Econ 1101
Spring 2013
Week 5

Section 038

2/20/2013

Announcements

- Midterm 1 is on Feb 25th 7:30-8:30pm (room assignment will be posted on Moodle)!
  - If you know you will miss the midterm but can make the makeup, you NEED to email headgrader@gmail.com to register for the makeup
  - Signup time for the makeup has passed but you can still register, though there will be a penalty (not getting extra points on the test).
- Platform debate explained during recitation today starting at 7.30pm.

Office Hours

- Sergio's this week:
  - Friday: 9am – 11am
  - Friday: 1pm – 3pm
- Radek's:
  - Monday: 12pm – 2pm
  - This is actually a permanent change:
    - Wednesdays, 4pm – 5pm
    - Mondays, 1pm – 2pm

Agenda for today

- Introducing price ceilings
- Impacts of price ceilings in Econland
- Impacts of price ceiling in Aplialand
- Supply Management in Econland and Canada
- Handy summary of the effects of policies
- A Few Comments about Midterm

Last time

- We looked at taxes and their impact on consumer/producer surplus and government revenue.

- We found that with a tax on the good itself, there is a deadweight loss – meaning that the allocation of resources in the economy is NOT Pareto efficient.

- We also looked at subsidies, and saw that we also get a deadweight loss – the government pays for MORE than what the consumer and producers get in what they gain in subsidies.

- Now we want to look at other possible policies that the government can do. We will look at price ceilings, price floors, and quotas.
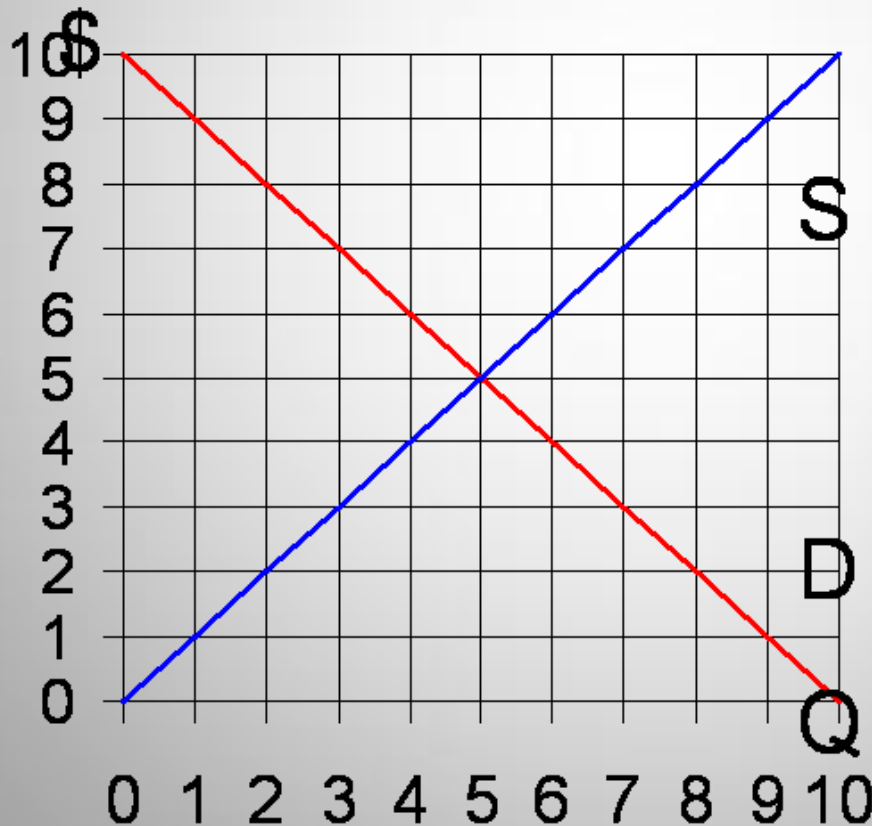
Price ceiling

Think about a balloon hitting a ceiling. The ceiling stops the balloon from keep on going up, in the same way, a price ceiling keeps the price from going up to the equilibrium. DO NOT be confused: A price ceiling DOES NOT mean you draw a line above the equilibrium! A price ceiling is represented by a line below the equilibrium price.

With a price ceiling, there is a

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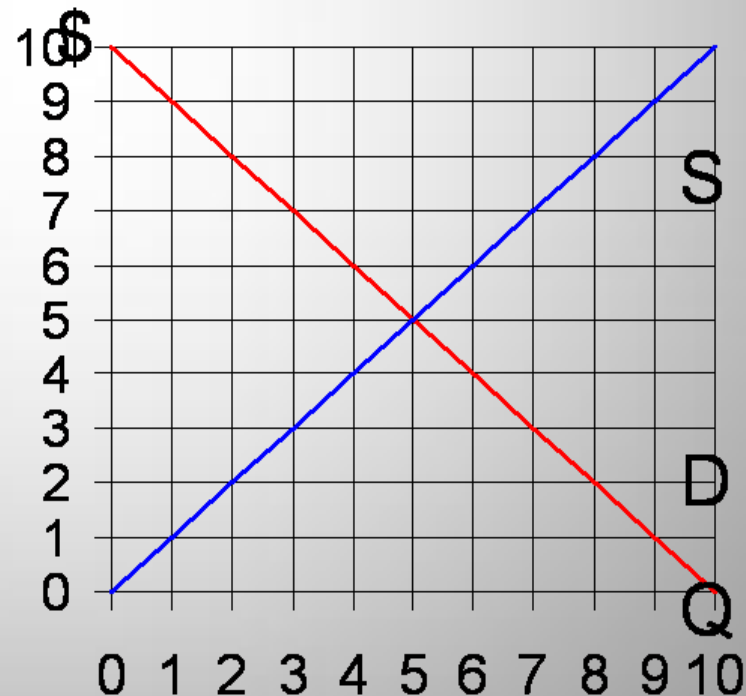
Price ceiling in Econland

Law in Econland: Illegal for anyone to sell widget for more than $3.

