Lecture 4(ii) Announcements

Experiment Thur 9am, 2pm, 10pm
Friday 3pm
(Only participate once!)

Midterm Mon Oct 8, 7pm-8pm
Covers Lec1(i) through Lec5(ii)
Deadline to register for the makeup without penalty is Mon Oct 1, 4pm.
headgrader@gmail.com)

Question and Answer Sessions

Wed Oct 3: 4-5:30: Anderson 310
Wed Oct 3, 7:30-9: Anderson 210
Thur Oct 4 3:30-5 : Anderson 210

Go to Midterm Practice Page at week 5 Canvas for Old Exams!

Lecture

1. Equilibrium with taxes
2. Who bears the burden of the tax?
3. Efficiency and Taxes

Next 4 lectures: Study government interventions into the market.

Use Econland to examine how government policy affects efficiency. We look at the size of the pie and the distribution of the pie.

Start with an outright ban.
Next look at:

Taxes and Subsidies

Cap and Trade

Price Ceilings and Price Floors
(rent control, minimum wage)

Taxes

Big Picture:

- We will see how taxes distort decision making in Econland
- With taxes we won't be getting socially efficient quantity (But remember, no externalities here)
- But government gets revenue and it might do something useful with it….

Taxes

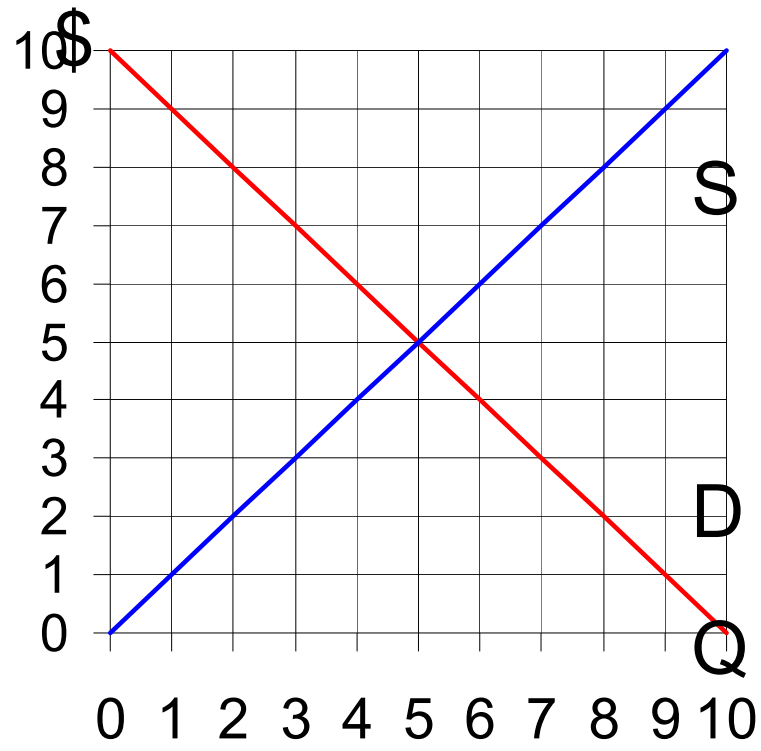
Tax is a wedge…

between price consumer pays and price producer receives

$P^D = tax + P^S$

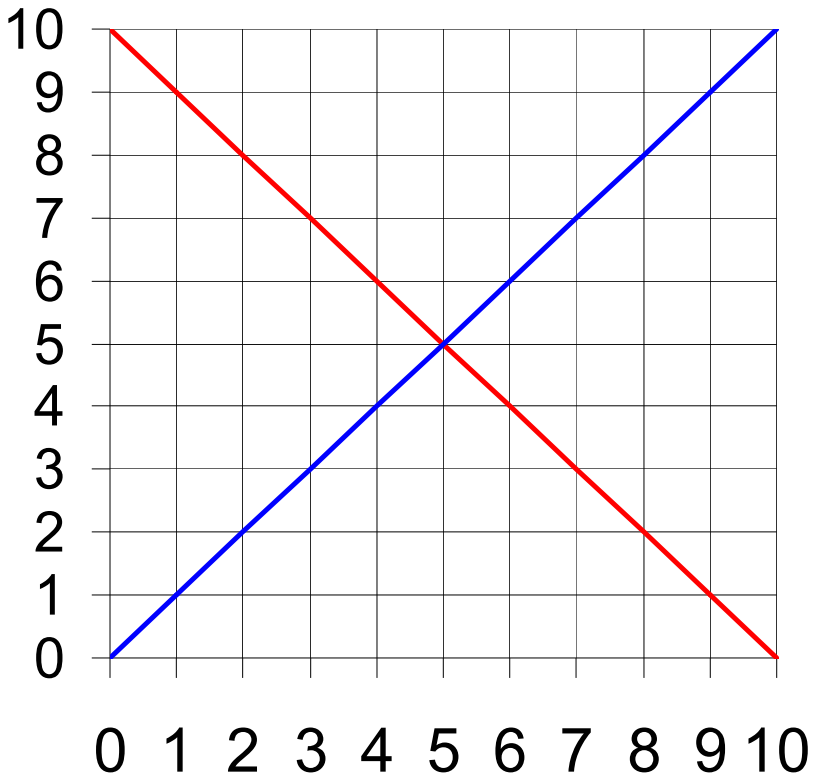
To find equilibrium under tax, find quantity where distance between demand and supply equals the tax.

