

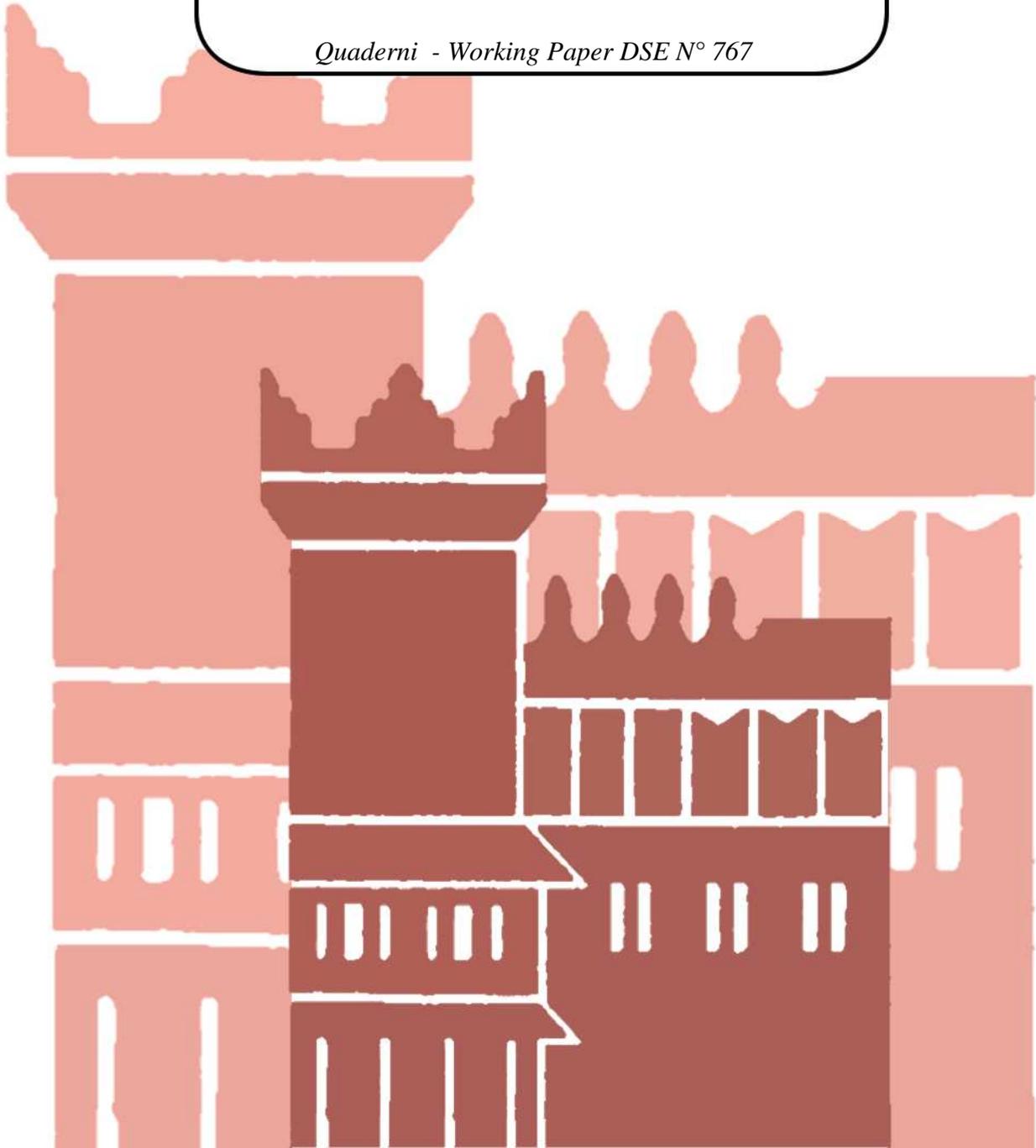


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**Competition and Commercial
Media Bias**

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Competition and Commercial Media Bias*

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Abstract

This paper reviews the empirical evidence on *commercial media bias* (i.e., advertisers influence over news reports) and then introduces a simple model to summarize the main elements of the theoretical literature. The analysis provides three main policy insights for media regulators: *i)* Media regulators should target their monitoring efforts towards news contents upon which advertisers are likely to share similar preferences; *ii)* In advertising industries characterized by highly correlated products, an increase in the degree of competition may translate into a lower accuracy of news reports; *iii)* A sufficiently high degree of competition in the market for news may drive out commercial media bias.

JEL Classification: L13, L15, L82, D82

Keywords: Advertising, Media accuracy, Two-sided market, Competition, Commercial Media Bias

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1 Introduction

Media outlets represent archetypal platforms of a two-sided market (Anderson and Gabszewicz 2006; Armstrong 2006). On one side, they offer entertainment and information to their viewers. On the other side, they allow advertisers to reach potential customers. For many types of media outlets, such as commercial TV, free online newspapers, blogs, radio, free-dailies, advertising represents the unique source of revenues. Moreover, even media outlets that are not purely advertising-funded (e.g., newspapers, magazine), greatly rely on advertising revenues to remain profitable. In the US, 50% to 80% of newspapers revenues come from advertising. In Europe this percentage goes from 30% to 80% (Baker 1994, Gabszewicz et al. 2001, Ellman and Germano 2009). The following graph shows, for OECD countries, the average percentage of ads and sales revenues of daily newspapers in 2008.

