

Market Definition in Online Markets

Michael R. Baye
Director, Bureau of Economics
Federal Trade Commission

&

Bert Elwert Professor of Business
Indiana University

Merger Analysis in High Technology Markets
George Mason University School of Law
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These are my views and not necessarily those of the Federal Trade Commission or any of the individual Commissioners.

Overview of Talk

- Market definition in traditional markets

- Conceptually, same principles apply in online retail markets

- But...the nature of online competition impacts
 - Estimates of demand elasticities
 - Different consumers differently
 - Relevant costs
 - Number of relevant competitors

Market Definition: *The Guidelines*

- “Group of products” and “geographic area”
- “No bigger than necessary” to satisfy hypothetical monopolist test.
- “Employed solely as a methodological tool”

Example: Symmetric Cournot Oligopoly

- Candidate market with
 - n sellers offering perfect substitutes
 - Constant marginal cost, c
 - Constant market elasticity of demand, E .

- Individual firm's elasticity: $E_F = nE$

Individual Firm's Profit-Maximizing Margin and Price

□ Margin:

$$\frac{P - c}{P} = \frac{1}{nE}$$

□ Price:

$$P = \frac{nE}{nE - 1} c$$

Market Definition: A Methodological Exercise ($E = 2$, $n = 4$, and $c = \$1$).

- Do the 4 firm's products constitute a relevant market?
- Price with 4 independent firms:

$$P = \frac{nE}{nE - 1} c = \frac{4(2)}{4(2) - 1} \approx \$1.14$$

- Price if 1 firm controlled all 4 products:

$$P = \frac{E}{E - 1} c = \frac{2}{2 - 1} = \$2.00$$

- These products comprise a relevant market for any SSNIP less than:

$$\% \Delta P = \frac{\$2 - \$1.14}{\$1.14} = 75\%$$

What if a Single Firm Controlled Only 2 of the 4 Products?

□ Price with 4 independent firms still $P = \$1.14$

□ Price if 1 firm controlled 2 of the 4 products:

$$P = \frac{nE}{nE - 1} c = \frac{3(2)}{3(2) - 1} = \$1.20$$

□ For a SSNIP of 5% or less, these two products constitute a relevant market, since:

$$\% \Delta P = \frac{\$1.20 - \$1.14}{\$1.14} = 5\%$$

Implications of this Hypothetical

- ❑ Firm controlling all 4 products could profitably increase prices by 75%
- ❑ Control of only subset of these perfect substitutes required to profitably impose a 5% price increase.
- ❑ Regardless of market definition, a 4 to 3 merger in this hypothetical leads to a 5% price increase

But...The Nature of Competition Matters

- If the 4 firms sold the perfect substitutes in a classical Bertrand fashion:
 - Price with 4, 3, or 2 independent firms: $P = c$
 - Price if 1 firm controlled all 4 products: $P = 2c$
- Relevant market includes all 4 firms' products and a SSNIP of 100% or less

Punch Line

- Nature of competition (the relevant economic model) matters for market definition and competitive effects
- Availability of perfect substitutes “outside” the (candidate) market not always a deal-breaker for defining a relevant market or establishing competitive effects
- Elasticities and number of sellers matter

Relevance for Online Retail Markets?

- Focus here on price comparison sites such as
 - Shopper.com
 - Nextag
 - Shopping.com
 - Kelkoo.com (Europe)
 - And more
- Some implications for market definition of my work with co-authors
 - Rupert Gatti and Paul Kattuman (Cambridge),
 - John Morgan (Berkeley)
 - Patrick Scholten (Bentley)

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Manufacturer: Canon USA, Inc. Part number: 1267B001
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Store	Certified rating	Inventory	Price	Total price
 BUYDIG.COM 800-617-4686 Your Trusted Source since 1983	★★★★★ Rate this store See store profile	In stock Great Accessory Prices	Price: \$309.00 Tax: \$0.00 Shipping: Free	\$309.00 Your best price Shop now
 WILLOUGHBY'S 800.378.1898 Est. 1888, NYC's Oldest Photographic Emporium	★★★★★ Rate this store See store profile	In stock FAST FREE SHIPPING!	Price: \$312.00 Tax: \$0.00 Shipping: Free	\$312.00 Shop now
	★★★★★ Rate this store See store profile	In stock	Price: \$319.00 Tax: \$0.00 Shipping: Free	\$319.00 Shop now
	★★★★★ Rate this store See store profile	In stock	Price: \$359.98 Tax: \$0.00 Shipping: Free	\$359.98 Shop now
	★★★★★ Rate this store See store profile	In stock	Price: \$379.99 Tax: \$22.80 Shipping: Free	\$402.79 Shop now
	★★★★★ Rate this store	In stock	Price: \$499.00 Tax: \$0.00	\$499.00

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PRODUCT DESCRIPTION

WHAT'S IN THE BOX

RATINGS & REVIEWS

Canon Powershot SD900 Digital ELPH w/ Epson PictureMate Total Imaging Solution Bundle

Catalog #: E3CNPSSD900 [View Kit Details](#)

