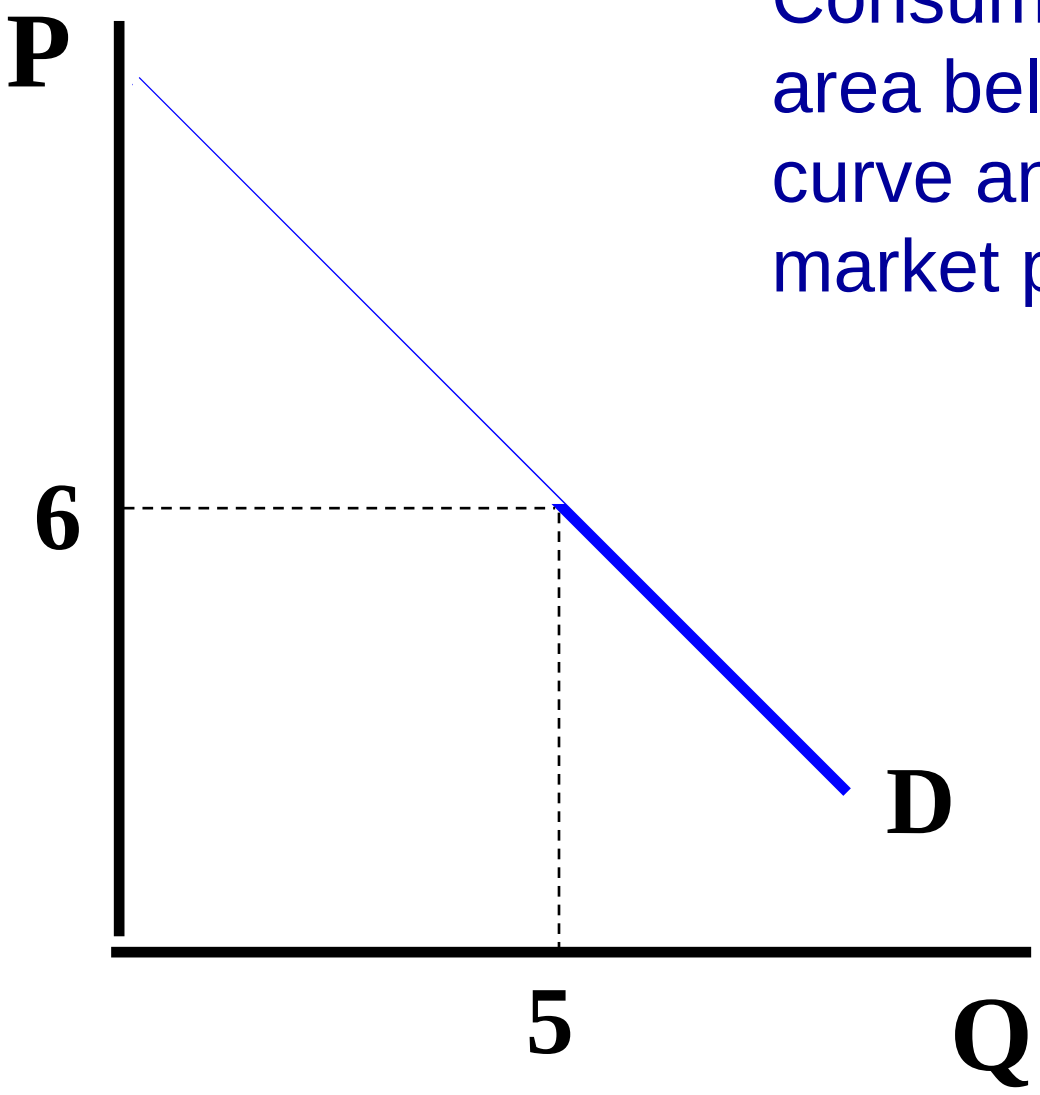
Tutorial 4
Chapter 5
Economic Efficiency

1. What is consumer surplus? How is it measured? What is producer surplus? How is it measured?

What is consumer surplus?

- **Consumer surplus** is equal to the difference between the buyer's willingness to pay and the actual price paid
- Consumer surplus measures the ***net benefits*** from consumption
- If consumer surplus increases, then consumers are better off

How is consumer surplus measured?

