

# News Aggregators and Competition among Newspapers in the Internet

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June , 2013

## Google threatens to drop French media links over fees plan

French newspaper publishers have called on the government to make search engines pay to link to their content

Angelique Chrisafis in Paris

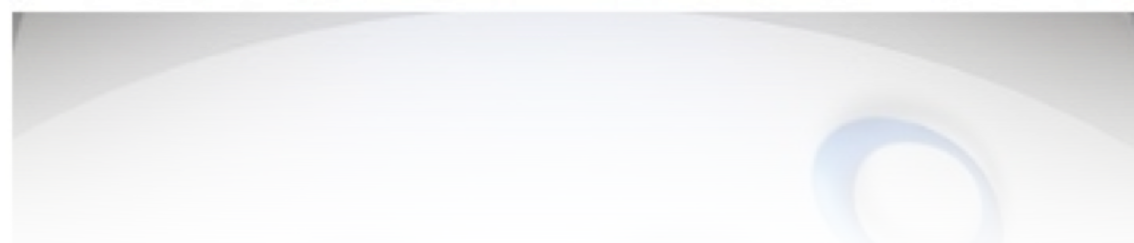
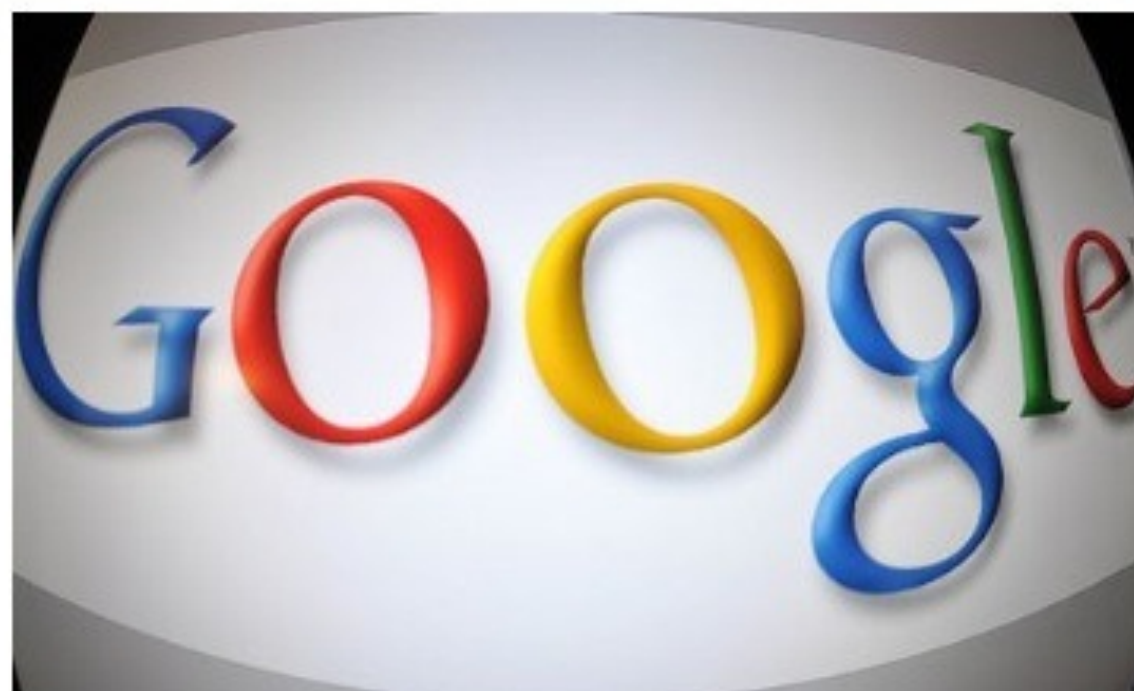
guardian.co.uk, Friday 19 October 2012 17.02 BST

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Article history



Oct 19, 2012 - 8:00AM

# Google News faces mass newspaper boycott in Brazil

BY Robert Andrews

5 Comments     

*A skirmish between Google and newspapers over crawling of news headlines suggests Latin America's digital publishing sector is maturing. But can Google keep publishers sweet enough to exploit opportunities in the fast-growing Brazilian market?*



photo: barkaway



photo: barkaway

# Outline

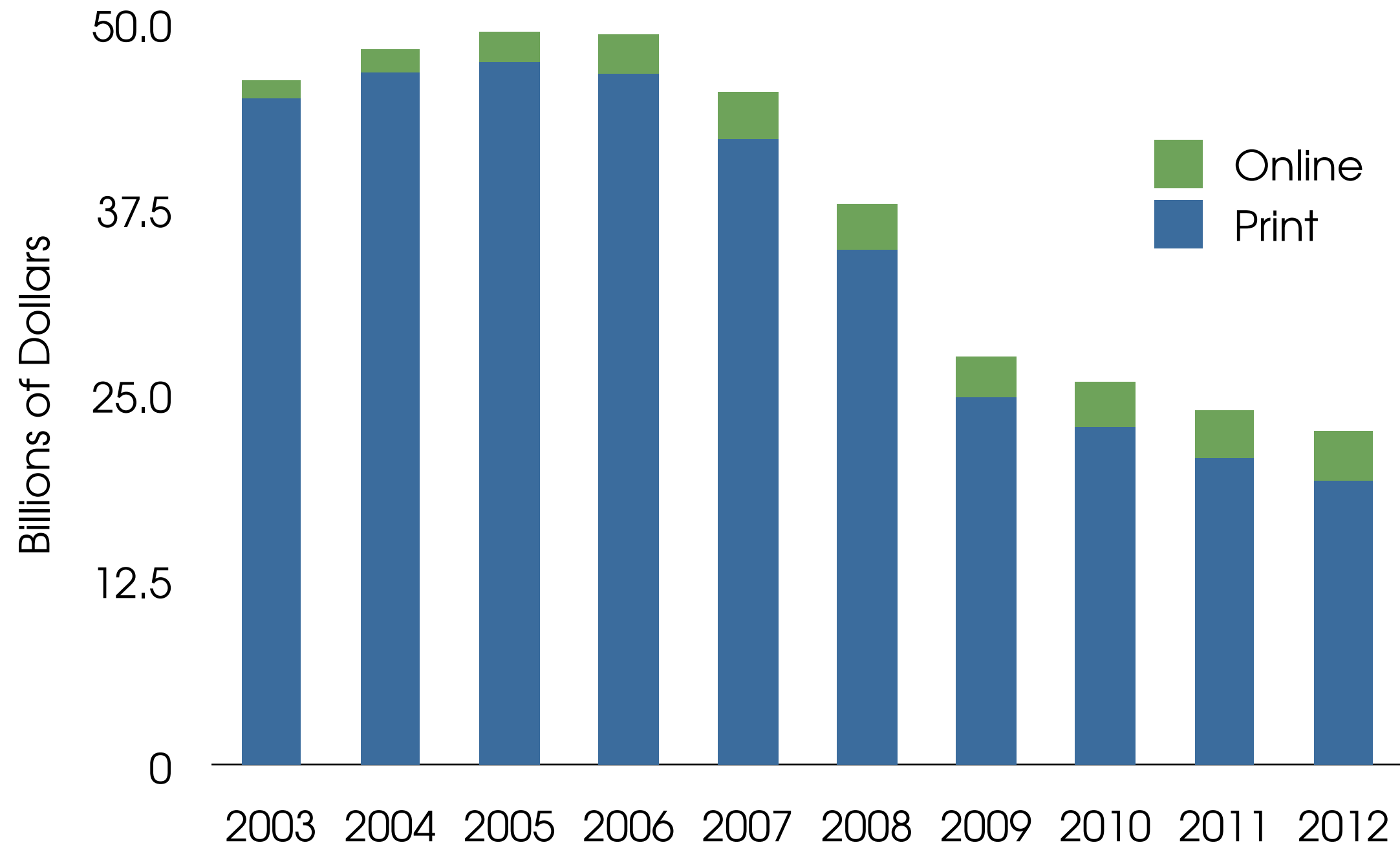
- Stylized Facts (The Advent of Internet)
- Debate (Puzzle)
- Model
- No Aggregator
- Aggregator
- Opting out
- Comparison
- Extension: Third parties' content

# Stylized Facts

## **I Advertising Revenue of Newspapers**

- 50% cut since 2000 (FTC, 2010)
- 80% of revenues came from advertising, and 20% came from subscription (FTC, 2010)
- The newspapers are the worst among the news media

