Outline

1. Consumer Surplus

2. Trade

3. Rent Control

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

• Nicholson, Ch. 5, pp. 169-173

• 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...

• Result:

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

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

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

• Welfare before tax

• Welfare after tax
2 Trade

• 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. 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 $t$:

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

• Supply function shifts to right and flattens:

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

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 \( \partial y(p, w, r) / \partial p > 0 \).

• 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 \( \pi > 0 \)

• \( (\pi > 0 \text{ as long as } p > AC) \)

• Entry of new firm until \( \pi = 0 \iff \text{entry until } p = AC \)

• Also:

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