

News Aggregators and Competition among Newspapers in the Internet

Doh-shin Jeon (Toulouse School of Economics)

Nikrooz Nasr (Toulouse School of Economics)

March, 2012

Outline

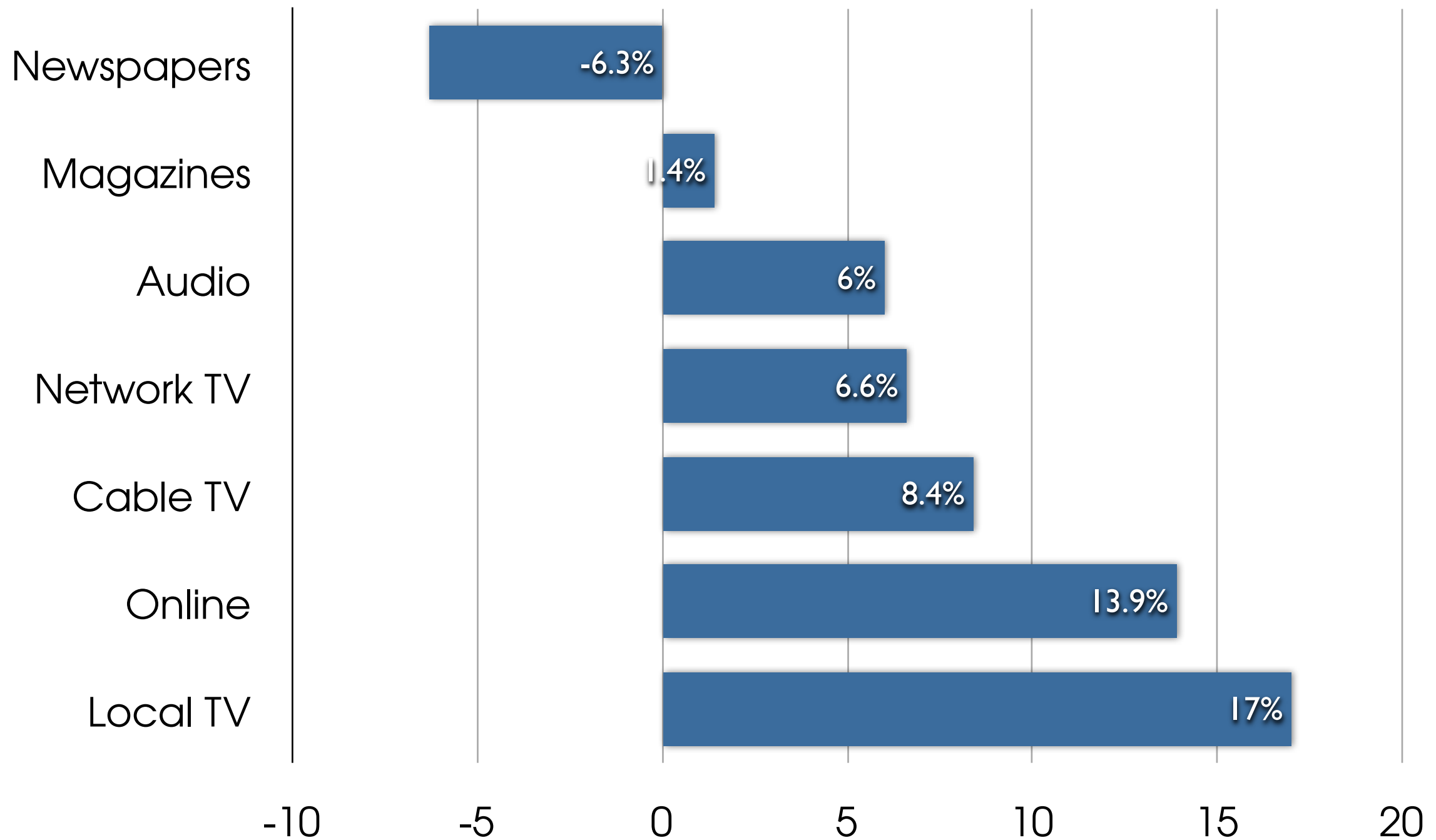
- Stylized Facts (The Advent of Internet)
- Debate (Puzzle)
- Model
- No Aggregator
- Aggregator
- Extension: Opting out
- Comparison
- Conclusion

Stylized Facts

I Advertising Revenue of Newspapers

- 45% cut since 2000 (FTC, 2010)
- 80% of revenues came from advertising, and 20% came from selling (FTC, 2010)
- The newspapers are the worst in the news media

Percentage change in Ad revenue, 2009-2010



Source: The State of News Media

Stylized Facts

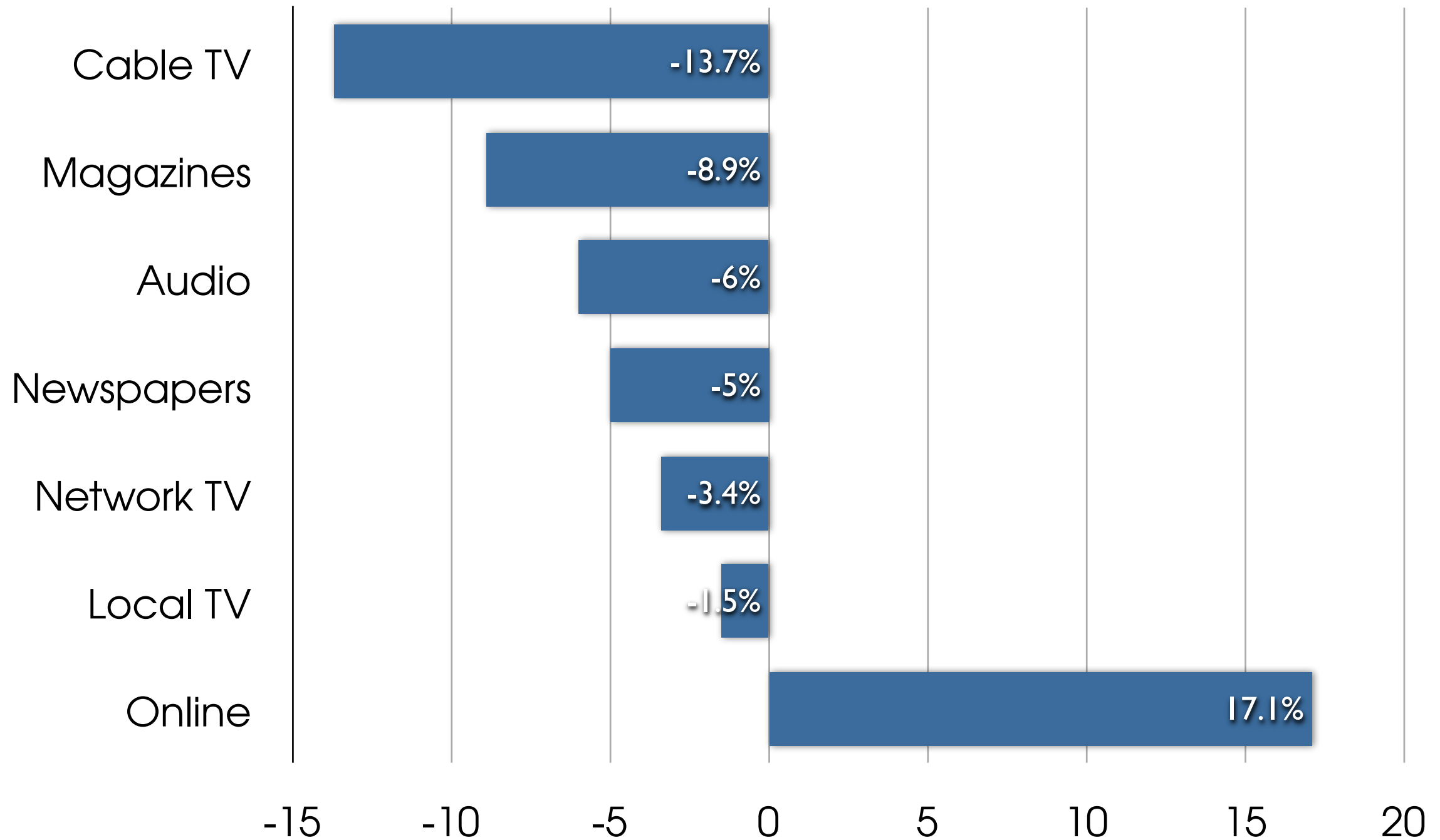
I Advertising Revenue of Newspapers

- 45% cut since 2000 (FTC, 2010)
- 80% of revenues came from advertising, and 20% came from selling (FTC, 2010)
- The newspapers are the worst in the news media

