MEDIA MERGERS AND MEDIA BIAS WITH RATIONAL CONSUMERS

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Abstract
We present an economic model of media bias and media mergers. Media owners have political motives as well as profit motives, and can influence public opinion by withholding information that is pejorative to their political agenda—provided that their agenda is not too far from the political mainstream. This is true even with rational consumers who understand the media owners' biases, because the public do not know how much information the news organizations have and so do not know when news is being withheld. In line with conventional wisdom, this problem can be undone by competition; but competition can be defeated in equilibrium by media mergers that enhance profits at the expense of the public interest. We thus derive a motive for media merger policy that is completely distinct from the motives behind conventional antitrust. While media bias may reduce the profit incentives to merge, media markets nonetheless err by being insufficiently competitive, and the consequences of merger are more severe than in other markets. (JEL: D23, L82)

1. Introduction

> The hand that rules the press, the radio, the screen and the far-spread magazine, rules the country.
>
> Judge Learned Hand, Memorial service for Justice Brandeis
> 21 December 1942

Media consolidation in the United States in recent decades has been dramatic,[1] and particularly so for local media.[2] Recent abortive attempts by the Federal Communications Commission (FCC) to relax merger restrictions have ignited fears by many that consolidation would accelerate, leading to diminished diversity of political expression and weakened public discourse.[3] Some vehement opponents of relaxed merger scrutiny have argued that because of the threat of faster media consolidation "democracy is in crisis" (Blethen 2004).[4]

The controversy is both political and economic: even if a media merger increases profit, it affects how well informed is the public and hence political outcomes. This means that traditional IO merger analysis is inadequate for media mergers, and until recently policy debates have been dominated by noneconomists. This paper presents an *economic* model of media bias and media mergers that incorporates informational and political issues from the outset. We show that if media corporations are motivated by political motives as well as profits, then (provided they are not too extreme) they can distort information to manipulate political outcomes to the detriment of social welfare, even if consumers are rational. Concern about information withholding provides a rationale for merger restrictions in media industries that is absent in others.

Bernard Goldberg (2001) famously argued that the major news media in the United States are biased with a liberal political agenda. Alterman (2003) rebutted that the media's real bias is in protecting its owners' corporate interests. Beyond media analysts, US news *consumers* increasingly perceive political agendas shaping the news they watch and read.

Some news organizations clearly have an agenda beyond profit. The *New York Post*, owned by Rupert Murdoch's News Corporation, has been estimated to lose $15–20m. annually: "Murdoch appears willing to underwrite Post losses, perhaps for the political bully pulpit it affords him" (Fine 1999). Murdoch has been known to harbor a political agenda, at one point promising to prohibit his British newspapers from publishing anything favorable to the prospect of the UK joining the Euro zone (Harding 2002)

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1. Bagdikian (2000) charts the concentration of the media into six large firms. Clear Channel Communications now owns 1,200 radio stations, reaching 180 million listeners (Hopkins 2004). Gannett owns 101 daily newspapers (Gallagher 2005).

2. George and Waldfogel (2000) report that 25% of MSAs (Metropolitan Standard Area) in the United States are served by one newspaper, while the median MSA is served by only two, with a median HHI of 75% (see their Table 1; HHI is the inverse of the "Paper Equivalents" statistic).

3. FCC commissioners in 2003 voted 3–2 to relax rules for merger approval. Previously the FCC had ruled that no single media entity could reach more than 35% of US households via TV, while the new rules raised the cap to 45% (Copps, 2003, argues that de facto the cap would actually be 90% because of the treatment of UHF channels). The previous rules had barred owning a TV station and a newspaper in the same market, but the new rules allowed three TV stations to be owned by the newspaper publisher in large markets. Considerable public opposition flared up and the new rules were overturned in a Federal court in 2004. The rules were sent back to the FCC for review, and have not been reissued (*New York Times*, 25 June 2004).

4. The rise of the internet has not blunted public concerns about media consolidation. The internet, rather than providing *new* sources of news, mostly provides alternative fora for *existing* news, and discussion thereof.

and recently admitting that he had attempted to sway public opinion on the Iraq War (Szalai 2007).

Perhaps the most striking example is Silvio Berlusconi, the former Italian Prime Minister. Berlusconi is a television magnate who controls close to 90% of Italian television.[5] He is not reluctant to use this power to control content, with a history of bullying both publicly and privately owned stations under his control, firing critics and satirists (Stille 2006), and using his privately owned stations as a "fan club" (Economist 2002). In short, news organizations with a political agenda and a willingness to use the news to promote it are by no means a mere theoretical possibility.

Press bias is often manifested in sins of omission (or hiding an inconvenient fact deep inside the newspaper). These are the focus of our formal model that follows. A reporter may also pass on thinly sourced information, subjecting contrary information to a higher standard, or may tilt a given set of facts through emphasis or subtle choices of words (Gentzkow and Shapiro 2010). As Posner (2005) puts it:

> Not that the media lie about the news they report; in fact, they have strong incentives not to lie. Instead, there is selection, slanting, decisions as to how much or how little prominence to give a particular news item.

In 2006, one Berlusconi station, RETE4, was fined €450,000 by the Italian broadcasting watchdog for blatantly biasing its coverage (Barber 2006). The imbalance was quite transparent: in one 15-day period in January, Berlusconi had 196 minutes of airtime; challenger Romano Prodi had 8 minutes (Hunt 2006). Recently, it is alleged that Berlusconi's TV stations suppressed a story of him consorting with paid escorts.[6]

The editor of the *Washington Times* (owned by Moon of the Unification Church) admits to "story selection" to promote conservative views (Ahrens 2002). Puglisi and Snyder (2008) document the tendency of Democratic papers to report more coverage of scandals involving Republican politicians than Democrats, while Republican papers are more inclined to cover Democrats' scandals. Enikolopov, Petrova, and Zhuravskaya (2007) show the (exogenous) presence of an independent TV news channel significantly increased votes for the opposition party in Russia. There are similar results for the United States: DellaVigna and Kaplan (2007) document the Fox News effect of increasing Republican votes, while Gerber, Karlan, and Berger (2009) find a strong Democratic effect from offering free subscriptions to the Washington Post. Thus, news organizations have both the motive and the means to skew news coverage towards a political agenda.

We present an economic theory of media bias and media mergers. This requires a model with several elements. First, there must be some variable, *x*, whose true value

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5. Companies controlled by the Berlusconi family have a 45% share of the Italian commercial TV audience, and 60% of advertising sales (www.ketupa.net/berlusconi.htm). Putting his own three stations together with the public RAI stations put the Berlusconi share at approximately 90% of the television audience (though RAI 3 appears to have taken a more independent or even anti-Berlusconi stance) (Stille 2006). Durante and Knight (2009) document the shift to the right of the RAI channels.

6. "News of the sex scandal has been limited to a few websites and one major newspaper—*La Repubblica*." http://www.guardian.co.uk/commentisfree/2009/jul/26/editorial-silvio-berlusconi-eu-scandals

is not known to the public and that is relevant to political outcomes. This could be a politician's integrity, the state of the housing market or social security, or the situation in Iraq. Second, it must be possible that documented information uncovered by a news organization can update the true value of x.[7] For simplicity, we assume that either the news organization uncovers information that proves the value of x, or else it uncovers nothing. Third, there must be a public-sector decision that is affected by the public's beliefs about the value of x. Assume that this public-sector decision is determined by majority voting. Fourth, there must be a market demand for news. This is tricky, because unless a citizen expects to be pivotal, becoming more informed does not improve electoral outcomes. Thus, we need a device to explain why consumers will pay for a newspaper (or spend valuable time watching the news on television). We assume that private decisions can be better informed by knowing x.[8]

One must purchase a newspaper to learn what its publisher is making public about x: we discuss further in what follows how advertising finance can be incorporated, and (hence) how the model can be construed as competition between television and newspaper. Perhaps x is the state of the social security program and the private decision concerns retirement planning. Alternatively, x is the state of terrorist threats and the private decision concerns travel plans. The desire to learn about x to make a better private decision generates a market demand for news, and this then through the voting system affects the direction of the public decision.

We show that strategic information management can still affect public opinion even when *rational* consumers understand the bias of a news provider. Because consumers do not know how much information a news organization has, if it presents no news that is pejorative to the view of its owners, readers do not know whether that is because of a genuine lack of information or because information is being withheld. Under monopoly, this prevents "unraveling" familiar in the Milgrom (1981) "persuasion game". In that game, a sender with private information can send or withhold information to induce the receiver to undertake some action. The receiver, knowing the sender's preferences, understands that the sender will send only the information most favorable to his case; in this way, she can deduce all of the sender's private information (a similar mechanism is at work in Lipman and Seppi 1995). In our model, uncertainty about whether the sender (the news organization) has information will prevent complete deduction of its information, with the result that a news organization can sometimes manipulate political outcomes to its advantage (in this respect, the mechanism is similar to the one used in Bennedsen and Feldmann (2002), as well as Austen-Smith (1993), where a lobbyist may choose to remain uninformed because the private cost of information is high).

Under competition, the truth is revealed to consumers who buy both papers. As noted by Milgrom and Roberts (1986, p. 19) "it has been argued that 'free and open

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7. The most closely related paper (Strömberg 2001) has a slightly different informational role for the press: it can communicate the policy stands of politicians to the electorate, rather than states of nature.

8. Another route is to assume some entertainment value to news, as in Strömberg (2001). We can readily allow papers to have some entertainment value in addition to, or instead of, the private-decision value of information, without changing the main points of the model.

discussion' or 'competition in the market for ideas' will result in the truth being known and appropriate decisions being made" and this feature arises naturally in our model.

We offer a static analysis, and hence do not have reputational effects.[9] We do not allow for punditry or opinion-mongering, which is quite different from news although it is often bundled with it. We also do not allow a news organization to improve its news-gathering ability by spending more resources on it. We offer our model as the simplest oligopoly model of media mergers and media bias with rational consumers, to capture the political externalities from merger in the clearest way.