## Print Advertising Revenue Falls, Online Grows



Source: The State of the News Media, 2013

# Stylized Facts

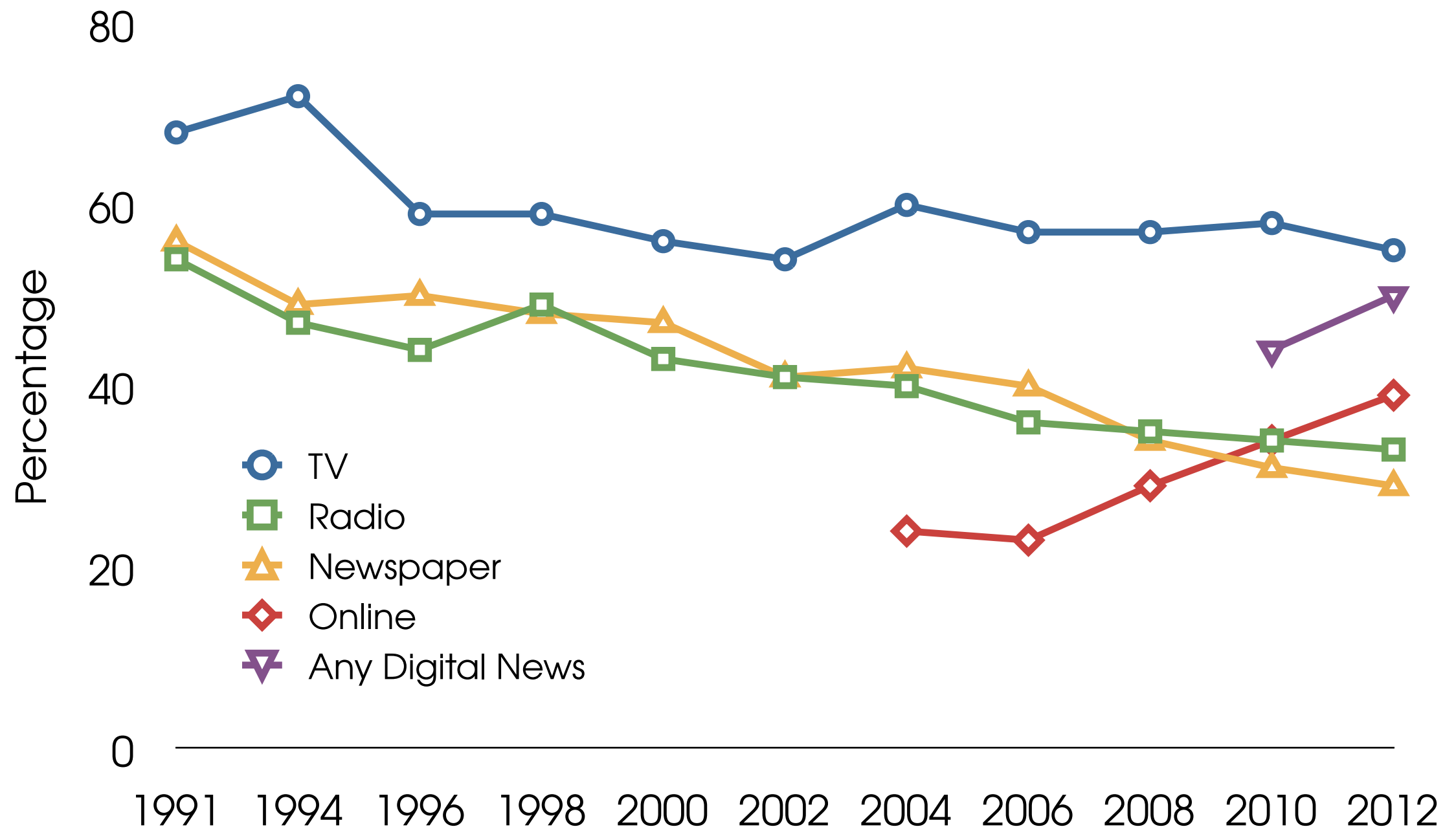
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## **II Audiences**

- Stiff competition from new media on the internet (web-only news, blogs and news aggregators)
- The traditional media are losing their consumers to the online media

# Where People Got News Yesterday



Source: The State of the News Media, 2013



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## **III Aggregator**

- The aggregators are the most important player in online media.
- Outsell (2009): 57% (Internet)=31% (agg)+8% (newspaper site) +18%(other)

<b>Online news sources used most often ...</b>	<b>%</b>
Yahoo/Yahoo News	26
Google/Google News	17
CNN	14
Local news sources	13
MSN	11
Fox	9
MSNBC	6
New York Times	5
AOL	5
Huffington Post	4
Facebook	3
ABC/ABC News	3
Wall Street Journal	3
BBC	2
USA Today	2
Internet service providers	2
ESPN	2
Washington Post	2
The Drudge Report	2

## Where People Get News Online?

Source: Pew Research Center, 2012

## Top Stories

Tony Award  
Dirk Nowitzki  
Kim Kardashian  
Mitt Romney  
Super 8  
Wallow Fire  
Johannes Mehserle  
Syria  
Jeffrey R. Immelt  
Recep Tayyip Erdoğan

## Starred ★

## World

## Midi-Pyrénées, France

## U.S.

## Business

## Sci/Tech

## Entertainment

## Sports

## Health

## Spotlight

## All news

## Headlines

## Images

Images

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## Top Stories



msnbc.com

## Oscar Grant protest remains peaceful and organized

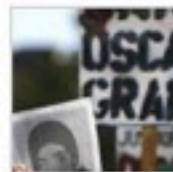
San Jose Mercury News - 1 hour ago

A protest Sunday over the expected release of former BART officer Johannes Mehserle two years after he shot and killed Oscar Grant III ended peacefully with barely a trace of the destruction and contention that marked ...

Former transit cop convicted in California subway shooting goes free CNN International

S.F. Bay transit cop convicted in killing released Seacoastonline.com

Local: Rally in Oakland over Johannes Mehserle's release San Francisco Chronicle  
Live Blog: LIVE: See coverage of the Johannes Mehserle protests in Oakland San Francisco Examiner

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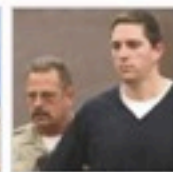
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San Franci...



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California ...



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The Associated Press - 25 minutes ago

WASHINGTON (AP) - Former White House press secretary Robert Gibbs will defend President Barack Obama in New Hampshire on Monday, countering criticism at a Republican presidential debate in the nation's first primary state.



New York T...

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BEIRUT (AP) - Syrians poured across the border Monday to refugee camps in Turkey, fleeing a military crackdown that sent elite forces backed by helicopters and tanks into a northern town that was spinning out of government control.



The Hindu



The Hindu

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## Circuits

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# Debate

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- News aggregators “steal” traffic from news sites.  $\Rightarrow$  lower quality

"When this work is misappropriated without regard to the investment made, it destroys the economics of producing high quality content."

- Rupert Murdoch, owner of News Corp. and The Wall Street Journal

"By providing the first few lines of our stories to internet users, (Google) reduces the chances that they will look at the entire story in our websites,"

- Carlos Fernando Lindenberg Neto, ANJ president

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The effect of news aggregators on the news media, and especially on the quality of journalism is a significant concern

There are two type of arguments in this debate:

- News aggregators “steal” traffic from news sites.  $\Rightarrow$  lower quality
- News aggregators “help” newspapers to find readers for the best contents.  $\Rightarrow$  higher quality



"Google makes it easy for users to find the news they are looking for and to discover new sources of information... We send more than four billion clicks each month to news publishers"

- Google, comments on FTC discussion draft, 2010

# A Big Picture

## **Sequential Consumption:**

From *homepage* to *individual articles*

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Aggregators reduce the traffics to newspapers' **home pages**

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## **Question:**

How does the presence of aggregators affect quality choice of newspapers?

# Main Results

If the increase in attention from high quality contents is large enough, the presence of aggregator would

- change strategic interactions of quality choices of newspapers from strategic substitutes to strategic complements.
- lead to specialized newspapers
- increase the average quality of newspapers
- improve the consumer surplus and welfare
- have ambiguous effect on the profit

# Literature Review

- **News Aggregator**

- ▶ **Empirical** (Chiou and Tucker, 2011 and Athey and Mobius, 2012): given supply side behavior, they find that readership expansion effect dominates business stealing effect
- ▶ **Theoretical** (Dellarocas, Katona, and Rand, 2012): A single-issue model with focus on interactions between quality choice and link decisions (i.e. every newspaper can provide a link to a rival's content)

- **Two-sided Market with Media**

- ▶ Anderson and Coate (2005)
- ▶ Athey, Calvano, and Gans (2012): consumer-tracking technology

# Model (Newspapers)

**Newspapers**  $\in \{1, 2\}$

- **Ideological view:** Hotelling model, (Mullainathan and Shleifer, 2005)



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## **Consumers** a unit mass of consumers distributed uniformly

- **Ideological view:** the location of a reader represents his/her ideological view.
- **Single-homing:** they visit only one newspaper (site)

# Model (Payoffs)

## Consumers

- Depending on the quality of an article, each consumer

	Utility	Attention
Low quality	$u_0$	1
High quality	$u_0 + \Delta u$	$1 + \delta$

# Model (Payoffs)

## Consumers

- The ideological characteristic is modeled by linear transportation cost,  $t$

$$U^1(x) = \mu(s_1)\Delta u + u_0 - xt$$

$$U^2(x) = \mu(s_2)\Delta u + u_0 - (1 - x)t$$

# Model (Payoffs)

## Newspapers

- Quadratic cost of investing (not possible to invest on more than half of the issues).

$$C(\mu(s_i)) = \begin{cases} \infty & \mu(s_i) > \frac{1}{2} \\ c\mu(s_i)^2 & \mu(s_i) \leq \frac{1}{2} \end{cases}$$

- Allows to choose average quality and coverage of issues in a separate way.