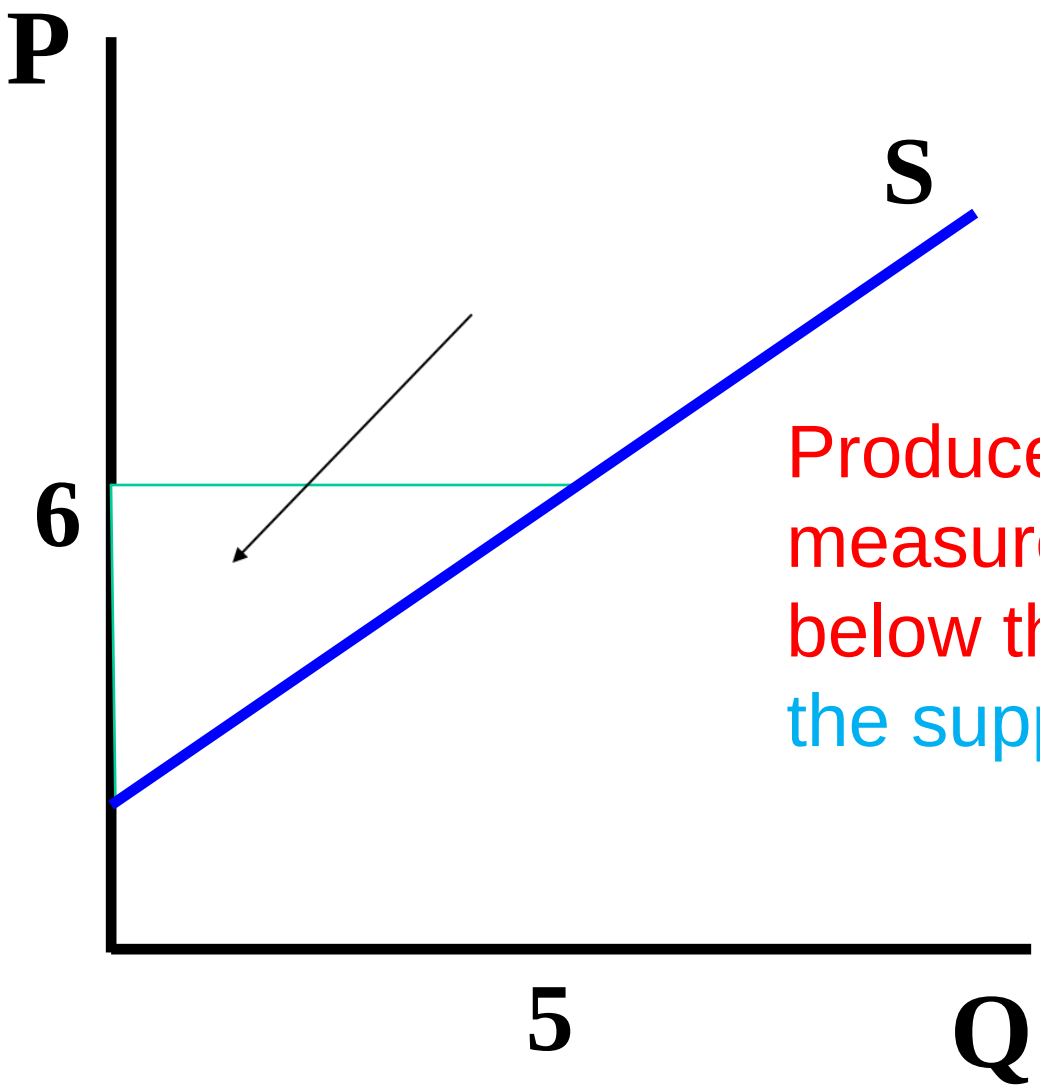


Consumer surplus is the area below the demand curve and above the market price.

What is producer surplus?

- ***Producer's surplus*** is the difference between the lowest price a firm would have been willing to accept and the price it actually receives.
- **Producer surplus** is the price of a good minus the marginal cost of producing it

How is producer surplus measured?



Producer surplus is measured by the area below the price and above the supply curve.

