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Watchdogs, Platforms and Audience: An Economic Perspective on Media Markets

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Abstract The present paper provides a basic model to describe the functioning of media markets. The authors use this general theoretical framework to illustrate the key economic contributions according to the two-sided literature and the media capture and media bias approaches. Particular attention is devoted to the issue of pluralism.

Keywords Media · Pluralism · Bias · Two-sided market · Press · Broadcasting

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Introduction

There is a worldwide consensus on the crucial importance of media markets on political, social and economic systems. Media provide and convey content that accounts for a relevant share of individuals' consumption. Media also contribute to the promotion of the consumption of goods and services in general. Additionally, media outlets disclose relevant information that affects the economic and financial decisions of media consumers. Finally, media systems represent important channels through which to build political and social consensus.

Moreover, in recent years, an impressive increase in the number of and range of media outlets has occurred. Broadcast transmission, through cable, satellite and digital means, has dramatically expanded the number of channels available to an audience. The internet, through capitalizing inexpensive channels of information and discussion, has created novel possibilities for the generation and exchange of news. These

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contributions are expanded when including the convergence between media and telecommunications, which provides a substantial amount of information to an audience on an instantaneous basis. Overall, we can state that the possibility of communication and the speed of the available information have reached a level that would have been unbelievable a few decades ago.

From an economic point of view, there exists a realm of consolidated theoretical and empirical literature called media economics. In this perspective, we would like to focus on economists' point of view in the analysis of media markets. Media economics, in fact, is located in the intersection between the fields of industrial organization, information economics and political economy in a mutually fertile area. However, we believe that it is possible to put together these different components in a single analytical framework, which can be adjusted and refined according to the specific issues that need to be addressed. This general model takes into account three main players, sources, audiences and platforms, and the basic concept of the message as the key object in the correlation between players.

More precisely, we identify three main streams of literature according to the specific correlations among these sets of agents. The first stream focuses on the key role of the platform in the correlation between the audience and advertisers. This approach is known as the two-sided approach. A second stream deserves particular attention regarding the effect of media sources on the audience's decisions, particularly in the voting context. This literature is closely related to the field of political economy and emphasizes the possibility of political parties or lobbies manipulating sources of information to gain electoral consensus. In this respect, we will discuss media bias and media capture. A third approach deals with the sources' competition and the effect of this competition on the audience market. This approach is related to industrial organization literature, analyzing the pricing structure, quantity and accuracy of information.[1]

Setup

As stated above, the recent economic literature on media markets is composed of a wide range of variations within a common framework, which we shall call the standard model. Agents in the standard model belong to three types. The first agent type is the receiver (viewer, listener or reader, depending on the medium to which we refer). The population of receivers is referred to as the audience. Receivers face two distinct sets of decisions. The first consists of choosing an action a out of a set A. A can be specified in a number of ways. As a matter of fact, the literature deals either with voting choices (A is the set of alternative candidates, or parties that the individual can support) or with more general resource allocation choices such as an investment, the purchase of a good, etc.

The second set of decisions refers to the media market. The audience must choose whether to expose itself to a variety of available messages. Broadly speaking, a message is a bundle of characteristics $m \in M$. For instance, in a newspaper article about a movie, the reader may find some objective information about the movie itself (the

[1] The present review is an expanded and formalized version of a previous Italian paper by Battaggion and Vaglio (2013).

director, the cast, and so on), the journalist's opinion, a piece of prose which may be enjoyable in itself, a photograph from the movie or a reported statement from the director. In this paper, however, we shall mostly treat messages as individual units of a single good rather than bundles of characteristics for simplicity, except when strictly necessary. Exposition to a message in general affects the utility to the receiver both directly and indirectly. The influence is indirect when the reception of a given message affects the choice of *a*. $a(\cdot)$: $M \rightarrow A$ is the decision rule which associates to each message an action. If

$$a(m) = \overline{a} \quad \forall m \in M, \tag{1}$$

then messages affect utility only directly. Finally, there exists a set of states of the world S that are relevant to the receiver. In general, the utility to a receiver takes the following form:

$$u^R(a, m, s) - r - w - T$$

where $s \in S$, while r and w are fees whose nature will be made clear later on. T is an opportunity cost, which on principle may depend on m. If a receiver instead prefers not to receive any message, he pays no fees and gets a reservation utility u_0^R. Then, the necessary condition for the receiver to be willing to actually receive a message is:

$$u^R(a(m), m, s) - r - w - T \geq u_0^R. \tag{2}$$

We must distinguish between situations where s is either given or irrelevant and situations where it is relevant and uncertain. In the former case, we shall simply express the utility to the receiver as $u^R(a(m), m)$. Intuitively, the difference between the two situations will turn out to be crucial.

The second type of agent appearing in the model is known as the sender, or as we prefer, the source. The surplus of a source in general is:

$$max\ u^S(a, m) + r - z - c(m)$$

where $a \in A$ is the receiver's action. The source chooses a message $m^* \in M$, z will be defined later on and $c(\cdot)$: $M \rightarrow R$ is the cost of producing the message. The variable r represents the compensation that the source gets from receivers. The term source covers a fairly wide set of agents, ranging from the extreme case of the "indifferent" author for whom

$$u^S(a(m), m) = \overline{u}^S \quad \forall m \in M \tag{3}$$

and who shall simply seek to minimize the message production cost, to the disinterested source, to whom $u^S(a(m), m) = u^S(\bar{a}, m)$, $\forall a \in A$, caring about the message but not about the receiver's behavior, and to strategic sources, who care about the receivers' actions and how they can be influenced by messages (strategic sources include advertisers, political parties, and pressure groups, etc.).