This Kit Includes

1. Canon Powershot SD900 Digital ELPH Camera
2. Epson PM200 - Picturemate Pal Personal Photo Lab
3. PQI 1 GB Secure Digital {SD} Memory Card
4. Sakar Hi-Speed SD USB 2.0 Card Reader
5. Mercury Innovations 900mah Battery Pack F/ Powershot SD700, SD800, SD850, SD900 (NB-5L)
6. GGI USB 2.0 Hi-Speed USB to Printer Cable (480Mbps) 10 Ft.
7. GGI Digital Camera and Camcorder Screen Protectors for LCD's (pack of 12)
8. DigPro Ultra-Compact Digital Camera Deluxe Carrying Case - DP800
9. Mercury Innovations Three Piece Lens Cleaning Kit

Total If Purchased Separately: **\$496.85**
Total Savings: **\$73.86**
Your Bundle Price: **\$422.99**

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Powershot S
C

Mack Five Yea
Camera Warra



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Battery Pack F
SD800, SD850, :



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Sakar Digital C
Rapid battery c
NB-5L and SD8



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Features of Price Comparison Sites

- Ubiquitous price dispersion
- Frequent changes in identity of low-priced firm
- Day-to-day variation in number of sellers
- Evidence suggests two types of consumers
 - “Shoppers” (13%)—buy purely based on price
 - “Loyals” (87 %)—prefer a particular seller, and “stick to” that seller (up to a reservation price)

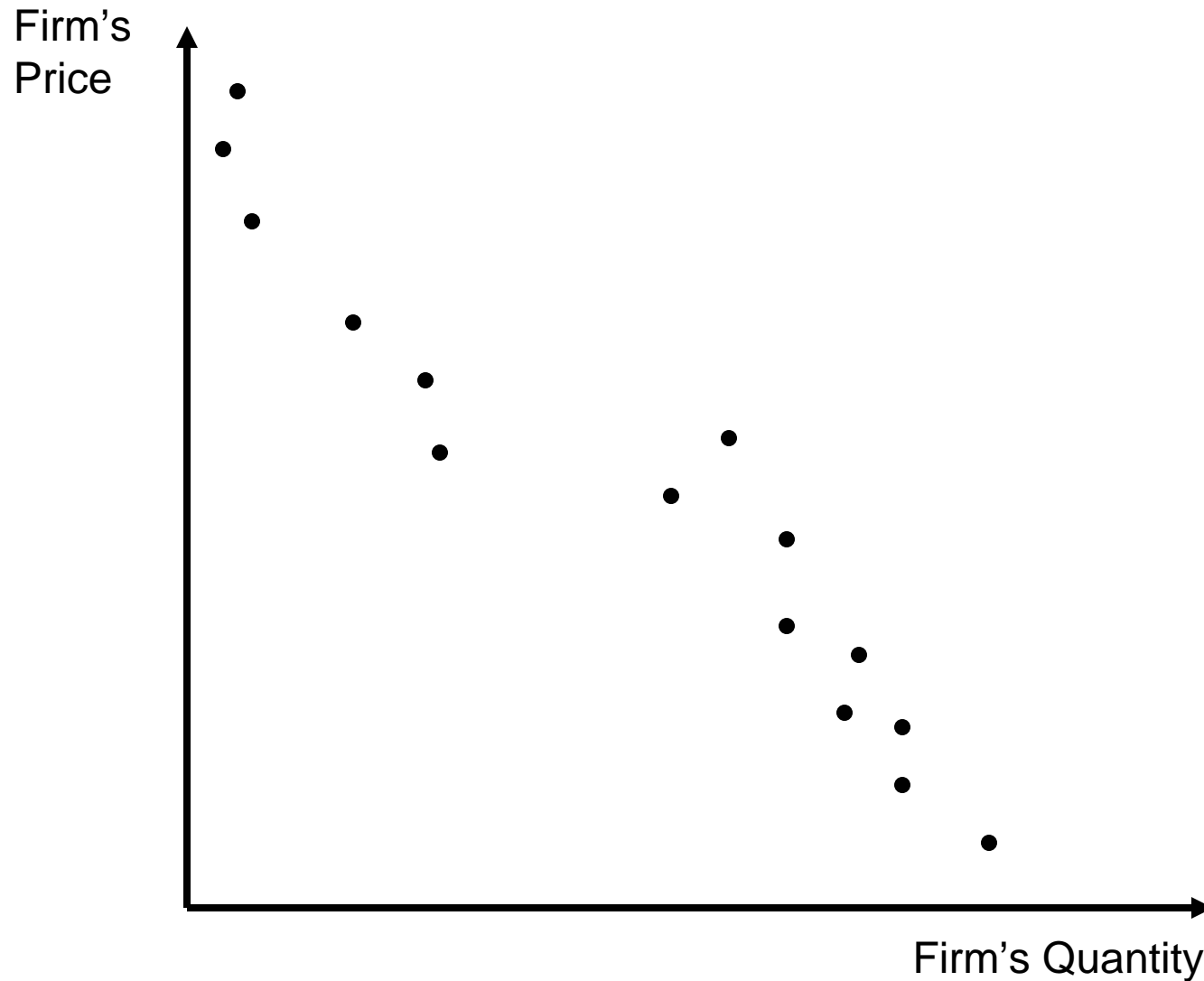
Issues Impacting Market Definition

- Relevant unit costs include
 - Costs of “free” shipping
 - Click-through fees
- Number of listings understates number of firms “active” at the site
- Elasticity of demand: Demand discontinuity due to mix of shoppers and loyals
- Differential effects on different consumers
 - Loyals pay average price
 - Shoppers pay average minimum price

