Paying Positive to Go Negative: Advertisers' Competition and Media Reports*

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Abstract

This paper analyzes a two-sided market for news where advertisers may pay a media outlet to conceal negative information on the quality of their own product (paying positive to avoid negative) and/or to reveal negative information on the quality of their competitors' products (paying positive to go negative). We show that the higher the competition among potential advertisers, the higher the probability that the media outlet fully discloses its information to consumers. Moreover, we analyze the media outlet's endogenous investment in its detection technology and characterize how such investment may differ from the socially optimal one.

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1 Introduction

Advertisers and media live in a symbiotic relationship. Advertisers need media to reach their consumers and media needs advertisers to finance their activities and to make profits. This is true for any type of media.[1] Moreover, this relationship becomes even more stringent for media whose revenues depend only on advertising (commercial TV, radio, online newspapers, blogs, internet web-sites, free-press, etc.).

The traditional economic literature on advertising (see Bagwell 2007) has been typically focused on understanding the economic rationale behind advertising (e.g., persuasive or informative advertising) while keeping media outside of the analysis. More recently, the literature on two-sided markets has found in the media one of its archetypal platform. Specifically, a platform connecting advertisers and consumers (see Anderson and Gabszewicz 2006). This literature has analyzed the interactions between media and advertisers in a two-sided market where media sell the medium content to media viewers and, at the same time, media sell to advertisers the access to such viewers.[2]

Less attention has been devoted to the understanding of the advertising value of the medium content itself. Advertisers may want to influence medium content for two main reasons. To attract (i.e., target) more valuable categories of viewers/consumers (see Gabszewicz et al. 2001,2002, George and Waldfogel 2003, Hamilton 2004, Strömberg 2004). On the other hand, advertisers may want to influence the medium content to influence the purchasing decisions of viewers/consumers. That is, apart from their entertainment value, consumers/viewers value media reports exactly because they may provide valuable information on consumers products (as well as on politics, crime, etc.). Hence, advertisers' profits will ultimately depend on how consumers will be influenced by the reports coming from the media, which in turn may affect the advertisers' willingness/ability to pay the media. Consequently, the relationships between advertisers and media outlets may go well beyond the simple sales of advertising space and the traditional rationales for advertising.

In this paper, we abstract from standard rationales for advertising (i.e., persuasive or informative advertising) in order to explicitly focus on an environment where media sell the medium content to media viewers and, at the same time, they sell a bundle to advertisers constituted by such viewers *and* the medium content. That is, how much

[1] Excluding few TV stations funded exclusively through subscriptions.

[2] Hamilton (2003) refers to selling the access to viewers as selling "eyeballs".

advertisers are willing to spend will depend on how many consumers they may reach trough the medium and what kind of information the medium is releasing. Moreover, differently from targeted advertising, in our model an advertiser wants to influence this content not to attract specific types of viewers/consumers but to influence the beliefs on products' quality of any type of viewer/consumer. Specifically, in our model media gather information on the quality of firms' products and then may use such information when bargaining over advertising fees.

To fix ideas on the basic intuition of our model consider the following example. The media outlet is a magazine specialized in computers' products. There are two producers (e.g., Apple and Microsoft). The magazine gathers information on the firms' products (i.e., it gets a signal on each firm's product).

Each producer would never want the media outlet to publish any negative information (if any) on its product. On the other hand, it will always want the media outlet to publish negative information (if any) on the rival's product. Hence, when contracting upon the cost of advertising, if the magazine found negative evidence on either or on both firms, then it can use such information to charge a higher advertising price to either firm. More specifically, each of the two producers will be willing to pay the magazine to hide the negative evidence on its own product (if any) and to publish the negative evidence on the other firm's product (if any). That is, advertisement expenditures may end up being a hidden form of payment aimed at either concealing negative information on the advertiser's own product (paying positive to avoid negative) or at revealing negative information on the competitors' products (paying positive to go negative). Hence, while in our model the only advertisements consumer watch are indeed "positive" (and do not contain any information on the other firms' products), such advertisements may hide an implicit payment to obtain a "negative advertisement" in the form of media negative reports on the rivals' products.

We show how competition among producers may influence the media incentives to truthful report their information. Specifically, we show that the presence of competition in the products' market induces a media outlet to make truthful reports (full disclosure of information) unless it finds that all products are of bad quality. In this case, the media outlet would "save" just one firm (i.e., hide the negative information on its product).

The analysis also shows that the media outlet's endogenous investment in detection technology may be different from the socially optimal one. Specifically, the media outlet may under-invest in its detection technology since it only internalizes the value of such investment for the marginal viewer rather than its overall value for all viewers.

2 Related Literature

The focus and the results of our model are complementary but rather different from the ones of the traditional literature on advertising (i.e., persuasive and informative advertising).[3] Specifically, in models of informative advertising a higher level of ads is, typically, associated with a higher level of information on the firm's product by consumers. Informative advertising may contain direct information regarding the product's existence, price, characteristics, store location (e.g., Butters 1977, Grossman and Shapiro 1984, Dukes 2004).[4] Advertising may also convey information indirectly by signaling product's quality, i.e., "money-burning" (Nelson 1974, Milgrom and Roberts 1986). Instead, in our stylized model, advertising does not have any informative value *per se.* Moreover, a higher level of advertising (higher transfers by the firms to media outlets) may be associated with a higher or lower level of information of consumers on the firms' products (depending on whether ads are paid to reveal or to hide information). Neither, advertising has any signaling value in our model since consumers do not observe the advertising price (transfers) paid by firms.[5] Hence, advertising *per se* do not convey or signal any information to consumers. On the other hand, advertising affects the incentives of media outlets to supply information and thus, indirectly, influences the information on the quality of the firms' products that consumers receive.[6] Our paper is also related to the literature on comparative advertising (Anderson and Renault, 2009, Barigozzi et al., 2009). In general, this literature shows that "a quality disadvantage is necessary for comparative advertising" (Anderson and Renault 2009, page 560). Our analysis instead shows that different media reports may arise even in presence of the same quality among firms.

[3]For an extensive survey of the literature on advertising, see Bagwell, 2007.

[4]Nevertheless, as noted by Dukes, "advertising seldomly takes this form. For instance, advertising often contains no price information. Furthermore, a great deal of advertising is for products whose existence is widely known" Dukes 2004, page 5.

[5]Indeed, the secrecy practices in the advertising industries are such that even competitors are unable to observe advertising agreements, see Dukes and Gal-Or, 2003.

[6]Moreover the literature on informative ads typically assumes that "a listener's media choice does not depend on this informational benefit" Dukes 2004, page 5. Instead in our model, consumers do take explicitly into account the informational benefit of watching a media outlet (and thus indirectly the informational benefits of advertising) when deciding whether to watch a media outlet or not.