The agents of the third group are called platforms, i.e., agents whose tasks consist of making message transmission possible. The platform profit is given by

$$max\ w + z - \theta(m) \tag{4}$$

where w and z are platform users' fees for audience and sources respectively, while $\theta(m)$ is the cost borne by the platform to convey the message m. Different degrees of

source-platform integration are possible, ranging from ownership of a platform by a source to the case of independent platforms.

Therefore, there exist three fundamental interactions: the interaction between platform and source, which can range between markets and hierarchy, the interaction between audience and platform, and finally, the source-audience interaction, consisting of the transmission of a message from the source through some platform and the response of the audience. This response may simply consist of payment of a reward to the source or of receivers' decisions in voting or in markets other than the media market. Furthermore, the analysis of the different interactions provides different approaches to the study of media market functioning. First, media markets are prominent examples in the literature of two-sided markets. The focus of this literature is on the relationship among the platform, the source and the audience. This approach emphasizes the role of the platform as a link between the audience and the sources, with a particular stress on the advertising side. Second, some of the literature focuses on the interaction between sources and the audience. In this framework, the sources provide an informative message and the audience reacts to this message by making a decision in some type of market, but not in the media market. Mostly in the literature, the audience is supposed to make a voting decision. Therefore, the issues of media bias and media capture are of crucial importance. Finally, the third approach analyzes the competitive relationships among different sources or different platforms. The key points here are the mix of price, quantity and quality of information and entertainment. This analysis is common to all the above approaches, and it implies the standard framework of industrial organization theory. In the media market perspective, the relationship between competition and pluralism represents a distinctive issue. Before dealing with the different approaches of the literature, we explore in more detail the issues surrounding the message and the individual decision choice.

Messages and Decision Rules

Non-influential Messages

So far, the notion of a "message" has remained rather undetermined. It is convenient to consider two extreme cases: influential versus non-influential messages. If $(a(m)=\bar{a})$ holds, the message is said to be non-influential. Under this condition, the media market is no different from any other market where a service is provided to a population of customers by means of a platform. The obvious examples of these media are purely recreational publications such as crossword and puzzle collections. However, somewhat paradoxically, novel publishing may be not so different either because the influence of novels on readers' behavior is small (entertainment literature) or because, however large the influence, the time and extent of the influence remain largely undetermined, such that sources do not include this influence in their publishing decisions. The economics of culture and cultural industries is better able to explain the latter case than media economics.

Influential Messages: The Black-Box Approach

At the other extreme, consider the case of influential messages (broadly speaking). In this case $a(m) \neq a(m')$ at least for some pair $m,m' \in M$. The influence of messages on actions can be explained in two fundamental ways. One of these ways can be defined somehow rashly as the "black box" approach, in which it is taken as a given that the exposition of an individual to such a message affects the individual's behavior in at least a partially predictable way, but we do not explain the nature of this influence. One might, for instance, assume that when an individual is exposed to an advertising message with given features, he will be willing to spend 10 % more on some specified good with other things being equal, or that after exposition to a political propaganda message, the individual will vote for some party with a larger probability than before this exposition. Philosophers, psychologists, anthropologists, and communication experts have much to say on the nature of this influence, but in some cases, economists may take all of this for granted and resort to a simple, stylized representation of it.

The other approach, which is actually a family of approaches, consists of bringing the issue of the influence of messages back into the familiar framework of individual preferences and rational behavior. For instance, Becker and Murphy (1993) frame advertising using the standard neoclassical theory of preferences (see also Bagwell 2007). As another example, the recent game-theoretic studies on economics and language may shed some new light on the issue of persuasion (see Rubinstein (2000)). In this article, we shall concentrate on one specific channel of influence of messages on actions, based on the idea that messages carry information and that individuals use information to make choices. The present subsection will be devoted to influential, "black box" messages, while the next subsection will deal with informative messages.

In the theory of media markets, sources and platforms are the agents that select and provide the messages to be made available to the audience, under technology and market structure constraints. To illustrate this, let us suppose that market power is entirely held by a monopoly source. Assume in the first place that the source is indifferent, according to definition (3). Given condition (2), the source will set r, the reward it gets from the receivers at the following level:

$$r = u^R(a(m), m) - u_0^R - w - T. \tag{5}$$

Given the 0-profit condition for the platform,

$$w + z - \theta(m) \geq 0 \tag{6}$$

The source will select m in order to solve:

$$max \overline{u}^S + u^R(a(m), m) - u_0^R - T - c(m) - \theta(m) \tag{7}$$

$$\overline{u}^S + u^R(a(m), m) - u_0^R - w - T - z - c(m) \geq u_0^S. \tag{8}$$

If we rewrite (8) assuming for simplicity that $\bar{u}^S = u_0^S = 0$, the following condition summarizes the driving forces ensuring that messages are actually provided:

$$u^R(a(\widehat{m}), \widehat{m}) - u_0^R \geq c(\widehat{m}) + \theta(\widehat{m}) + T. \tag{9}$$

The left-hand side of the condition (9) represents the additional benefit that comes from the provision of the message. The right-hand side summarizes instead the opportunity cost of accessing the message (T), the cost of producing the message and the cost of the platform ($\theta(\widehat{m})$). If one looks at the long term spread of book publishing, one recognizes the effect of diffused education in the reduction of T and the "Gutenberg effect" in the reduction of $\theta(\widehat{m})$.