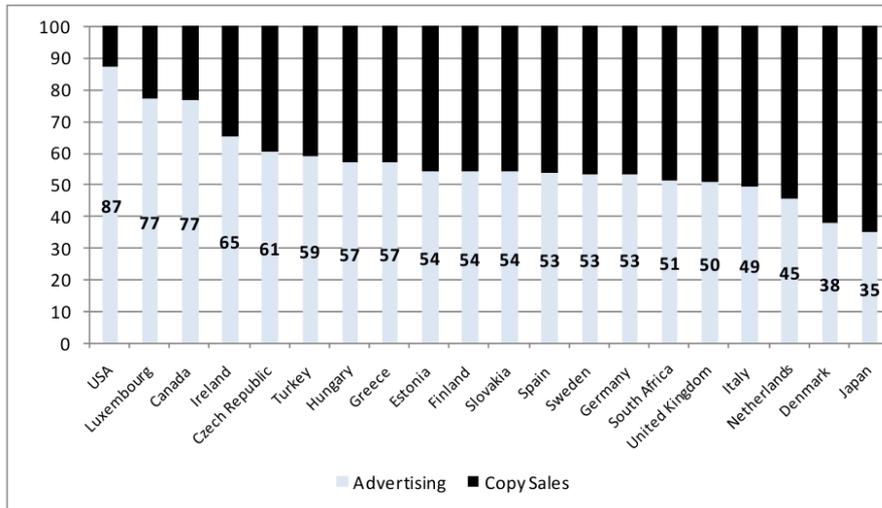


Figure 1. Contribution of advertising and sales to daily newspapers revenues
(source: OECD 2010)

The fact that almost all media outlets need advertisers to survive has raised concerns on the possibility of advertisers creating distortions in media contents (Baker, 1994; Bagdikian, 2004; Hamilton, 2004). Indeed, there is a crucial feature that makes the relationship between media and advertisers go well beyond the simple sales of viewers “eye-balls” (Hamilton 2004). That is, the value that an advertiser attaches to a media outlet may not simply consist on how many viewers it may reach trough

that outlet. Such a value depends also on the non-advertising contents provided by the media outlet. Advertisers typically care about the media contents since they value the characteristics of media viewers (e.g., demographics). In the context of “target advertising” (e.g., Gabszewicz et al., 2001, 2002; George and Waldfogel, 2003; Hamilton, 2004; Strömberg, 2004; Gal-Or et al., 2010; Bergemann and Bonatti 2010) this may create distortions since advertisers may want, for example, news contents to cover only issues preferred/relevant to large groups (Gabszewicz et al., 2001, 2002; Strömberg, 2004). At the same time, since media information contents typically concern also consumer products, advertisers may value the information content of news media since this may influence the demand for their products. That is, advertisers may want media to produce favorable news reports (e.g., hide any negative information concerning their products). Thus, advertisers’ pressure may create a *bias* in media news reports.¹

The economic literature on media bias has been mainly focused on the bias in the informative contents of political news reports. Specifically, it has shown that there may be a “supply-driven” political media bias deriving from the idiosyncratic preferences of journalists (Baron, 2006), owners (Djankov et al., 2003; Anderson and McLaren, 2010), governments (Besley and Prat, 2006) or lobbies (Sobbrio, 2010; Petrova, 2011). Moreover, the endogenous demand of politically “slanted” news by viewers may result in a “demand-driven” bias in news reports (Mullainathan and Shleifer, 2005; Gentzkow and Shapiro, 2006; Chan and Suen, 2008; Sobbrio, 2011). While the literature has been trying to address the sources and the welfare implications of *political media bias*, less attention has been devoted to analyze the advertisers-induced distortions in the informative contents of media outlets, i.e., to *commercial media bias* (Ellman and Germano, 2009; Germano and Meier, 2010).

This paper provides a survey of the anecdotal evidence on the presence of commercial media bias within specific industries and of the empirical literature looking at the link between advertising and media accuracy. At the same time, we introduce

¹There are also other types of distortions related to advertising. Armstrong and Weeds (2007) show that, due to the disutility of advertising, the welfare associated with advertising-funded media is lower than the one arising in presence of other funding schemes (i.e., public broadcasting). Moreover, advertising may distort downward the quality chosen by media platforms (Roger, 2010).

a simple model to review and summarizes the main elements of the theoretical literature (Ellman and Germano, 2009; Germano and Meier, 2010; Blasco, Pin and Sobbrío, 2011). The model provides insights on the main features of the link between competition in the market for products and commercial media bias. Moreover, the model also analyzes the role of competition in the market for news. The theoretical analysis leads to three main policy insights for media regulators. Specifically, the model suggests that:

1. Media regulators should target their monitoring efforts towards news contents/issues upon which advertisers are likely to share similar preferences.
2. In advertising industries characterized by highly correlated products, an increase in the degree of competition may translate into a lower accuracy of news reports.
3. A sufficiently high degree of competition in the market for news may drive out commercial media bias.

