

Two-Sided Markets and the Sharing Economy:

Nuances, Challenges, and Cautionary Notes

Michael R. Baye

Prepared for the 2nd Annual BCCP Conference on Regulatory Challenges in Digital Markets
Berlin, June 1, 2017



KELLEY SCHOOL OF BUSINESS

INDIANA UNIVERSITY



Roadmap

- Main Thesis: The *sharing economy* is “just” another application of two-sided markets
- Review features of two-sided markets potentially relevant for understanding sharing platforms
 - Based on my collaborative work with John Morgan (e.g., *American Economic Review*, 2001)
 - Independent work by many others, notably Rochet & Tirole (e.g., *Journal of European Economic Association* (2003))
- Identify a potential driver of the growth in sharing platforms
- Off-the-shelf model of a sharing platform
 - Based on work with Tom Cosimano
- Discuss some nuances and challenges, and provide a few cautionary notes for policymakers



Key Features of a Two-Sided (or Multi-Sided) Market

- **Platform serves at least two distinct customer groups**
 - An online newspaper, e.g., serves readers (subscribers) and advertisers
- **Platform sets prices for these groups**
 - Online newspaper sets advertising and subscription fees
- **Significant network externalities across customer groups**
 - The value of the online newspaper to an advertiser depends on the number of subscribers
- **Note—The platform may:**
 - Merely serve as a matchmaker (e.g., connect customers)
 - Or also provide additional services to some customer groups (e.g., news content to subscribers)



Pricing On One Side of a Platform Impacts Profits On the Other Side

- Suppose a newspaper increases the price of a subscription
 - Attracts fewer subscribers
 - Reduces the value of the platform to advertisers
 - Attracts fewer advertisers
 - Reduces the amount advertisers are willing to pay the platform
- May earn higher profits on the subscriber side (depends on their elasticity of demand), but will earn lower profits on the advertising side
- Network externalities reduce the platform's incentive to exercise market power over subscribers



INDIANA UNIVERSITY

Other Examples of Two-Sided Markets

PDF creator/reader:



Dating sites:



Social networks:



Shopping platforms:



Job platforms:



Internet Search:



Credit Cards:



Home Selling Sites:





Business Strategies are Complex in Two-Sided Markets

- **Platforms often subsidize one or more sides**
 - Free access
 - Google, Acrobat Reader, Shopper.com, Zillow, no cover charge for women at bars
 - Subsidized access
 - Newspapers, “rewards” for using a credit card
 - Free content
 - Google, Shopper.com, Zillow
- **Earn revenues from other sides**
 - Advertising (Google, Zillow, newspapers)
 - Listing/click-through fees (Shopper.com)
 - Access fees (Adobe Acrobat; cover charges for men at bars)
- **Platform strategies in a nutshell**
 - Create a “virtuous circle”
 - Don’t “kill the goose that laid the golden egg”



Example: Price Comparison Site

- **Platform serves two customer groups, e.g.,**
 - Merchants
 - Shoppers
- **Value to one customer group depends on the size of the other customer group**
 - Value to a merchant is greater when more consumers visit the site
 - Value to a consumer is greater when more merchants list prices at the site
- **Platform sets fees to merchants and shoppers**
 - Listing fees to merchants
 - Access fees to shoppers
- **Price comparison sites evolved to provide other content (e.g., product and seller reviews) to attract customers to its site**





INDIANA UNIVERSITY



36% OFF

Samsung UN46C7000 46" 3D LED TV

1920x1080, 240Hz, HDTV, LED Backlight, 3D - MPN: UN46C7000 - [See Product Details](#)

As low as **\$1,349.00** from [True1080p.com](#)- [See Price History](#) [Like](#)

Rated ★★★★★ out of 1 review

[See More Images](#)