If we assume that condition (3) no longer holds, then m is selected in order to solve

$$maxu^S(a(m),m) + u^R(a(m),m) - u_0^R - w - T - z - c(m)$$

still subject to (6) and (8). The chosen m^* will then be in general form m and because in general $u^S(a(m^*),m^*) \neq 0$ the condition for message provision becomes (retaining the assumption $u_0^S=0$.):

$$u^R\left(a\left(m^*\right),m^*\right) - c\left(m^*\right) \geq u_0^R - u^S\left(a\left(m^*\right),m^*\right) + T + \theta\left(m^*\right) \tag{10}$$

Informative Messages

In order to deal with informative messages, some additional structure is required. Let us suppose that both of the receiver's decisions (the allocation decision and the media decision) must be made before knowing the state of the world. Assume for simplicity that $u^R(a,m,s)=u^R(a,s)$ and define

$$E\left[u^R(a,s);\pi_0\right] \tag{11}$$

as the expected utility of the receiver against a given prior probability distribution on S, π_0. Now suppose that the receiver maximizes the expected utility. In the absence of any further information, the receiver will choose an action a_0 such that

$$E\left[u^R(a_0,s);\pi_0\right] \geq E\left[u^R(a,s);\pi_0\right] \quad \forall a \in A. \tag{12}$$

The reservation utility in this case can be defined as follows:

$$u_0^R = E\left[u^R(a_0,s);\pi_0\right] \tag{13}$$

The basic intuition, that we develop in more detail below, is that exposition to messages can modify the distribution π_0 into another distribution $\pi(m)$ and consequently possibly modify the action chosen by the agent. In general, in this case $a(m)$ is defined as:

$$E\left[u^R(a(m),s);\pi(m)\right] \geq E\left[u^R(a,s);\pi(m)\right] \quad \forall a \in A \tag{14}$$

As it can be easily foreseen, the transformation from π_0 into $\pi(m)$ is generally assumed to be expressed by Bayes's Rule. Let there exist a set of signals Σ. For every signal $\sigma \in \Sigma$ and *every* $s \in S$, $p(\sigma;s)$ is the probability that σ is generated when the state of the world is s.

In the case of media markets, the crucial idea is that signals are directly received only by sources, or that they can do so in a highly efficient way as compared to what individuals in the audience could do. The latter can access the signals only indirectly, i.e., through corresponding messages released by the

source. In this case, a message is a statement about the signal that the source has received. Let us first consider a rather trivial case, the one of unambiguous signals. Suppose that there are n possible states of the world and that Σ can be divided into n mutually disjoint subsets $\Sigma_1, \Sigma_2, \ldots, \Sigma_n$. Signals in a set Σ_i are said to be unambiguous if for some state of the world s_i.

$$\begin{gathered} p(\sigma; s_i) = 1 \\ p(\sigma; s_j) = 0 \\ \forall \sigma \in \Sigma_i \text{ and } \forall s_i \neq s_j . \end{gathered}$$

Observing an unambiguous signal is equivalent to knowing with certainty the state of the world, which is to say that the posterior probability $\pi(s_i;\sigma)=1\ \forall \sigma \in \Sigma_i$. If instead σ_i. is an ambiguous signal, then for every $s_k \in S$, Bayes rule dictates

$$\pi(s_k; \sigma_j) = \frac{\pi(s_k) p(s_k; \sigma_j)}{\pi(s_k) p(s_k; \sigma_j) + \Sigma_{k \neq i} \pi(s_i) p(s_i; \sigma_j)}. \tag{15}$$

Now suppose for a moment that not only are all signals unambiguous but also that there exist exactly n signals (i.e., the subsets $\Sigma_1, \Sigma_2, \ldots, \Sigma_n$ are singletons). However, it is still possible that the source does not correctly receive the signal. Defining $\overline{\sigma}$ as the signal received and $q(\overline{\sigma}_i; \sigma_i)$ as the probability that the source receives $\overline{\sigma} = \sigma_i$, when the actual signal is σ_i. (that is, when the state of the world is s_i), again we have

$$\pi(s_i; \overline{\sigma}) = \frac{\pi(s_i) q(\overline{\sigma}_i; \sigma_i)}{\pi(s_i) q(\overline{\sigma}_i; \sigma_i) + \Sigma_{j \neq i} \pi(s_j) p(\overline{\sigma}_i; \sigma_j)}. \tag{16}$$

The difference between (15) and (16) lies in the interpretion. While $p(s_k;\sigma_j)<1$ can be seen as some sort of exogenous, "natural" ambiguity, $q(\overline{\sigma}_i; \sigma_i)$ can be interpreted as a representation of the source's accuracy, something that on principle may be chosen by the source and that entails a cost.

Let us look at another interpretation of ambiguity. Suppose again that all n signals are unambiguous and that the source is fully accurate, i.e., $q(\overline{\sigma}_i; \sigma_i)=1$. In this situation, receiving a signal σ_j. means that the state of the world is s_j. If we assume that the source always reveals the signal, i.e.,

$$m = \sigma \ \ \forall \sigma, s, \tag{17}$$

then receivers learn the true state of the world when they access the message.