II Audiences

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

Percentage change in Audience, 2009-2010



Source: The State of News Media

Stylized Facts

I Advertising Revenue of Newspapers

- 45% cut since 2000 (FTC, 2010)
- 80% of revenues came from advertising, and 20% came from selling (FTC, 2010)
- The newspapers are the worst in the news media

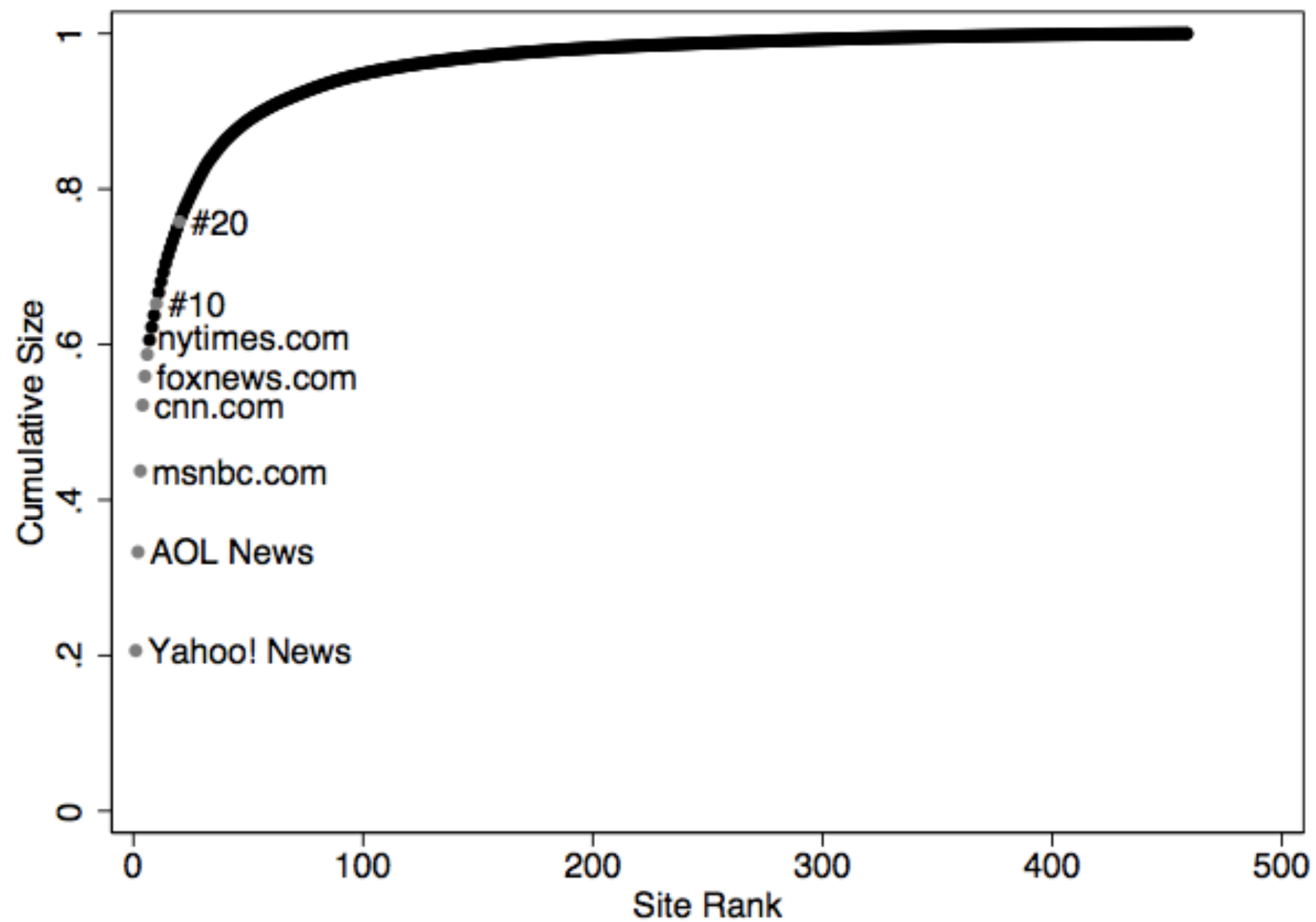
II Audiences

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

III Aggregator

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

Cumulative Distribution of Internet Visits in Online Media



Source: Gentzkow and Shapiro (2010)

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](#)[Headlines](#)[All news](#)[All news](#)

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

[See all 413 sources »](#)

Newsday (...)



San Franci...



Los Angel...



abc7.com



San Franci...



California ...



ABC

Gibbs to counter GOP message in New Hampshire

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...

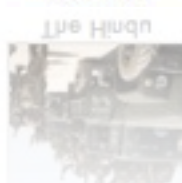
Syrians pour across the border after crackdown

The Associated Press - 15 minutes ago

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

a northern town that was spinning out of government control, fleeing a military crackdown that sent elite forces backed by helicopters and tanks into BEIRUT (AP) - Syrians poured across the border Monday to refugee camps in Turkey, The Associated Press - 15 minutes ago

Syrians pour across the border after crackdown

Washington bureau reports: reports in the northern part of the country

Related

Johannes Mehserle »
Oscar Grant »
Oakland, California »

Recent

Reports: US man held in Egypt as Israeli spy

msnbc.com - 16 minutes ago

FTSE stages modest recovery, led by ENRC

Reuters - 19 minutes ago

US STOCKS-Futures tick higher after six weeks of S&P losses

Reuters - 24 minutes ago

[Midi-Pyrénées, France »](#) - [Edit](#)

Jane Avril: Toulouse-Lautrec's muse

Telegraph.co.uk - 2 hours ago

New Toulouse - Manchester flights from Jet2

Guide 2 Midi-Pyrenees - Jun 10, 2011

Building a garden pond - Kingdom Vegetal garden centre, Boulogne sur Gesse

Guide 2 Midi-Pyrenees - May 27, 2011

Spotlight »

Rule by Rentiers

New York Times - Jun 9, 2011

Getting Divorced or Separated? 7 Financial Mistakes Not to Make

WalletPop - Jun 9, 2011

Apple AirPlay set for quick takeoff

CNN - Jun 10, 2011

IBM Researchers Create High-Speed Graphene Circuits

New York Times - Jun 9, 2011

Chicago Police Brace for 'Flash Mob' Attacks

New York Times - Jun 9, 2011

Circuits

IBM Researchers Create High-Speed Graphene

CNN - Jun 10, 2011

Apple AirPlay set for quick takeoff

Debate

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:

"The people who simply just pick up everything and run with it – steal our stories, we say they steal our stories – they just take them."

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

Debate

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
“Copyright reform” in U.S, and “Google tax” in France

"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

Debate

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

Main Results

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

- changes strategic interactions of quality choices of newspapers from strategic substitutes to strategic complements.
- lead to specialized newspapers
- increases the average quality of newspapers
- improve the consumer surplus
- increases(decreases) the profit of newspapers if cost of investment is low(high).