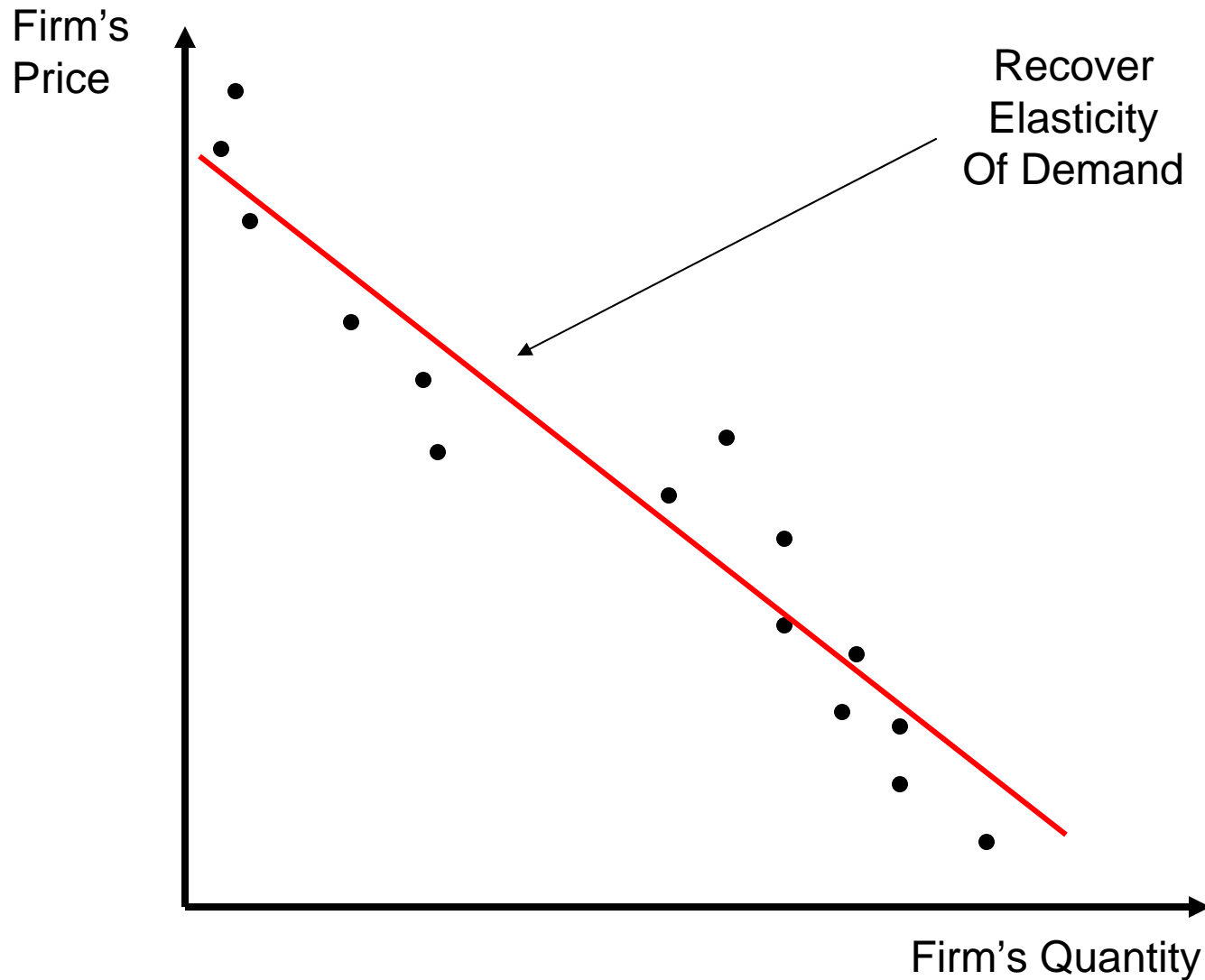
Estimating Demand Elasticities Online

- Suppose we have some reliable price and quantity data for firms selling at a comparison site
- And a trusted econometrician

