Lecture 4(i) Announcements

Aplia Experiment Thur or Friday:
3 rounds (around 10 minutes)
If participate, add 1.5 bonus to HW4
Choose between 4 different times:
Thur 9am, 2pm, 10pm
Friday 3pm
(Only participate once!)

Evening Midterm in two weeks!
Mon Oct 8 7:00-8:00 pm
If you have conflict, you need to register with headgrader@gmail.com
for makeup Wed 4-5pm
Makeup Registration Deadline (for no penalty) Mon Oct 1, 4pm

Start looking at practice midterm
See Canvas, bottom of week 5!

Lecture

1. Review Consumer Surplus and Producer Surplus in Market Allocation

2. Pareto Efficiency

3. Link between efficiency and the market allocation.

Adam Smith Theorem

After midterm will introduce concept of **externalities**. Pay attention to news about climate change..

4. Policy 1: Banning Widgets

Last class we figured out what happens when Econland has a

market economy

- Q = 5
- P = 5
- S1, S2, S3, S4, S5 produce
- D1, D2, D3, D4, D5 consume

Consumer surplus of particular buyer
= reservation price – price paid

Producer surplus of seller
= price received – cost

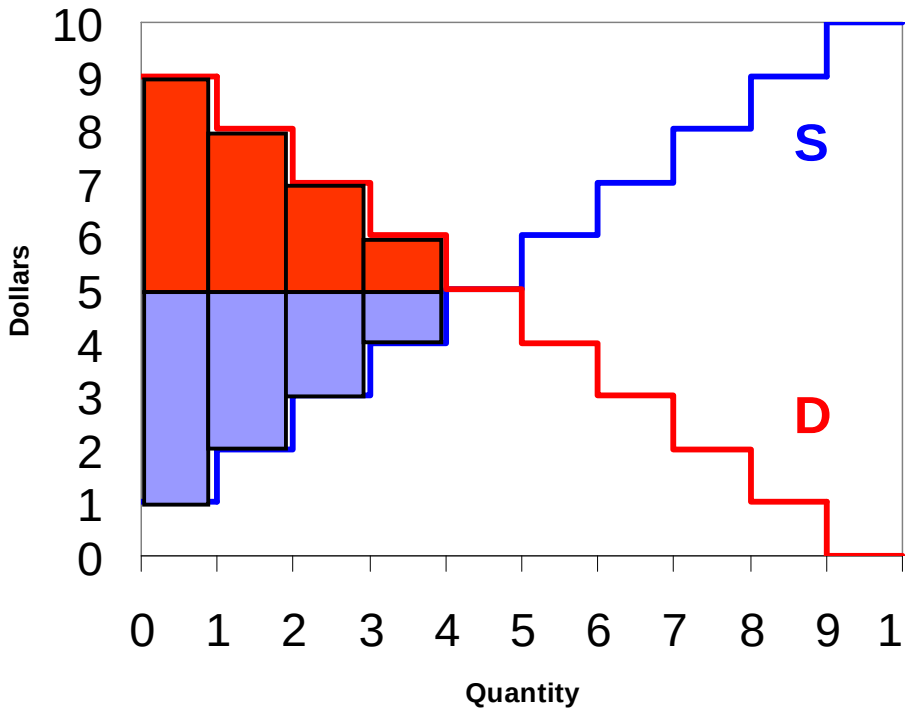
filled in table to get:

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

Consumer Surplus and Producer Surplus in Competitive Equilibrium



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.)

Temporary detour to a simpler economy:

MoonPieLand

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

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

Examples

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 1 pie to the student and 1 pie to me, and both are better off.)

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.

Concept is easy to understand if **pies** are the only thing in the economy

Pretty simplistic view of the world that there is a fixed pie out there and the only economic question is how the pie is divided up. **Somebody has to bake the pie.**

Redistribution policies could very well affect how many pies are baked!

