Reporting for Sale: the market for news coverage *

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Abstract

The demand for political information has long presented a problem to rational choice theorists. In terms of news coverage, market pressures should lead to see the same coverage by different media outlets. But then why do we see so many claims to the contrary? Contemporary work in the psychology of decision making suggests that people suffer from a confirmation bias. This bias can be thought of as a tendency to seek out, or prefer, information that confirms a prior belief. In this paper we propose a formal model of the market for political news, and show that when the audience has this bias it may be profitable for firms to differentiate their coverage or evaluations

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The news media play a crucial role in how individuals go about acquiring information. They provide information that the public might deem useful in making individual and collective decisions. Yet, several recent books – and some street-level folk wisdom – have accused major news networks of having a political bias. However, there does not seem to be a consensus on the direction of the bias. Some public figures, such as Ann Coulter (2002), claim an overwhelming liberal bias, while others, such as Al Franken (2003), point to right wing media outlets. Our goal is not to argue that there *is* a bias, be it a left or a right wing one. Rather, we examine formally how different evaluations of a political event may come from a purely profit driven news organization.

Our results also speak to a deeper impact of polarization of the electorate. There is a growing literature on the recent polarization of American politics (McCarty, Poole, and Rosenthal, 2006; Bartels, 2008; Gelman, Park, Shor, Bafumi, and Cortina, 2008). This literature, however, does not address the impact of polarization on the mass media and hence the provision of political information. This paper, in part, fills this gap.

Though many studies often examine the effect of the media on the voter, they rarely investigate the incentives for the news organization. These broadcasts and coverage are often taken as given or as indicative of a political preference of the outlet. Graber, however, rightly points out that stories are selected primarily due to audience appeal rather than to the political significance, educational value, or broader social purposes. (Graber, 2006)

The canonical rational choice and economic theory literature views the demand for news purely as a demand for information. Consumers watch or listen in order to become more informed. If the information is not accurate, then it is worth less to the consumer. So one would think that competition from other outlets will drive the market to supply more accurate information, much in the same way that market competition leads to better widgets.(Coase, 1974) Therefore, one would expect that market competition would drive firms to converge to the same coverage. However, why do we see claims otherwise?

In our model, we attempt to resolve this puzzle. We model individuals (news consumers) as purposive. Yet, results in psychology indicate that individuals must also deal with the

cognitive conflict involved with integrating information that counters their prior opinion. Given that a news audience has these tendencies, we then analyze the market competition. In particular, we study a game of product placement between two news organizations, and show that it may be profitable for a news organization to position itself away from its rival firm.

While our model will look similar to a standard spatial model of elections, but it is different. One of the seminal results in this literature is Black's median voter result (Black, 1948)., which shows that only the location of the median voter determines the "winning" outcome. In particular the distribution of voters and the polarization of the electorate are irrelevant. In contrast, in our model the distribution of political preferences matters and is a certral component of the news organization's placement strategy.

Other recent papers have also looked at trying to resolve the tension between the traditional theory and the claims to the contrary. David Baron looks at a supply-side explanation. He argues that if the media organizations can hire "activist" journalists, they might do so to cut costs and raise profits (Baron, 2006). In a paper that uses a similar demand-side explanation to ours, Mullainathan and Shleifer show that newspaper organizations might slant the news in order to raise the price that they can charge for the paper (Mullainathan and Shleifer, 2005). In an alternative demand-side explanation, Gentzkow and Shapiro show how a Bayesian consumer might infer the quality of an outlet by how closely it reports a story to the consumer's prior belief. This in turn produces an incentive for media outlets to pander to a target audience (Gentzkow and Shapiro, 2006a).

A forthcoming paper by Larcinese addresses the fact that, from a purely rational point of view, only individuals that can be induced to change their course of action should be interested in acquiring the information. Therefore, ideologically moderate and independent citizens should have a stronger incentive to obtain information than loyal partisans. While each new piece of news is potentially useful to moderates, almost no amount of news could change an extremist's behavior (Larcinese, ming).

In a different stream of literature, there is a vast amount of academic attention devoted

to understanding how the public responds to news media, and more generally the role of media in elections. Several studies show that people are not perfectly rational consumers, and that they use heuristics and systematically succumb to biases (Popkin, 1991; Zaller, 1992; Kahneman and Tversky, 1982). Though these studies often examine the effect on the consumer, they rarely investigate the incentives for the news organization. These broadcasts and coverage are often taken as given.

Although it is crucial to understanding political communication, investigations into the supply-side of news media are more commonly found in economics journals. As we mentioned however, the traditional economic approach uses a very different set of assumptions. Reasoning from these assumptions leads one to believe that there should be homogeneous coverage.