Several authors have attempted to measure media bias statistically. D'Alessio and Allen (2000) review studies in the communications literature, finding little robust evidence of aggregate bias. Groseclose and Milyo (2005) find a left-wing bias by comparing media citations of think-tanks with Congressional citations of think-tanks. Gentzkow and Shapiro (2010) show how such a result can be interpreted as profit-maximizing behavior rather than bias per se. They distinguish between "slant", which indicates how coverage is skewed toward a particular political agenda, and "bias", which indicates how a given newspaper's slant differs from its profit-maximizing slant. They also propose a new measure of slant, comparing a newspaper's word choices to the word choices of Republican and Democratic members of Congress. Significantly, Gentzkow and Shapiro find that although the *median* bias in US newspapers is near zero, there is a large amount of *variance* in the bias as well, so that individual papers show significant bias in one direction or another.[10]

The theoretical literature on media bias can be broadly split into two main camps: demand side, in which profit-maximizing news media supply consumers' preferred slant; and supply side, in which news media with a political agenda impose slant to manipulate political outcomes. Each side can be viewed as complementary to the other insofar as explanations from each side can be simultaneously entertained. Thus, while our model is a supply-side one, it can be paired with a demand side where at least some readers are interested in views which are slanted to their way of thinking.

Mullainathan and Shleifer (2005) analyze models with a demand for slant, with newspapers acting on purely profit motives. Then duopoly delivers two very different slants (to relax price competition). When they allow for omission of information (as in our model) as a device for papers to implement a slant policy, a "conscientious" reader of both papers will get more information under competition. Their conclusion that competition is beneficial is like ours, except that their papers are satisfying an intrinsic heterogenous demand for slant (of possibly irrational consumers), while we model manipulative newspaper owners as red-lining contrary information. In a similar vein, Gabszewicz, Laussel, and Sonnac (2001) analyze the newspapers' location game

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9. Li and Mylovanov (2008) address media bias in a repeated game: once reputation is lost though (through an adverse shock), it is lost forever in their model. See also Gentzkow and Shapiro (2006).

10. Media can have measurable effects on political outcomes: DellaVigna and Kaplan (2007) on the Fox News effect in US elections; Snyder and Strömberg (2004) on US newspapers' effect on the performance of representatives in Congress, and Besley and Burgess (2001) on the effect of newspapers on government responsiveness to food shortages in India. See also Gentzkow and Shapiro (2008) for a fine survey.

taking into account the effect of slant on newsstand prices and advertising revenues. Bernhardt, Krasa, and Polborn (2008) also analyze the political process with a demand model that incorporates consumer demand for slant.

Balan, DeGraba, and Wickelgren (2004) proffer a supply-side analysis of bias with owners having preferences for tilting what is read. The consumer demand for newspapers depends on the amount of "persuasion" in each of two newspapers (although the price of the newspapers is exogenous). Newspaper owners care about "effective persuasion" plus profit, where effective persuasion is own persuasion offset or abetted by the rival's persuasion. In Ellman and Germano (2009) and Germano (2009), media self-censor to avoid annoying the advertisers that finance them. Several compelling examples are given in these papers.

Two papers model demand-driven slant with consumers who are not intrinsically interested in slanted or biased opinions. In Gentzkow and Shapiro (2006), slant arises through a reputation game whereby newspapers strive for quality reporting: this can sometimes best be delivered by following people's priors rather than the truth. Chan and Suen (2008) assume that the communication technology offered by newspapers is quite limited in that they can only say whether the true state of nature is above or below a critical threshold. This implies that readers will buy only one newspaper to help decide which party to vote for. Since the optimal choice is the paper closest to their own preferred threshold, people buy papers offering opinions close to their own political beliefs, in order to decide more finely between closely competing alternatives.

A type of demand-driven bias is derived in Strömberg (2001, 2004). A single newspaper decides how much space to devote to issues. Demand for the newspaper is generated from individuals of two types: each gets a benefit when it reads news about its concern, and is more likely to read such news the more space the newspaper devotes to it. Thus, profit-maximizing news media cater more toward serving the informational needs of population segments who are more willing to pay for information.

Our approach overlaps with several of these papers. We share with Balan, DeGraba and Wickelgren (2004) a supply-side model whereby owners aim to influence outcomes, and also a concern for the effects of merger policy. We share with Strömberg (2004) an endogenous demand for news. We share with Chan and Suen (2008) and Gentzkow and Shapiro (2006) that consumers are Bayesian, updating their beliefs after reading reports in the newspaper. We show how a politically motivated publisher can manipulate political outcomes with rational, Bayesian consumers who know the publisher's bias.

2. The Model

Let $x \in [0, 1]$ be the variable whose true value is not known to the public. The common prior for x has density $f(x) > 0$ with distribution function $F(x)$. Denote by $\rho \equiv \int_0^1 x f(x) \, dx$ the ex ante mean of x, and denote by $\sigma^2 \equiv \int_0^1 (x - \rho)^2 f(x) \, dx$ the

ex ante variance. Let π be the probability that the news organization uncovers proof of the true value of x. We assume that $\pi > 0$ is the same for all news organizations, and that information discovery is perfectly correlated for all active news organizations.[11]

The public-sector decision, d^{pub}, can take the value -1 or 1. Denote the private decision $d^{priv} \in [0, 1]$. The typical citizen's preferences are summarized by the utility function

$$U^{cit} = -\alpha_1(x - d^{priv})^2 + \alpha_2(x - \beta)d^{pub} - \sum_i p_i n_i, \qquad (1)$$

where $\alpha_i > 0$ and $\beta \in [0, 1]$ are constants; p_i is the price of newspaper i; and n_i is a dummy variable indicating purchase of newspaper i (where the index i covers all newspapers available).[12] Clearly, if the citizen knew x, she would want to set $d^{priv} = x$. If $x > \beta$, the citizen would prefer that the political process set $d^{pub} = 1$ while if $x < \beta$, the citizen would prefer that $d^{pub} = -1$. More generally, if the posterior Bayesian mean for x is greater (less) than β, voters prefer $d^{pub} = 1$ ($=-1$). We normalize the population size to unity.[13]

The usual economic objections to monopoly do not apply in this model. This is because all consumers of news are identical, and under a news monopoly each decides simply to buy or not buy the one available newspaper. Without a downward-sloping demand curve, there is no conventional monopoly deadweight loss. Thus, the usual economic analysis of antitrust is not relevant. However, a new political-economic rationale for antitrust can arise, based on the political manipulation of information.

There are two possible publishers, A and B. The payoff to publisher i is

$$U^i = \alpha_i(x - \beta_i)d^{pub} + p_i n_i - \delta_i K, \quad i = A, B, \qquad (2)$$

where $\alpha_i > 0$ measures the strength of the political motive relative to the profit motive; $\beta_A = 0$; $\beta_B = 1$; δ_i takes a value of 1 if publisher i operates a newspaper and 0 otherwise; and $K \geq 0$ is the cost of operating a newspaper. The first term is the publisher's interest in the public-policy outcome, and the second is its profits.[14]

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11. It would be interesting to extend the model to allow π to be endogenous (and imperfectly correlated), by having increasing costs to uncovering more information. We conjecture that duopolists might do less investigation than monopoly, because their prices are determined by the incremental value of their information and they also hide some of what they find. If correct, this would be in line with some recent empirical evidence in George and Waldfogel (2006) and Arnold (2004), who find that information tends to decrease with competition. One (quite compelling) explanation is that journalists are forced to provide more of what the public wants—sports and celebrity coverage, rather than political news stories.

12. We can allow for heterogeneous voters by treating (1) as representing the preferences of the median voter. None of the analysis changes as long as all voters have the same value of α_1. By contrast, Chan and Suen (2008) show that if such heterogeneity is combined with a coarser information technology for newspapers than we have here, the result can be profit-maximizing newspapers differentiating themselves to appeal to politically diverse consumers. The formulation in (1) also omits another possible public benefit from a more informed electorate, that politician actions may be directly better disciplined. This effect implies a further potential benefit from competition.

13. Although we describe a single event, the analysis applies equally well to a series of issues that voters may care about (so that readers need to buy papers on a daily basis). See CEPR Discussion Paper 7768 for details.

14. For simplicity, we ignore the publisher's private decision, variable production costs, and distribution costs, as they have no role in what follows.

Clearly, publisher A would like to see $d^{pub} = 1$, regardless of x, while B would like to see $d^{pub} = -1$. A publisher cannot commit to not interfere in the operation of the news organization. All of this is common knowledge. This means that consumers take into account the political motivations of the publishers.

The industry is either a monopoly by publisher A or B, competition between the two, or no newspaper. Denote the structure by S, which takes the values A, B, C, and $\emptyset$ representing these four structures respectively. The sequence of events is as follows. Each publisher in the market chooses its price p_i (simultaneously if they are both functioning), then the state x is either revealed to all publishers in the market (with probability π) or is not revealed (with probability $(1 - \pi)$). If x has been revealed, each publisher then decides whether to print the information or to withhold it. Each consumer then decides whether to purchase a copy of available newspapers (before knowing their content). The Bayesian prior on x is updated with any information revealed in the papers, consumers vote on d^{pub}, and they make their decisions on d^{priv}.

Note that we have assumed for convenience that newspapers rely only on purchase price for revenue, but the model can easily be extended to incorporate advertising revenue, as detailed in the Discussion Paper. In addition, although we have called these news entities "newspapers", once advertising has been incorporated the analysis applies to TV stations—relevant given the debate in the United States about whether to allow joint ownership of a TV station and a newspaper in the same market, or indeed to Italy where Berlusconi effectively controls a large fraction of the TV market.

3. Equilibrium News Content and Inference

We first take market structure as exogenous, and study equilibrium information management and then equilibrium pricing. These can be dealt with separately because of the additive structure of preferences. Given homogeneous consumers and zero production costs for newspapers, prices will be set so that every consumer will purchase a copy of every newspaper available, and so all information printed in any newspaper will go to all consumers.

Each publisher has a very simple decision to make regarding news management: whether to publish any information received about x or to keep it quiet. Since it is not possible to falsify news, only to hide it, if a value of x is published, readers know it is true.

For a given market structure S, let $g(x; S, \beta, \pi)$ denote the Bayesian posterior density for x, conditional on no news being published regarding x. Let $G(x; S, \beta, \pi)$ be the associated cumulative distribution. Let $\tilde{\rho}(S, \beta, \pi)$ denote the mean value of x, conditional on no news being published regarding x, while $\tilde{\sigma}^2(S, \beta, \pi)$ denotes the conditional variance.