Model (Newspapers)

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

- **Ideological view:** Hotelling model



Model (Newspapers)

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

- **Ideological view:** Hotelling model
- **Quality:** S , set of (a continuum of) issues which newspapers cover
Each issue could be covered as high quality or low quality. $\mu(S) = 1$

Model (Newspapers)

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

- **Ideological view:** Hotelling model
- **Quality:** S , set of (a continuum of) issues which newspapers cover
Each issue could be covered as high quality or low quality. $\mu(S) = 1$
- **Strategy:** $s_i \subset S$, set of issues which newspaper invest to cover them with high quality.
- **Advertising revenue:** contents are free

Model (Consumers)

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

- **Ideological view:** Hotelling model
- **Quality:** S , set of (a continuum of) issues which newspapers cover
Each issue could be covered as high quality or low quality. $\mu(S) = 1$
- **Strategy:** $s_i \subset S$, set of issues which newspaper invest to cover them with high quality.
- **Advertising revenue:** contents are free

Consumers a unit mass of consumers distributed uniformly

- **Ideological view:** the location of a reader represents his/her ideological view.



Model (Consumers)

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

- **Ideological view:** Hotelling model
- **Quality:** S , set of (a continuum of) issues which newspapers cover
Each issue could be covered as high quality or low quality. $\mu(S) = 1$
- **Strategy:** $s_i \subset S$, set of issues which newspaper invest to cover them with high quality.
- **Advertising revenue:** contents are free

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

- spends unit(s) of attention on it
- gets some utility.

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

Model (Payoffs)

Consumers Depending on the quality of an article, each consumer

- spends unit(s) of attention on it
- gets some utility.
- 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 half the issues).

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

Model (Payoffs)

Newspapers

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

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

Model

Assumptions (δ, β, c)

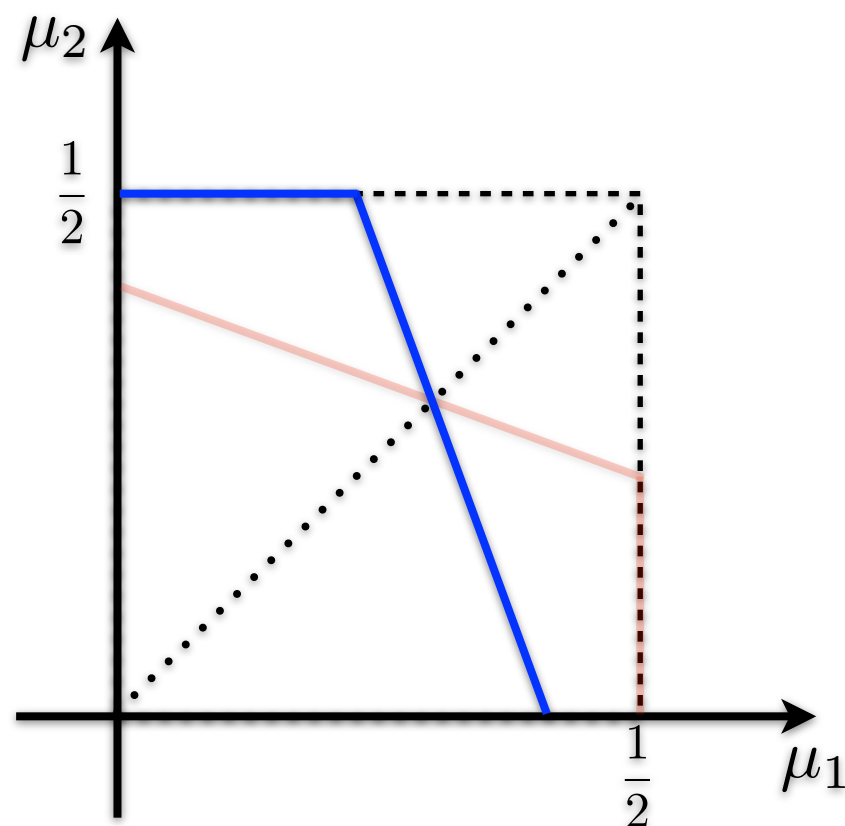
- $t < u_0$
- $0 \leq \beta = \frac{\Delta u}{t} < 1$
- $c > \frac{\delta\beta}{4} + \frac{\delta}{2} + \frac{\beta}{2}$

Timing

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

No Aggregator

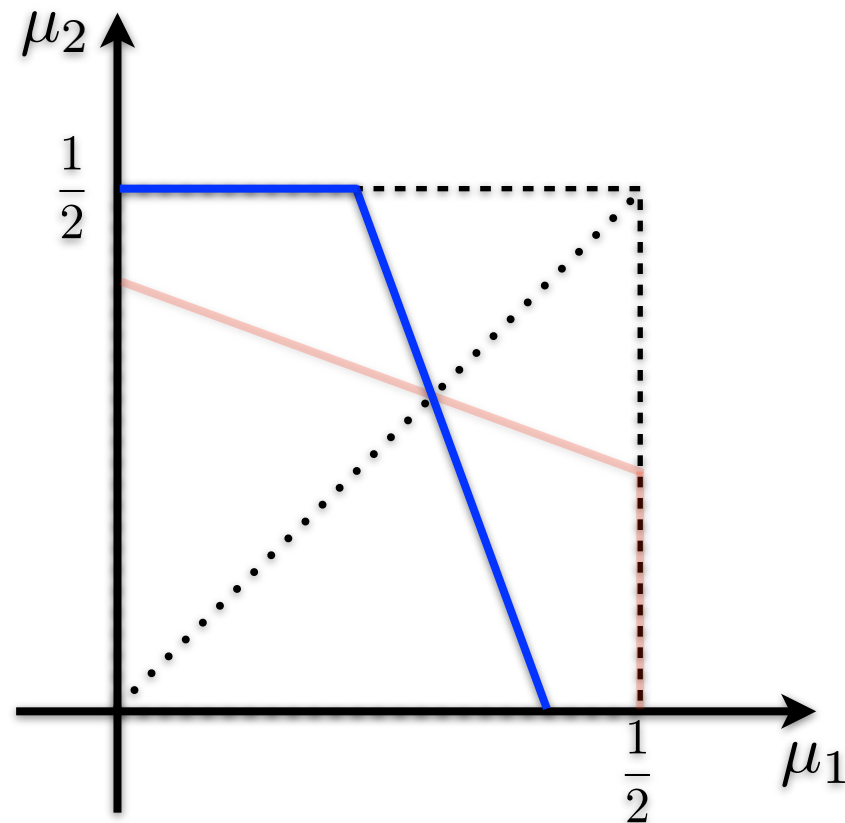
Lemma 1. *Newspapers' choice of average quality, μ_i , are strategic substitutes, in the absence of aggregator.*



No Aggregator

Lemma 1. *Newspapers' choice of average quality, μ_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 the articles on its site with a link to the original article.
- For a given issue, if it is covered by high quality, the aggregator finds and publishes it, but if there is no high quality article, the aggregator publishes a low quality one.
- For a given issue, if the quality of both newspapers are 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

Model (Aggregator)

