Industrial Economics and Policy
Debora Di Gioacchino

• Classes: MON: 2am-4am; WED: 11am-1pm
• Office: Room 636, 6th Flor
  • debora.digioacchino@uniroma1.it
• Web site: https://sites.google.com/a/uniroma1.it/deboradigioacchino/

Course outline

• Course introduction and basic microeconomics recap.
• Game theory and applications
  • Nash Equilibrium; quantity competition; price competition with homogeneous and differentiated products.
  • Subgame perfect equilibrium; entry deterrence; sequential quantity and price competition; two-stage games: choice of capacity, choice of location, vertical relationship.
  • Repeated games; collusion in prices and quantities.

Digital Economy, ICT and media markets
• Economic characteristics of ICT markets: economies of scale and scope; price discrimination; lock in; switching costs.
• Price discrimination; Pricing strategies: bundling and versioning.
• R&D, innovation and innovation policy
• Networks externalities.
• Two-sided markets
• Media economics
• Big data
References

• Part I: any book on industrial organization, e.g.
  • Church and Ware. Industrial Organization, 2000, available on line.

• Part II:
  • Comino and Manenti (CM). Industrial Organization of High-Technology Markets, Edward Elgar Publishing, 2014 (chs. 2-4)

• Additional readings
  • Will be given during course

Exam

• Multiple choice only on part I (33%): 15 questions (1 if correct, -0.5 if wrong, 0 if not answered). If mark at least 9 then proceed to written exam or register the grade (maximum 20).

• Written exam (66%): theory and exercises. Written exam is a pass if grade is at least 12/20.

• If final grade 26 or more you may ask for oral examination (final grade may decrease up to 2 and increase up to 2).

• There will be a mid-term exam on part I (in the first week of May).
Industrial Economics or IO

- Study of firms’ behaviour in imperfectly competitive markets in which firms have MARKET POWER (MP)
- Firms adopt strategies to obtain and maintain MP
  - Pricing strategies, including price discrimination and predatory pricing.
  - Product differentiation (horizontal and vertical)
  - Choice of quantity and Productive capacity
  - Merger decisions
  - Vertical and horizontal relationships with competitors (e.g. agreements)
  - Advertising
  - R&D

“New” Industrial Organization

- Relies on game theory
  - focuses on strategic interaction
- Builds models: abstractions
  - Simplification but gain the power of generalization
- Empirical Analysis—Use theory to form testable hypotheses
- Game theory in IO is a tool to analyse strategic interaction among firms whose aim is profit maximization
  - profits depend on firm’s strategy as well as competitors’ strategies
  \[ \Pi_i(s_1, s_2, \ldots, s_n) \]
Motivation for Industrial Organization

- **Firm’s perspective** (positive)
  - Market power and profits

- **Society’s perspective** (normative)
  - Market power and efficiency
  - Need for anti-trust policy recognized by Adam Smith
    “The monopolists, by keeping the market constantly understocked, by never fully supplying the effectual demand, sell their commodities much above the natural price.”
    “People of the same trade seldom meet together, even for merriment or diversion, but the conversation ends in a conspiracy against the public, or in some contrivance to raise prices.”

Market Structure and Market Power

- Industries have very different structures
  - numbers and size distributions of firms
    - ready-to-eat breakfast cereals: high concentration
    - newspapers: low concentration
  - How to measure market structure
    - concentration ratio or Herfindahl-Hirschman index
  - Market Performance
    - Lerner index of market power
What is a market?

- No clear consensus
- the market for automobiles
  - should we include light trucks; pick-ups SUVs?
- the market for soft drinks
  - what are the competitors for Coca Cola and Pepsi?
- With whom do McDonalds and Burger King compete?
- Presumably define a market by closeness in substitutability of the commodities involved
  - how close is close?
  - how homogeneous do commodities have to be?
    - Does wood compete with plastic? Rayon with wool?