Our framework follows the more recent approach to the analysis of advertising, viewing media as platforms of a two-sided market connecting advertisers and consumers.[7] More specifically, our paper is closely related to the literature looking at the link between advertising and news contents. There are two different issues analyzed within this literature. The first one looks at how targeted advertising may interact with news content (see Gabszewicz et al. 2001,2002, George and Waldfogel 2003, Hamilton 2004, Strömberg 2004). This literature suggests that given a constraint in the number of news that can be reported (or time slots in a broadcast schedule), advertisers may influence media to induce them to choose news that interest the most valuable consumers. The second one is a complementary view looking at how the news content of the media may directly affect advertisers' profits (Ellman and Germano 2009, Germano 2009). Ellman and Germano (2009) argue that, for many years, tobacco advertisers managed to induce media to not provide news on tobacco issues to avoid having consumers becoming aware of the negative effects of its consumption. Indeed, their model shows that, if an advertiser could commit to withdraw ads in case a media outlet reports negative information, it may induce the media outlet to not publish such information. Germano (2009) focuses on the same issue allowing for the presence of N media outlets located on a network and shows that if the number of media outlets is high enough, the media outlets' reports will be fully truthful. The present paper is closely related to this second line of research. We show that, when introducing competition on the advertisers' side, the media incentives to produce truthful reports are not necessarily misaligned with the advertisers' ones (as in Ellman and Germano 2009 and Germano 2009). While any advertiser would want the media to always conceal any negative information regarding its product, such advertiser would also want the media to always reveal any negative information regarding its rivals' products. Hence, in our model, the fees paid by a firm to buy an advertising slot may end up being a hidden transfer to induce media to "go negative" on the competitors' products.[8]

Our results are consistent with the evidence found by Reuter and Zitzewitz (2006). Indeed, in their paper the authors find a positive relation between mutual fund recommendation and advertising expenditures for personal finance media while no correlation for national newspapers. This seems to suggest that where the competition

[7] See Anderson and Gabszewicz 2006, for an extensive survey.

[8] For negative advertising in the political market, see Harrington and Hess (1996), Polborn and Yi (2006) and Gandhi et al. (2010).

among competing advertisers is higher (i.e., national newspapers), the negative effects due to the single advertiser influence over media content is lower.

The analysis of this paper is also relevant for the literature analyzing the influence on media reports by other economic and political agents (e.g., political candidates). In particular, within the framework of Besley and Prat (2006) where an incumbent politician may capture the media by buying their silence, introducing competition in the "bribing offers" may increase the quality of information. That is, our model suggests that if also the challenger were able to offer monetary transfers to the media to buy their silence on her own bad type or to avoid their silence on the incumbent bad type, this would reduce the probability of media capture and lead to a higher level of information by voters.

The paper is structured as follows. Section 3 describes the model and analyzes the equilibrium reporting strategy of a media outlet. Section 4 analyzes the endogenous investment in detection technology by a media outlet and compares it with the socially optimal one. Section 5 provides a discussion on the alternative applications of the benchmark model. Section 6 concludes. All the proofs are provided in the Appendix.

3 The Model

Consider L firms $l = 1, .., L$ each selling one product to a unit mass of potential consumers. All firms are *ex-ante* identical. That is, firms produce a homogenous good of the same *ex-ante* quality. Firms sell their products to consumers at a (fixed) price p. While firms are all *ex-ante* identical, each firm may experience a negative shock in the quality of its product (e.g., a defect) with probability $(1 - \nu) \in (0, 1)$. That is, the *ex-post* quality of firm l's product may turn out to be either high or low. Specifically, $q_l \in \{g\,; b\}$ with $g > b = 0$ where q_l is *i.i.d.* for all firms.[9] Hence, the prior probability that the product of a firm will be a good quality one is $\nu = \Pr\{q_l = g\} \in (0, 1)$, $\forall l$.

Consumers purchase at most one product and get a positive benefit g from consuming a high quality one (instead, since $b = 0$, they get no benefit for consuming a low quality one). There is a single media outlet who observes a signal $z_l \in \{\varnothing; b\}$ for each q_l. Specifically, if product l is of good quality, the media outlet receives no signal, i.e., $\Pr(z_l = \varnothing | q_l = g) = 1$. Instead, if it is of "bad" quality, the media outlet receives

[9]Recent examples, reported by media, of this type of negative shocks in the quality of a product are the Toyota issues with its malfunctioning car accelerator, the IPhone 4 signal problems, the Toshiba's over-heating and fire episodes of some of its laptop series, the Ferrari 458 burning episodes, etc.

signal b with probability $\theta \in [0,1]$, i.e., $\Pr(z_l = b | q_l = b) = \theta$.[10] Once the media outlet has received the signals, it has to choose a reporting strategy.

The signals gathered by the media outlet are hard information, i.e., the media outlet may conceal but not forge information. Thus, the vector of messages $\mathbf{m} = (m_1, ..., m_L)$ that the media outlet sends to viewers must be consistent with the set of signals observed. That is, $\mathbf{m} \in \mathcal{M}$ where $\mathcal{M} = \{\varnothing \cup z_1\} \times .... \times \{\varnothing \cup z_L\}$ represents the message space of the media outlet and $m_l \in \{\varnothing \cup z_l\}, \forall l$.

Suppose that the media outlet observed signal b on firm l_1's product and $\varnothing$ on firm l_2's product. Clearly, firm l_1 would want the media outlet to hide such signal since consumers would not buy its products upon observing $m_{l_1} = b$. Instead, firm l_2 would want the media outlet not to hide such signal since consumers would be more likely to buy its products, rather than the rival's product, upon observing it. Hence, the media outlet knows that its reporting strategy will affect the firms' profits and may use this information to impose high advertising transfers to the firms. Thus, before selecting its reporting strategy, the media outlet will bargain with the firms over the advertising fees. Specifically, we assume that the media outlet makes a take–it–or–leave–it offer to each producer (i.e., ask an advertising price t_l to each producer) contingent on the signal received and the set of messages it will send to consumers. Each producer may accept or refuse this offer.[11] Then, the media outlet will select a reporting strategy consistent with the accepted offer(s) from the advertisers.

Since the media outlet's reports may be informative for her purchasing decision, a consumer i may decide to pay an opportunity cost $c_i \sim U[0, \gamma]$ and watch these reports (i.e., pay c_i to observe $\mathbf{m}$), where γ is the upper-bound on such opportunity cost. Then, if a consumer decides to watch the media outlet's reports, she updates her beliefs accordingly and she decides which product to buy, if any. Specifically, the expected utility of a consumer when not watching the media outlet's reports is:

$$U^U = \max\left\{\nu g - p, 0\right\} \tag{1}$$

[10]Notice that, as Besley and Prat (2006), we assume that signals can only be bad. However, as in their model, we could easily extend our framework to incorporate also good signals, as long as the probability of good signal is lower than the one of bad ones. That is, from the media outlet's perspective, not observing any signal would increase the probability of the product being of good quality.

[11]The assumed structure of the bargaining game between potential advertisers and the media outlet is without loss of generality. If potential advertisers were competing *á la Bertrand* in their offers to the media outlet to hide/reveal its signals, the results of the model would remain the same.