Aggregator and Consumers

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

Aggregator and Newspapers

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

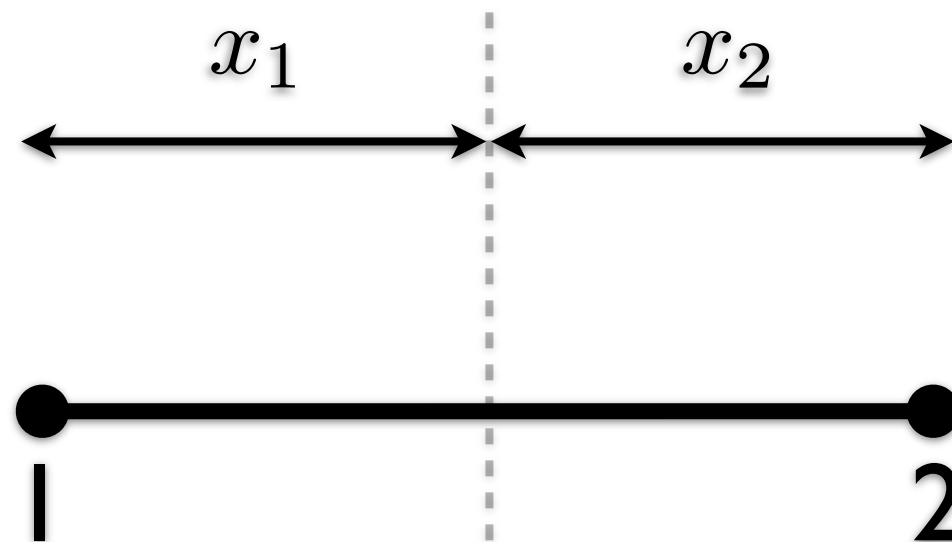
Model (Aggregator)

Aggregator and Consumers

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

Aggregator and Newspapers

- **Business Stealing Effect:** Steals the readers who would be loyal to newspapers otherwise. Consumers are redirected to newspapers only for high quality, and spend δ attention on newspaper



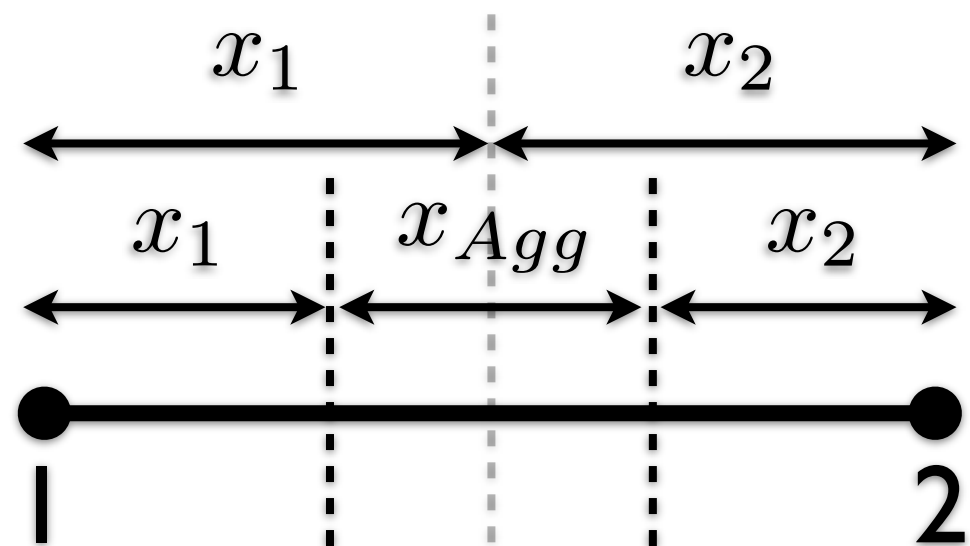
Model (Aggregator)

Aggregator and Consumers

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

Aggregator and Newspapers

- **Business Stealing Effect:** Steals the readers who would be loyal to newspapers otherwise. Consumers are redirected to newspapers only for high quality, and spend δ attention on newspaper



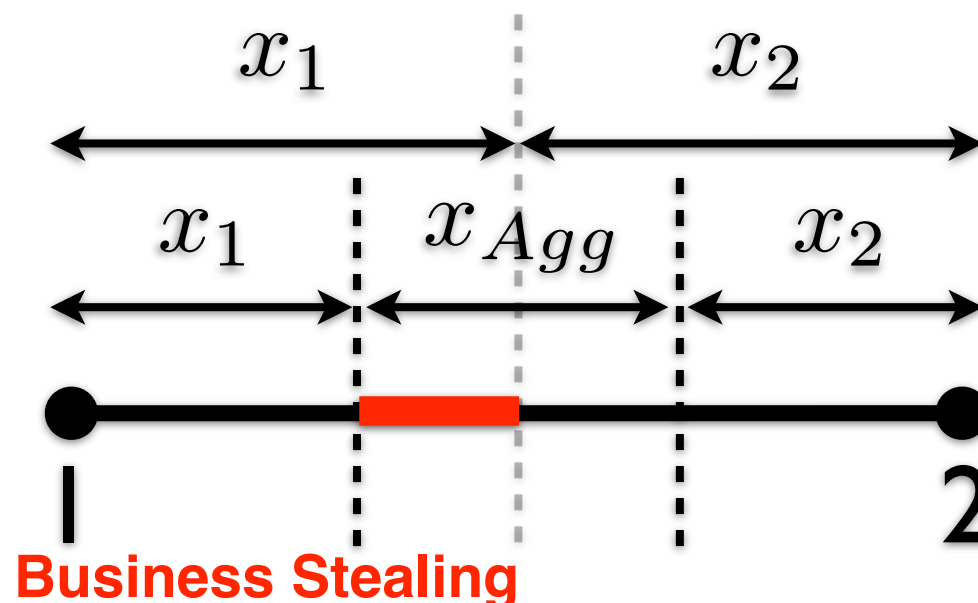
Model (Aggregator)

Aggregator and Consumers

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

Aggregator and Newspapers

- **Business Stealing Effect:** Steals the readers who would be loyal to newspapers otherwise. Consumers are redirected to newspapers only for high quality, and spend δ attention on newspaper



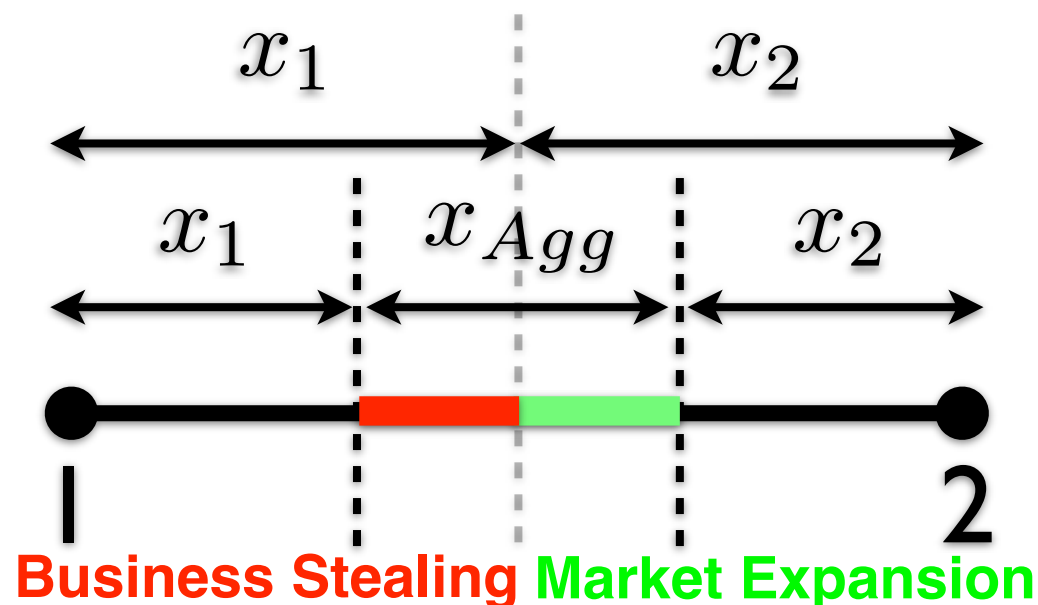
Model (Aggregator)