SEE IT	Seller Name	Seller Rating	Discounts	Condition	Price	BottomLinePrice™
SEE IT		★★★★★ 122 Reviews	Free Shipping!	New	\$1,349.00	Your Best Price No Tax + Free Shipping \$1,349.00
SEE IT		★★★★★ 89 Reviews	Free Shipping!	New	\$1,399.00	No Tax + Free Shipping \$1,399.00
SEE IT	Notebook For Less	★★★★★ 185 Reviews	Free Shipping!	New	\$1,438.00	No Tax + Free Shipping \$1,438.00
SEE IT		★★★★★ 1352 Reviews	Free Shipping!	New	\$1,487.77	No Tax + Free Shipping \$1,487.77
SEE IT		★★★★★ 2262 Reviews	Free Shipping!	New	\$1,595.00	No Tax + Free Shipping \$1,595.00
SEE IT	Vanns.com	★★★★★ 811 Reviews	Free Shipping!	New	\$1,597.00	No Tax + Free Shipping \$1,597.00
SEE IT		See all-time ratings 411 Reviews	Free Shipping!	New	\$1,599.99	No Tax + Free Shipping \$1,599.99
SEE IT		★★★★★ 14312 Reviews		New	\$1,499.00	No Tax + \$147.75 shipping \$1,646.75
SEE IT		★★★★★ 2734 Reviews	Free Shipping!	New	\$1,663.81	No Tax + Free Shipping \$1,663.81
SEE IT		★★★★★ 172 Reviews		New	\$1,599.99	+ \$96.00 tax + \$22.45 shipping \$1,718.44
SEE IT		★★★★★ 50687 Reviews		New	\$1,967.99	No Tax + \$25.37 shipping \$1,993.36
SEE IT	CompUSA	★★★★★ 4262 Reviews		New	\$1,967.99	+ \$118.08 tax + \$25.37 shipping \$2,111.44
SEE IT		★★★★★ 24787 Reviews	Free Shipping! Click for Better Price	Get Better Price	\$2,599.99	No Tax + Free Shipping \$2,599.99



INDIANA UNIVERSITY



36% OFF

Samsung UN46C7000 46" 3D LED TV

1920x1080, 240Hz, HDTV, LED Backlight, 3D - MPN: UN46C7000 - [See Product Details](#)

As low as **\$1,349.00** from [True1080p.com](#)- [See Price History](#) [Like](#)

Rated ★★★★★ out of 1 review

[See More Images](#)

SEE IT	Seller Name	Seller Rating	Discounts	Condition	Price	BottomLinePrice™
SEE IT		★★★★★ 122 Reviews	Free Shipping!	New	\$1,349.00	Your Best Price No Tax + Free Shipping \$1,349.00
SEE IT		★★★★★ 89 Reviews	Free Shipping!	New	\$1,399.00	No Tax + Free Shipping \$1,399.00
SEE IT	Notebook For Less	★★★★★ 185 Reviews	Free Shipping!	New	\$1,438.00	No Tax + Free Shipping \$1,438.00
SEE IT		★★★★★ 1352 Reviews	Free Shipping!	New	\$1,487.77	No Tax + Free Shipping \$1,487.77
SEE IT		★★★★★ 2262 Reviews	Free Shipping!	New	\$1,595.00	No Tax + Free Shipping \$1,595.00
SEE IT	Vanns.com	★★★★★ 811 Reviews	Free Shipping!	New	\$1,597.00	No Tax + Free Shipping \$1,597.00
SEE IT	amazon.com	See all-time ratings 411 Reviews	Free Shipping!	New	\$1,599.99	No Tax + Free Shipping \$1,599.99
SEE IT		★★★★★ 14312 Reviews		New	\$1,499.00	No Tax + \$147.75 shipping \$1,646.75
SEE IT		★★★★★ 2734 Reviews	Free Shipping!	New	\$1,663.81	No Tax + Free Shipping \$1,663.81
SEE IT		★★★★★ 172 Reviews		New	\$1,599.99	+ \$96.00 tax + \$22.45 shipping \$1,718.44
SEE IT		★★★★★ 50687 Reviews		New	\$1,967.99	No Tax + \$25.37 shipping \$1,993.36
SEE IT	CompUSA	★★★★★ 4262 Reviews		New	\$1,967.99	+ \$118.08 tax + \$25.37 shipping \$2,111.44
SEE IT		★★★★★ 24787 Reviews	Free Shipping! Click for Better Price	Get Better Price	\$2,599.99	No Tax + Free Shipping \$2,599.99



INDIANA UNIVERSITY



36% OFF

Samsung UN46C7000 46" 3D LED TV

1920x1080, 240Hz, HDTV, LED Backlight, 3D - MPN: UN46C7000 - See Product Details

As low as **\$1,349.00** from [True1080p.com](#) - See Price History Like

Rated ★★★★★ out of 1 review

[See More Images](#)