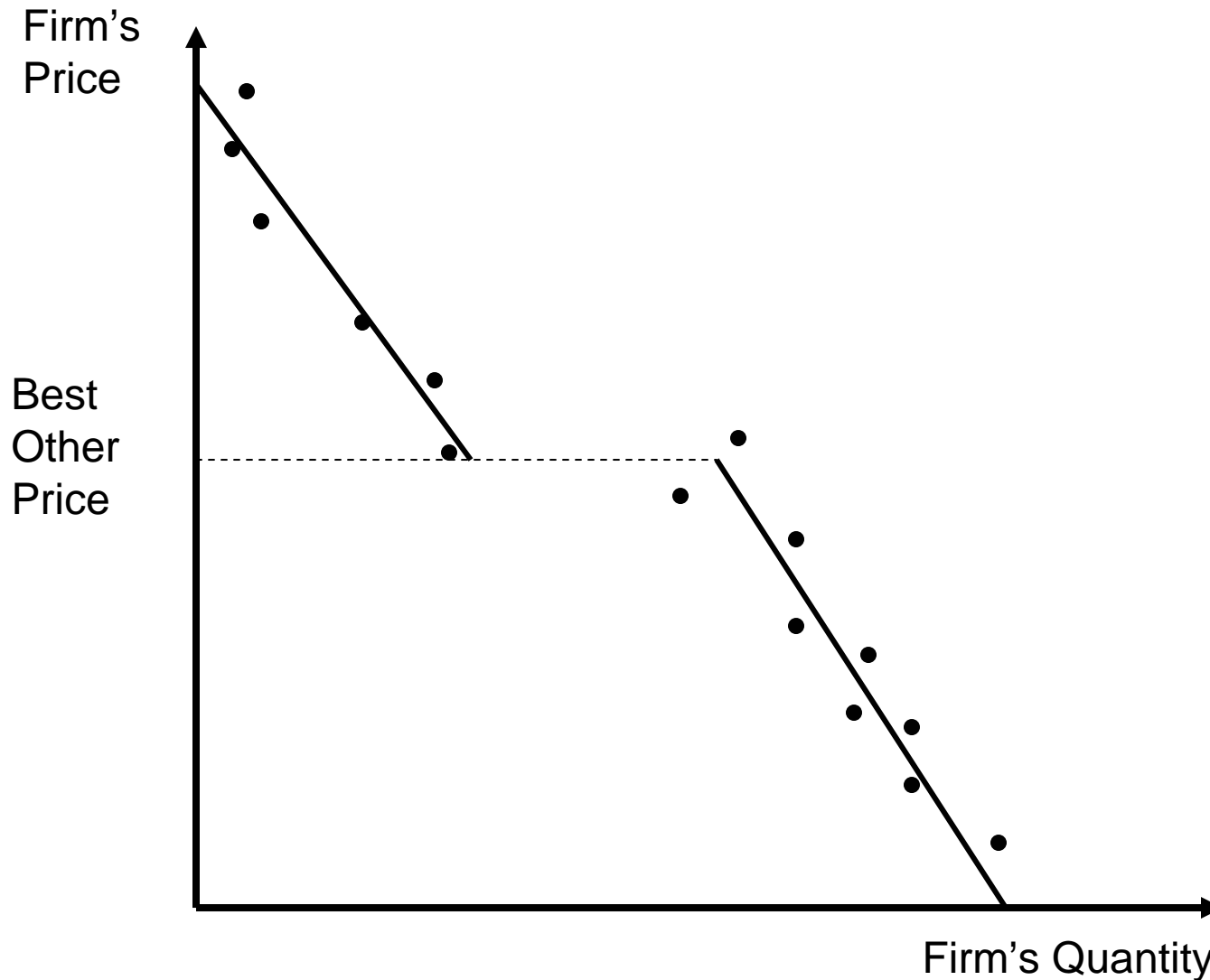
Given Data, Estimate Demand



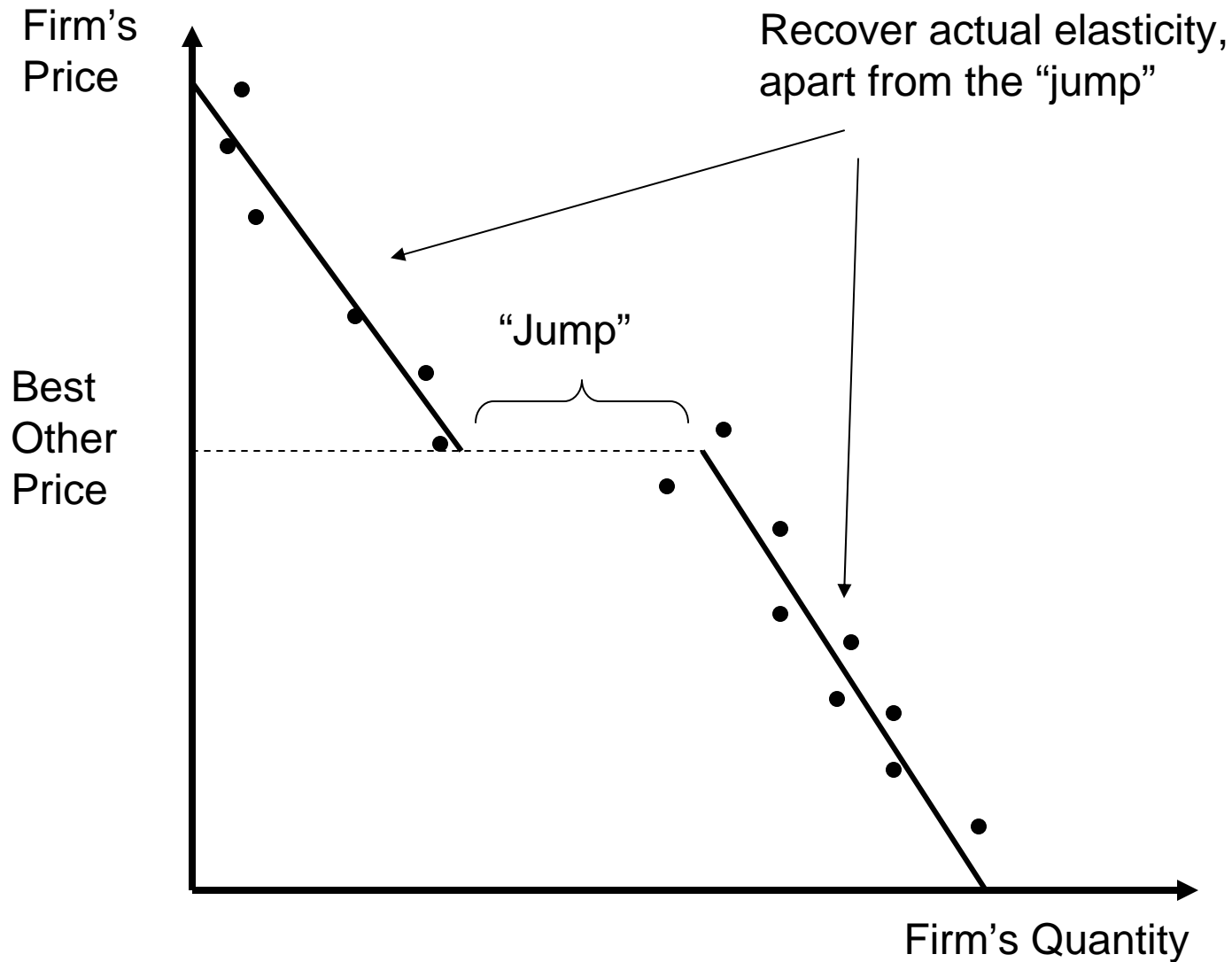
Given Data, Estimate Demand