Aggregator and Consumers

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

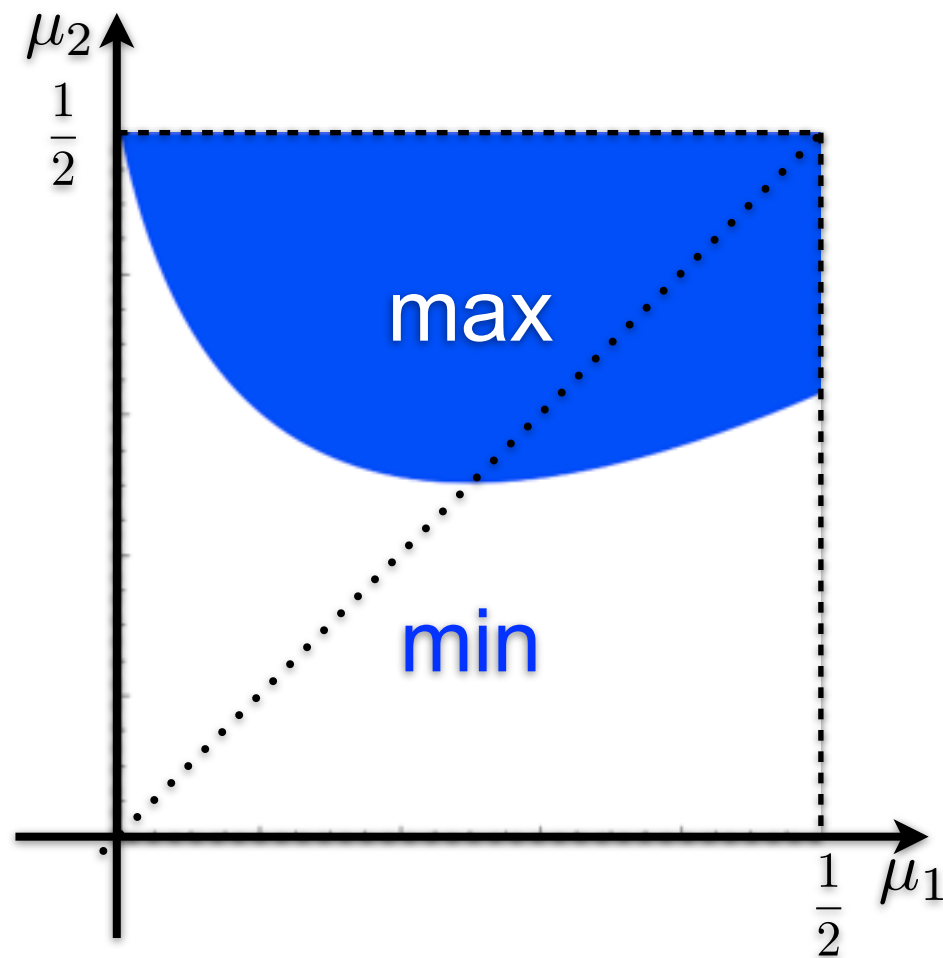
Aggregator and Newspapers

- **Business Stealing Effect:** Steals the readers who would be loyal to newspapers otherwise. Consumers are redirected to newspapers only for high quality, and spend δ attention on newspaper
- **Market Expansion Effect:** Aggregator brings revenue of δ for H contents from readers who would be loyal to the rival otherwise.



Aggregator

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

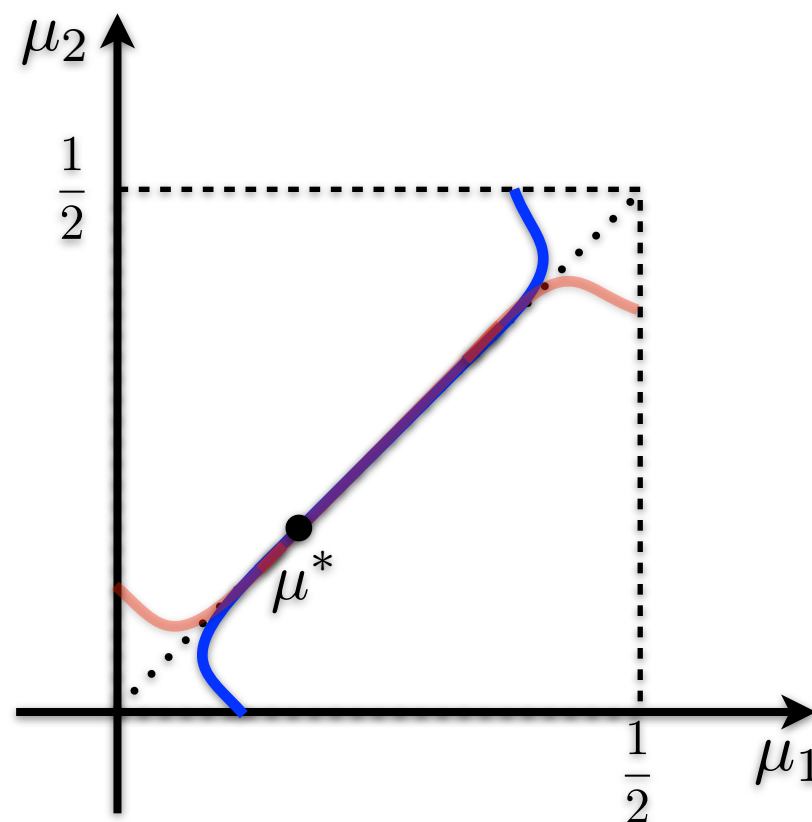


Aggregator (No Specialization)

Proposition 3. *Given min differentiation, there exist(s) symmetric equilibrium(s) in which newspapers invest on the same set of issues;*

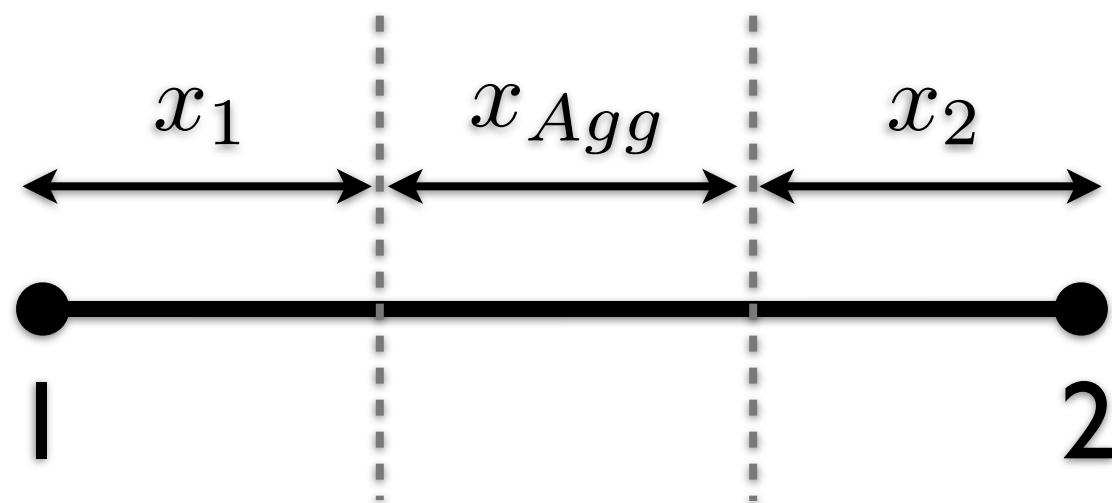
$$1) \mu_1 = \mu_2 = \mu^m \in \left[\frac{\delta}{4c - \delta\beta}, \frac{1}{2} \right], \text{ if } c \leq \frac{\delta}{2} + \frac{\delta\beta}{4} + \beta$$