On the other hand, the expected utility of a consumer (net of the opportunity cost of acquiring information) when watching the media outlet's reports is:

$$U^I(\mathbf{m}) = \max\big\{ \max_{q_l} \{E[q_l|\mathbf{m}]\} - p, 0\big\} \tag{2}$$

In the rest of our analysis we will focus on the case where $\nu g - p \geq 0$. That is, if an individual decides not to watch the media outlet's reports, she will still buy (randomly) one of the L products. Hence, consumer i will be willing to watch a media outlet if and only if:

$$c_i \leq E[U^I(\mathbf{m})] - (\nu g - p) \tag{3}$$

Therefore, the expected fraction of readers will be:

$$\alpha = \frac{E[U^I(\mathbf{m})] - (\nu g - p)}{\gamma} \tag{4}$$

Moreover, to ensure that the upper bound of α is always one we assume, without loss of generality, that $\gamma \geq g(1-v)$. Consumers have rational expectations about the media outlet's reporting strategy (i.e., in equilibrium $m_l^e = m_l, \forall l$). For instance, if the media outlet were to always conceal any negative information on all the products, its reports would be uninformative. Consumer would anticipate this and thus α would be equal to 0.[12]

The profit function of firm l, net of advertising fees, is:

$$\Pi_l(\mathbf{m}) = \begin{cases} p\left(\alpha + \frac{(1-\alpha)}{L}\right) & \text{if } E[q_l|\mathbf{m}] > \max_{j\neq l} E[q_j|\mathbf{m}] \\ p\left(\frac{\alpha}{|\arg\max_j\{E[q_j|\mathbf{m}]\}|} + \frac{(1-\alpha)}{L}\right) & \text{if } E[q_l|\mathbf{m}] = \max_{j\neq l} E[q_j|\mathbf{m}] > 0 \\ p\left(\frac{(1-\alpha)}{L}\right) & \text{otherwise} \end{cases} \tag{5}$$

where $|\arg\max_j\{E[q_j|\mathbf{m}]\}|$ is the number of firms that the informed consumers expect to have a high quality product given $\mathbf{m}$. Then, the profit function of the media outlet is:

$$\Gamma = \sum_{l=1}^{L} t_l(\mathbf{m}) \tag{6}$$

That is, the profits of the media outlet depend on the advertising fees it is able to collect

[12]Notice that if we were to introduce a nuisance parameter ρ, in our model to capture the consumers' disutility from ads, nothing would change. Indeed, in our game the bargaining process between advertisers and media does not involve the level of ads but only the price of ads.

from advertisers. We consider the media outlet's profits as not directly depending on the number of viewers to focus on the incentives to produce truthful reports coming from the advertisers' side, while abstracting from the ones coming from the consumers' side *per se* (i.e., profits from viewership independent from advertising). Nevertheless, although the media outlet does not directly care about the fraction of people watching its reports, its profits indirectly depend on it. Indeed, as it is shown in the equilibrium analysis below, the advertising fees that it can obtain from producers are an increasing function of α. Moreover, we assume that, when indifferent, a producer always prefers the negative signal on its product to be concealed, whereas the media outlet, as well as any competing producer, always prefers to disclose it.[13]

Notice that, while consumer expectations must be correct *ex-post*, at the bargaining stage between the media outlet and the advertisers, the fraction of viewers α will be considered as fixed (since expectations were formed at the previous stage). That is, for any $\alpha > 0$, the media outlet has an incentive to conceal negative information (if any) in exchange of a transfer $t_l(\mathbf{m}) \geq 0$ from each producer whose profits would be negatively affected by publishing such information. However, at the same time, each producer would also be willing to pay a positive transfer to the media outlet in order to publish negative information on its competitor.[14]

To summarize the timing of the game is as follows:

1. Nature draws quality q_l for each firm's product.
2. The media outlet receives a signal z_l on each product's quality.
3. The media outlet makes a take-it-or-leave-it offer to each firm (i.e., ask an advertising fee t_l to each firm) contingent on the signals received and the vector of messages $\mathbf{m}$ that it will send to consumers.
4. Each firm then decides whether to accept the offer or not.

[13] This tie-breaking rule is simply (implicitly) suggesting that, all other things equal, the profits of the media outlet are increasing in the informativeness of its messages (e.g., reputation concerns, profits from advertisers in other markets, etc.).

[14] As an analogy, we may think of this framework as if the media outlet was selling tickets (entry costs) to bad quality firms in order to access the α-market share of informed consumers. On the other hand, the media outlet could also sell a ticket to the "good" quality firms (i.e. firms whose product the media outlet did not find being to be of bad quality) to restrict the bad quality firms (i.e. firms whose product the media outlet discovered being of bad quality) to access this α-market share of informed consumers.

5. The media outlet selects the vector of messages $\mathbf{m}$ to be sent to its viewers consistent with the set of advertising fees accepted by the firms.

6. Every consumer i decides whether to pay the opportunity cost c_i to watch the media outlet's reports and if so she updates her beliefs accordingly. Then, given her posterior beliefs, every consumer decides which product to buy (if any).

Notice that in Ellman and Germano (2009) advertisers are willing to pay transfers to media outlets to reduce the accuracy of their reports up to the point where the accuracy is set to zero and media outlets do not produce any report at all on a given issue. The authors assume that when readers do not observe any report (or an uninformative report) on a given issue, they do not update their beliefs on the underlying value of the product advertised (posterior beliefs equal to priors). *Viceversa*, we explicitly take into account how uninformative reports may affect consumers' choice.[15] That is, we consider the presence of rational Bayesian individuals who upon watching an uninformative report by the media outlet update their beliefs. Viewers take into account that an uninformative report may be the result of two different outcomes. It may be the case that the media outlet did not find any negative information on the advertiser's product. Or, the media outlet found such negative information but it decided to conceal it.

Indeed, in our model where viewers/consumers are rational bayesian agents, if we were to assume the presence of a single advertiser (or that all advertisers were sharing the same preferences over news reports, as in the benchmark model of Ellman and Germano, 2009), viewers would know that whenever the media outlet receives a negative signal, then the advertiser would pay it to hide such signal. Hence, the media outlet reports would always be uninformative. That is, none would ever want to pay the opportunity cost to watch the media outlet' reports, i.e., $\alpha = 0$.[16]

3.1 Duopoly

In order to better illustrate the main intuition behind our model, we analyze here the case where there are only two firms competing in the market for consumers' products.

[15] As noticed by Milgrom (1981), upon observing no news a Bayesian individual would update her beliefs and, depending on the structure of the game, they may also end up inferring that the sender (e.g., a media outlet) had bad news.

[16] Clearly, if the media outlet had also an entertainment value for its viewers, some consumers would be willing to watch the media outlet even in presence of uninformative reports. That is, there would exist a lower bound $\alpha^{\min}$ in the fraction of "informed" consumers.

In presence of two producers, given the structure of the game described in the previous section, the media outlet may observe four different signals realization.
Before analyzing the equilibrium disclosure strategy of the media outlet with respect to its viewers, we should first point out that the media outlet has always an incentive to fully disclose its signals to producers. The following lemma provides a formal statement of this result.

Lemma 1 *The expected profits of the media outlet are increasing in the number of bad signals on firms' products that it observes. Moreover, by disclosing all its signals to producers, the media outlet always maximizes the adverting fees that it may obtain from them.* □

The intuition behind this result is simple. The higher the number of bad signal observed by the media outlet, the higher the profits it may extract from advertisers. Hence, since the higher the number of bad signal observed, the higher the "bargaining power" of the media outlet with respect to producers, the media outlet has always an incentive to disclose all its signals to potential advertisers since by doing so it can maximize the adverting fees that it can impose on them.
Once that we have established that the media outlet has always an incentive to disclose its information to potential advertisers, we may turn out attention to the media outlet optimal disclosure strategy towards its viewers. The following proposition summarizes the results.