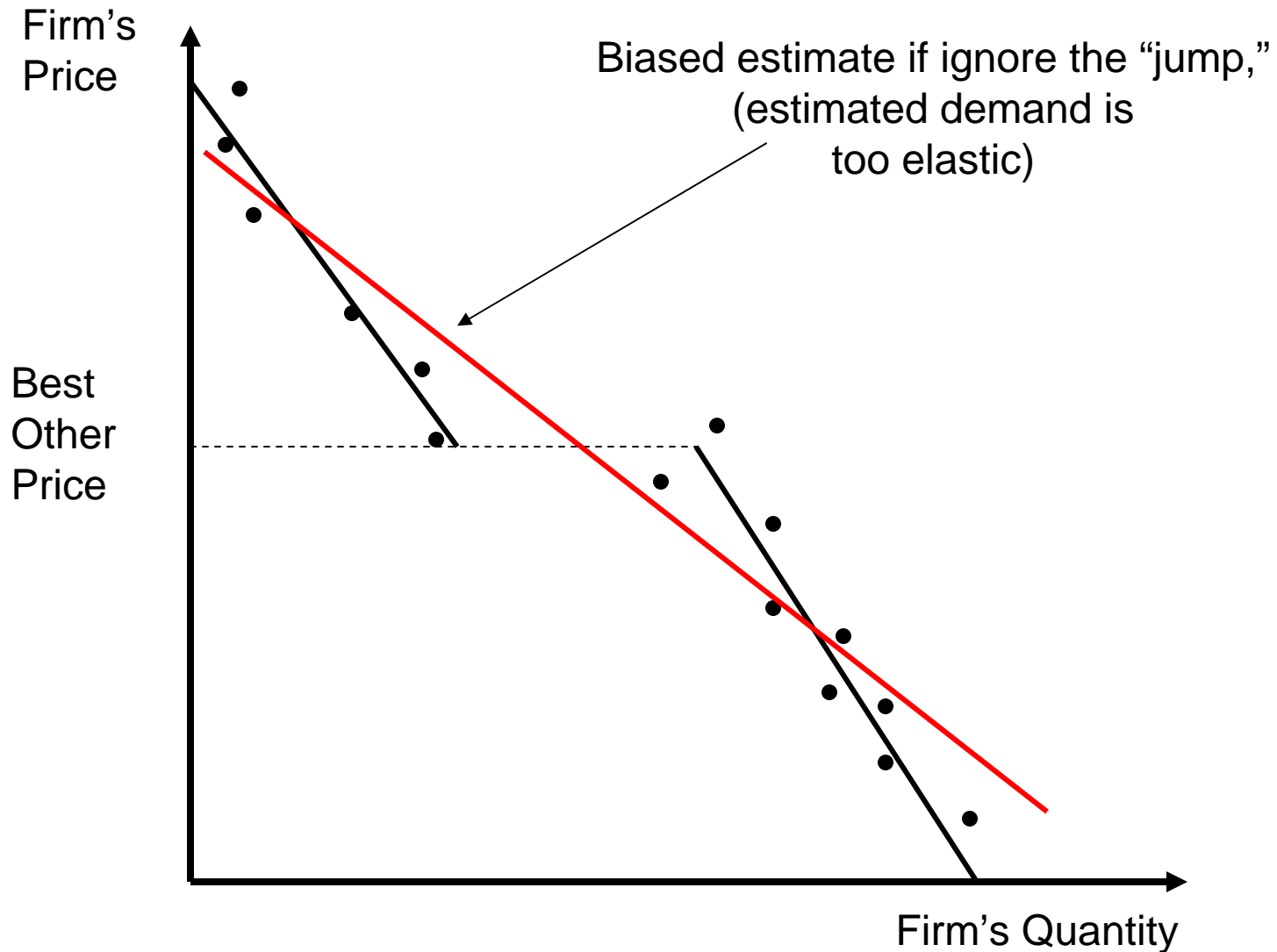
But...Get Different Estimate Properly Accounting for Mix of Shoppers & Loyals