The paper is structured as follows. Section 2 presents the anecdotal and empirical evidence on the presence of commercial media bias within specific industries. Section 3 presents the empirical economic literature looking at the link between advertising and media accuracy. Section 4 introduces the theoretical framework. Section 5 provides three main policy insights for media regulators. Section 6 concludes.

2 Empirical evidence on commercial media bias

In this section we present the anecdotal and empirical evidence within specific advertising industries where the presence of commercial media bias has been extensively documented. Then, in the next section, we review the empirical economic literature looking at the link between advertising and the accuracy of media reports.

2.1 Big tobacco

The most well known and documented case of commercial media bias is represented by the influence of tobacco companies over US media. In 1954, the American Cancer Society released a result of a study on 187,000 men. The study showed that cigarette smokers had a death rate from **all diseases** 75% higher than nonsmokers. The mortality rate related to lung cancer was sixteen times higher with respect to nonsmokers. Despite the overwhelming evidence on the dangerous effects of smoking available since 1954, US media did not disclose this information for decades. Overall, tobacco products have been causing more than 300,000 deaths per year in the US. That is, tobacco kills every year six times more people than car accidents (Bagdikian, 2004). The fact that tobacco companies have been major advertisers (“the tobacco industry spends 4\$ a year for every American man, woman or child” Baker, 1994) seems to have played a key role in this cover-up. By analyzing a sample of 99 US magazines over 25 years, Warner et al. (1992) show that magazines that did not carry cigarette advertising were more than 40% more likely to report news on the health consequences of smoking than those with cigarette advertising. This difference was much more striking for women’s magazines, i.e., the magazines not carrying tobacco ads were 230% more likely to report news on the hazards of smoking. Kennedy and Bero (1999) performed a content analysis on newspapers and magazine coverage of research on passive smoking. They showed that acceptance of tobacco industry advertising was significantly associated with the conclusion that research on passive smoking was controversial.² It is also worthwhile to notice that, while in 1965 the US congress passed a legislation that required cigarette packages to be accompanied by a warning label, the very same bill prohibited the Federal Trade Commission, state and local governments from regulating tobacco advertising (Michaels, 2008). Indeed, as noticed by a contemporary writer “The effect of the advertising regulation is what the cigarette industry most feared. [...] The National Association of Broadcasters submitted statements firmly opposing any advertising regulation” (Drew, 1965). The history of tobacco advertisers’ influence on US media

²See also Chaloupka and Warner 2000 for an extensive survey of the empirical literature on the economics of smoking.

contains also “retaliation” episodes. In 1957, *Reader’s Digest* published an article disclosing medical evidence against tobacco. Following that article, the American Tobacco Company successfully pressured the *Digest’s* advertising agency to end its contractual relationship with the magazine. After *Mother Jones* published an article on the link between tobacco and health risks, tobacco companies reacted by cancelling their ads (Baker, 1994). Overall, as stated by Bagdikian (2004) the commercial media bias created by tobacco companies seems to represent “the most shameful money-induced censorship of American news media, a corruption of news that has contributed to millions of deaths”.

2.2 Big pharma

The medical academic community has been concerned over the influence of drug companies on the scientific evidence presented in medical journal. A peculiar characteristic of this type of media is that four out of five of the most important North American medical journal (i.e., *New England Journal of Medicine*, *Journal of the American Medical Association*, *Annals of Internal Medicine*, *American Family Physician*) accept only advertisements related to medical products. This implies that “although no policy restricted advertising only to pharmaceuticals, in practice, drug ads dominate” (Fugh-Berman et al., 2006, page 763). In 2010, Pharmaceutical Companies spent 326\$ millions for advertising in medical journals (IMS Health, 2010). In addition, drug companies finance medical journals by using “sponsor” subscriptions (also referred as “controlled” subscriptions). That is, drug companies pay medical journals to provide free-of-charge subscriptions to target populations. Finally, the pharmaceutical industry also contributes to medical journals’ profits through reprint orders (James, 2002). Thus, this symbiotic relationship between medical journal and pharmaceutical companies seem to have provided a very fertile ground for commercial media bias. Indeed, various scholars suggest that editorial decisions in medical journals have been, sometimes, influenced by advertisers’ concerns (Fletcher, 2003; Fugh-Berman et al., 2006). Wilkes and Kravitz (1995) provide a survey of North American journal editors showing that 12% of them noted conflicts between advertisers’ preferences and editorial decisions. As reported by

Fugh-Berman et al. (2006), in 1992 many large pharmaceutical companies withdrew their ads from *Annals of Medicine* after that journal published a study criticizing the accuracy of advertisements in medical journals. As stated by Robert Fletcher “The pharmaceutical industry showed us that the advertising dollar could be a two-edged sword, a carrot or a stick. If you ever wonder whether they play hardball, that was a pretty good demonstration that they do” (Tsai, 2003). In a notorious case, the executive editor of *Transplantation and Dialysis*, despite favorable peer review, rejected a guest editorial questioning the efficacy of epoetin in end stage renal disease since, as he wrote to the author, “it went beyond what our marketing department was willing to accommodate” (Dyer, 2004). Specifically, in his letter the editor told the author that his decision to publish the editorial was overruled by the marketing department. The article was also suggesting that the Medicare spending on this treatment was unjustified given the limited benefits on patients.³