What is Q^D?

What is Q^S?

What is $Q^{ceiling}$?

Price ceiling in Econland

At ceiling price of $3:

- $Q^D = 7$

- $Q^S = 3$

$Q^{Ceiling}$ = minimum of Q^D and Q^S

    = 3

Producer Surplus easy to calculate

- (All sellers who want to sell are able to sell). So we use normal rule of calculating area under the P^S line (the price producers get) and above the supply curve.

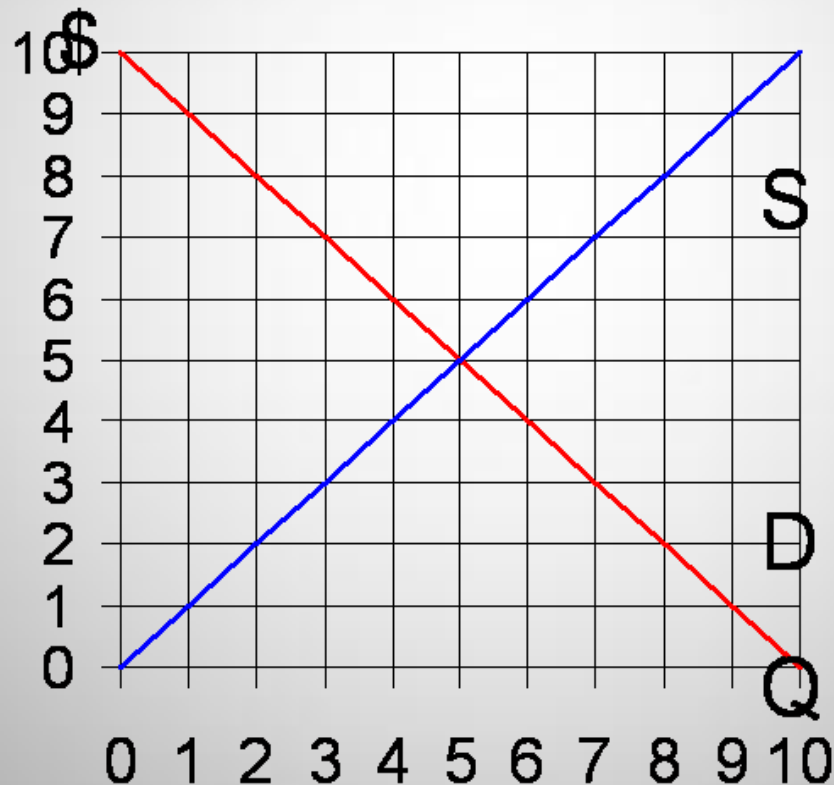# Price ceiling in Econland

What is CS?

- It depends

Why?

Price ceiling in Econland

There are 7 people who want a widget (D1, D2, D3, D4, D5, D6, D7), but only 3 are for sale.

CS depends on who gets the widgets because they differ in their willingness to pay.
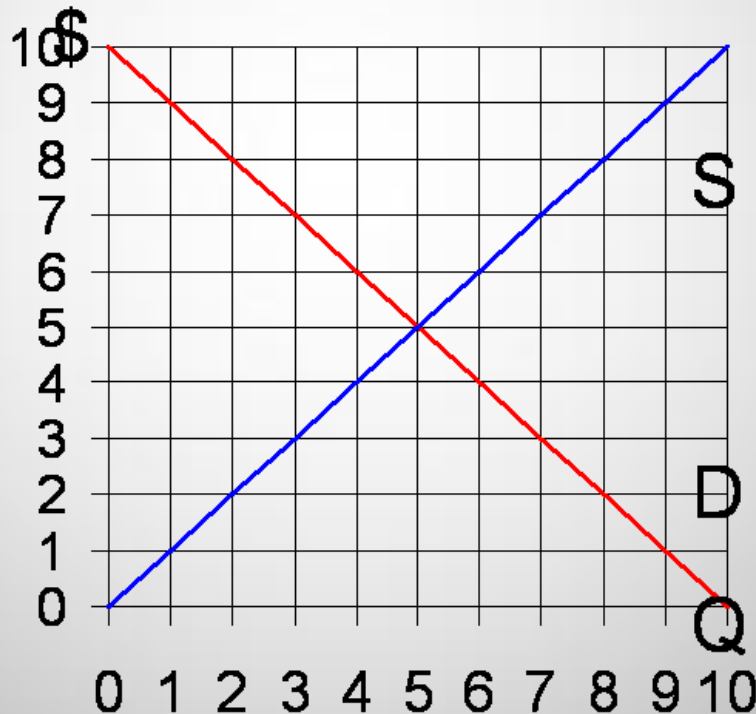
Price ceiling in Econland

<u>One extreme case</u>: perfectly efficient rationing: Highest value consumers get the widgets (rationing goes their way)

Price ceiling in Econland

<u>Opposite extreme case</u>: Perfectly inefficient rationing - Lowest Value Consumers that want widget get it. **CS is much lower!**

Of course, there are many different cases in between the two extreme cases.