Recover Size of Jump and Elasticity Apart from the Jump



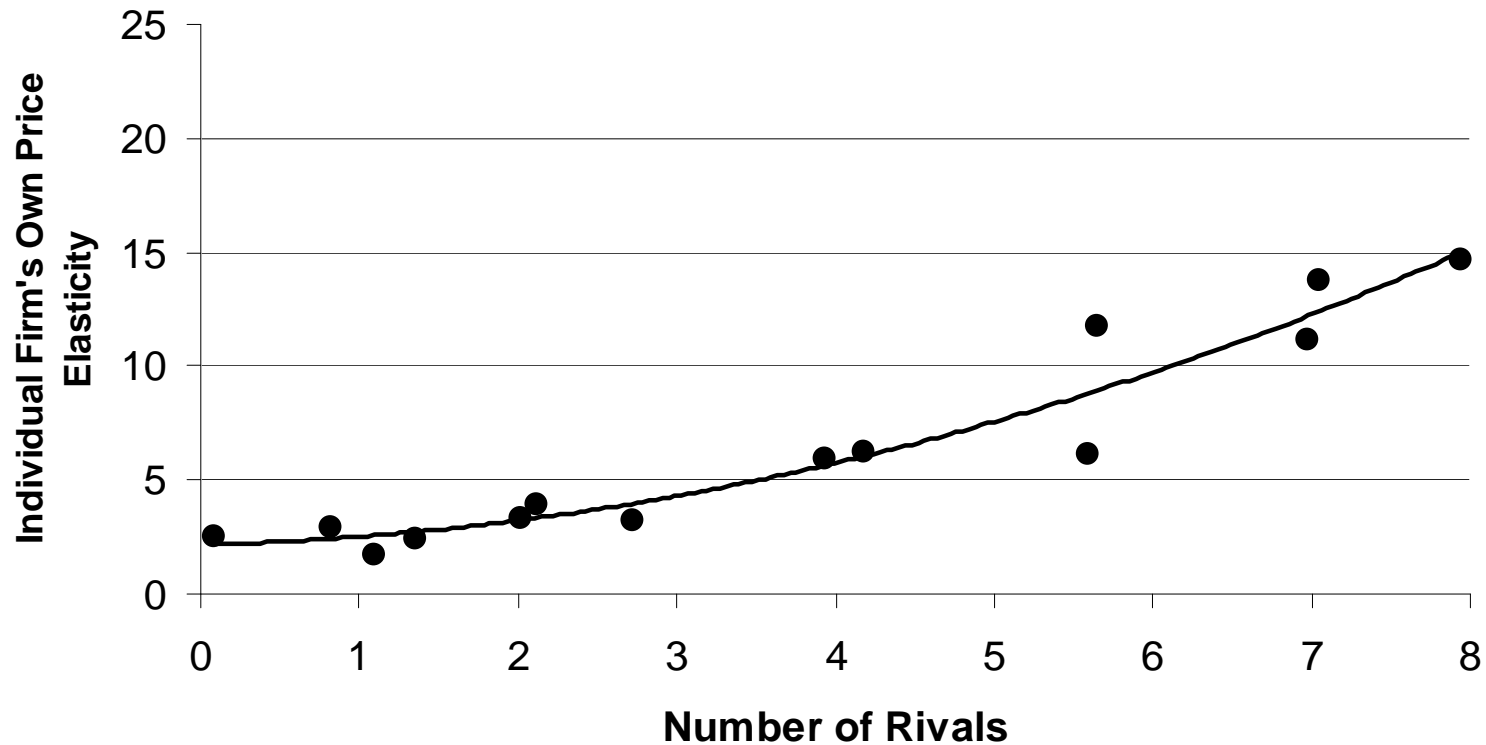
Ignoring the Jump Results in Biased Estimate of Firm's Demand Elasticity