2.3 The debate over anthropogenic global warming

The evidence that has been presented by US media on the sources of global warming seems to be largely unbalanced with respect to the consensus of the scientific community (Oreskes, 2004; Boykoff and Boykoff, 2004; Boykoff, 2007; Oreskes and Conway, 2010). That is, while since the mid 1990s the scientific community reached a consensus about the anthropogenic nature of global warming (Oreskes, 2004), media have been presenting this as a controversial issue. By analyzing the coverage on the causes of global warming by the major US newspapers (i.e., *New York Times*, *Los Angeles Times*, *Washington Post* and *Wall Street Journal*), Boykoff and Boykoff (2004) found that the 52.6% of articles were devoting the same space to the mainstream scientific view and to the deniers of anthropogenic global warming. A remaining 35.2% of the articles was giving more weight to the scientific consensus while still mentioning the presence of opposite views. The 6.1% of article was dominated by the skeptical view. Hence, only the 5.9% of articles was

³Medicare spent over \$7.6 billions on epoetin between 1991 and 2002, (Dyer, 2004). Epoetin is the main component of two similar drug products (i.e., Procrit and Epogen) produced by two different drug companies (source: medicinenet.com/epoetin_alfa).

exclusively devoting space to the scientific consensus. In other words, as argued by the authors, these newspapers seem to have been using “balance as bias”. Boykoff (2007) compares the evidence on the causes of global warming presented between 2003 and 2006 by US and UK media. While the US newspapers coverage of this issue seemed to diverge from the scientific consensus, especially between 2003 and 2004, UK newspapers do not seem to exhibit this type of divergence. As pointed out by Ellman and Germano (2009) the conspicuous advertisements by car manufactures is likely to have played an important role in inducing media to put a disproportional weight on views against anthropogenic global warming.⁴

3 Empirical literature on advertising and news contents

Over the last few years, a burgeoning empirical literature has been investigating how advertising expenditure influences media coverage (e.g., Reuter and Zitzewitz, 2006; Di Tella and Franceschelli, 2009; Rinallo and Basuroy, 2009; Reuters, 2009; Gambaro and Puglisi, 2010). While this literature usually finds a positive correlation between advertising expenditure and favorable media coverage, the evidence is not always univocal. Specifically, the correlation between ads expenditure and favorable news becomes less significant, or even disappears, in contexts where the competition of advertisers over news contents is higher. For example, Reuter and Zitzewitz (2006) find a positive relation between mutual fund recommendation and advertising expenditures for personal finance media (i.e., *Money Magazine*, *Kiplinger’s Personal Finance* and *SmartMoney*) while no correlation for national newspapers (i.e., the *New York Times* and the *Wall Street Journal*). Rinallo and Basuroy (2009) construct a dataset covering 291 Italian fashion firms and then analyze the relationship between their advertising expenditure and the coverage of their products in newspapers and magazines in Italy, France, Germany, the United Kingdom, and the United States. The authors find that preferential coverage of the adver-

⁴In the US, Automotive advertising summed up to \$19.8 billions just in 2006 (Ellman and Germano, 2009).

tisers' products is weaker when the media outlet's advertising revenues are more diversified. Reuter (2009) finds weak evidence on the correlation between wines' ratings and advertising in *Wine Spectator*.

Similarly, the literature looking at the effect of advertising on media accuracy from a historical perspective shows that advertising may also play a positive role. Gentzkow et al. (2006) investigate this issue by focusing on the US newspaper industry between the end of the 19th century and the beginning of the 20th century. Technological changes, such as a decreasing production costs, created significant economies of scale and then increased the competitiveness of the newspaper industry. As a consequence, these technological changes increased advertising revenues contributing to the creation of a politically independent press in the US. Petrova (2010) looks at the US press in the 1880s and shows that a higher profitability of advertising in local markets was conducive to the presence of more independent newspapers. Poitras and Sutter (2009) empirically investigate the decline in muckraking by US magazines at the beginning of the 20th century. The authors show that there is no evidence in support of the hypothesis that such decline was the consequence of advertisers' boycott as a reaction for adverse news coverage.

4 Theoretical framework

The previous section presented anecdotal and empirical evidence on the presence of commercial media bias within specific industries. At the same time, we reviewed the mixed empirical evidence arising from the economic literature on the effects of advertising on media accuracy. In this section, we present a theoretical framework that allows to reconcile this mixed evidence. Specifically, we construct a simple model which summarizes the main elements of the theoretical literature on commercial media bias (Ellman and Germano, 2009; Germano and Meier, 2010; Blasco, Pin and Sobbrío, 2011).