Taxes in Econland
Equilibrium when tax = $4



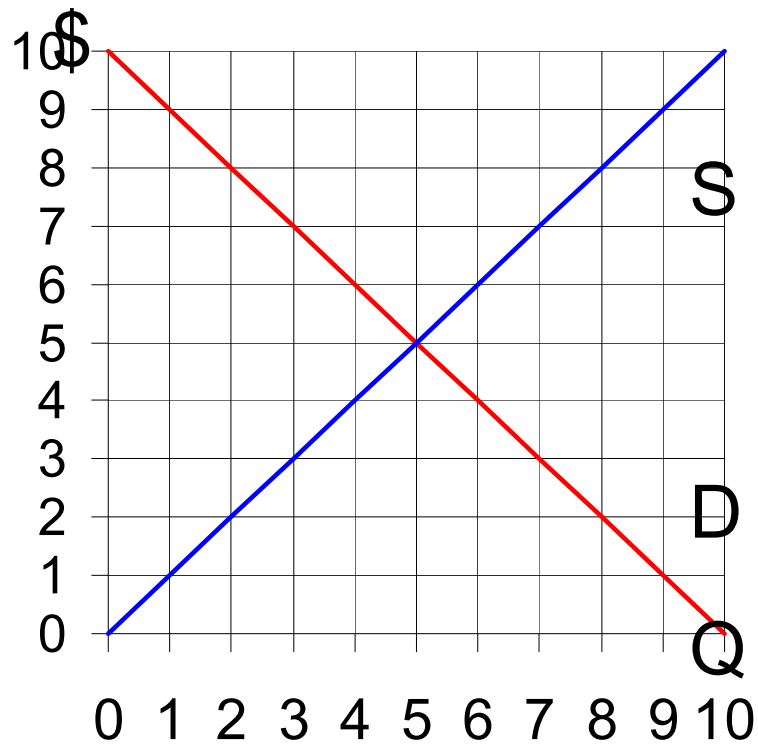
Tax = $4. Pick up and put on graph so top hits Demand (at point pD) and bottom hits Supply (at point pS)

Econland



Equilibrium with tax of 0, 4, and 8?