This brings us back to Econland. Widgets are NOT scattered about on the ground waiting to be picked up. they have to be produced.

In Econland there are dollars and widgets. The S people can produce widgets and the D people can consume them. Everyone likes dollars!

The fundamental economic questions that need to be addressed:

- How many widgets should be produced?
- Who should produce widgets?
- Who should consume widgets?
- How many dollars does each person get?

Reservation Prices and Costs for Widgets

Name	Res. Price
D1	9
D2	8
D3	7
D4	6
D5	5
D6	4
D7	3
D8	2
D9	1
D10	0

Cost	Name
1	S1
2	S2
3	S3
4	S4
5	S5
6	S6
7	S7
8	S8
9	S9
10	S10

The following allocation is not Pareto efficient.

An allocation where D8 consumes a widget but D2 does not can not be Pareto efficient.

Because...

D8 gives widget D2
D2 gives $5 to D8

D8 better off (get $5 for widget he values at $2) $5 - 2 = $3 ahead.

D2 better off (pays ~~$5~~ dollars for $ widget he values at ~~$8~~.) $8 - 5 = $3 ahead.
(And no one worse off)

Note this is just one possible trade that can make some people better off with no one worse off. Other possibilities?

Suppose instead D2 gives $4.

D2 now gets $8-$4 = $4

D8 gets $4,but value widget at $2, so ahead by $4-$2 = $2.

General Principle 1
Efficient Allocation of Consumption

In any efficient allocation, consumers with highest willingness to pay consume.

Reservation Prices and Costs for Widgets

Name	Res. Price
D1	9
D2	8
D3	7
D4	6
D5	5
D6	4
D7	3
D8	2
D9	1
D10	0

Cost	Name
1	S1
2	S2
3	S3
4	S4
5	S5
6	S6
7	S7
8	S8
9	S9
10	S10

Next consider an allocation where S7 produces a widget but S3 does not. Is this Pareto efficient?

No.

Consider this alternative deal.

S3 makes a widget and gives it to S7.

S7 doesn't make widget and gives $5 cash to S3

S7 is outsourcing

S3 better off because she gets $5 to make the widget that costs her $3 to make.

S7 pays $5 to get widget rather than incur costs of $7 to make it herself.

So she is better off too.

The key point here is by the high cost S7 outsourcing the widget work to the low cost S3, gains from trade are created equal to the difference in costs, $7-$3 = $4. The alternative deal just described is one possible way this could take place. There are other deals that could be mutually beneficial, including cases where a student may serve as an intermediary and cut him or herselft into the deal.

For example, one student suggested the following alternative deal:
S3 makes widget and give it to S7.
S7 doesn't make widget and gives $4 to S3 and $2 to the student!

S3 is still better off because she gets $4 for something that costs her $3 to make. S7 is better off because she spends $6 total instead of $7. And of course, the student is better off too.

For this example, we obtain the general principle:

General Principle 2
Efficient Allocation of Production

In any efficient allocation, producers with the lowest cost produce.

What about quantity? Let's see what we can learn from the next two examples.

Next consider an allocation where 3 widgets are produced (by S1, S2, S3) and 3 widgets are consumed (by D1, D2, and D3).

Pareto efficient?

No.

Consider the following alternative deal suggested by a student.

S4 makes widget, gives it to D4.
D4 pays $5 to S4 and .50 cents to student arranging the deal.

S4 gets $5 for widget that cost her $4 to make. She is ahead.

D4 pays $5.50 for widget he values at $6. So ahead.

And student gets .50, so ahead.

Next consider an allocation where 8 widgets are produced (by S1 through S8) and 8 widgets are consumed (by D1 through D8). Let's say S8 is supposed to deliver a widget to D8.

Pareto efficient?

Relative to the initial allocation, S8 can give $5 instead of a widget.

- Paying $5 is cheaper for S8 than making a widget.
- D8 would rather have $5 than a widget.
- So both better off, no one worse off.

