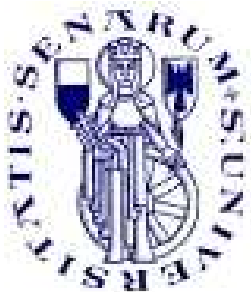




Paying Positive to Go Negative: Advertisers' Competition and Media Reports

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Outline

- ⑥ Motivation
- ⑥ Literature
- ⑥ The model
- ⑥ Results



“The one area in which the case for a [Federal Trade Commission] agency is stronger than previously suggested is where no seller has an incentive to furnish correct information [...] An example is cigarettes [...] Apart from sellers of other tobacco products, for whom a campaign of disparaging cigarettes would involve a palpable risk of being hoist with their own petard, no seller or group of sellers could anticipate a marked rise in sales as a result of a reduction in smoking. There is therefore no competitor with an incentive to supply information on the relationship between smoking and health that cigarette companies naturally try to withhold”.

Richard A. Posner, (1969), page 68.

Motivation

- ⑥ An economic rationale for advertising
- ⑥ There are products for which there is evidence of pressure for hiding any bad news (**paying positive to avoid negative**):
 - △ tobacco, pollution, pharmaceuticals. . .
- ⑥ There are products for which bad news are disclosed:
 - △ cars, electronics. . .
- ⑥ Is there a relation between market competition for products, advertising, and media competition for news?
- ⑥ **Paying positive to go negative.**

Examples: cars

Toyota recalls: Toyota announces recall for fuel system problems - latimes.com http://www.latimes.com/business/la-fi-0127-autos-toyota-20110127,0...

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Toyota announces new global recall
Problems with the fuel systems of several models prompt Toyota to issue another large recall. In the U.S., about 245,000 Lexus vehicles are affected.

California Budget Balancer »

Cutting: \$1,050,000,000 Remaining Deficit: \$45,951,000,000

Examples: cars

The screenshot shows the website **la Repubblica.it** with the **Motori** section selected. The navigation bar includes categories like Home, Affari&Finanza, Sport, Spettacoli&Cultura, Ambiente, Scienze, Tecnologia, Motori, Moda, Casa, Viaggi, Roma, Milano, Annunci, Lavoro, Meteo, and Oroscopo. A search bar is visible at the top right.

The main article is titled **Classe E sotto inchiesta Problemi all'airbag**. The sub-headline reads: "La National Highway Traffic Safety Administration sta indagando sulla berlina Mercedes su un difetto legato agli airbag che durante gli incidenti potrebbero non aprirsi correttamente".

The article text states: "Classe E nell'occhio del ciclone. La National Highway Traffic Safety Administration, sta indagando sulla Classe E in America a causa del fatto che gli airbag durante gli incidenti potrebbero non aprirsi correttamente. Complessivamente circa 100mila unità, costruite tra il 2005 ed il 2006 potrebbero essere interessate da questo difetto. L'agenzia che si occupa della sicurezza delle auto ha già ricevuto quattro reclami in merito ai difetti che riguardano la colonna dello sterzo che potrebbe impedire agli airbag di gonfiarsi in caso di incidente frontale. Robert Moran, portavoce dell'unità statunitense di Mercedes a Montvale, in New Jersey, non ha commentato la notizia. Il congresso americano quest'anno, a seguito dei problemi di Toyota che

On the right side of the page, there is a **NEWS ALERT** box and an advertisement for **Audi A3 Young Edition**. The advertisement text says: "Audi A3 Young Edition contiene le emissioni, riduce i consumi ed è efficiente anche nel prezzo, da 21.570 euro".

Two red arrows are present: one pointing from the top navigation bar to the word "SICUREZZA" in the article's sub-headline, and another pointing from the Audi advertisement to the text "Audi A3 Young Edition".

Examples: phones

The screenshot shows the 'Business Day Technology' section of The New York Times website. The main article is titled 'Consumer Reports Says iPhone 4 Has Design Flaw' by Nick Bilton, dated July 12, 2010. A red arrow points from the highlighted title to a video player below it showing a hand holding an iPhone 4. To the right, a sidebar features a 'Samsung GALAXY Tab' advertisement with the text 'MORE POSSIBILITIES ON THE GO'. A red circle highlights the Samsung logo and the product name in the ad. Another red arrow points from the 'FOLLOW THIS BLOG' section above the ad to the Samsung logo. The page includes navigation menus for various topics like 'WORLD', 'U.S.', and 'TECHNOLOGY', and a search bar.