3.1. Competitive News Production

Initially, suppose that both A and B operate (i.e., $S = C$). In this case, A (which would like to see $d^{pub} = 1$) will trumpet any information revealing that $x > \beta$, while

B will bandy any information revealing that $x < \beta$. Since any news is available to both publishers, all of the information will be revealed. If there is no hard evidence published either way, the public will know that such evidence is not available.[15] Thus, $\tilde{\rho}(C, \beta, \pi) = \rho$, $\tilde{\sigma}^2(C, \beta, \pi) = \sigma^2$, and $g(x; C, \beta, \pi) = f(x)$ for all x. This corresponds to the "conventional wisdom" discussed by Milgrom and Roberts (1986) that the truth will out under competition.

3.2. Monopoly News Production

Now suppose that publisher B has been shut down, leaving A as the monopoly news source. A would like to convince the electorate that $x > \beta$ if possible, to motivate voters to choose $d^{pub} = 1$. Therefore, if in truth $x > \beta$, and A finds proof, then it will publish x. The electorate will be certain that $x > \beta$, and the political process selects $d^{pub} = 1$.

If though $x < \beta$, and A finds proof, it will withhold the information. The consumer sees two reasons for no news. Either no news was discovered (with probability $(1 - \pi)$), or else news was discovered but is being withheld. Given the known bias of publisher A to withhold $x < \beta$, the combined probability of these events is $\nu(A; \beta, \pi) \equiv 1 - \pi + \pi F(\beta)$.

This implies the Bayesian posterior density, conditional on no news reported, is

$$g(x'; A, \beta, \pi) = \frac{f(x')}{\nu(A; \beta, \pi)} \qquad \text{if } x' \le \beta;$$

$$= \frac{(1 - \pi)f(x')}{\nu(A; \beta, \pi)} \qquad \text{if } x' > \beta.$$

For a value $x' \le \beta$, the probability that $x < x'$, conditional on no news reported, is

$$G(x'; A, \beta, \pi) = \frac{F(x')}{\nu(A; \beta, \pi)},$$

and for a value $x' > \beta$, the corresponding probability is

$$G(x'; A, \beta, \pi) = \frac{\pi F(\beta) + (1 - \pi)F(x')}{\nu(A; \beta, \pi)}.$$

It is straightforward to verify that $G(x; A, \beta, \pi) > F(x)$ for all $x \in (0, 1)$, so that $\tilde{\rho}(A, \beta, \pi) < \rho$ for all $\beta \in (0, 1)$. This is the *suspicion effect*, which works against publisher A's interests. News consumers know that A withholds news that cuts against its interests. When there is no news reported of a sort that decisively affects public policy debates, people rationally wonder if something is hidden from them, and they

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15. There are also other Nash equilibria. For example, if A is expected to always reveal the value of x, then B will be unable to manipulate public opinion, and will be indifferent between all available strategy choices. Thus, it is a Nash equilibrium for both publishers to reveal all information. However, revelation of information about x that is prejudicial to one's own preferences regarding d^{pub} is a weakly dominated strategy. We eliminate such strategies in the equilibrium discussed here.
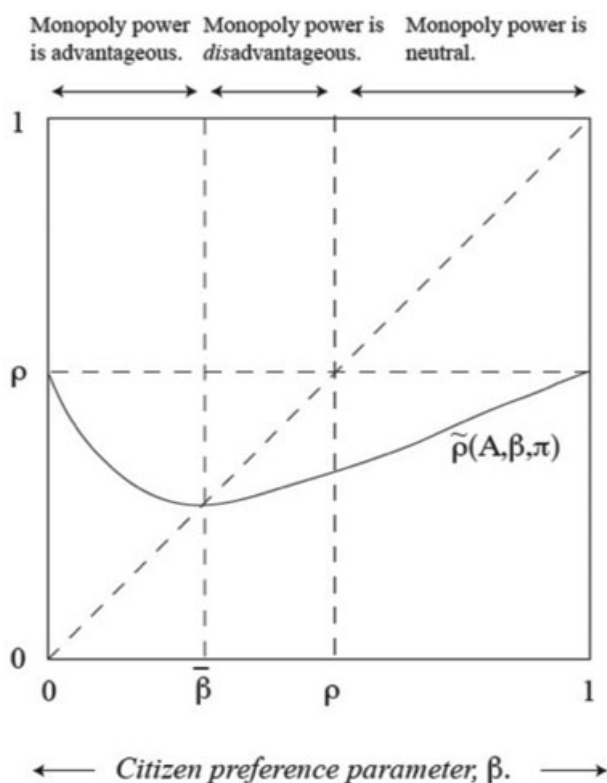
FIGURE 1. The suspicion effect: When is monopoly advantageous relative to competition?

shade their posterior probabilities accordingly. It is easy to see that $\tilde{\rho}(A, \beta, \pi) \to \rho$ as $\beta \to 0$ and as $\beta \to 1$. The former case is when the public's preferences are similar to A's, so that only rarely (when $x \in [0, \beta)$) would A withhold information. Consequently, when β is small, the suspicion effect is weak. The latter case is when the public's preferences are very different from the monopolist's. Rarely then does the publisher *not* withhold information (when $x \in (\beta, 1]$): the public expects the newspaper to be uninformative, so not much is deduced when they see nothing there. Thus, in this case as well, paradoxically, the suspicion effect is weak.[16] The effect is strongest when the public and the publisher have an intermediate degree of divergence in their preferences. This is illustrated in Figure 1.

The publisher has considerable power to mold public opinion by withholding information, but because consumers are rational, monopoly also comes with the liability of the suspicion effect. This effect can be strong enough that monopoly is *detrimental* to the publisher.

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16. The suspicion itself is strong, but its effect is weak because there is little updating of priors.

PROPOSITION 1. *There is a unique value $\bar{\beta} \in (0, \rho)$ such that $\beta < \bar{\beta}$ implies that $\tilde{\rho}(A, \beta, \pi) > \beta$ and $\beta > \bar{\beta}$ implies that $\tilde{\rho}(A, \beta, \pi) < \beta$.*

Proof. The $\tilde{\rho}(A, \beta, \pi)$ function is given by

$$\tilde{\rho}(A, \beta, \pi) = \frac{1}{\nu(A; \beta, \pi)} \left(\int_0^\beta x f(x)\, dx + (1 - \pi) \int_\beta^1 x f(x)\, dx \right), \qquad (3)$$

with $\nu(A; \beta, \pi) = 1 - \pi + \pi F(\beta)$ the probability of seeing no news. The derivative of (3) is

$$\frac{\partial}{\partial \beta} \tilde{\rho}(A, \beta, \pi) = \frac{\pi f(\beta)}{\nu(A, \beta, \pi)} \left[\beta - \tilde{\rho}(A, \beta, \pi) \right]. \qquad (4)$$

We know that $\tilde{\rho}(A, 0, \pi) = \rho > 0$ and $\tilde{\rho}(A, 1, \pi) = \rho < 1$. Therefore, by continuity of $\tilde{\rho}(A, \beta, \pi)$, there exists at least one β such that $\tilde{\rho}(A, \beta, \pi) = \beta$. Furthermore, by (4), the function $\tilde{\rho}(.)$ is decreasing for $\tilde{\rho} > \beta$, and increasing for $\tilde{\rho} < \beta$, with a zero derivative where $\tilde{\rho} = \beta$. (Think by analogy of the behavior of average costs when marginal cost is rising, with here β playing the role of marginal cost and $\tilde{\rho}$ the role of average cost.) Hence $\tilde{\rho}$ falls initially until it reaches the 45-degree line (see Figure 1), which it crosses with zero slope, and then rises without further crossings (since to cross the 45-degree line from below would require $\partial \tilde{\rho} / \partial \tilde{\beta} \geqslant 1$, which cannot be satisfied at the crossing point because equation (4) implies $\partial \tilde{\rho} / \partial \tilde{\beta} = 0$ at any crossing point). This means that the solution, $\bar{\beta}$ is unique. Moreover, since $\tilde{\rho} < \rho$ for all $\beta \in (0, 1)$, then $\bar{\beta} < \rho$. $\qquad \square$

Thus, if publisher A's preferences are not too far from those of the general public (if $\beta \in [0, \bar{\beta})$), the political outcome when no news is published is $d^{pub} = 1$. If A is far from the mainstream ($\beta \in (\bar{\beta}, 1]$), the outcome that ensues following silence is $d^{pub} = -1$. The former regime is when the public can be successfully manipulated; in the latter regime it cannot. The latter regime has two sub-cases, so consider the three cases illustrated by Figure 1.

Case I. $0 < \beta < \bar{\beta}$. If voters received no hard news, they would vote for $d^{pub} = 1$ (since $\tilde{\rho} > \beta$). Thus, $d^{pub} = 1$ with probability 1. In this case, monopoly is of clear political benefit to publisher A, and it strictly prefers an A-monopoly to competition.

Case II. $\bar{\beta} < \beta < \rho$. Here, the suspicion effect is strong enough that when voters receive no hard news, they vote for $d^{pub} = -1$ (since $\tilde{\rho} < \beta$). Thus, $d^{pub} = 1$ if A uncovers x is high, and $d^{pub} = -1$ if x is revealed to be low (A withholds the information but is tarred by suspicion). The outcome is the same as under competition if A learns hard information. If A does not find hard information about x, the suspicion effect causes $d^{pub} = -1$, while the same event under competition leads to $d^{pub} = 1$ (since $\tilde{\rho} < \beta < \rho$). Thus, as regards political outcomes, A is now worse off under monopoly than under competition.

Case III. $\rho < \beta < 1$. The outcome of the political process is exactly as under competition. Voters choose $d^{pub} = -1$ unless A finds hard evidence that $x > \beta$.

Clearly, in Case I, A is politically advantaged by a news monopoly, and would be willing to pay to enjoy that situation - the power to truncate the information available can change public decisions. This is true despite the rationality of the public, and its knowledge of A's bias. While Case I benefits A, in Case II A would be better off politically by forfeiting the monopoly. This is when the public's tastes are farther from A's. If A's tastes are extremely different from popular tastes, as in Case III, monopoly makes no difference.