Proposition 2 *In presence of two producers, when the media outlet observes at most one bad signal, it makes a fully truthful report. Instead, upon observing a bad signal on both products, the media outlet reveals just one of them. Moreover, in any equilibrium, the profits of the media outlet are* $\Gamma = p\frac{\alpha}{2}\left(\mathcal{I}_{z_1=b} + \mathcal{I}_{z_2=b}\right)$. □

Thus, the media outlet makes a fully truthful report when it finds only one firm being of bad quality. Instead, it makes a partially informative report when it finds both firms to be of bad quality. Hence, viewers/consumers may observe two types of news reports by the media outlet. Either the media outlet would not show any negative information on either firm. In this case, consumers know that such report is fully truthful since the media outlet simply did not find any negative information on either of them. Alternatively, consumers may observe a negative report on one of the two firms' products. In this case, consumers would not know whether the media outlet indeed gathered negative information on only one or both products. In the first case, such report would indeed be truthful (and the media outlet was paid by the "good" firm to disclose such signal). In the second one, the media outlet was paid by one of the producers to disclose only the bad signal on its' rival product.

3.2 Multiple Producers

We now analyze the more general model with $L > 2$ firms in the products market. Exactly as in the case with only two firms, the media outlet will choose a reporting strategy (i.e., a vector of messages $\mathbf{m} = (m_0, m_1, \cdots, m_L)$) in order to extract the maximum possible profits from them.[17]

Now, let B $(\leq L)$ be the number of bad signals observed by the media outlet. We denote as $\mathcal{B} = \{l : z_l = b\}$ the set of firms whose product the media outlet knows being of bad quality. Then, a reporting strategy by the media outlet simply consists in disclosing the bad quality of the product of a set $\mathcal{D} \subseteq \mathcal{B}$ of firms. Moreover, since firms differ only in the quality of their products, the reporting strategy of the media outlet will reduce to simply choosing a number D $(\leq B)$ of bad signals to disclose. Then, by disclosing D signals, the media outlet can obtain the following advertising fees (transfers) from "good" quality firms (i.e., $j \notin \mathcal{B}$):

$$\sum_{j \notin \mathcal{B}} t_j(D) = p(L - B)\left[\frac{\alpha}{L - D} - \frac{\alpha}{L}\right] \tag{7}$$

since, clearly, if the media outlet does not disclose any bad signal the profits of each firm would be α/L.

On the other hand, by not disclosing $B - D$ signals (i.e., hiding that $B - D$ firms have a bad quality product), the media outlet can obtain the following transfers from the $B - D$ firms belonging to $\mathcal{B}$:

$$\sum_{l \in \mathcal{B}} t_l(D) = p(B - D)\left[\frac{\alpha}{L - D}\right] \tag{8}$$

That is, the above equation represents the profits that the media outlet may extract from the $B-D$ advertisers in exchange for hiding the negative signal on their product. Hence, the media outlet will optimally select D in order to maximize the amount of

[17] Indeed, any accepted offer that does not extract the entire surplus from an advertiser, is clearly dominated by a higher offer.

advertising fees it can charge. Notice that, given that the overall amount of profits in the product market is fixed, the media outlet is indifferent from "extracting" these profits from a smaller or a larger set of firms.
That is, the optimization problem of the media outlet is:

$$\max_{D \leq B} \Gamma = \sum t_{l \in \mathcal{B}}(D) + \sum t_{j \notin \mathcal{B}}(D) \tag{9}$$

Before analyzing the equilibrium disclosure strategy of the media outlet, we should first point out that the results of lemma 1 generalize to this case with L producers. That is, by disclosing all its signals to producers, the media outlet always maximizes the adverting fees that it may obtain from them. Then, the following proposition shows that the equilibrium outcome will depend on the set of signals observed by the media outlet.

Proposition 3 *In presence of L competing producers:*

1. *If $B < L$, there is a unique equilibrium with full disclosure, i.e., $D = B$.*
2. *If $B = L$, there is are L symmetric equilibria with partial disclosure, i.e., $D = B - 1$.*

Moreover, in any equilibrium, the profits of the media outlet are $\Gamma = p \cdot \alpha \frac{B}{L}$. □

The above proposition generalizes the intuitive result that we obtained for the case with two producers. When not all firms are bad, the media outlet will always find it optimal to be paid by "good" producers to disclose all the information. Instead, when all firms are found to have a bad quality product, the media outlet will "save" just one of them. Clearly, a truthful report in this case would lead all viewers to not buy any product. Hence, there would be no profits to be extracted. Thus, in this case, the media outlet always prefers to hide one bad signal so that one firm will become the monopolist in the products market. Then, the media outlet can ask to such monopolist an advertising fee (transfer) equal to the entire profits in the α-market share of viewers/consumers. Indeed, the higher the fraction of firms whose product the media outlet finds to be of bad quality, the higher its profits. Clearly, the more information the media outlet has, the higher its bargaining power with advertisers. Nevertheless, as shown by the following corollary, a higher degree of competition among firms always increases the probability of the media outlet fully disclosing its information to its viewers.

Corollary 4 *The higher the competition in the market for products the higher the probability of full disclosure by the media outlet.* □

Thus, regardless of other possible positive effects on products' qualities and prices, the more competitive the market, the more likely that consumers will choose a high quality product. Hence, competition among firms has a positive effect on consumers' expected utility trough the media information channel.

Given that consumers rationally anticipate the equilibrium strategy of the media outlet specified in proposition 3, we may also derive the equilibrium fraction of informed consumers, i.e., α. Specifically, we can express α as a function of the opportunity cost that the marginal consumer, who is indifferent between watching the media outlet and remaining uninformed, would be willing to pay. The *ex–ante* expected utility (net of the opportunity cost of acquiring information) for an informed consumer is:

$$\begin{aligned} E(U^I) &= \Pr(B < L)E(q_l|z_l = \varnothing) + \Pr(B = L)E(q_l|z_l = b) - p \\ &= (1 - (\theta(1-\nu))^L)\frac{vg}{1-\theta(1-\nu)} - p \end{aligned} \tag{10}$$

while the *ex–ante* expected utility of an uninformed consumer, is clearly $U^U = \nu g - p$. Hence, the opportunity cost that the marginal consumer would be willing to incur in order to access the media outlet's reports is:

$$\begin{aligned} \tilde{c}(\theta) = E(U^I) - U^U &= vg\frac{\theta(1-\nu)\left(1-(\theta(1-\nu))^{L-1}\right)}{1-\theta(1-\nu)} \\ &= \nu g\left(\sum_{l=1}^{L-1}(1-\nu)^l\theta^l\right) \end{aligned} \tag{11}$$

Then, from equation (4):

$$\alpha \equiv \frac{\tilde{c}(\theta)}{\gamma} \tag{12}$$

The following graph illustrates the equilibrium fraction of informed consumers as a function of the *ex-ante* probability of a firm's product turning out being of good quality (i.e., ν) and it shows how such function changes as L increases.