Suppose, however, that the source's surplus depends on the actions chosen by receivers. To simplify, suppose that the source prefers some action $\bar{a} \in A$ never to be taken, and the source is indifferent to all other actions. In turn, receivers take action a only if the probability they assign to $\bar{a}$ specific state (say s_j) exceeds some value $\overline{\pi}$. Such a probability is the prior $\pi(s_j)$ if receivers do not resort to the source, while it is the posterior $\pi(s_j;m)$ when they receive a message $m \in M$. As a consequence, when the signal received was σ_j, the source faces an incentive to violate the (17) rule. It must choose a disclosure rule, i.e., a rule that associates a message to each pair (s,σ). Whenever the disclosure rule does not coincide with (17), we have a media bias. Now define $r(m_h;\sigma_k)$ as the probability that a message m_h is reported when the signal received by the

source was actually σ_k. The probability that the state of the world is s_j conditional on receiving a message m is then

$$\pi(s_j;m) = \frac{\pi(s_j)r(m;\sigma_j)}{\pi(s_j)r(m;\sigma_j) + \sum_{j\neq i}\pi(s_i)r(m;\sigma_i)}.$$

Take a favorable case (for the source), i.e., one where $\pi(s_j) < \overline{\pi}$. Then in the absence of any further information, the receiver does not choose $\bar{a}$. Now there is a simple disclosure rule that the source might apply: set $r(m_j;\sigma)=0\ \forall\sigma\in\Sigma$; $r(m_h;\sigma_k)=0$, $m_h\neq\sigma_k$ *and* $r(m_h;\sigma_h)=1$, $h\neq j$. Moreover:

$$r(m_h;\sigma_j) = \frac{\pi(s_h)}{\sum_{j\neq i}\pi(s_i)}. \tag{19}$$

Intuitively, the message m_j is never released. If any state of the world other than s_j occurs, it is truthfully revealed. If s_j occurs, the message is randomly selected according to the probabilities in (19). Under this disclosure rule, the prior probability of state s_j never changes, so that receiver will continue not to choose $\bar{a}$. Messages may alter the beliefs about the probability of individual states other than s_j, but not their total probability. Suppose, however, that all other choices are irrelevant to the receiver, i.e., if the state of the world is not s_j they do not care what action (different from $\bar{a}$) to take, while they do care about choosing a when the state of the world is s_j. If this is the case, they are not willing to pay for a message generated by the disclosure rule described above. Then, if the source also has a revenue objective, besides the strategic goal of preventing the choice of $\bar{a}$, this represents a trade-off that might induce the source to reveal with non-zero probability that the state of the world is s_j. An even more compelling constraint emerges when $\pi(s_j)\geq\overline{\pi}$. In this case, the source cannot be satisfied with a disclosure strategy providing no relevant information, because this would mean giving up any chance of influencing the receiver's behavior. Then the probability of correctly transmitting that $\sigma=\sigma_j$ must be sufficiently high so as to induce receivers to resort to the source and let their beliefs be shaped by the messages it issues. This incentive for truthful revelation exists even if the source has no revenue motives.

Finally, it is clear that competition represents the most important incentive for truthful revelation. Sources compete in the price of messages and in their disclosure rules, with receivers choosing those sources that *ceteris paribus* provide the least distorted reports. In this sense, pluralism, meaning the availability of more independent sources, represents a powerful stimulus to truthful information. We will discuss the role of competition in shaping media markets and pluralism later on in the paper.

Media, Two-Sided Markets and the Role of Platforms

A media market represents an idiosyncratic example of a two-sided market, as described by: Caillaud and Jullien (2001, 2003), Armstrong (2006), Rochet and Tirole (2006). Basically, the idea is that there exists a platform taking on board two opposing sides of the market, namely the audience and the sources, where one side of the market, say, the broadcaster, the newspaper, or the review, aims to sell advertising space to

advertisers (or advertising agencies) while simultaneously conveying content to the audience. The key feature in the two-sided setup is that the platform generates network externalities in the interaction between advertisers and the audience. In fact, if a large audience likes the content, there will be a great deal of room for advertisements and, thus, a relevant growth in the platform revenues. Therefore, these network externalities affect both the access and use prices of the platform as well as the structure of broadcasters, newspapers and radio stations.

Referring to the previous Eq. (4), we can specify the objective function of the platform (broadcaster/newspaper) as follows:

$$\Pi_{platform} = n_{ad}(M_{ad} - \theta_{ad}(m)) + n_a(M_a - \theta_a(m)) \tag{20}$$

where n_{ad} and n_a represent the number of advertisers and readers or viewers respectively. M_i, for $i=ad,a$, represents the membership fee which is the access charge.[2] θ_i, *for* $i=ad,a$, is the platform cost to convey information. Notice that n_i, *for* $i=ad,a$, depends upon the benefit for advertisers and audience to access the platform, which, in turn, is a function of the size of the opposing side.

In this setup, the equilibrium deeply depends on the role of the advertising. On the one hand, advertisers and platforms are keen to expose viewers or readers to advertisements, while, on the other hand, viewers or readers consider advertising as a nuisance, particularly in the case of repeated announcements. This dynamic is very obvious when the audience does not pay any fee to access the content, as in the case of state television. A large part of the contributions considers the assumption of decreasing utility to individuals with respect to advertisement exposure (e.g., Ambrus and Reisinger (2006), Anderson and Coate (2005), Choi (2006), Crampes et al. (2009), Gabszewicz et al. (2004), Kind et al. (2009), Kohlschein (2004), Kremheler and Zenger (2008), Mangani (2003), Peitz and Valletti (2008)). Conversely, there exist few remarkable exceptions, such as Armstrong (2006), Häckner and Nyberg (2008) and Sonnac (2000). Armstrong (2006) distinguishes among three different attitudes towards advertisement, namely an averse audience, a neutral audience, or an ad-loving audience. Analogously, Sonnac (2000) distinguishes between individuals who like and dislike advertising. Finally, Hackner and Nyberg (2008) account for the possibility that readers like advertising in the press. It seems that readers' attitudes towards advertisements rather different from the attitudes of the general media audience. In fact, the former might overcome advertisements by just turning the page, and, for many specialized journals (e.g., fashion, sports, hobbies), the advertising message is itself a relevant part of the content. Therefore, the literature considers that the utility to the audience decreases as the advertising time increases, while there does not exist a clear relationship between disutility to the reader and advertising space in the press.