A B-monopoly is analogous. B withholds information that $x > \beta$. The analogous posterior cumulative distribution conditional on no news being published is

$$G(x; B, \beta, \pi) = \frac{(1 - \pi)F(x)}{\nu(B, \beta, \pi)} \qquad \text{if } x < \beta;$$

$$= \frac{F(x) - \pi F(\beta)}{\nu(B, \beta, \pi)} \qquad \text{if } x > \beta,$$

where $\nu(B, \beta, \pi) = 1 - \pi F(\beta)$ is the probability that no news is published by B. The suspicion effect implies that $\tilde{\rho}(B, \beta, \pi) > \rho$, and $\tilde{\rho}(B, \beta, \pi)$ reaches its maximum at a value $\beta = \bar{\bar{\beta}} > \rho$.[17]

4. Equilibrium Pricing

4.1. Monopoly Pricing

A news monopolist will charge the highest price consumers are willing to pay, which is the expected payoff from improving the private decision, d^{priv}, after reading the information in the paper. From (1), the payoff from the private decision is

$$E \left[-\alpha_1 (x - d^{priv})^2 | I \right],$$

where I denotes all the information available to the consumer when the decision is made. The first-order condition for this implies simply $d^{priv} = E[x|I]$, so the maximized value of this component of utility becomes $-\alpha_1 \sigma^2(I)$, where $\sigma^2(I)$ denotes the variance of x given information I. Thus, the information in the newspaper is useful only to the extent that it reduces the conditional variance of x.[18]

If the consumer purchases no newspaper, the decision on d^{priv} is made with no more information about x, resulting in payoff $-\alpha_1 \sigma^2$. There are two possible outcomes if the consumer buys the newspaper. If it reports no relevant news, the private decision must be made with an ex post variance for x of $\tilde{\sigma}^2(A, \beta, \pi)$, yielding a payoff $-\alpha_1 \tilde{\sigma}^2(A, \beta, \pi)$. This occurs with probability $\nu(A, \beta, \pi)$. If there is news about x in the paper, the value of x is known precisely. This results in payoff of zero.

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17. The analogue to Figure 1 then has $\tilde{\rho}(B, \beta, \pi)$ rising from $\tilde{\rho}(B, 0, \pi) = \rho$ until it reaches the 45-degree line at $\bar{\bar{\beta}} > \rho > \bar{\beta}$. It then falls back down to reach $\tilde{\rho}(B, 1, \pi) = \rho$.

18. At the time a newspaper is purchased, the consumer does not know what information it will reveal, so at the time of purchase I is itself a random variable.

Consequently, the expected payoff from the private decision when the consumer buys the paper is $-\alpha_1 \nu(A, \beta, \pi)\tilde{\sigma}^2(A, \beta, \pi)$. Given that the publisher prices so as to extract all of the surplus, A's monopoly price is thus:

$$P_A(A, \beta, \pi) = \alpha_1 \left[\sigma^2 - \nu(A, \beta, \pi)\tilde{\sigma}^2(A, \beta, \pi)\right]. \tag{5}$$

Similarly, the monopoly price of the B newspaper is given by

$$P_B(B, \beta, \pi) = \alpha_1 \left[\sigma^2 - \nu(B, \beta, \pi)\tilde{\sigma}^2(B, \beta, \pi)\right]. \tag{6}$$

The following result is proved in the Appendix.

PROPOSITION 2. *The monopoly prices are strictly positive for $\beta \in (0, 1)$. The monopoly equilibrium price of the A newspaper is strictly decreasing in β, with*

$$P_A(A, 0, \pi) = \alpha_1\pi\sigma^2 \ and \ P_A(A, 1, \pi) = 0. \tag{7}$$

The monopoly equilibrium price of the B newspaper is strictly increasing in β, with

$$P_B(B, 0, \pi) = 0 \ and \ P_B(B, 1, \pi) = \alpha_1\pi\sigma^2. \tag{8}$$

For f symmetric ($f(x) = f(1 - x)$), $P_A(A, 1/2, \pi) = P_B(B, 1/2, \pi)$, and $P_A(A, \beta, \pi) \gtrless P_B(B, \beta, \pi)$ as $\beta \lessgtr 1/2$.

Thus, the price of a monopoly newspaper is always strictly positive as long as the voters are not at an extreme.[19] This is because the newspaper always imparts some useful information. As $\beta \to 0$, the range of x values for which A withholds news (that is, $x \in [0, \beta]$) becomes vanishingly small. Therefore, the probability ν that there is no news in the paper tends to $(1 - \pi)$, the probability that there is no news to report. In addition, the difference between the densities f and g becomes vanishingly small, so $\tilde{\sigma}^2(A, \beta, \pi)$ will converge to σ^2. Therefore, from (5), the price of the newspaper approaches the limit of $\alpha_1\pi\sigma^2$. This is the value to the consumer of a newspaper with full disclosure, so this is the maximum possible price a newspaper could possibly have.

Similarly, as $\beta \to 1$, $\nu(A, \beta, \pi) \to 1$ and $\tilde{\sigma}(A, \beta, \pi) \to \sigma$ so, again from (5), the price of the newspaper will converge to zero. The case of the B-monopolist is parallel. Under symmetry, the more profitable newspaper is the one closer to the mainstream. This is the paper that reveals more information. The more mainstream are the political views of the monopoly publisher, the less the public will expect that publisher to distort the news, and thus the more informative and valuable the paper will be. We now turn to competition.

4.2. Competitive Pricing

Prices under competition are determined by Bertrand competition. This does not drive profits to zero because the news sources are not perfect substitutes, owing to the

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19. Any entertainment value would be simply added to the equilibrium price expression.

different political biases of the publishers and hence different content of the papers. We assume that consumers simultaneously choose which paper(s) to buy.[20]

In any equilibrium, neither publisher will price itself out of the market. Hence, all consumers will purchase both papers, although the consumer homogeneity assumption that gives rise to this result is not essential: all that matters for our main conclusions on pricing is that *some* voters buy both papers in equilibrium[21] (or, indeed, that some voters watch the television station and buy the newspaper in the mixed media interpretation of the model). Each paper then has a price no greater than the additional payoff derived from reading that paper, given that the consumer is already reading the other paper. The price can be pushed all the way up to this additional payoff without losing any customers. Hence, the price charged for newspaper i is equal to the payoff from reading both papers (that is, $-(1-\pi)\alpha_1\sigma^2$), minus the payoff derived from reading only paper $j \neq i$ (that is, $-\alpha_1 v(j, \beta, \pi)\tilde{\sigma}^2(j, \beta, \pi)$). Differencing gives the price of each paper as its *incremental* contribution to utility, conditional on purchase of the other paper. It remains to check that with this pricing scheme the *sum* of the two prices is no greater than the *total* utility contributed by purchase of *both* papers, so that the consumer receives positive net surplus from buying both papers. This analysis is in the Appendix.

LEMMA 1. *The price of a newspaper under duopoly is equal to its incremental information value for the private decision*

$$P_i(C, \beta, \pi) = \alpha_1[v(j, \beta, \pi)\tilde{\sigma}^2(j, \beta, \pi) - (1-\pi)\sigma^2], \quad i \neq j, i, j = A, B. \quad (9)$$

Using the previous analysis of the monopoly prices indicates that as $\beta \to 0$, $P_A(C, \beta, \pi) \to \alpha_1\pi\sigma^2$ and $P_B(C, \beta, \pi) \to 0$, while as $\beta \to 1$, $P_A(C, \beta, \pi) \to 0$ and $P_B(C, \beta, \pi) \to \alpha_1\pi\sigma^2$.[22] The monopoly analysis also facilitates deriving further properties via the following adding up property, which follows directly from equations (5), (6), and (9).

LEMMA 2. $P_A(C, \beta, \pi) + P_B(B, \beta, \pi) = P_B(C, \beta, \pi) + P_A(A, \beta, \pi) = \alpha_1\pi\sigma^2$.

Lemma 2 and Proposition 2 enable us now to characterize the duopoly price.

PROPOSITION 3. *Newspaper A's duopoly equilibrium price is strictly decreasing in β, with*

$$P_A(C, 0, \pi) = \alpha_1\pi\sigma^2 \text{ and } P_A(C, 1, \pi) = 0.$$

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20. In particular, they are not able to buy one and check what news it contains before deciding to buy the other. Think for example of taking out long-term subscriptions.

21. As long as this is true, then equilibrium pricing under duopoly will depend on the incremental value of information, so our pricing results that follow hold true and the main results follow. Further, if neither the number of voters who read only paper 1 nor the number who read paper 2 is a majority of the population, then the welfare results later on hold as well. Details are available on request.

22. If paper i also had a net idiosyncratic entertainment value of E_i over and above that of the other paper, then E_i is then simply added to the equilibrium values of prices derived previously.

The duopoly equilibrium price of the B newspaper is strictly increasing in β, with

$$P_B(C, 0, \pi) = 0 \text{ and } P_B(C, 1, \pi) = \alpha_1 \pi \sigma^2.$$

For f symmetric, $P_A(C, 1/2, \pi) = P_B(C, 1/2, \pi)$, and $P_A(C, \beta, \pi) \gtrless P_B(C, \beta, \pi)$ as $\beta \lessgtr 1/2$.

The limit prices are the same as under monopoly because one of the papers is worthless (it never prints any hard information) while the other has full value. Thus, both under monopoly and competition, *a publisher known to be in the political mainstream is profitable, while a publisher far out of the mainstream has trouble generating revenues.* The property parallels the monopoly one: more profit goes to the paper printing more hard information.

Next, we compare welfare under the different market structures. To confirm that citizen utility is higher under competition, first denote the private portion of citizen utility by

$$U^{priv}(S, \beta, \pi) \equiv -\alpha_1 E[(x - d^{priv})^2 | S] - \sum_i P^i(S, \beta, \pi) n_i, \qquad (10)$$

where $S \in \{A, B, C, \emptyset\}$ denotes the market structure. Since the monopolist prices so that each consumer is indifferent between buying the newspaper and not buying it, then $U^{priv}(A, \beta, \pi) = U^{priv}(B, \beta, \pi) = U^{priv}(\emptyset, \beta, \pi)$. Under duopoly each citizen has the option of purchasing no newspaper, so

$$U^{priv}(C, \beta, \pi) \geq U^{priv}(A, \beta, \pi) = U^{priv}(B, \beta, \pi). \qquad (11)$$

Denote the public part of a citizen's utility by $U^{pub}(S, \beta, \pi) = \alpha_2 E[(x - \beta) d^{pub} | S]$. Since voters have strictly more information under competition than monopoly, then $U^{pub}(C, \beta, \pi) > U^{pub}(i, \beta, \pi)$ for $i = A, B$, with the following lemma being the immediate consequence.

