Economics 101A
(Lecture 19)

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Outline

1. Rent Control

2. Market Equilibrium in The Long-Run

3. Profit Maximization: Monopoly

4. Price Discrimination

1 Rent Control

- Rent control: Restrict increase of rent that can be charged
  - San Francisco + Berkeley: only 1-2% increase per year
  - Covers all rental units built before 1979
- Intent: Keep area affordable
- Consider graphically effect of Rent control

- Two costs of rent control:
  - Cost 1. Some units will not be rented
  - Cost 2. Existing units may be misallocated

2 Market Equilibrium in the Long-Run

- Nicholson, Ch. 12, pp. 425-435

- So far, short-run analysis: no. of firms fixed to J

- How about firm entry?

- Long-run: free entry of firms

- When do firms enter? When positive profits!

- This drives profits to zero.

- Entry of one firm on industry supply function $Y^S(p,w,r)$ from period $t-1$ to period t :

$$Y_t^S(p,w,r) = Y_{t-1}^S(p,w,r) + y(p,w,r)$$

- Supply function shifts to right and flattens:

$$\begin{aligned} Y_t^S(p,w,r) &= Y_{t-1}^S(p,w,r) + y(p,w,r) \\ &> Y_{t-1}^S(p,w,r) \text{ for } p \text{ above } AC \end{aligned}$$

since $y(p,w,r) > 0$ on the increasing part of the supply function.

- Also:

$$Y_t^S(p,w,r) = Y_{t-1}^S(p,w,r) \text{ for } p \text{ below } AC$$

since for p below AC the firm does not produce $(y(p,w,r) = 0)$.

- In the long-run, price equals minimum of average cost

- Why? Entry of new firms as long as $\pi > 0$

- ($\pi > 0$ as long as $p > AC$)

- Entry of new firm until $\pi = 0 \Longrightarrow$ entry until $p = AC$

- Also:

$$\text{If } C'(y) = \frac{C(y)}{y}, \text{ then } \frac{\partial}{\partial}\frac{C(y)}{y} = 0$$

- Graphically,

- Special case:

- **Constant cost industry**

- Cost function of each company does not depend on number of firms

3 Profit Maximization: Monopoly

- Nicholson, Ch. 11, pp. 371-380

- Nicholson, Ch. 14, pp. 501-510

- **Perfect competition.** Firms small

- **Monopoly.** One, large firm. Firm sets price p to maximize profits.

- What does it mean to set prices?

- Firm chooses p, demand given by $y = D(p)$

- (OR: firm sets quantity y. Price $p(y) = D^{-1}(y)$)

- Write maximization with respect to y

- Firm maximizes profits, that is, revenue minus costs:

$$\max_y p(y)\, y - c(y)$$

- Notice $p(y) = D^{-1}(y)$

- First order condition:

$$p'(y)\, y + p(y) - c'_y(y) = 0$$

or

$$\frac{p(y) - c'_y(y)}{p} = -p'(y)\frac{y}{p} = -\frac{1}{\varepsilon_{y,p}}$$

- Compare with f.o.c. in perfect competition

- Check s.o.c.

- Elasticity of demand determines markup:
  - very elastic demand $\longrightarrow$ low mark-up
  - relatively inelastic demand $\longrightarrow$ higher mark-up

- Graphically, y^* is where marginal revenue $\left(p'\left(y\right)y+p\left(y\right)\right)$ equals marginal cost $\left(c_y'\left(y\right)\right)$

- Find p on demand function

- Example.

- Linear inverse demand function $p = a - by$

- Linear costs: $C(y) = cy$, with $c > 0$

- Maximization:

$$\max_y (a - by)\, y - cy$$

- Solution:

$$y^*(a, b, c) = \frac{a - c}{2b}$$

and

$$p^*(a, b, c) = a - b\frac{a - c}{2b} = \frac{a + c}{2}$$

- s.o.c.

- Figure

- Comparative statics:

  - Change in marginal cost c

  - Shift in demand curve a

- Monopoly profits

- Case 1. High profits

- Case 2. No profits

- Welfare consequences of monopoly
  - Too little production
  - Too high prices

- Graphical analysis

4 Price Discrimination

- Nicholson, Ch. 14, pp. 513-519

- Restriction of contract space:

  - So far, one price for all consumers. But:

  - Can sell at different prices to differing consumers (**first degree** or perfect price discrimination).

  - Self-selection: Prices as function of quantity purchased, equal across people (**second degree** price discrimination).

  - Segmented markets: equal per-unit prices across units (**third degree** price discrimination).

4.1 Perfect price discrimination

- Monopolist decides price and quantity consumer-by-consumer

- What does it charge? Graphically,

- Welfare:

  - gain in efficiency;

  - all the surplus goes to firm

4.2 Self-selection

- Perfect price discrimination not legal

- Cannot charge different prices for same quantity to A and B

- Partial Solution:

  – offer different quantities of goods at different prices;

  – allow consumers to choose quantity desired

- Examples (very important!):
  - bundling of goods (xeroxing machines and toner);
  - quantity discounts
  - two-part tariffs (cell phones)

- Example:

- Consumer A has value \$1 for up to 100 photocopies per month

- Consumer B has value \$.50 for up to 1,000 photocopies per month

- Firm maximizes profits by selling (for ε small):

  - 100 photocopies for \$100-ε

  - 1,000 photocopies for \$500-ε

- Problem if resale!

4.3 Segmented markets

- Firm now separates markets

- Within market, charges constant per-unit price

- Example:

  - cost function $TC(y) = cy$.

  - Market A: inverse demand function $p_A(y)$ or

  - Market B: inverse function $p_B(y)$

- Profit maximization problem:

$$\max_{y_A, y_B} p_A(y_A)\, y_A + p_B(y_B)\, y_B - c(y_A + y_B)$$

- First order conditions:

- Elasticity interpretation

- Firm charges more to markets with lower elasticity

- Examples:
  - student discounts
  - prices of goods across countries:
    * airlines (US and Europe)
    * books (US and UK)
    * cars (Europe)
    * drugs (US vs. Canada vs. Africa)
- As markets integrate (Internet), less possible to do the latter.

5 Next Lecture

- Oligopoly?

- Game theory

- Back to oligopoly:

  - Cournot

  - Bertrand