

# Economics 101A

## (Lecture 18)

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## 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

$$\begin{aligned} e(p_0, u) - e(p_1, u) &= \left( e(0, u) + \int_0^{p_0} \frac{\partial e(p, u)}{\partial p} dp \right) - \\ &\quad - \left( e(0, u) + \int_0^{p_1} \frac{\partial e(p, u)}{\partial p} dp \right) \\ &= \int_{p_1}^{p_0} \frac{\partial e(p, u)}{\partial p} dp \end{aligned}$$

- 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 Hicksian 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  $t$  :

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

- 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 ( $y(p, w, r) = 0$ ).

- Flattening:

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

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  $\pi > 0$
- ( $\pi > 0$  as long as  $p > AC$ )
- Entry of new firm until  $\pi = 0 \implies$  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