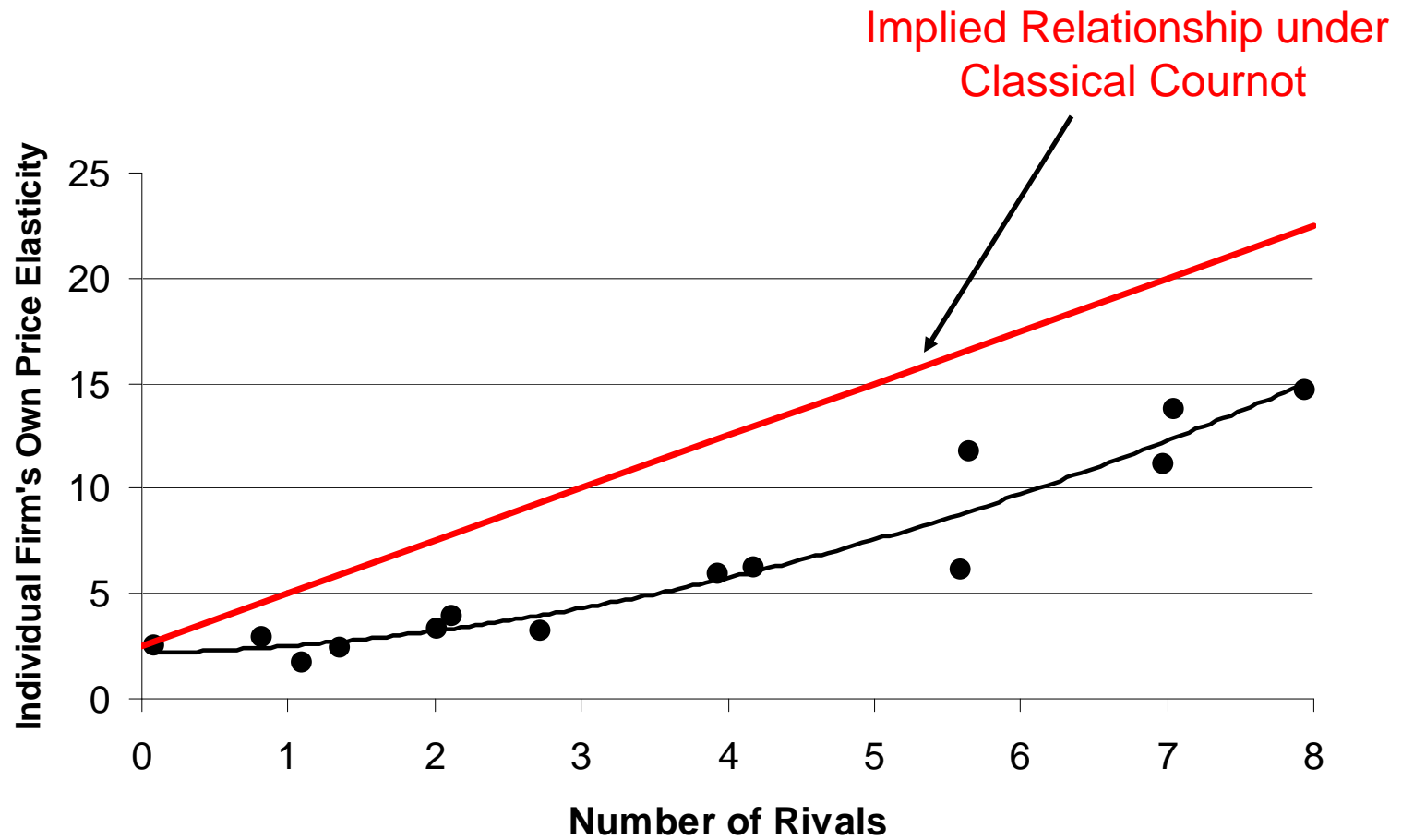
Empirical Evidence (from UK Data)

Source: Baye, Gatti, Kattuman & Morgan (2007)