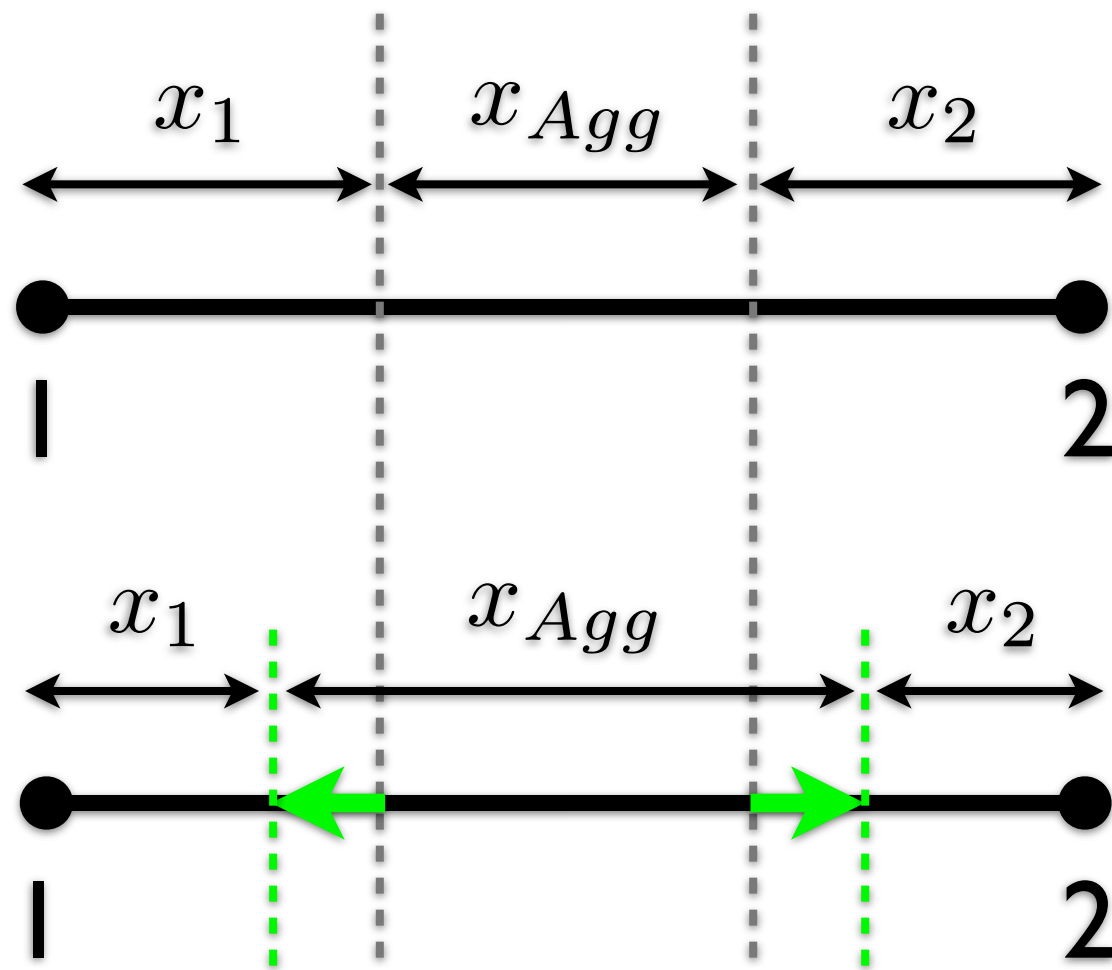
$$2) \mu_1 = \mu_2 = \mu^m \in \left[\frac{\delta}{4c - \delta\beta}, \frac{\delta + 2\beta}{4c - \delta\beta} \right], \text{ if } \frac{\delta}{2} + \frac{\delta\beta}{4} + \beta < c$$



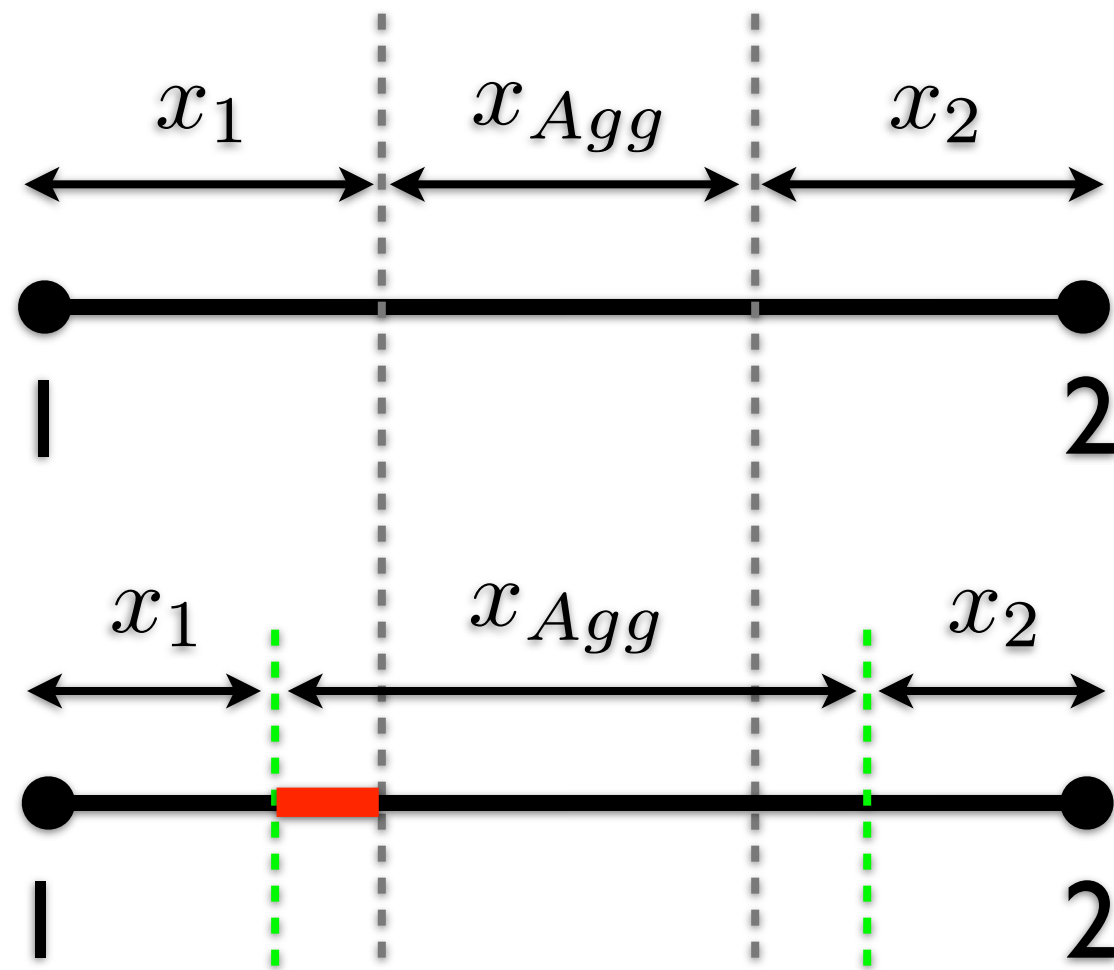
Aggregator (Specialization)