# Model (Payoffs)

## Newspapers

- Quadratic cost of investing (not possible to invest on more than half of the issues).
- Each unit of attention generates  $\omega$  dollars of advertising revenue;  $\omega$  is normalized to one.

$$\pi_i(s_i) = \alpha_i [1 + \delta\mu(s_i)] - c\mu(s)^2$$

where  $\alpha_i$  is newspaper  $i$ 's market share

# Model

## Assumptions $(\delta, \beta, c)$

- Full Coverage:  $t < u_0$
- Interior market share:  $0 \leq \beta = \frac{\Delta u}{t} < 1$
- Interior quality:  $c > \frac{\delta\beta}{4} + \frac{\delta}{2} + \frac{\beta}{2}$

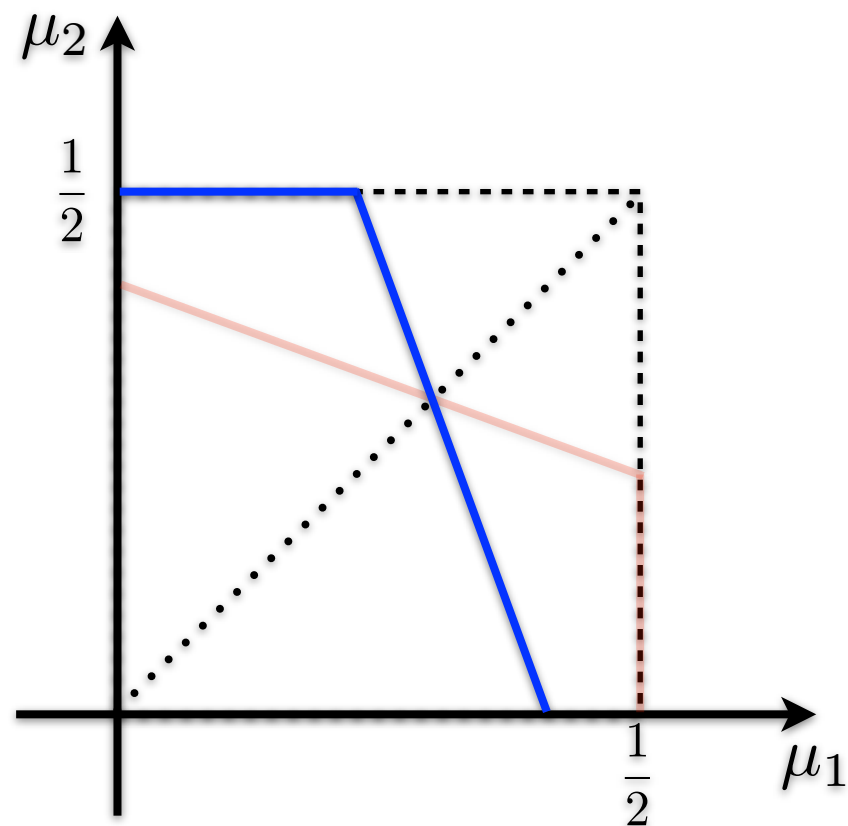
## Timing

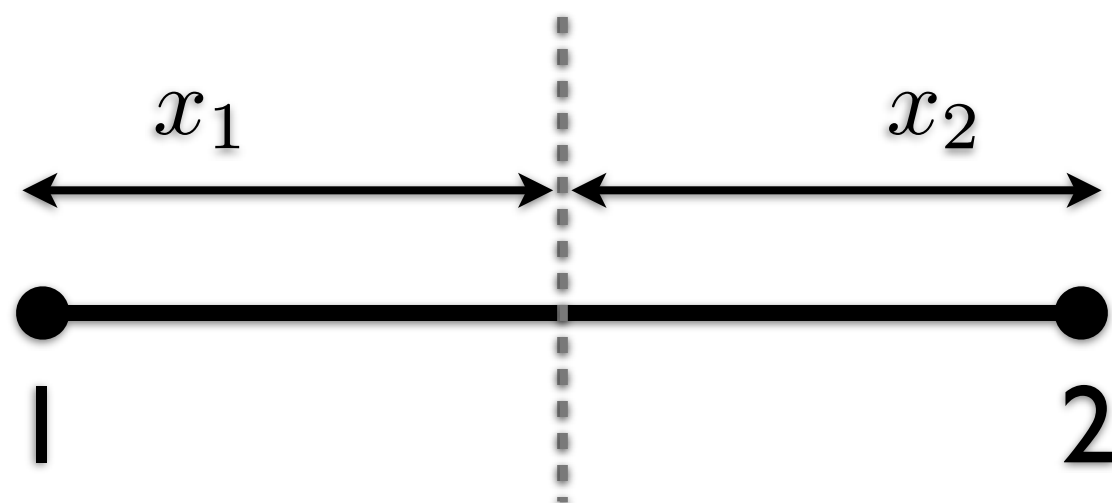
- Each newspaper  $i$  chooses  $s_i$ .
- Each consumer chooses between the newspapers (and aggregator)

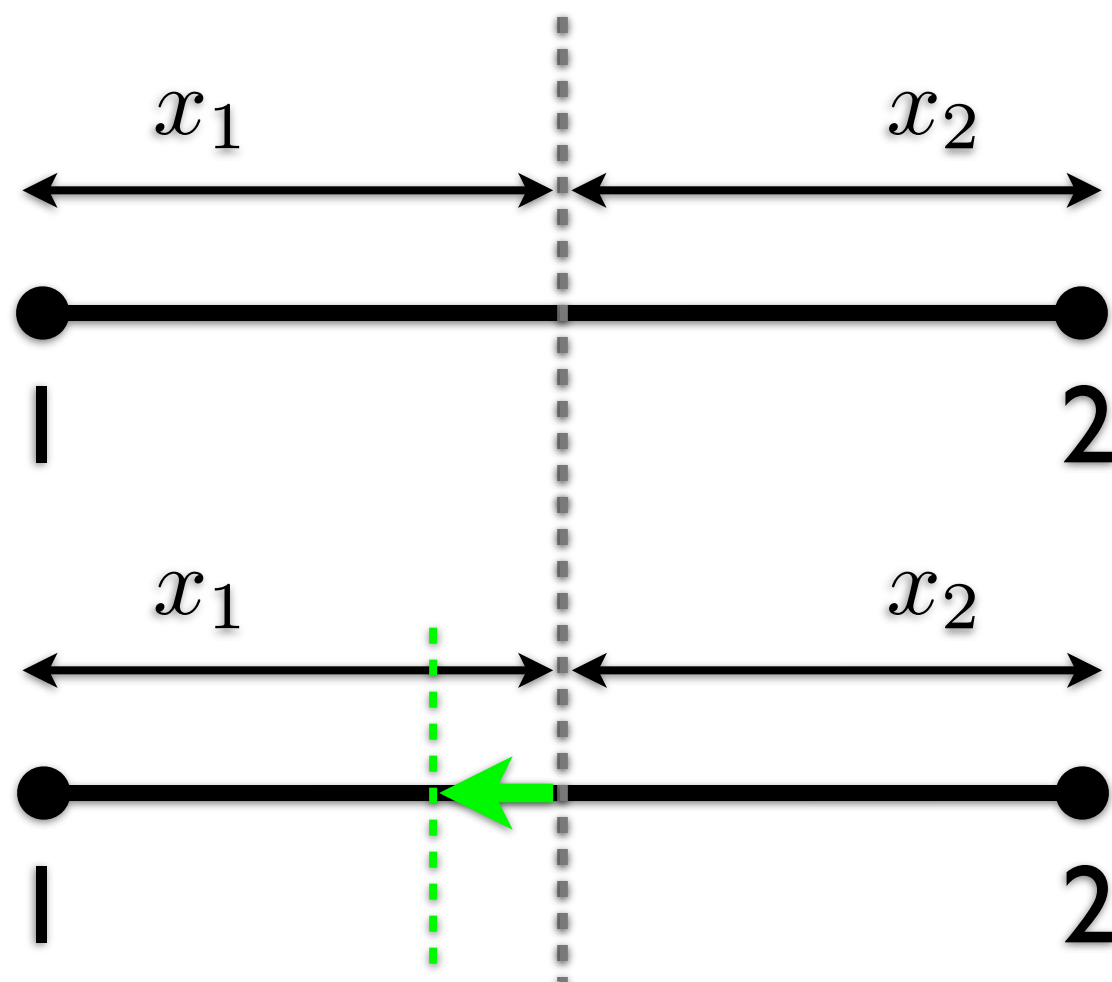


# No Aggregator

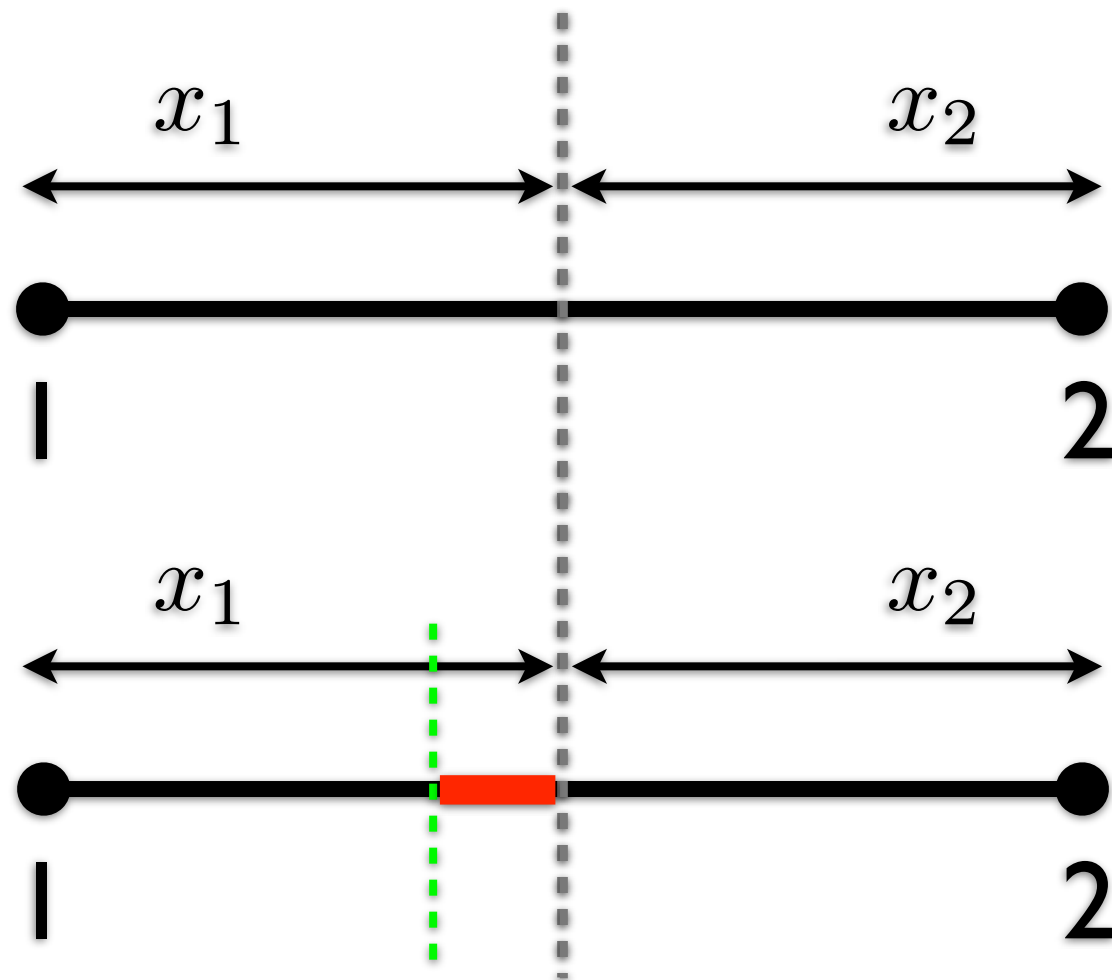
**Lemma 1.** *Newspapers' choice of average quality,  $\mu_i$ , are strategic substitutes, in the absence of aggregator.*