Quick question

- What happens if a price ceiling is set ABOVE the equilibrium price?

- What happens if a price floor is set BELOW the equilibrium price?
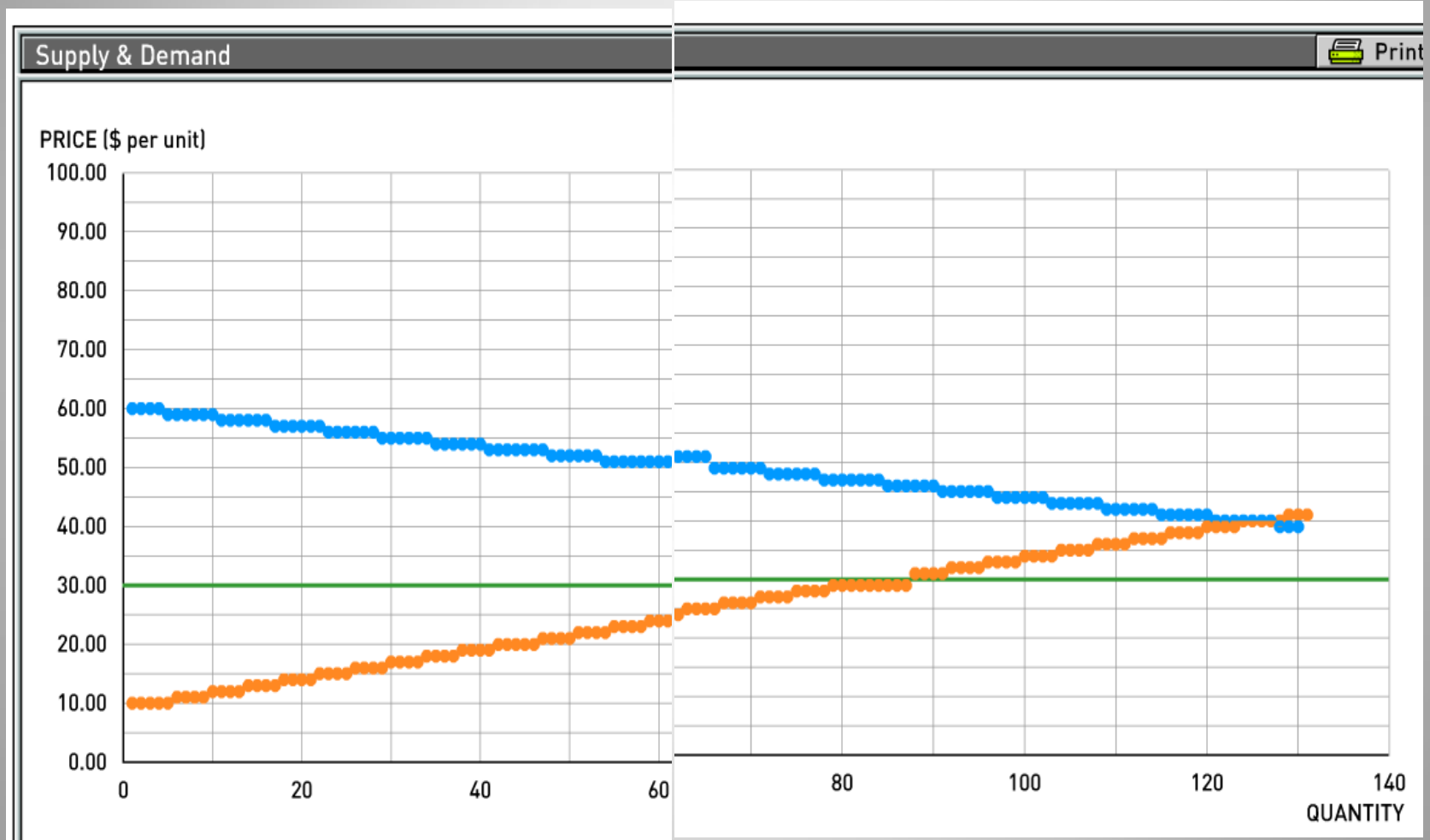
Price ceiling in Aplialand

Price Ceiling of $30 in Aplialand:

"Immoral to charge more than $30 for a textbook. Anyone selling a text for more than this in Aplialand will be shot".

If you were a buyer in the experiment, would you figure out the optimal strategy?

What is optimal strategy of a seller?

Q*=125, Q^c=87

Price ceiling in Aplialand

At ceiling price:

$Q^D = 130$ (everyone wants to buy!)

$Q^S = 87$

$Q^{Ceiling}$ = minimum of Q^D and Q^S

= 87

Price ceiling in Aplialand

PS easy to calculate
(All sellers who want to sell are able to sell)

$PS = Q*(30-10)*.5 = 870$

What is CS?
It depends

There are 130 people who want at book, but only 87 are for sale. CS depends on who gets the books because different people place different values on the goods.

Price ceiling in Aplialand

Earlier in class we discussed how to graph:

- Perfectly Efficient Rationing

- Perfectly Inefficient Rationing

- But in the Aplia auction, we will get something in between these extreme cases. We get uniform rationing where the 130 people trying to buy the book at $30 are equally likely to be one of the 87 people who will get a book. By chance, there will be cases where a buyer willing to pay $40, gets a book, while one willing to pay $60 does not. That is, we get inefficient allocation of consumption.

Price ceiling in Aplialand

Uniform Rationing:

- Low and high value consumers who want books are equally likely to get them.

- So there is 87/130th chance you will get to buy the textbook.

- What principles are violated?

