Econ Land, Markets and Pareto Efficiency

Econ 1101

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ECON 1101 Lecture 3.3

1. Introducing EconLand

2. A Market Economy

3. Gains from trade and surpluses

4. Pareto Efficiency

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1. Introducing EconLand

Introducing the Widget Industry in EconLand

Now, let's look at something different: let's introduce a model that we will use to study how markets work.

Our ECON 1101 economy that follows our assumptions. Like the map example from the first day of class, what happens in Econland can tell us something useful about the real world.

We are going to use EconLand this to examine the efficiency of competitive markets and the impacts of government policies.

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

EconLand: Setup - 1. Consumers

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

1. **Consumers:** D people

   - Only "D" (Demand) people eat Widgets
   - Each D person can eat at most one widget. ă
   - Each D person has a **reservation value** for one widget: the amount of dollars he would be exactly willing to give up to get one.

Table of Reservation Values:

1. Consumers: Table of 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

Suppose D1 has \$20 to start with.

D1 indifferent between:

Keeping \$20 and having 0 widget

Or

Having \$11 and 1 widget (he values a widget a \$9, so \$20-\$9 = \$11)

EconLand: Setup 2. Suppliers

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

2. Suppliers: S people

- Don't eat widgets, but know how to make them
- However, they get hungry from widget work (they won't do it for free!)
- Each S-person only can make one widget

Cost to a S person to make one widget can be interpreted as the amount of dollars we have to give her so she is just willing to do it.

Table of Costs:

2. Suppliers Table of COST:

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

Suppose S3 has $20 to start with.

S3 indifferent between:

$20 and making 0 widget

Or

$23 and making 1 widget (She must get $3 from selling a widget to be still indifferent)

Towards the market equilibrium

We are looking to derive the market equilibrium in our economy so:

- As we explained in the beginning of the class,we need Supply, Demand and market clearing
- We put together consumers and producers (rankings)
- Next we **plot this on a Graph.**

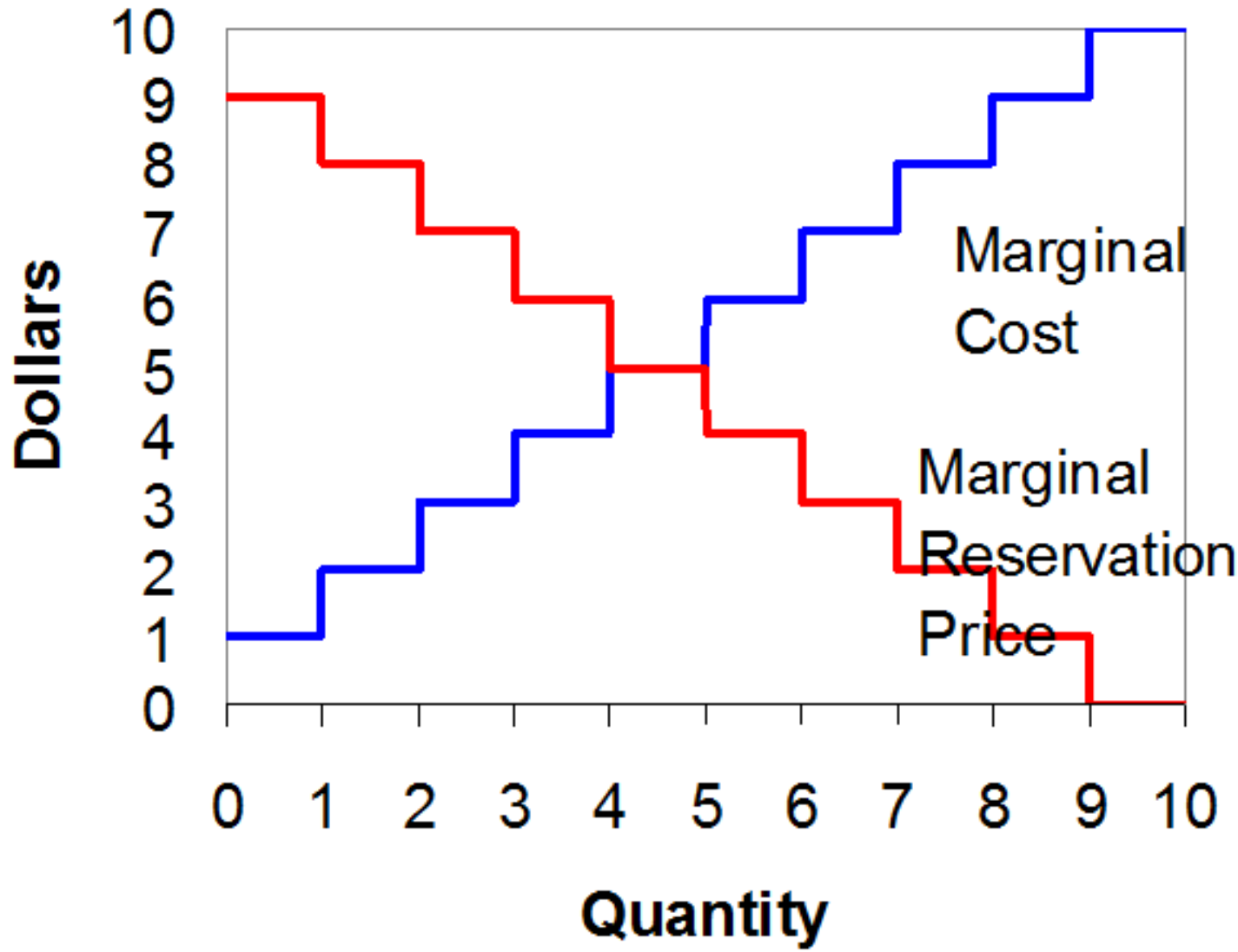
Two important concepts

- Marginal Cost: the cost of the next one in (think of the additional cost to sellers as a group due to the next unit)
- Marginal Reservation Price: The value of the next one in (or additional value to buyers as a group that the next unit provides)
- Often referred to as marginal benefit

Putting Togegther

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

Plotting on a Graph



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2. Setting up a Market Economy in Econ Land

Setting up a market economy: Equilibrium

- From the Marginal Cost Curve we will derive the Supply Curve
- From the Marginal Benefit Curve, the demand Curve
- The market will determine the P, Q and the Who: Market Clearing or Market Equilibrium

- What happens when ECON LAND is a market Economy?
  - Q=5 (quantity produced and consumed)
  - P=5 (price of widget)
  - S1, S2, S3, S4,S5 produce
  - D1, D2, D3, D4,D5 consume

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3. Gains From Trade: Surpluses

What are the Gains from Trade?

Definitions: Surpluses

- Consumer surplus of particular buyer = reservation price – price paid
- Producer surplus of seller = price received – cost
- Total Surplus (of Econ Land) = Total CS + Total PS