Effects of $4 Widget Tax



Effects of tax on Price and Quantity

	No Tax	$4 tax	Change
Q			
P^S			
P^D			

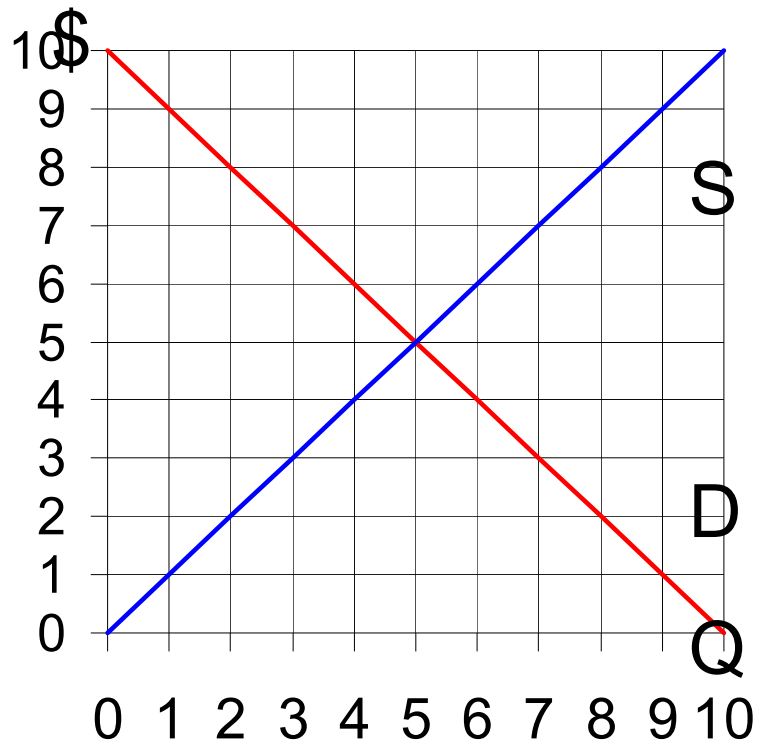
$P^D = P^S + tax$

Great question: Are we always on the left side of the free market quantity with a tax?

What about a $4 widget subsidy

$P^S = P^D + subsidy$

Subsidy in Econland
Equilibrium when subsidy = $4

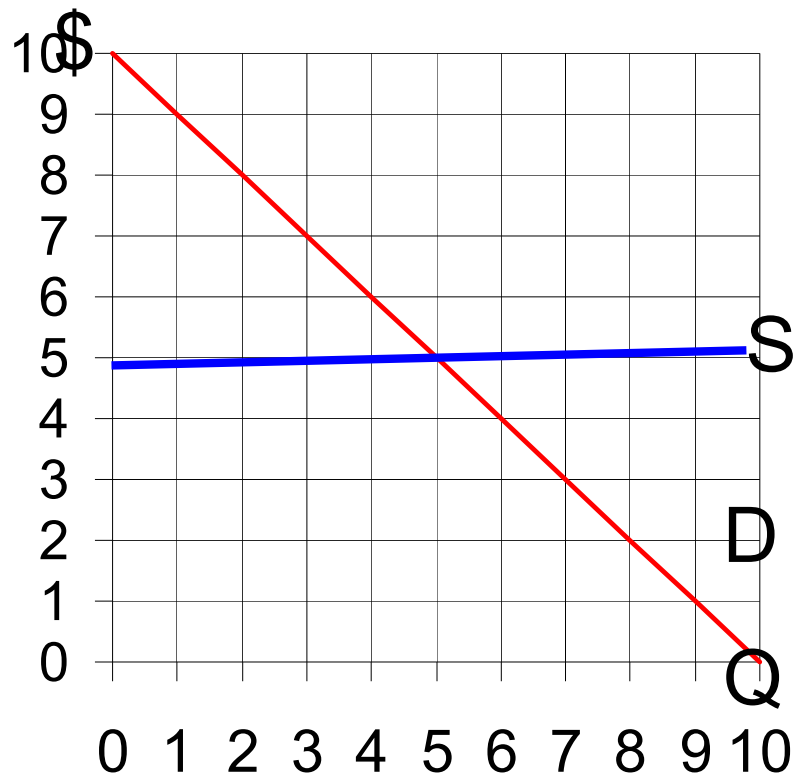


Subsidy = $4. Pick up and put on graph so top hits Supply (at point p^S) and bottom hits Demand (at point p^D)

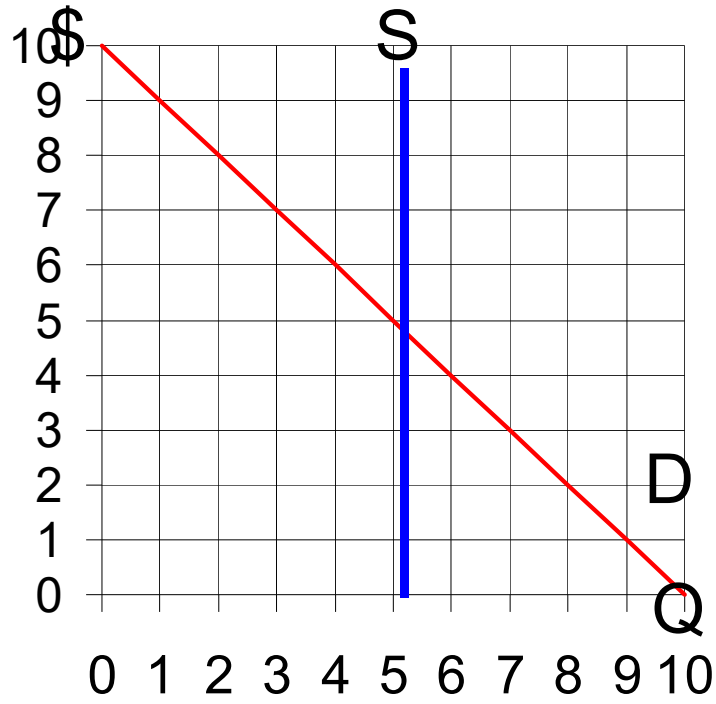
Great question: In Econland, after the $4 tax,
ΔP^D = +$2, ΔP^S =–$2. Do buyers and sellers always split the tax 50/50?

