

Two Challenges to Media Markets: High Fixed Costs and Piracy

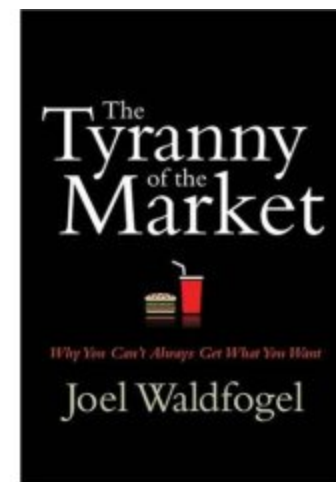
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ENCORE Conference
on Competition in Media Markets, May 29, 2008

How are media products special?

- High fixed costs, low (zero) marginal costs
 - too many products, too few
 - old challenges to appropriability
- Information and behavior
 - voting



New challenges and opportunities for media products

- Piracy
 - Threat to appropriability
- Sophisticated pricing to the rescue?

“Tyranny of the Market”: Theory

- What happens when fixed costs are large?
 - What determines what products are available?
- Is it a problem?

Markets vs Government

- Conventional view: markets good, government bad
- Friedman:
 - The “characteristic feature of action through political channels is that it tends to require or enforce substantial conformity. The great advantage of the market, on the other hand, is that it permits wide diversity. It is, in political terms, a system of proportional representation. **Each man can vote, as it were, for the color of tie he wants and get it**; he does not have to see what color the majority wants and then, if he is in the minority, submit.”
- Markets avoid, and government entails, tyranny of the majority. **Is this right?**



High FC and Differing Preferences

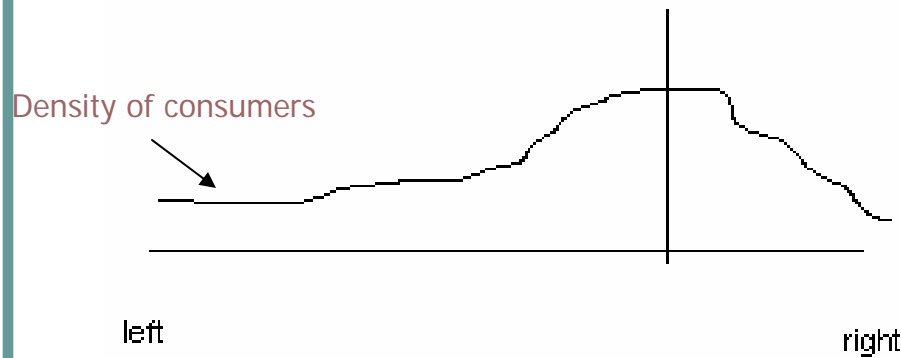
- People benefit each other in markets by helping to make additional products profitable and therefore available.
- Who benefits whom?
 - your satisfaction as a consumer depends on how many share your preferences.
- Tyranny of the majority
 - If there is a single product whose appeal depends on its positioning, then consumers are better off as more people agree with them and worse off as more people disagree

Possible Mechanisms

- entry and positioning
 - Depends on size of FC
- Think of products on a line
 - Density of most preferred products
 - One-dimensional
 - Positive “transport costs”
- Suppose FC large enough to support only one product

Positioning: where does the product locate?

- Here, “lefts” have large transport costs



- Here, “rights” have high transport costs



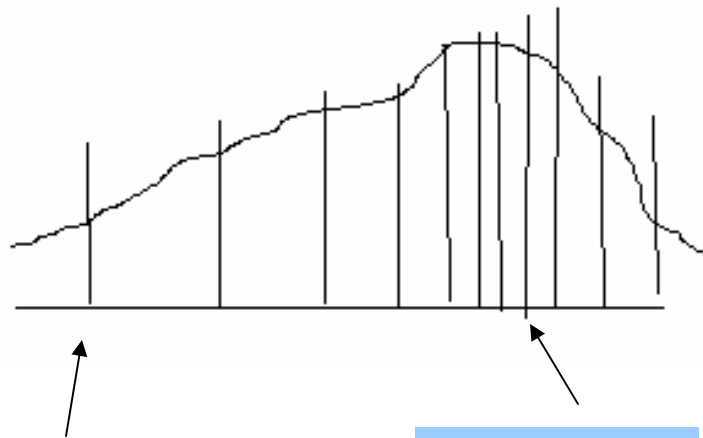
People are happier, as consumers, when more people share their preferences

Entry vs positioning

- Suppose fixed costs are lower but still “substantial”
 - Then get multiple products but get more products nearer denser masses of potential consumers

Entry illustration

- When a lot of people share my preferences, there are more products near our ideal



Far to products

Close to products

“Preference Externalities”

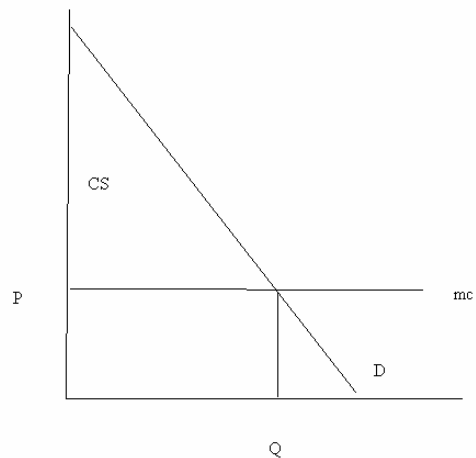
- As more people share my preferences
 - More products targeted to us
 - Greater satisfaction
- As more people disagree with my preferences
 - Entry – no effect on me (“zero across-group effects”)
 - Positioning – the product moves away from me (“negative across group effects”)

...but is it a problem?

- One might have equity concerns
- I'll concentrate on efficiency

Market Success

- The model in the back of our heads:
 - constant marginal costs, no fixed costs



Demand curve shows distribution of consumers' valuations of the product, from highest to lowest

Good costs mc per unit to make, so there are Q units where benefit exceeds cost. Hence the good should be available

Revenue of P per unit covers costs, so good is made available, and consumers get surplus CS

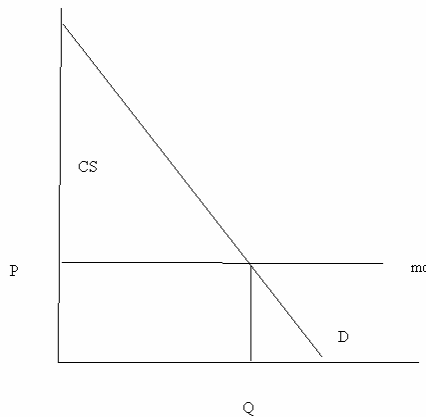
- There is willingness to pay that exceeds cost
 - The good should – and will – be provided.

Market Success, cont'd

- Efficiency:
 - Everything that should be done is done.
 - Things that should not be done aren't.
- Even if demand shrinks, good should - and will - be provided.
- This arises **automatically** unless we interfere
- Gov't regulation creates deadweight loss

But add fixed costs of production

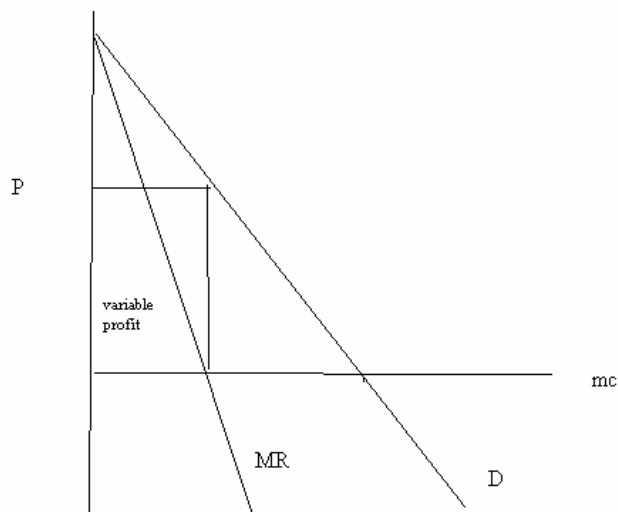
- “first-copy costs,” independent of how many units I produce
 - A big issue for media products
- $TC = F + cq$



- If $CS > F$, entry, production should occur

When does entry occur?