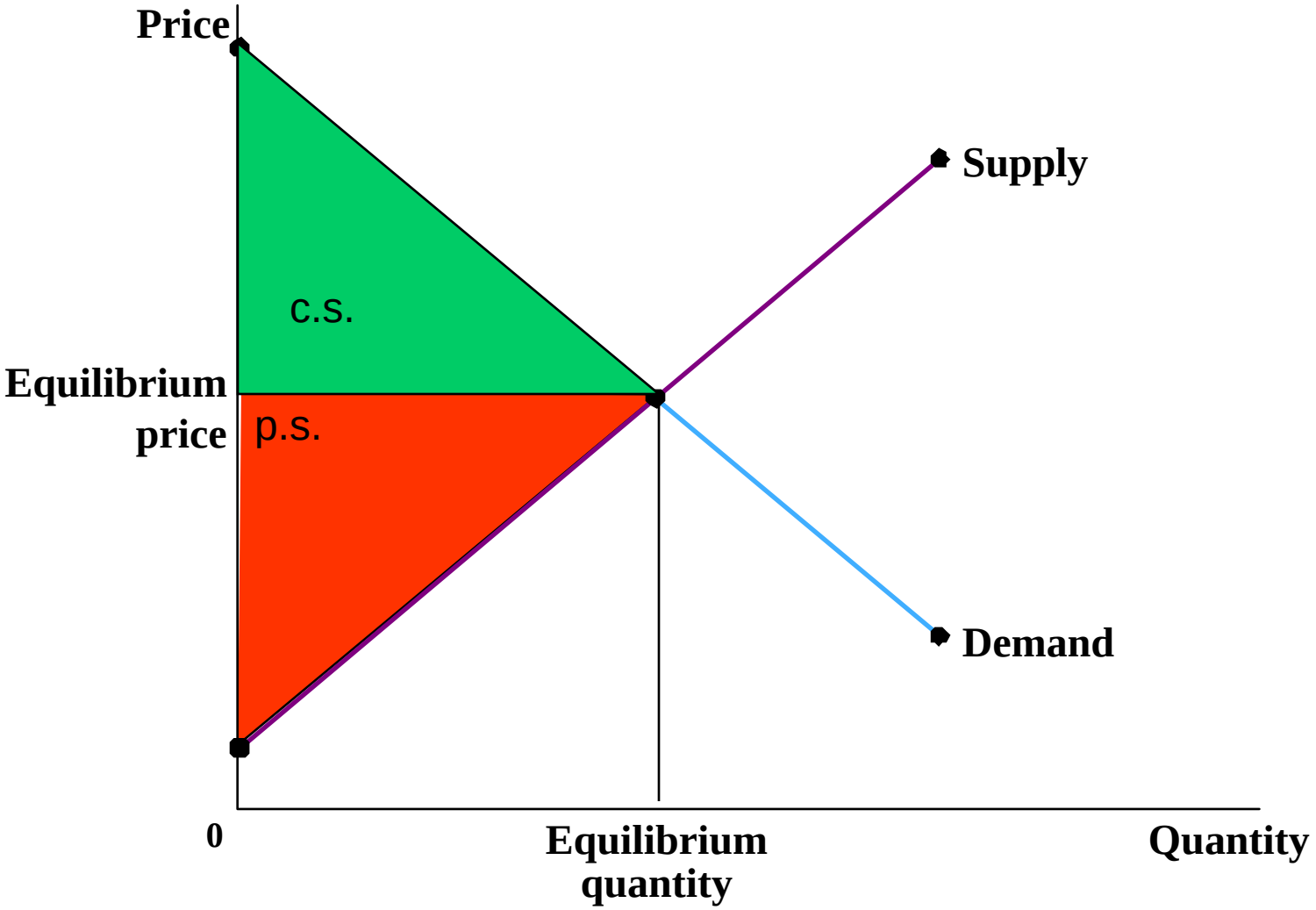
2. What does economic analysis suggest regarding the impact on economic efficiency of government imposed price ceilings & price floors? (refer to p.136)

Economic well-being and total surplus

Total Surplus = **Consumer Surplus** + **Producer Surplus**

When this surplus is MAXIMISED the level of economic well-being is also maximised

Economic Surplus/ Total Surplus = Consumer surplus + producer surplus



Market Efficiency

- The economic well-being of a society is measured as the sum of consumer surplus and producer surplus - **total (economic) surplus**.
- **Market efficiency is attained when the allocation of resources maximises total surplus.**

Sources of Market Inefficiency

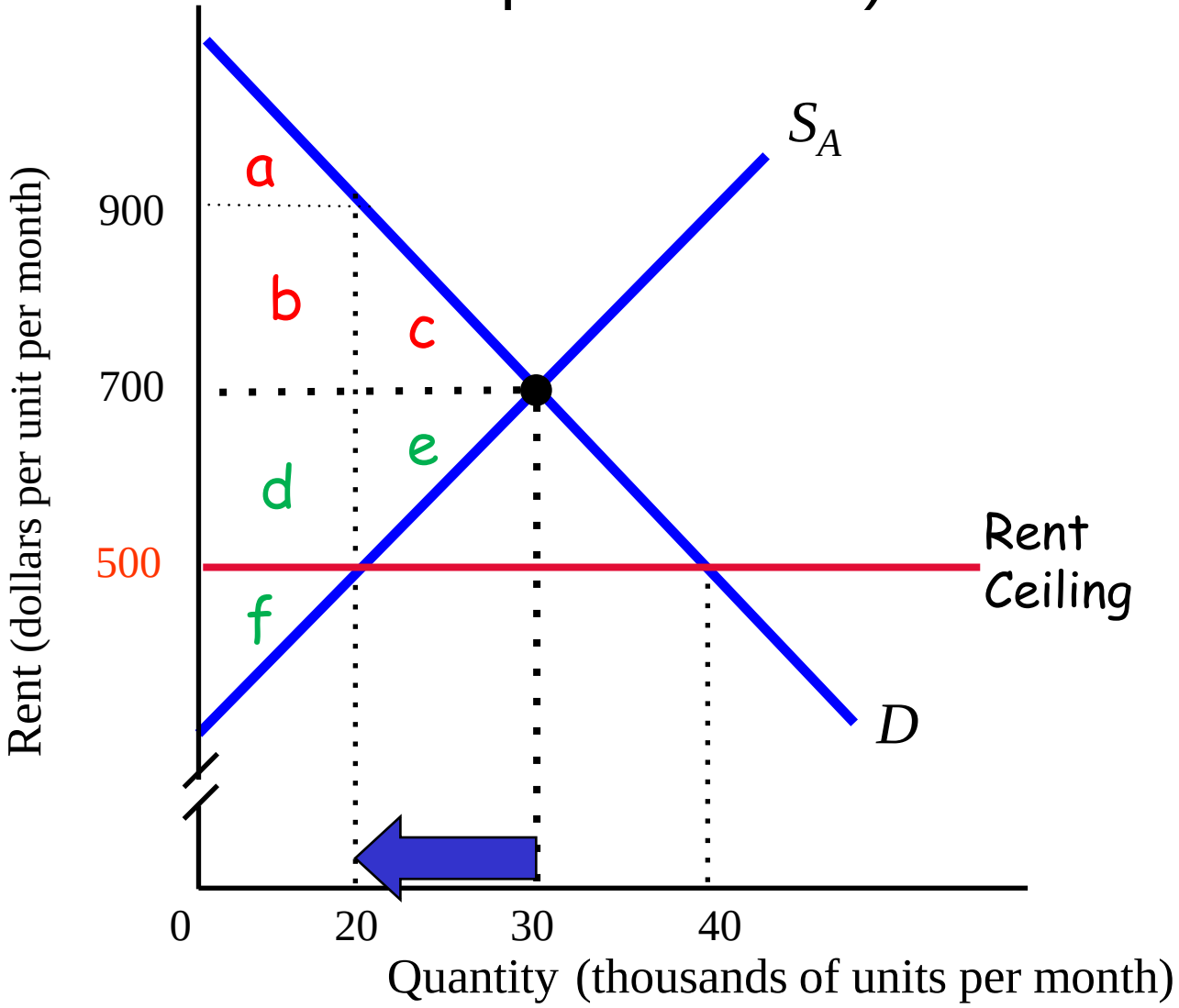
- *Deadweight Loss*

  The decrease in total (economic) surplus that results from a market not being in competitive equilibrium