Burden of the tax depends on the elasticity of supply and demand.

Suppose supply is perfectly elastic:



Suppose supply is perfectly inelastic

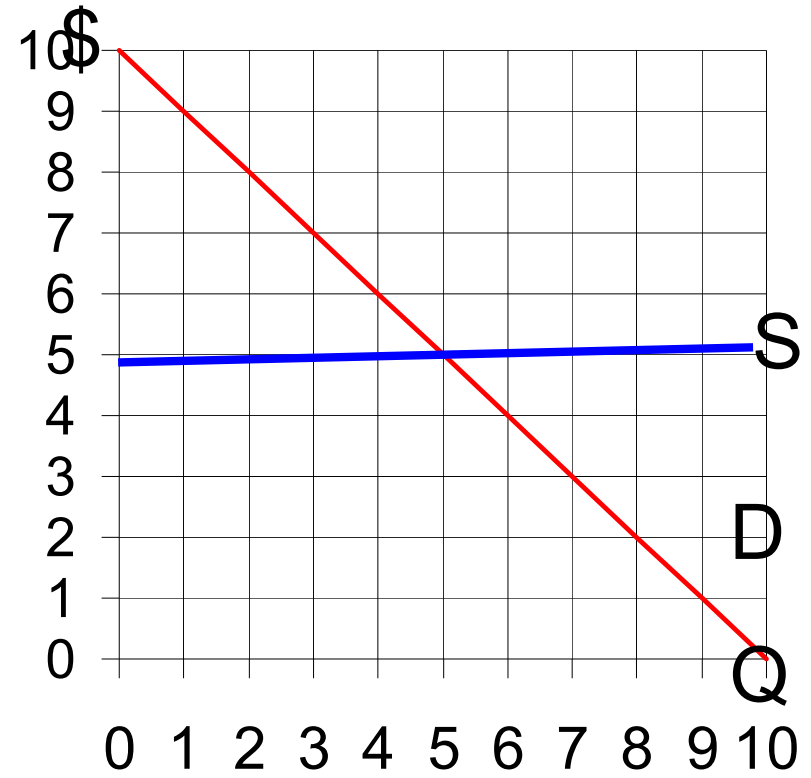


The less elastic the side of the market you are on, the more you pay of the tax!

Let's look at retail gas prices and gas taxes across countries from homework 3.

Key point: the world oil market is global. Since any one country tends to be small, its own demand has a small impact on world market. If Spain doubles its demand, it won't impact the global market

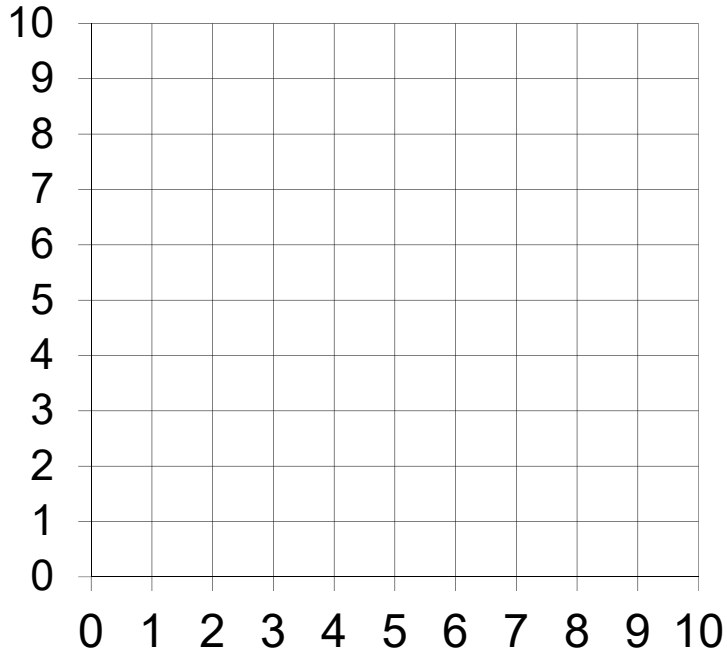
This means the market for oil in Spain looks like