Quality 2 



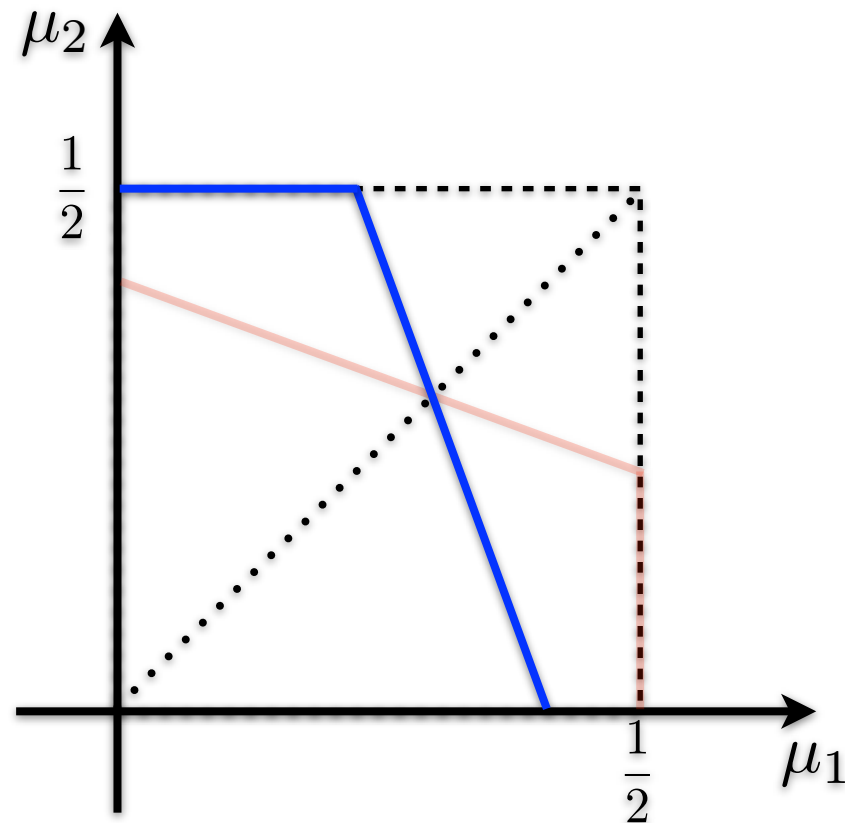
Quality 2   $\Rightarrow$  Market share for 1   $\Rightarrow$  Quality 1 

**Strategic Substitute**

# No Aggregator

**Lemma 1.** *Newspapers' choice of average quality,  $\mu_i$ , are strategic substitutes, in the absence of aggregator.*

**Proposition 1.** *There is a unique equilibrium in which the average quality of newspapers is  $\mu^* = \frac{\delta + \beta}{4c - \delta\beta}$*



# Model (Aggregator)

## **Aggregator's Technology**

- publishes summary of articles on its site with a link to the original articles.
- For a given issue, the aggregator finds and publishes only the higher quality article.
- For a given issue, if the quality is the same (high or low) the aggregator picks one randomly.

# Model (Aggregator)

## **Aggregator and Consumers**

- **Benefit:** Consuming more high quality contents
- **Cost:** Consuming news with more ideological mismatch

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## Aggregator and Newspapers

	No Agg Newspaper	Agg	
		Agg	Newspaper
Low	1	1	0
High	$1 + \delta$	1	$\delta$



# Model (Aggregator)

**Lemma 2.** *Newspapers are not directly in competition with each other: For any given  $(s_1, s_2)$ , there exists no  $x \in [0, 1]$  such that  $\min\{U_1(x), U_2(x)\} > U_{Agg}(x)$ .*

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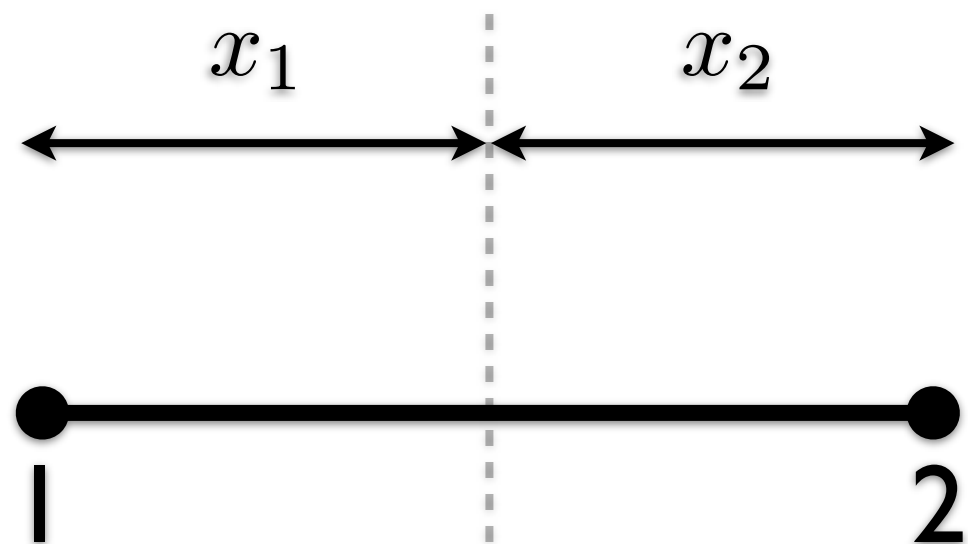
**Lemma 3.** *The market shares of newspapers 1 and 2 are*

$$\alpha_1 = \frac{1}{2} - \frac{\Delta u}{t} \frac{\mu(s_2) - \mu(s_1 \cap s_2)}{1 - \mu(s_1) + \mu(s_2)}$$
$$\alpha_2 = \frac{1}{2} - \frac{\Delta u}{t} \frac{\mu(s_1) - \mu(s_1 \cap s_2)}{1 - \mu(s_2) + \mu(s_1)}$$

# Model (Aggregator)

## Aggregator and Newspapers

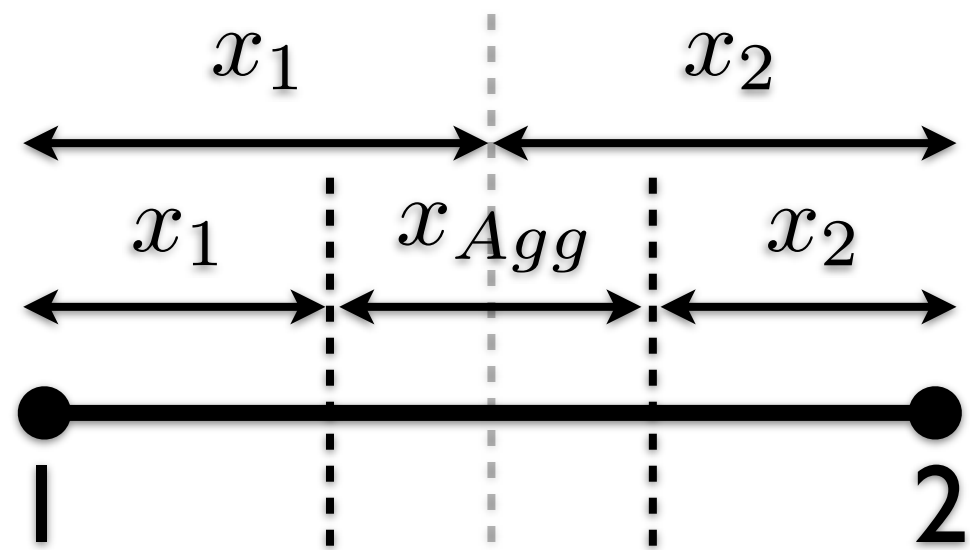
- **Business Stealing Effect:** Steals the readers who would be loyal to newspapers otherwise.