There are two firms $i = g, b$ each producing a product at zero marginal costs. Without loss of generality, we focus on the relevant case where one firm has a bad quality product (e.g., a defective product) while the other is producing a good

quality one. There is a unit mass of potential consumers and a media outlet. The two firms and the media outlet know the quality of the products while consumers do not. Specifically, consumers rely on the media outlet to gather information on products' qualities. Moreover, information is *hard* (it could be concealed but not forged). Thus the media outlet has to choose whether to reveal to consumers that firm b has a bad quality product or to conceal such information.

There are two periods. In each period, the media outlet may reach a unit mass of readers. However, when it hides some information in the first period, the number of readers in the second period drops to $\theta < 1$. That is, in the second period readers will perceive the media outlet as less informative. We denote by $\hat{\Pi}_i$ and $\hat{\psi}_i$ the profits of firm i and the ads fee paid by firm i , respectively, when the media outlet makes a truthful news report (i.e., discloses the bad news on firm b 's product). *Viceversa*, we denote by Π_i and ψ_i the profits of firm i and the ads fee paid by firm i , respectively, when the media outlet hides the bad news on firm b 's product. Hence, the profits of firm b when the media outlet conceals the negative news on its product are:

$$\Pi_b = \underline{\pi} \cdot [\alpha(1 + \theta)] - \psi_b \quad (1)$$

where $\underline{\pi} > 0$ denotes the mark-up when both firms are active in the market and $\alpha \leq 1$ denotes the exogenous fraction of consumers out of the unit mass of readers. When bad news are revealed, no reader would buy the product of firm b and so, its profits would simply be $\hat{\Pi}_b = 0$. Thus, firm b would never be willing to pay any positive ads fees when the media outlet discloses such bad news, i.e., $\hat{\psi}_b = 0$. Hence, the maximum ads fee that firm b is willing to pay to the media outlet, in exchange of hiding the bad news on its products, is:

$$\psi_b^{\max} = \underline{\pi} \cdot \alpha(1 + \theta) \quad (2)$$

Indeed, clearly, firm b would rather have the media outlet disclosing the bad news on its product, and then earn zero profits, rather than paying any $\psi_b > \psi_b^{\max}$.

On the other hand, the good producer (i.e., firm g) would never be willing to pay any ads fee when the media outlet hides the negative information on firm b 's product,

i.e., $\psi_g = 0$. Moreover, if the media outlet were to hide the bad news on firm b 's product, the profits of firm g would be

$$\Pi_g = \underline{\pi} \cdot [\alpha(1 + \theta)] = \Pi_b + \psi_b \quad (3)$$

Instead, when the media outlet reveals the bad information on firm b 's product:

$$\hat{\Pi}_g = \bar{\pi} \cdot 2\alpha - \hat{\psi}_g \quad (4)$$

where $\bar{\pi} > \underline{\pi}$ denotes the mark-up that firm g could obtain when it is not facing the competition of firm b . Clearly, since $\bar{\pi} > \underline{\pi}$ and $\theta < 1$, the profits of the good producer, gross of the ads fee, will always be higher when the media outlet discloses the bad news to consumers. Hence, the maximum ads fee that firm g would be willing to pay to the media outlet in exchange of disclosing the bad news on its rival's product is $\hat{\psi}_g^{\max}$ such that $\hat{\Pi}_g = \Pi_g$. That is:

$$\hat{\psi}_g^{\max} = \alpha [\bar{\pi} \cdot 2 - \underline{\pi} \cdot (1 + \theta)]$$

The media outlet. We denote by Γ the media outlet's profits when it hides the negative news on firm b 's product. That is:

$$\Gamma = s \cdot (1 + \theta) + \psi_b$$

where $s > 0$ represents the subscription fees obtained from the readers. That is, the media outlet acts as a platform of a two sided market. Its profits depend both on its revenues in the market for readers and the ones in the market for advertisers. On the other hand, the media outlet's profits when reporting the bad news on firm b 's product, are:

$$\hat{\Gamma} = s \cdot 2 + \hat{\psi}_g$$

Hence, if the media outlet were not to receive any payment (i.e., ads fee) from firm b , it would always prefer to produce truthful news reports (i.e., *reputation effect*). Now suppose that firm g and b compete to influence the media outlet's decision on

whether to report the bad news on firm b 's product or not. Specifically, as discussed above, the maximum firm b may be willing to pay to the media outlet in order to hide the bad news on its product is ψ_b^{\max} . Hence, the good quality producer will always be able to match firm b 's offer as long as $\hat{\psi}_g^{\max} \geq \psi_b^{\max}$. Specifically, the maximum willingness to pay of the good quality firm is higher than the one of the bad quality one, if and only if:

$$\bar{\pi} \geq \underline{\pi}(1 + \theta) \quad (5)$$

Thus, whenever $\bar{\pi} \geq 2\underline{\pi}$ the above condition is always verified. Moreover, from the media outlet perspective, it will always be optimal to be paid by the good quality firm to disclose the bad news on firm b rather than being paid the latter to hide such bad news, if and only if:

$$s \cdot (1 - \theta) \geq \psi_b - \hat{\psi}_g$$

That is, a necessary and sufficient condition to ensure that the media outlet has an incentive to disclose the bad information on firm b 's product will be:

$$s \cdot (1 - \theta) \geq 2\alpha [\underline{\pi}(1 + \theta) - \bar{\pi}] \quad (6)$$