Examples: phones

The screenshot shows the New York Times website's Technology section. At the top, there are navigation links for 'HOME PAGE', 'TODAY'S PAPER', 'VIDEO', 'MOST POPULAR', and 'TIMES TOPICS'. The main header reads 'The New York Times Business Day Technology'. A search bar is located on the right. Below the header is a secondary navigation bar with categories like 'WORLD', 'U.S.', 'N.Y. / REGION', 'BUSINESS', 'TECHNOLOGY', 'SCIENCE', 'HEALTH', 'SPORTS', 'OPINION', 'ARTS', 'STYLE', 'TRAVEL', 'JOBS', 'REAL ESTATE', and 'AUTOS'. A 'Search Technology' box is on the left, and 'Inside Technology' sub-sections like 'Internet', 'Start-Ups', 'Business Computing', and 'Companies' are in the center. On the right, there are links for 'Bits Blog', 'Personal Tech', 'Digital Cameras', and 'Cellphones'. The main article is titled 'Apple Acknowledges Flaw in iPhone Signal Meter' by Miguel Helft, published on July 2, 2010. The article text discusses a signal strength issue on iPhones. A photo shows a hand holding an iPhone 4 with a 'death grip' label. A sidebar on the right contains 'COMMENTS', 'SIGN IN TO E-MAIL', 'PRINT', 'REPRINTS', 'SHARE', and a 'WIN WIN MARCH 18' banner. On the far right, there is a 'Today's Headlines Daily E-Mail' sign-up box and a large advertisement for the Samsung GALAXY Tab, which is circled in red. A red arrow points from the top of the page down to the 'Cellphones' link, and another red arrow points from the 'Today's Headlines Daily E-Mail' box down to the Samsung advertisement.

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Apple Acknowledges Flaw in iPhone Signal Meter

By MIGUEL HELFT
Published: July 2, 2010

Apple customers love to complain about the reception on their iPhones. And the problem may be worse than it looks.

Enlarge This Image

Raymond McCrea Jones/The New York Times

A user holding the iPhone 4 in the so-called "death grip."

Enlarge This Image

Apple said on Friday that for years its phones had been exaggerating signal strength by displaying too many bars — indicating stronger reception than there ever was. The problem, Apple said, is a bug in the software, which it promised to fix soon.

WIN WIN MARCH 18

Once it does, it seems, customers will be able to see just how bad reception really is.

The company said it discovered the problem while trying to explain the mystery of the disappearing bars on its new

Today's Headlines Daily E-Mail

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Enlarge This Image

Samsung GALAXY Tab

MORE POSSIBILITIES ON THE GO

Examples: computers

The screenshot shows the PCMag.com website interface. At the top, there is a navigation bar with links for HOME, PC (PCMAG.COM), REVIEWS, NEWS & OPINION, DOWNLOADS, BUSINESS, and SHOP. A search bar is located on the right side of the navigation bar. Below the navigation bar, there is a large advertisement for Acer Aspire One laptops, featuring the text "want one? ASPIRE one" and "the new AMD HD notebook platform". The main content area displays a news article titled "Toshiba Recalls 41K Satellite Laptops Due to Overheating" by Chris Adamski, dated 09.03.2010. The article text states: "Toshiba is recalling 41,000 laptops due to concerns about overheating AC adapter plugs. Affected models include the Toshiba Satellite T135, Satellite T1350, and Satellite ProT130 notebook computers, according to the U.S. Consumer Product Safety Commission (CPSC) and its Canadian counterpart, Health Canada. At issue is the DC-in jack, where the AC adapter plugs into the computer. In some cases, it has overheated to the point of melting the plastic base around the DC-in jack opening, the agencies said. Toshiba Canada received 14 reports of excessive heat or smoke due to this glitch, with no reported injuries, Health Canada said. In the U.S., there were 129 reports of overheating computers, two reports of minor burn injuries, and two reports of minor property damage, according to the CPSC. The affected devices were sold between August 2009 and August 2010." To the right of the article, there is a sidebar with social sharing options (email, print, share, reprint), a "Submit to Digg" button with 40 reports, and a "Constant Contact" logo. Below the article, there is an advertisement for Acer Aspire AMD series laptops, featuring the text "acer Acer Aspire AMD series Performance and HD entertainment". At the bottom of the sidebar, there is a "RESOURCE CENTER" section for the "Lenovo IdeaCentre B500" advertisement, which includes a "Learn More" link. The footer of the page displays "PCMag.com on digg".

Literature: why advertising?