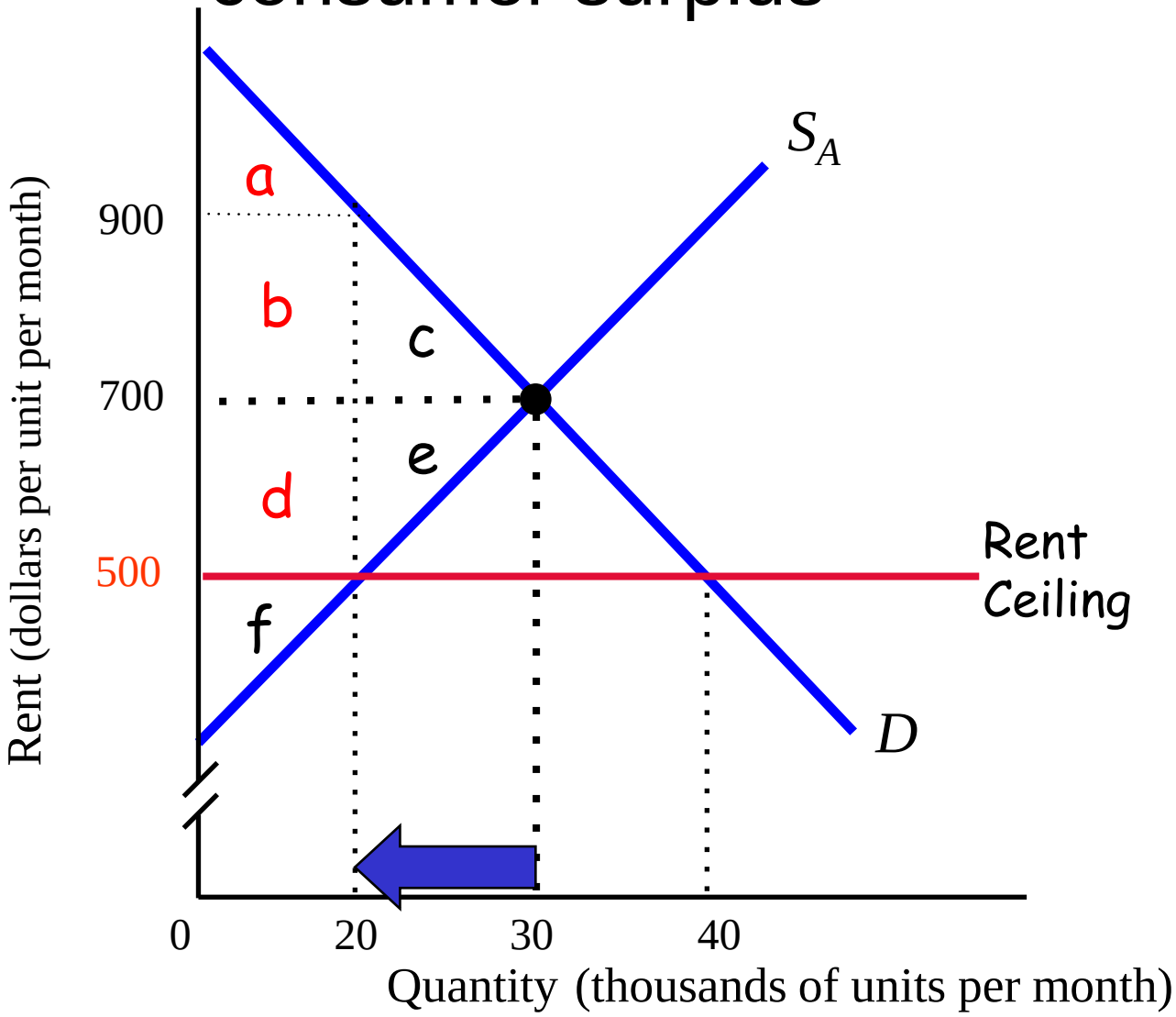
Price Ceilings & Price Floors

- Price Ceiling
  - A legally established maximum price at which a good can be sold. (e.g. rent ceilings, ceilings on petrol prices)
- Price Floor
  - A legally established minimum price at which a good can be sold. (e.g. agricultural prices, minimum wage laws)
- The results of Govt intervention: Price ceilings or Price floors
  - Some people win; winners
  - Some people lose; losers
  - There is a loss of economic efficiency; economic inefficiency

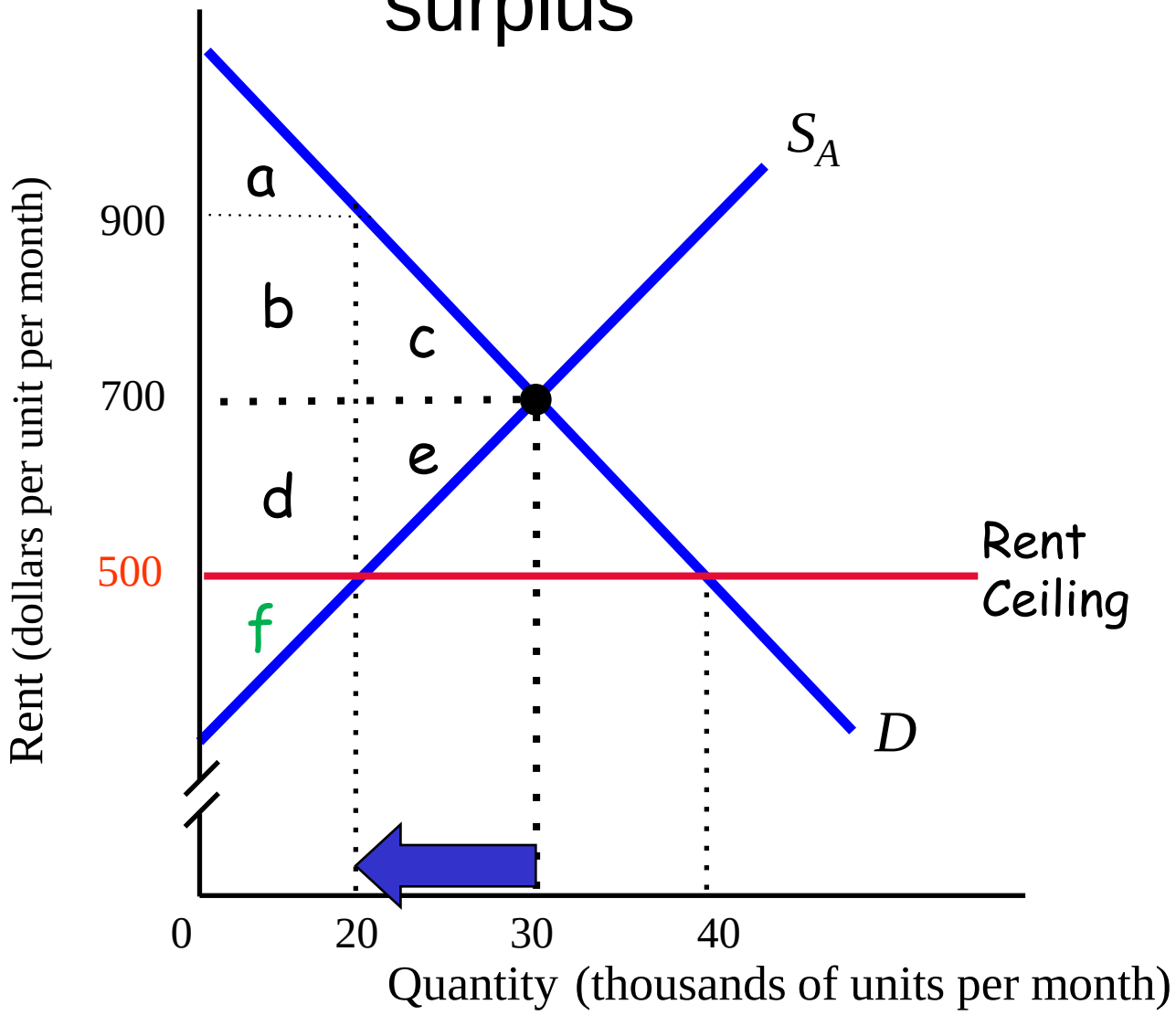
Surpluses before the Rent Ceiling (C.S.= a+b+c and p.s. = d+e+f)