Thus, (5) is a sufficient condition for the above being satisfied. That is, the media outlet will always be induced to disclose its information to readers when the gain of firm g in the mark-up from driving out of the market its competitor is sufficiently large (i.e., *profit maximization effect*). Moreover, immediate comparative statics point out that the higher are the media outlet's profits in the market for readers (i.e., the higher are the subscription fees s), and the higher the reputation cost when not disclosing bad news (i.e., the lower is θ), the more likely that the media outlet will end up revealing all its information to consumers. *Viceversa*, the higher is the fraction of readers who are also potential consumers (i.e., the higher is α), the higher the media outlet's incentives to hide information (when $\bar{\pi} < \underline{\pi}(1 + \theta)$).

4.1 Correlation and competition in the market for products

In this section, we extend the theoretical framework described above by considering a situation where the quality of firms' products is correlated. Specifically, when the media outlet reports the bad news on firm b 's product, the fraction of readers buying firm g 's product (i.e., α) is reduced by a factor $(1 - \rho)$ with respect to the uncorrelated case. That is, ρ is a parameter capturing the degree of correlation between products. Hence, when the correlation is sufficiently high, firm g has no longer incentives to pay the media outlet to reveal the bad news on firm b 's product. Specifically, the correlation between products' qualities negatively affects the value of driving out of the market firm b since, from the readers perspective, bad news on firm b 's product are (partly) also bad news on firm g 's product.⁵ Hence, the maximum ads fee the good producer is willing to pay to the media outlet becomes:

$$\hat{\psi}_g^{\max} = \alpha [\bar{\pi} \cdot 2(1 - \rho) - \underline{\pi}(1 + \theta)]$$

That is, when correlation increases $\hat{\psi}_g^{\max}$ decreases, up to the point where the above threshold becomes negative. Moreover, $\hat{\psi}_g^{\max}$ is always lower than the maximum willingness to pay of firm g discussed in the previous section. Therefore, in presence of correlation between products' qualities, the media outlet will have less incentives to disclose the negative news on firm b 's product and it will do so only when it could obtain sufficiently high subscription fees from its readers.⁶

Indeed, when subscription fees are zero $s = 0$ (i.e., purely advertising funded media outlet), the media outlet will disclose such bad news if and only if:

$$\rho \leq \bar{\rho} \equiv 1 - \frac{\pi}{\bar{\pi}} \cdot (1 + \theta) \quad (7)$$

That is, in advertising industries characterized by highly correlated products, firms

⁵It is here, implicitly, assumed that the media outlet observes the quality of firm b while it gets only a noisy signal on firm g 's product (which is correlated with the quality of firm b 's product). Hence, the higher the correlation between products, the more bad news on product b are (relatively) also bad news on product g .

⁶Notice that, we are here implicitly assuming that the media outlet's readership does not depend on products' correlation. More generally, since correlation affects the accuracy of the media outlet's news reports, readership would endogenously depend on it (see Blasco, Pin and Sobbrío, 2011)

end up sharing similar preferences over news content. Hence, consistent with the anecdotal and empirical evidence presented in section 2 on the tobacco, pharmaceutical and automotive industries, in this case the media outlet may be induced by advertisers to not produce accurate news reports. Instead, when products qualities are weakly correlated, firms have conflicting preferences over news reports. Then, in this case, the media outlet is more likely to have the proper incentives to deliver accurate news reports (consistent with the empirical evidence discussed in section 3).

On the other hand, more competition in the market for products may be detrimental to the accuracy of the media outlet's report. Indeed, when the products market becomes more competitive the gain in the mark-up from excluding one rival from the market, i.e., $(\bar{\pi} - \underline{\pi})$, decreases. Hence, the ratio $\underline{\pi}/\bar{\pi}$ increases. Therefore, a higher degree of competition in the market for products does not necessarily lead to a higher accuracy of the media outlet's reports. Moreover, the higher is the degree of correlation among products' qualities, the more likely it is that this competition effect is detrimental for accuracy. That is, the higher is ρ , the lower $\underline{\pi}/\bar{\pi}$ must be to ensure that the media outlet has an incentive to produce an accurate news report.

4.2 Competition in the market for news

In this section we extend the framework described in section 4 to allow for the presence of two media outlets competing in the market for news. Specifically, we assume that there is an incumbent media outlet and an entrant one. The two media outlets are horizontally differentiated. Hence, readers can access the news reports from both media outlets but have to incur in a transportation cost to move from a media outlet to the other (as in Germano and Meier, 2010). Specifically, we capture the presence of competition between the two media outlets and the presence of readers' transportation cost, by assuming that the incumbent media outlet will charge a subscription fee $\underline{s} < s$ to the unit mass of readers and, upon not observing any news on firms' products, only a fraction $1 - \epsilon > 0$ of them will get informed also from the entrant media outlet. That is, $\epsilon \in (0, 1]$ represents a proxy of the transportation cost. Moreover, without loss of generality, the entrant media outlet