Lets Calculate Surpluses and see a visual of them

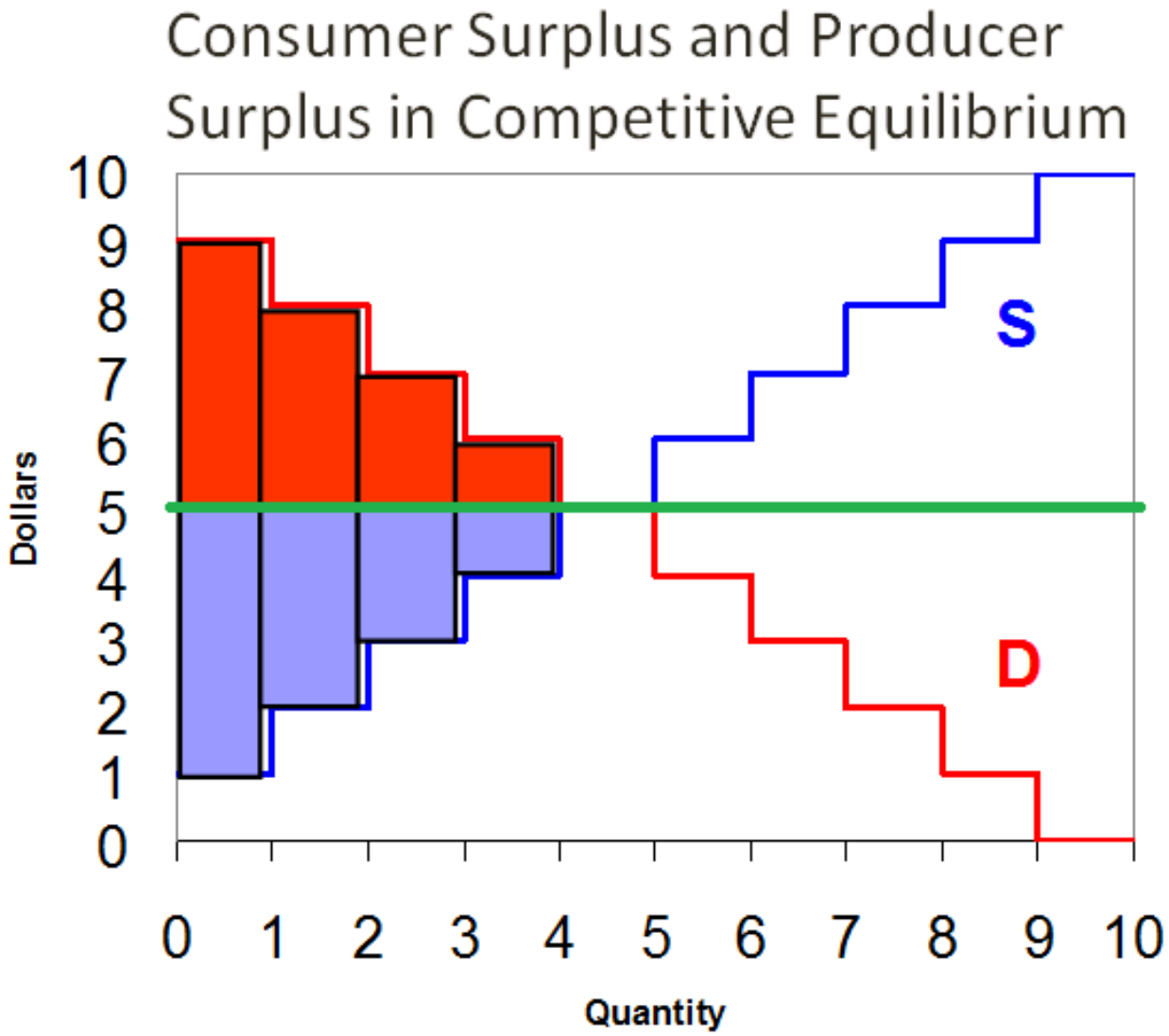
Consumer and Producer Surplus

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

CS and PS GRAPHICALLY



Consumer and Producer Surplus

Consumer Surplus

Area between demand curve and price line

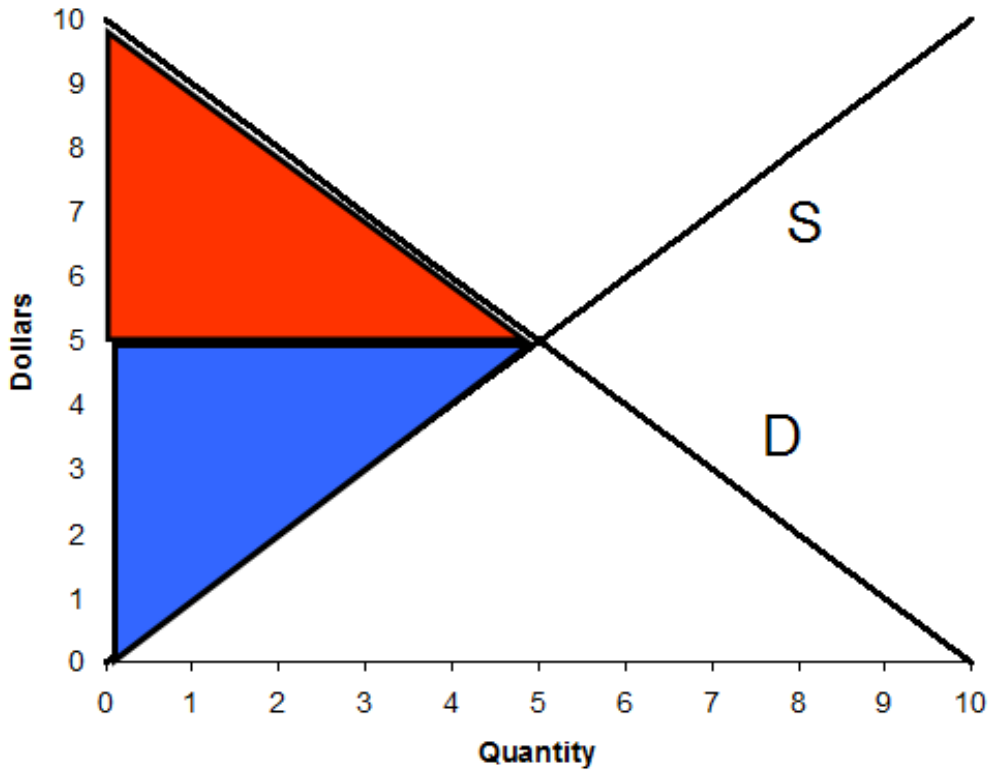
ă**Producer Surplus**

Area between price line and supply curve NOTE: In Econland, demand and

supply curves look like steps

- In an economy with lots of people, we won't notice the steps, things will smooth out
- this example had 10 people, but think about an economy with 1000 people, the steps will become smaller.
- Now think about an economy with infinitely many people

CS and PS: The General Case.



CS = Area of Triangle
= ½×5 ×5 = 12.5

PS = ½×5 ×5 = 12.5

TS = CS + PS = 25

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4. Pareto Efficiency

Pareto Efficiency

We just have the same supply and demand diagram that we've always been looking at.

- This is the case when the allocation is a **market allocation** (P, Q, and Who are determined competitively)

How should we interpret this new "Total Surplus"

- idea? Look at it like a "**Social surplus**"... or if it helps, a "Social pie"

Consumers get part of the social pie, producers get part of the social pie

But can we say that the **market allocation** is **efficient**?

What does it mean for an allocation to be efficient? We need a concept of efficiency.

- The standard concept in Economics is **Pareto Efficiency**

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.
- Alternatively: 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.)

Examples: Pareto Efficiency

There are 6 pies. Is the following allocation Pareto efficient?

2 pies to student, 2 pies to me, and 2 pies in trash.

Not Pareto efficient Because there exists an alternative feasible allocation that can make one person better off without making anyone worse off.

If we take 2 pies out of trash and give both to me, I am better off and the student is not worse off. (Or we can give 1 pie to the student and 1 pie

to me, and both are better off.)

Examples: Pareto Efficiency

How about 3 pies for me, 3 pies for student, and no pies in trash.
This is Pareto efficient. The only way to make the student better off is to take a pie from me. I will be worse off.

How about 6 pies for me, 0 to student, and no pies in trash.
This is Pareto efficient. Again, the only way to make the student better off is to take a pie from me

Note: the term "equity" does not show up in the definition of efficiency. So if the "pie" as as big as can be, the allocation can still be efficient even if one person gets the whole pie

More Examples: Pareto Efficiency (MARKET ALLOCATION)