The two-sided literature has dealt with different aspects related to the media market price structure and performance. In particular, a couple of prominent characteristics deserve some further attention: the quality and the content variety of the supply. Given that standard industrial organization theory has dealt deeply with the issue of quality (vertical) differentiation and variety (horizontal) differentiation, these classes of models

[2] The price structure of the platform distinguishes between the membership (access) fee and transaction (usage) fee. However, for the sake of simplicity, we abstract from the usage fee.

have been extensively used to manage media markets as well, with a peculiar focus on the broadcasting market encompassing both paid and free on air television. According to the seminal papers of Gabszewich et al. (2002, 2004) and Anderson and Gabszewich (2005), viewers have to decide which channel to look at, under the assumption that they watch a single-channel, single-homing case, to maximize their utility. The viewer's satisfaction depends on the proximity of the channel to the viewer's taste and to the quality of the channel, but it decreases the amount of advertising. Conversely, the advertising side is represented by the firms themselves that provide goods and services, therefore, their revenues depend on the sales of final goods or services. Revenues are increasing in advertising, but there is a cost associated with accessing a viewer, which is given by the access price to the platform. Then, TV stations make a profit by charging a price for advertising and an access price to viewers.

In this setup, there are two driving forces of market equilibrium. On the one hand, television platforms attempt to diversify their supply in terms of both variety and quality to meet a larger audience and to increase advertisers' willingness to pay, with growth in the number of potential eyeballs. On the other hand, viewers are bored by advertising, which is an implicit cost to access television content. In the short run, assuming a competition increase among platforms, we get a result close to the effect of competition on traditional markets, which forces the amount of advertising to drop. Thus, the price for an advertising contact goes up. Even though this relationship is controversial, Anderson and Coate (2005) state, for example, that a higher concentration pushes down the advertising prices. In the long run, under the assumption of free entry, equilibrium profits are equal to zero. Therefore, the models provide the optimal number of firms in equilibrium (meaning maximizing the social welfare). The crucial point here is the effect on the content, but not advertising, provided by broadcasters. We will deal with this issue more extensively later on. Let us say that if the advertising impact is relatively narrow, the broadcasters will be more stimulated to differentiate their channel supply and therefore grant a pluralism of contents.

This general approach can be specialized in some specific topics: the relationship among concentration, competition and advertising (e.g., Choi (2006), Crampes et al. (2009) and Reisenger (2012)) and the relationship between competition, advertising and news contents (e.g., Dukes and Gal-Or (2003), Gal-Or and Dukes (2003), Cunningham and Alexander (2004), Anderson and Coate (2005), Armstrong and Weeds (2007), Peitz and Valletti (2008), Anderson et al. (2012), A. J. Garcia Pires, (2014), Weeds (2014)). From an empirical point of view, the literature has not only tested the relationship between concentration and advertising prices (e.g., Brown and Alexander (2005) or between advertising and consumers' preferences (e.g.,. Kaiser and Song (2009), Hiller et al. (2014)), but has also attempted to measure the degree of market power, taking into account the peculiar features of two-sided markets; see, e.g., Kaiser and Wright (2006) for reviews of the market in Germany and Argentesi and Filistrucchi (2007) for reviews of the market in Italy.

Media Capture and Bias

In the previous sections, we have already defined media bias. In particular, we stressed that the phenomenon emerges when the sources attempt to influence the actions that

readers are expected to take after being exposed to messages. Actually, media bias can take different forms. Media can try to influence what and how readers should think or even simply what they should think about: this depends on the type of issues involved, on the attitudes of readers and on the relevance of issues. Since the reader's decision to be influenced is often a voting one, the literature on media capture and bias is linked to political economy.

A source has an incentive to bias the news it releases, to the extent that it is captured by lobbies, political parties or pressure groups of various kinds. Capture itself can take different forms. The capture might be explicit. This is the case of media owned by political parties or by entrepreneurs with interests in fields other than publishing, which can be favorably affected by activities in the media market. In most cases, however, pressure groups and sources entertain non-contractual, tacit links through which they affect the messages diffused by the media, without readers explicitly knowing. In this respect media bias takes the form of distortion, selection and slanting in the information provision. In particular, the literature distinguishes among issue bias, when there is a selection of the topics to be covered by news, facts bias, when there is selection on information disclosure, and ideological bias, when the manner of presenting news and information is distorted. Obviously media and journalists' ethics and in some cases, the law, at least partly ban this kind of behavior, but this is not enough to prevent media bias phenomena.

As we mentioned above, the pressure groups might include governments, political parties, lobbies (Stromberg (2004), Mullainathan and Shleifer (2005), Besley and Pratt (2006), Corneo (2006), Chan and Suen (2008), Larcinese (2009), Sobbrio (2014), Petrova (2012)), advertisers (Brown and Cavazoos (2005), Reuter and Zitzewitz (2006), Ellman and Germano (2009), Germano and Meier (2013)) or simply the owners of the sources (Djankov et al. (2003), Anderson and McLaren (2012)). An important insight in this literature establishes a negative relationship between competition among sources and the opportunities for media capture. As the number of independent sources increases, biasing information becomes increasingly costly. Intuitively, as long as one or few sources are not controlled, bribed, influenced, etc., all resources spent in controlling, bribing, influencing the other sources might turn out to be useless (Besley and Pratt (2006)). More precisely, Corneo (2006) shows that a higher concentration rate in the media ownership increases the chance of media being captured. Therefore, he suggests a negative correlation between competition and capture. Conversely, Mullainathan and Shleifer (2005) stress the role of reading behaviour in countering media bias. They show in particular that the existence of "sophisticated" readers matters for the accuracy of the news, an issue we shall come back to in the subsequent sections.

At the empirical level, a large literature exists. Some contributions focus on the single country analysis to study the relationship between media and political parties and their effect on news contents (e.g., Puglisi (2011), Petrova (2009), Gambaro and Puglisi (2010), Di Tella and Franceschelli (2011)). In a cross section of countries, Brunetti and Weder (2003) show the existence of a significant negative correlation between press freedom and corruption. A third bunch of papers considers the possibility for political parties to affect voters' decisions via the media system. The effects of information bias have been analyzed by Groseclose and Milyo (2005), Puglisi (2011), DellaVigna and Kaplan (2007), Ho and Quinn (2008),

Durante and Knight (2012), Gerber et al. (2009), Gentzkow and Shapiro (2010) and Sobbrio (2014). The results are two-fold. On the one hand, it seems very difficult to alter through the media the basic ideological orientation of the majority of readers, since individuals tend to select sources on the basis of political orientation. On the other hand, there exists a population of swingers, whose attitudes and choices are deeply affected by press and broadcasting news. Since these individuals may be pivotal in an election, their importance in the eyes of those pursuing a media bias strategy is often larger than bare numerical proportions would suggest.

Finally, an interesting paper (Baron 2006) suggests that journalists might be induced to bias information, because of incentives built in their career mechanisms. For instance, publishing a very alarming report about some controversial issue can be more rewarding, in terms of notoriety, prestige, appearances in talk shows, etc., than publishing a more truthful, reassuring and less sensational piece, although neither the journalist nor the publisher have a specific interest in influencing readers in one or the other direction.

Competition and Pluralism

As previously mentioned, the ongoing literature has mainly focused on the relationship between upstream and downstream sides of the platform, without particular attention to the competition among different media outlets. In this paragraph we review some contributions which address the specificities of competition in media markets.

If one looks at media, one immediately realizes that differentiation, vertical or horizontal, is standard fare in the analysis. In particular, an important stream of the literature has focused on advertising in horizontally differentiated markets. While in the traditional products industry, the well-established "principle of maximum differentiation" applies (d'Aspremont et al. (1979)), the media industry seems to mainly follow the "principle of minimum differentiation." Radio and television channels tend to offer similar programming and end up with remarkable duplications in this respect.

In order to explain this stylized fact, the crucial factors are the absence of price competition and the role of advertising. In the absence of price competition, maximizing profit from advertising coincides with audience maximization, which discourages niche programming and induces media outlets to cater for the tastes of the majority. However, this picture is not complete. Gabszewicz et al. (2004) show that if viewers dislike advertising, platforms choose instead maximal differentiation in the programming space. In this case, with other things being equal, viewers choose the programs featuring the least level of advertising, or they simply quit watching during ads. In fact, differentiation represents a means to soften competition. Accordingly, Anderson and Coate (2005), one of the seminal papers in this field, considers a model of two competing media platforms with a given set of contents, which can be either maximally differentiated or identical. The authors show that advertising levels and the resources devoted to programming may be too high or too low depending on whether advertising is considered or not a nuisance by viewers. Therefore, if advertising revenues were sufficiently high, media firms would prefer to provide identical media content and to duplicate programs. Gal-Or and Dukes (2003) also describe broadcasters' incentives to provide identical programming, but in a setup with endogenous content provision. In

this framework, identical programming raises the competition for audiences, and, at the same time, reduces the time allocated to ads, so that advertisers are willing to pay higher prices for advertising space. Therefore, they show that both platforms end up offering the same content. Similarly, Gabszewicz et al. (2001, 2002) show that, when the audience is indifferent to the level of advertising, platforms provide the same programming, that is, there is minimal differentiation in the content space. While the contributions just mentioned end up with either minimal or maximal differentiation in the content space, the work of Peitz and Valletti (2008) demonstrates that the variety of content provision depends on the different degrees of disutility attached to advertising. The more sensitive viewers are to advertising, the less channels there are that advertise, and content becomes more differentiated. Furthermore, the authors show that pay-TV always ends up providing maximal content differentiation, while free-to-air television provides less diversity of content.

While horizontal differentiation is common to many markets, in the case of media markets, differentiation can be to some extent associated with the broader idea of pluralism. Pluralism is a multifaceted notion related to the options to express a wide range of political opinions and cultural and social values through the media. This general definition embraces a number of aspects, such as the concentration of sources, diversity of ownership, independence of journalists, coverage of news, and the relationship between media and political actors and pressure groups, among others. Quoting the European Council, "[. . .] ensuring media pluralism [. . .] implies all measures that ensure citizens' access to a variety of information sources, opinions, voices, etc. in order to form their opinion without the undue influence of one dominant opinion forming power" (Commission of European Community (2007). In addition to this general definition, pluralism has been further specified as external vs. internal. External pluralism refers to a situation where the number of media outlets is sufficiently large and the contents provided largely differ across outlets. Internal pluralism means that each outlet covers a sufficiently large variety of content.

In other words, external pluralism alludes to a situation where the existing sources of information, taken together, are able to represent and express the whole range of political or cultural opinions and points of view. Under external pluralism, the audience may then choose among a large range of independent sources, which suggests an analogy between the idea of pluralism and the ideas of competition and variety differentiation, be it maximal or at least partial. At a first glance, a gross indicator of the degree of external pluralism is measured by the number of media and media companies. However, the existence of a large number of sources and the abundance of information do not necessarily guarantee that external pluralism holds. It is required that media outlets and platforms are at least owned or controlled by a plurality of independent and autonomous actors at the level of media production, supply and distribution (i.e., variety in media sources, outlets, suppliers and distribution platforms). In this respect, economic studies measure supply distribution and accessibility of media by means of different indicators, namely, media concentration (CR4, HHI), ownership concentration, turnover of the total media industry, extent of vertical integration, merger and acquisition trends, and so forth (e.g., Motta and Polo (1997), Ward (2004), Katholieke Universiteit,Interdisciplinary Center for Law and ICT (2009), OECD (2010, 2011)).[3]

[3] For an interesting survey on "media governance," see Puppis (2014).

Conversely, the definition of internal pluralism requires that the contents supplied by each media outlet review a sufficiently wide range of opinions on the relevant political, cultural, and social issues. Unlike the external version of the concept, the industrial organization counterpart of internal pluralism seems to be a situation where media outlets do not differ too much from one another, but each one contains and provides all of the existing varieties.

While aforementioned contributions focus on horizontal differentiation, another stream of literature deals with vertical differentiation, namely by quality. Motta and Polo (1997) explicitly take into account the role of quality in shaping the broadcasting market.[4] More precisely, broadcasting channels have to choose both the variety and the quality of the programming to be scheduled. On the cost side, program quality is an endogenous sunk cost. In line with Sutton (1991), an increase in programming quality pushes a higher concentration in the media market. However, the possibility of horizontal differentiation, in terms of choice of variety, allows specialized channels to attract a negligible share of viewers. In this respect, the authors show that the broadcasting market is characterized by a dual structure with few large broadcasters and a fringe group of small, specialized channels.

Taking this idea a step further, Nilssen and Sørgard (2000) describe the effect of both quality decisions and industry competition on the media market. The authors show that a TV channel's two strategic variables, programming quality and either price or quantity, always reinforce each other. Increasing one variable also increases the marginal profit with respect to the other variable. By comparing monopoly and duopoly in the television market, the authors found that rivalry between television channels can lead to a reduction in the total number of viewers, due to the duplication of programs in duopoly and the too-low investment in quality with respect to the monopoly case. They also show that less intense price competition in product markets results in higher prices of advertising, more advertising, and more investment in program quality. Therefore, both investment in program quality and advertising could be interpreted as rent-seeking activities. Furthermore, there is no evidence that competition, namely increasing the number of broadcasters in the market, leads to a higher level of variety and quality. In a slightly different framework, Cunningham and Alexander (2004) illustrate the effect of market concentration in shaping the broadcast industry's supply of non-advertising content. They demonstrate that broadcasters' response to increased concentration depends upon consumers' responses to a change in the fraction of broadcast time devoted to advertising. More precisely, the authors show different scenarios. Therefore, it might be the case that an increase in concentration results in a reduction of the fraction of broadcast time devoted to advertising and a crowding-in of non-advertising broadcasting. Apparently, theoretical models suggest that competition in the broadcasting industry does not lead to larger content variety and higher quality. In other words, it is not clear that increasing the number of media firms and media competition would create a larger range of content and higher quality or a higher degree of pluralism.

As we said, previous analyses focused on the television and broadcasting sector. When the analysis is extended to press, some specific features of the newspaper

[4] Notice that in Motta and Polo (1997) quality is not related to the cultural content, but it is interpreted as popular appeal or perceived quality.

industry must be taken into account. First of all, advertising exerts different influences on readers as compared to viewers. As for TV viewers, advertising by definition interrupts the broadcasting content. That the viewer can switch to a different channel does not mean that this is not a nuisance or a cost. Readers can instead turn the page containing the advertisement with a negligible loss of utility. Therefore, readers are less affected by advertising, unless advertising completely changes the intrinsic characteristics of the newspaper (total number of pages, editing, etc.). Second, horizontal differentiation is also present in the newspaper industry, but competition here is more akin to what one finds in the pay-TV industry rather than in the advertising-financed free-on-air broadcasting. The existence of some price competition introduces one additional incentive to product differentiation, which in the press industry sometimes takes the form of specialized newspapers (finance, sports, etc.). Other forms of milder differentiation are also present, where different contents (foreign/national/local news, sports/classified ads, etc.) receive slightly different weights in competing newspapers, none of which is utterly specialized.

Demand and Pluralism

According to the previous literature, great attention has been devoted to the conditions for pluralism on the supply side, i.e., conditions concerning ownership concentration, freedom and independence of sources, and the availability of a wide range of media and content. Rather surprisingly, the role of the demand side of the market has instead been partially neglected by the literature. Despite the well-known fact that the propensity to become informed is systematically related to socio-demographic characteristics, namely gender, age, socio-economic status and education, very little effort has been exerted to investigate how demand influences the equilibrium and pluralism of the media market. More precisely, given that the conditions for pluralism are met on the supply side, the willingness of individuals to invest costly resources (above all, time) in getting, understanding, comparing and evaluating the information available matters for determining the extent to which pluralism and freedom are actually achieved in society. (Battaggion and Vaglio (2012a)). There exist relatively few contributions dealing with the general framework of individual decision-making to access the information and services provided by the media. Recently, there has been renewed attention on the fact that consumers are not simply passive receivers of news. However, very little effort has been expended analyzing reasons why people like to or do not like to resort to different media. The literature indicates that individuals are motivated to get informed in order to vote, but rarely do so in order to make a private choice. Therefore, equilibrium with agents who do not read newspapers is not taken into consideration. Few remarkable exceptions are due to Stromberg (2004) and Elmann and Germano (2009) who assume that the value of information must exceed the reservation utility of the individual, in order for him to be informed. However, the reservation utility is homogeneous across the population of individuals and therefore, either all or none become informed. Obviously, only the former case has been thoroughly studied. Furthermore, the literature misses a rigorous characterization of the opportunity costs of the readers or viewers. Either it is assumed that getting informed is a costless activity (Besley and Prat (2006) and Corneo (2006)) or the cost of reading is represented by the