Downs points out that the cost of acquiring information will lead an individual to use some selection of data from the vast amount available to him. Thus there could exist a bias from the very selection process alone.(Downs, 1957) Moreover, any report one observes also has the ability to be biased, if only because even a well meaning reporter acquiring information faces the same data selection issue: for various reasons, the reporter must drop some information for the report from the total available to him or her.

The potential for an inaccurate report becomes amplified when one considers the (opportunity) cost of evaluating the data. It is reasonable to think that the consumer, or voter, must rely on some process or thing to help him bear the costs involved with becoming informed. Popkin, Zaller and others suggest that people use informational shortcuts to aid in this process. (Popkin, 1991; Zaller, 1992; Lupia and McCubbins, 1998)

An example of an informational shortcut is an elite's interpretation, or commentary. As Popkin points out, a key source of such commentary is television: "Television news provides commentary on speeches, proposals, and crises from a variety of well-known political figures from whom voters can triangulate, just as they do with local opinion leaders"[1] (Popkin, 1993). These commentary and evaluations help the individual deal with the costs of becoming

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informed. These costs are now taken on by the organization providing the news coverage.

To cover these costs, an organization must make enough revenues (from advertising, etc.) by providing these evaluations. If the evaluations are not "accurate," then they are worth less to the consumer. If firms compete for the audience, then one might expect convergence on the commentary provided. Therefore, even if people do rely on evaluations from news media, it does not necessarily mean that the news market offers different or perhaps "biased," evaluations.

This reasoning, however, relies on key assumptions about the consumer. These assumptions are in conflict with the evidence from psychology that suggests people use heuristics and systematically have biases. Empirical evidence suggests that people do not search for information in an optimal way. One common finding is that people prefer, and systematically seek out, information that confirms their prior belief.[2] Such research clearly indicates a departure from the traditional rational-man found in economic theory. In traditional rational choice theory, the value of information is only measured by how much it aids an individual in making a decision. In our model, we change this assumption.

We model individuals as experiencing some benefit from hearing information that confirms their belief. For instance, opponents of an incumbent might enjoy hearing about his poor performance in office. Similarly, people may receive disutility from hearing information that differs from their previous opinion. For example, initial advocates of a new casino might dislike hearing that the casino has failed to do anything for the local economy. Therefore, we are incorporating a version of the confirmation bias. Yet, in our model, people are purposive; they choose which, if any, broadcast they benefit from the most.

Given news consumers have this preference for confirming news, we then examine the news market organization, i.e., we examine how broadcasting firms best respond to each

[2]This phenomena is typically referred to as the "confirmation bias." However, this phrase is a common label given to several distinct phenomena; see (Fischhoff and Beyth-Marom, 1983). For example, in addition to actively seeking confirming information people also disregard disconfirming information and only pay attention to evidence that supports their belief. Rabin and Schrag model this interpretation of the confirmation bias (Rabin and Schrag, 1999).

other given that their consumers have this preference. The model fits into the class of spatial models in study of industrial organization. Since this literature was the starting point for the spatial voting models, it might seem very familiar. However, it is different. News organiztions need no converge to the median in equilibrium. Moreover, unlike many spatial models of voting, the amount of vaiance in the distribution of voters and the polarization of the electorate is crucial to the model.

1 The Model

For simplicity, we will assume that there are two news broadcasting firms, A and B, that can report on an event, or story, s. This story can be thought of as anything, such as the state of the economy, how an incumbent is performing, or even the moral character of an election hopeful. An underlying presumption is that individuals preferences about the event are heterogeneous. For example, an administration's post-war performance might be viewed positively by initial supporters of the war, but poorly by those initially against it.

In terms of political ideology, we will assume that we can position people on an ideological line, $\mathcal{I}$. Substantively, we can think of this in terms of the standard liberal-conservative unidimensional case. We will intuitively be thinking of $\mathcal{I}$ as the real line, $\mathcal{I} = \mathbb{R}$. We will assume that people are distributed according to a normal (Gaussian) distribution across the line with mean μ and variance σ^2.This just says that most people are in the middle of the road in terms of ideology, i.e., there are more moderates than extremists. Figure 1 depicts the total available market.

Figure 1 here

The viewer simply decides which news broadcast, if any, to watch. However, we assume that each broadcasting company has the ability to take a position on the event it is covering. So each media company chooses how, if at all, to evaluate the coverage of s. Therefore, our model of news broadcasting is a spatial model the news industry. Recall, however, that this model is different than the standard voting model which may be familar to many readers.

One of the main differences between our model and the traditional spatial models of elections is the difference between a firm's incentive and a candidate's incentive. As we highlight in the next section, a new firm wants to maximize it's audience size rather than "win" the market.