- First entrant is monopolist (unable to perfectly price discriminate)



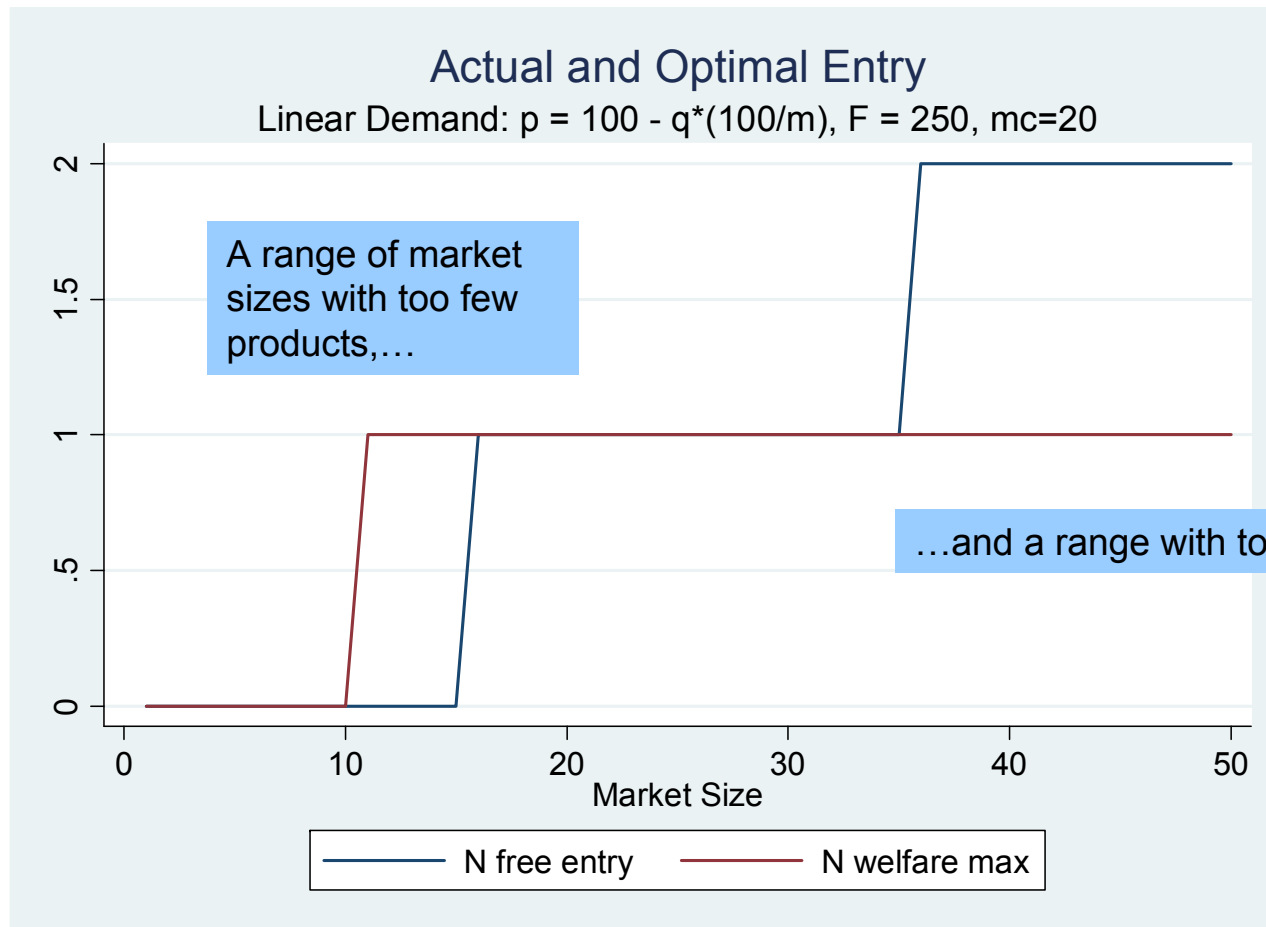
e.g. $p=\$10$, $mc=\$5$,
sell 100 units. Then
“variable profit” =
\$500. Is this enough to
cover fixed costs?

- Viable if variable profit $> F$.
 - Whether it's available depends on whether others also want it!
 - Vs. “Each man can vote, as it were, for the color of tie he wants and get it.”

Perhaps paradoxically...

- ...can also have too many products
- When the market is large it can accommodate lots of firms.
 - Additional firms are good because they put competitive pressure on prices'
 - But – because of fixed costs - costly to society to have additional firms
- In general, too many
 - Old idea: Spence, Dixit & Stiglitz, Mankiw & Whinston

Problems with autopilot summarized



Theory therefore suggests...

- Markets need not avoid “unfortunate” features of politics
- Reliance on markets
 - need not favor efficiency
 - benefits some consumers instead of – or at the expense of - others
- In particular, expect inefficient underprovision to small groups with atypical preferences
 - Small markets
 - Minority groups even within large geographic markets

Evidence

- Local media markets provide good examples
 - Distinct local markets
 - Good data on products, consumption
 - High – exclusively – fixed costs
 - Illustrate WBW and TOM phenomena
- Start with information on preferences

TABLE 1 Listening Preferences by Group and Format

Format	% of Group Listening		% of Format Listening That Is Hispanic	Cumulative % of Group Listening	
	Hispanic	Non-Hispanic		Hispanic	Non-Hispanic
Narrowly Hispanic-targeted					
Hispanic	45.74%	.53%	96.19%	45.74%	.53%
Hispanic overlap					
Contemporary Hit Radio	8.59%	6.01%	29.50%	54.33%	6.54%
Contemporary Hit Radio/Urban	6.36%	4.24%	30.51%	60.69%	10.79%

Hispanics and non-Hispanics listen to different radio

Format	% of Group Listening		% of Format Listening That Is Black	Cumulative % of Group Listening	
	Black	Non-Black		Black	Non-Black
Narrowly black-targeted					
Black	32.52%	1.70%	81.70%	32.52%	1.70%
Black/Adult Contemporary	18.31%	.77%	84.79%	50.83%	2.47%
Gospel	3.84%	.09%	90.58%	54.67%	2.56%
Black/Oldies	2.42%	.07%	89.49%	57.10%	2.63%
Black/Gospel	1.77%	.03%	94.24%	58.87%	2.65%
Black/Talk	1.40%	.03%	91.33%	60.27%	2.68%
Black overlap					
Contemporary Hit Radio	7.68%	2.67%	40.17%	67.95%	5.35%
Jazz	6.47%	2.32%	39.44%	74.41%	7.67%
Religious	2.50%	1.19%	32.94%	76.91%	8.85%

Blacks and whites listen to different radio

TV Preferences

- The top 10 shows among black viewers (recently)
 - (1) Girlfriends (UPN)
 - (2) NFL Monday Night Football (ABC)
 - (3) Half and Half (UPN)
 - (4) Second Time Around (UPN)
 - (5) One on One (UPN)
 - (6) Eve (UPN)
 - (7) NFL Monday Showcase (ABC)
 - (8) Kevin Hill (UPN)
 - (9) America's Next Top Model (UPN)
 - (10) CSI: NY (CBS).

2, 7, 10
In top 10 for
all viewers

The average overall ranking of the remainder is **96**
(among 141 ranked shows).

Newspaper Preferences

- Tabloid/broadsheet shares differ sharply across zip codes
- Whiter zip codes prefer more “hard” news
- Preferences differ sharply

Music Preferences in the Netherlands and France (vs US)

Billboard.biz

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Charts

INTERNATIONAL CHARTS

NETHERLANDS
SINGLES
Issue Date: May 24, 2008

This Week	Last Week	Label		
1	1	WIT LICHT	MARCO BORSATO	UNIVERSAL
2	2	4 MINUTES	MADONNA FT. JUSTIN TIMBERLAKE	WARNER BROS.
3	3	THIS IS THE LIFE	AMY MACDONALD	VERTIGO
4	6	24 UUR VERLIEFD	GERARD JOLING	NRGY
5	5	MERCY	DUFFY	A&M

NETHERLANDS
ALBUMS
Issue Date: May 24, 2008

This Week	Last Week	Label		
1	1	MADONNA	HARD CANDY	WARNER BROS.
2	3	AMY WINEHOUSE	BACK TO BLACK	ISLAND
3	2	AMY MACDONALD	THIS IS THE LIFE	VERTIGO
4	7	NICK & SIMON	VANDAAG	ARTIST & COMPANY
5	4	DUFFY	ROCKFERRY	A&M

Charts

INTERNATIONAL CHARTS

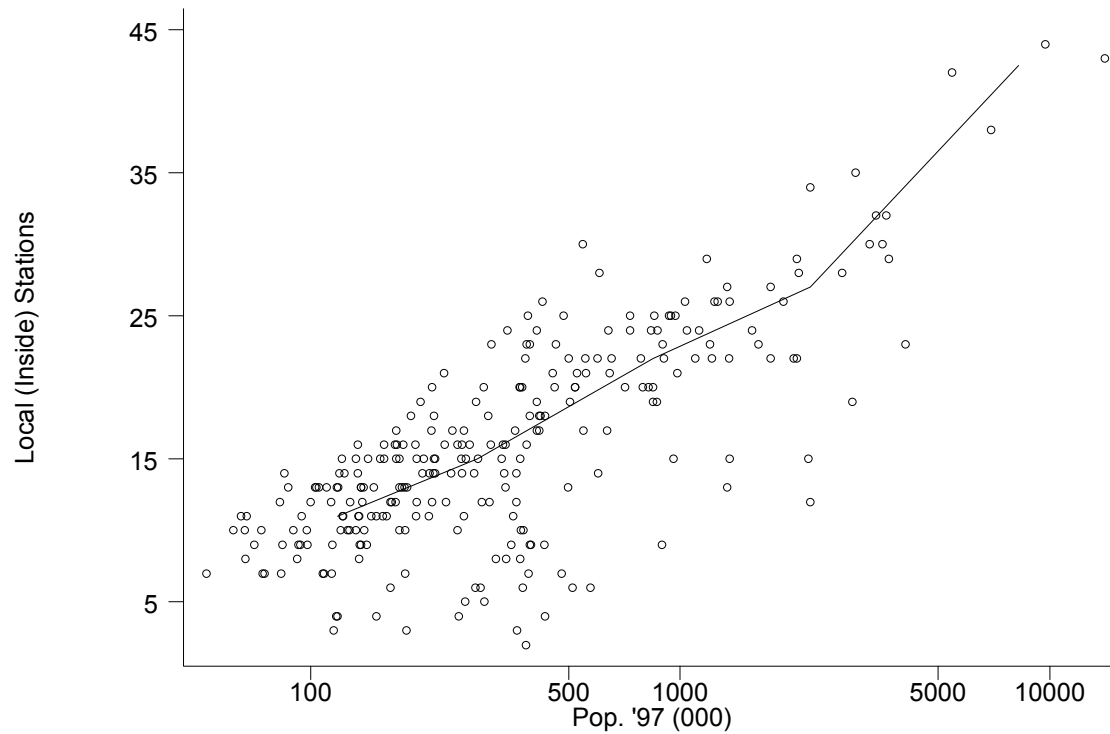
FRANCE
SINGLES
Issue Date: May 24, 2008

This Week	Last Week	Label		
1	1	TIRED OF BEING SORRY	ENRIQUE IGLESIAS	INTERSCOPE
2	2	4 MINUTES	MADONNA FT. JUSTIN TIMBERLAKE	WARNER BROS.
3	3	C'EST CHELOU	ZAHO	CAPITOL
4	6	NO STRESS	LAURENT WOLF FT. ERIC CARTER	COLUMBIA
5	5	MERCY	DUFFY	A&M
6	NEW	NOW YOU'RE GONE	BASSHUNTER & DJ MENTAL THEO'S BAZZHEADZ	WARNER
7	4	HE, BILOUTE! MONTE L' SON! HEIN!	CH'TI DJ	NORD-WAY
8	7	TANT BESOIN DE TOI	MARC ANTOINE	HOSTILE
9	12	RUN THE SHOW	KAT DELUNA FT. BUSTA RHYMES	EPIC
10	8	MI CHUI CH'TI, ET TI?	HAPPY & FAX	EMI

How high are fixed costs?