- How is what happened in Aplialand different from what happens in many cases with rationing in the real world?

Price ceiling with resales

Law in Econland: S people cannot sell widget for more than $3.

- D people allowed to resell at any price.
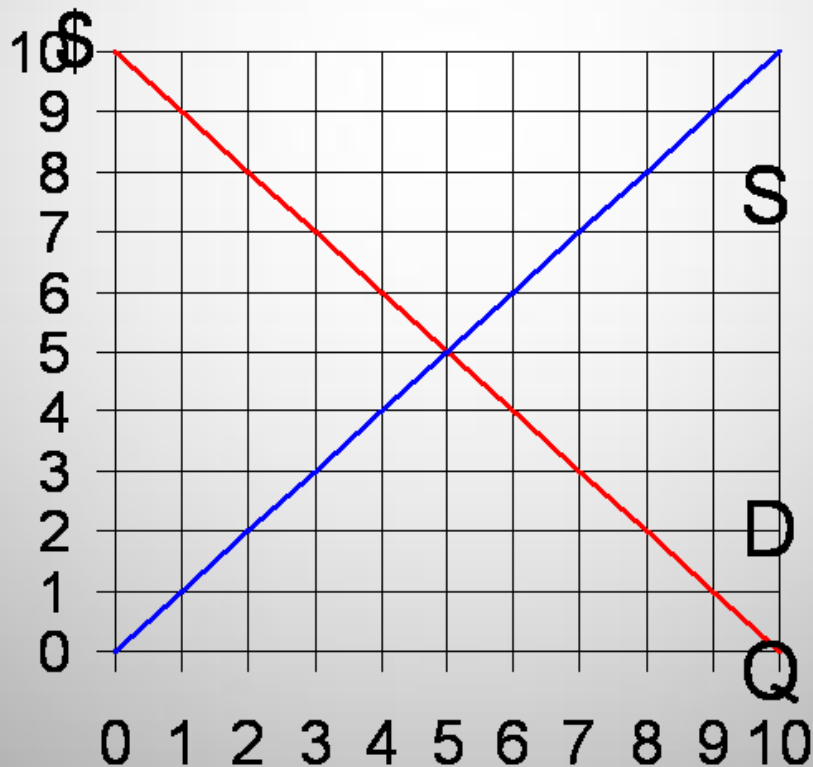
Price ceiling with resales

What happens?

Step 1: Take ceiling of $3 and figure out how much the S people are willing to sell. This is Q = 3.

Step 2. Draw a vertical line at Q=3 above the price P=3. This is the supply of goods in the resale market

Step 3. Demand in the resale market is the original demand curve. Even if a particular D person is able to initially buy a widget from an S person for $3, the D person needs to consider whether it is worth holding onto it or reselling. The opportunity cost of consuming a widget is the price the widget could sell for in the resale market.

Step 4: Demand and Supply in the resale market yields an equilibrium resale price P = $7.

Price ceiling with resales

At an opportunity cost of $7, 3 units are demanded in the resale market and this equals supply.

Consumer surplus in the resale market is consumer surplus at $P^D = \$7$.

Producer surplus obtained by the S people in the original market is producer surplus at
$P^S = \$3$.

The green box is "scalping profit," the money made when someone buys a widget for $3 and resells it for $7.

Price ceiling with resales

Note that when resale is possible, market forces will ensure that the widgets end up going to those with the highest willingness to pay. (That is, D1, D2, and D3 well end up outbidding the others and each will consume a widget).

It may be the D10 gets lucky and buys all 3 widgets at the initial price of $3 and sells them to D1, D2, and D3 at $7. In this case, D10 gets the green box of scalping profit.

Price ceiling with resales

What would happen if D1, D2, and D3 each were lucky enough to buy widgets at the initial price of $3? We can think of them as first selling their widgets in the resale market at $7 and then buying them back at $7. In this case, the green box goes to D1, D2, and D3.

Note that the surplus they get, red triangle plus green box, is exactly the same as the surplus with efficient rationing (where D1, D2, and D3 get widgets) that we calculated earlier in the class.

Bottom Line

If a price ceiling of $3 is set and resale is illegal, then in general we expect two sources of inefficiency:

- Output is too low (violates condition 3).
- Highest valuation consumers don't always get the good first (violates condition 1).

Even if resale is legal, it won't do anything about quantity being too low. (The S people will still sell only 3 units at the price of $3). However, allowing the resale market means the free-market is put to work determining how the 3 available units are allocated. The workings of the market will ensure they end up going to the people with the highest willingness to pay.

Price floors

- You should try to think about price floors on your own. Basically, it's the opposite case that the price is set too high, so now consumer surplus is easy to find but producer surplus depends on who gets to sell.

Price Controls: Big picture

- Start with the first welfare theorem. With no externalities and no monopoly, the free-market allocation is Pareto efficient.

- Price system acts as an invisible hand in such a way that:
  - Consumers willing to pay market price all buy (efficient allocation of consumption).
  - Producers with cost less than the market price produce (efficient allocation of production)
  - Value of last unit in equals its cost (efficient quantity)

Price Controls: Big picture

When we add taxes and subsidies:

- distort quantity.
- but price system is still put to work in allocating consumption and production.