Seller Name	Seller Rating	Discounts	Condition	Price	BottomLinePrice™
SEE IT	★★★★★ 122 Reviews	Free Shipping!	New	\$1,349.00	Your Best Price No Tax + Free Shipping \$1,349.00
SEE IT	★★★★★ 89 Reviews	Free Shipping!	New	\$1,399.00	+ Free Shipping \$1,399.00
Your Best Price: Free Shipping, No Tax \$1,349.00					
SEE IT	★★★★☆ 1352 Reviews	Free Shipping!	New	\$1,487.77	No Tax + Free Shipping \$1,487.77
SEE IT	★★★★★ 2262 Reviews	Free Shipping!	New	\$1,595.00	No Tax + Free Shipping \$1,595.00
SEE IT Vanns.com	 ★★★★★ 811 Reviews	Free Shipping!	New	\$1,597.00	No Tax + Free Shipping \$1,597.00
SEE IT	 See all-time ratings 411 Reviews	Free Shipping!	New	\$1,599.99	No Tax + Free Shipping \$1,599.99
SEE IT	 ★★★★★ 14312 Reviews		New	\$1,499.00	No Tax + \$147.75 shipping \$1,646.75
SEE IT	 ★★★★★ 2734 Reviews	Free Shipping!	New	\$1,663.81	No Tax + Free Shipping \$1,663.81
SEE IT	FEATURED ★★★★★ 172 Reviews		New	\$1,599.99	+ \$96.00 tax + \$22.45 shipping \$1,718.44
SEE IT	FEATURED ★★★★★ 50687 Reviews		New	\$1,967.99	No Tax + \$25.37 shipping \$1,993.36
SEE IT CompUSA	 ★★★★★ 4262 Reviews		New	\$1,967.99	+ \$118.08 tax + \$25.37 shipping \$2,111.44
SEE IT	FEATURED ★★★★★ 24787 Reviews	Free Shipping! Click for Better Price	Get Better Price	\$2,599.99	No Tax + Free Shipping \$2,599.99



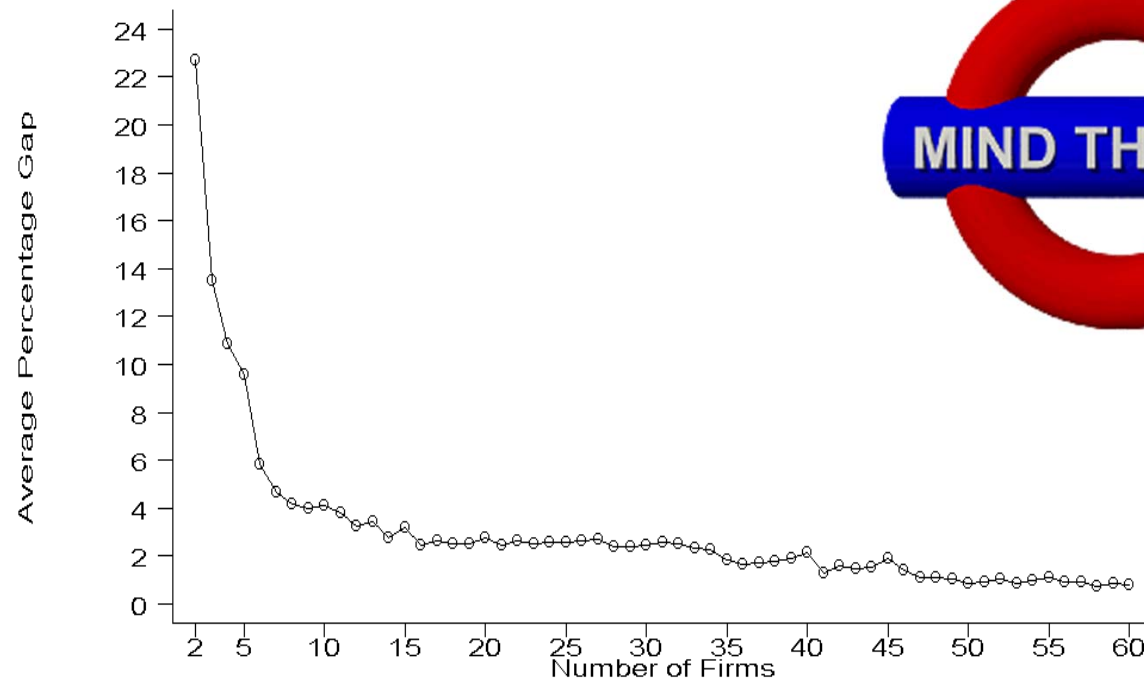
Shifts from “Price Information” to the “Long Tail”