LEMMA 3. *Citizen welfare is higher under competition than under monopoly.*

This can be used to deduce a simple fact about the effect of competition on prices, as follows.

PROPOSITION 4. *Each newspaper's price is no higher under competition than under monopoly.*

Proof. Since each newspaper under competition is priced at its incremental information value, each consumer is indifferent between buying both papers and buying only the *A* paper:

$$U^{priv}(C, \beta, \pi) = -\alpha_1 E\left[(x - d^{priv})^2 | C\right] - \sum_i P_i(C, \beta, \pi)$$

$$= -\alpha_1 E\left[(x - d^{priv})^2 | A\right] - P_A(C, \beta, \pi).$$

Since $\quad U^{priv}(C, \beta, \pi) \geq U^{priv}(A, \beta, \pi)$
$$= -\alpha_1 E\left[(x - d^{priv})^2 | A\right] - P_A(A, \beta, \pi),$$

this implies that we must have $P_A(A, \beta, \pi) \geq P_A(C, \beta, \pi)$. □

Despite lower prices, duopoly may generate higher gross profits than monopoly. Define

$$\Delta(\beta, \pi) \equiv \max\{P_A(A, \beta, \pi), P_B(B, \beta, \pi)\} - (P_A(C, \beta, \pi) + P_B(C, \beta, \pi)) \quad (12)$$

as the profit advantage of monopoly over duopoly. It may initially be surprising that Δ can take negative values. In a conventional oligopoly model, a monopoly is ensured higher profits than a duopoly, because at worst it can always duplicate the behavior of the duopolists. For newspapers with political agendas, that logic does not apply. It is not possible for a monopolist to publish both an A-type newspaper and a B-type newspaper because it has no way to credibly commit to publish information that is ex post injurious to its political interests. Thus, if a newspaper is a monopoly with the editorial bias of its publisher intact, it earns less than if it could commit to being as informative as a duopoly. This loss-of-variety effect pushes monopoly profits down relative to duopoly profits. Of course, the familiar effect of competitive pricing in a duopoly works in the other direction, so whether duopoly or monopoly profits are higher will be determined by which effect is stronger.

This trade-off can be illustrated with a simple example. Suppose that x has a two-point distribution, taking a value of 1/4 or 3/4 with equal probability. Then, if β is between 1/4 and 3/4, an A-monopolist will report the value of x if it is equal to 3/4 but suppress it if $x = 1/4$. If the probability of finding news, π, is sufficiently high, news readers would interpret the lack of news as strong evidence that x is indeed equal to 1/4. With this information, the value to those readers of a B-newspaper in addition to the A-newspaper would be negligible. Likewise, the value of an A-newspaper given access to the B-newspaper is also negligible. Therefore, the duopoly price for either newspaper would be close to zero, and a monopoly would clearly be more profitable than duopoly.

What kills duopoly profits in this example is that news readers learn almost everything they need to know even in the absence of news. Thus, the best chance for a duopoly to be relatively profitable is for a lack of news to be relatively uninformative, in other words, for $\tilde{\rho}$ to be relatively close to ρ. Recalling Figure 1, the situations favoring that outcome are a value of β close to 0 or 1 and a low value of π. The next proposition confirms that these conditions do indeed favor duopoly profitability.

PROPOSITION 5. *Duopoly is more profitable than monopoly (that is, $\Delta(\pi, \beta) < 0$) if β is sufficiently close to 0 or 1, or if π is sufficiently close to 0. If f is symmetric, then in a neighborhood of the point $(\beta, \pi) = (1/2, 1)$, monopoly is more profitable than duopoly (that is, $\Delta(1/2, 1) > 0$) if and only if $2\sigma^2/3 > \tilde{\sigma}^2(A, 1/2, 1)$.*

Thus, duopoly dominates (in the absence of fixed costs) when one of the publishers is an extremist, or when there is not much news to be had. Second, under a weak sufficient condition, monopoly is more profitable when the publishers are balanced and news is plentiful. In other words, the relevant condition is that the variance of x conditional on $x < 1/2$ is no greater than 2/3 of the unconditional variance. Figure 2 shows the shape of $\Delta(\beta, \pi)$ for the Beta distribution (in this example, which we will
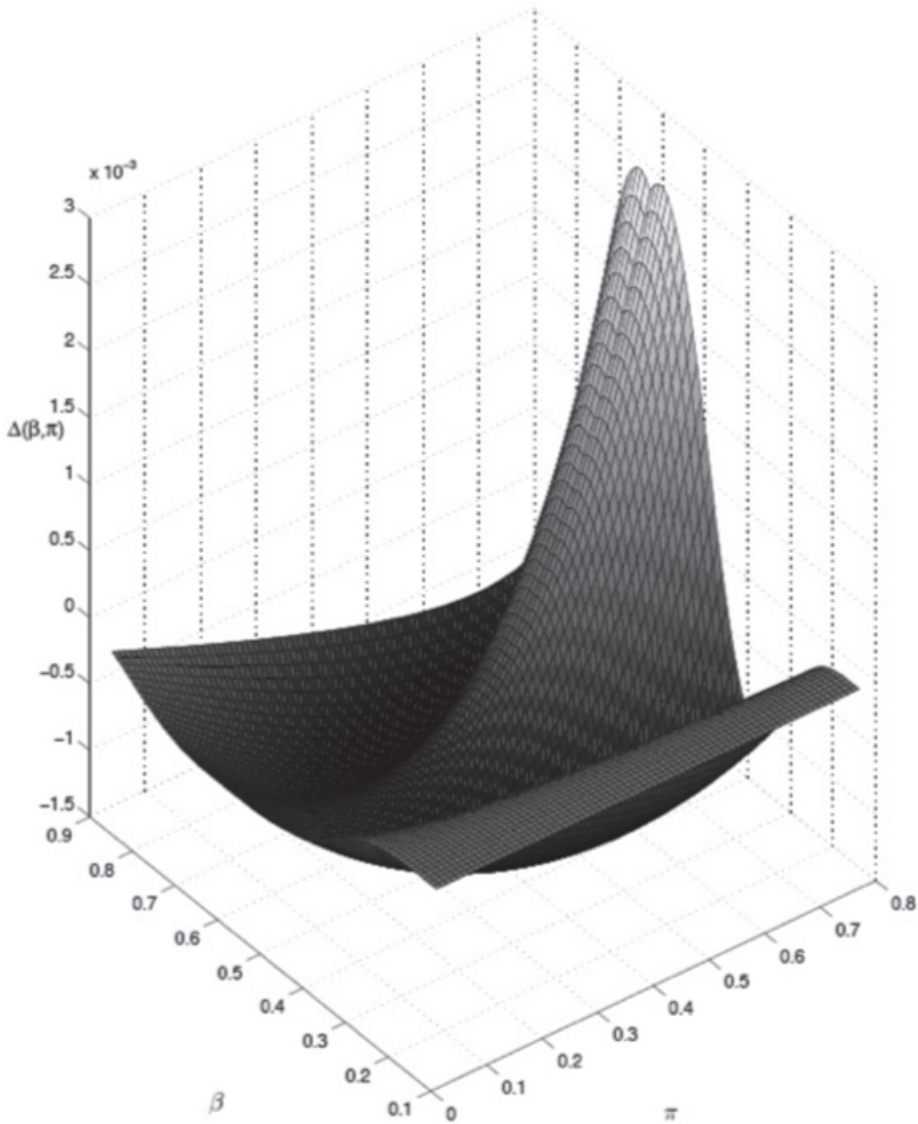
FIGURE 2. The publisher's bargaining surplus.

pursue in what follows, we use $f(x) = Ax^4(1-x)^4$, where A is chosen so that the density has a unit integral). This shows that the function turns sharply positive (indicating gains from merger) where π is near 1 and β is near 1/2.

We now turn to comparing industry profits under the alternative market structures.

5. Equilibrium Market Structure

Here we endogenize market structure and analyze the effects of a rule prohibiting media mergers. Since most of the recent policy interest has to do with exit, rather than entry (see Perez-Pena 2009), we assume that there are two existing firms in the industry, either of which may choose to exit. It is easiest to do this by first considering market structure if mergers are disallowed, then market structure if mergers are permitted. After doing this, we analyze the welfare effects of a no-merger rule by studying the differences between these two regimes. For simplicity, we analyze the limit case of a dominant profit motive: the broader case is to be found in the discussion paper, and some salient properties are discussed at the end of this section.

5.1. Mergers Disallowed

If mergers are not possible, the equilibrium market structure is simply the Nash equilibrium of an exit game. Let $K \geq 0$ be the sunk cost of staying in the industry (for example, contracts that need to be renewed) and running a newspaper. In the limiting case of a dominant profit motive (i.e., when α_A and α_B are both small), a publisher stays in if and only if it earns positive profits. Then, an i monopoly is an equilibrium if

$$P_i(i, \beta, \pi) \geq K \text{ and } P_j(C, \beta, \pi) \leq K, \tag{13}$$

where $i \neq j$; competition is an equilibrium if $P_i(C, \beta, \pi) \geq K$ for $i = A, B$; and both exit if $P_i(i, \beta, \pi) \leq K$ for $i = A, B$. These conditions determine a unique equilibrium unless (13) is satisfied for both $i = A$ and $i = B$, in which case both an A-monopoly and a B-monopoly are equilibria. (This can occur under symmetry if β is not too far from 1/2, so that the profitabilities of the two are fairly balanced: see Figure 3.)

The main point about equilibrium structure can be deduced quickly. Recalling that each publisher's revenue equals the incremental value of its information for the private decision (Proposition 1), it is clear that a publisher will stay if and only if that incremental value exceeds K. This, together with the fact that entry improves the quality of public decision-making (effectively a positive externality from entry), implies that if competition is an equilibrium, then it is the market structure that maximizes social welfare.[23] In summary, we have the following proposition.

PROPOSITION 6. *Consider a dominant profit motive with exit and with mergers barred. The equilibrium can provide too little competition, but not too much.*

This result contrasts with standard findings of over-entry in industrial organization models.