Measure of concentration

- Compare two different measures of concentration:

<table>
<thead>
<tr>
<th>Firm Rank Market</th>
<th>Market Share (%)</th>
<th>Squared Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25</td>
<td>625</td>
</tr>
<tr>
<td>2</td>
<td>25</td>
<td>625</td>
</tr>
<tr>
<td>3</td>
<td>25</td>
<td>625</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>7</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>8</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>Concentration Index</td>
<td>CR₄ = 80</td>
<td>H = 2,000</td>
</tr>
</tbody>
</table>
Concentration index is affected by mergers

<table>
<thead>
<tr>
<th>Firm Rank</th>
<th>Market Share (%)</th>
<th>Squared Market Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25</td>
<td>625</td>
</tr>
<tr>
<td>2</td>
<td>25</td>
<td>625</td>
</tr>
<tr>
<td>3</td>
<td>25</td>
<td>625</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>7</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>8</td>
<td>5</td>
<td>25</td>
</tr>
</tbody>
</table>

Assume that firms 4 and 5 decide to merge

Market shares change

The Concentration Index changes

Concentration Index

CR_4 = 80

Assume that firms 4 and 5 decide to merge

Market shares change

The Concentration Index changes

Concentration Index

CR_4 = 80

85

H = 2,000

2,050

Measuring Market Power/Performance

• Market structure is often a guide to market performance
• But this is not a perfect measure
  • can have near competitive prices even with “few” firms
• Measure market performance using the Lerner Index

\[ L = \frac{P - MC}{P} \]
Market Performance 2

• Perfect competition: $L = 0$ since $P = MC$
• Monopoly: $L = 1/\varepsilon$ – inverse of elasticity of demand
• With more than one but not “many” firms, the Lerner Index is more complicated: need to average.
  • suppose the goods are homogeneous so all firms sell at the same price

\[ L = \frac{P - \Sigma s_iMC_i}{P} \]

Concentration and Market Power

• There is a positive relationship between concentration and market power ...

\[ L = H/\varepsilon \]

$L$ is Lerner index of market power
$H$ is HH index of concentration
$\varepsilon$ is elasticity of demand
**Assignment**

Consider two markets (A and B), each with 4 firms. Market shares are as given in table below.

Which market is more concentrated?

In the last column of table above you find MC in market B.

Suppose the equilibrium price in that sector is $P=2$, compute the Lerner index.

<table>
<thead>
<tr>
<th>Firms</th>
<th>A</th>
<th>B</th>
<th>MC in market B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>35%</td>
<td>40%</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>35%</td>
<td>30%</td>
<td>1.2</td>
</tr>
<tr>
<td>3</td>
<td>25%</td>
<td>20%</td>
<td>1.4</td>
</tr>
<tr>
<td>4</td>
<td>5%</td>
<td>10%</td>
<td>1.5</td>
</tr>
</tbody>
</table>

**Video-game consoles**


- The home video game industry can be traced back in 1972
- Atari released Atari 400 and 800 in 1979
- The promise of success attracted a flood of imitators ..
- In 1985 Nintendo released the NES boundled with the video game «Super Mario» at 199 $
- Some generations of technology later, CD-based consoles ... Sega, Sony ...
- 2000’s Sony PS vs Microsoft Xbox with Nintendo as third player
• Pricing decisions

• In 2006
  • PS3 basic $499 premium $599
  • Xbox basic $299 elite $ 599

• 2007
  • Microsoft reduced Xbox elite’s price at $450. Two months later Sony reduced each price by $100

• 2008
  • Sony cut price of high-end model at $399. Microsoft cut Cbox elite’s price at $399. Nintendo did not change its prices

• 2009
Assignment

• Given the information in Exhibits 1, 2, 3
  • Draw AVC and ATC
  • Calculate Sony’s profit over variable cost when Ps=Pm=399
  • Assuming demand curves are linear, calculate own-price elasticities of demand at price 399
  • To be continued ....
Average Cost Curves

AC.xps