1.1 *Firm Incentives*

We will assume that there are two firms, i and j, and each broadcasting company is purely profit driven. Therefore, the objective of each news broadcasting company, i, is to maximize profits, Π_i, by its choice of where to locate its news broadcast $b_i \in I$, given the choice of the other company

$$\max_{b_i} \Pi_i(b_i, b_j)$$

We will assume that the firms are simply reporting b and not charging a price to watch the broadcast. Each company's profits are assumed to come from other sources (such as advertising revenues), which are increasing in the number of viewers. Thus, for simplicity, we equate profits with viewership; i.e., the firm wants to maximize the number of viewers watching the broadcast.

Recall that we are assuming that people are distributed with mean μ and variance σ^2 on an ideological line $\mathcal{I}$. Therefore the broadcasting company i's viewership is equal to the following definite integral:

$$\Pi_i(b_i, b_j) = \int_{L_i(b_i,b_j)}^{U_i(b_i,b_j)} f(x)dx$$

where

$$f(x) = \frac{1}{\sqrt{2\pi\sigma^2}} \exp[-\frac{(x-\mu)^2}{2\sigma^2}]$$

is the Normal pdf, and the numbers $U_i(b_i, b_j)$ and $L_i(b_i, b_j)$ denote the upper and lower bounds, respectfully, of company i's market. Individuals beyond these bounds choose not to watch firm i's broadcast. As denoted, these bounds are determined by the broadcasts, $b = (b_i, b_j)$, and by the viewers' utility.

1.2 *Viewer Utility*

We will assume that the viewer is purposive and attempts to maximize his utility, which is given by the following function:

$$u_i(b^o) = \begin{cases} \varphi - C(x_i, b^o), & \text{if he watches broadcast } b^o; \\ 0, & \text{otherwise.} \end{cases}$$

Here, φ is the net utility received by watching the news. Though we will leave this abstract, one could think of it as capturing several different things. For instance, it could capture the actual value of the information or (social) benefit of being informed to converse with others. It could also incorporate the cost, in terms of time, the viewer gives up to to listen to the report. For simplicity we will assume that φ is the same for all viewers of the broadcast. To make the model non-trivial, we will also assume that the utility, or benefit, someone receives from watching the news is positive but not "too big." Specifically, we will make φ small enough that the entire market is not covered, i.e., some individuals will not choose to watch the broadcast because the (cognitive) costs outweigh the benefit. We will also assume that an individual only watches one broadcast, and randomizes with equal probability if he is indifferent.

Though we are assuming that the viewers are purposive in the model, we are also motivated by some of the literature that suggests people fall victim to the confirmation bias. This bias can be thought of as a preference for receiving information that confirms an individual's prior opinion. While still in its general form, $C(x_i, b)$ is an attempt to represent the confirmation bias. It can be thought of as the cognitive disutility[3] the viewer experiences by hearing a broadcast that is different from his preferred position.

Here $x_i \in I$ is the viewer i's prior (or ideal) belief about the event s, and $b_i^o \in \{b_A, b_B\}$ is the news broadcast the the viewer watched. Exactly how one specifies $C(\cdot, \cdot)$ is an interesting and complex problem. For simplicity, we assume that $C(x_i, b^o) = c||x_i - b^o||$, with $c \geq 0$. Thus the cognitive disutility an individual receives is some positive constant c multiplied by the distance between his prior opinion and the broadcast he watches.

[3]In Psychology there is a vast literature on this internal conflict under the heading Cognitive Dissonance.

1.3 *Market Competition with Two Firms*

Recall that we are assuming that each news organization wants to maximize the number of people viewing its broadcast. Formally, it wishes to maximize

$$\Pi_i(b_i, b_j) = \int_{L_i(b_i,b_j)}^{U_i(b_i,b_j)} f(x)dx$$

by choice of b_i. However, we have not defined precisely the upper and lower bounds of the organization's market share, $U_i(b_i, b_j)$ and $L_i(b_i, b_j)$. f Intuitively, the upper bound of the organization's market share is the right most individual that chooses to watch the news broadcast. Any individual who is more conservative, i.e., farther to the right on I, than $U_i(b_i, b_j)$ will experience too much disutility (frustration, anger, etc.) and choose not to watch.[4] Similarly, $L_i(b_i, b_j)$ defines the lower bound of the organization's market. Therefore, everyone between $L_i(b_i, b_j)$ and $U_i(b_i, b_j)$ is watching firm i's broadcast.

Lemma 1 (Bounds of the news market)**.** *In equilibrium, audience members outside of the interval*

$$[L_i(b_i, b_j), U_i(b_i, b_j)]$$

abstain from watching broadcast b_i*.*

Figure 2 here

Figure 2 illustrates the market share of an organization when there is only one firm in the market. Here the news organization chooses to locate its coverage, p, at the mean of the distribution. Note the unshaded area to the left of L_p. This area represents the amount of people who choose not to watch the news broadcast because they view it as too right wing. Similarly, the area to the right of U_p represents those that don't watch the news because they feel that it is too left wing in its coverage.