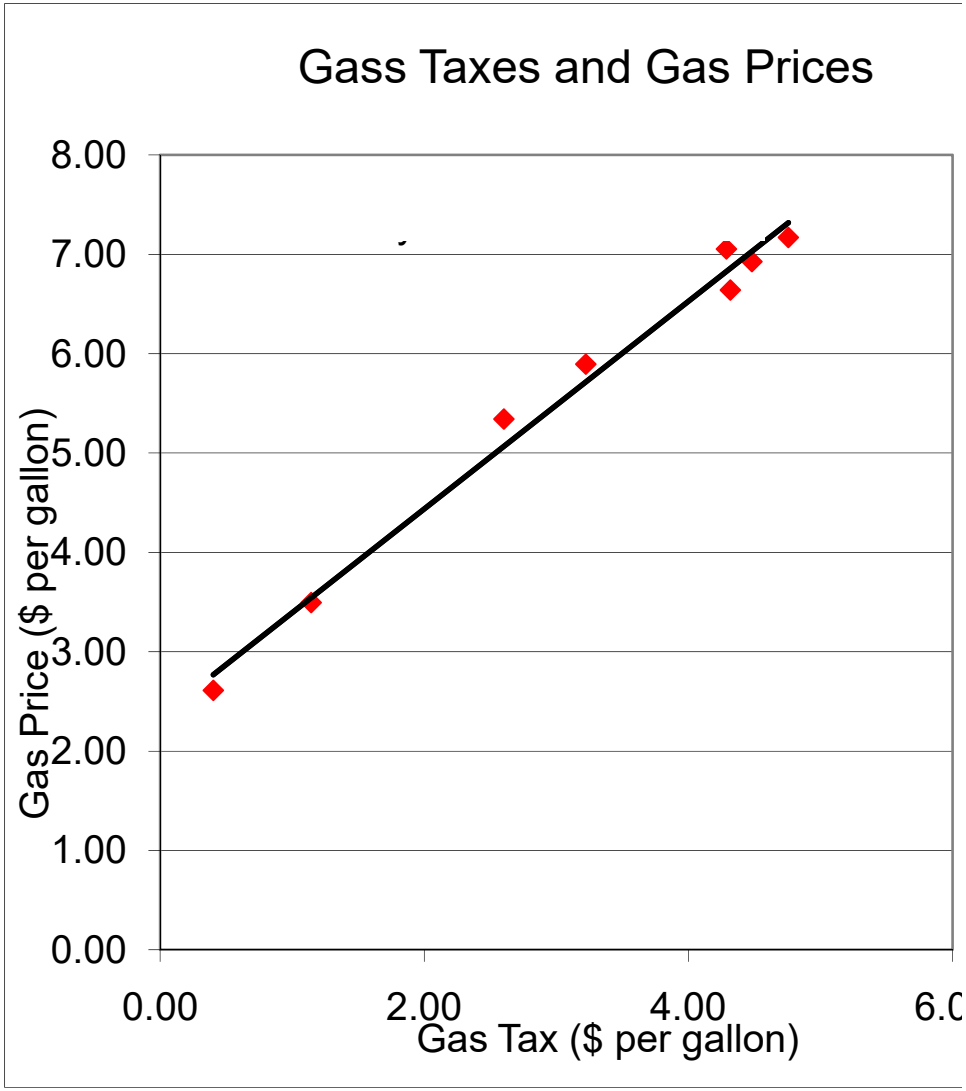
Theory implies a gas tax in Spain gets passed on to consumers, Euro for Euro.

Tax	P^S	P^D
0		
2		
4		

Plot Tax and P^D



How does the theory do?