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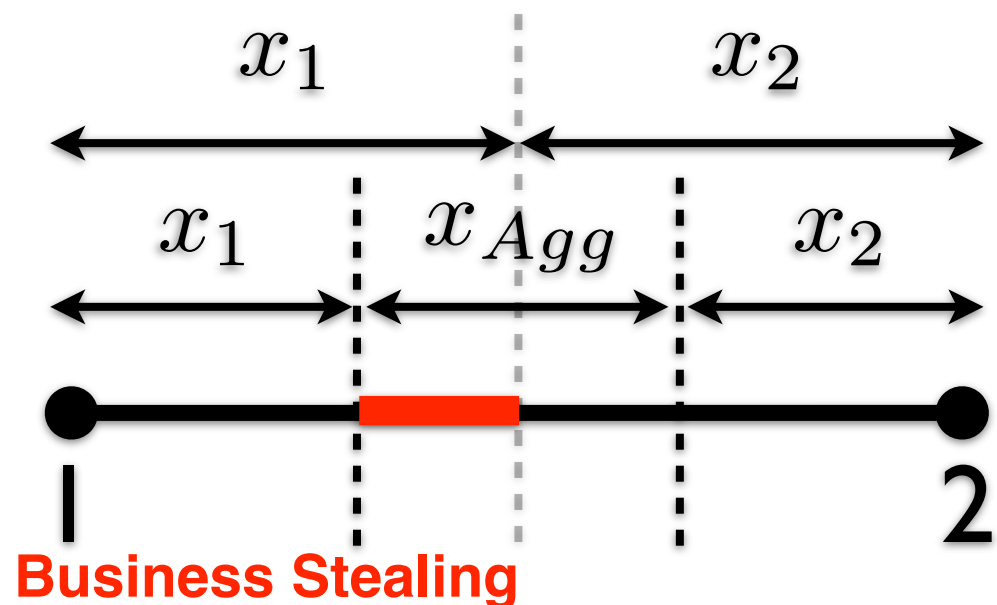
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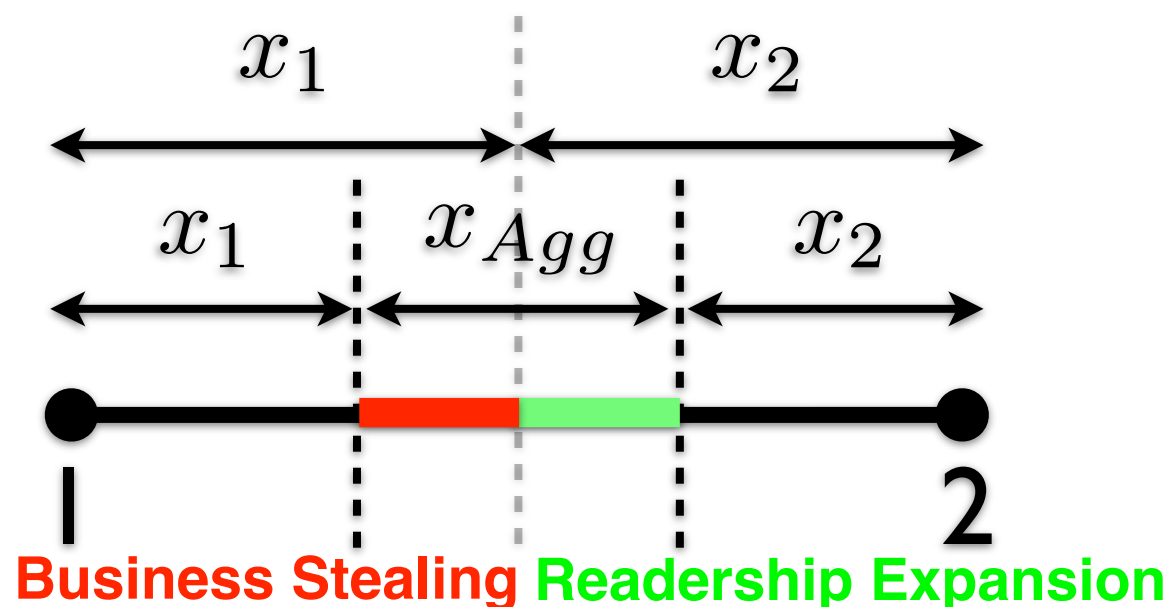
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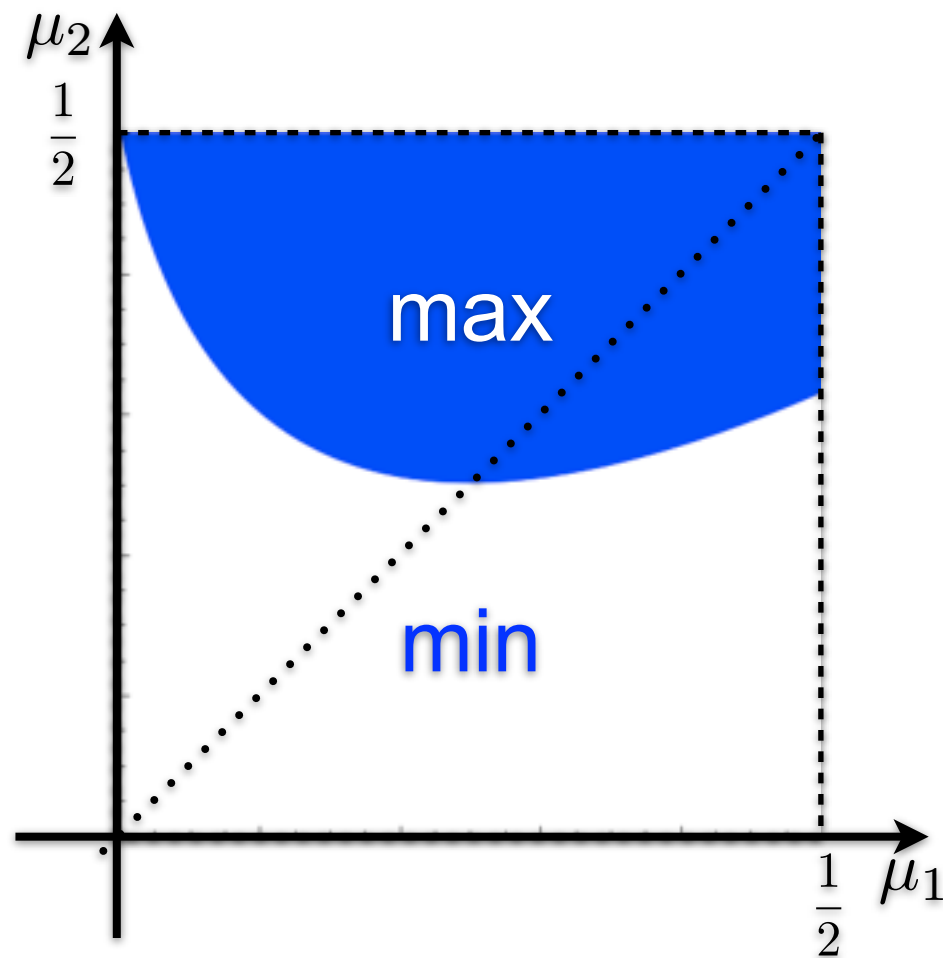
## Aggregator and Newspapers

- **Business Stealing Effect:** Steals the readers who would be loyal to newspapers otherwise.
- **Readership Expansion Effect:** Aggregator brings revenue of  $\delta$  to high quality articles of 1 from readers who would be loyal to 2 otherwise.



# Aggregator

**Proposition 2.** *Given quality of 1 and 2 , newspapers strictly prefer either max differentiation or min differentiation.*

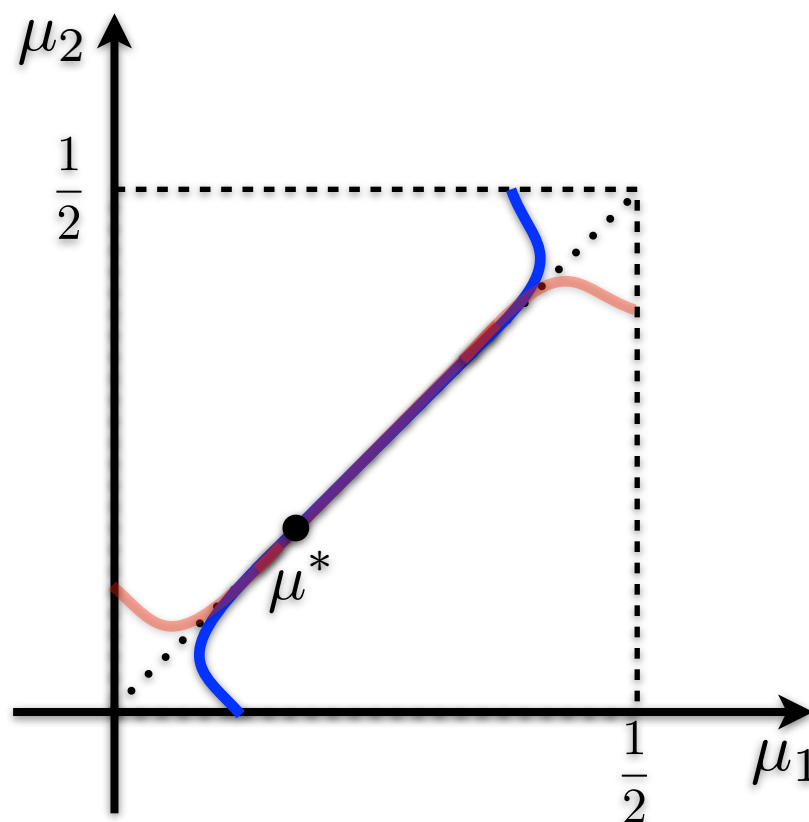


# Aggregator (No Specialization)

**Proposition 3.** *Given min differentiation, there exists a continuum of symmetric equilibria in which newspapers invest on the same issues;*

$$1) \mu_1 = \mu_2 = \mu^m \in \left[ \frac{\delta}{4c - \delta\beta}, \frac{1}{2} \right], \text{ if } c \leq \frac{\delta}{2} + \frac{\delta\beta}{4} + \beta$$