is assumed to be purely subscription funded (i.e., advertisers cannot influence its news reports and thus it will always disclose the bad news on firm b 's product).⁷ Thus, even if the entrant media outlet does not *directly* compete in the advertising market with the incumbent, it will still negatively affect the advertising revenues of the incumbent media outlet by indirectly decreasing the value of its reports from the advertisers' perspective (i.e., the value of hiding/disclosing the bad news on firm b 's product). That is, when the incumbent media outlet conceals the negative news on firm b 's product, firm b 's profits are:

$$\Pi_b = \epsilon \cdot \alpha \cdot \underline{\pi}(1 + \theta) - \psi_b$$

Therefore, the maximum ads fee that firm b is willing to pay to the incumbent media outlet, in exchange of hiding the bad news on its products, becomes:

$$\psi_b^{\max} = \epsilon \cdot \alpha \cdot \underline{\pi}(1 + \theta) \quad (8)$$

Hence, ψ_b^{\max} is lower than the one derived in the single media outlet case, and it is increasing in the transportation costs ϵ .

As before, the good producer (i.e., firm g) would never be willing to pay any ads fee to the incumbent media outlet when it hides the negative information on firm b 's product, i.e., $\psi_g = 0$. On the other hand, regardless of the news report of the incumbent media outlet, firm g knows that a fraction $\alpha(1 - \epsilon)$ of readers would anyway learn that firm b 's product is a bad quality one. That is, a fraction $\alpha(1 - \epsilon)$ of readers would always buy its products. Thus, firm g will always earn a mark-up $\bar{\pi}$ from at least a fraction $\alpha(1 - \epsilon)$ of readers.⁸ Hence, if the incumbent media outlet

⁷Alternatively, this assumption may simply reflect the fact that the entrant media outlet must build its reputation for accurate news reporting.

⁸Notice that, here we are implicitly assuming, without loss of generality, that firm g can perfectly price discriminate between the $(1 - \epsilon)$ readers who learn from the entrant media outlet that firm b has a bad quality product, and the other ϵ readers who do not. Indeed, alternatively, equation (10) may be expressed as:

$$\Pi_g = \epsilon [\underline{\pi} \cdot \alpha(1 + \theta)] + (1 - \epsilon) [(\underline{\pi} + \eta) \cdot 2\alpha] \quad (9)$$

where $\eta \in [0, \bar{\pi} - \underline{\pi}]$ denotes different levels of price discrimination. That is, the case of perfect price discrimination is captured by $\eta = \bar{\pi} - \underline{\pi}$. Instead, when $\eta = 0$ firm g is not able to price

were to hide the bad news on firm b 's product, the profits of firm g would be:

$$\Pi_g = \epsilon [\underline{\pi} \cdot \alpha(1 + \theta)] + (1 - \epsilon) [\bar{\pi} \cdot 2\alpha] \quad (10)$$

Instead, when the media outlet reveals the bad information on firm b 's product:

$$\hat{\Pi}_g = [\bar{\pi} \cdot 2\alpha] - \hat{\psi}_g \quad (11)$$

hence

$$\hat{\psi}_g^{\max} = \epsilon \cdot \alpha [2\bar{\pi} - \underline{\pi}(1 + \theta)] \quad (12)$$

Hence, also $\hat{\psi}_g^{\max}$ is lower than the one derived in the single media outlet case and it is increasing in the transportation costs ϵ . Therefore, by denoting $\tilde{s} = \underline{s}/\epsilon$, the incumbent media outlet will report accurate information to its readers if and only if:

$$\tilde{s}(1 - \theta) \geq 2\alpha[\underline{\pi}(1 + \theta) - \bar{\pi}] \quad (13)$$

Thus, in order to compare whether the incumbent media outlet's incentives to produce accurate news reports increase or decrease when it faces the competition of the entrant, it is sufficient to compare \tilde{s} with s . It is immediate to verify that when all readers are willing to watch the entrant media outlet, upon not observing any bad news from the incumbent, i.e., $\epsilon \rightarrow 0$, then the media outlet could not gain anything from advertisers. Hence, it will always report accurate information to consumers, i.e., for every $\underline{s} \in (0, s]$. *Viceversa*, when only a small fraction of readers is willing to watch the entrant's news reports, the above condition is less likely to be satisfied. That is, when the readers' transportation cost is high, the decrease in the subscription fees due to the entrant competition may result in the incumbent media outlet being more likely to not report accurate information due to the advertising pressure from firm b . In other words, when the readers transportation cost is low, the presence of an additional media outlet is likely to be beneficial for discriminate. In this case, equation (12) would become:

$$\hat{\psi}_g^{\max} = \alpha[2\bar{\pi} - \underline{\pi}(2 - \epsilon(1 - \theta))]$$

readers. When the transportation cost is high, this may not be the case.