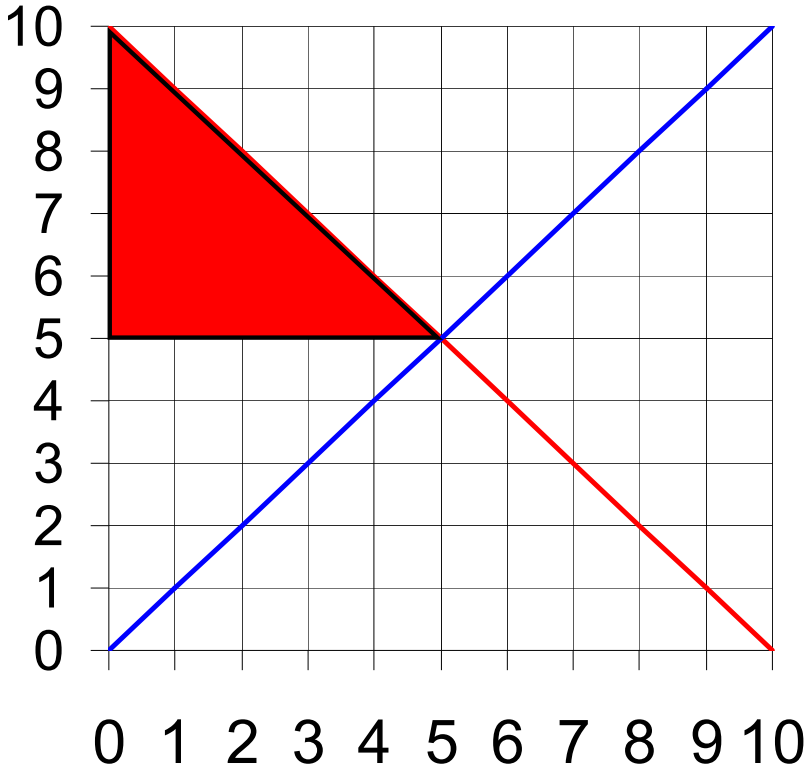
Let’s get back to Econland and the $4 tax.

Let’s do a welfare analysis of the effects of the tax

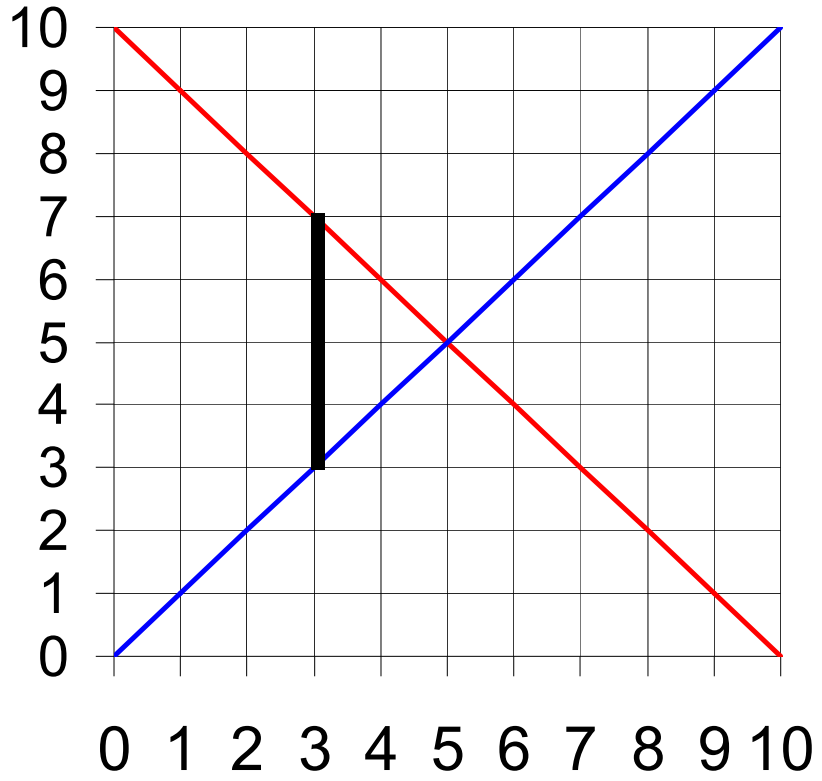
Effect of $4 Tax in Econland
Surplus Calculations

	No Tax	$4 Tax	Change
Q	5	3	-2
P^S	5	3	-2
P^D	5	7	2
CS			
PS			
Gov't Surplus			
TS			

