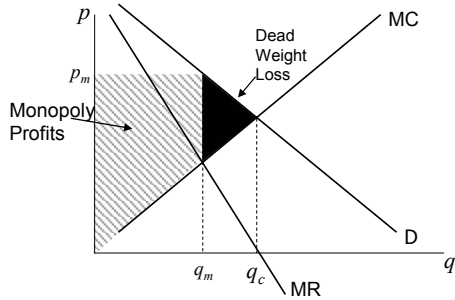# Monopoly

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: $0 = \dfrac{\partial \pi}{\partial q} = p(q_m) + q_m p'(q_m) - c'(q_m)$

- MR = MC

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

Standard Monopoly Diagram

Price-Cost Margin

- $\frac{p - mc}{p}$ is the *price-cost* margin

- AKA Lerner Index $\quad \frac{p(q_m) - c'(q_m)}{p(q_m)} = \frac{1}{\varepsilon}$

- 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
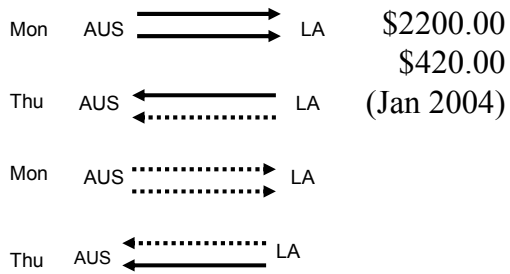- Other purchases
- Arbitrage still a problem

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

Mon   AUS ——————→ LA $2200.00
                          $420.00
Thu   AUS ←—————— LA   (Jan 2004)
      AUS ◄·······

Mon   AUS ·······→ LA
      AUS ·······→ LA

Thu   AUS ◄······· LA
      AUS ←—————— LA

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

Large Business	$289.99
GSA/DOD	$266.21
Home	$275.49
Small Business	$246.49

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↓
• 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
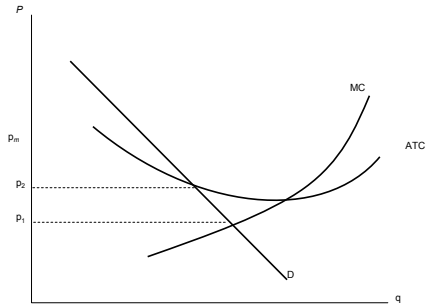- In principle permits efficient monopoly

Two Part Pricing Diagram
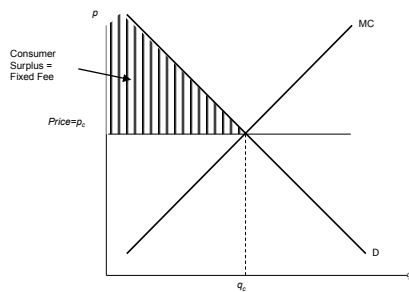
Natural Monopoly

- Decreasing average cost
- Thus MC < AC
- Marginal cost pricing unprofitable
- Efficiency requires subsides
- Best unsubsidized price is average cost

Natural Monopoly Diagram

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