Price controls (a ceiling that price can't go above, a floor that price can't go below)

- distort quantity AND
- distort allocation on the side of the market facing rationing
  - buyer side with price ceiling
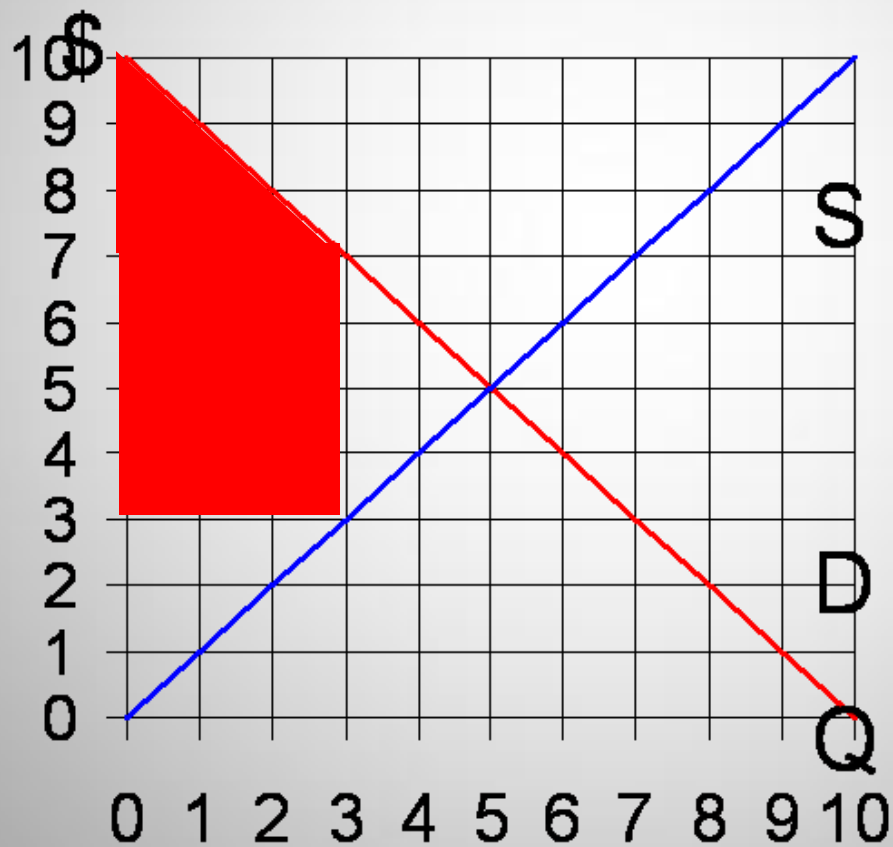 - seller side with price floor.

Be carefull…

In terms of our Econland example, if there is a price ceiling of $3 the following WILL **NOT** BE CONSUMER SURPLUS
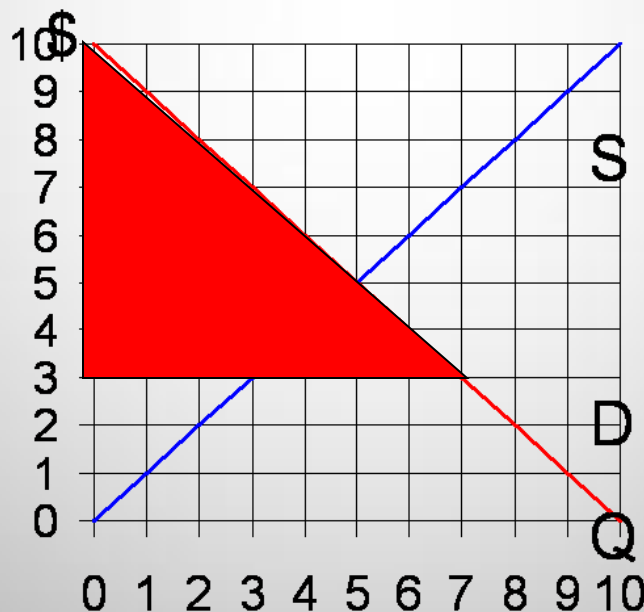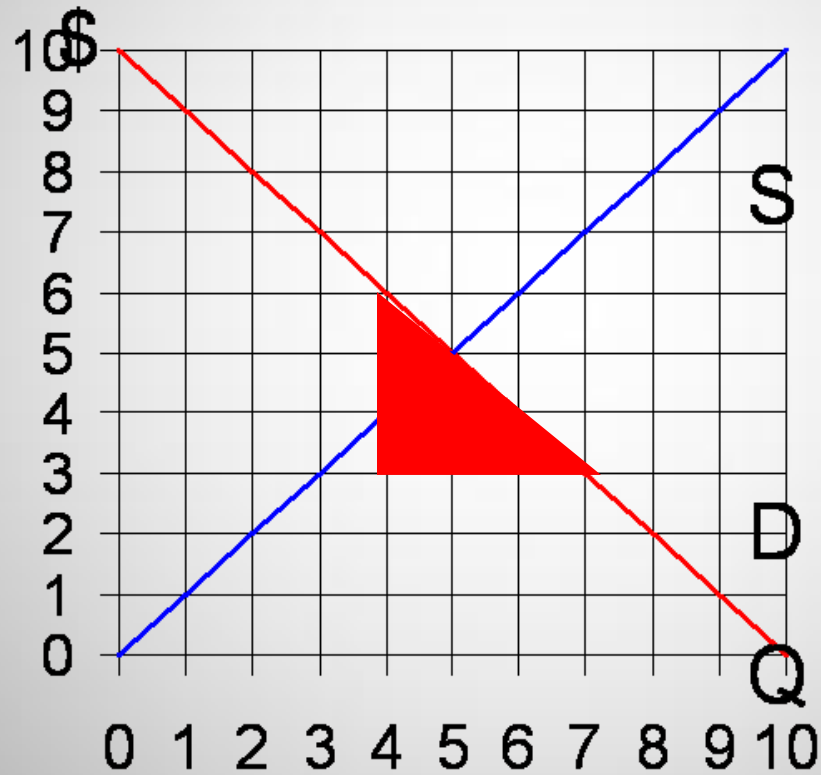