So what do we learn from these last two examples?

When Q=3, there is someone out there (D4) not consuming who is willing to pay more than it will cost someone (S4) to produce.

So raise quantity

When Q=8, there is someone out there consuming (D8) who is willing to pay less than what it is costing someone (S8) to produce.

So lower quantity.

From this, we get a general principle:

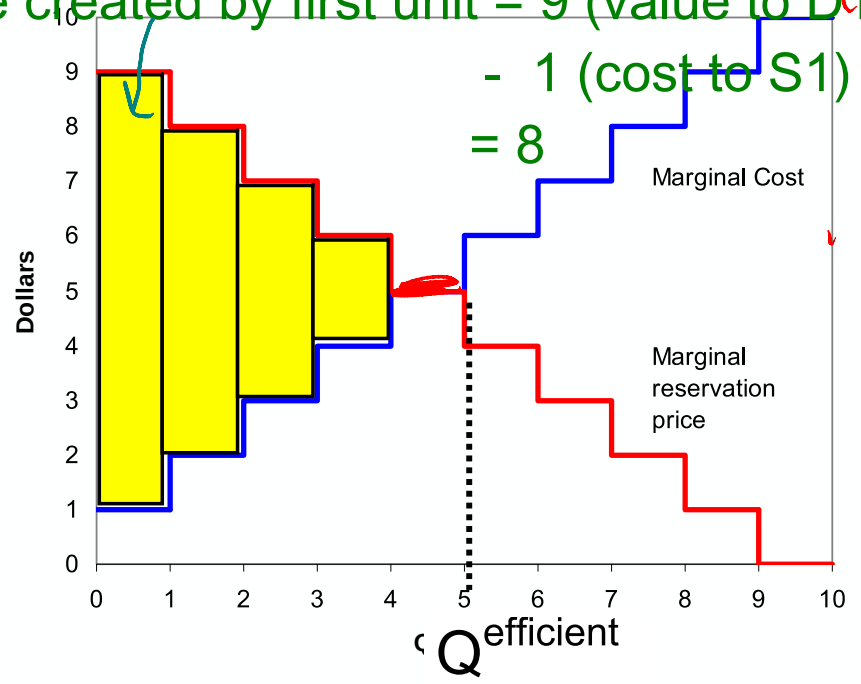
General Principle 3
Efficient Quantity

In any efficient allocation, the quantity is where the marginal valuation of the last unit consumed equals the marginal cost of the last unit produced.

Principles 1, 2, and 3 imply that in an efficient allocation for the widget industry in Econ land:

Q = 5
S1, S2, S3, S4, S5 produce
D1, D2, D3, D4, D5 consume

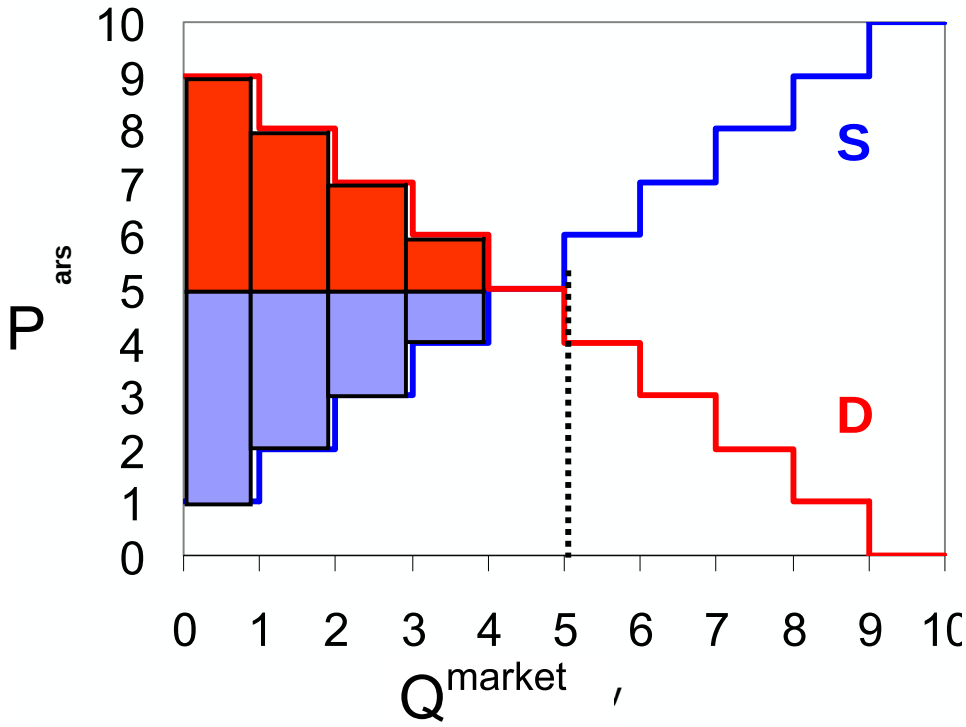
Pie created by first unit = 9 (value to D1
- 1 (cost to S1)
= 8