[4]This does not imply immediately that person in question won't watch any news. He might – if the other news broadcast, b_j, is closer to his view and proves worthwhile.

More formally, in the case where there is only one firm in the market, U_p defines the point $\bar{x}$ on the right such that $\varphi - c|\bar{x} - p| = 0$. Or in other words, $\bar{x}$ is indifferent between watching and not watching the broadcast. Solving for $\bar{x}$ we have $U_p = \bar{x} = p + \frac{\varphi}{c}$. For notational simplicity we will let $k = \frac{\varphi}{c}$. Similarly, L_p defines the point, $\underline{x} = p - k$, to the left of p that is indifferent between watching and not watching it.

Say we have someone at a position x', that is farther to the right than $\bar{x}$, or that $x' > \bar{x}$. It is straightforward to see that $c(x' - p) > c(\bar{x} - p)$. Therefore the cognitive disutility would be greater than φ, and an individual at x' would choose not to watch the news.

When there are two competitors, an organization's market share is only slightly more complicated. If the two market shares do not overlap, then each organization's share can be thought of as before. Alternatively, if two organizations' potential markets overlap, then they compete for the same audience members. This situation can been seen in figure 3, where the darkest shaded region indicates overlapping target audiences, or competition. Audience members in the overlapping region would prefer to watch either broadcast than neither one. However, half of the interval is closer to one firm than the other. Since individuals choose the closer broadcast, the midpoint between the two firms defines the boundary point of the firm's market share.

Now we may rewrite the firm's payoff, or objective, function. For notational simplicity will we assume without loss of generality that $b_i \leq b_j$. Firm i's market share becomes:

$$\Pi_i(b_i, b_j) = \begin{cases} \int_{b_i-k}^{b_i+k} f(x)dx, & b_i + 2k < b_j; \\ \int_{b_i-k}^{b_j-k} f(x)dx + \int_{b_j-k}^{\frac{b_i+b_j}{2}} f(x)dx, & b_i + 2k \geq b_j. \end{cases}$$

When $b_i + 2k < b_j$ the markets do not overlap and the firm receives all of his uncontested market. If $b_i + 2k \geq b_j$, each firm captures all of its uncontested potential market, plus the half of the overlap.

To summarize, the basic outline of the model is as follows: Each news organization must simultaneously choose where to locate their coverage of a story (or evaluation of an event). Their basic desire is to capture as much of the market as possible in order to increase their revenues from advertisers. After each firm decides on how it will cover an event, individual

news consumers then choose which report to watch, if any. They choose which report on the basis that they want know about the event, but only if the coverage is sufficiently close to their own view.

Figure 3 here

Results

In the previous section we specified the structure of the model and outlined the decisions news organizations and individual consumers must make. In this section we will examine the implications of the model. The analysis will focus mainly on the symmetric Nash equilibrium of the model. We will not present the proofs in the main text, but we will try to give some of the intuition behind each result. However, more detail of the proofs may be found in the appendix.

The first implication of the model is useful in understanding and proving the main results. However it also has a meaningful substantive interpretation. It states that we should never expect to observe extreme differences in news coverage.

Lemma 2 (Moderate Coverage)**.** *In equilibrium, the distance between b_i^* and b_j^* is at most $2\frac{\varphi}{c}$.*

The intuition behind the result is rather straightforward. In equilibrium there will never be a gap between the two news markets. From the fact that the distribution of beliefs is unimodal, either firm would have an incentive to appeal to the moderate audience members.

The first theorem is perhaps the main result of the paper. Basically is says that in equilibrium, profit (viewership) driven firms do not necessarily converge to the same coverage. More specifically, a firm may find it profitable to differentiate its broadcast from the other news source.

Theorem 1 (Differentiation)**.** *For $\varphi < M^*$ there exists an equilibrium where firms differentiate, i.e., $b^* = (b_i^*, b_j^*)$ and $b_i^* \neq b_j^*$, where M^* depends on the distribution of x_i.*

The condition imposes that the benefit an individual receives, φ, be "small enough." Such a condition excludes cases where everyone watches the news. Or another way of thinking of violating this condition is when the costs will *never* outweigh the benefit. Technically, bounding φ allows us to talk about a crucial tradeoff between the variance of opinion, σ^2, and k, the ratio of the utility to the cognitive dissonance received from watching the broadcast.

The intuition behind the result comes from the fact that the market isn't covered. Recall that everyone has a sufficiently small yet positive utility for the news coverage. Given this is the case, the people away from the middle of the distribution do not end up watching a broadcast located at the mean because it is too "costly." So a firm might find it profitable to move to the left or right. Obviously, it would only be profitable if the number of people it gains is greater than the number it will lose to the competition.

However, as the following corollary states, when viewers' value of the broadcast is great enough, firms produce homogenous coverage.

Corollary 1. *As people value information more, more moderate coverage prevails. Or more precisely,* $\lim_{\varphi \to \infty} b^* = (\mu, \mu)$.

If φ is too large, everyone watches. The competition between firms does lead to convergence, because the firms are not losing any of their audience. As such, they do not have any incentive to move away from the mean of the distribution.

A similar comparative static also comes out if we think that the cognitive disutility, or dissonance, involved varies from one issue to another. If the cost of hearing different information, c, is varies by issue, then some issues will produce more moderate coverage than others.

Corollary 2. *As people experience less cognitive disutility, more moderate coverage prevails. Or,* $\lim_{c \to 0} b^* = (\mu, \mu)$.

Therefore if there topics where audience members do not take issue with hearing different information than their expectation, we would expect more moderate coverage to prevail.

However, holding c constant and with a sufficiently small φ, more mass in the tail (larger σ^2) will induce a firm to move away from the mean. A firm would do so to capture a section of the market in the tail of the distribution. This is the idea underlying the following result. It says that the more varied the audience, the more one would expect differences in reporting.

Theorem 2 (Variance of opinion)**.** *The amount of differentiation between the firms in a symmetric equilibrium, $||b_i^* - b_j^*||$, is nondecreasing in the variance, σ^2.*

The intuitions behind this result are best gained by thinking of what occurs graphically. Suppose we have the market depicted in figure 3.[5] Now consider what would happen if the distribution over I had more variance, i.e., the mass was spread farther out. With more mass in the tails of the distribution, there is more of an incentive for a firm to move away from the mean.

Figure 4 here

If firms did not adjust to the larger variance, then we would have the situation depicted by figure 4. This figure illustrates what market shares each firm would capture if A and B located themselves in the same positions as in the market in figure 3.

With enough viewers in the tail of the distribution, A would gain if it moved more to the left, (and similarly B would move to the right). The market share in the middle (where the two compete and only get half) now has a much smaller total area, so moving won't cost each firm as many viewers. On the other hand, the area of the market share toward each tail is now larger. So each firm could gain by moving away from each other. In equilibrium, we would have the situation illustrated by figure 5.

Figure 5 here

Therefore as the variance of opinions, σ^2, increases there is a larger incentive for an outlet to pander to less moderate individuals; i.e., those away from the mean. In other words,

[5]Note, no figures are drawn to scale.

we would expect a greater difference in the coverage of an issue which is more divisive. Conversely if there is not much diversity of opinion around a given issue, then we would not expect much difference between the two outlets coverage.

Measuring the difference in broadcasts is a difficult empirical problem. Empirically however, there is a difference in news audiences (Hamilton, 2004; Pew, 2004). However, as the following proposition warns, caution should be used if you infer the "slant" of the broadcast by only looking at its average audience member.

Proposition 1. *In a differentiated symmetric equilibrium, the average viewer of a broadcast will look more moderate than the actual position of the broadcast.*

The intuition behind this proposition follows from the realization that the average audience member is related to the conditional mean of the distribution. From the very fact that there are more moderates watching (i.e., more mass of the distribution is centered over that section of $\mathcal{I}$), the audience profile will look more moderate than the firm's coverage.

In the next section, we will compare the implications of our model to recent empirical data by the Pew Research Center. This data shows that news audiences are becoming more polarized. The above proposition indicates that this difference might be an understatement of the true differences between outlets.

Perhaps this pronounced difference in broadcasting is due to the increased polarization of audiences. This is the prediction of theorem 2. However, we also know that in equilibrium we would never observe extreme differences in broadcasts. As will be see, roughly 45% of people surveyed said that the news media were pretty much the same. (Pew, 2004)

This is not to say that there is no difference between outlets. These theoretical results indicate that when firms compete for an audience, they might find it profitable to separate themselves from the competition. Perhaps this is why 78% of the public say there is some bias in the media. (ASNE, 1999)

2 Discussion

2.1 *The Model*

As noted above, the model presented might look reminiscent of a spatial voting model. However in this model with perfect information, we have conditions under which firms do not converge to the median. A key requirement for this result is that individuals tune out or turn off the news when it is too far away from their ideological position.

This 'not watching' is analogous to abstention from alienation in a voting setting. However, this analogy is not sufficient to equate the two models. The candidates (or firms) motivation is key to understanding the difference between candidate competition and news coverage competition. Interestingly, the difference is similar to the difference between vote maximization and plurality maximization, as originally pointed out by Hinich and Ordeshook (1970).[6]

For example, imagine a situation in which both firms are at the mean (median) and the conditions for theorem 1 are met. A small deviation for firm 1 would imply that firm 1's market has increased (it has picked up individuals in the tail of the distribution). Therefore the firm is reaching more people and is making more advertising profits, so he should move away.

However, when firm 1 moves away, it actually increases the rival firm's market as well. If the firms were candidates in an election, firm 2 would now have a larger plurality. So in a voting setting, firm (candidate) 1 would not find it incentive compatible to move away.

Therefore as long as a firm's profits (from advertising, etc.) are increasing in market size and the market is sufficiently polarized, differentiation is a Nash equilibrium.[7] However, it

[6]With probabilistic voters (here viewers) (Ledyard, 1984) argues that asymptotically vote maximization and plurality maximization are equivalent . However, as (Patty, 2002) points out with a counter example, this result might not hold.

[7]Note, if we assume that a firm's profits are increasing in the proportion of the market, the differentiation result does not hold. This is because we are not fixing the size of the market, or in other words the market is not covered. Therefore unilateral deviations to the left/right increase the market size, but decrease the

is not the case in a voting interpretation of the model. In the setting where candidates want to win an election, differentiation is not Nash behavior because moving away *increases* the opponents plurality (and hence decreases candidate 1's plurality).

Perhaps one of the more questionable assumptions we have made has been that an audience member watches only one broadcast. Empirically this seems suspect. However, exactly how many news outlets one watches is variable and watching multiple outlets need not effect the divergence result. To see this observe that any audience members in the middle of the distribution, specifically those members who would watch both but are dictated to watch one by our assumption, are not the ones driving the result. The crucial audience members are those in the tail of the distribution. If the outlet did not lose audience members in middle of the distribution, there would be a stronger incentive to move away and pick up those viewers in the tail. Therefore the assumption of only watching one broadcast works against the divergence result in the two news outlet case. Moreover, while it is empirically questionable, a clear parsimonious alternative assumption about how many outlets a viewer watches is not obvious.

2.2 *The Implications*

The American Society of Newspaper Editors conducted a survey in 1999 that reports that 78% of the public believed that there was a bias in news reporting (ASNE, 1999). More recently, there have been several books have accused major news networks of having a political bias. However, there does not seem to be a consensus on the direction of the bias, or moreover how to measure it.[8]

In this paper, we do not wish to argue that there is a liberal or conservative bias in the news. Rather we are concerned with whether it can be possible for purely profit driven firms to sustain different evaluations of a political event.

firms percentage of the market.

[8]Although there are a few recent papers, such as (Groseclose and Milyo, 2005) , which attempt to tackle this problem.

Proposition 1 suggests that the answer is yes. This is because organizations can segment the market to increase their profits. Fortunately, a research report released in 2004 by the Pew Research Center confirms this prediction (Pew, 2004).

In their biennial news consumption survey of 3000 people, the Pew Research Center finds that news audiences are segmenting according to their political views, i.e., Democrats are seeking information from different sources than Republicans. For instance, 35% of Republicans watch Fox, compared to 21% of Democrats. Whereas of those watching CNN, 28% are Democrats and only 19% are Republicans. Even with the margin of error of two to three percentage points, the differences in the markets suggest that different news organizations are appealing to different audiences (Pew, 2004).

In our model we claim that people prefer news that confirms their original view. However, results from Pew's survey report indicate that 58% of Americans say they do not care if the news reflects their own viewpoint.

This self-report is not overly surprising. It is well known in psychology that people are not typically aware of their biases (in this case, that they select confirming information). What is more surprising is that, according to Pew's results, some 36% state that they want the news source to share their view. Moreover, these people are very selective in what they watch (Pew, 2004).

Pew's report finds that Fox News Channel and National Public Radio appeal much more to this type of individual. Of those who like news that shares their viewpoint, 41% of conservatives watch Fox News Channel, versus 25% of the general public. Similarly, roughly twice as many liberals who like confirming news (33% compared to the national average of 16%) regularly listen to NPR (Pew, 2004).

Moreover, while most people say that they do not want confirming news and that the news outlets are "mostly the same," this is from their point of view. In terms of our model, these are the people in the middle of the distribution. Recall that we are assuming it is a normal distribution, and this implies that most of people are located near the mean.

It should be clear that even though firms differentiate, neither firm wants to be too

far away from the mean position. Therefore most people - i.e., those in the middle of the distribution - have a preference but it is not as overwhelming as it is for the people toward the tails. This would explain why 78% of the public say there is some bias in the media (ASNE, 1999), but that 45% say that the news media is pretty much the same (Pew, 2004). Moreover, it illuminates why there is a lack of consensus on the direction (liberal/conservative) of the bias.

3 Conclusion

The Fourth Estate plays a crucial role in how individuals go about acquiring information. It provides information that the public might deem useful in making individual and collective decisions. Yet, many have accused major news networks of having a political bias. However, there does not seem to be a consensus as to which direction it goes.