- Benefits platforms potentially offer consumers
 - **Consumers can find lower prices** (Brynjolfsson-Smith; others)
 - **Competition results in lower prices** (Baye-Morgan-Scholten; others)
 - **Product variety/long tail** (Brynjolfsson-Smith; Brynjolfsson-Hu-Smith; others)
- Growing role for platforms to efficiently match buyers and sellers
 - More challenging for platforms to match preferences over buyer/seller *characteristics*
- Sharing economy is a natural extension of this shift



INDIANA UNIVERSITY

The Greater the Competition, the Smaller the Price Gap



Source: Baye, Morgan and Scholten



Shifts from “Price Information” to the “Long Tail”

- Benefits platforms potentially offer consumers
 - **Consumers can find lower prices** (Brynjolfsson-Smith; others)
 - **Competition results in lower prices** (Baye-Morgan-Scholten; others)
 - **Product variety/long tail** (Brynjolfsson-Smith; Brynjolfsson-Hu-Smith; others)
- Growing role for platforms to efficiently match buyers and sellers
 - More challenging for platforms to match preferences over buyer/seller *characteristics*
- Sharing economy is a natural extension of this shift



INDIANA UNIVERSITY

Sharing Platforms: Just Other Examples of Two-Sided Markets?

PROPER

couchsurfing

Care.com®

lyft

airbnb

betahaus

yoWork

wework



UBER



TaskRabbit



Nature of Fees is Endogenous (Consistent with Agency Theory)

- Fixed access fees
- Per-unit access fees
 - Clicks or “leads”
 - Impressions or “eyeballs”
- Access fees that depend on value of transaction
 - Percentage of seller’s revenues
 - Percentage of buyer’s payment



A Model of a Sharing Platform

- Re-interpretation of my earlier work with Tom Cosimano
 - “Choosing Sides in Matching Games: Nash Equilibria and Comparative Statics,” *Economica* (1990)
- Assumptions
 - Distribution of unit valuations of an item, $F(a)$
 - Pareto efficient trades from matching folks with “low” valuations to people with “high” valuations
 - Low a : Gains from being a seller, G_S
 - High a : Gains from being a buyer, G_B
- Platform is a matchmaker, charges fees to buy or sell the item on the platform
 - Fee to participate as seller: c_S
 - Fee to participate as buyer: c_B
- Consumers can choose not to pay any fees (e.g., not participate)