Figure 3 shows the equilibria for a range of parameter values with $K = 0.001$ and the Beta distribution used in Figure 2. (Properties are proved more generally in

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23. Adding together the payoffs of publishers with the utility of consumers, the price terms disappear, so that the utility from private and public decisions together with the sunk costs K are all that matter.
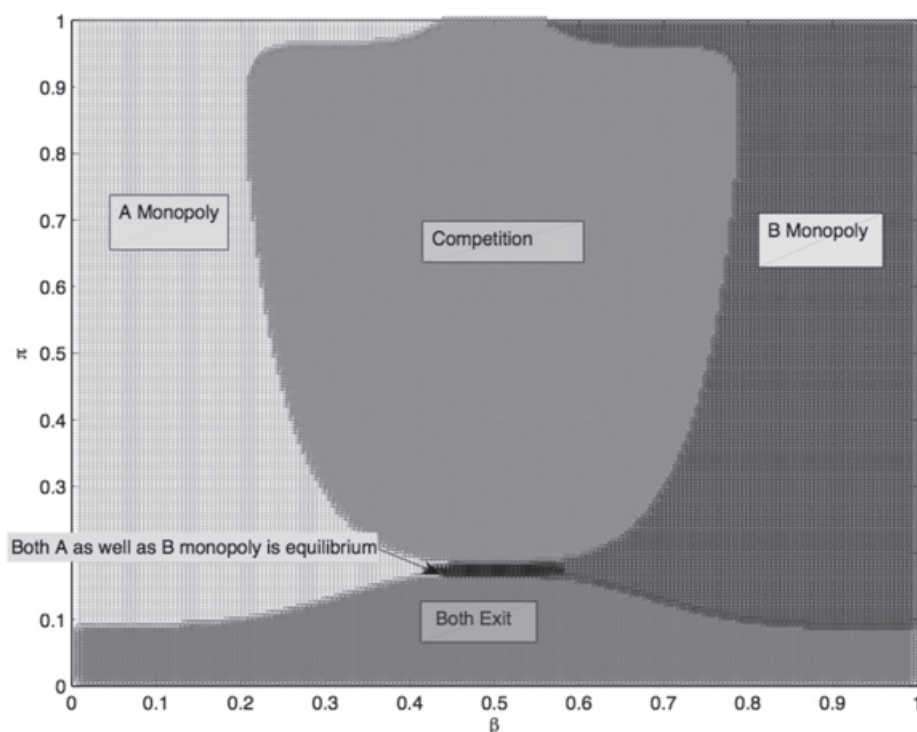
FIGURE 3. Equilibrium market structure without mergers—dominant profit motive.

the discussion paper for f symmetric.) First, the both-exit region is at the bottom with an upward-sloping boundary for $\beta < 1/2$. This follows because under symmetry the A-monopoly price is decreasing in β (Proposition 2), and both monopoly prices are increasing in π. Second, the competitive region is in the middle: the profit of the weaker duopolist always increases as β moves closer to 1/2. Third, if $K > 0$, competition cannot be an equilibrium for β close enough to 0 or 1. This follows from Proposition 3 that $P^A(C, \beta, \pi) \to 0$ as $\beta \to 1$ and $P^B(C, \beta, \pi) \to 0$ as $\beta \to 0$. In other words, if hardly any real news can be generated (π low), neither news source will be profitable; and duopoly is a more likely outcome if neither publisher is a fringe extremist.

5.2. Mergers Allowed

Now we consider what happens if mergers are permitted. Assume that the game is played in two stages. First, the publishers choose independently whether to exit. If neither has exited, they engage in Nash bargaining to decide whether to merge, and on what terms. In case of merger, one publisher remains, along with its political preferences. An important qualification is that the publishers do not jointly run the

merged paper, and agree to no strategic omissions. If that were possible, monopoly would be socially preferred to competition (due to fixed cost savings).[24]

We say that a *no-merger rule has bite* if and only if imposing a prohibition on mergers will change the outcome. This requires that (i) a merger will occur if both stay, and (ii) both will want to stay. In the limiting case with a dominant profit motive, noting that (12) defines $\Delta(\beta, \pi)$ as the joint bargaining surplus in the merger stage, the criterion for a no-merger rule to have bite is that (i) $\Delta(\beta, \pi) > 0$ and (ii) $P_i(C, \beta, \pi) + \Delta(\beta, \pi)/2 > K$ for $i = A, B$. Clearly, staying for buyout occurs if these two conditions hold and $P_i(C, \beta, \pi) < K$ for $i = A$ or B; i buys out j if $P_i(i, \beta, \pi) > P_j(j, \beta, \pi)$. In this case, a no-merger rule *prevents staying for buyout*; it does not change the final market structure, but it does prevent publishers hanging on with a pure rent-seeking motive.

If instead $P_i(C, \beta, \pi) \geq K$ for $i = A, B$, and again $\Delta(\beta, \pi) > 0$, then a no-merger rule has bite and the outcome with mergers allowed is merger to monopoly, whereas competition prevails if mergers are barred. In this case, a no-merger rule *preserves competition*.

Figure 4 shows the equilibrium market structure for the Beta distribution used in Figure 2. The no-merger rule has bite only near the top-central portion of the box, where the bargaining surplus Δ is at its highest because prices under duopoly are especially low.

There are two separate regions where the no-merger rule has bite. The first is a subset of the duopoly region in Figure 3: duopolists merge if they are allowed to do so. A no-merger rule preserves competition in this region. Above that lies a second region, which is a subset of the monopoly region from Figure 3. In this region, if mergers are allowed, one publisher declines to exit for the sole purpose of receiving and accepting a merger offer from the other. Here, the no-merger rule prevents such staying around for buyout.

Putting all of this together, we can summarize the effects of the no-merger rule as follows: With a dominant profit motive, the no-merger rule is most likely to have bite if news is plentiful (π is high) and neither publisher is a fringe extremist (β is not too close to 0 or 1).

Another striking feature of the equilibrium with mergers allowed is that there is so little merger activity: competition remains as an equilibrium across a large swathe of the parameter space despite no impediment to merging. This points to the distinctive features of the media industry—in a standard differentiated products duopoly we would expect to see merger throughout the parameter range. Here, at least for intermediate values of π, the bias of the magnates and the profit motive together police the market and ensure "diversity of voices" (which is one of the major stated objectives of

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24. However, if one publisher has a stronger political preference, and the suspicion effect is not detrimental to it, that publisher might be expected to buy out the other's political preferences in the daily operation of the paper with a greater share of operating profits in a post-merger bargaining solution. This means that even a jointly run paper would not be immune to strategic omissions.
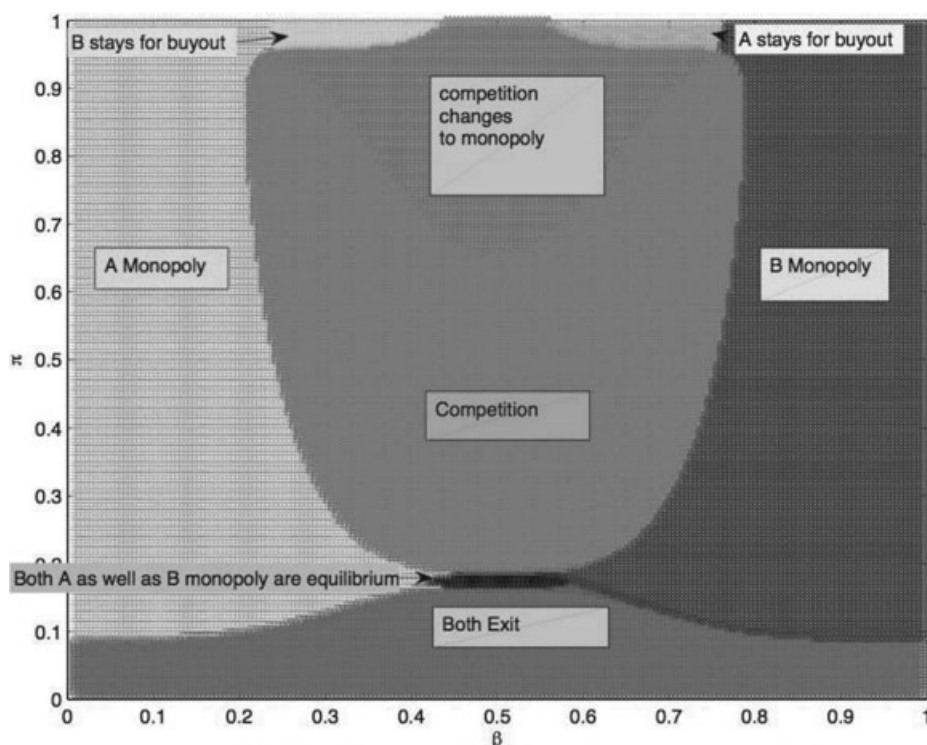
FIGURE 4. Equilibrium market structure allowing mergers—dominant profit motive.

the FCC) even though the political motive for running a newspaper is arbitrarily small.

5.3. Welfare Effects of No-Merger Rule

The welfare effects are clear in the case of staying for buyout: the final market structure is the same with or without the no-merger rule. With the no-merger rule, only one publisher stays, so the sunk cost K is paid only once, but it is paid twice under staying for buy-out. The publisher who intends to be bought out is purely seeking rent. With a dominant profit motive, welfare is determined entirely by the utility the citizens receive from the public and private decisions. Switching from a monopoly to competition, as the no-merger rule does in this case, improves this utility by providing more information to the public. Therefore, welfare rises. In summary, we have the following proposition.

PROPOSITION 7. *If a no-merger rule prevents staying for buyout, it improves welfare. With a dominant profit motive, the no-merger rule strictly improves welfare when it has bite.*

Thus a no-merger rule unambiguously improves welfare even though the usual grounds for merger regulation are absent. In conventional IO merger models, the social cost to merger is that greater monopoly power increases the wedge between price and marginal cost and prices out some consumers whose benefit exceeds marginal production cost. Here, by contrast, with or without a merger, all consumers purchase all newspapers available on the market (due to the artificial assumption that all consumers are identical). Therefore, *the welfare loss from merger results from the distortion of information due to the political motivation of the publishers. This distortion is facilitated by monopolization.* We thus derive a motive for merger review that is completely separate from the motive that drives merger review in non-media oligopolies.

5.4. Strong Political Motives

The previous discussion has focussed on a dominant profit motive. Here we comment briefly on how things change when the *political* motive of the publishers is also strong (so that α_A and α_B are not vanishingly small).[25] An example is illustrated in Figure 5, which shows equilibrium outcomes for the case in which $\alpha_A = \alpha_B = 1$ and merger is barred. Otherwise, the parameters are the same as in Figure 2.