Because only 3 people get widgets, not 7

- Cut 4 widgets out, loss of consumer surplus depends upon where you do the cutting.
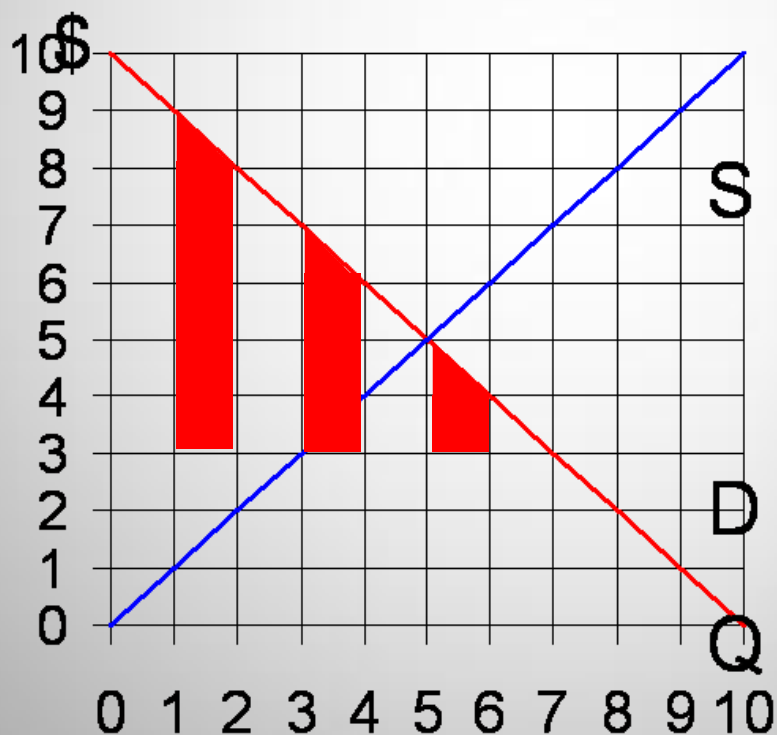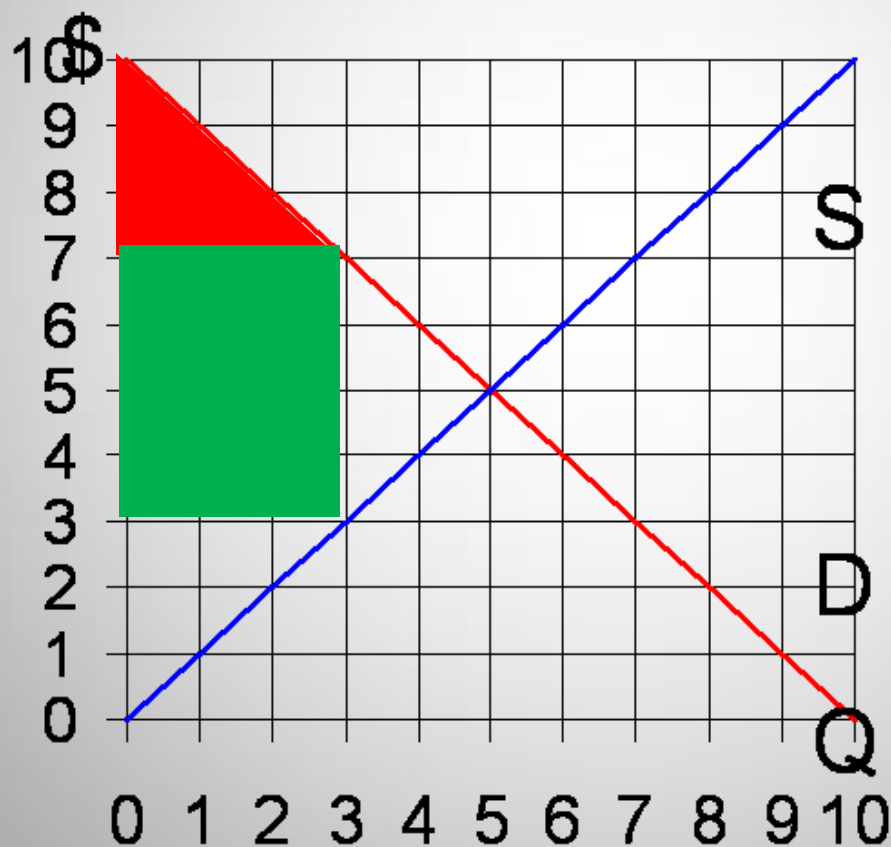
Cut 4 from right (efficient rationing)

Cut 4 from left (perfectly inefficient rationing)

