

Constraints, Subsidies and Taxes

Goals

- ▶ Deep review of consumer and producer surplus
- ▶ What they really mean
- ▶ Work Examples

Welfare Measure

- ▶ CS/PS is a welfare measure
- ▶ There are others
 - ▶ Compensating Variation – How much money would be required after a changes in prices to give you the same utility.
 - ▶ Equivalent Variation – What you would pay to avoid the price change.

Why CV or EV?

- ▶ They use the expenditure function.
- ▶ Capture general equilibrium effects
- ▶ CS/PS only captures one market, CV and EV capture all markets.
- ▶ Almost all the of the time CS/PS is not that far off.

Producer Surplus

- ▶ $\int_0^q (p - S(q)) dq$
- ▶ Roughly the area below price and above supply up to the quantity.
- ▶ Gets complex when quantities and prices don't line up nice.

Decompose

- ▶ Total Revenue (TR): $p \cdot q$
- ▶ Variable Cost (VC): area under the supply curve
- ▶ Producer surplus ($\Pi + FC$): Profit + FC

$$\Pi = TR - (VC - FC)$$

Consumer Surplus

- ▶ Total Surplus: Area under the demand function up to q .
- ▶ Total Surplus: Integral of D is the expenditure function, how much money to achieve a level of utility.
- ▶ The benefit of being able to purchase

Consumer surplus subtracts off what you pay and give net benefit of being able to buy in the market.

Example 1: Competitive Market

Example 2: Ceiling

Example 3: Ceiling but must provide

This is what happens when you keep gas or electricity cheap for locals.

Example 4: Export Oil

Example 5: Tax on Oil (No Trade)

Comments About Tax

- ▶ Yes, there is deadweight loss.
- ▶ Remember, the tax revenue should be paying for things that have value to society greater than cost.

Incidence: Who Pays?

Example 6: Tax on Oil with Export Market

Example 7: Rooftop Solar