To make this point explicit, let's look at what happens if the transportation cost ϵ depends directly on the number of competing media outlets in the market. Suppose that there are n entrant media outlets. For simplicity, as before, we assume that these n media outlets do not directly compete in ads fees with the incumbent. Thus, the only direct effect of increasing competition in the market for news on the incumbent's profits is given by a decrease in the readers' transportation cost (which now depends on the number of entrants). Specifically, we can assume that $\epsilon(n) \equiv \epsilon^n$. That is, transaction costs are strictly decreasing in the number of entrants (see Germano and Meier 2010). Thus, by substituting this function into (13), we can characterize a threshold in the number of media outlets competing in the market for news, above which the news reports of the incumbent are accurate (no commercial media bias). Specifically:

$$\bar{n} = \frac{\log(2\alpha) + \log(\underline{\pi}(1 + \theta) - \bar{\pi}) - \log(\underline{s}(1 - \theta))}{\log(\epsilon)} \quad (14)$$

In other words, whenever $n > \bar{n}$, the transportation cost that each reader has to incur in order to watch one of the entrant media outlet will be small enough to ensure that the incumbent media outlet will have an incentive to produce accurate news reports.

5 Regulatory implications

In this section, we discuss the implications for media regulators arising from the theoretical framework described in the previous section. Specifically, the results of the model imply that media regulators should look at three different aspects when trying to address commercial media bias: the degree of correlation among the products of potential advertisers within a given industry, the degree of competition of potential advertisers in that industry, the degree of competition in the market for news. As discussed above, commercial media bias is more likely to arise in presence of advertisers whose products belong to industries exhibiting a high degree

of correlation. Indeed, when advertisers' products are highly correlated they will end up sharing the same preferences over news reports. That is, both the good quality (firm g) and bad quality (firm b) producers will prefer the media to hide any negative news on products' qualities (as in the case of tobacco companies). Instead, in industries where products are weakly correlated, potential advertisers have conflicting preferences over news reports. Hence, the competition between good and bad quality producers over news reports ends up creating the proper incentives for media to deliver accurate news reports. That is, the effect of products correlation on the accuracy of news reports leads to the first policy insight for media regulators.

Policy insight 1 *Media regulators should target their monitoring efforts towards news contents/issues upon which advertisers are likely to share similar preferences.*

Therefore, when potential advertisers have conflicting preferences over news reports, the virtuous effect of competition would prevent commercial media bias to arise in the first place. Instead, when potential advertisers share the same preferences over news reports, commercial media bias is likely to represent a serious concern. Hence, media regulators should allocate their monitoring efforts towards advertising industries where firms are more likely to have positively correlated preferences over news reports.

Moreover, when advertisers share similar preferences over news reports, an increase in the degree of products market competition may not be beneficial for the accuracy of news reports. This leads to the second policy insight for media regulators.

Policy insight 2 *In industries characterized by highly correlated products qualities, an increase in the degree of competition in the market for products may translate into a lower accuracy of news reports*

Indeed, when $\rho = 0$, an increase in the competitiveness of the industry such that $\bar{\pi} \cong \underline{\pi} \rightarrow 0$, translates in the media outlet always producing accurate news reports (condition (6) is always verified). Instead, the higher is ρ , the more likely that a

higher degree of competition in the products market ends up weakening the media outlet's incentives to report accurate information (less likely that (7) is verified). Finally, when advertisers have highly correlated preferences over news reports, a significant level of competition in the market for news may help counterbalancing the incentives to bias the news coverage in favor of advertisers. This represents the third policy insight for media regulators.

Policy insight 3 *A sufficiently high degree of competition in the market for news drives out the commercial media bias that would otherwise arise in presence of news contents/issues upon which advertisers share similar preferences.*

In conclusion, our analysis suggests that the efforts and the policy instruments used by media regulators should vary according to the characteristics of the advertisers' industry.

6 Conclusions

As pointed out by Ellman and Germano (2009), there are two scholarly views regarding the role of advertising on the accuracy of media reports. On one side, the “regulatory” view emphasizes the danger of distortions arising from advertisers pressure over media to deliver favorable news reports (e.g., Baker, 1994; Bagdikian, 2004). The anecdotal and empirical evidence on Tobacco, Pharmaceutical and Automotive industries, reviewed in section 2, seems indeed to substantiate these concerns. On the other hand, the “liberal” view emphasizes the positive role of advertising in creating and maintaining a politically independent press (e.g., Kaplan, 2002; Gentzkow et al., 2006). The historical evidence presented in section 3 seems, indeed, consistent with this alternative view. More generally, the recent empirical literature looking at the link between advertising and accuracy of media reports seems to provide mixed evidence on this issue (as pointed out in section 3). This paper provides a theoretical framework which allows to reconcile this mixed evidence. Specifically, we have constructed a simple model summarizing the main features of the theoretical literature on commercial media bias (Ellman and Germano, 2009;

Germano and Meier, 2010; Blasco, Pin and Sobbrío, 2011). The theoretical analysis emphasizes that the efforts and the policy instruments used by media regulators in addressing commercial media bias should vary according to the characteristics of the advertisers' industry. Specifically, the results of the model deliver three main policy insights for media regulators:

1. Media regulators should target their monitoring efforts towards news contents/issues upon which advertisers are likely to share similar preferences.
2. In advertising industries characterized by highly correlated products, an increase in the degree of competition may translate into a lower accuracy of news reports.
3. A sufficiently high degree of competition in the market for news may drive out commercial media bias.

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