In this paper we have attempted to show why there might be differences in coverage and evaluations by different media outlets. In our model, individuals (news consumers) are purposive, yet have to deal with the cognitive conflict involved with integrating information that counters their prior opinion. Given that a news audience has these tendencies, we then analyze the market competition between two news organizations. From the model, we see why profit driven firms might rather appeal to sections of the market, rather than compete with one another by saying the same thing. Yet at the same time, firms do not wish to become too slanted and begin to lose too many viewers. Therefore, while we are hesitant to say that there actually is any bias in the media, we can say that a news organization might find it profitable to differentiate its coverage from that of its competitors.

Appendix: Proofs

Without loss of generality, we will assume that $b_i \leq b_j$. For notational simplicity, we will set $\frac{\varphi}{c} = k$.

Recall firm i's payoff function:

$$\Pi_i(b_i, b_j) = \begin{cases} \int_{b_i-k}^{b_i+k} f(x)dx, & b_i + 2k < b_j; \\ \int_{b_i-k}^{b_j-k} f(x)dx + \int_{b_j-k}^{\frac{b_i+b_j}{2}} f(x)dx, & b_i + 2k \geq b_j. \end{cases}$$

where

$$f(x) = \frac{1}{\sqrt{2\pi\sigma^2}} \exp[-\frac{(x-\mu)^2}{2\sigma^2}]$$

The following lemma will allow us to focus only on the second case, $b_i + 2k \geq b_j$.

Lemma (2)**.** *In equilibrium, the distance between b_i^* and b_j^* is at most $2k$.*

Proof. By inspection. Assume there is some gap between b_i^* and b_j^*, say ϵ or that $b_i^* + 2k + \epsilon = b_j^*$. Then suppose firm 1 chose a location ϵ closer to the mean of the distribution. This choice yields a strictly higher payoff. Thus b_i^* is not a best response to b_j^*, and hence not a Nash equilibrium. □

Therefore, for the proof's we will consider firm i's objective function:

$$\Pi_i(b_i, b_j) = \int_{b_i-k}^{b_j-k} f(x)dx + \int_{b_j-k}^{\frac{b_i+b_j}{2}} f(x)dx \tag{3.1}$$

Theorem (1)**.** *If there exists a sufficiently small M, then there exists an equilibrium where firms differentiate, i.e., $b^* = (b_i^*, b_j^*)$ and $b_i^* \neq b_j^*$.*

Proof. Let there be an $M > \varphi$ such that $M \leq c\sigma\sqrt{2\ln 2}$. Then by assumption, $k < \sigma\sqrt{2\ln 2}$. Supposing firm i maximizes their payoff function, 3.1, Leibniz's Rule yields the following first order conditions:

$$\frac{d\Pi}{db_i} = \frac{1}{2} * f(\frac{b_i + b_j}{2}) - f(b_i - k) = 0 \tag{3.2}$$

Examining symmetric equilibria allows us to identify the midpoint between the two firms.

Remark 1. In a symmetric equilibrium, the midpoint between the two firms will be the mean of the distribution. $\frac{b_i+b_j}{2} = \mu$

By remark 1 and equation 3.2 we know that

$$\frac{1}{2}f(\mu) = f(b_i - k).$$

Solving for b_i

$$b_i^* = \mu - \sigma\sqrt{2\ln 2} + k$$

By symmetry, the equilibrium profile is

$$b^* = (\mu - \sigma\sqrt{2\ln 2} + k, \mu + \sigma\sqrt{2\ln 2} - k). \tag{3.3}$$

Recall, $k < \sigma\sqrt{2\ln 2}$, hence $b_i^* \neq b_j^*$. □

Theorem (2)**.** *The amount of differentiation between the firms in a symmetric equilibrium,* $||b_i^* - b_j^*||$*, is increasing in the variance,* σ^2*.*

Proof. By proposition 1 we have identified the equilibrium profile in equation 3.3. Consider the case of b_i. As σ increases, $b_i = \mu - \sigma\sqrt{2\ln 2} + k$ is decreasing. Or in other words, as the variance is increasing, b_i is moving to the left. Similarly b_j is moving to the right. Therefore the distance between b_i and b_j is increasing. □

Proposition (1)**.** *In a differentiated symmetric equilibrium, the average viewer of a broadcast will look more moderate than the actual broadcast position.*

Proof. The key requirement is that $\int_{\mu}^{\mu+\sigma\sqrt{2\ln 2}} xf(x)dx - \mu - \sigma\sqrt{2\ln 2} + \frac{\varphi}{c} < 0$, where $f(x)$ is the normal density function $f(x) = \frac{1}{\sqrt{2\pi\sigma^2}}\exp[-\frac{(x-\mu)^2}{2\sigma^2}]$. The first term is the conditional mean of the distribution from μ to $\mu + \sigma\sqrt{2\ln 2}$. Note, by symmetry, we are focusing on the right side of the distribution. Hence, this conditional mean is the average audience member of the right slanting outlet.

