Outline

1. Consumer Surplus

2. Trade

3. Rent Control

4. Market Equilibrium in The Long-Run
1 Welfare: Consumer Surplus

• Nicholson, Ch. 5, pp. 165-169 (Ch. 5, pp. 145–149, 9th)

• Welfare effect of price change from $p_0$ to $p_1$

• Proposed measure:
  \[ e(p_0, u) - e(p_1, u) \]

• Can rewrite expression above as
  \[
  e(p_0, u) - e(p_1, u) = 
  \left( e(0, u) + \int_0^{p_0} \frac{\partial e(p, u)}{\partial p} \, dp \right) - 
  \left( e(0, u) + \int_0^{p_1} \frac{\partial e(p, u)}{\partial p} \, dp \right) 
  = \int_{p_0}^{p_1} \frac{\partial e(p, u)}{\partial p} \, dp
  \]

• What is $\frac{\partial e(p, u)}{\partial p}$?
• Remember envelope theorem...

\[ \frac{\partial e(p, u)}{\partial p} = h(p, u) \]

• Welfare measure is integral of area to the side of Hicky-sian compensated demand

• Graphically,
• Example of welfare effects: Imposition of Tax

• Welfare before tax

• Welfare after tax
2 Trade

- Nicholson, Ch. 12, pp. 427-429 (Ch. 11, pp. 326–327, 9th)

- Assume that domestic industry opens to trade

- Is this a good or a bad thing?

- Consider graphically

- Equilibrium with no trade at quantity $X^*_D$ and price $p^*_D$
• Trade: Goods available at lower price $p_T^*$

• (Otherwise, openness to trade irrelevant)

• Shift in price to $p_T^* < p_D^*$ and in quantity to $X_T^* > X_D^*$

• Label domestic production and imports
• What happens to profits of domestic firms?

• What happens to consumer surplus?

• More total surplus, but firms lost some profits and some employment — Difficult trade-off
3 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
4 Market Equilibrium in the Long-Run

• Nicholson, Ch. 12, pp. 406-417 (Ch. 10, pp. 295–306, 9th)

• 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 $Y^S_t(p, w, r)$ from period $t - 1$ to period $t$:

$$Y^S_t(p, w, r) = Y^S_{t-1}(p, w, r) + y(p, w, r)$$

• Supply function shifts to right and flattens:

$$Y^S_t(p, w, r) = Y^S_{t-1}(p, w, r) + y(p, w, r)$$

> $Y^S_t(p, w, r) > Y^S_{t-1}(p, w, r)$ for $p$ above $AC$ since $y(p, w, r) > 0$ on the increasing part of the supply function.

• Also:

$$Y^S_t(p, w, r) = Y^S_{t-1}(p, w, r)$$ for $p$ below $AC$ since for $p$ below $AC$ the firm does not produce ($y(p, w, r) = 0$).
• Flattening:

\[
\frac{\partial Y_t^S (p, w, r)}{\partial p} = \frac{\partial Y_{t-1}^S (p, w, r)}{\partial p} + \frac{\partial y (p, w, r)}{\partial p} > \frac{\partial Y_{t-1}^S (p, w, r)}{\partial p}
\text{ for } p \text{ above } AC
\]

since \( \frac{\partial y (p, w, r)}{\partial p} > 0 \).

• Also:

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

• Profits go down since demand curve downward-sloping
• 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 $\pi = 0 \implies$ entry until $p = AC$

• Also:

  If $C'' (y) = \frac{C (y)}{y}$, then $\frac{\partial C (y)}{\partial y} = 0$
• Graphically,
• Special cases:

• **Constant cost industry**

• Cost function of each company does not depend on number of firms
- Increasing cost industry

- Cost function of each company increasing in no. of firms

- Ex.: congestion in labor markets
• Decreasing cost industry

• Cost function of each company decreasing in no. of firms

• Ex.: set up office to promote exports
5 Next Lecture

- Market Power

- Monopoly

- Price Discrimination

- Then... Game Theory