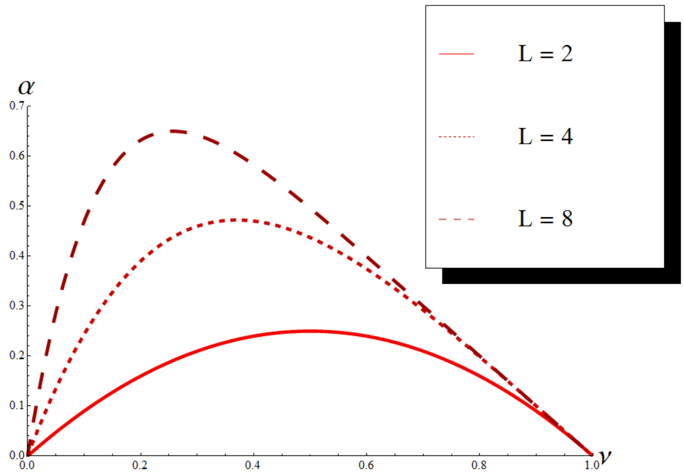

Figure 1. Equilibrium Fraction of Informed Consumers

An increase in L has a monotonic increasing effect on α since it just increases the probability of full disclosure by the media outlet (see corollary 4) and thus increases the value of being informed. Instead, the *ex-ante* uncertainty on products' quality has a non-monotonic effect on α. Specifically, an increase in ν :

1. Always increases the probability of full disclosure by the media outlet $\rightarrow \alpha \uparrow$

2. Always increases the expected value of remaining uninformed $\rightarrow \alpha \downarrow$

3. Increases the uncertainty in the quality of the products for $\nu \in [0, 0.5) \rightarrow \alpha \uparrow$

   Decreases the uncertainty in the quality of the products for $\nu \in [0.5, 1] \rightarrow \alpha \downarrow$

Hence, there is a skewness in the value of uncertainty since, *ceteris paribus*, consumers finds more valuable the media outlet's reports when, by remaining uninformed, they are likely to buy a low quality product (low ν) than when they are likely to buy a high quality one (high ν). Thus, the maximum level of viewership will always occur for a $v \in (0, 0.5)$. Moreover when L is higher, the probability of full disclosure is high even for low values of ν, hence the maximum value of α occurs for a lower value of ν.

At this point it is natural to ask what role the media outlet's detection technology (i.e., θ) plays in this game. Next section looks at this issue by analyzing the optimal quality of detection from the media outlet perspective and then compares it to the socially optimal one.

4 Optimal Detection Technology

In this section, we endogenize the detection technology of the media outlet. That is, we now analyze a setting where the media outlet can make an *ex-ante* (costly) investment $K(\theta)$, such that it will detect any bad–quality firm with probability $\theta \in [0,1]$.

First of all, we need to compute the *ex-ante* (gross) expected profits of the media outlet. We start by deriving the expected fraction of firms having a bad quality product, which is:

$$E\left(\frac{B}{L}\right) = \sum_{\kappa=1}^{L} \Pr(B=\kappa)\frac{\kappa}{L}$$

where

$$\Pr(B=\kappa) = \binom{L}{\kappa}(1-\nu)^{\kappa}\theta^{\kappa}(1-(1-\nu)\theta)^{L-\kappa}$$

thus $E\left(\frac{B}{L}\right) = (1-\nu)\theta$, i.e., the expected fraction of firms that the media outlet finds out having a bad quality product, is simply equal to the prior probability of a firm having a bad quality product times the detection probability. Hence, the gross expected profits of the media outlet are:

$$E[\Gamma] = p\cdot\alpha(1-\nu)\theta$$

where α corresponds to the equilibrium fraction of informed consumers specified in (12). That is, the gross expected profits of the media outlet are equal to expected fraction of firms discovered having a bad quality product, times the "market value" of viewers/consumers (i.e., $p\cdot\alpha$).

Consider now an increasing and non–convex cost $K(\theta)$ (such that $K(0)=0$) that the media outlet has to pay in order to obtain signals of quality θ. The optimization problem for the media outlet becomes:

$$\max_{\theta\in[0,1]}\Big(p\cdot\alpha(1-\nu)\theta - K(\theta)\Big) \geq 0 \tag{13}$$

From (11) and (12) it is immediate to verify that α is increasing in L and it is increasing and convex in θ. Hence, the gross expected profits of the media outlet specified in (13) are also increasing in L and they are increasing and convex in θ. This, together with the fact that $K(\theta)$ is non–convex in θ, implies that (13) admits only corner solutions

Therefore, the optimal detection quality chosen by the media outlet is:

$$\theta^* = \begin{cases} 1 & \text{if} \quad K(1)\gamma \leq (1-\nu) \\ 0 & \text{if} \quad K(1)\gamma > p \cdot \bar{c}(1-\nu) \end{cases} \tag{14}$$

where $\bar{c} \equiv \tilde{c}(1)$ is the consumer's value of acquiring information from a media outlet having perfect information on firms' products. Clearly, from (11), $\bar{c}$ is increasing in L. Hence the incentives of the media outlet to invest in detection quality are increasing in L. That is, the higher the number of producers (and, thus, of potential advertisers), the more likely that the media outlet will invest in a perfect detection technology.

Notice that by finding the detection quality which is optimal from the media outlet perspective, we are implicitly determining the corresponding fraction of consumers watching the media outlet's reports:

$$\alpha^* = \frac{\nu g \left(\sum_{l=1}^{L-1} (1-\nu)^l \right)}{\gamma}$$

when condition $p \cdot \bar{c}(1-\nu) \geq K(1)$ holds, and 0 (no viewership) otherwise.

Now we turn to the analysis of the socially optimal detection technology. The *ex–ante* welfare function is equal to the sum of consumers' expected utilities minus the cost of investing in the detection technology.[18] That is:

$$\begin{aligned} W &= (1-\alpha)U^U + \alpha \left(U^I - \int_0^{\tilde{c}(\theta)} x dx \right) - K(\theta(\alpha)) + p \\ &= vg + \alpha \tilde{c}(\theta) \left(1 - \frac{\tilde{c}(\theta)}{2} \right) - K(\theta(\alpha)) \end{aligned} \tag{15}$$

where $\int_0^{\tilde{c}(\theta)} x dx$ is the aggregate cost that informed consumers have to bear to acquire information, and $K(\theta(\alpha))$ is the cost paid by the media outlet to reach a fraction α of consumers.

To have a clear characterization of the parameter space where the media outlet investment is also socially efficient, we introduce a sufficient condition to ensure that the maximization problem of (15) also admits only corner solutions. Namely, we assume

[18] Clearly, advertising transfers $\mathbf{t}$ do not enter in the welfare function since they are simply transfers between the advertisers and the media outlet. Similarly, the aggregate price p paid by consumers to producers/advertisers cancels out and does not finally enter into the welfare function.

that $g \leq g^{\max} = \frac{2}{3}\frac{1}{1-v}$.[19] Then, the detection technology which maximizes the social welfare is:

$$\theta^w = \begin{cases} 1 & \text{if} \;\; K(1)\gamma \leq \bar{c}^2\left(1-\frac{\bar{c}}{2}\right) \\ 0 & \text{if} \;\; K(1)\gamma > \bar{c}^2\left(1-\frac{\bar{c}}{2}\right) \end{cases} \tag{16}$$

Clearly, since as we stated above $\bar{c}$ is increasing in L, as the number of producers increases, the probability of perfect detection being socially optimal increases. Moreover, there will be a socially optimal fraction of informed consumers α^w corresponding to such socially optimal quality of detection θ^w.