We should point out that if this condition fails, then the average audience member will be the same (the difference will equal zero) or appear more moderate (greater than zero) than the outlet. □

Lemma 3 (1.3)**.** *In equilibrium, audience members outside of the interval*

$$[L_i(b_i, b_j), U_i(b_i, b_j)]$$

abstain from watching broadcast b_i*.*

Proof. By construction. Take any broadcast, $b^0 \notin [L_i(b_i, b_j), U_j(b_i, b_j)]$. Then by the definition of a viewer's utility

$$u_i(b^o) = \begin{cases} \varphi - c|x_i - b^o|, & \text{if he watches broadcast } b^o; \\ 0, & \text{otherwise.} \end{cases}$$

By the proof of theorem 1 when can explicitly solve for the lower and upper bounds in a symmetric equilibrium. Since we know that $b^* = (\mu - \sigma\sqrt{2\ln 2} + k, \mu + \sigma\sqrt{2\ln 2} - k)$, it follows that

$$L_i(b_i, b_j) = \mu - \sigma\sqrt{2\ln 2} + k$$

□

Figures

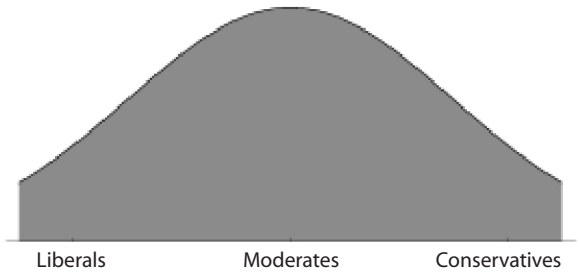

Figure 1: Total available market

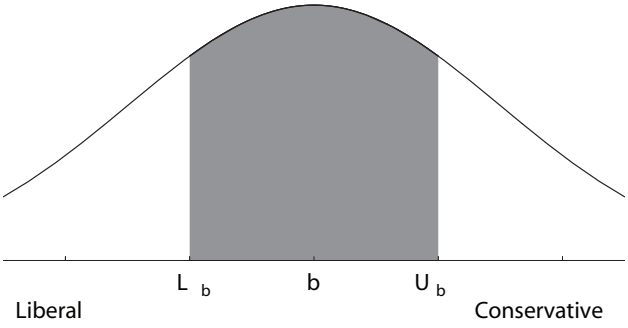

Figure 2: The market a monopolist may capture.

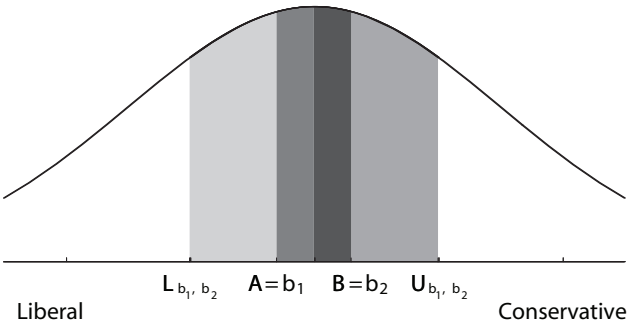

Figure 3: full market

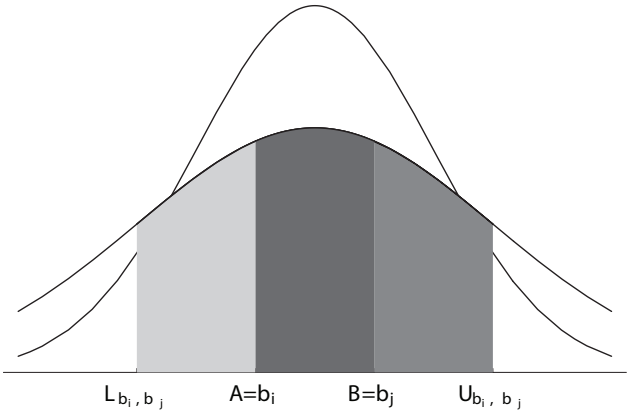

Figure 4: A market with a higher variance, but with locations as before.

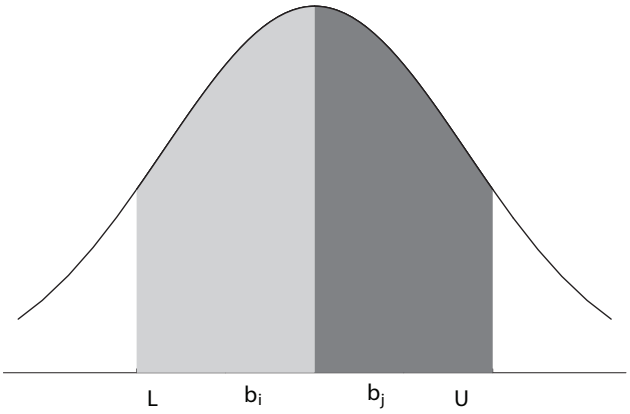

Figure 5: Equilibrium in a market with a higher variance.

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