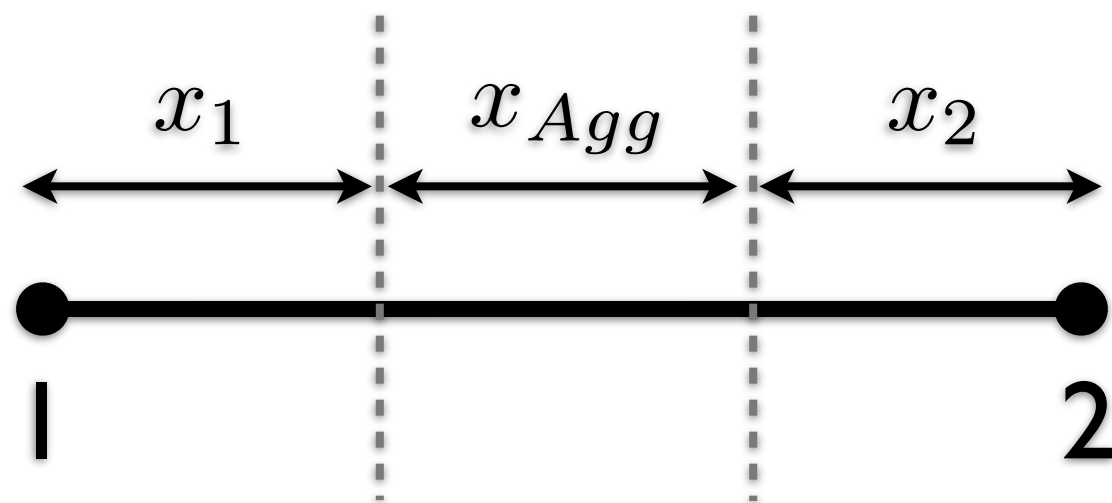
$$2) \mu_1 = \mu_2 = \mu^m \in \left[ \frac{\delta}{4c - \delta\beta}, \frac{\delta + 2\beta}{4c - \delta\beta} \right], \text{ if } \frac{\delta}{2} + \frac{\delta\beta}{4} + \beta < c$$

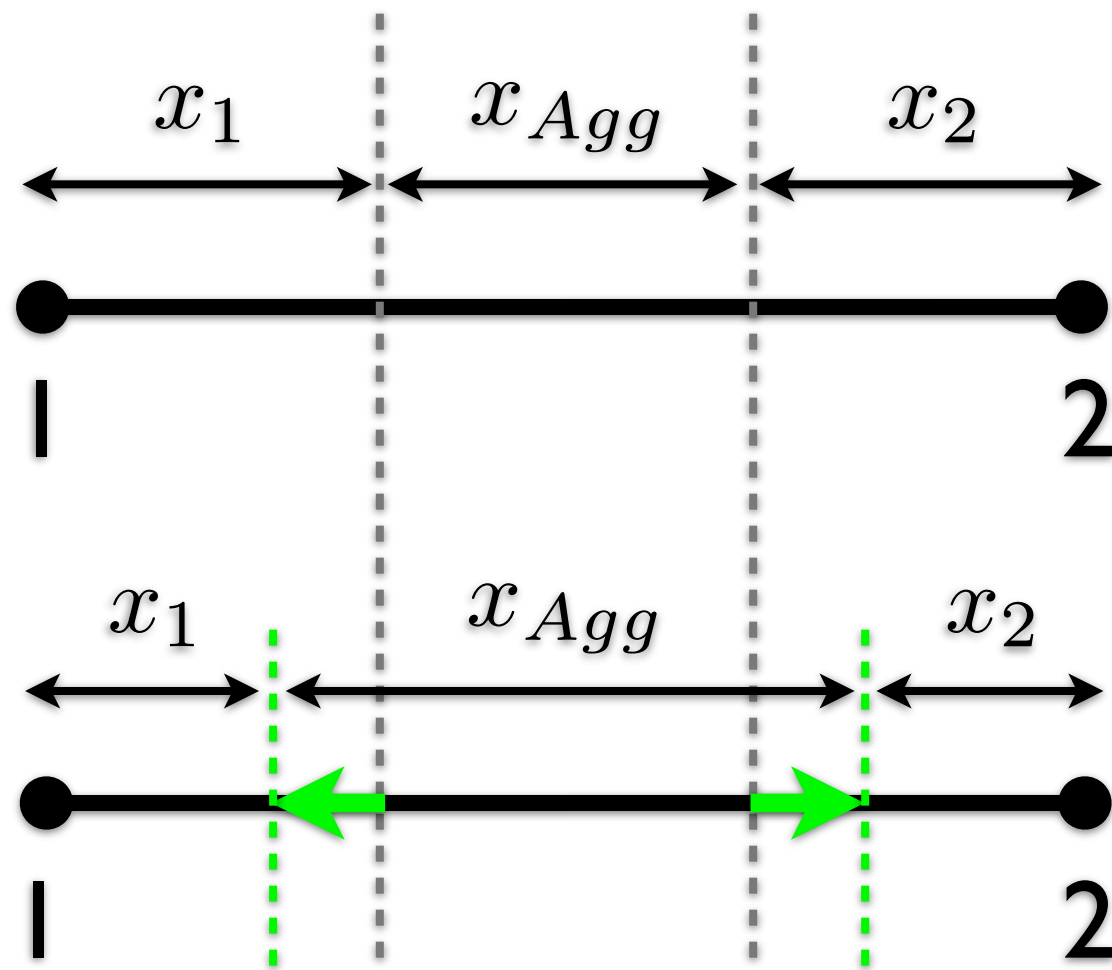




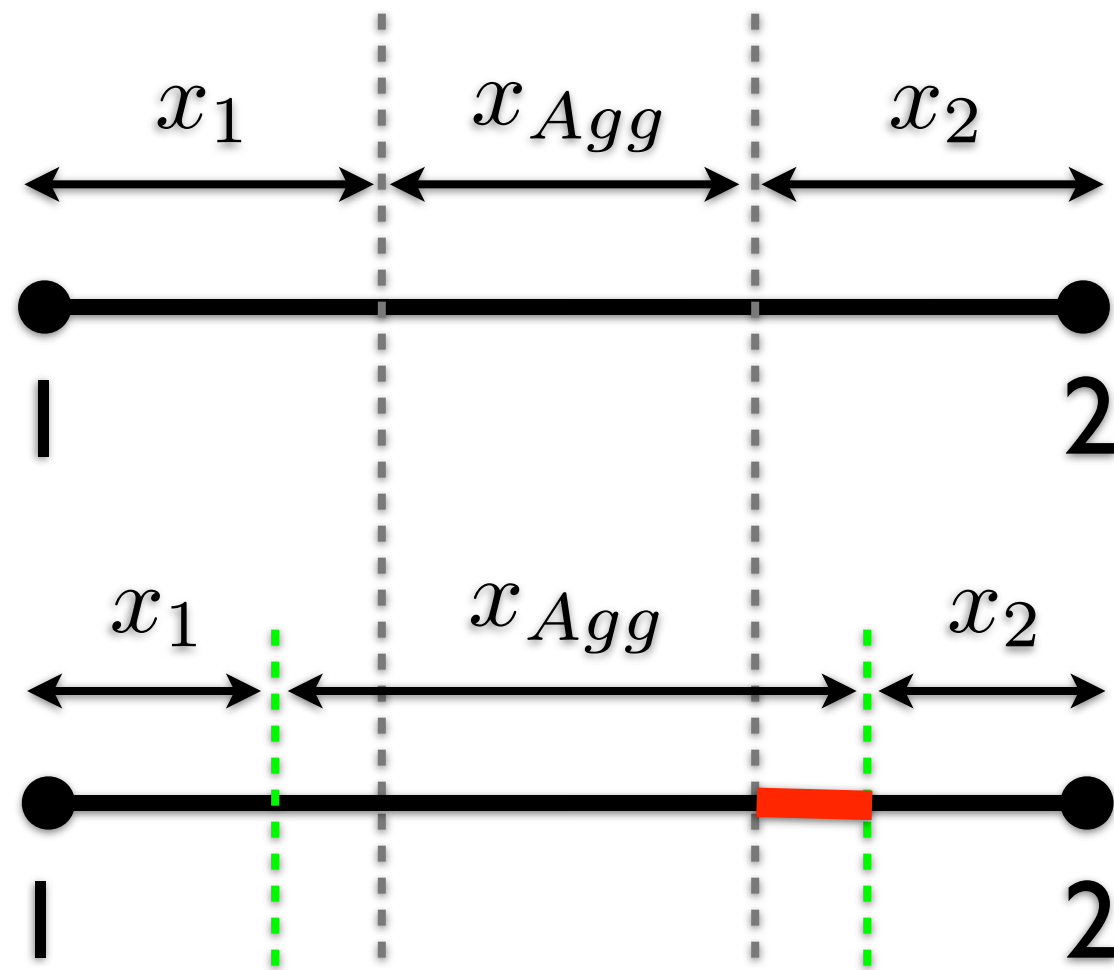
# Aggregator (Specialization)

**Lemma 5.** *Given max differentiation, quality choices are strategic complements.*

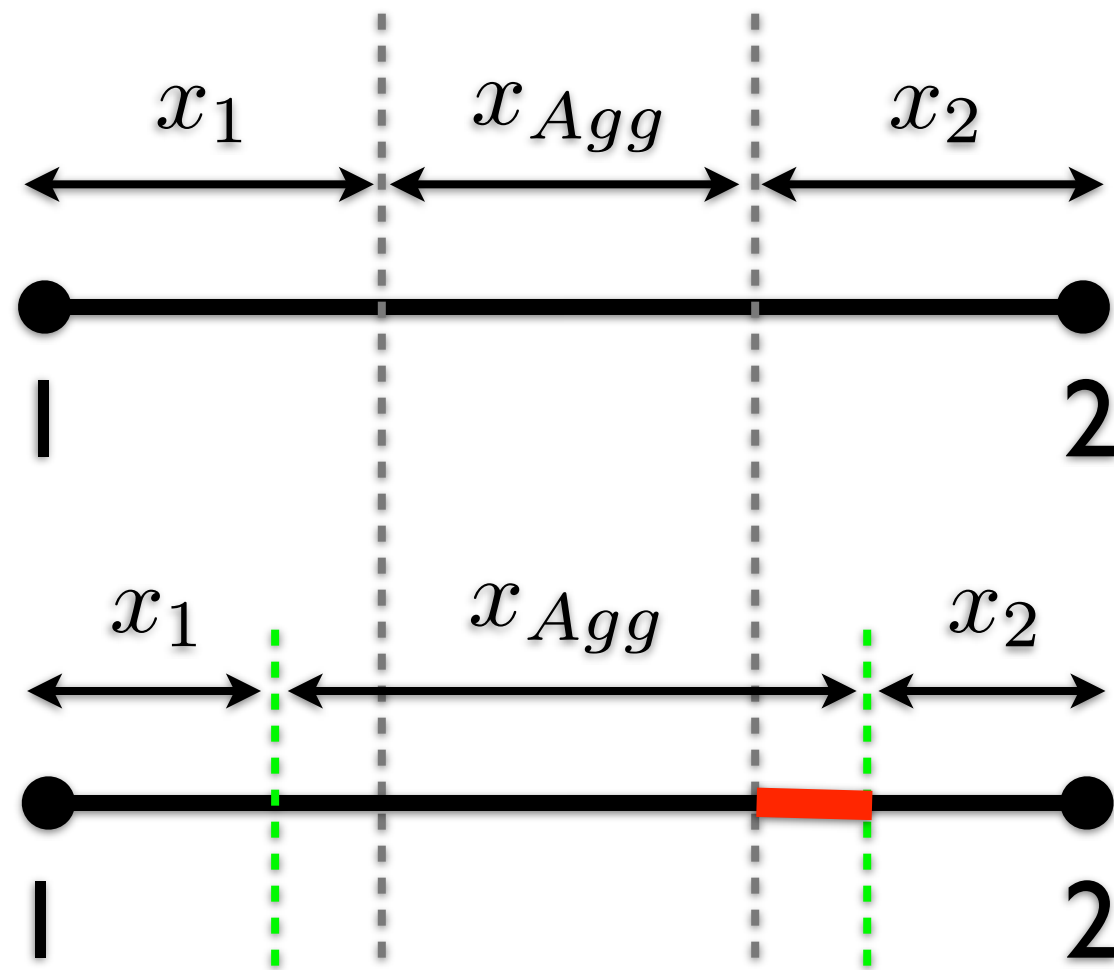




Quality 2 ↑



Quality 2   $\Rightarrow$  Readership Expansion for 1 



Quality 2   $\Rightarrow$  Readership Expansion for 1   $\Rightarrow$  Quality 1 

**Strategic Complements**

# Aggregator (Specialization)

For given symmetric equilibrium  $\mu$

- Market share of the aggregator is  $2\beta\mu$  ( $\beta\mu$  from each)
- Business-stealing effect:  $\beta\mu$
- Readership-expansion effect:  $\beta\mu\delta\mu$

Readership-expansion effect dominates Business-stealing effect if

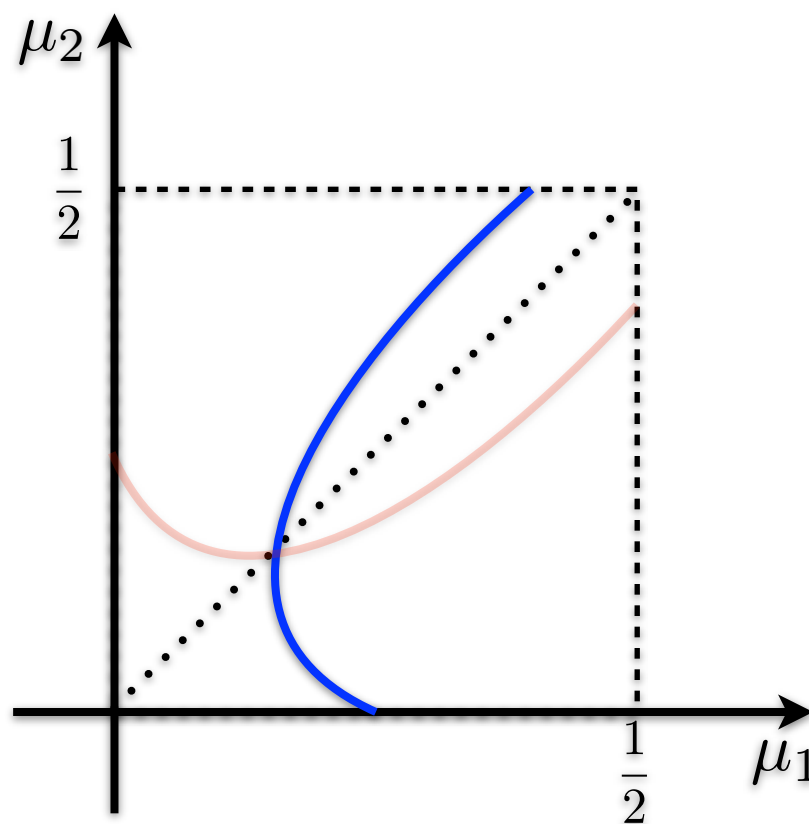
$$\beta\mu < \beta\mu\delta\mu \Leftrightarrow \delta\mu > 1$$

# Aggregator (Specialization)

**Proposition 4.** *Given max differentiation, there is a unique symmetric equilibrium, in which newspapers invest in disjoint sets of issues;*

$$1) \mu^M = \frac{1}{2}, \text{ if } c \leq \frac{\delta}{2} - \frac{\beta}{2} + \frac{3}{4}\delta\beta$$

$$2) \mu^M = \frac{(-\beta + 2\delta\beta - 2c) + \sqrt{(-\beta + 2\delta\beta - 2c)^2 + 2\delta^2\beta}}{\delta\beta}, \text{ if } c > \frac{\delta}{2} - \frac{\beta}{2} + \frac{3}{4}\delta\beta$$

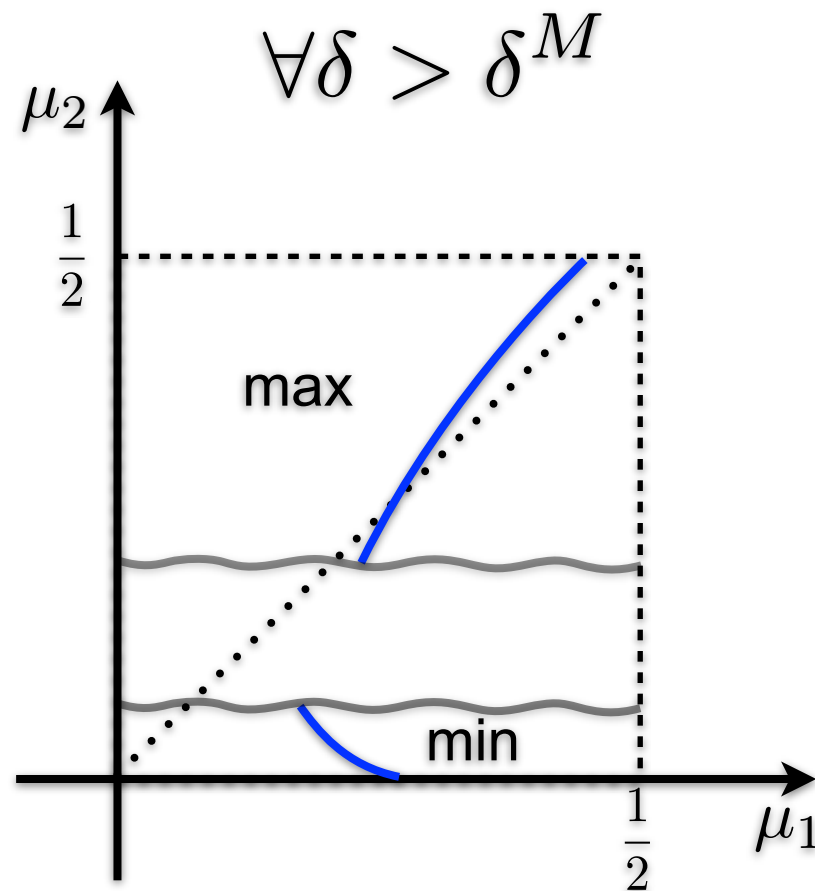


# Aggregator

**Proposition 5.** *There exist  $0 < \delta^m \leq \delta^M$  such that*

*$\forall \delta < \delta^m$  the min differentiation is the unique class of eq*

*$\forall \delta > \delta^M$  the max differentiation is the unique class of eq.*





# Extension (Opting out)

- Publishers can remove their contents from Google news (opt out).
- However, fewer than 1 percent have opted out of the service,  
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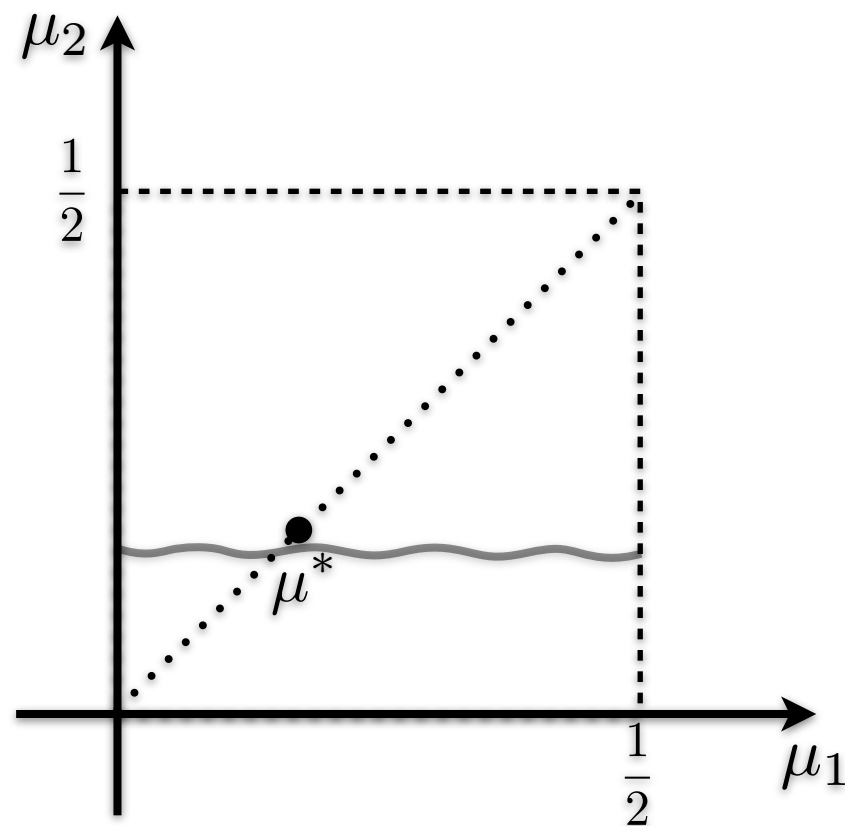
**Proposition 6.** *When opting out option is available to each newspaper,*

*i) among the continuum of min differentiation equilibria,  
only the equilibrium quality without the aggregator  
survives opting out*

*ii) max differentiation (specialization) eq survives for  
high  $\delta$*

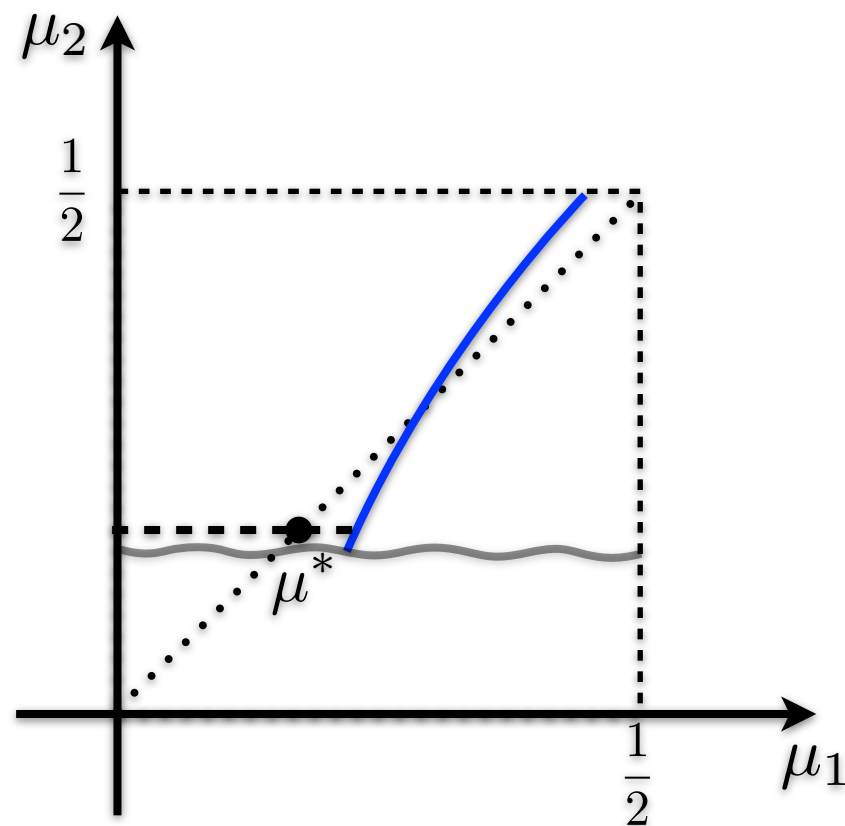
# Comparison: Quality

**Proposition 7.** *In the maximum differentiation equilibrium, the quality of newspapers increases compared to case of no aggregator,  $\mu^M \geq \mu^*$*



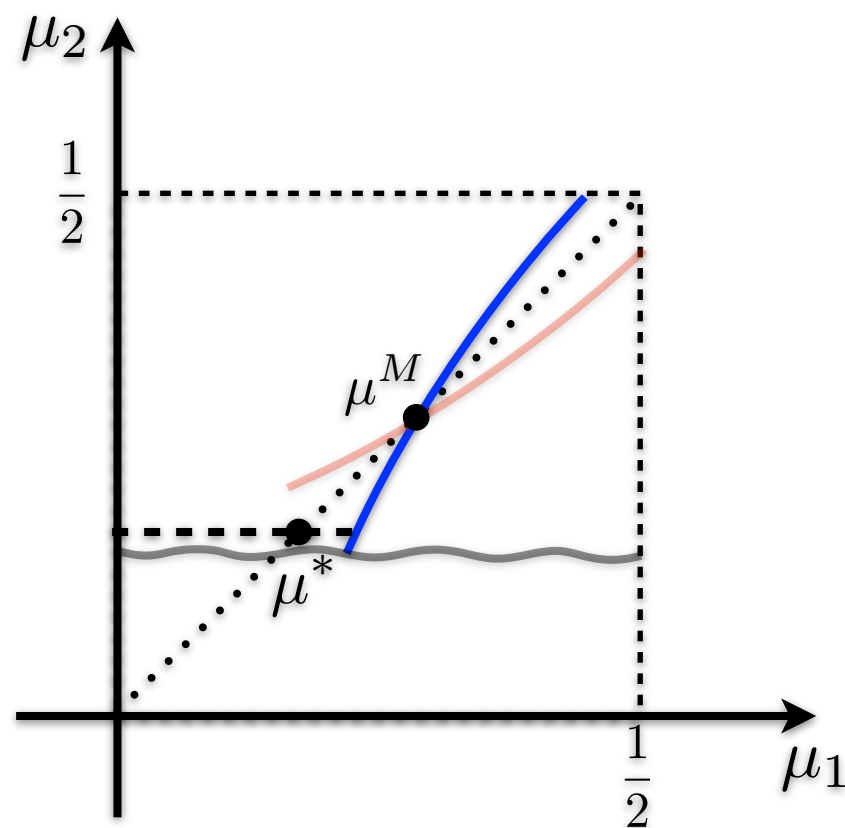
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# Comparison: Consumer Surplus, Profit and Welfare

**Proposition 8.** *If the presence of the aggregator leads to the specialization equilibrium*

*i) Consumer surplus increases,  $CS^M > CS^*$ .*

*ii) The profits of newspapers increases if the cost is low, and*

*decreases otherwise  $\exists \hat{c} \mid \forall c > \hat{c} : \pi^M < \pi^*$*

$$\forall c < \hat{c} : \pi^M > \pi^*$$

*iii) Social welfare is higher.*

# Discussions: Effect on Profits

$$\pi_i(s_i) = \omega \alpha_i [1 + \delta \mu(s_i)] - c \mu(s)^2$$

What matters is not  $c$ , but  $c/\omega$ , where  $\omega$  is ad revenue per attention. Because of **advertising congestion**, Internet lowers  $\omega$  and hence aggregators are likely to reduce newspapers' profit (Anderson, Foros, Kind and Peitz 2012)

# Contents from Third Parties

- In the model of two newspapers, a single newspaper can reduce the market share of the aggregator to zero
- If there are many news sites (large and small), this is impossible
- Extension: we introduce  $u_T$ , the utility that each consumer can get through the aggregator (from third parties' content) even if both newspapers opt out.



# Contents from Third Parties

**Proposition 9.** *Suppose that the utility from third party content is high enough  $u_T \geq \frac{\Delta u}{2} \max\{1, \frac{3}{\delta}\}$*

*i) The maximum differentiation,  $\mu(s_1 \cap s_2) = 0$ , is a dominant strategy for each newspaper.*

*ii) For all  $\delta \geq 0$  newspapers' quality choices are strategic complements.*

*iii) For all  $\delta \geq 0$  there is a unique symmetric equilibrium,  $\mu^T$ , where newspapers invest on disjoint set of issues,*

$$\delta \in [0, \underline{\delta}^T] \quad \mu^T = 0$$

$$\delta \in [\underline{\delta}^T, \bar{\delta}^T] \quad 0 < \mu^T < \frac{1}{2}$$

$$\delta \in [\bar{\delta}^T, \infty) \quad \mu^T = \frac{1}{2}$$

# Contents from Third Parties

- *The value of  $\delta$  is the key parameter.*
- *Empirical studies* allow us to pin down a lower bound of  $\delta$  :
  - ▶ **Chiou and Tucker (2012)** exploit a contract dispute which led Google News to remove the content from AP. They show that the presence of the AP content on Google News would have increased traffic to the news sites indexed by Google News
  - ▶ **Athey and Mobius (2012)** find that after adding content from new local outlets to Google News, traffic increases not only to these new outlets but also to the old outlets.

$$\frac{\partial \pi^T}{\partial u_T} \Big|_{\mu^T = cst} > 0 \Leftrightarrow \delta \mu^T > 1$$

**Readership-expansion effect** dominates **Business-stealing effect**

# Contents from Third Parties

**Proposition 10.** *If  $\delta\mu^T \geq 1$  :*

- i) The presence of aggregator improves the quality,  $\mu^T \geq \mu^*$*
- ii) When the aggregator is present, each newspaper has no incentive to opt out*
- iii) The presence of the aggregator increases consumer surplus and social welfare.*

# Conclusion

Impact of news aggregator on the quality choices of newspapers

- Changes the strategic interactions of quality choices from *strategic substitutes* to *strategic complements*.
- Specialization Eq in the presence of aggregator and higher quality
- However, specialization is likely to weaken newspapers' role as curators