price of the newspaper, which is uniform across individuals. A few remarkable exceptions are indicated by Mullainathan and Shleifer (2005), McCluskey and Swinnen (2007), Larcinese (2009) and Anderson and McLaren (2012). However, most literature considers that individuals bear the cost of being exposed to advertising messages, which do not provide any utility to the individuals and constitute only nuisance advertising. Analogously, the leisure component, which is one of the reasons why individuals resort to media, does not play any role in this literature. In other words, contents other than news are assumed to be irrelevant to individuals (however, Stromberg (2004) accounts for other desirable characteristics of newspapers, which are exogenously given). Conversely, individuals might resort to media outlets for information related to some voting decision or any other allocative choice, or for leisure, as a standard consumption activity. The interesting point here is that the two components of a media outlet are not sharply separable on the audience side. Notice that this is the basic assumption for advertising: people consider advertisements to be a nuisance because they cannot be separated from the content. Furthermore, among practitioners, the word "infotainment" is used to describe a mix between news and entertainment, where the entertainment component positively affects the consumer's satisfaction regarding news and information.

However, it seems that the theoretical literature does not pay any attention to the entertainment component of the media market. In other words, all content except for news is considered to be irrelevant for the individual decisions. Stromberg (2004) represents an exception. In fact, he takes into account the entertainment component, but it is exogenously given. Additionally, the individual's use of the information is not completely clear. Given the supply of news, in other words, according to some degree of pluralism on the supply side, the individual might benefit in two different ways. On the one hand, the audience can select the best outlet according to their preferences, or the audience can afford to consume more than one single media outlet and jointly use the information. The second way is called active pluralism, in which an individual has the chance to compare different sources of information. Obviously, active pluralism is based upon the impossibility of having one single, exhaustive, reliable and correct source of information. Assume, for instance, that the relevant information is built upon different bits that the source can publish or not publish. In this respect, only an individual collecting different bits can get the relevant information (see Mullainathan, Shleifer (2005)). A second interpretation of pluralism corresponds with the idea that the information provided by a source is an independent observation of a stochastic event. With a higher number of considered sources, the accuracy level increases.[5]

In discussing active pluralism, a key point to consider is the role of demand in the market for news. Such a pluralistic behavior is costly and therefore would emerge when these costs are lower. Given that the costs of becoming informed are basically considered opportunity costs, linked, for instance, to the disutility of reading, we can imagine that this disutility inversely depends upon educational level. Therefore, to understand why media systems are so different across countries also implies the need to have a closer look at the institutional factors affecting the level and the distribution of

[5] Two unpublished papers' (Sobbrio (2011), Battaggion and Vaglio (2012b)) attempt to formalize this notion within a Bayesian framework.

education across populations. Such a concept is well known in sociology and cultural economics, but it might be very useful in media economics as well.

A further implication of active pluralism is related to the degree of competition. Without active pluralism, competition among sources is rather standard. Every individual picks his best choice, according to different media features, while sources compete for the audience. In the case of multi-homing individuals or active pluralism, the best choice is given by the sum of different sources. Therefore, there is some room for free-riding behaviors.

Conclusions

Research in media economics has experienced an exceptional expansion in the last 15 years. Different streams of literature contributed to this unprecedented growth: two-sided markets literature, research on information disclosure and signaling, studies in voting behavior and in political economy in general, together with a flow of empirical studies made possible by the exploitation of newly created databases. Behind these intellectual developments, the matter-of-fact relevance of a rapidly expanding and innovation-propelled media industry provided the real-world stimulus to research. In the present paper, we attempted to provide an overview of these developments, in an effort to discuss a vast and multifaceted literature within a unified theoretical framework.

Antitrust and, more generally, competition policy, mostly benefited from the growth of the literature reviewed. Competition in the media markets interacts with a related, but distinct, concept, namely pluralism. Market performance itself has a dimension (the degree of information bias, or its counterparts, namely fairness, reliability, and accuracy) which is specific to these markets. In this respect, the literature provided an improved lens through which laws on mergers and acquisitions, band allocation and the debate on state or private ownership in broadcasting should be scrutinized and assessed.

In this field, additional investigation is needed on the consequences of alternative models of firm organization. The fact that most media companies are multi-network or even multi-media should perhaps be more thoroughly investigated, especially in regard to issues of quality, product differentiation and market segmentation.

The relationship between media and the political system has obviously also received close attention in the literature. Media provide a service which influences, among other things, election turnout, voting choices, the setting of political agenda, the general attitude towards public issues with dramatic implications for the workings of democratic systems and, as recent history witnesses, for democratic opposition to dictatorships. Here, the contribution of demand to shaping the structure of media markets should be the object of renewed interest. Contributions on the fundamental issues of why, how, and how much people resort to media seem to be surprisingly rare, especially in comparison to the richness of literature concerning the supply side and the interest that the media business has in audience studies.

Technology is the ultimate driving force behind many of the changes in the media sector. As a matter of fact, media economics tends to take as given what innovation economics says, while researchers in the economics of technology rarely discuss

implications of technical innovation in the media sector as regards media quality, media bias, and the structure and size of media demand. Increased integration among the two disciplines would be a welcome development in the literature.

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