INDIANA UNIVERSITY

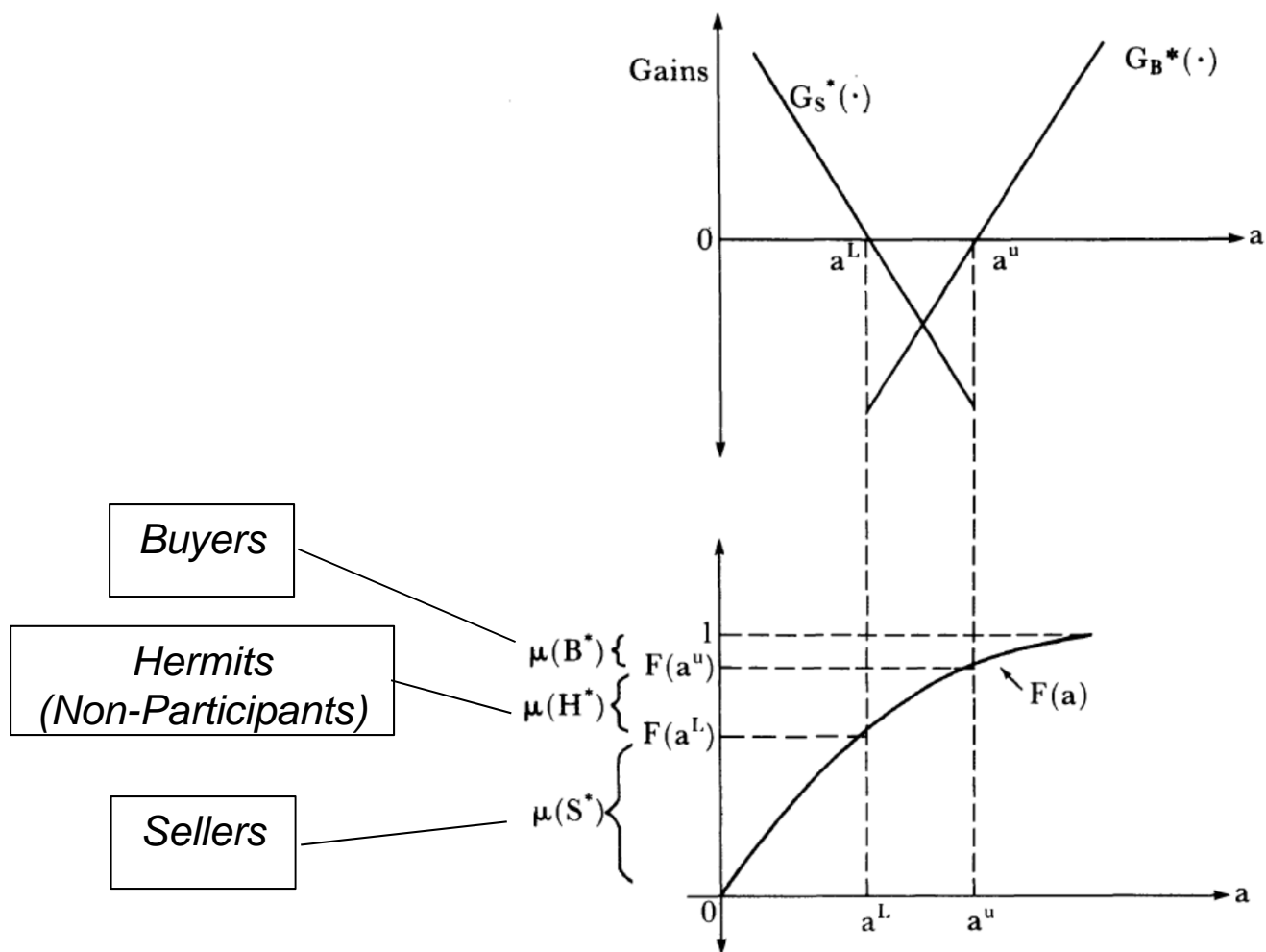


FIGURE 3. Determination of partial participation equilibrium.



COMPARATIVE-STATIC RESULTS UNDER PARTIAL PARTICIPATION

Exogenous variable		a^L	Endogenous variable		
			a^U	$\mu(S^*)$	$\mu(B^*)$
c_S	$c_B < \frac{1}{2}(a^U - a^L)$		+	-	+
	$c_B > \frac{1}{2}(a^U - a^L)$	-	-	+	?
c_B	$c_S < \frac{1}{2}(a^U - a^L)$	-	-	-	+
	$c_S > \frac{1}{2}(a^U - a^L)$	+	+	+	?



Nuances of (*Some*) Sharing Platforms

- More sellers may come at the expense of fewer buyers:

$$\mu(B) + \mu(S) + \mu(H) = 1$$

- Heterogeneities, so less emphasis on price, more on characteristics and match value
- Buy vs. rent
 - Property rights/incentive issues
 - Stock/flow issues



