 thus shows that if  $D_1^M > D_1^L$  and  $D_2^M > D_2^L$ , then the source will approach the small newspaper. This simply reflects the fact that the source will exploit the smaller firm's strong incentives to publish the scoop by providing relatively little information. Note that this implicitly assumes that it does not matter for the source whether the scoop is published by the larger or the smaller newspaper (or at least that the source does not have too strong preferences for the larger newspaper). At the outset this might seem dubious, but it is well known from the press history that if one newspaper publishes a scoop, then it will as a general rule be more or less copied by rivals within a short time period. Indeed, this is one of the big controversies in the internet age; automatic aggregators like Google News are quick to copy and spread news to a broader public from the media firms that originally run a scoop. For news of more local interest, we likewise see that it typically does not take long from a scoop is published by one newspaper until the same story can be found on the competitor's internet pages.

An important and interesting corollary from proposition 7, is that the more asymmetric the media firms, the less information the source must allow to be printed:

**Corollary 1** *Assume that the sufficient conditions which ensure that  $v_{Duo}^{SL} > v_{Duo}^{SM}$  are fulfilled. Suppose that the source provides information to the small firm and that  $v_{Duo}^{SL}$  is the binding constraint. The greater the asymmetry between the newspapers, the less information the source will provide.*

## 6 Some concluding remarks

Even though the majority of political news comes from informal sources, the literature on media economics has neglected how they may affect media bias (Sigal, 1999, and Manning, 2001). In this paper we use insight from political science, and model the relationship between media firms and news sources as an informal contract in a repeated game. Based on observations made by political scientists, we assume that the news source has strong preferences with regard to how much information a media firm should publish. The media firm, on the other hand, would like to publish as much audience-generating information as possible.

Whether there exists a collaborative equilibrium between a news source and a media firm clearly depends on the media firm's valuation of the future.



The more patient the firm is, the more willing it is to bias the information that it provides to its audience. This is so simply because the profitability of maintaining a long-lasting relationship with the source to build up a larger audience in the future is increasing in the discount rate. A high intrinsic value of the news draws in the same direction, since it is more valuable for the media firm to cooperate with the news source if it continuously provides commercially valuable information. However, the stronger the audience's demand for news, the more information the source must allow the media firm to publish in order to ensure that it cooperates.

The existing literature typically predicts that competition in the media market reduces supply-driven media bias. We show that this need not be the case once we take into account the fact that news sources may be strategic players. The intuition is that the opportunity cost for a media firm of not publishing a story tends to increase if it faces competition, and the stronger the business-stealing effects, the more important it is for the firm to get the story. The news source can take advantage of this, and persuade the media firm with which it wants to collaborate to reduce publication of unfavorable information. Thereby competition might increase media bias. However, precisely because competition increases a media firm's willingness to accept the news source's request to conceal certain information from its audience, there also exist situations where a news story will be published if and only if there is competition in the media market.

We further investigate the consequences of asymmetries between media firms, for instance with respect to the size of their audiences. In theory it is not clear whether the large or the small media firm has the strongest incentives to cooperate with the news source. However, we argue that under reasonable assumptions, it might be the small firm. This is the case if the smaller firm has the larger potential for increasing the size of its market by publishing news stories based on information from the source, and the most to lose if instead it is the rival that collaborates with the source. If so, the small firm will be more willing to obey the source's request not to publish unfavorable information, and will therefore, other things equal, be the preferred partner for the source. An interesting implication of this, is that the more asymmetric the media firms are, the greater we might expect supply-driven media bias to be.

Our study is relevant for news sources that can provide media firms with a steady stream of news. This implies that institutions with potential for long-term relationships with media firms, such as police departments, gov-

ernment offices or private firms with a high public profile, can exploit the mechanisms we have modelled and therefore be able to withhold information. This is exactly what we observe that such institutions are doing, according to the referred political science literature. Our study then calls for a more detailed study of this mechanism, for example empirical evidence of whether competition creates more or less source-induced media bias.

There are a number of issues that need to be further explored. In particular, the role of complementary supply and demand side forces for media bias, such as media owners' political preferences and readers' political priors, should be studied. Another interesting research path would be to analyze how the publication of a news scoop by one media firm affects the rivals' incentives to invest in investigative journalism. These incentives might be particularly strong if the rivals can reveal that the original publisher and the news source have collaborated in hiding important information. In the same vein, it is important to investigate the consequences of having more than one news source in the market. This issue could be of great importance when news sources have conflicting objectives about what can be published. Finally, given that the effects of competition in the media market are substantially different from those in conventional industries, further work should also focus on the role of competition policy and regulation in the news market.

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