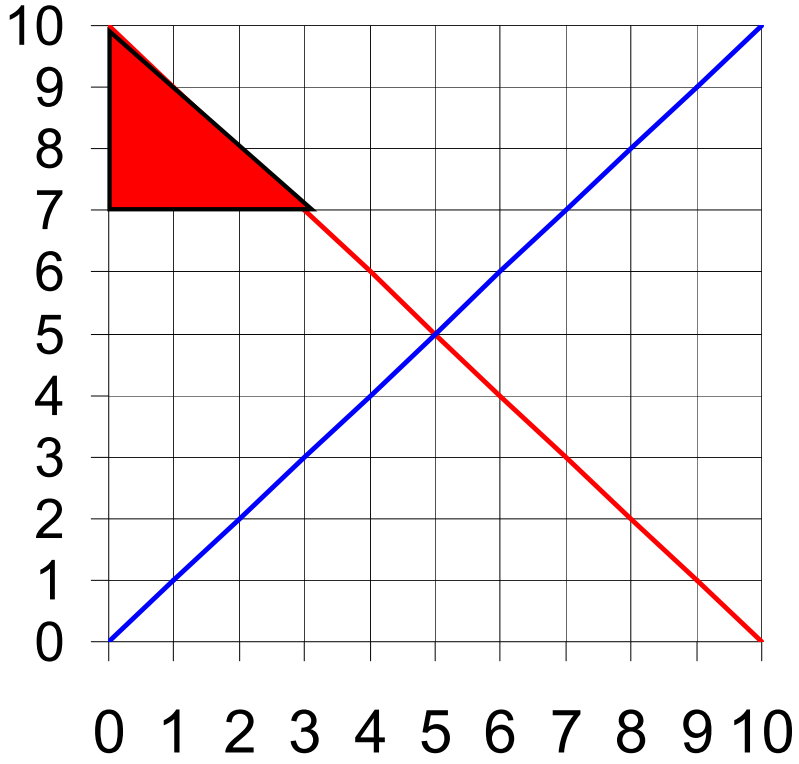
Consumer Surplus at $P^D = 5$



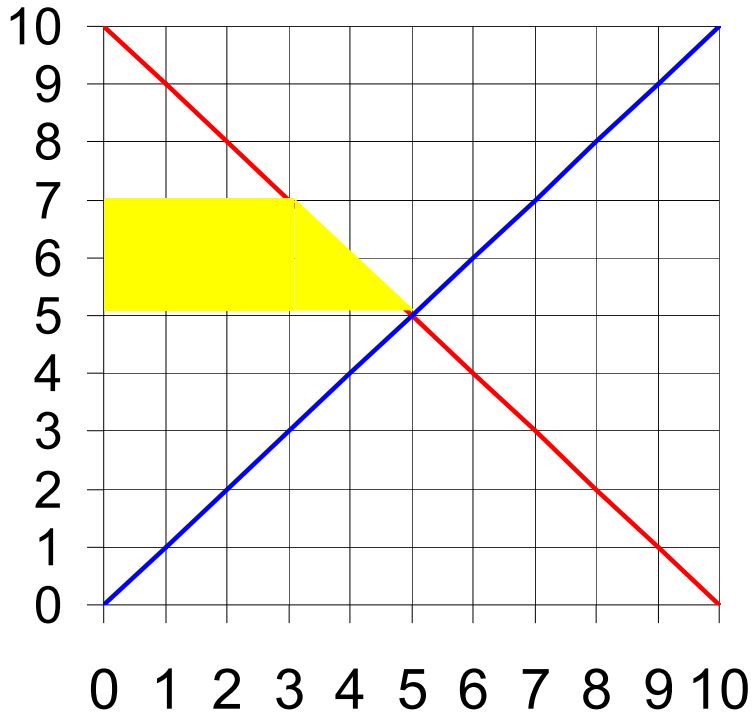
$4 tax in Econland.
P^D increases from $5 to $7



Consumer Surplus at $P^D = 7$



Change in Consumer Surplus
ΔCS
(P^D from 5 to 7)