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

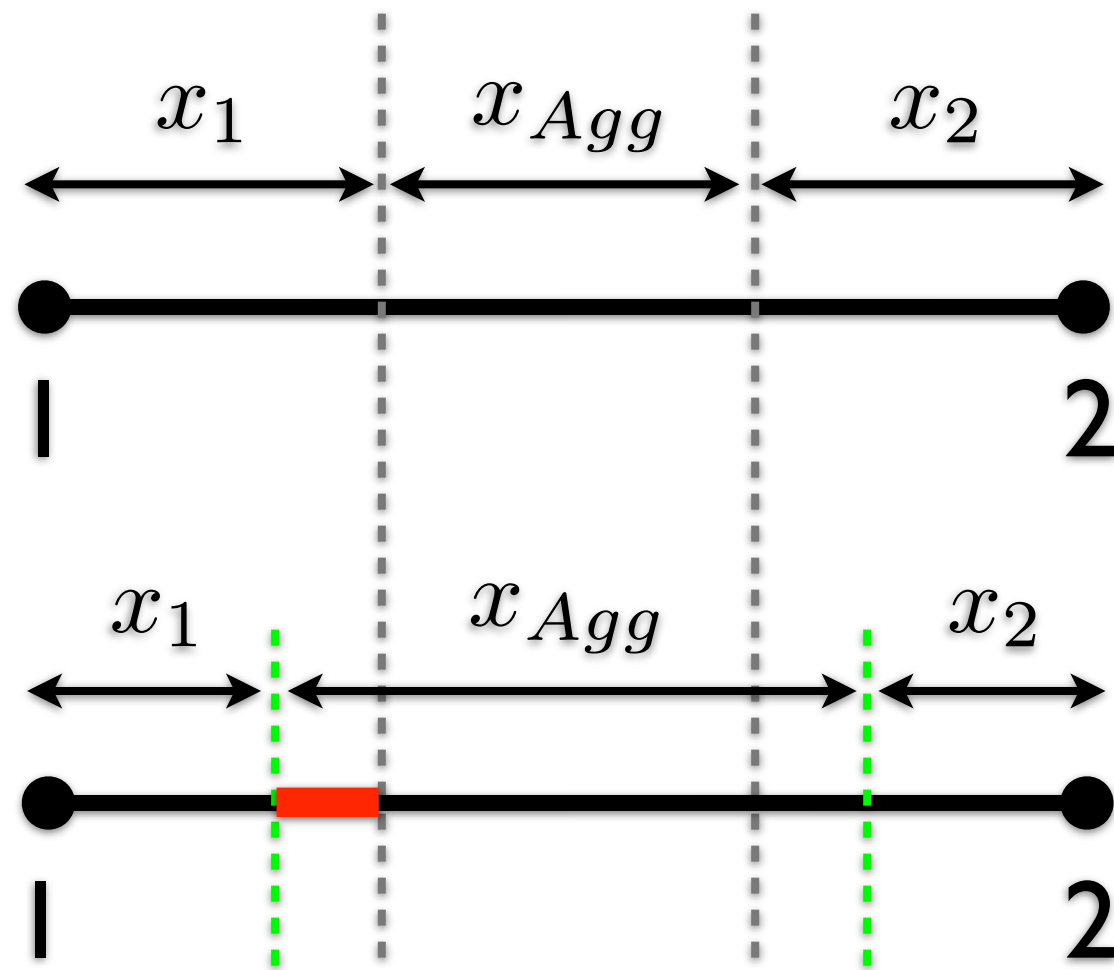




Quality 1 



Quality 1  \Rightarrow Market Expansion for 2 



Quality 1 $\uparrow \Rightarrow$ Market Expansion for 2 $\uparrow \Rightarrow$ Quality 2 \uparrow

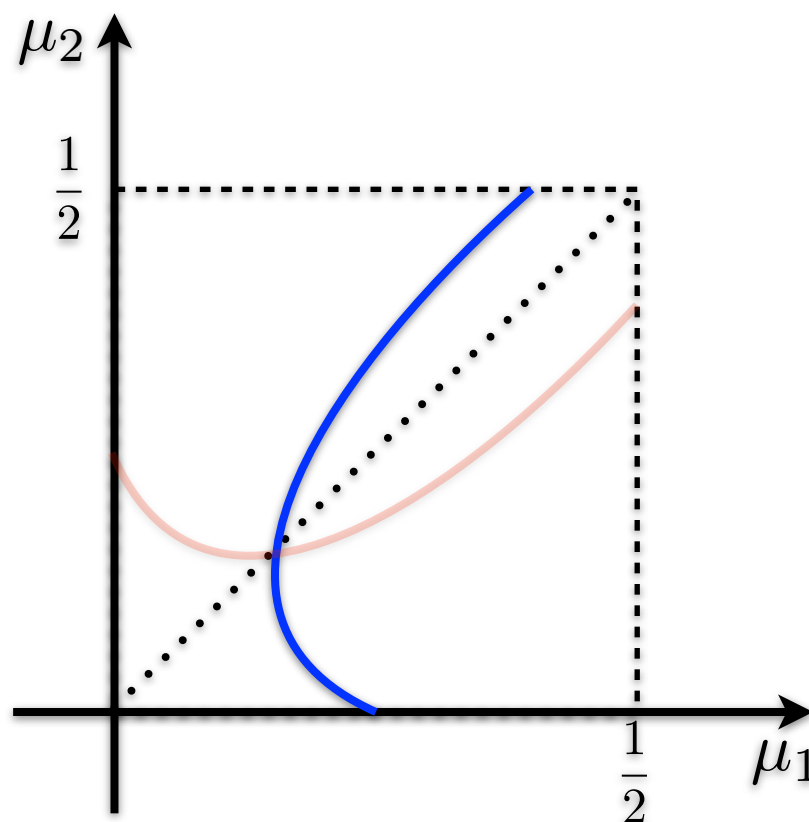
Strategic Complements

Aggregator (Specialization)

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

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

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

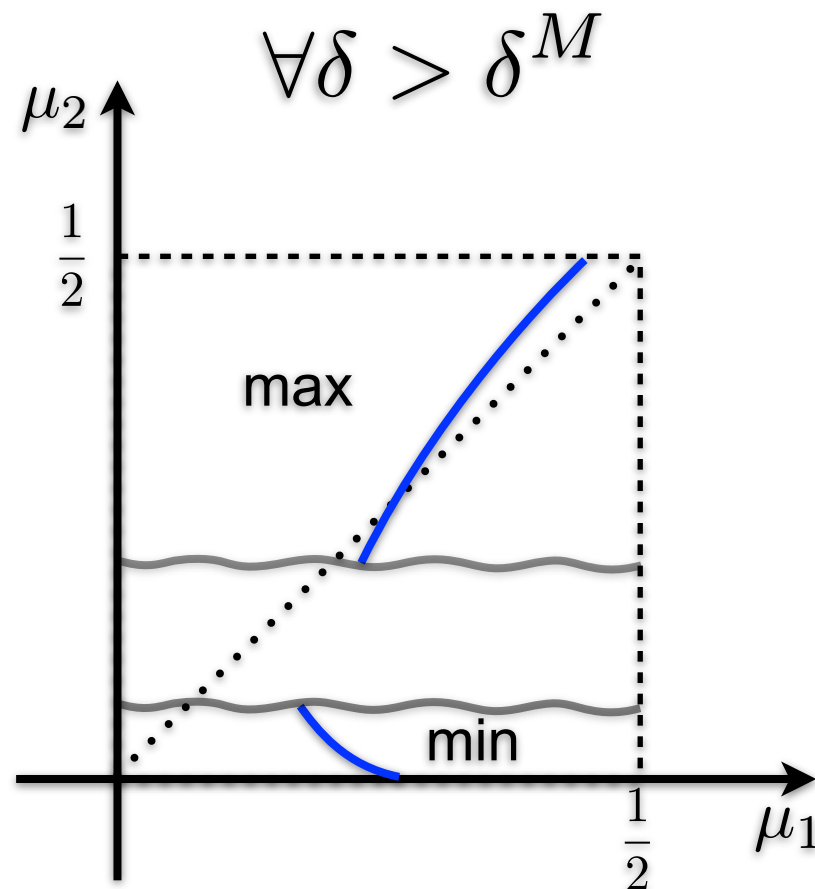


Aggregator

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,
-Josh Cohen, head of Google's news division

Extension (Opting out)