The following proposition illustrates under which conditions the detection quality chosen by the media outlet differs from the socially optimal one.

Proposition 5 *When both inequalities*

$$p \cdot \bar{c}(1-\nu) > K(1)\gamma > \bar{c}^2\left(1-\frac{\bar{c}}{2}\right) \tag{17}$$

hold, then there is a unique equilibrium in which the media outlet invests in perfect quality of detection, while this is not socially optimal (over–investment)*.*

When the above inequalities are both reversed, then there is a unique equilibrium in which no information is acquired by the media outlet, while this is not socially optimal (under–investment)*.*

In the remaining cases, the media outlet's equilibrium investment in the detection technology coincides with the socially optimal one (efficiency)*.* □

Notice that γ and $K(\theta)$ play the same role. That is, the average opportunity cost of accessing information for consumers and the marginal cost of investing in the detection technology are (log–)substitutes. When they are sufficiently small the market for news is "active" and efficient. When they are sufficiently large, the media outlet will choose (efficiently) to not acquire any news on firms' products.

The above proposition provides a full characterization of the conditions under which the media outlet's optimal investment corresponds to the socially optimal one (efficiency) and the ones where, instead, such investment decision generates inefficiencies (i.e., either over or under-investment). Nevertheless, as the following corollary suggests, when L is sufficiently high (i.e., $L \geq 3$), over-investment by the media outlet can never arise in equilibrium.

[19] Indeed $g \leq g^{\max}$ is a sufficient condition to ensure that W is increasing and convex in θ.

Corollary 6 *For $L \geq 3$, the media outlet would never over-invest in quality of detection in any equilibrium.* $\square$

Thus, the only inefficiency that may occur in equilibrium, for $L \geq 3$, is the one where there is under-investment. Such discrepancy between the media outlet's equilibrium investment in detection technology and the socially optimal one may arise because the media outlet only cares about the marginal viewer, i.e., $\bar{c}$. It does not internalize the effect of its investment on all the consumers having an opportunity cost of acquiring information $c_i < \bar{c}$. That is, the media outlet just internalizes the value of investing in detection technology for the marginal viewer (i.e., the consumer with an opportunity cost $\bar{c}$) rather than the value of investing in detection technology occurring for all consumers having an opportunity cost of acquiring information $c \leq \bar{c}$.
The following graph illustrates the areas of efficient and under-investment by the media outlet as a function of the number of firms competing in the products market and the prior probability of a firm's product being a good quality one.

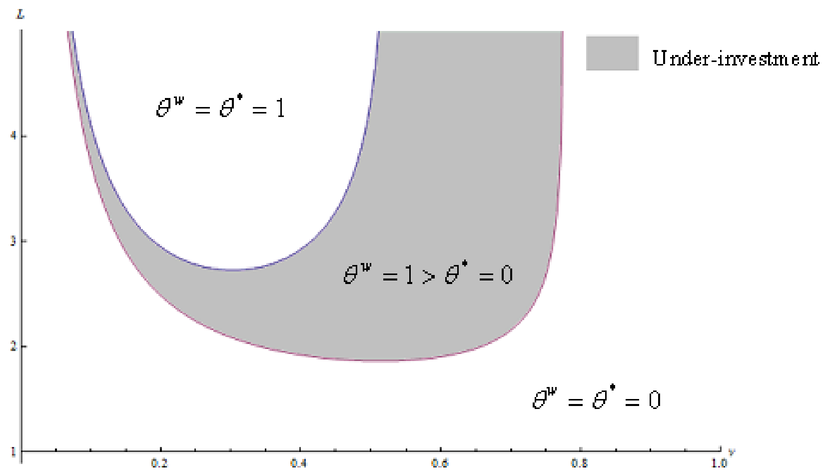

Figure 2. Optimal Detection Technology

As the above figure shows, there is a skewness in the area of under-investment with respect to the *ex-ante* uncertainty on the quality of the good. Specifically, the media outlet finds optimal to invest in detection technology only when the probability of detecting a bad quality firm is high (i.e., small v) and when the expected fraction of viewers is high (i.e., α high) Hence, given the skewness in α and that, *ceteris paribus*, the expected profits of the media outlet are decreasing in v, the area where the media outlet would find optimal to invest in detection technology will be also skewed with respect to v. That is, *ceteris paribus*, the media outlet prefers to invest when the *ex-ante* uncertainty on the products quality is pointing towards the presence of many bad quality products.

On the other hand, when L is small (i.e., $L = 2$), another type of inefficiency may arise. Specifically, it is easy to find examples where the media outlet will over-invest in the detection technology. For example, if $p = \frac{\nu g}{4}(4 - g\nu(1-\nu))$, $K(1) = (1 - \nu)\frac{\nu g}{10}(10 - g\nu(1-\nu))$ and $\gamma = 1$, it is immediate to show that the over-investment condition is always satisfied. Indeed, when L is small there is a low probability of full disclosure by the media outlet. Hence, the investment in detection technology is likely to translate in higher profits for the media outlet but not in a higher quality of information for consumers. Thus, such investment may not be socially optimal. The following picture illustrates an example where there may be over-investment by the media outlet for $L = 2$.

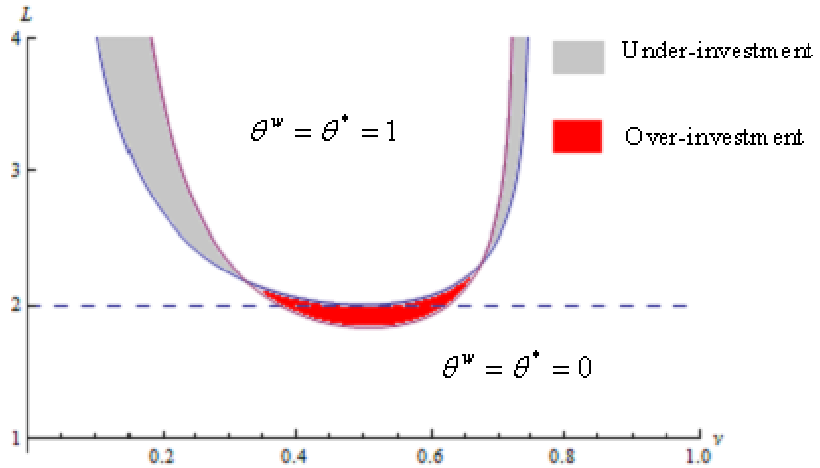

Figure 3. Example of Over-investment in Detection Technology

5 Discussion

5.1 Multiple Media Outlets

This section discusses the robustness of our results to the presence of multiple media outlets (i.e., $N = 2$). As in Besley and Prat (2006), we assume that all media have the same information, i.e., $\mathcal{B}_n \equiv \mathcal{B}\ \forall n$, and that if at least one outlet has informative news, then all media viewers become informed. That is, if at least one media outlet publishes a negative report on a firm's product, than every media viewer becomes informed of the bad quality of that product.[20] The following proposition provides a generalization of the results obtained in proposition 2 to the case of multiple media outlets.