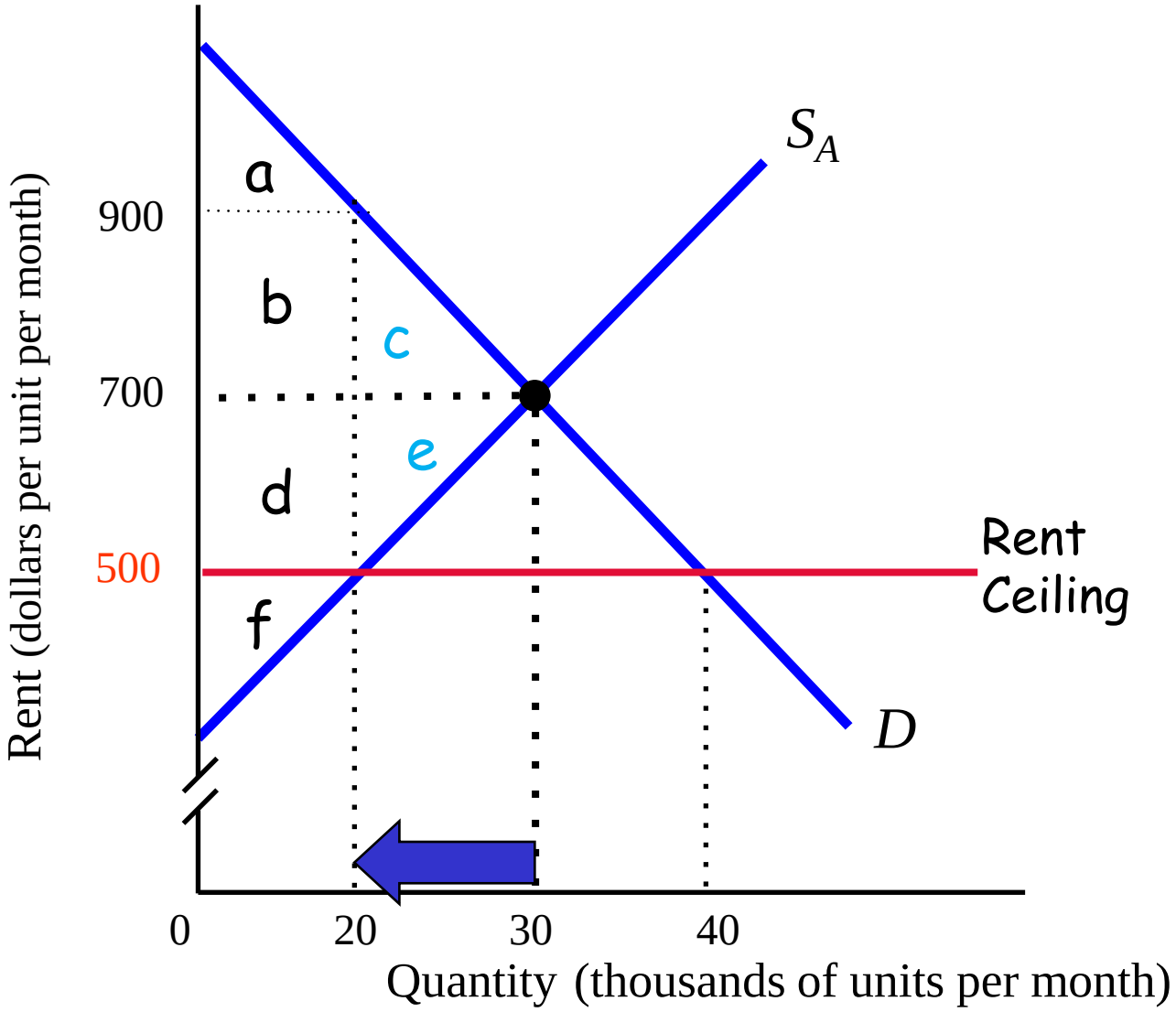
A Rent Ceiling – change in consumer surplus



