

Newspapers

Joel Sobel

Mullainathan-
Shleifer

Gentzkow-
Shapiro

Ellman and
Germano

Posner

Newspapers

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UCSD and UAB

15 February 2007

ISSUES

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- What do papers sell?
- Origin and Persistence of Bias?
- Does Competition Improve Outcomes?

Relevance:

Production and Consumption of Information in Group Environments.

MODEL

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- 1 Underlying information t .
- 2 Newspapers receive $d = t + \epsilon$.
- 3 Newspapers select "slant" (report $n = d + s$ given d) and price P .
- 4 With multiple newspapers, first public and simultaneous announcement of s , then select price.

t and ϵ normal, mean zero.

Readers know the variance, but might have a biased estimate of mean of t .

READER PREFERENCES

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$$V - As^2 - B(n - b)^2 - P$$

Where $A, B, V \geq 0$, V valuation, P price.

Reduced-form model of value of information.

If $B > 0$ agent loses utility when reported news differs from bias.

Expected utility computed using the true distribution of d .

RATIONAL AGENTS

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If $B = 0$, then monopolist sets $s = 0$ and fully extracts surplus.

If $B = 0$, then there exists an equilibrium with two sellers in which $s = P = 0$.

(There are other, weird, equilibria.)

Reason: $s \neq 0$ simply lowers valuations.

Unbiased news is the result of optimization by newspapers (not competition).

Homogeneous Bias

$B > 0$ and $b \neq 0$, but common to all readers.

Monopoly policy: Report

$$\frac{Bb + Ad}{A + B}$$

(so slant is $B(b - d)/(A + B)$)

Price extracts all surplus:

$$P = V - AB(b^2 + \nu_d)/(A + B),$$

where ν_d is the variance of d .

(This requires $P > 0$, otherwise there is no market.) This is a direct computation. Solution has "obvious" sensitivity properties.

Monopolist maximizes utility of representative reader.

Competition: There exists an equilibrium with the same slant and $P = 0$.

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Heterogeneous Bias: Monopoly

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Assume that b is uniformly distributed on $[-c, c]$ for $c > 0$.
If c is small, then monopolist serves entire market.

$$s = -\frac{Bd}{A+B}$$

and

$$P = V - \frac{AB(b^2 + \nu_d)}{A+B} - B^2c^2.$$

If c is large, extreme readers don't buy the newspaper.
This analysis is similar to the homogeneous bias case, but heterogeneity lowers prices and profits.
If biases are not symmetrically distributed, then reported.

Heterogeneous Bias: Duopoly

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$$s_1 = \frac{B(1.5c - d_1)}{A + B}$$

,

$$s_2 = \frac{B(-1.5c - d_2)}{A + B}$$

, and

$$P = \frac{6B^2c^2}{A + B}$$

That is, the papers take extreme positions – more biased than their most biased readers – and divide the market. Taking extreme positions permits firms to maintain higher prices.

“Competition” leads to more biased information than monopoly.

Details depend functional forms, form of competition, and the assumption that there are just two papers.

MODELING SLANT

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Mullainathan and Shleifer sketch a model in which papers generate bias by omission. A conscientious reader could get full information by sampling different sources.

CONCLUSIONS

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- 1 Competition lowers price, but does not increase information.
- 2 Diversity of readers may increase information.

CRITIQUE

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- People care about slant, not information.
- Modeling of preferences and information informal.

REPUTATION CONCERNS

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Basic Idea: Newspapers tailor reports towards biases of readers to create reputation for quality.

THE MODEL

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- Binary state, action, signal, symmetric payoffs:
 $u(i, i) = 0$, $u(i, j) = -1$ if $i \neq j$.
- Newspaper has two intrinsic, unobserved quality levels. Perfect: learn state. Imperfect: receive signal that is accurate with probability $p > .5$.
- λ probability newspaper is perfect.
- $\pi > .5$, π_N different priors that state is 1 for readers and newspaper.
- $\pi < p$: information changes readers' optimal action in the sense that a signal for state zero lowers posterior below .5.
- $\pi_N \in (1 - p, p)$. Newspaper's posterior is below .5 if signal is 0; above .5 if signal is 1.

THE GAME

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- Everyone buys.
- Firms care about reputation.
- Reputation formed by updating prior based on incomplete feedback on accuracy.
With probability μ reader learns true state. With probability $1 - \mu$ the reader learns nothing.
- Perfect firms report truthfully.
- Imperfect firms report strategically

Imperfect firms generally have an incentive to report dishonestly to improve reputation.

In particular, when $\pi > .5$, equilibrium involves imperfect firms always reporting 1 when their signal supports 1 and sometimes reporting 1 when their signal supports 0.

BASIC INTUITION

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The stronger the prior favors state 1 (π higher) and the weaker the feedback (lower μ) the better the reputation of someone who reports 1.

VARIATION

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- Model competition as process by which readers gain feedback.
- One paper receives information as above and makes report.
- Other papers get perfect information and can make reports.
- If (a) other papers report honestly and (b) the probability of a reader receiving a secondary report is increasing in the number of papers, then one obtains the technology of the monopoly case.
One difference: increasing competition leads to higher μ .
That is, more competition leads to better feedback, which leads to less bias.

Compare to Mullainathan-Shleifer's statement about competition.

Heterogeneous Readers

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Assume that there are two groups of readers who differ only in their prior.

$$\pi_0 < .5 = \pi_N < \pi_1.$$

One can construct an equilibrium in a market with two papers in which the papers segment the market, acting as monopolists to subgroups of reader.

A reader biased towards state one prefers a newspaper biased towards state one because the paper reports honestly with higher probability.

- Bias in “rational” model.
- Somewhat strange incentives and feedback.
- Pricing not modeled.

ADVERTISING VERSUS SALES

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A model with three elements: readers, newspapers, and advertisers.

- K topics; newspaper n selects accuracy vector $r_n \in [0, 1]^K$, also $p_n, q_n(j)$.
- Reader i obtains $\sum_k s_i(k)r_n(k) - p_n$ from paper n . Must exceed b_i .
- Advertiser j obtains $\sum_n x_n(i)(1 - \sum_k t_j(k)r_n(k)) - q_n(j)$ where:
 - $x_n(i)$ is the probability that i reads n .
 - $t_j(k)$ is the cost associated with accurate reporting on topic k as seen by advertiser j .
- Advertisers' revenue separable across papers.
- Paper maximizes revenue.

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- Papers set r .
- Papers set p .
- Readers decide which paper to buy.
- Papers set q .
- Advertisers decide where to buy.

ANALYSIS: Easy Cases

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- Papers fully extract surplus from advertisers.
- Monopoly: extreme cases
 - Lots of advertisers with identical t_j : Set $p = 0$. Produce minimally informative paper.
 - No advertisers: Accurate newspaper. Fully extract consumer rents.
 - Advertising lowers accuracy. Does not improve welfare.
- Homogeneous Duopoly: Full information and zero prices. (Readers only read the best paper.)

COMPETITION AND HETEROGENEOUS AGENTS

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Two qualitatively different possibilities:

- 1 Lots of advertisers: As in homogeneous duopoly.
- 2 Lots of diversity: Market segmentation.

In the first case, papers generate readership in order to sell ads. Papers are free and accurate.

In the second case, papers differentiate themselves in order to gain monopoly power with readers.

COMPARISON

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Similar to MS, but pressure for bias comes from advertisers. Somewhat surprisingly, a lot of advertisers and competition improve accuracy.

COMMENTS

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- Attractive assumptions on consumers: no bias, different preferences.
- Weird assumption on advertisers.
- Ability to say something about whether papers earn money from advertisements or readers.
- Ability to generate market segmentation.
- Cannot do full welfare analysis.
- Somewhat strange assumption about information content.

INFORMAL STORIES

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Posner argues that more competition leads to more polarization.
Product differentiation story dominates.

WISH LIST

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- 1 Readers care about different things.
- 2 Providing information is costly.
- 3 Newspapers cannot cover everything.
- 4 Readers gravitate towards paper that gives necessary information.
- 5 Information may polarize opinions.
- 6 Newspapers/advertisers point of view.
- 7 Connection between what readers want to know and what advertisers sell.
- 8 More competition: market segmentation and shift towards selling ads, not papers.
- 9 Competition gives advertisers greater control.

sectionFinal Comments and Questions

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QUESTIONS

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■ Group Size Effects

Do larger groups make better decisions?

[Are two heads better than one?]

(For fixed institution, no. For best institution, yes?)

Juries – incentives to collect information and report honestly.

Committees – Career concerns.

Newspapers – Increasing the number of readers or newspapers.

■ “Broad Indifference”

In almost all models, voter behavior makes a difference with small probability, yet conditioning on low probability event (being pivotal) is essential for equilibrium analysis.

Implications for:

- 1 Participation or information acquisition (substantively).
We should be thinking about reasons why people do participate and how institutional environment matters.
- 2 Equilibrium Refinement (technically)

■ Organization of Deliberation

- 1 Who talks when?
- 2 Subdivision.
- 3 Choice of Information Source: Dependence versus Accuracy.

- How do group decisions differ from individual decisions?
 - 1 Accuracy
 - 2 Polarization