Proposition 7 *In presence of $L = 2$ competing producers and $N = 2$ media outlets:*

1. *If $B < L$, there are two symmetric equilibria both characterized by full disclosure, i.e., $D = B$. Specifically, in each of the two symmetric equilibria, only one of the two media outlets earns positive profits, i.e.,$\forall i \neq j$, $\Gamma_i = p\alpha \frac{B}{L}\left(\frac{1}{(L-B+D)}\right); \Gamma_j = 0$.*
2. *If $B = L$, there are two symmetric equilibria with partial disclosure, i.e., $D = B-1$. In this case, the profits of the two media outlets are $\Gamma_i = \Gamma_j = p\frac{\alpha}{2}\frac{B}{L}\left(\frac{1}{(L-B+D)}\right)$.*
   □

The above proposition shows how the results of the benchmark model could be generalized to the case of multiple media outlets. The probability of observing full disclosure remains the same, however the expected profits in the news market are different. Specifically, when only one media outlet was present in the market for news, it always had a monopoly power over information and it was always able to extract all the possible profits from advertisers. Instead, introducing competition in the news market has a positive effect on the profits of "good" producers. Specifically, a firm producing a good quality product (or whose product none of the media outlets found out being of bad quality), only needs to pay one of the media outlet to reveal the negative information on its rival product. Hence, its bargaining power with respect to the single media outlet case increases. That is, it just needs to pay one media outlet an advertising fee equal to a fraction $\frac{B}{L}\left(\frac{1}{(L-B+D)}\right)$ of the total profits in the $\alpha-$market share of informed consumers (i.e., the maximum the bad quality firm would offer to each of the media outlets).[21] Thus, good quality firms benefit from the competition in the news market since "paying positive to go negative" becomes cheaper.

5.2 Political market

While the main application of our model has focused on the products market, our framework naturally extends to the political market. Specifically, our model represents

[20] This scenario is, for example, consistent with the empirical evidence found by Swinnen et al. (2005) regarding the case of the media coverage of the food dioxin crisis in 1999 in Belgium. The authors show that once a media outlet started publishing negative reports on this issue all the others quickly followed.

[21] The same reasoning applies for the case where $L > 2$.

a generalization of the one of Besley and Prat (2006). Our results point out that introducing competition in the "bribing offers" among alternative candidates reduces the probability of media capture by the incumbent. That is, if also the challenger(s) were able to offer monetary transfers to the media to buy their silence on her (their) own bad type(s) or to avoid their silence on the incumbent bad type, the probability of media capture by the incumbent would decrease and the expected level of information available to voters would increase.[22]

6 Conclusions

Consumers typically watch media for their entertainment and informational value. Such informational value consists of news on politics, crime but also consumers' products. Hence, the information supplied by media will ultimately affect the purchasing decisions of consumers. Since producers are also potential advertisers, there may be a subtle relationship between news and advertising. Specifically, adverting fees may represent a form of hidden transfer to the media to hide negative information on the advertiser's own product (paying positive to avoid negative) or to disclose negative information on the competitors' products (paying positive to go negative). This paper looks at this issue by analyzing a simple model of advertising and media optimal disclosure strategy. We show that despite the possible distortionary effects on consumers' information due to the single advertiser incentives to "bribe" the media, the presence of competition among advertisers is likely to avoid such distortionary effects. That is, the higher the competition in the products market, the more likely that a media outlet chooses to fully disclose its information to consumers. Moreover, the detection technology chosen by the media outlet may be different from the socially optimal one. Specifically, the media outlet may, typically, end up under-investing in quality of detection since it does not internalize the overall value of such investment for all viewers.

[22]Obviously, in a political setting the incumbent is likely to have a power advantage in capturing the media with respect to the challenger, hence we should observe a higher (likelihood of) media capture and a lower level of information when an incumbent is up for re-election with respect to an open seat election.

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Appendix

Proof of Lemma 1
It is quite straightforward to show that it is always optimal for the media outlet to fully reveal the realized signals to the firms before making its take-it-or-leave-it offers. Indeed, the larger the message space the higher will be the transfers that it may ask to the advertisers. Let's start analyzing the case where $z_1 = z_2 = \varnothing$. In this case $\mathcal{M} = \{(\varnothing, \varnothing)\}$. Hence, there are no bad signals that can be sent. Thus, the media outlet cannot ask any positive transfer to the advertisers, i.e., $t_1 = t_2 = 0$. In this, trivial, case the media outlet cannot do anything else than reporting $(\varnothing, \varnothing)$, since signals are hard information.
Consider the case where $z_1 = z_2 = b$. In this case $\mathcal{M} = \{\varnothing, b\}^2$. Hence, the media outlet will offer firms to choose simultaneously between two alternatives: either paying a transfer $\tau > 0$ to conceal the bad signal about their own quality, i.e., $m_l = \varnothing$, or not paying such transfer and having the media outlet reporting this bad signal to viewers, i.e. $m_l = b$. Thus, given this signals realization, the two firms are playing a sub-game with the following payoff matrix:

		Firm 1: τ	Firm 1: 0
Firm 2	τ	$\frac{p}{2} - \tau$, $\frac{p}{2} - \tau$	$p\frac{(1+\alpha)}{2} - \tau$, $p\frac{(1-\alpha)}{2}$
	0	$p\frac{(1-\alpha)}{2}$, $p\frac{(1+\alpha)}{2} - \tau$	$p\frac{(1-\alpha)}{2}$, $p\frac{(1-\alpha)}{2}$

Hence, depending on advertising prices, three different equilibria outcomes may arise. When $\tau > p \cdot \alpha$, both firms have a dominant strategy of not accepting the offer, hence the media outlet would report all bad signals.
When $\tau \leq p\frac{\alpha}{2}$, both firms have a dominant strategy of accepting the offer, hence the media outlet would conceal all bad signals.
Finally, when $p(1+\alpha)/2 \geq \tau > p\frac{\alpha}{2}$, there are two asymmetric equilibria where only one firm is paying the transfer τ and the media outlet reports only the bad signal on the other firm's product.
The media outlet will select τ in order to maximize its profits (6). Given the above analysis, the media outlet restricts attention to two alternative levels. That is, it either sets $\tau = p\frac{\alpha}{2}$, does not report any bad signal and earns profits $\Gamma = p \cdot \alpha$, or it sets $\tau = p \cdot \alpha$, does report exactly one bad signal and earns profits $\Gamma = p \cdot \alpha$. Hence in either case, by disclosing both its signals to both producers, the media outlet is able to extract all the profits in the $\alpha-$market share of informed consumers. Thus the media outlet will never have an incentive to hide one or both signals to a producer.
In the last two cases, either $z_1 = \varnothing$ and $z_2 = b$ or *viceversa*. Using the same reasoning of the previous case, an asymmetric outcome emerges, but in this case the media outlet fully reveals its information (i.e., signals) and its profits are $\Gamma = p\frac{\alpha}{2}$. Again, this is the maximum profits that the media outlet can extract from producers. By hiding $z_2 = b$ to both producers it would earn nothing. By hiding $z_2 = b$ to firm 1, firm 1 would not be willing to pay any advertising fee. Similarly, by hiding $z_2 = b$ to firm 2, firm 2 would not be willing to pay any advertising fee. Hence, the payoff of the media outlets will always be (weakly) higher upon disclosing all its available information to producers before making its take-it-or-leave-it offers. **Q.E.D.**