$Q^{efficient}$ = 5, Social Surplus equals:
8+6+4+2+0 = 20

All of this should look familiar.
Let's link this to the market

Market Allocation:



Q = 5, S1, S2, S3, S4, S5 produce,
D1, D2, D3, D4, D5 consume
Market Allocation is Pareto Efficient!

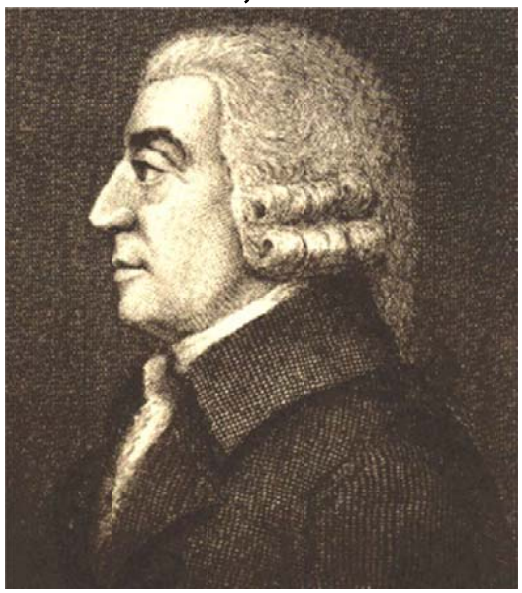
Big Idea

Assume
1. Market structure is perfectly competitive (not monopoly or oligopoly)
2. No externalities (my action hurts or benefits others, but I don't take into account. Like pollution.)

Then the unregulated market (laissez-faire) allocation is Pareto efficient. (It maximizes the size of the social pie.)

First Welfare Theorem

Adam Smith was on to this.
Wealth of Nations, 1776



Every individual... neither intends to promote the public interest, nor knows how much he is promoting it…(but)…by directing that industry (to) …its … greatest value, he is …led by an **invisible hand** to promote an end which was no part of his intention."

The First Welfare Theorem also sometimes called:

Adam Smith Theorem

or

Invisible Hand Theorem

Now while the market maximizes the size of the pie (under the assumptions given above), you might not like the way it is divided up.

Market delivers on efficiency.

Not necessarily on equity.

Policy Analysis 1:
Effect of Banning Widgets

Government ban products sometimes, often claiming issues of safety.

London just announced it is kicking Uber out (though decision is being appealed)
Safety is the store.

Let's look at banning widgets in Econland. Even if safety is an issue with widgets, lets' assume the D people now what they are doing and factor it into their reservation prices.

Start with happens in free market and update:

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

Free market is a

Pareto Improvement!

To make analysis more like London, need to introduce the "T" people who make tridgets, that substitute for widgets. The "T" people look like this: