

Lecture 3(iii)

Announcements

Lecture

1. What makes demand more elastic?
2. Income Elasticity
3. Widget Industry in Econland
Consumer Surplus
Producer Surplus
4. Pareto Efficiency

What Makes Demand More Elastic?

1. Long time horizon

If taxes on gasoline are high for a long period of time, like in Europe, consumers will gas guzzling cars will get old be be scrapped, and they will tend to be replaced by fuel efficient cars. People will move closer to where they work. And other adjustments that take time. So demand is more elastic in the long run than the short turn.

2. When products are defined more narrowly so there exist closer substitutes. (Hard to define substitutes for broad categories)

Look at Food
Hard to substitute away from food.

A) Price elasticity of food as a group is low (inelastic). So if all prices increase 10%, quantity falls less than 10% (so spending on food goes up).

B) But now suppose look at one kind of food, meat. Raise price of meat, price of other foods fixed... Meat is a more narrow category than food as whole. So substitutes (not great) exist, like tofu, fish, and beans.

C) Now look at raising price of Johnsonville Brats 10%
Can easily substitute a different kind of brat. Demand is very elastic.

Income Elasticity of Demand

$$e^{Income} = \frac{\% \Delta Q^D}{\% \Delta Income}$$

For **Inferior Goods**: $e^{Income} < 0$

For **Normal Goods**: $e^{Income} > 0$

Two kinds:

Necessity $0 < e^{Income} < 1$

(Or **income inelastic**. Spending share falls as income rises)

toilet paper...

Luxury $1 < e^{Income}$

(Or **income elastic**: Spending share rises as income rises)

vacation homes... and

Health Care

(At country level)

Look at this data on health care spending as percent of GDP (gross domestic product) for various countries

Data from, Uwe E. Reinhardt, Peter S. Hussey and Gerard F. Anderson, "U.S. Health Care Spending In An International Context," *Health Affairs*, 23, no. 3 (2004): 10-25

<http://content.healthaffairs.org/cgi/content/full/23/3/10>

Country	GDP per Capita	Health Spending Share
US	35.2	13.9
Switzerland	29.9	11.1
Norway	36.4	9.0
Germany	26.2	10.7
Canada	28.8	9.7
Average Rich	31.3	10.9
Hungary	13.4	6.8
Slovak Rep	12.0	5.7
Mexico	8.9	6.0
Turkey	5.7	4.8
Average Poor	10.0	5.8

So health care at the country level is clearly an **income elastic** good.

Richer countries tend to spend a higher share of income on health care.

Next we introduce a model that will we use to study how markets work.

As is standard practice in economics, the model will be fully specified. We will explicit about all the agents in the economy and how they behave.

Widget Industry in Econland

Going to use this to examine the efficiency of competitive markets and the impacts of government policies.

Inhabitants: D1, D2, D3,....D10
S1, S2, S3,,S10

Only D people eat Widgets.

Each D person has a **reservation value** for one widget. Amount of dollars he would be exactly willing to give up to get one.

(Note: each D person can eat at most one widget)

Table of reservation values

Name	Reservation price for one widget
D1	9
D2	8
D3	7
D4	6
D5	5
D6	4
D7	3
D8	2
D9	1
D10	0

D1 indifferent between:

\$20 and 0 widget

\$11 and 1 widget

S people

- don't eat widgets.
- but know how to make them
- get hungry from widget work

Cost to a S person to make one widget. Amount of dollars we have to give her so she is just willing to do it.

(Each S person can make at most one widget.)

Table of Costs

Cost of one widget (dollars)	Name
1	S1
2	S2
3	S3
4	S4
5	S5
6	S6
7	S7
8	S8
9	S9
10	S10

S3 indifferent between:

\$20 and making 0 widget

\$23 and making 1 widget

Gather the Information Up

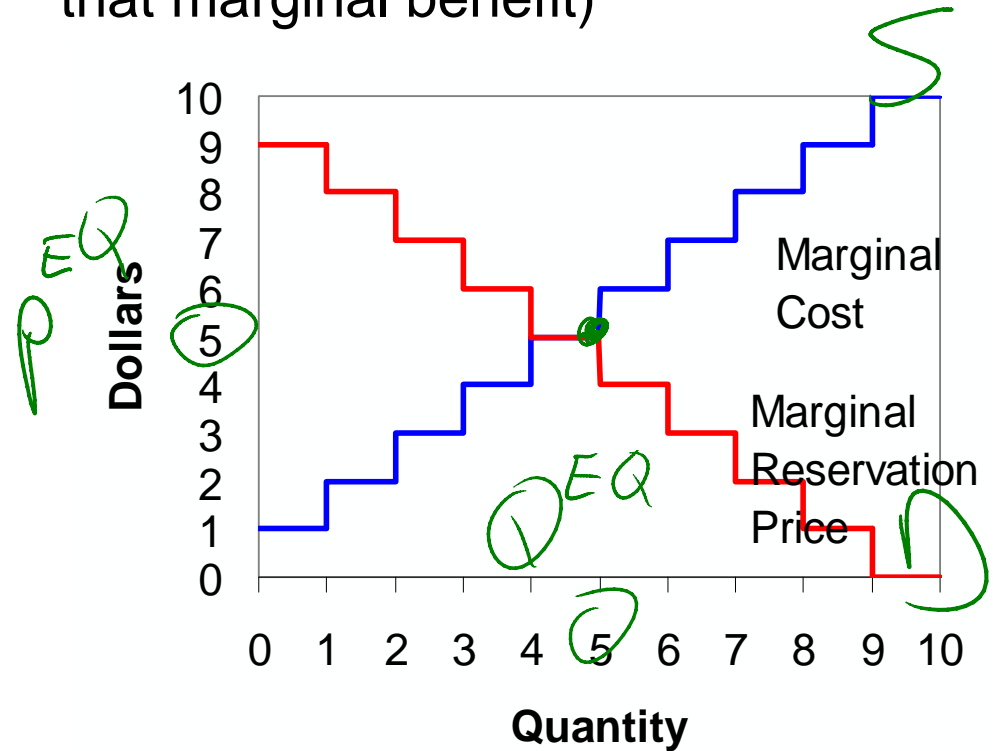
Reservation Prices and Costs for Widgets

Name	Res. Price	Cost	Name
D1	9	1	S1
D2	8	2	S2
D3	7	3	S3
D4	6	4	S4
D5	5	5	S5
D6	4	6	S6
D7	3	7	S7
D8	2	8	S8
D9	1	9	S9
D10	0	10	S10

Let's plot this.

Marginal Cost: the cost of the next one in.

Marginal Reservation Price: The value of the next one in. (Could call that marginal benefit)



Suppose we set up a market economy in Econland

At $P=3$, who is willing to sell?

so Q^S is S_1, S_2, S_3
3

So from **Marginal Cost** curve,
we get

Supply Curve

At $P=7$, who is willing to buy?

So Q^D is D_1, D_2, D_3
3

So **Marginal Res. Price** curve
we get

Demand Curve

What happens when Econland is a Market Economy?

P : price of a widget

MRP is demand curve

MC is supply curve

- $Q = 5$
- $P = 5$
- S_1, S_2, S_3, S_4, S_5 produce
- D_1, D_2, D_3, D_4, D_5 consume

Market determines the
 P, Q , and who.

What are the Gains from Trade?

Consumer surplus of particular
buyer

= reservation price – price paid

Producer surplus of seller

= price received – cost

Q	Res. Price	price paid	CS	Price rec.	Cost	PS
1	9	5	4	5	1	4
2	8	5	3	5	2	3
3	7	5	2	5	3	2
4	6	5	1	5	4	1
5	5	5	0	5	5	0
6	4	-	0	-	6	0
7	3	-	0	-	7	0
8	2	-	0	-	8	0
9	1	-	0	-	9	0
10	0	-	0	-	10	0
Total			10			10

$TS = CS + PS$
 $20 = 10 + 10$

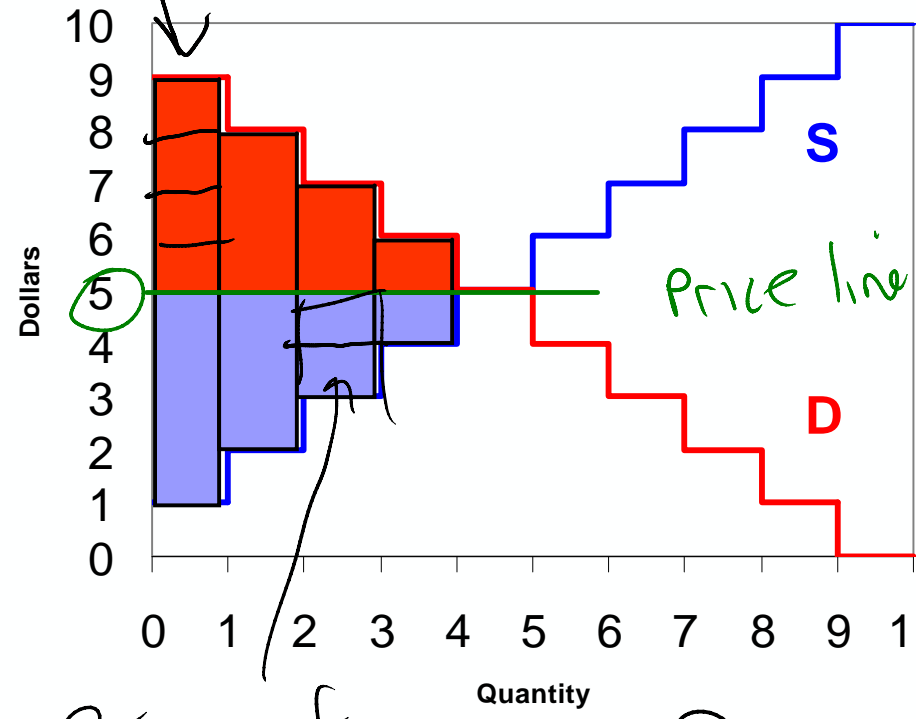
↑
Total Surplus

↑
Total CS

↑
Total PS

Consumer Surplus and Producer Surplus in Competitive Equilibrium

CS = 4 (surplus of D)



PS of S2 = 2

See in graph

In a market economy...

Consumer Surplus

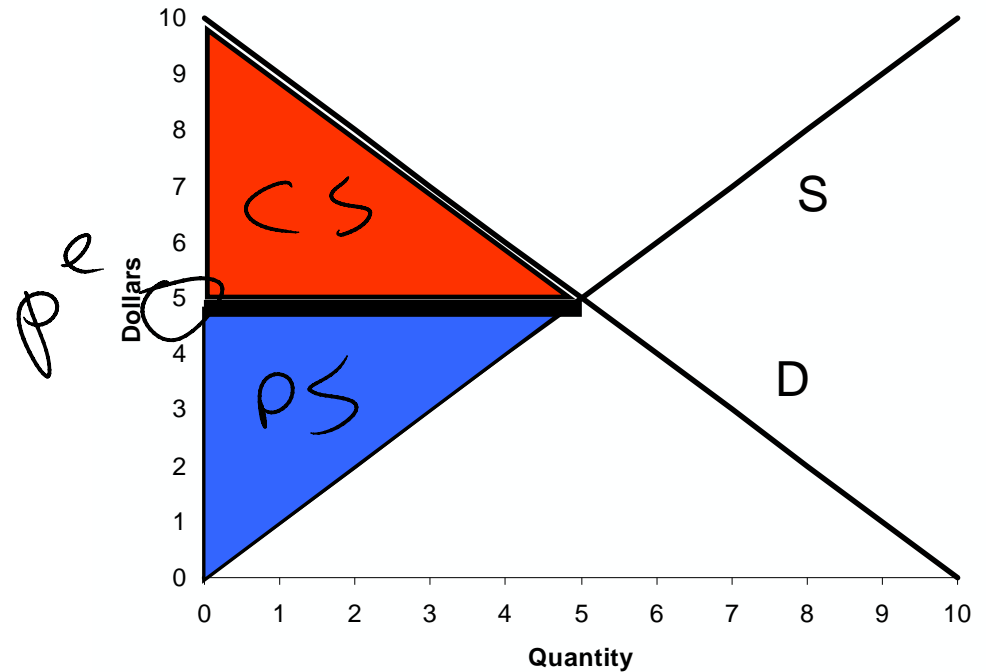
Area between demand curve and price line