Proof of Proposition 2.
When $z_1 = z_2 = \varnothing$. In this case $\mathcal{M} = \{(\varnothing, \varnothing)\}$, thus the media outlet cannot hide any information in this case. In the case where $z_1 = z_2 = b$, we know from the proof of Lemma 1 that the media outlet can either sets $\tau = p\frac{\alpha}{2}$, does not report any bad signal and earns profits $\Gamma = p \cdot \alpha$, or it sets $\tau = p \cdot \alpha$, does report exactly one bad signal and earns profits $\Gamma = p \cdot \alpha$. Hence, given our tie-braking rule, when the media outlet has observed all bad signals, advertisers competition will induce the media outlet to report exactly one signal, concealing the other. Finally, in the last two cases, either $z_1 = \varnothing$ and $z_2 = b$ or *viceversa*. Using the same reasoning of the previous case, an asymmetric outcome emerges, but in this case the media outlet fully reveals its information (i.e., its signal) and its profits are $\Gamma = p\frac{\alpha}{2}$.
Q.E.D.

Proof of Proposition 3
As before when $\mathcal{B} = \{\varnothing\}$ so that $B = 0$, the media outlet earns zero payoffs.
When $B = L$, multiple equilibria arise in which the media outlet earns a profit $\Gamma = p \cdot \alpha$ for any $D < B$ action. Clearly, the media outlet would never disclose all bad signals since in this case no firm would be willing to pay a positive advertising fee. Hence, since (i) the media outlet is indifferent between "extracting" profits from a smaller or a larger set of advertisers; and (ii) our tie-breaking rule is such that when indifferent the media outlet always prefers to reveal information; there will be a unique type of equilibrium where $D = L - 1$.
Finally, applying the same intuition, when $B < L$, the media outlet finds optimal to reveal $D = B$ and then earns $\Gamma = p \cdot \alpha B/L$. **Q.E.D.**

Proof of Corollary 4
It is immediate since the probability of full disclosure by the media outlet is equal to $\Pr(B < L) = 1 - \Pr(B = L) = 1 - [(1-\nu)\theta]^L$ which is clearly increasing in L. **Q.E.D.**

Proof of Proposition 5
Conditions in (17) are a direct derivation of (14) and (16). **Q.E.D.**

Proof of Corollary 6. First notice that a necessary condition to over-investment in detection quality is

$$p(1-\nu) > \bar{c} \cdot (1 - \frac{\bar{c}}{2}) \tag{18}$$

where

$$\bar{c} = g(1-\nu)\left(1 - ((1-\nu))^{L-1}\right) \tag{19}$$

The RHS of (18) is increasing in L since:

$$\begin{aligned}
&\frac{\partial}{\partial L}\left(\left(g(1-\nu)\left(1-((1-\nu))^{L-1}\right)\left(1-\frac{1}{2}g(1-\nu)\left(1-((1-\nu))^{L-1}\right)\right)\right)\right) \\
&= -\left(\ln(1-\nu)\right) g(1-\nu)^L \left(1 - g + g\nu + g(1-\nu)^L\right) > 0
\end{aligned}$$

hence if we just need to prove that (18) does not hold for $L = 3$ to ensure that there is no over-investment for $L \geq 3$. Specifically, when $L = 3$, the above condition can be rewritten as

$$p > g\left(1 - (1-\nu)^2\right)\left(1 - \frac{1}{2}g(1-\nu)\left(1 - (1-\nu)^2\right)\right)$$

hence given that $p \leq \nu g$:

$$\nu - \left(1-(1-\nu)^2\right)\left(1-\frac{1}{2}g(1-\nu)\left(1-(1-\nu)^2\right)\right) > 0$$

that is

$$\left(\frac{1}{2}\right)\nu(1-\nu)\left(4g\nu(1-\nu)+g\nu^3-2\right) > 0$$

which is never satisfied since $\nu(1-\nu) \leq 1/4$ and $g \leq g^{\max}$.
Viceversa, for $L = 2$, (18) becomes:

$$p > g\nu\left(1-\frac{1}{2}g\nu(1-\nu)\right)$$

hence given $p \leq \nu g$, the necessary condition becomes:

$$\left(\frac{1}{2}\right)\nu^2 g^2(1-\nu) > 0$$

which is always satisfied. **Q.E.D.**

Proof of Proposition 7.
By paying the opportunity cost of accessing information, all viewers have access to the same vector of messages about products' quality, i.e. $\mathbf{m}_n \equiv \mathbf{m}\ \forall n$. Let's analyze all the possible cases.

1. Suppose that $B = 1$. That is, $z_l = b, z_j = \varnothing$.[23] Each media outlet can make a take-it-or-leave-it offer to each producer contingent on the vector of messages realized *ex-post.* Clearly, in order to avoid having informed consumers becoming informed of its bad quality product, the "bad" firm must pay a positive advertising fee to each media outlet. Moreover, even if media outlets were to both conceal the negative information on this firm's product, the maximum profits such firm may earn in the α market-share of informed viewers, would be half of the total profits in such market (since this firm has to compete with the "good" quality one). Hence, by restricting attention to symmetric equilibria, the two media outlets know that the maximum advertising fee they may each ask to the firm with a bad quality product, in exchange of hiding the negative info on its product, is equal to 1/4 of the total profits in the α market share of informed consumers. That is

$$t_n = p \cdot \frac{\alpha}{4} \quad \forall n = 1, 2 \tag{20}$$

   On the other hand, the "good" producer does not need to pay both media outlets to disclose the negative information on its competitor. Hence, each media outlet may want to compete with the other to be the one selected by the good quality firm to disclose the bad signal on the other producer. Moreover, the maximum profits that such producer may obtain (and thus media outlets may extract) in the α-market of informed consumers is $p\alpha$. Hence, the two media outlets will each have an incentive to ask an advertising price to the "good" quality firm higher than the one they could ask to the bad quality one. That is, by assuming that the two media outlets compete *á la Bertrand* in the advertising fees asked to the "good" quality producer, the will end up asking an advertising fee equal to the one the bad quality firm would be willing to pay

[23] The proof for the symmetric case is identical.

each of them, i.e., (20). Hence, given our tie-breaking rule, the media outlets would prefer to ask this advertising fee to the good quality producer to reveal the bad signal on the other than viceversa. Hence, the good producer will accept this offer from one of the media outlet who will then earn a profit $p\frac{\alpha}{4}$, while the other would get nothing.

2. Suppose that $B = 2$. That is, $z_l = z_j = b$. Again the same type of take-it-or-leave-it offers contingent on the vector of messages realized *ex-post* can be offered by media outlets to all producers. We restrict to the unique symmetric equilibrium. Clearly, if the two media outlets reveal different signals they would not earn anything. Instead, if they either conceal all signals or reveal the same bad signal and hide the other, they would each earn half of the profits in the α-market of informed consumers. Again, we use the tie-breaking rule to select the unique equilibrium. Hence, the two media outlet will both "save" the same firm by concealing its bad signal while revealing the one of the other firm. **Q.E.D.**