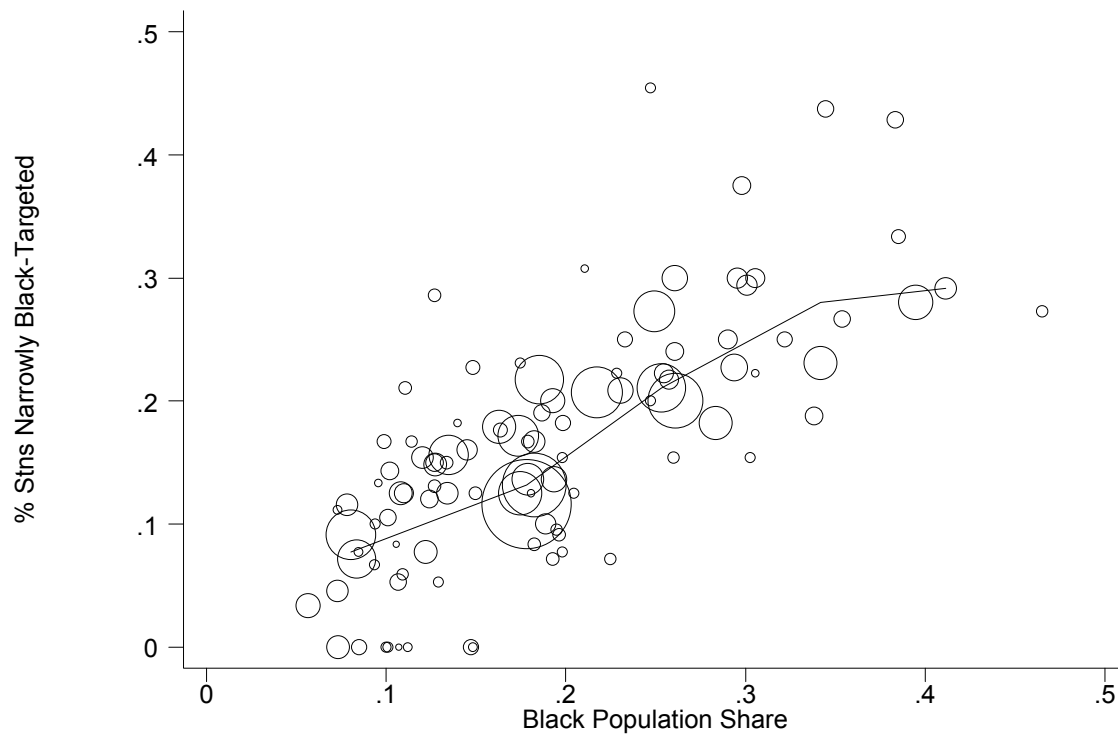
- Radio – 20 products per market
 - Entry is the mechanism
 - Candidate for WBW
- Daily newspapers – usually 1 product per market
 - Positioning is the mechanism
 - Candidate for TOM

Larger Markets Have More Radio Stations



Larger markets have more stations: people benefit each other generally, as radio listeners

Larger groups face more products



Places with few blacks have no black-targeted stations, while places with more blacks have more (some)

Consumer Use/Satisfaction from Radio

- Looking for direct evidence of “who benefits whom”
- How does group listening vary with group population, other population, across metro areas?
 - Listening measure: share of pop listening for at least 5 minutes during average quarter hour

Consumer Use/Satisfaction from Radio

- Back radio listening increases in black local pop
- White listening increases in white local pop
- No cross-effects
- Bottom line: blacks benefit blacks, and whites benefit whites, in their capacity as radio listeners
 - No benefit to each other
- Contrast with Friedman's ties

Tyranny of the Market

- Daily Newspapers
 - Very few per market
 - Targeting sensitive to demographic composition
 - E.g. Targeting Hispanic readers
- Positioning of the product is determined by overall metro area
 - Heavily black metro areas have papers that are more black-targeted
 - Measured by their topical coverage

...continued

- How does reading vary across zip codes (that differ substantially in composition)?
 - In heavily white metro areas, paper purchases are lower in heavily black zip codes
- Blacks (whites) more likely to purchase in markets with more blacks (whites)
 - Negative cross-effects: whites “hurt” blacks!
- Tyranny of the majority translated into markets

WBW in Media Markets and Voting

- (in case you don't care about products but do care about voting)
- Places with black-targeted radio have higher black turnout
 - Across cities and over time
- Places with Spanish-language local television news have higher Hispanic turnout in non-presidential elections
 - Big effects: around a third
- **Those disadvantaged as consumers also find themselves disadvantaged as citizens**
 - Special reason to care about media products

Market Solutions

- Problem arises from large FC, relative to market size
- Solutions:
 - Market enlargement
 - Trade, Internet
 - FC reductions
 - Technology
 - Limits of Solutions

Trade as Liberation

- “Dish cities” (Mantua, Overtoomse Veld)
 - Satellite TV, carrying options not available locally
- Systematic evidence
 - Cable television
 - Internet use
 - Despite digital divide, blacks more likely to connect as more isolated locally
- Liberation
 - But: effect small and nonlocal products not perfect substitute for local ones

Limits of Salvation

- When products proliferate with market size, liberation, but not if products just grow with market size
 - E.g. newspapers

Trade and the Tyranny of Alien Majorities

- With high FC, trade can cause repositioning of products, not just liberation
- Film:
 - Hollywood now sees world as market
 - Fewer sports movies, less dialogue
 - France worried that imports would shrink domestic sector

National distribution of New York Times

- Add a product to the choice set. Unambiguous good news?
- Targets educated readers, who choose NYT over local paper
 - Local paper re-positions toward less educated readers
 - Headline: “It’s Hot!”
 - Good news for some, less so for others
 - The way markets work with high FC

Wrap-up on FC

- The way markets work entails features akin to the shortcomings of voting
- **Amended statement on ties:**
 - Each man can vote, as it were, for the color of tie he wants, and [if a bunch of other people also want it,] he can get it;
- When FC are substantial, there is no theoretical reason to expect market outcomes to be efficient.
 - Many markets have high fixed costs
- Markets provide much – but not total – liberation

New Challenges and Opportunities for Media Products

- Piracy as threat to appropriability
 - Another reason, besides imperfect price discrimination, why markets can fail to offer products they should.
- Pricing to the rescue?

Sources

● Piracy

● Rob and Waldfogel

- “Piracy on the High C’s” JLE (2006)
- “Piracy on the Silver Screen” JIE (2007)

● Waldfogel (2007)

- “Lost on the Web”

● Pricing

● Shiller and Waldfogel (2008)

- “Music for a Song”

New Technologies

- Service flow from media at all-time high
- But it's hard to control distribution
 - Music, movies, TV, games,...
- How can sellers appropriate consumers' valuation?
 - Which products will get made?
-

Other concerned industries

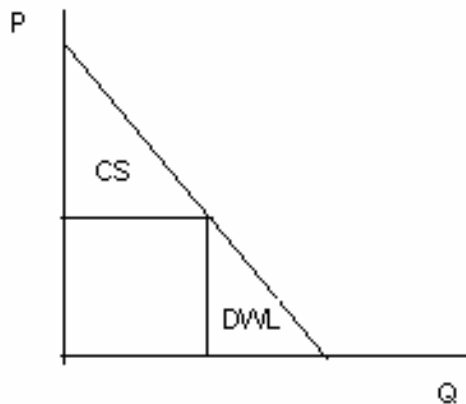
- Movies
- TV
- Newspapers
- Books (?)