Producer Surplus

Area between price line and supply curve

In Econland, demand and supply curves look like steps

In economy with lots of people, we won't notice the steps, things will smooth out.

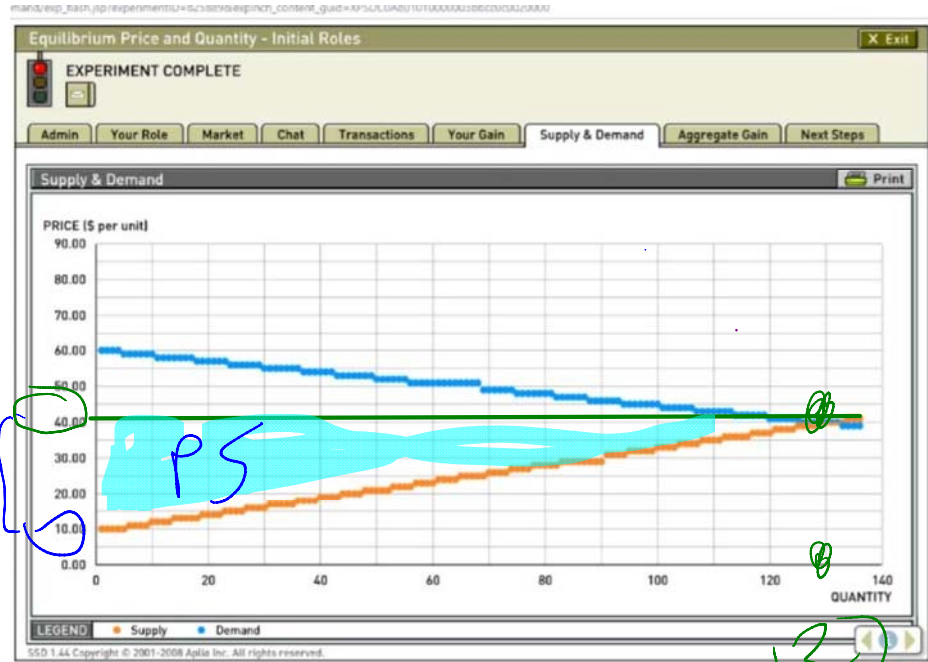


$$\begin{aligned} \text{CS} &= \text{Area of Triangle} \\ &= \frac{1}{2} \times 5 \times 5 = 12.5 \end{aligned}$$

$$\text{PS} = \frac{1}{2} \times 5 \times 5 = 12.5$$

$$\text{TS} = \text{CS} + \text{PS} = 25$$

Like this from last week:



PS at competitive price?

$$40 - 10 = 30$$

130

30

Area of triangle

$$\frac{30 \times 130}{2}$$

= \$1950 of producer surplus

So that is **market allocation**

And the **social surplus** (or “pie”)
And the division of the surplus (“who get’s what slice”)

The next step is to examine the **efficiency** of the market.

Need a concept of efficiency.

The standard concept is

Pareto Efficiency

Vilfredo Pareto 1848-1923



An allocation is **Pareto Efficient** if it is feasible and there is no way to make someone better off without making someone worse off.

or...The Pie is big as it can be. (If someone is to get a bigger slice, it can only come from someone else getting a smaller slice.)