Monopoly

Sources

• Patents, Copyright
• Government Franchise
  – Electricity
• Economy of scale ("natural monopoly")
• Network externality
  – Demand side equivalent of scale economy
• Control of an essential input

Basic Model

• Profit \[ \pi = p(q)q - c(q) \]
• FOC: \[ 0 = \frac{\partial \pi}{\partial q} = p(q_m) + q_mp'(q_m) - c'(q_m) \]
• MR = MC
  \[ \frac{p(q_m) - c'(q_m)}{p(q_m)} = 1 - \frac{q_mp'(q_m)}{p(q_m)} = 1 - \frac{1}{\varepsilon} \]
Price-Cost Margin

- $\frac{p - mc}{p}$ is the price-cost margin
- AKA Lerner Index $\frac{p(q_m) - c'(q_m)}{p(q_m)} = \frac{1}{\varepsilon}$
- Inverse elasticity rule
- Price higher to more inelastic demand

\[ p(q_m) = \frac{\varepsilon}{\varepsilon - 1} c'(q_m). \]

Taxes

- Monopoly responds to taxes differently
- A competitive industry eventually passes on entire tax
- A monopoly may absorb part of tax forever
Pricing

• Profit maximization entails charging more to the less elastic demanders
• Creates a problem of arbitrage
  – Consumers charged high prices attempt to buy at lower price

Direct Price Discrimination

• AKA value-based pricing
• Charge based on customer characteristics
  – Student, elderly discounts
• Location
  – Pharmaceuticals by country
• Other purchases
• Arbitrage still a problem

Indirect Price Discrimination

• Coupons
• Quantity discounts
• Other good purchases
• Solves arbitrage by "self-selection"
Examples: Damaged Goods

- Pharmaceutical pricing
  - Brand price rises when generics available
- 486SX, 487SX
  - disabled math co processor
- IBM LaserPrinter E
  - Added chips to slow processing
- Sony 74, 60 minute mini-discs
  - differ by instructions on disc

Two Ways of Booking
Two Roundtrips

<table>
<thead>
<tr>
<th></th>
<th>AUS → LA</th>
<th>AUS ← LA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mon</td>
<td></td>
<td>$2200.00</td>
</tr>
<tr>
<td>Thu</td>
<td></td>
<td>$420.00</td>
</tr>
<tr>
<td>(Jan 2004)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Means of Preventing Arbitrage

- Transportation costs
  - Gravel, gasoline
- Legal impediments to resale
  - Airlines
- Personalized products or services
  - Window installation
- Thin markets and matching problem
  - Airlines, pre-internet
- Informational problems
  - Veterinary vs. human drugs
Dell 512 MB Memory Module

• Part Number A 019 3405

<table>
<thead>
<tr>
<th>Segment</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Business</td>
<td>$289.99</td>
</tr>
<tr>
<td>GSA/DOD</td>
<td>$266.21</td>
</tr>
<tr>
<td>Home</td>
<td>$275.49</td>
</tr>
<tr>
<td>Small Business</td>
<td>$246.49</td>
</tr>
</tbody>
</table>

Dell’s Spokesperson

• Each Segment sets its own pricing
• Customer is free to pick the one that’s cheapest

Welfare Effects of Price Discrimination

• If discrimination makes total output fall, \( W \downarrow \)
• \( W \) can rise, if output rises
  – Example: US price > Mexico price for a drug
  – If price discrimination prohibited, seller quits serving Mexican market
  – Price discrimination is a pareto improvement
Two-Part Pricing

- Standard monopoly price creates dead-weight loss
- Dead-weight loss avoided with pricing that includes a fixed charge (profit) and price equal to marginal cost
- In principle permits efficient monopoly

Two Part Pricing Diagram

Natural Monopoly

- Decreasing average cost
- Thus MC < AC
- Marginal cost pricing unprofitable
- Efficiency requires subsidies
- Best unsubsidized price is average cost
Peak-load Pricing

- At capacity, marginal costs include
  - Costs of expanding capacity
  - Value of unserved customers
- For electricity, airlines, hotels, marginal costs fluctuate dramatically
- Pricing should reflect likelihood of sellout or reaching capacity