An Online Seller's Demand Becomes More Elastic as the Number of Rivals Rises



More Inelastic Firm Demand than Cournot

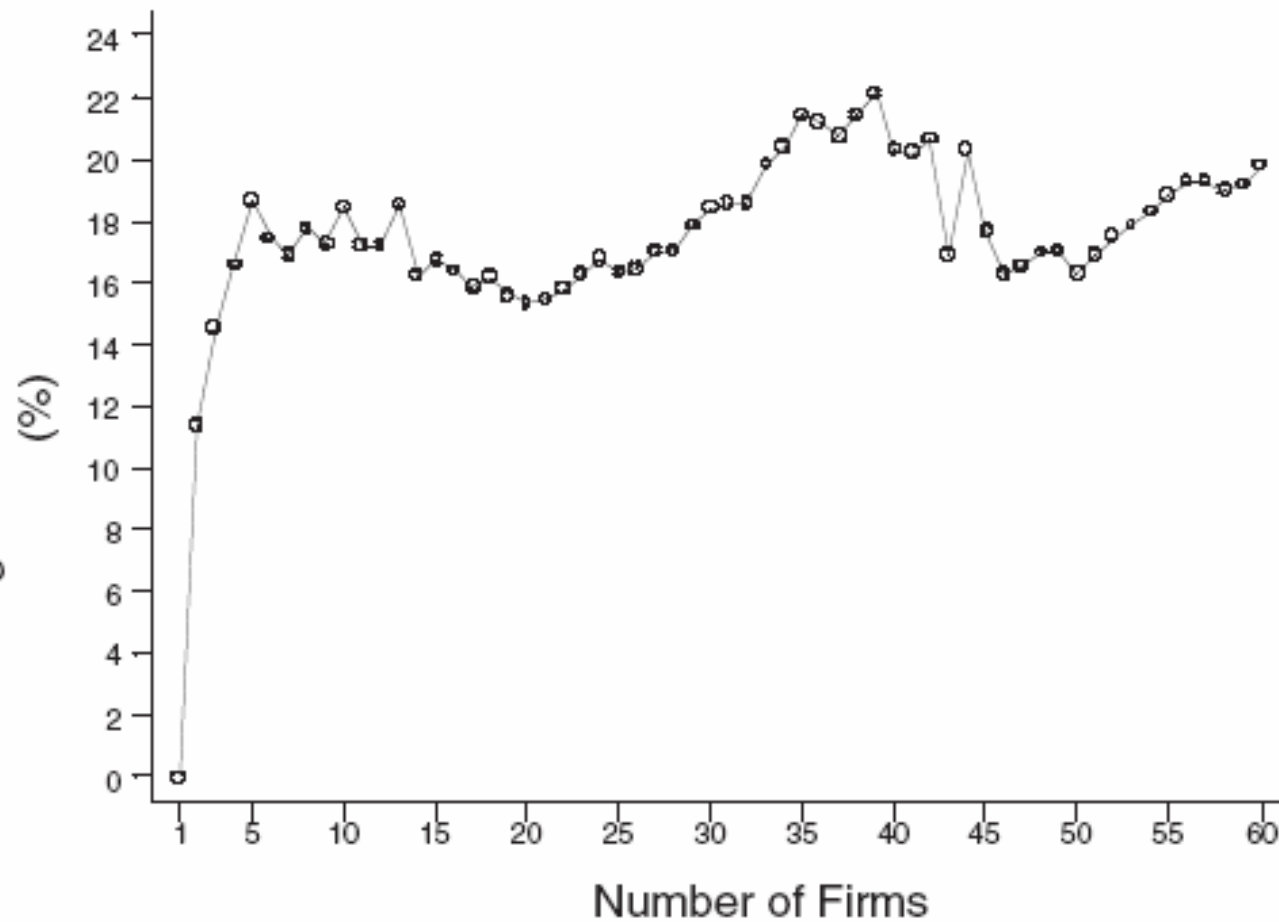


Differential Effects on Different Consumers

- Impose a SSNIP on whom?
 - Representative loyal consumer pays the average price listed at a comparison site
 - Representative shopper pays the average minimum price
- Different models of online competition have different implications for how changes in the number of firms impacts the prices paid by loyals and shoppers

Differences in Prices Paid by Shoppers and Loyals

Source: Baye, Morgan, and Scholten (2003)



Conclusions

- ❑ A relevant market may logically exclude *some* perfect substitutes
- ❑ A horizontal merger can have significant competitive effects even when
 - Transactions are “frictionless”
 - There are low (or even zero) search costs
- ❑ Market definition and competitive effects depend on
 - The nature of competition (the relevant economic model)
 - Market fundamentals (including demand elasticities, number of competitors and relevant costs)
- ❑ Complexities of online markets can impact estimates of market fundamentals

Ubiquitous Price Dispersion



Michael R. Baye
John Morgan
Patrick Scholten

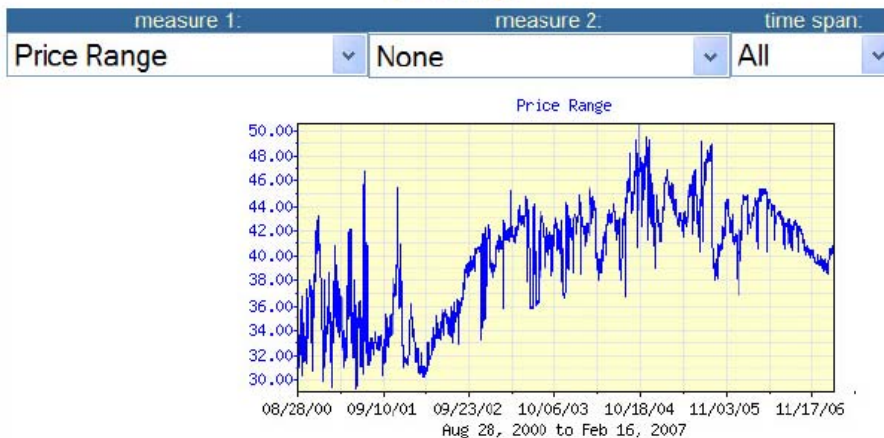
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Indices Graph



Internet Indices as of Wednesday January 23, 2008

Index	This Week	Last Week	Change	% Change
Internet Competitiveness	101.32	99.82	1.50	1.50
Price Gap	1.84	1.92	-0.08	-4.17
Market Thickness Index	122.81	125.71	-2.90	-2.31
Relative Dispersion	10.04	10.02	0.02	0.20
Price Range	40.83	40.34	0.49	1.21
Value of Information	16.40	16.22	0.18	1.11

What is Price Range?

The Price Range summarizes the percentage difference between the highest and lowest prices for each product in our database. When the price range is zero, prices charged do not vary across sellers.

Tip for Users:

You may click a measure in the above table to graph its historical values, or click a column header to sort values.

Price Range This Week:

The **Price Range** rose to 40.83 percent this week. Low-price sellers are now offering 40.83 percent better deals than sellers charging the highest prices.

Did you know?

This [research](#) is featured in the Wall Street Journal, New York Times, and Forbes. Information about these articles is contained in the [Press Coverage](#) tab.

Changes in Identity of Low-Priced Firm

Source: Baye, Morgan, and Scholten, 2004)

TABLE 3a

3Com HomeConnect: Low-Price Firm's Identity and Price (\$)

FIRM	5-NOV-99	5-DEC-99	5-JAN-00	5-FEB-00	5-MAR-00	5-APR-00	5-MAY-00	5-JUN-00	5-JUL-00	5-AUG-00	5-SEP-00	5-OCT-00	5-NOV-00	5-DEC-00	5-JAN-01	5-FEB-01	5-MAR-01
1								109.93									
2	104.95																
3											118.34					104.95	
4		104.99	104.99			113.79											
5														108.99			
6				103.88				114.25				117.94					
7													105.00		101.50		
8					114.95												
9																	109.85
10										117.95							
11							109.99										

Firm identities:

- | | | | | | |
|---|-----------------|---|------------------|----|--------------------|
| 1 | AllBusiness.com | 5 | EGGHEAD.com | 9 | Page Computer |
| 2 | Buy.com | 6 | firstsource.com | 10 | pcWonders/BuyItNow |
| 3 | ChaseShop.com | 7 | MultiwaveDirect | 11 | Ssmart.com |
| 4 | eCOST.com | 8 | NationStores.com | | |