A strong political motive changes equilibrium behavior in several ways. First, it expands the range of entry. The boundaries of the "shield-shaped" region in Figure 3 indicating duopoly have spread out in Figure 5. At the edges of the region where the less mainstream publisher was just unwilling to enter because it was unable to break even, it now enters to achieve some political influence.[26] Thus, the out-of-mainstream publisher can derive a political benefit from continuing to operate that compensates for its financial loss. The *Washington Times* and the *New York Post* come to mind. Second, for the same reason, the area in which both publishers leave diminishes. Comparing Figure 5 with Figure 3, there is a section in the bottom-center where both exit if profits are dominant, but the less mainstream publisher stays under a strong political motive (this is publisher B if $\beta < \rho$ and A if $\beta > \rho$). Once again, the reason is that the less mainstream publisher can change the political outcome in its favor by staying. This implies, though, that *the market is served by the publisher who both makes the larger loss and provides less information germane to voting and private decision-making.*

Third, with a strong political motive there is now a region in which only mixed-strategy equilibria exist. In the middle of the " Competition" section of Figure 5, for example, just to the left of $\beta = 1/2$, in the case of a dominant political motive the outcome would be competition, but with the strong political motive the outcome is

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25. An extensive analysis of the case of strong political motives is contained in our Discussion Paper, available on our web pages.

26. For example, at the left-hand edge of the duopoly region in Figure 3, B is just indifferent between entering and not. At the same location in Figure 5, B stays because if it leaves the market to A, the political outcome will be $d^{pub} = 1$ with probability 1, but if B stays it can change the outcome to $d^{pub} = -1$ when it discovers a low value of x.
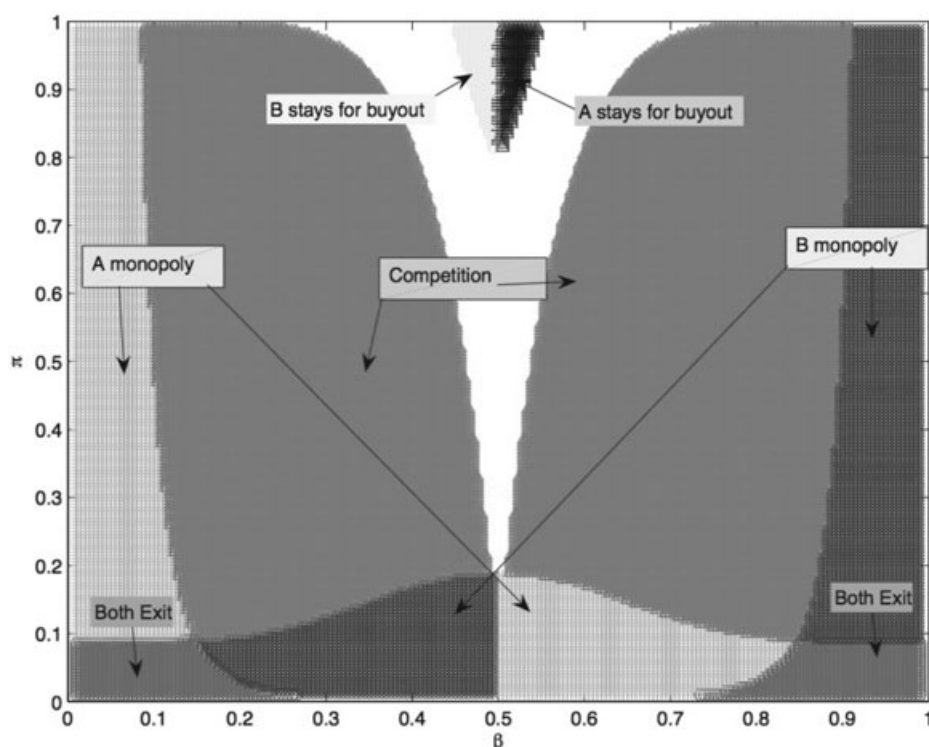
FIGURE 5. Alpha $= 1$, mergers allowed.

random. The reason is that the suspicion effect is active in a way that is prejudicial to publisher A and beneficial to B. If A is expected to enter, then it is politically *advantageous* for B *not* to enter. That way, when A does not have any hard information to report, the suspicion effect will cause the public to choose $d^{pub} = -1$, an outcome that B would have been unable to achieve without the suspicion effect. Thus, competition is no longer an equilibrium.[27]

6. Conclusions

Media owners can manipulate political outcomes by distorting the information that consumers of news receive. In our model, they can do this *even though news consumers are perfectly rational and know the publisher's bias*, because consumers do not know

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27. Neither is any other pure strategy outcome. (i) An A-monopoly is not, because on political grounds, due to the suspicion effect, A prefers to stay out rather than remain and have the political outcome reverse when A reports no news. (ii) Both exit is not an equilibrium, because on political grounds (as well as for profits) B prefers to be a monopolist rather than leave. With no paper, the public decision will be $d^{pub} = 1$ with probability 1, but B can change the outcome to $d^{pub} = -1$ with positive probability. (iii) A B monopoly is not an equilibrium because A would stay to make it a duopoly. Then the political outcome is unchanged, but A also makes some profit.

how much information the news organization has. However, a media monopoly can be politically disadvantageous, due to the suspicion of rational consumers about news withholding. We have characterized equilibrium market structure and identified when mergers occur. A ban on mergers can improve welfare, even though traditional deadweight loss has been expunged.

Media markets differ from other markets in a number of important ways. First, media market power can induce market failure because the news organizations distort the information available to citizens, compromising the quality of both public and private decision-making. Second, even when mergers are allowed, they may not happen. If the political motive of the media owners is strong, they may not want to relinquish the megaphone that comes from owning a news organization, even if there is a substantial financial cost to keeping it. Moreover, publishers may find that joint duopoly profits exceed monopoly profits. This is not possible in a conventional oligopoly model, because a merged entity can always duplicate duopoly prices. For media organizations with a political agenda the news products produced under owners with different agendas are differentiated products, which cannot be replicated by a merged entity because the owner cannot credibly commit to a news product that is incompatible with his or her own political agenda.

Thus, the problem with media markets can be self-correcting: the very source of the inefficiency, the political agenda of the media owners, can also provide the equilibrium level of competition that may be enough to rectify the problem. All of these effects, of course, are absent in a conventional oligopoly.

Finally, we have identified a role for merger review in a media oligopoly that is distinct from the role it has in conventional oligopoly. We formalize the idea that the market may not provide sufficient diversity of political viewpoints, and that this conclusion does not rest on any assumption of irrationality on the part of news consumers. In our model, a policy banning media mergers either has no effect or improves welfare. This constitutes a distinct rationale for merger review, based not on standard deadweight loss but rather on the need to preserve variety of political viewpoints in the public arena. However, we should point out that other models of the demand for news could generate beneficial mergers. For example, if the demand for news is driven by heterogeneous viewer demand for slant, then it may be possible that replacing a duopoly with extreme positions by a centrally located monopoly could improve the quality of information (see Stone, 2010, for such a result in a model where consumers have biased beliefs).

Appendix: Proofs

Proof of Proposition 2. The limit values follow from (5) and (6). To prove that $P_A(A, \beta, \pi)$ is strictly decreasing in $\beta \in (0, 1)$, recall from (5) that

$$P_A(A, \beta, \pi)/\alpha_1 = \sigma^2 - \nu(A, \beta, \pi)\, \tilde{\sigma}_A^2(A, \beta, \pi),$$

where $v(A, \beta, \pi) = 1 - \pi + \pi F(\beta)$. We can write

$$\sigma^2 = \int_0^1 x^2 f(x) \, dx - \rho^2,$$

while

$$\tilde{\sigma}_A^2(A, \beta, \pi) = \int_0^\beta x^2 \frac{f(x)}{v(A, \beta, \pi)} dx$$

$$+ (1 - \pi) \int_\beta^1 x^2 \frac{f(x)}{v(A, \beta, \pi)} dx - \tilde{\rho}^2(A, \beta, \pi).$$

Hence

$$P_A(A, \beta, \pi)/\alpha_1 = -\rho^2 + \tilde{\rho}^2(A, \beta, \pi) v(A, \beta, \pi) + \pi \int_\beta^1 x^2 f(x) \, dx,$$

and so

$$\frac{\partial P_A(A, \beta, \pi)/\alpha_1}{\partial \beta} = 2\tilde{\rho}(A, \beta, \pi) \frac{\partial \tilde{\rho}(A, \beta, \pi)}{\partial \beta} v(A, \beta, \pi)$$

$$+ \tilde{\rho}^2(A, \beta, \pi) \pi f(\beta) - \pi \beta^2 f(\beta).$$

From equation (4)

$$\partial \tilde{\rho}(A, \beta, \pi)/\partial \beta = [\pi f(\beta)/v(A, \beta, \pi)] [\beta - \tilde{\rho}(A, \beta, \pi)],$$

so the derivative simplifies to

$$\frac{\partial P_A(A, \beta, \pi)/\alpha_1}{\partial \beta} = -\pi f(\beta) [\beta - \tilde{\rho}(A, \beta, \pi)]^2, \tag{A.1}$$

which is clearly negative, as desired. The fact that $P_A(A, 1, \pi) = 0$ together with the monotonicity result proves that $P_A(A, \beta, \pi)$ is positive for all $\beta \in (0, 1)$. The argument for the B monopoly price is parallel. The symmetry result is a simple corollary. $\quad\square$

Proof of Proposition 1. Since the total utility contribution is $\alpha_1 \pi \sigma^2$, the condition to check is that $\sum_i P_i(C, \beta, \pi) \leq \alpha_1 \pi \sigma^2$. Using the relevant definitions, this is equivalent to $Q(\pi) \leq R(\pi)$, where

$$Q(\pi) = \sum_i v(i, \beta, \pi) \int_0^1 (x - \tilde{\rho}(i, \beta, \pi))^2 g(x; i, \beta, \pi) \, dx$$

and $R(\pi) = (2 - \pi)\sigma^2$. Further

$$Q'(\pi) = -\int_0^\beta (x - \tilde{\rho}(B, \beta, \pi))^2 f(x) \, dx - \int_\beta^1 (x - \tilde{\rho}(A, \beta, \pi))^2 f(x) \, dx.$$