Unauthorized Distribution and Sales

- Not obvious whether “file sharing” is a friend or a foe
 - Substitution or stimulation
- Framework relevant for
 - Music
 - Movies
 - Television
- Interesting differences across media

Supply and Demand Analysis

Prior to unauthorized access, single-price monopolists:

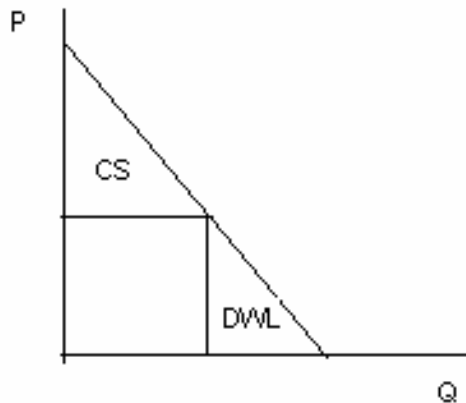


If music or movies, price has natural interpretation

Unauthorized use segments demand

Supply and Demand Analysis

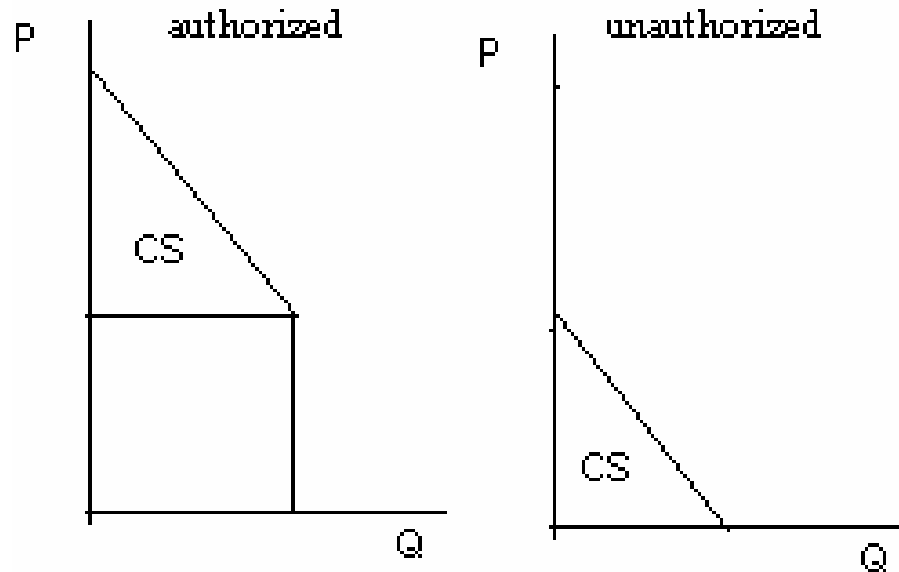
Prior to unauthorized access, single-price monopolists:



- with television, “price” is willingness to watch commercials, adapt lifestyle to program schedule
- (Similar to TiVo)

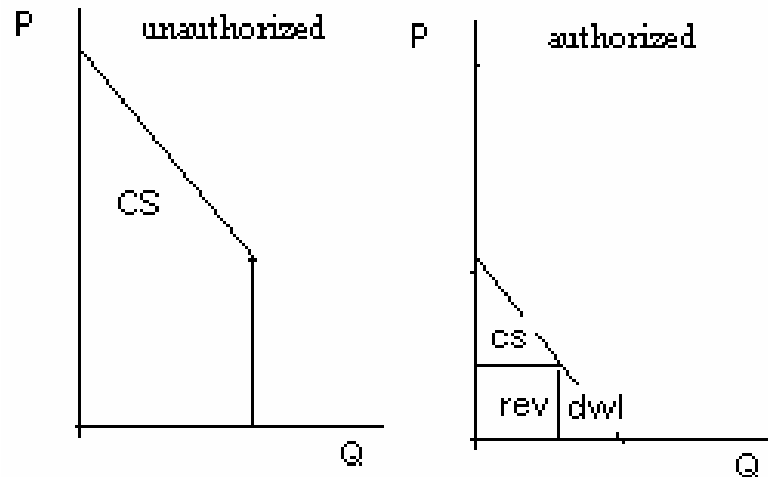
Unauthorized use segments demand

One possibility: unauth'd users are low-value demanders



- DWL becomes CS, no reduction in revenue
- Music or movies that would otherwise inefficiently have been missed
- TiVo aspect of web dist

Another possibility: unauth'd users are high-valuation demanders



Then CS increases, and revenue and deadweight loss decrease
Key point: effects of unauthorized use hinge on whether material
*would have been used through authorized channels
absent the unauthorized use*

Wrinkle: Theoretical Ambiguity

- Information sharing literature

- (Besen, 1986; Bakos, Brynjolffson, and Lichtman, 1999; and Varian, 2000)
- Collectively we might buy stuff we wouldn't buy alone



- Sampling as inducement to buy

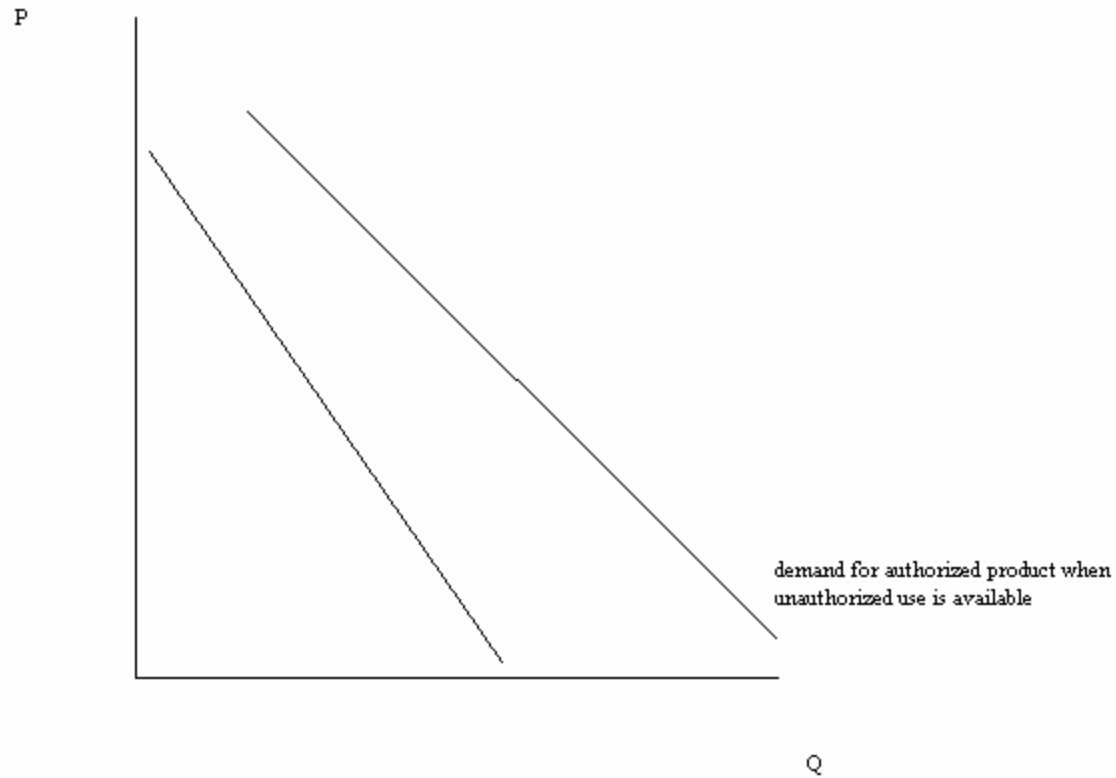
- Shapiro & Varian, 1999

- Reasons why unauthorized use might stimulate conventional use

- Plausibility varies across media



Demand stimulation

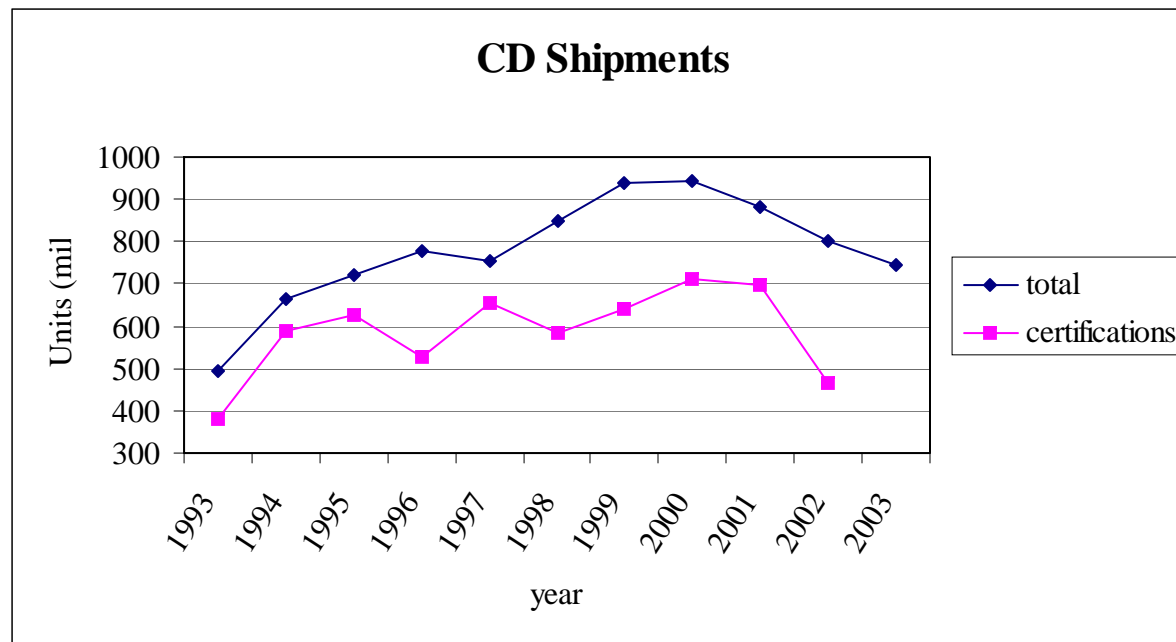


Differences across Media

- Music
 - Close substitute, quick and easy to get
 - Divided attention
- Movies
 - Web offers poor substitute, DVD copying better
 - Undivided attention
- TV different?
 - Episodes complements
 - Demand stimulation plausible

Pressure from Events in Two media

Music industry in crisis



Source: RIAA

Is downloading the cause?

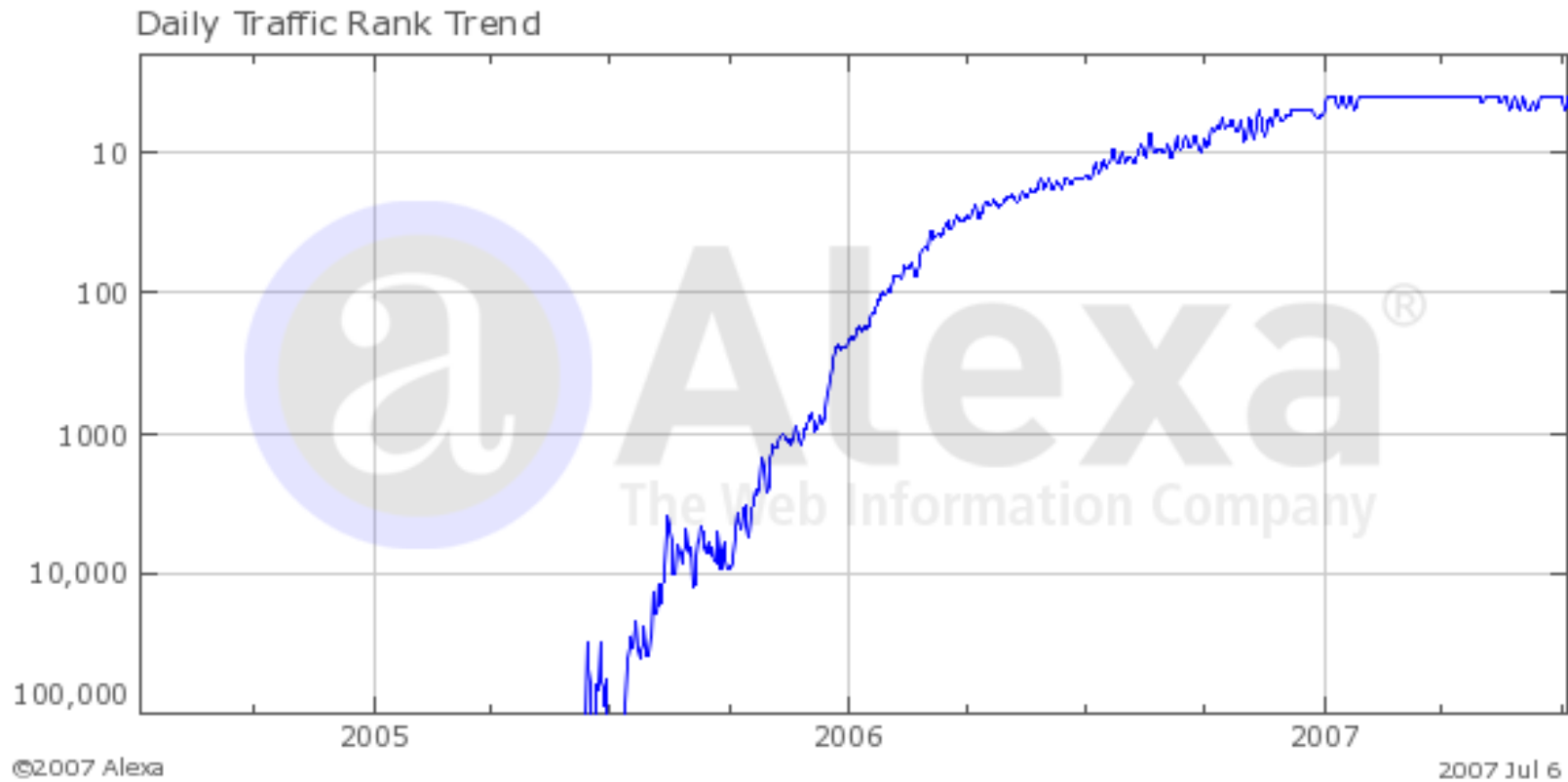


Television

- YouTube:
 - Site hosting video
 - User-generated
 - Network content
 - Appeared in Feb 2005, rapid growth
 - Top 10 sites within year
 - *Time's* Innovation of the Year '06



YouTube Growth



We've been living through an "experiment"

Networks huffy about unauthorized content





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	Jon Stewart vs Gary England and warnings. First Warning is now used nationwide...Jon Stewart Daily Show Comedy Central Gary England Tornado KWTW9 Local News Oklahoma City funny comedy (more) Time: 03:42	★★★★★ From: woxntox Views: 52,640 Added: 1 month ago More in Entertainment

Is Jon Stewart Fair?



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- Stressed Out?! Watch NEW [One Less Stress TV](#) And learn how to deal with stress everyday!

How to Study

- It's hard to get direct evidence
- Want panel data on randomized trial, some people get broadband, others not
 - Do the broadband guys download more after getting broadband, purchase less, relative to the control group?
 - No such luck!
- Instead, opportunistic empiricism

Survey-based micro data on movies, music, TV

- How much do you consume through authorized channels?
 - CDs purchased
 - Movie rental, purchase
 - Watching traditional TV (or authorized)
- How much do you consume through unauthorized channels?
 - Unpaid song downloading
 - DVD copying
 - Unauthorized web viewing
- Same questions retrospectively to create panel

Findings Differ across Media

Music Conclusion

- Lots of unpaid consumption
- Significant sales displacement, *but far less than 1:1*
 - Between -0.1 and $?$, best = -0.2 ?
 - Explains about 10 percent reduction
 - Downloaded albums are less valued
- Downloading
 - Increases CS by \$70 per capita
 - Of this, \$25 comes from sellers, \$45 from reduced DWL

Movies: Hollywood Ending

- *Amount* of unpaid consumption low, but *rate* of displacement high
- Large but not 1:1 (about 1/1.3)
 - Suggests gains to consumers are mostly transfers from sellers rather than reduced DWL, as in music
 - Why so high?
 - Copying still cumbersome
 - Even when faster, movies require undivided attention
- Ominous, as copying gets easier?

TV Results

- Overall, TV down 0.24 hours, web viewing up 4.04 hours
- Implied change in weekly hours
 - Authorized web = 1.78
 - Unauthorized web = 2.26
- Effect on networks depends on value of viewers on TV vs authorized web
- Less displacement than in movies and music
 - Movies (1:1) ... music (less) ...TV (none?)

Pricing to the Rescue?

- Music for a Song:
An Empirical Look at Uniform Song Pricing and its Alternatives
 - With Ben Shiller

Two Questions

- How much revenue is foregone by uniform pricing at \$0.99, relative to other pricing schemes:
 - another uniform price, component pricing, pure bundling, two-part tariffs, (nonlinear and mixed bundling)
 - Third-degree price discrimination
- How much of surplus is appropriable with “fancy pricing”

Managerial Motivation

- Could Apple make more money?
- Important Aside:
 - Apple sells songs and hardware
 - 2007 iTunes revenue = \$1.7 billion
 - 2007 iPod revenue \approx \$8 billion
 - More on this later
- Could Apple make more money, holding consumers harmless?

Welfare/Policy Motivation

- With large FC, inefficient under-provision is possible
 - Markets can fail to provide goods with benefit in excess of costs
 - Problem goes away if price discrimination is perfect
 - How well can we do with “fancy pricing”?

Direct Elicitation

- Ask 500 students how highly they value 50 songs
 - Top songs at iTunes, early January 2008
- “You can observe a lot just by watching”



(Yogi Berra,
Yankee catcher and philosopher)

The key instruction

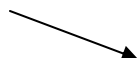
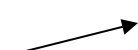
- **...indicate the maximum amount you would be willing to pay to obtain it from the authorized source.**
- **Aside: began as classroom exercise for illustrating managerial econ concepts**
 - **Preferences, demand, pricing**

Some Features of the Data

Survey Songs and their Valuations

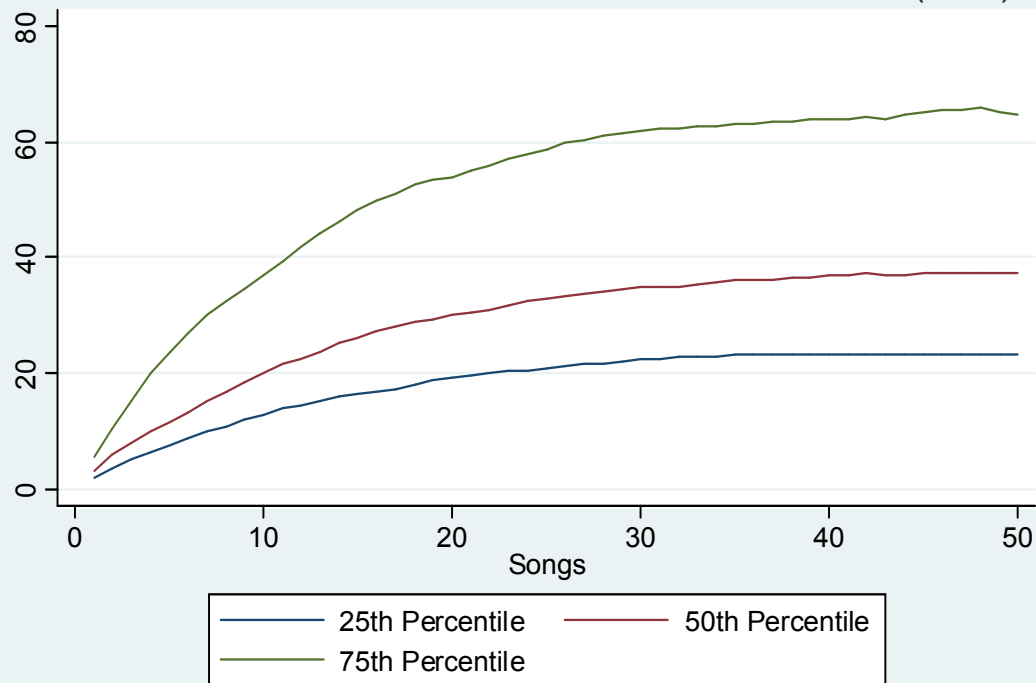
Song name	mean	25 th pctile	median	75 th pctile
Apologize (feat. OneRepublic) - Timbaland	\$2.37	\$0.59	\$1.39	\$2.67
Big Girls Don't Cry (Personal) - Fergie	\$1.16	\$0.08	\$0.53	\$1.22
Bubbly - Colbie Caillat	\$1.47	\$0.08	\$0.68	\$1.73
Clumsy - Fergie	\$0.78	\$0.04	\$0.29	\$1.01
Crank That (Soulja Boy) - Soulja Boy Tell 'Em	\$2.00	\$0.28	\$1.01	\$2.10
Crushcrushcrush - Paramore	\$0.58	\$0.01	\$0.13	\$0.71
Cyclone (feat. T-Pain) - Baby Bash	\$1.29	\$0.08	\$0.56	\$1.45
Don't Stop the Music - Rihanna	\$1.40	\$0.11	\$0.63	\$1.44
Feedback - Janet	\$0.63	\$0.01	\$0.11	\$0.57
Hate That I Love You (feat. Ne-Yo) - Rihanna	\$1.30	\$0.10	\$0.55	\$1.47
Hero/Heroine (Tom Lord-Alge Mix) - Boys Like Girls	\$0.77	\$0.02	\$0.26	\$1.00
Hey There Delilah - Plain White T's	\$2.02	\$0.15	\$0.94	\$2.02
How Far We've Come - Matchbox Twenty	\$1.41	\$0.10	\$0.69	\$1.47
Hypnotized (feat. Akon) - Plies	\$1.15	\$0.06	\$0.48	\$1.12
I Don't Wanna Be In Love (Dance Floor Anthem) - Good Charlotte	\$1.06	\$0.06	\$0.47	\$1.20
Into the Night (feat. Chad Kroeger) - Santana	\$1.49	\$0.09	\$0.71	\$1.53
Kiss Kiss (feat. T-Pain) - Chris Brown	\$1.45	\$0.12	\$0.85	\$1.70
Love Like This - Natasha Bedingfield	\$1.04	\$0.06	\$0.43	\$1.06
Love Song - Sara Bareilles	\$1.02	\$0.05	\$0.37	\$1.07
Low (feat. T-Pain) - Flo Rida	\$1.60	\$0.11	\$0.88	\$1.93

variation



Variation across songs and respondents

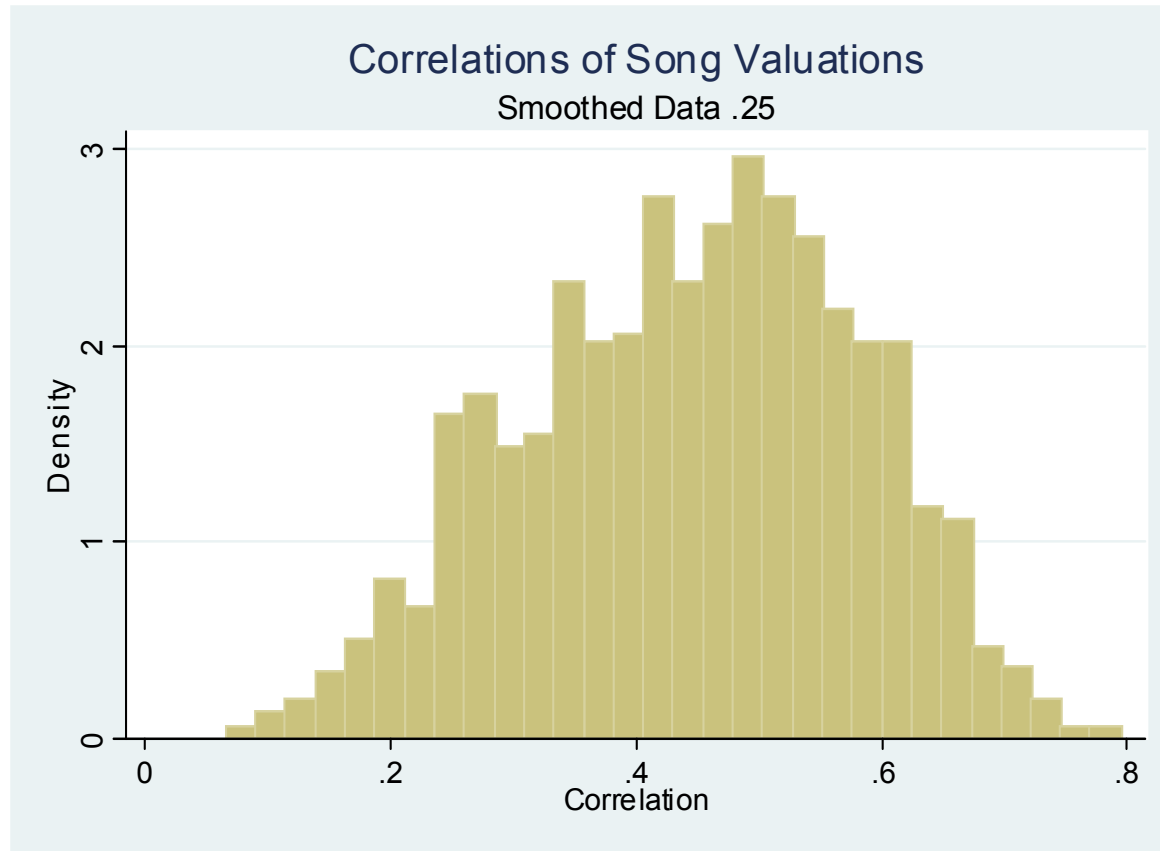
Distribution of Cumulative Valuations, Smoothed (0.25)



Median respondent is willing to pay \$20 for his/her top 10 songs. vs \$40 for 75th p'ctile, and \$12 for 25th p'ctile

Related fact: songs explain 4 percent of variation, individuals explain 40 percent

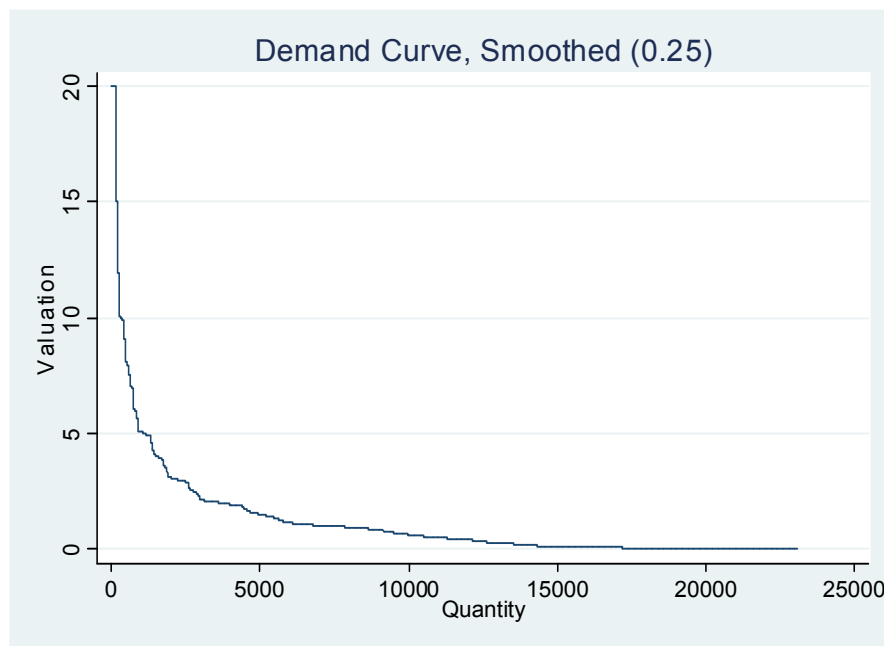
Correlation of Valuations



Relevant to whether bundling will enhance revenue:
Less so as song valuations are more positively correlated

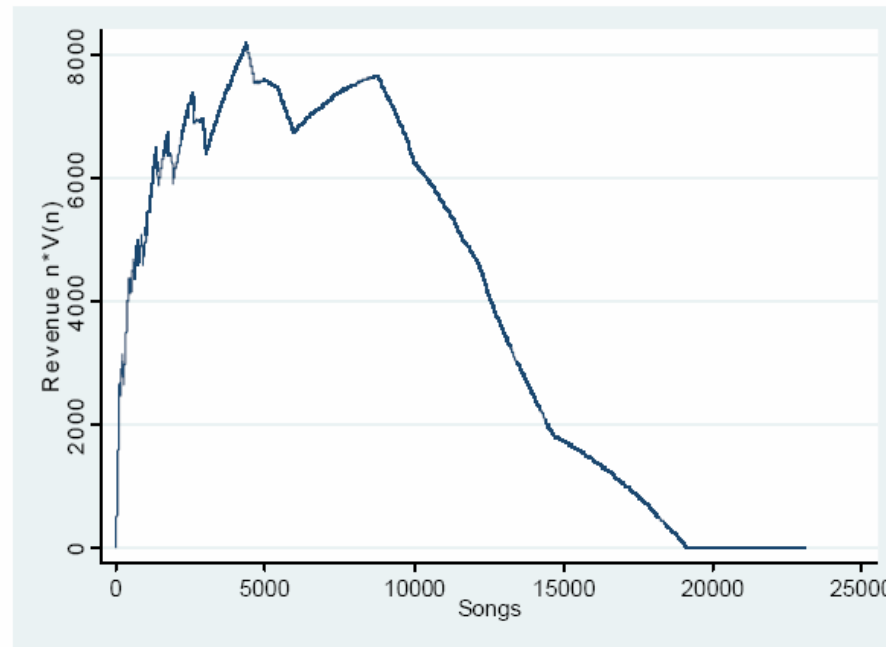
Uniform Pricing

- Create a demand curve by ordering valuations from highest to lowest



Revenue Function

- Find revenue-maximum, associated price, etc. ($MC=0$)



UP: \$0.99 vs Revenue Max

- Current
 - $p = \$0.99$
 - $q = 7438$
 - revenue = \$7,364
- Revenue maximizing
 - $p = \$1.87$
 - $q = 4351$ songs sold
 - revenue = \$8,158

Keeping Score: Uniform Pricing

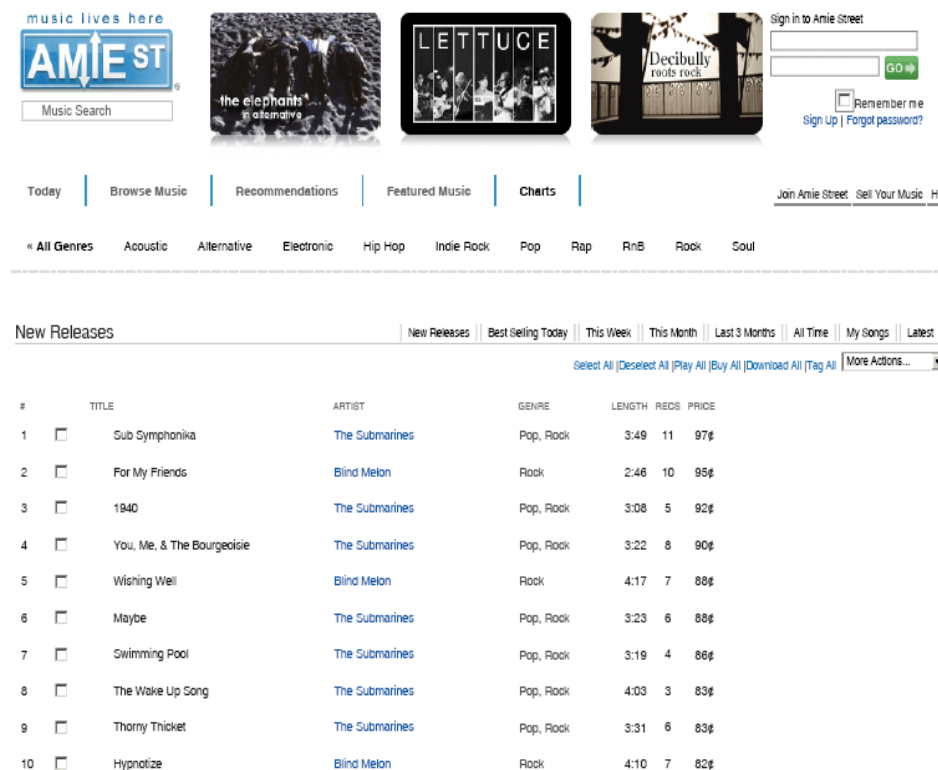
	<i>Dollars</i>			<i>Shares of Total Surplus</i>			<i>Relative to Uniform Monopoly</i>		
	PS	CS	DWL	PS	CS	DWL	PS	CS	DWL
Single Price Monopoly, p=\$1.87	8158	11607	8020	29.4%	41.8%	28.9%	0.0%	0.0%	0.0%
Single Price Monopoly, p=\$0.99	7364	16317	4105	26.5%	58.7%	14.8%	-9.7%	40.6%	-48.8%
Song-Specific Monopoly									
Pure Bundling ^[1]									
Two Part Tariff ^[2]									
Nonlinear (1,3,5,10)									

UP at \$0.99 instead of \$1.87 sacrifices a tenth of (song) revenue

Neither approach captures over 30% of surplus as revenue.

Song-Specific (Component) Pricing

- Calculate demand curve for each song
- Currently in use at
 - Amazon (a little)
 - Amie Street



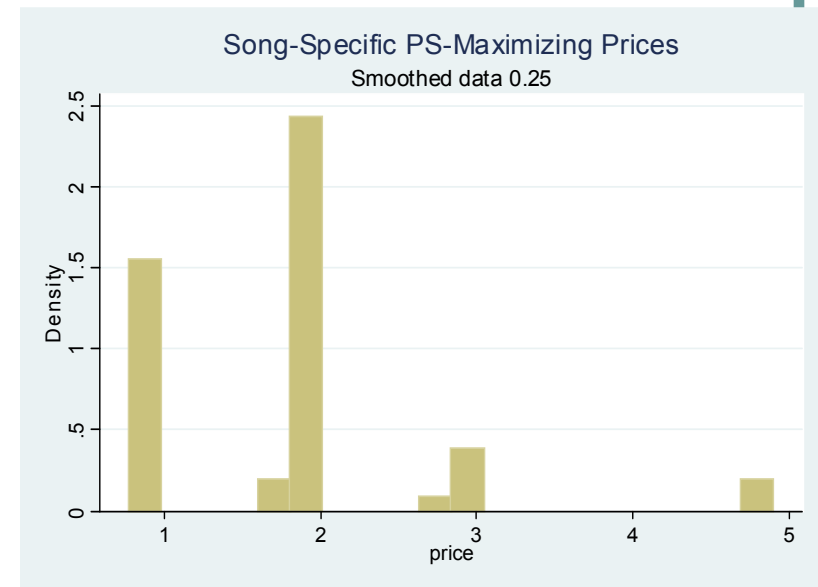
The screenshot shows the Amie Street music website. At the top, there is a navigation bar with links for 'Today', 'Browse Music', 'Recommendations', 'Featured Music', and 'Charts'. Below this is a genre filter bar with options like 'All Genres', 'Acoustic', 'Alternative', 'Electronic', 'Hip Hop', 'Indie Rock', 'Pop', 'Rap', 'RnB', 'Rock', and 'Soul'. The main content area is titled 'New Releases' and includes a table of 10 songs. The table has columns for '#', 'TITLE', 'ARTIST', 'GENRE', 'LENGTH', 'RECS', and 'PRICE'. The songs listed are: 1. Sub Symphonika by The Submarines (Pop, Rock, 3:49, 11 recs, 97¢); 2. For My Friends by Blind Melon (Rock, 2:46, 10 recs, 95¢); 3. 1840 by The Submarines (Pop, Rock, 3:08, 5 recs, 92¢); 4. You, Me, & The Bourgeoisie by The Submarines (Pop, Rock, 3:22, 8 recs, 90¢); 5. Wishing Well by Blind Melon (Rock, 4:17, 7 recs, 88¢); 6. Maybe by The Submarines (Pop, Rock, 3:23, 6 recs, 88¢); 7. Swimming Pool by The Submarines (Pop, Rock, 3:19, 4 recs, 86¢); 8. The Wake Up Song by The Submarines (Pop, Rock, 4:03, 3 recs, 83¢); 9. Thorny Thicket by The Submarines (Pop, Rock, 3:31, 6 recs, 83¢); 10. Hypnotize by Blind Melon (Rock, 4:10, 7 recs, 82¢).

#	TITLE	ARTIST	GENRE	LENGTH	RECS	PRICE
1	Sub Symphonika	The Submarines	Pop, Rock	3:49	11	97¢
2	For My Friends	Blind Melon	Rock	2:46	10	95¢
3	1840	The Submarines	Pop, Rock	3:08	5	92¢
4	You, Me, & The Bourgeoisie	The Submarines	Pop, Rock	3:22	8	90¢
5	Wishing Well	Blind Melon	Rock	4:17	7	88¢
6	Maybe	The Submarines	Pop, Rock	3:23	6	88¢
7	Swimming Pool	The Submarines	Pop, Rock	3:19	4	86¢
8	The Wake Up Song	The Submarines	Pop, Rock	4:03	3	83¢
9	Thorny Thicket	The Submarines	Pop, Rock	3:31	6	83¢
10	Hypnotize	Blind Melon	Rock	4:10	7	82¢

Song-Specific Pricing

Table 2: Song-Specific Revenue Maximizing Prices

<i>song</i>	<i>Price (smoothed Data)</i>
Apologize (feat. OneRepublic) - Timbaland	\$1.88
Big Girls Don't Cry (Personal) - Fergie	\$1.84
Bubbly - Colbie Caillat	\$1.72
Clumsy - Fergie	\$0.90
Crank That (Soulja Boy) - Soulja Boy Tell 'Em	\$1.88
Crushcrushcrush - Paramore	\$0.85
Cyclone (feat. T-Pain) - Baby Bash	\$1.93
Don't Stop the Music - Rihanna	\$2.88
Feedback - Janet	\$1.90
Hate That I Love You (feat. Ne-Yo) - Rihanna	\$1.82
Hero/Heroine (Tom Lord-Alge Mix) - Boys Like Girls	\$0.93
Hey There Delilah - Plain White T's	\$4.88
How Far We've Come - Matchbox Twenty	\$0.88
Hypnotized (feat. Akon) - Plies	\$0.88
I Don't Wanna Be In Love (Dance Floor Anthem) - Good Charlotte	\$0.87
Into the Night (feat. Chad Kroeger) - Santana	\$2.86
Kiss Kiss (feat. T-Pain) - Chris Brown	\$1.83
Love Like This - Natasha Bedingfield	\$1.88
Love Song - Sara Bareilles	\$0.88
Low (feat. T-Pain) - Flo Rida	\$1.86
Misery Business - Paramore	\$0.86



Song-Specific Pricing

	<i>Dollars</i>			<i>Shares of Total Surplus</i>			<i>Relative to Uniform Monopoly</i>		
	PS	CS	DWL	PS	CS	DWL	PS	CS	DWL
Single Price Monopoly, p=\$1.87	8158	11607	8020	29.4%	41.8%	28.9%	0.0%	0.0%	0.0%
Single Price Monopoly, p=\$0.99	7364	16317	4105	26.5%	58.7%	14.8%	-9.7%	40.6%	-48.8%
Song-Specific Monopoly	8471	12336	6978	30.5%	44.4%	25.1%	3.8%	6.3%	-13.0%
Pure Bundling ^[1]									
Two Part Tariff ^[2]									
Nonlinear (1,3,5,10)									

Relative to UP (\$1.87), song-specific pricing raises PS 4%, raises CS 6%, reduces DWL 13%

Bundling theory

- Can increase revenue even when correlations are positive
- Should increase revenue more as bundle size increases

Keeping Score: PB (All 50)

	<i>Dollars</i>			<i>Shares of Total Surplus</i>			<i>Relative to Uniform Monopoly</i>		
	PS	CS	DWL	PS	CS	DWL	PS	CS	DWL
Single Price Monopoly, p=\$1.87	8158	11607	8020	29.4%	41.8%	28.9%	0.0%	0.0%	0.0%
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Song-Specific Monopoly	8471	12336	6978	30.5%	44.4%	25.1%	3.8%	6.3%	-13.0%
Pure Bundling ^[1]	8911	14343	4532	32.1%	51.6%	16.3%	9.2%	23.6%	-43.5%
Two Part Tariff ^[2]									
Nonlinear (1,3,5,10)									

50-song Bundle price = \$36.08.

relative to UP(1.87), rev up 9%, DWL down 44%

Two Part Tariff

	<i>Dollars</i>			<i>Shares of Total Surplus</i>			<i>Relative to Uniform Monopoly</i>		
	PS	CS	DWL	PS	CS	DWL	PS	CS	DWL
Single Price Monopoly, p=\$1.87	8158	11607	8020	29.4%	41.8%	28.9%	0.0%	0.0%	0.0%
Single Price Monopoly, p=\$0.99	7364	16317	4105	26.5%	58.7%	14.8%	-9.7%	40.6%	-48.8%
Song-Specific Monopoly	8471	12336	6978	30.5%	44.4%	25.1%	3.8%	6.3%	-13.0%
Pure Bundling ^[1]	8911	14343	4532	32.1%	51.6%	16.3%	9.2%	23.6%	-43.5%
Two Part Tariff ^[2]	8931	14358	4497	32.2%	51.7%	16.2%	9.5%	23.7%	-43.9%
Nonlinear (1,3,5,10)									

Two part tariff: hookup fee = \$35.55, per-unit price = 0.01.

Result: only slightly better than pure bundling

So Far...

- We've raised revenue by nearly 10 percent
 - ...but not above 1/3 of surplus
- We haven't tried the heavy artillery – mixed bundling – yet
- MB does better, but still delivers only a third of surplus as revenue

Discriminatory Pricing

- So far, we've gotten PS only up to 1/3.
- How about 3rd degree?

<i>Smooth Data</i> ²¹	<i>Dollars</i>			<i>Relative to Uniform Monopoly</i>		
	PS	CS	DWL	PS	CS	DWL
gender	8159	11621	8005	0.01%	0.12%	-0.19%
ethnicity	8474	12852	6459	3.87%	10.73%	-19.46%
resident alien	8162	11611	8013	0.05%	0.03%	-0.09%
age	8160	11610	8016	0.02%	0.03%	-0.05%
person-specific	14532	6150	7104	78.13%	-47.01%	-11.42%

Person-specific pricing, the upper bound of 3rd degree price discrimination, raises revenue substantially

But 3rd degree based on observables does little.

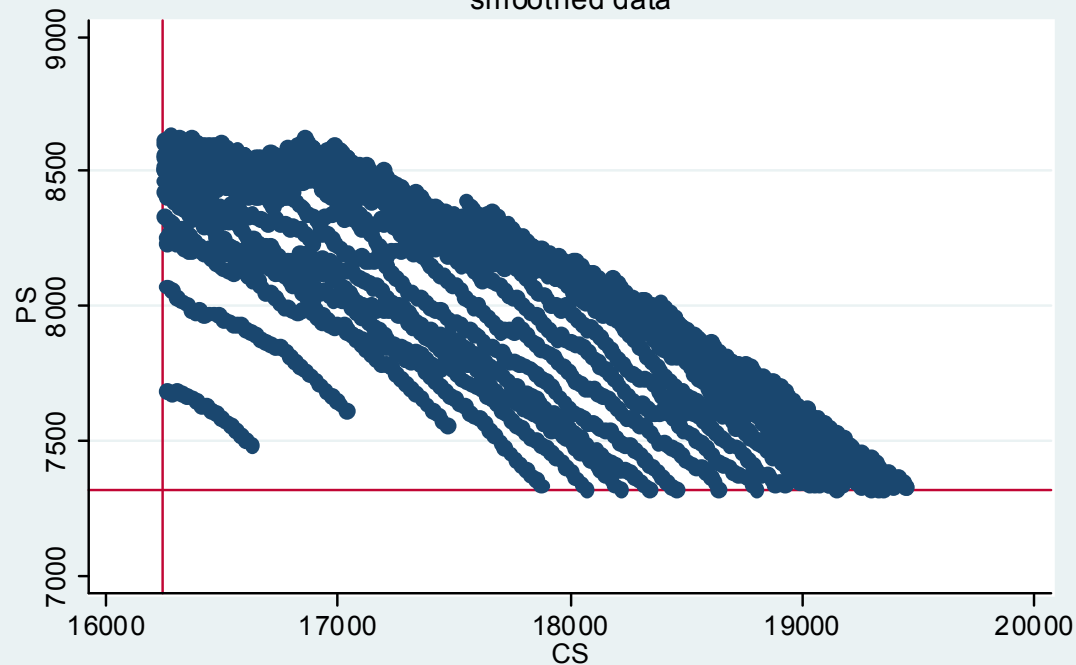
Pareto-Improving Prices

- There is a tradeoff between CS and PS.
- \$0.99 song pricing keeps CS high, which may stimulate demand for hardware
- Can raise revenue 10 percent while holding consumers harmless

Pareto-Improving Two-Part Tariffs

Current CS

Surplus for Win-Win 2 Part Tariffs
smoothed data



Current PS

Note: Figure compares CS and PS available with two-part tariffs with the surplus available with current uniform $p=\$0.99$ pricing.

could hold consumers harmless, raise revenue 10 percent

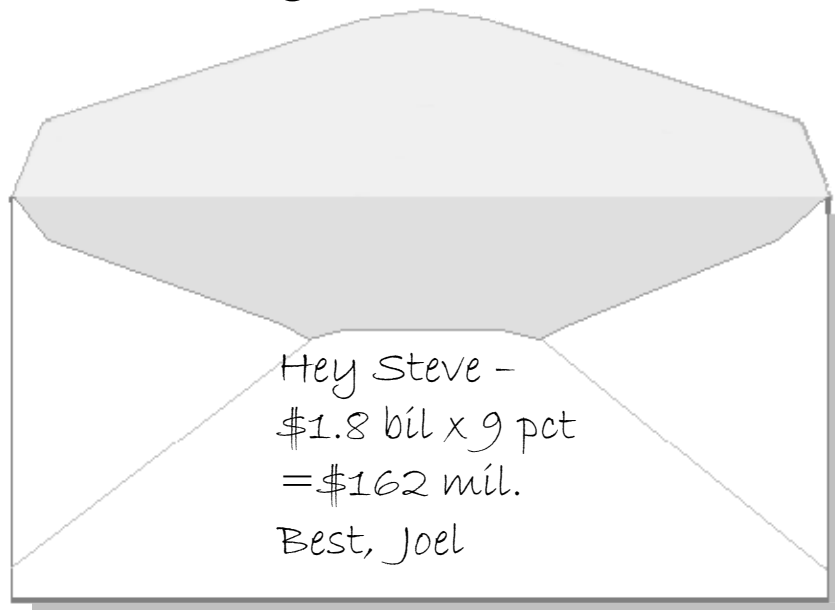
Conclusion

- Is the glass half empty or half full?



Conclusion

- Glass half full:
 - More revenue is available (10 percent)
 - Even holding consumers harmless



Conclusion

- Glass half full:
 - More revenue is available (10 percent)
 - Even holding consumers harmless
- Glass half empty:
 - Relatively small share of surplus available as revenue, even with feasible fancy pricing schemes

Finally

- Music industry hurting from piracy even as service stream historically high
 - need clever ways to appropriate value
- Relevance:
 - Nokia and Apple (reportedly) currently contemplating bundling
- Additional challenge:
 - How to share revenue with bundle pricing