Market Definition in Online Markets

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Merger Analysis in High Technology Markets
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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)
**Canon PowerShot SD900**

Manufacturer: Canon USA, Inc. Part number: 1267B001

$309.00 - $499.00 at 8 online stores.

This product is NOT in stock in 47401 (change zip code).

To view your personal information for future use, become a CNET member!

CNET Editors' rating: 7.6 out of 10
Average user rating: 7.8 out of 10

More product information: CNET Editor's Review | User opinions | Full specs | Accessories | Manufacturer info | Compare

Product photos: 1 2 3 4

**Online stores**

<table>
<thead>
<tr>
<th>Store</th>
<th>Certified rating</th>
<th>Inventory</th>
<th>Price</th>
<th>Total price</th>
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<tr>
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<td>★★★★★</td>
<td>In stock</td>
<td>Price: $309.00</td>
<td>$309.00</td>
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<td>In stock</td>
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<td>Dell</td>
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<td>Price: $379.99</td>
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<td>In stock</td>
<td>Price: $402.79</td>
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<tr>
<td><strong>Newegg</strong></td>
<td>★★★★★</td>
<td>In stock</td>
<td>Price: $499.00</td>
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**Similar products to Canon PowerShot SD900**

- Canon PowerShot SD800 IS: $255.00 - $349.99
- Canon PowerShot SD1000 Digital ELPH (Silver): $167.19 - $200.45
- Canon PowerShot SD850 IS: $219.95 - $314.57
- Canon PowerShot SD70 IS (Black): $289.00 - $399.99
- Canon PowerShot SD950 IS: $319.00 - $434.97
Canon Powershot SD900 Digital ELPH Camera

Catalog #: CNPBSD900  MFG Part #: 1267B001

With its sinuous perpetual curve design elegance clad in pure titanium, the PowerShot SD900 ELPH is visually arresting. But what's inside is just as impressive: a powerful 10.0 megapixel CO2, 3x optical zoom and newly developed DIGIC II Image Processor.

Shipping Info: In Stock. Usually Ships in 1-2 Business Days
Condition: Brand new, USA Warranty

FREE SHIPPING ON THIS ITEM

ALL ITEMS ARE BRAND NEW, FACTORY FRESH AND INCLUDE FULL MANUFACTURERS USA WARRANTY UNLESS OTHERWISE STATED. 30-DAY RETURN POLICY! (see policy for details)

Our Price: $309.00

Add to Cart

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

Catalog #: E3CNPBSD900  View Kit Details

This Kit Includes

1. Canon Powershot SD900 Digital ELPH Camera
2. Epson PW200 - Pictomate Fe Personal Photo Lab
3. PCT 1 GB Secure Digital (SD) Memory Card
4. Sakar Hi-Speed SD USB 2.0 Card Reader
5. Memory Innovations 900mah Battery Pack For Powershot SD700, SD800, SD860, SD960 (NS-5L)
6. GGI USB 2.0 Hi-Speed USB to Printer Cable (480Mbps) 10 Ft.
7. GGI Digital Cameras and Camcorder Screen Protectors for LCD's (pack of 12)
8. Digitpro Ultra-Compact Digital Camera Deluxe Carrying Case - DP800
9. Mercury Innovations Three Piece Lens Cleaning Kit

Total if Purchased Separately: $495.85
Total Savings: $73.86
Your Bundle Price: $422.99
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

Firm’s Price

Recover Elasticity Of Demand

Firm’s Quantity
But…Get Different Estimate Properly
Accounting for Mix of Shoppers & Loyals
Recover Size of Jump and Elasticity Apart from the Jump

Firm’s Quantity

Firm’s Price

Best Other Price

“Jump”

Recover actual elasticity, apart from the “jump”
Ignoring the Jump Results in Biased Estimate of Firm’s Demand Elasticity

Biased estimate if ignore the “jump,” (estimated demand is too elastic)
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

Implied Relationship under Classical 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
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

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

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</tbody>
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**Firm Identities:**

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