Since

$$\partial/\partial y \int_\beta^1 (x - y)^2 f(x) \, dx = 2(y - \rho^+)(1 - F(\beta)) < 0$$

if $y < \rho^+ \equiv E[x|x > \beta]$, and since $\tilde{\rho}(A; \beta, \pi) < \rho < \rho^+$, clearly:

$$\int_\beta^1 (x - \tilde{\rho}(A, \beta, \pi))^2 f(x)\, dx > \int_\beta^1 (x - \rho)^2 f(x)\, dx.$$

By parallel logic

$$\int_0^\beta (x - \tilde{\rho}(B, \beta, \pi))^2 f(x)\, dx > \int_0^\beta (x - \rho)^2 f(x)\, dx.$$

Therefore, $Q'(\pi) < -\sigma^2$. But $R'(\pi) = -\sigma^2$ for all π. Since, $Q(0) = R(0)$ and $Q'(\pi) < R'(\pi)$ for all π, then $Q(\pi) \leq R(\pi)$, with strict inequality for $\pi > 0$.   □

Proof of Proposition 5. (i) *The case with β close to 0 or 1.* Recall the derivatives of duopoly prices

$$\frac{\partial P_A(C, \beta)}{\partial \beta} = -\alpha_1 \pi f(\beta)(\beta - \tilde{\rho}(B, \beta))^2 < 0$$

and

$$\frac{\partial P_B(C, \beta)}{\partial \beta} = \alpha_1 \pi f(\beta)(\beta - \tilde{\rho}(A, \beta))^2 > 0.$$

Further, the derivatives of monopoly prices are (the first is (A.1))

$$\frac{\partial P_A(A, \beta, \pi)/\alpha_1}{\partial \beta} = -\pi f(\beta)[\beta - \tilde{\rho}(A, \beta, \pi)]^2$$

and

$$\frac{\partial P_B(B, \beta, \pi)/\alpha_1}{\partial \beta} = \pi f(\beta)[\beta - \tilde{\rho}(B, \beta, \pi)]^2. \tag{A.2}$$

Given equation (12)

$$\Delta(\beta, \pi) \equiv \max\{P_A(A, \beta, \pi), P_B(B, \beta, \pi)\} - (P_A(C, \beta, \pi) + P_B(C, \beta, \pi)),$$

then $\frac{\partial \Delta}{\partial \beta} =$

$$\alpha_1 \pi f(\beta)\left[(\beta - \tilde{\rho}(B, \beta))^2 - 2(\beta - \tilde{\rho}(A, \beta))^2\right] \text{ if } P_A(A, \beta) > P_B(B, \beta)$$
$$\alpha_1 \pi f(\beta)\left[2(\beta - \tilde{\rho}(B, \beta))^2 - (\beta - \tilde{\rho}(A, \beta))^2\right] \text{ if } P_A(A, \beta) < P_B(B, \beta).$$

If β is close to zero, then $P_A(A, \beta) > P_B(B, \beta)$, so $\partial \Delta/\partial \beta < 0$ for small β iff

$$2(\beta - \tilde{\rho}(A, \beta))^2 > (\beta - \tilde{\rho}(B, \beta))^2.$$

This condition holds because $\lim_{\beta \to 0} \tilde{\rho}(j, \beta) = \rho$ for $j = A, B$. Since $\Delta(0, \pi) = 0$, this implies that $\Delta < 0$ for β close to 0. By parallel logic, $\Delta < 0$ for β close to 1.

   (ii) *The case with π close to 0.* Consider the case with $P_A(A, \beta, \pi) > P_B(B, \beta, \pi)$. Using the expressions for the monopoly and duopoly prices, we can write the

bargaining surplus as

$$\Delta(\beta, \pi) = (3 - 2\pi)\sigma^2 - 2\nu(A, \beta, \pi)\tilde{\sigma}^2(A, \beta, \pi) - \nu(B, \beta, \pi)\tilde{\sigma}^2(B, \beta, \pi) > 0.$$
(A.3)

If $\pi = 0$, then $\nu_A = \nu_B = 1$ and $\tilde{\sigma}^2(A, \beta, \pi) = \tilde{\sigma}^2(B, \beta, \pi) = \sigma^2$, and so $\Delta(\beta, 0) = 0$ (duopoly papers and monopoly papers are all worthless, and so the difference in their values is also zero). We are now interested in the derivative of $\Delta(\beta, \pi)$ at $\pi = 0$.

The second term in $\Delta(\beta, \pi)$ in (A.3) is

$$-2\int_0^\beta (x - \tilde{\rho}(A, \beta, \pi))^2 f(x)\, dx - 2(1 - \pi)\int_\beta^1 (x - \tilde{\rho}(A, \beta, \pi))^2 f(x)\, dx.$$

The derivative of this with respect to π is

$$4\frac{\partial \tilde{\rho}}{\partial \pi}\int_0^\beta (x - \tilde{\rho}) f(x)\, dx + 4(1 - \pi)\frac{\partial \tilde{\rho}}{\partial \pi}\int_\beta^1 (x - \tilde{\rho}) f(x)\, dx$$

$$+2\int_\beta^1 (x - \tilde{\rho})^2 f(x)\, dx,$$

where $\partial \tilde{\rho}/\partial \pi$ is finite. When $\pi = 0$, $\tilde{\rho}(A, \beta, 0) = \rho$, so the first two terms sum to zero, leaving

$$2\int_\beta^1 (x - \rho)^2 f(x)\, dx > 0.$$

Applying this logic to the first term of $\Delta(\beta, \pi)$ in (A.3) as well, we find

$$\frac{\partial \Delta(\beta, 0)}{\partial \pi} = -2\sigma^2 + 2\int_\beta^1 (x - \rho)^2 f(x)\, dx + \int_0^\beta (x - \rho)^2 f(x)\, dx$$

$$= -\int_0^\beta (x - \rho)^2 f(x)\, dx < 0.$$

Therefore, for small positive values of π, $\Delta(\beta, \pi) < 0$, and so joint duopoly profits dominate an A-monopoly. Parallel logic applies when $P_A(A, \beta, \pi) < P_B(B, \beta, \pi)$.

(iii) Duopoly profits at the point $\beta = 1/2$, $\pi = 1$ can be written as

$$2\pi\sigma^2 - P_A\left(A, \frac{1}{2}, 1\right) - P_B\left(B, \frac{1}{2}, 1\right)$$

$$= 2\pi\sigma^2 - 2P_A\left(A, \frac{1}{2}, 1\right).$$

The A-monopoly is more profitable if and only if

$$P_A\left(A, \frac{1}{2}, 1\right) > 2\pi\sigma^2 - 2P_A\left(A, \frac{1}{2}, 1\right),$$

or

$$3P_A\left(A, \frac{1}{2}, 1\right) > 2\pi\sigma^2.$$

Gallagher, John (2005). "FTC OK's Acquisition by Gannett." *Detroit Free Press*, March 9.

Gentzkow, Matthew Aaron and Jesse M. Shapiro (2006). "Media Bias and Reputation." *Journal of Political Economy*, 114, 280–316.

Gentzkow, Matthew Aaron and Jesse M. Shapiro (2008). "Competition and Truth in the Market for News." *Journal of Economic Perspectives*, 22, 133–154.

Gentzkow, Matthew Aaron and Jesse M. Shapiro (2010). "What Drives News Media Slant? Evidence from U.S. Daily Newspapers." *Econometrica*, 78, 35–71.

George, Lisa and Joel Waldfogel (2000). "Who Benefits Whom in Local Newspaper Markets." NBER Working Paper #7944 (October).

George, Lisa and Joel Waldfogel (2003). "Who Benefits Whom in Daily Newspaper Markets?" *Journal of Political Economy*, 111, 765–784.

George, Lisa M. and Joel Waldfogel (2006). "The New York Times and the Market for Local Newspapers." *American Economic Review*, 96, 435–447.

Gerber, Alan, Dean Karlan, and Daniel Bergan (2009). "Does The Media Matter? A Field Experiment Measuring the Effect of Newspapers on Voting Behavior and Political Opinions." *American Economic Journal: Applied Economics*, 1, 35–52.

Germano, Fabrizio (2009). "On Commercial Media Bias." Working Paper, Universitat Pompeu Fabra.

Goldberg, Bernard (2001). *Bias: A CBS Insider Exposes How the Media Distort the News*. Regnery Publishing, Washington, DC.

Groseclose, Tim and Jeffrey Milyo (2005). "A Measure of Media Bias." *Quarterly Journal of Economics*, 120, 1191–1237.

Harding, James (2002). "Media King Warms to his Subjects." *Financial Times*, June 11, 30.

Hopkins, Jim (2004). "Clear Channel Execs Donate More to Bush." *USA Today*, March 23.

Hunt, Tristram (2006). "A Berlusconi Victory would be as Damaging as was Bush's." *The Guardian*, February 6.

Li, Ming and Tymofiy Mylovanov (2008). "Indifferent Public, Passionate Advocates, and Strategic Media." Working Paper, Concordia University.

Lipman, Barton L. and Duane J. Seppi (1995). "Robust Inference in Communication Games with Partial Provability." *Journal of Economic Theory*, 66, 370–405.

Milgrom, Paul R. (1981). "Good News and Bad News: Representation Theorems and Applications." *Bell Journal of Economics*, 12, 380–391.

Milgrom, Paul R. and John Roberts (1986). "Relying on the Information of Interested Parties." *RAND Journal of Economics*, 17, 18–32.

Mullainathan, Sendhil and Andrei Shleifer (2005). "The Market for News." *American Economic Review*, 95, 1031–1053.

Perez-Pena, Richard (2009). "As Cities go from Two Papers to One, Talk of Zero." *New York Times*, March 12.

Posner, Richard A. (2005). "Bad News." *New York Times Book Review*, July 31.

Puglisi, Ricardo and James M. Snyder (2008). "Media Coverage of Political Scandals." NBER Working Paper 14598.

Snyder, James M. and David Strömberg (2004). "Media Markets' Impact on Politics." Working Paper, MIT.

Stone, Daniel F. (2010). "Ideological Media Bias." Working Paper, Oregon State University.

Stille, Alexander (2006). "Silvio's Shadow." *Columbia Journalism Review*, September/October.

Strömberg, David (2001). "Mass Media and Public Policy." *European Economic Review*, 45, 652–663.

Strömberg, David (2004). "Mass Media Competition, Political Competition, and Public Policy." *Review of Economic Studies*, 71, 265–284.

Szalai, Georg (2007). "Murdoch: Big Media has Less Sway on Internet." *The Hollywood Reporter*, January 27.