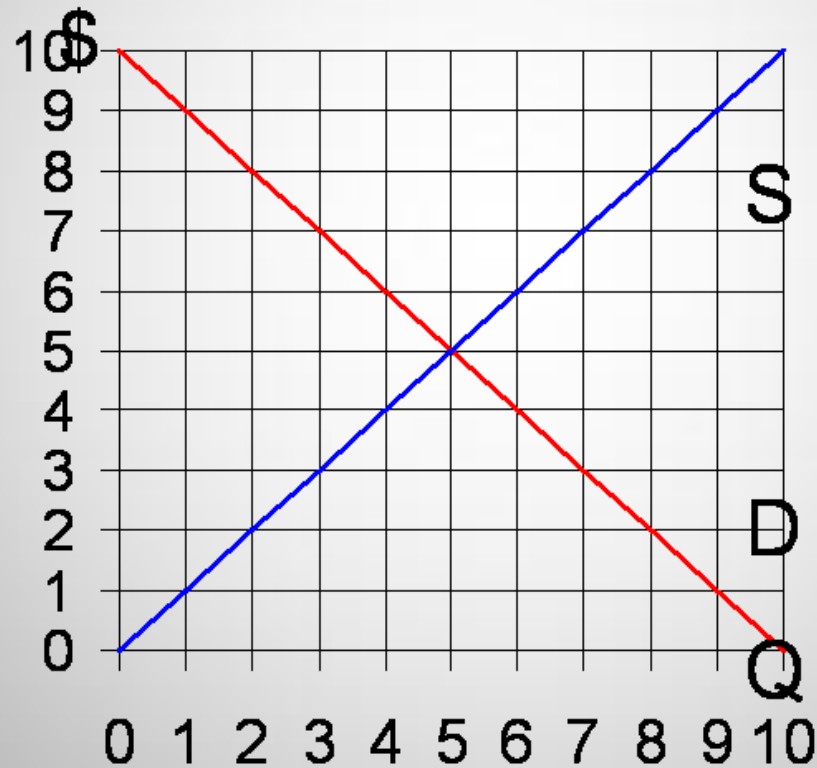Or cut 4 this way, (something close to uniform rationing, like what happened in Aplia auction).

If resale is legal however, we still get consumer surplus like that of efficient rationing. The only difference is that somebody else takes over the "scalping profit".

Supply Management

So you want farmers to get $7 for their widgets....

Supply Management

There is excess supply when the price is 7 so something will have to be done about it.

In the US, maybe direct management. Perhaps subsidies for people to buy up the good, or the government directly purchases the good.

In Canada, mainly by supply management. Government organized cartel to hold back output (like the OPEC).

Supply Management in Canada

In order to sell milk in Canada, a farmer needs to own quota. Quota is a legal right created by the government and limited in supply.

Farmers are free to buy and sell quota in the quota exchange

How it currently works in Canada:

One quota unit is approximately what you need to sell the milk of one cow per day

Supply Management in Canada

Currently trading for $25,000 for one quota unit.

This is a lot more than what the cow costs!

In fact, this is the biggest cost of being in the dairy business. In the reading there is a link to a real estate listing where:

$5.8 million for the whole farm

Of that, $2.8 million is for the quota!

Supply Management in Canada

Let's go back to Econland numbers and figure out what happens with **quota=3**.

Step 1: Compare total quota to free market quantity. If quota is more than free market, irrelevant and price of quota = 0. If quota quantity less, then market quantity is quota.

Here Quota=3 < 5 (unregulated Q)

Step 2: Get widget price from demand curve at quota.
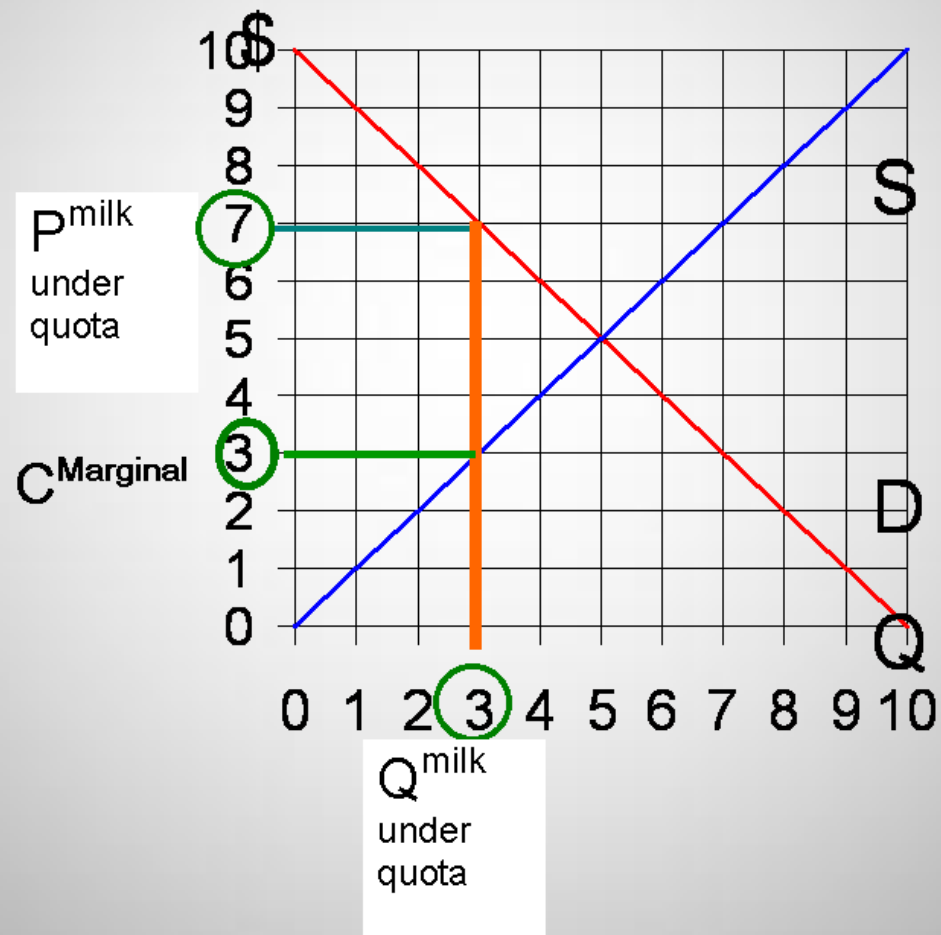
Here P = $7.

Supply Management in Canada

Step 3: Set price of quota so marginal producer breaks even taking into account the opportunity cost of quota.

Total cost = $production cost
        + $cost of quota

Marginal production cost at Q = 3 is $3. (see this on S curve)

If total cost equals $7, marginal producer just breaks even. Thus

Price of quota = $7 - $3 = $4.

Why does this rule work?

Think of opportunity cost!

Let farmers maintain two books:

One for their milk business (where they deduct opportunity cost of using quota).

One for their quota business (where they make money of quota if they are lucky enough to have inherited some).

When price of quota equals $4, the marginal producer just breaks even on milk business.

Variable	Free Market	Quota of 3	Change
P^{Milk}	5	$7	+2
Q	5	3	-2
P^{Quota}	0	$4	+$4
CS	12.5	4.5	-8
PS^{Milk}	12.5	4.5	-8
PS^{Quota}	0	12	+12
$PS^{Combined}$	12.5	16.5	+4
TS	25	21	-4

Call up the Economics Doctor:

What is the source of the inefficiency?

Violation of Principle 3, that the quantity be at the point where the value of the last unit consumed equals the cost of the last unit produced.

What if quota were not tradable?

We expect there to be an additional inefficiency. A violation of rule #2 that the lowest cost producers produce. If S6 inherits a quota unit and can't sell it, she will produce instead of a lower cost producer.

- The $4 we calculated in class is what they use of the quota for one day. In Canada, quota is good for today, tomorrow, the next day, etc.

- The asset value is calculated by adding up the values of these various payments. We need to do present value calculations that involve interest rates that we will skip here.

- But just to make the point, if we give the people in Econland a year to live, (and we don't worry about interest rates) then the asset value of a unit of quota at the beginning of the year equals $4×365 = $1,460

Summary

$\$$

S

D

Q_{low} $Q_{efficient}$

Q
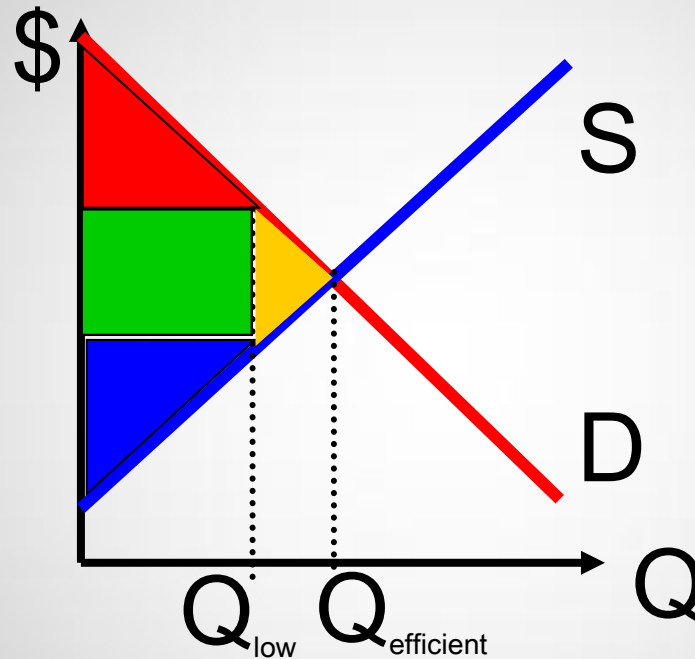
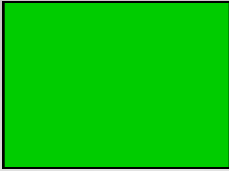For all the policies on the next page:
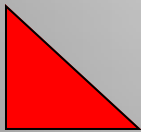
Goes to consumers

Goes to producers

Is loss in total surplus from output being too low

(Q_{low} instead of $Q_{efficient}$)

Where ▮ goes depends upon policy

Policy	Where green box goes
Tax	Government
Quota	Quota Owners
Price Ceiling efficient rationing (unlikely)	Consumers
Price Ceiling (more likely)	Partly destroyed by inefficient allocation
Price Floor efficient rationing (unlikely)	Producers
Price Floor (more likely)	Partly destroyed by inefficient allocation

Where does subsidy fit the table?

It doesn't fit in.

Subsidies make quantity higher than the equilibrium quantity.

Note on Midterm

Midterm

Bring:

> **#2 Pencils, University I.D.**

Don't Bring:

Calculator, scratch paper

Syllabus on Academic Dishonesty

- "The test-taking period begins when a student is handed the question sheet and ends after the student's answer sheet has been collected. During the test-taking period, a student may not speak with any other student, nor use any communication device or notes. Any violation of this rule, regardless of the subject matter of the communication, is considered a form of academic dishonesty, and it will not be tolerated in this class.?

Coverage

Everything up to this lecture.

- Supply and Demand

- Elasticity

- Efficiency of the Free Market (the first welfare theorem)

- Government intervention in markets
  - taxes and subsidies
  - price floors and ceilings
  - supply management

- Best way to study – do sample midterms and also read through lecture notes.

On top of that, read these articles assigned on Moodle

Readings

1) Electric Power

2) Long and Short Run Elasticity

3) Supply Management