Survey in Bagwell (2007)

- ⑥ persuasive (bounded rationality)
 - △ e.g. imitation, limited memory, associations and neuroeconomics...
- ⑥ informative *per se*
 - △ comparative advertising
- ⑥ entertaining
 - △ e.g. reduce opportunity costs, signaling quality...
- ⑥ a two sided markets (Armstrong, 2006) even when the Media is for free

Literature: correlation between advertising and news



- ⑥ Downs (1957): people acquire info for consumption, entertainment and voting
- ⑥ All the political literature is surveyed in Prat and Strömberg (2011)
- ⑥ Targeted advertising and news content:
 - △ George and Waldfogel 2003, Hamilton 2004, Gal-Or et al. 2010
- ⑥ Accuracy for news and advertisers profits:
 - △ Ellman and Germano 2009, Germano and Meier 2010
- ⑥ Empirical papers:
 - △ Reuter and Zitzewitz 2006, Rinallo and Basuroy 2009, Reuter 2009
- ⑥ Structure of the model:
 - △ Besley and Prat 2006, Segal 1999

Reuter and Zitzewitz (QJE, 2006)

- ⑥ Mutual fund advertising in 5 newspapers (45% of total)
- ⑥ All articles and all mentioned funds
- ⑥ Period 1998-2002

	M\$/Year	%	corr. ads/recommended funds
Wall Street Journal	48.5	3.8	null
New York Times	14	1.1	null
Money	22.1	15	strongly positive and significant
Kiplinger's Personal Finance	12.2	28	strongly positive and significant
SmartMoney	8.7	16	strongly positive and significant

- ⑥ Correlation is checked across time (news \leftrightarrow ads?);
- ⑥ it goes mainly in the direction: ads \rightarrow news;
- ⑥ big newspapers and rate of failed predictions as control.

Open questions

- ⑥ There is evidence of news concealing, but also on correlation adds/suggestion & news.
- ⑥ Do we expect the same correlation when considering only news and not also suggestions?
- ⑥ Can we model (measure) the conditions under which firms will pay to go positive or to go negative?
- ⑥ In the former case, are there incentives to protect each other, without assuming collusion?
- ⑥ Is competition always good?

The model: the Media

- ⑥ A single period, a single Media
- ⑥ There are L firms, their product can be *bad* with a prob. dist. \mathcal{P}
 - △ ex-ante: firms are homogeneous and prob. of being *good* is ν
 - △ \mathcal{P} can be more or less correlated (from perfect correlation to Bernoulli)
- ⑥ The Media obtains info on a bad product with i.i.d. prob. θ
- ⑥ This info is a vector \mathbf{z} (with B_θ bad signals) and is hard evidence
- ⑥ The Media asks transfer $t_\ell > 0$ to each firm ℓ to report a certain vector \mathbf{m}_ℓ of signals consistent with \mathbf{z}
 - △ i.e. no bad info on a firm without bad signals
 - △ in exchange the Media will disclose (other) $B_\ell \leq B_\theta$ *bad* firms
- ⑥ its profit $\Gamma(\mathbf{m}, \mathbf{t}, \mathbf{B})$ is the sum of the accepted contracts that will be respected
- ⑥ when indifferent the Media reports more info (reputation concerns)

The model: firms

- ⑥ Firms anticipate that a fraction α of consumers (we will see) get the news
- ⑥ Firm ℓ knows her quality q_ℓ , if *bad* she decides whether not to pay t_ℓ (contingent on the contract)
 - △ and get for sure $\frac{1-\alpha}{L}$ of the market
- ⑥ or to pay t_ℓ (contingent on a contract that disclose B_ℓ firms)
 - △ and get $\frac{1-\alpha}{L} + \frac{\alpha}{L-B_\ell}$ of the market
- ⑥ if *good* the firm pays t_ℓ to disclose a number of *bad* firms that maximizes ex-post utility (correlation plays a role here, through the choices of ex-post informed consumers)
- ⑥ as the offer is take-it-or-leave from the Media, firms have no contract power
- ⑥ this adds another tie-breaking rule

The model: consumers

- ⑥ There is a continuous unit mass of consumers
- ⑥ each is satiated with one product, and has utility
 - △ $u_b = 0$ for a *bad* product,
 - △ $u_0 = 1$ for not buying,
 - △ $u_g > \frac{u_0}{\nu}$ for a *good* product
- ⑥ they have opportunity cost $c_i \sim U[0, c]$ for accessing the Media
- ⑥ the utility for being informed by a vector \mathbf{m} is

$$U^I(\mathbf{m}) = \max \left\{ \arg \max_{\ell} \mathbf{E}_{\mathcal{P}}[\mathbf{u}(\mathbf{q}_{\ell})|\mathbf{m}]; \mathbf{u}_0 \right\}$$

- ⑥ the fraction of consumers that will access the media is

$$\alpha = \frac{E_{\mathcal{P}}[U^I(\mathbf{m})] - \nu \cdot u_g}{c}$$

Timing

1. Nature determines which products experience a negative shock (i.e., ex-post quality $q_\ell, \forall \ell$).
2. The media outlet and the firms observe \vec{z} and B_θ (given θ).
3. The media outlet asks an advertising fee τ_ℓ to each firm contingent on a news report \vec{m}_ℓ .
4. All firms simultaneously decide whether to accept the media outlet's offer or not.
5. Given the set of accepted offers, the media outlet selects \vec{m} (consistent with \vec{z}) to maximize its profit Γ .
6. Every consumer i decides whether to incur the opportunity cost c_i to watch the media outlet's report ($\rightarrow \alpha$) and, if so, she updates her beliefs on products' qualities.
7. Consumers choose the product(s) with the highest expected quality.

Assumptions and Structure of the Game

- ⑥ Existence of Subgame perfect Bayes–Nash equilibrium
- ⑥ Characterization:
 - △ α endogenous is best response to the bargaining game
 - △ but the payoffs of firms are linear in α , and we can consider it as fixed (for the same reason α could be stochastic, without loss of generality)
- ⑥ No price but opportunity costs for watching the media (but α influences the payoffs of media and firms)
- ⑥ Role of advertising
 - △ no direct (but indirect) quality revelation
 - △ no direct (but indirect) signal of expenditure
 - △ no full comparative advertising (on the contrary, asymmetries may arise in equilibrium)

No correlation



Result:

Let $D^* \leq B_\theta$ be the number of bad signals disclosed by the media outlet in equilibrium given its news report m^* . When firms face uncorrelated shocks in the quality of their products, for any $L \geq 2$ and $\alpha > 0$ then

$$D^* = \min \{B_\theta, L - 1\}$$

and

$$\Gamma = \alpha \frac{B_\theta}{L}.$$

No correlation: sketch of proof

Intuitive proof ($L = 2$):

two producers, e.g., Toshiba-Acer.

- ⑥ Case 1: Toshiba defect/ Acer defect \Rightarrow both are willing to pay α to avoid negative news on their own product and to 'go negative' on the competitor's product.
- ⑥ Case 2: Toshiba defect/Acer no-defect \Rightarrow T. is willing to 'pay positive to avoid negative' $\alpha/2$, A. is willing to 'pay positive to go negative' $\alpha/2$.
- ⑥ Given tie-breaking rule \Rightarrow
 - △ Case 1: Media outlet earns α and hides one signal.
 - △ Case 2: Media outlet earns $\alpha/2$ and reveals the bad firm

$L = 2$ and correlation

Proposition:

Let $D^* \leq B_\theta$ be the number of bad signals disclosed by the media outlet in equilibrium given its news report m^* . Then, for $L = 2$ and $\alpha > 0$ there exists a threshold in the correlation between the negative shocks in products qualities:

$$\bar{\rho} = \frac{2(u_g\nu - 1) + \theta(1 - \nu)}{\nu(2u_g - \theta)}$$

such that:

1. If $\rho \leq \bar{\rho}$, then $D^* = \min \{B_\theta, 1\}$, $\alpha > 0$ and $\Gamma = \alpha \frac{B_\theta}{2}$.
2. If $\rho > \bar{\rho}$, then $D^* = 0$, $\alpha = 0$.

Correlation when $L > 2$.

Definition:

Let \mathcal{P} and \mathcal{Q} be two discrete probability distributions on L products (with the same expectation $(1 - \nu)$). Moreover, let $1 \leq \bar{D} \leq L - 1$. We define \mathcal{P} as **more correlated than \mathcal{Q} above \bar{D}** , if, for every $\bar{D} \leq k \leq L - 1$:

$$\frac{p(k)}{q(k)} \leq \frac{p(k+1)}{q(k+1)}$$

and there is at least one $\bar{D} \leq k \leq L - 1$ for which the above inequality is strict.

Example on correlation.

\mathcal{P} such that:

- ⊗ with probability $1 - p_0$ all firms have a good quality product,
- ⊗ otherwise each of them has a bad quality product with i.i.d. probability p_b .

\mathcal{P} is such that

- ⊗ $p(0) = (1 - p_0) + p_0(1 - p_b)^L$
- ⊗ for $k > 0$, $p(k) = p_0 \binom{L}{k} p_b^k (1 - p_b)^{L-k}$
- ⊗ $p_0 p_b = 1 - \nu$ (\mathcal{P} and \mathcal{Q} have the same ν if and only if $p_0 p_b = q_0 q_b$).

Then:

1. $L = 2$: $\rho = \frac{1-p_0}{p_0} \frac{1-\nu}{\nu}$; if \mathcal{P} and \mathcal{Q} have the same expectation ν , \mathcal{P} is more correlated than \mathcal{Q} if and only if $p_0 < q_0$ ($p_b > q_b$);
2. $L > 2$: if \mathcal{P} and \mathcal{Q} have the same expectation ν ,
 - ⊗ if $p_0 < q_0$ ($p_b > q_b$) then $\frac{p(k)}{q(k)} < \frac{p(k+1)}{q(k+1)}$ for every $k \geq 1$.

General case: L firms and correlation

Proposition:

Let $D^* \leq B_\theta$ be the number of bad signals disclosed by the media outlet in equilibrium given its news report m^* . When firms face correlated shock in the quality of their products, for any $L \geq 2$ and $\alpha > 0$ there exists a threshold in the number of bad signals disclosed by the media outlet:

$$\bar{D} = \sup_{h \in \{0, 1, \dots, L\}} \left\{ \max_{l \in \mathcal{L}} E_{\mathcal{P}} [u(q_l) | D^* = h] \geq 1 \right\}$$

such that $D^* = \min \{B_\theta, \bar{D}\}$. Moreover,

1. If $\bar{D} > 0$, $\Gamma = \alpha \frac{B_\theta}{L}$
2. If $\bar{D} = 0$, $\alpha = 0$.

Comparative statics on correlation.



Corollary:

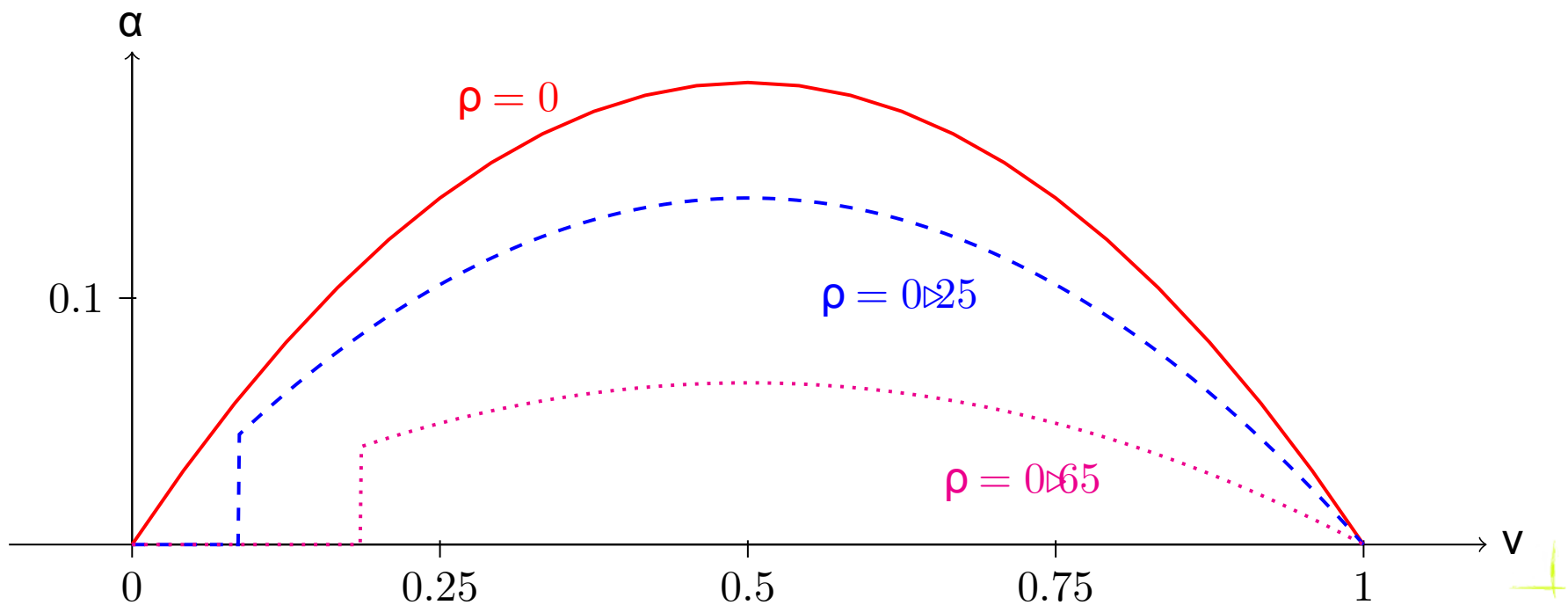
Given two discrete probability distributions (over the negative shocks in products' qualities) \mathcal{P} and \mathcal{Q} , such that \mathcal{P} is more correlated than \mathcal{Q} above $\bar{D}(\mathcal{P})$, it is always the case that:

$$\bar{D}(\mathcal{P}) \leq \bar{D}(\mathcal{Q})$$

The size of α , when $L = 2$

$$\text{If } \rho \geq \bar{\rho} = \frac{2(u_g\nu - 1) + \theta(1 - \nu)}{\nu(2u_g - \theta)} :$$

$$\alpha = \frac{u_g}{c} (1 - \nu)\nu\theta(1 - \rho) ,$$



The size of α , general case

Proposition:

For any $L \leq 2$, the equilibrium fraction α of informed consumers is always non-decreasing in u_g , θ and \bar{D} , non-increasing in c and non-monotone in ν . Moreover, whenever $\alpha > 0$, α is strictly increasing in u_g , θ and \bar{D} , and strictly decreasing in c .

Intuition for ν :

- ⌚ as *low* ν increases, news are more informative
- ⌚ as *high* ν increases, the cost of being uninformed decreases

Is competition always good?

An example



Adding a firm, even uncorrelated with the others, may decrease *accuracy* $\phi \equiv \frac{\bar{D}}{L}$ of the media:

⑥ $u_g = 3, \theta = 1/2$

⑥ $L = 3$ Firms

△ $\mathbf{p} = \left(\frac{5}{16}, \frac{1}{2}, \frac{1}{16}, \frac{1}{8}\right)$ which implies ex-ante $\nu = \frac{2}{3}$

△ $\bar{D} = 1$ (if higher, ex-post informed agents may not buy) so that $\phi = \frac{1}{3}$

△ $U_I^{(3)} = \frac{873}{448}$

⑥ $L = 4$ Firms

△ let us add another firm uncorrelated with the others (same $\nu = 2/3$)

△ this results in $\mathbf{p} = \left(\frac{5}{24}, \frac{7}{16}, \frac{5}{24}, \frac{5}{48}, \frac{1}{24}\right)$

△ also in this case $\bar{D} = 1$, so that $\phi = \frac{1}{4}$

△ but now $U_I^{(4)} = \frac{497}{256} < U_I^{(3)}$ (also α decreases)



Robustness

⑥ Media outlets' private info

- △ it is a weakly dominated strategy for the Media to hide signals

⑥ Multiple Media Outlets

- △ if they receive heterogeneous information, this is always good for consumers
- △ suppose homogeneous information, and that a single 'bad' disclosure is enough
- △ no difference for consumers and firms revealed *bad*
- △ less aggregate profits for Medias (Bertrand competition)
- △ positive effect for good firms

Multiple dimensions

Products in the same category could be correlated in one dimension and uncorrelated in another.

Examples

- ⑥ cars: technical malfunctioning vs. pollution
- ⑥ mobile phones: electronic defects vs. possible health risks
- ⑥ politics: scandals on different issues

Even within an industry: Media are more likely to report accurate news on issues upon which advertisers have conflicting preferences.

Conclusions

- ⑥ Advertisers may exert pressure on media to lower news accuracy (**Paying Positive to Avoid Negative**), but also to increase news accuracy, (**Paying Positive to Go Negative**)
- ⑥ If low correlation in advertisers' products \Rightarrow Competition in the market for products translates into competition over news reports \Rightarrow Media outlet reports accurate info (Toyota, iPhone, Toshiba cases)
- ⑥ If high correlation in advertisers' products \Rightarrow Competition in the market for products does not translate into competition over news reports \Rightarrow Media outlet does not report accurate info (tobacco, pollution, pharmaceutical)
- ⑥ Empirical implications: empirical studies looking at the advertisers' influence over news reports, should take into account the extent of competition and correlation in the market of advertisers' products.
- ⑥ Policy implications: see initial quote