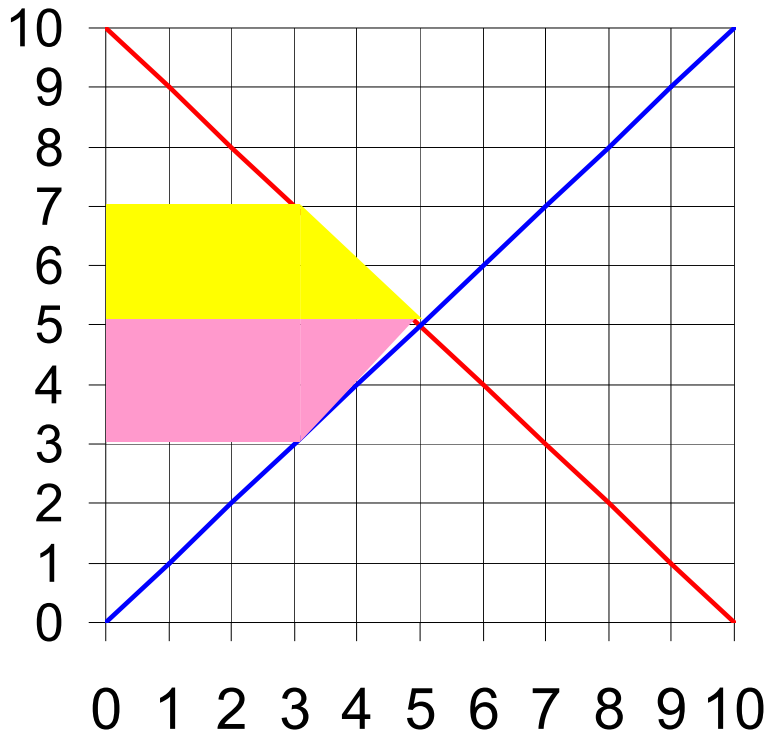


Effect of $4 Tax in Econland
Surplus Calculations

	No Tax	$4 Tax	Change
Q	5	3	-2
P^S	5	3	-2
P^D	5	7	2
CS	12.5	4.5	
PS	12.5	4.5	
Gov't Surplus	0		
TS	25	21	

ΔCS and ΔPS

(P^D from 5 to 7)
(P^S from 5 to 3

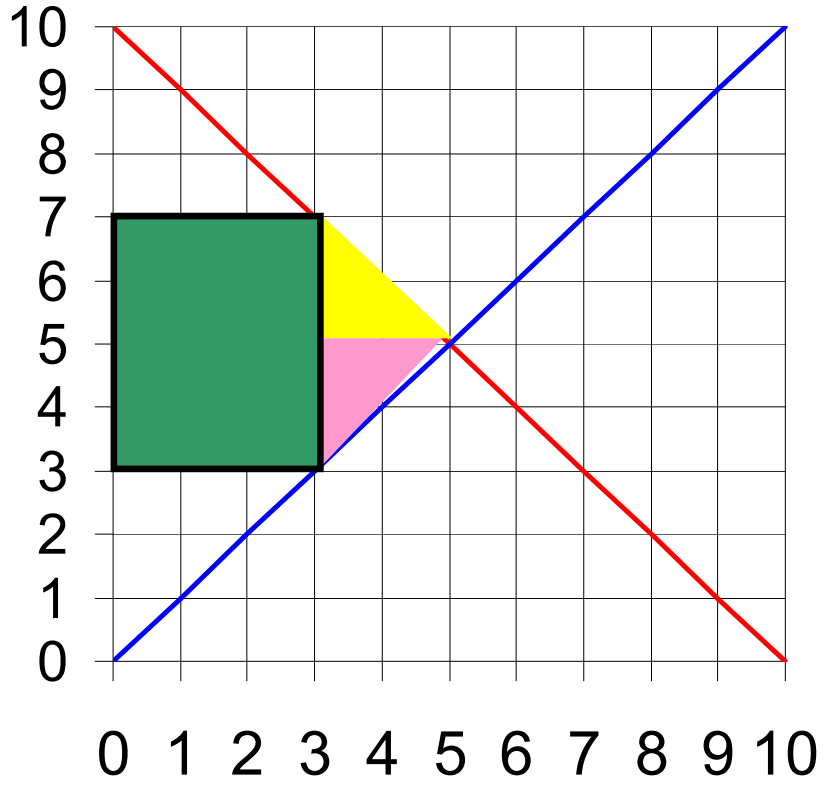


Effect of $4 Tax in Econland
Surplus Calculations

	No Tax	$4 Tax	Change
Q	5	3	-2
P^S	5	3	-2
P^D	5	7	2
CS	12.5	4.5	-8
PS	12.5	4.5	-8
Gov't Surplus	0	12	12
TS	25	21	-4

Change in Government Surplus

$$\Delta GS = Q \times tax$$
$$= 3 \times 4 = 12$$



Deadweight loss.

Allocation with tax not Pareto Efficient.

Diagnosis of the Source of Inefficiency.

Problem: Breakdown of General Principle 3, Efficient Quantity where
Marginal Reservation Price (MRP) equal to Marginal Cost (MC).

Q = 3 is too small (Tax puts wedge between MRP and MC)

(But note General Principle 1 and 2 continue to hold. Get efficient allocation of consumption and production.)