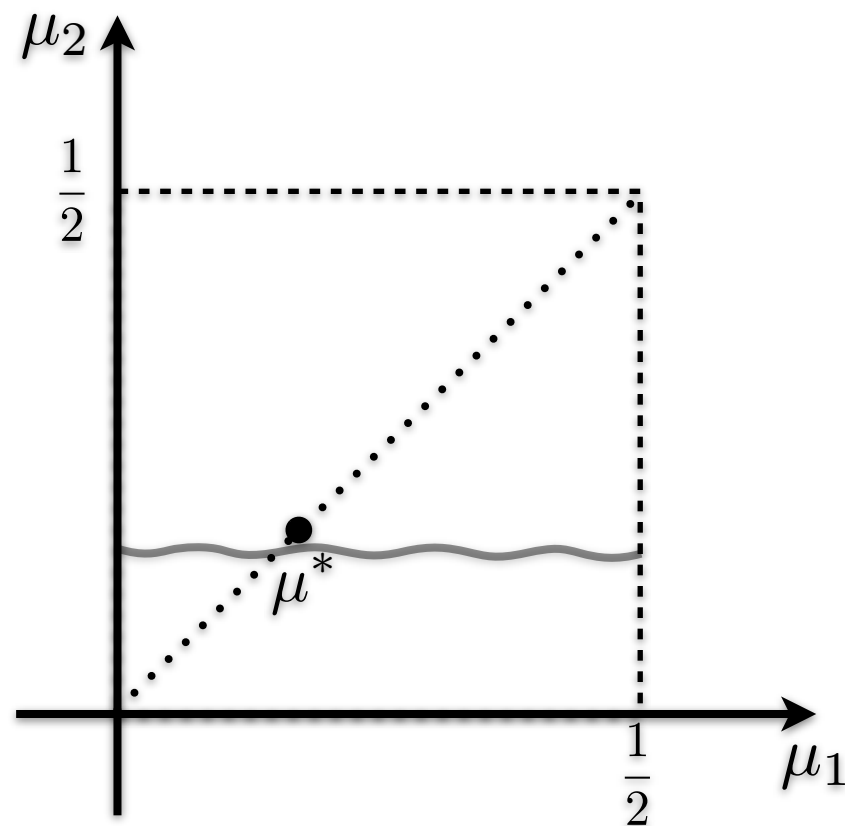
- Publishers can remove their contents from Google news (opt out).
- However, fewer than 1 percent have opted out of the service,
-Josh Cohen, head of Google's news division

Proposition 6. *By introducing opting out option for newspapers*

- i) Always there exists an eq in which every one opts out*
- ii) max differentiation (specialization) eq survive for high δ*

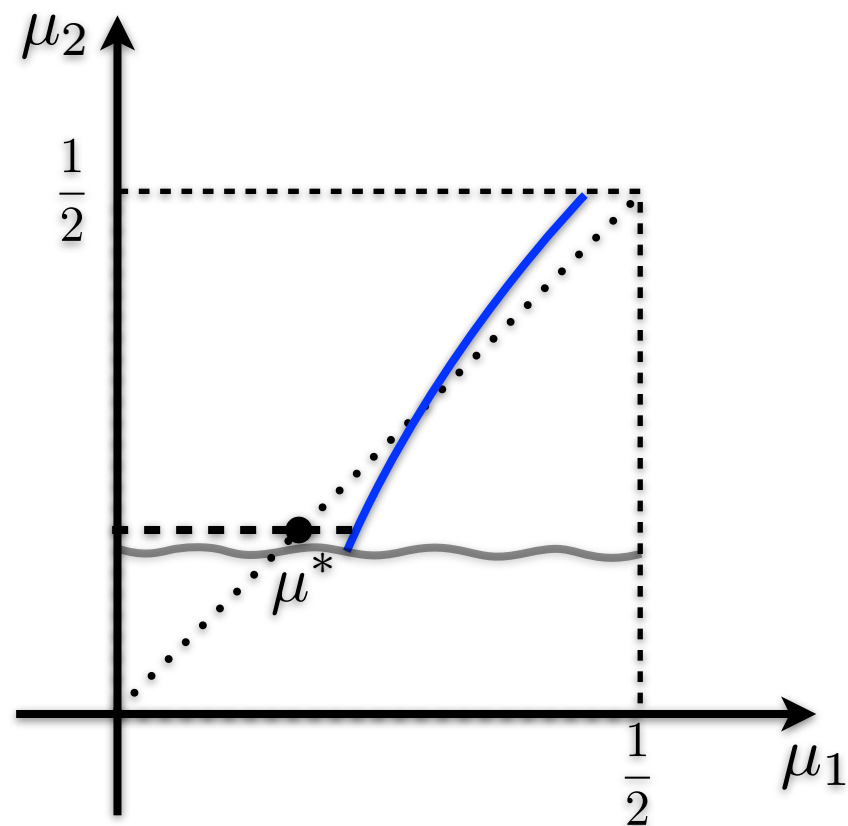
Comparison: Quality

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



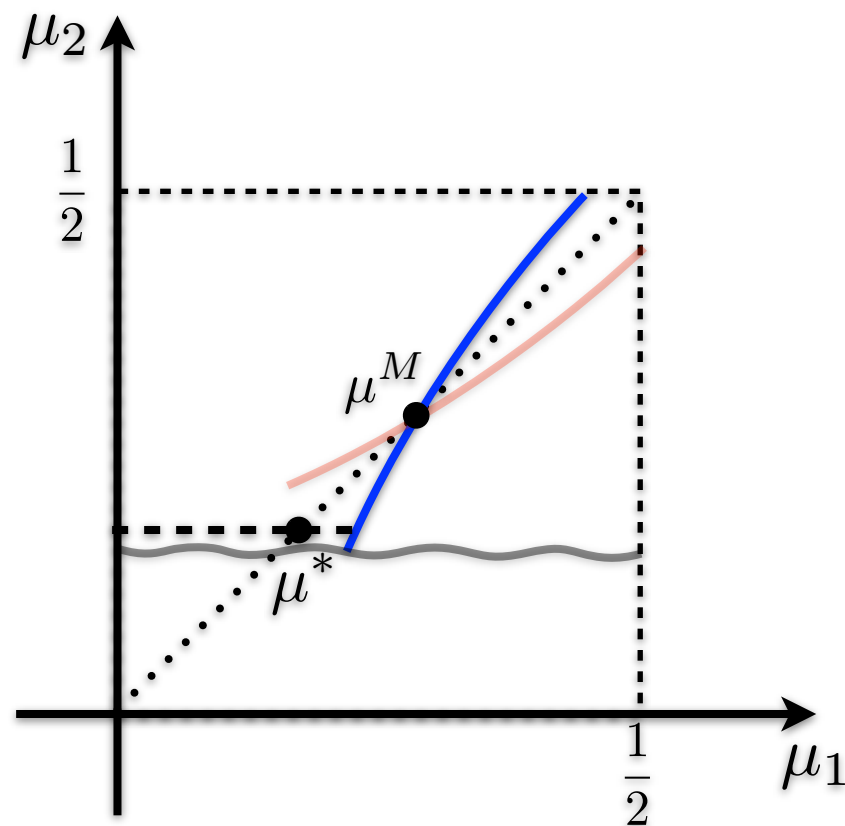
Comparison: Quality

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



Comparison: Quality

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



Comparison: Consumer Surplus and Profit

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

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

Discussions

- What matters is not c , but c/ω , where is ad revenue per attention. As Internet decreases ω , aggregators likely to reduce newspapers profit.
- For $n(>2)$ newspapers, max differentiation eq can exist even when δ is small, which is consistent with the fact that fewer than 1 percent have opted out of Google News.

Conclusion

- The presence of aggregator may lead to specialized newspapers
- The aggregator changes strategic interactions of quality choices of newspapers from strategic substitutes to strategic complements.
- The presence of the aggregator may result in an increase in the quality.
- The aggregator is beneficial for consumers, where as it may harm newspapers.
- Even if the aggregator harms newspapers, each newspaper may prefer to keep its link with the aggregator.