

LECTURE 5: APPLICATIONS 1

Today's Topics

1. **Price Controls:** ceilings, floors, rationing, unemployment.
2. **Taxes:** on buyers, on sellers, elasticity and tax incidence.
3. **Consumer surplus:** willingness to pay, graphically.
4. **Producer surplus:** willingness to sell, graphically.
5. **Market Efficiency:** why competitive markets? the Dead Weight Losses of taxes.
6. **Two Cases:** fur sales, newspaper sales.

1. PRICE CONTROLS

Governments may try to control prices. Why?

Price ceiling: \bar{P} , a maximum price.

Price floor: \underline{P} , a minimum price.

If the ceiling is not binding ($\bar{P} > P^*$, the market-clearing, equilibrium price), or the floor is not binding ($\underline{P} < P^*$), then no concern.

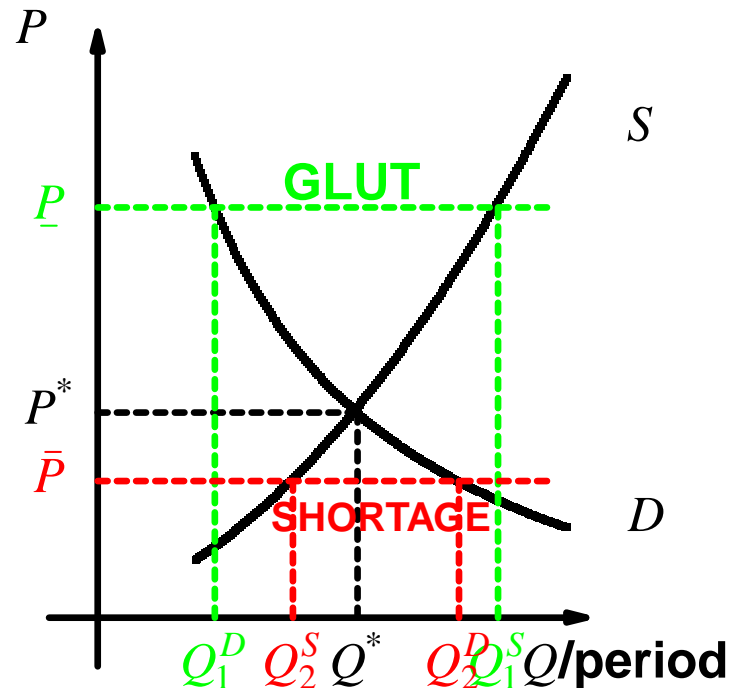
If the ceiling is binding ($\bar{P} < P^*$) → a shortage.

If the floor is binding ($\underline{P} > P^*$) → a glut.

Get non-price rationing. Examples? FCFS, lotteries, scalping, “contacts/influence”, nepotism, waiting.

GLUTS AND SHORTAGES

From Lecture 3:



When $P = P^*$ $S = D$, market-clearing equilibrium, at P^* , Q^* .

When $P = \bar{P}$, $D > S$, a sellers' market and shortage.

When $P = \underline{P}$, $S > D$, a buyers' market and glut.

NON-PRICE RATIONING

A shortage of petrol when the refinery is off-line but there is a price ceiling $\bar{P} < P^*$ the new equilibrium price $P^* \rightarrow$ queues, or first-come-first-served.

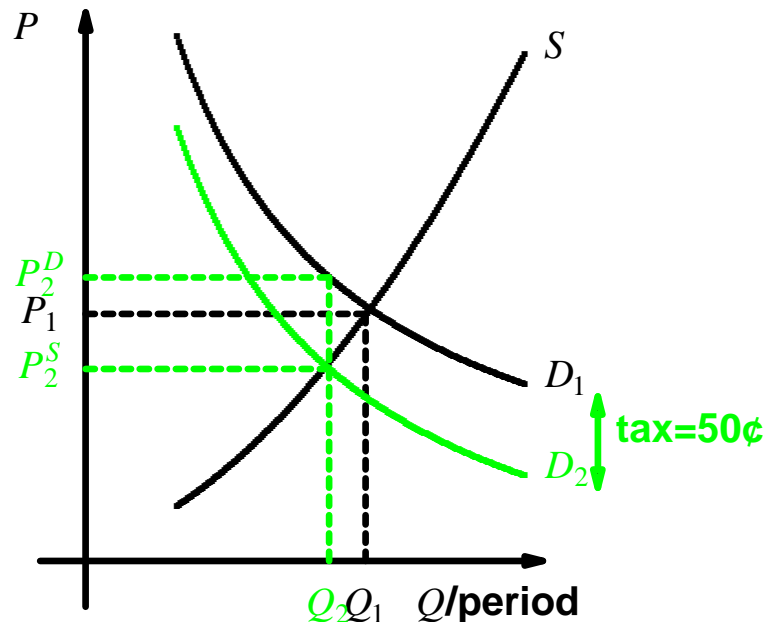
Rent control \rightarrow shortages: $\bar{P} < P^*$, with long-term deterioration of the quality of rent-controlled housing. Why?

Minimum wage laws: a floor \underline{w} on wages \rightarrow a glut in the labour market, called *unemployment*, with $\underline{w} > w^*$, the market-clearing wage.

By maintaining the wages of the low-paid, the government reduces the number of their jobs.

2. TAXES ON BUYERS

A unit tax on buyers: each unit bought costs 50¢ more, but the seller gets only (price paid – tax): a wedge between the buyers' price P^D and the sellers' price P^S . How do equilibrium price and quantity change?



SHIFTED DEMAND AND THE BURDEN

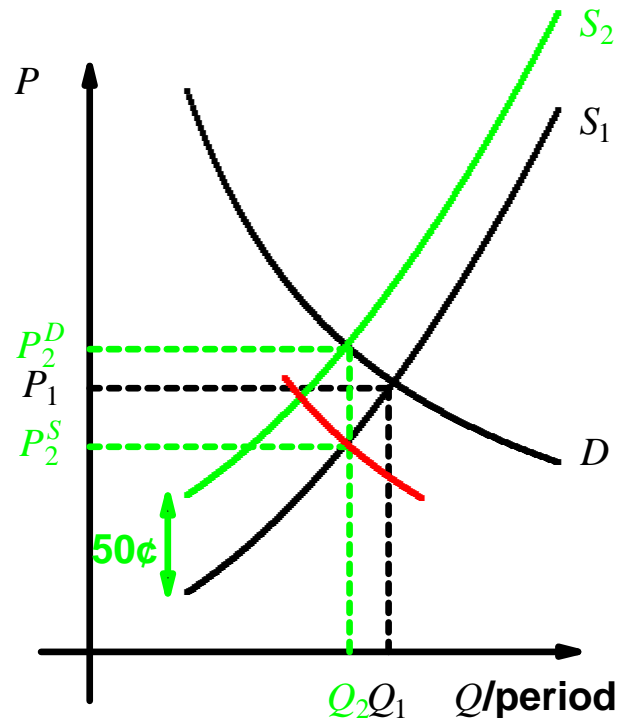
If the previous (before-tax) price P^* was \$2.00, the buyers' price is now \$2.50; but at the higher price, buyers demand less: to sell the same quantity, the before-tax price must be 50¢ less. The demand curve in effect shifts down by 50¢ to D_2 .

The after-tax quantity falls to Q_2 , and the price paid (P_2^D) is 50¢ higher than the price received by sellers (P_2^S).

Who bears the burden of the tax? Sellers receive ($P_1 - P_2^S$), i.e. less per unit; buyers pay ($P_2^D - P_1$), i.e. more. And less is sold: *both sides bear the tax burden.*

TAXES ON SELLERS

A unit tax on sellers: no shift in demand, but the cost of selling has risen by 50¢ a unit: the supply curve in effect shifts up by 50¢ to S_2 .



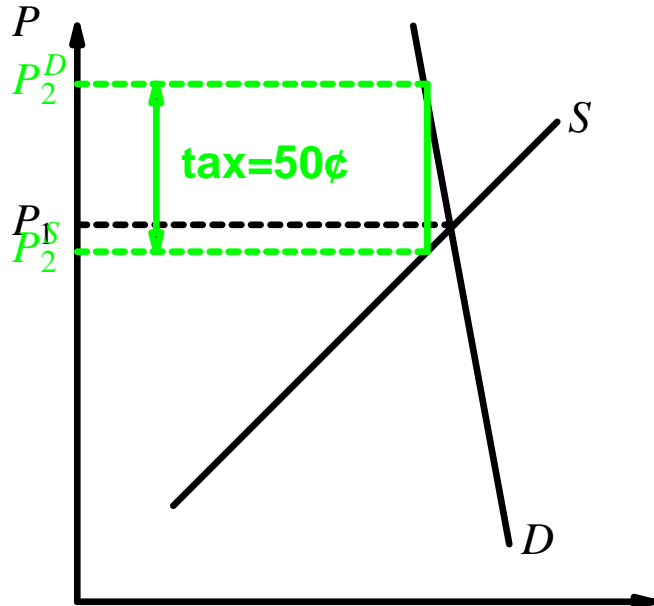
TAX INCIDENCE

Taxes on buyers and sellers are equivalent: the after-tax prices and quantities and burdens identical, as seen above: P_2^D , P_2^S , Q_2 .

How the burden is shared depends on the elasticities: the burden is heavier on the more inelastic side of the market.

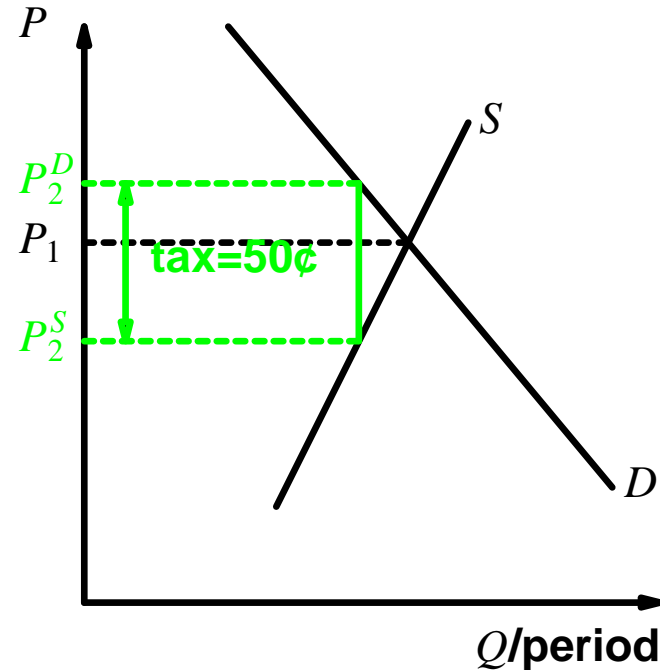
The burdens are measured by the relative movements of the buyers' price P_2^D and the sellers' price P_2^S from the before-tax equilibrium price of P^* .

TAX BURDEN & ELASTICITIES



Elastic supply;
inelastic demand.

**Consumers' burden is
greater than producers'.**



Inelastic supply;
elastic demand.

**Consumers' burden is
less than producers'.**

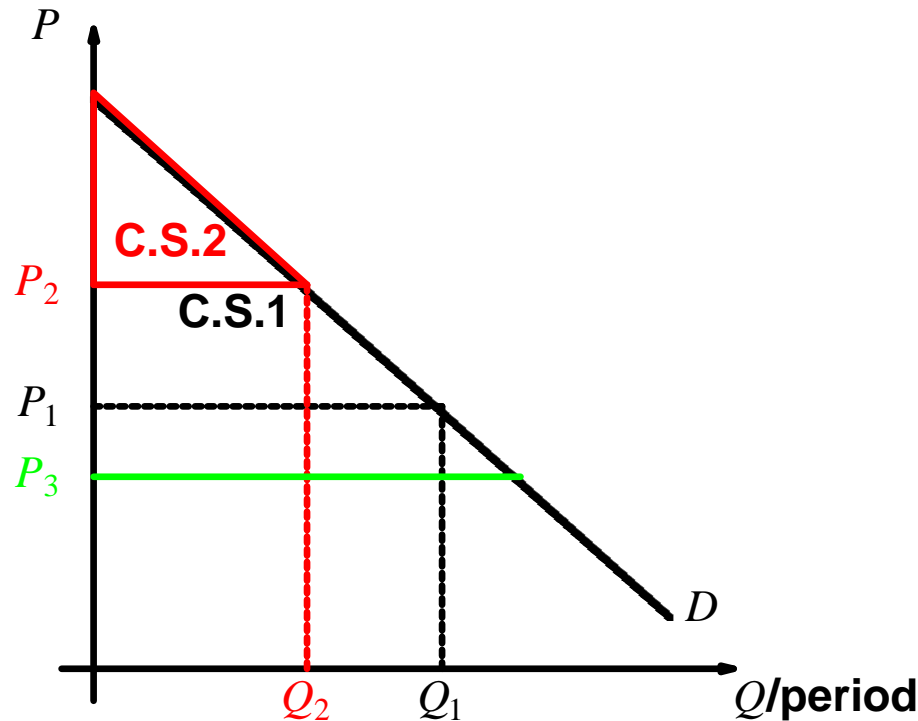
3. CONSUMER SURPLUS

Remember: The market demand curve measures the maximum quantity demanded at any price, or the maximum *willingness to pay* for any quantity.

At any price P_1 , consumers buy Q_1 units, and are left with a positive net willingness to pay: their *consumers' surplus*, which equals the area above the price and below the demand curve.

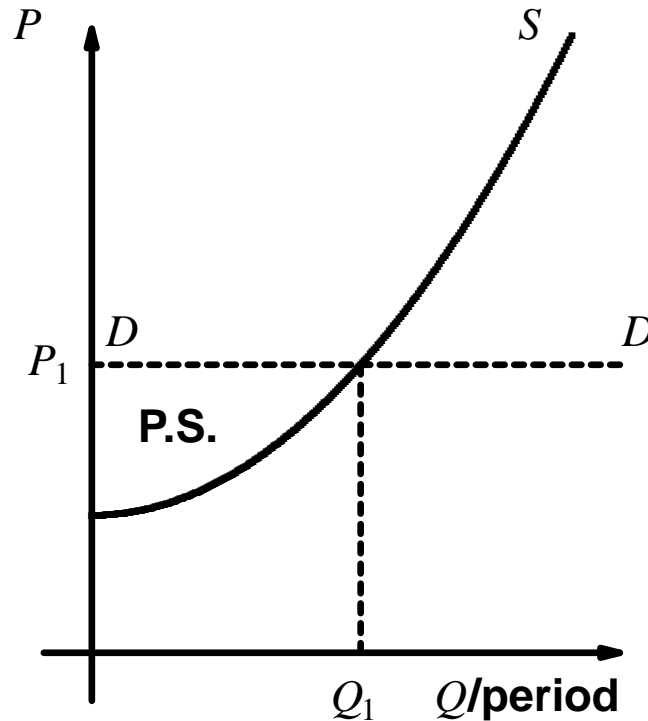
So consumers' surplus is a willingness to pay over and above the price, or net willingness to pay.

GRAPHICALLY



If price rises, C.S. shrinks. From C.S.1 at P_1 to **C.S.2 at P_2** . Some demand is choked off ($Q_1 - Q_2$), and for the first Q_2 units, the net willingness to pay is less. **If price falls, C.S. grows.**

4. PRODUCER SURPLUS

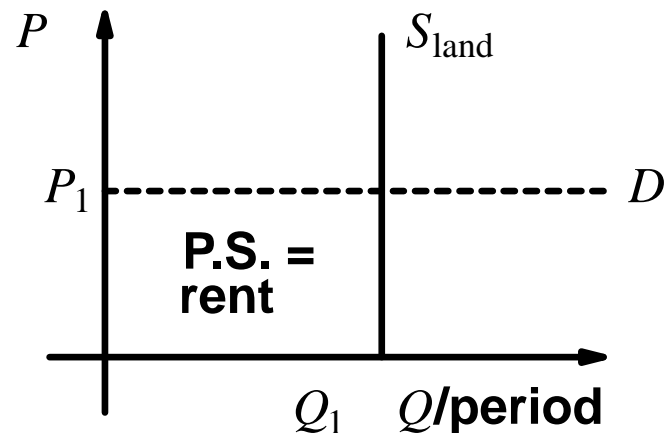


Remember: Each point on the supply curve gives the lowest price at which suppliers are willing to sell the corresponding quantity of output, or the maximum quantity they will supply at any price.

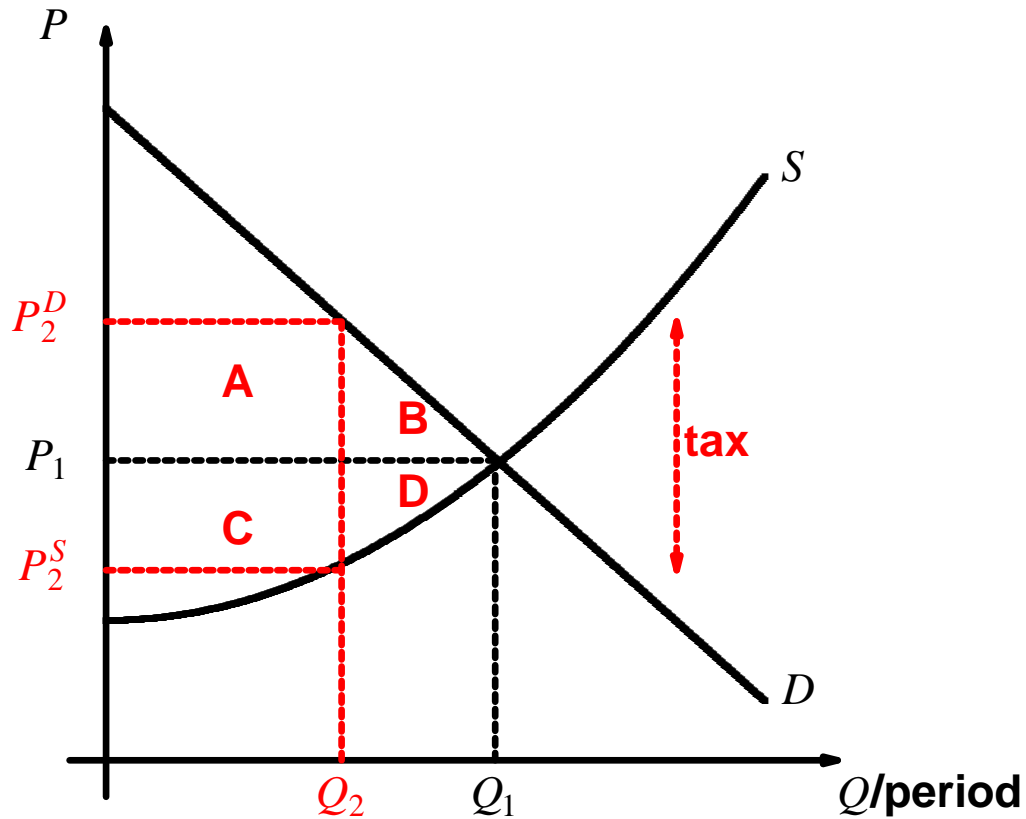
WILLINGNESS TO SUPPLY

At P_1 some producers (at the bottom of the supply curve) would sell at prices below P_1 : their *net willingness to supply* at P_1 is still positive.

At P_1 they gain *producers' surplus*, or *economic rent*: a return to producers over and above the minimum necessary to induce them to supply Q_1 in aggregate. P.S. equals the area below the price and above the supply curve.



5. MARKET EFFICIENCY



TAXES AND EFFICIENCY

The tax drives a wedge between P_2^D and P_2^S , and the quantity supplied falls from Q_1 to Q_2 .

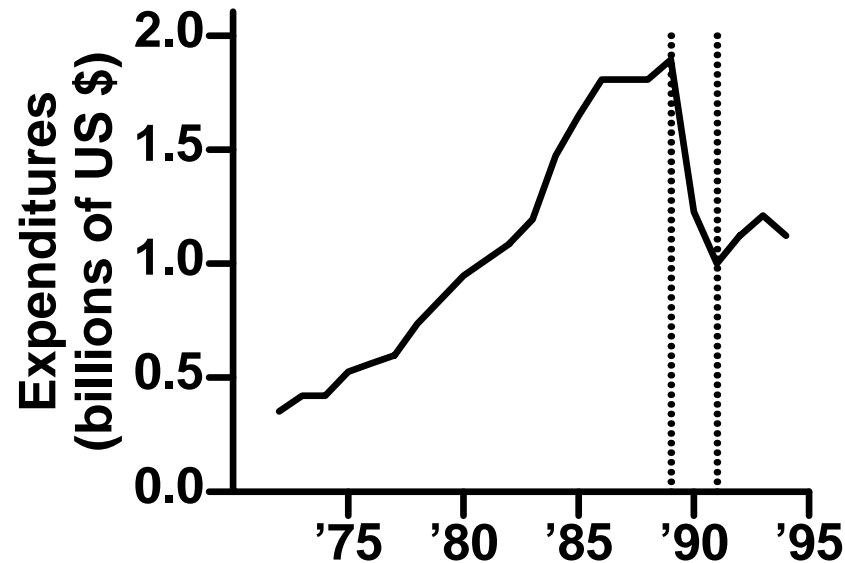
Consumer surplus falls as the price paid rises: shrinks by area A+B. Producer surplus falls as the price received falls: shrinks by area C+D. Tax revenue is area A+C.

So what happens to area B+D?

This is the *Dead Weight Loss* (DWL) associated with the tax: an inefficiency.

Efficient allocation maximizes the Total Surplus = C.S. + P.S.

6A. U.S. FUR SALES



$$\frac{\Delta Q}{Q} = \eta \frac{\Delta P}{P} + \varepsilon \frac{\Delta I}{I} + \eta_{X,Y} \frac{\Delta P_Y}{P_Y} + \Delta_{\text{temperatures}} + \Delta_{\text{tastes}}$$

$$\frac{\Delta Q}{Q} = _, \eta = _, \frac{\Delta P}{P} = _, \varepsilon = _, \frac{\Delta I}{I} = _$$

6B. LONDON NEWSPAPER SALES

	August 1993	May 1994
<i>The Times</i>	355,000	518,000
<i>Daily Telegraph</i>	1,024,000	993,000
<i>The Independent</i>	325,000	277,000
<i>The Guardian</i>	392,000	402,000

$$\frac{\Delta P_{Times}}{P} = - \frac{\quad}{\quad}$$