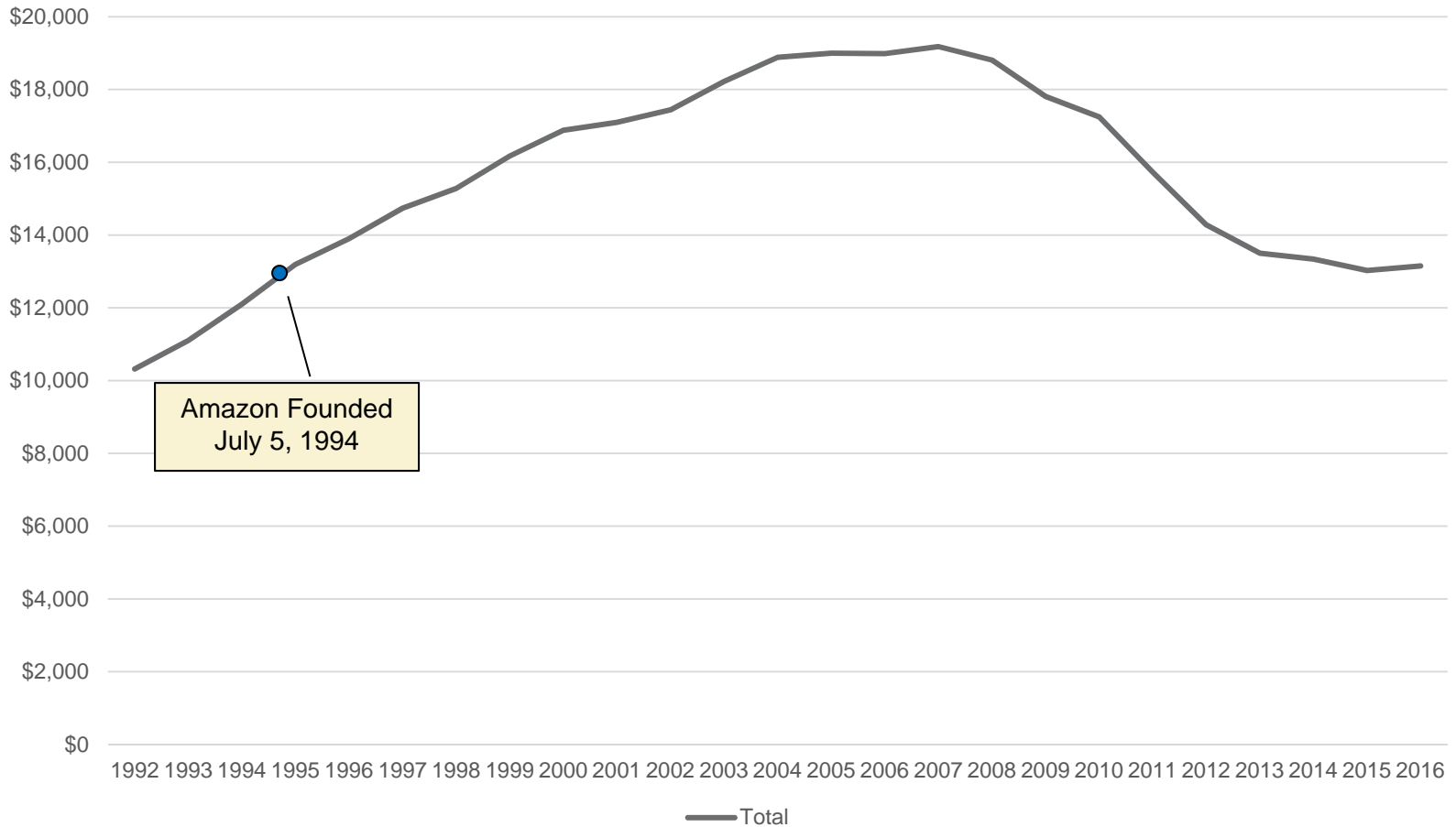
Caveats and Cautionary Notes

- Price effects are complex, often counter-intuitive
- Market definition is tricky
- Lock-in not guaranteed; innovations and social media can facilitate “rapid coordination” from one platform to a competing one
- Rent-seeking (and rent-preserving) activities potentially harm participants
- It can take time for platforms to fully evolve to work out kinks



INDIANA UNIVERSITY

Annual U.S. Retail Sales at Brick-and-Mortar Stores (Millions)



Source: Updated from: Michael R. Baye, Babur De los Santos, and Matthijs R. Wildenbeest, "Searching for Physical and Digital Media: The Evolution of Platforms for Finding Books," *Economic Analysis of the Digital Economy*, 2015 (edited by Shane Greenstein, Avi Goldfarb, and Catherine Tucker).



Defining Relevant Antitrust Markets

- Platforms serve many constituents, and it is easy to ignore this when defining relevant antitrust markets
 - Relevant antitrust markets (e.g., “a SSNIP on whom?”)
- Price effects are complex and impact decisions of multiple sides, often in unintuitive ways.
 - Baye-Morgan; Rochet-Tirole; Baye-Cosimano



Natural Monopoly, Lock-in, and Tipping: Theoretical Possibilities

- A single platform may be the most efficient way to serve customers
 - Network externalities
 - Economies of scale
- Raises the theoretical possibility that once customers “tip” to a single platform, they might get “locked in”
 - Key assumption is that network effects prevent customers from “coordinating” a shift to a new equilibrium (e.g., a superior platform)



INDIANA UNIVERSITY

Natural Monopoly, Lock-in, and Tipping: Reality Check

- Customers have shifted from “dominant” to new and emerging platforms
 - Myspace, AOL, Yahoo
- Dominance on one side need not foreclose competition with other platforms
 - In 2005, Monster.com had about 5 times more resumes than CareerBuilder.com
 - Yet, CareerBuilder.com had 45.2 percent of online job postings, compared to Monster’s 37 percent
- Sharing & Technology markets are dynamic and evolving



Concluding Remarks

- Platforms often serve many groups of customers and are differentiated
- Structure of fees (e.g., nature of access and/or usage fees) matters
- Most sharing platforms don't merely match participants; they attract participants with "content"
- Social media can facilitate "rapid coordination" to new equilibria
 - Impact of Taylor Swift's Tumblr post on the conduct of Apple Music