A Rent Ceiling – change in producer surplus



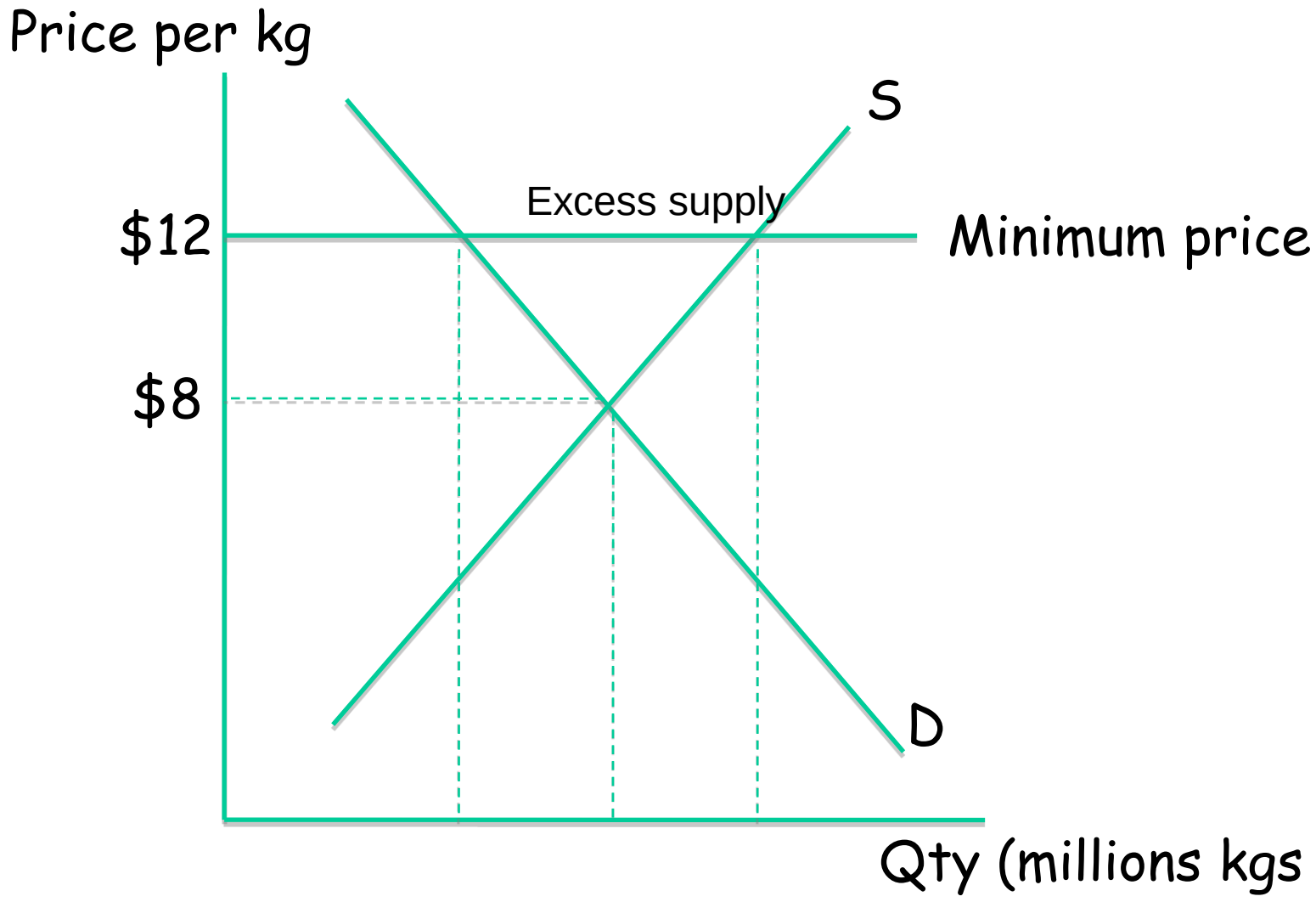
A Rent Ceiling – deadweight loss = c+e



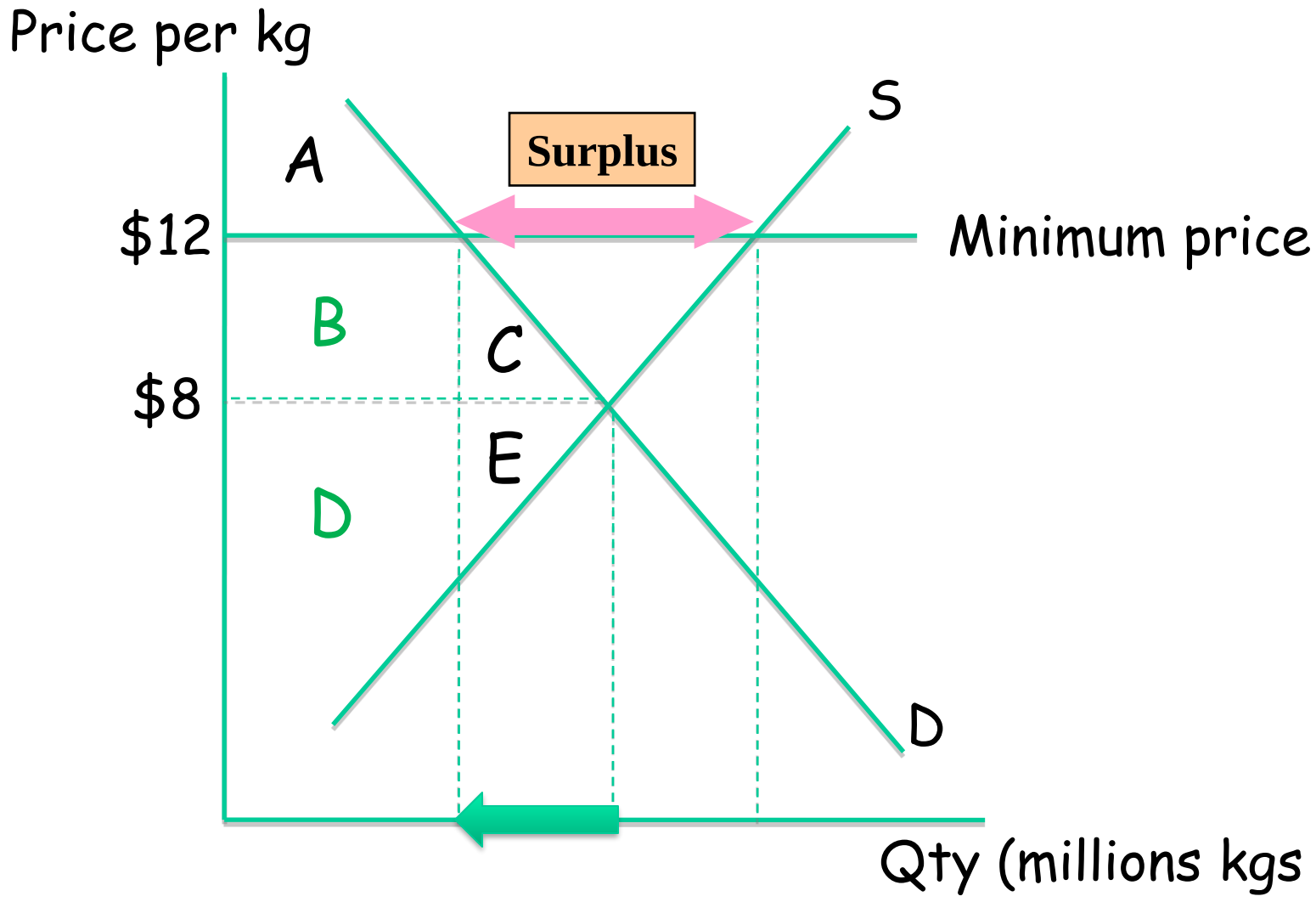
Price Floors

- A **price floor** is a regulation that makes it illegal to sell at a price lower than a specified level.
- It is the minimum price that should be paid for a commodity.

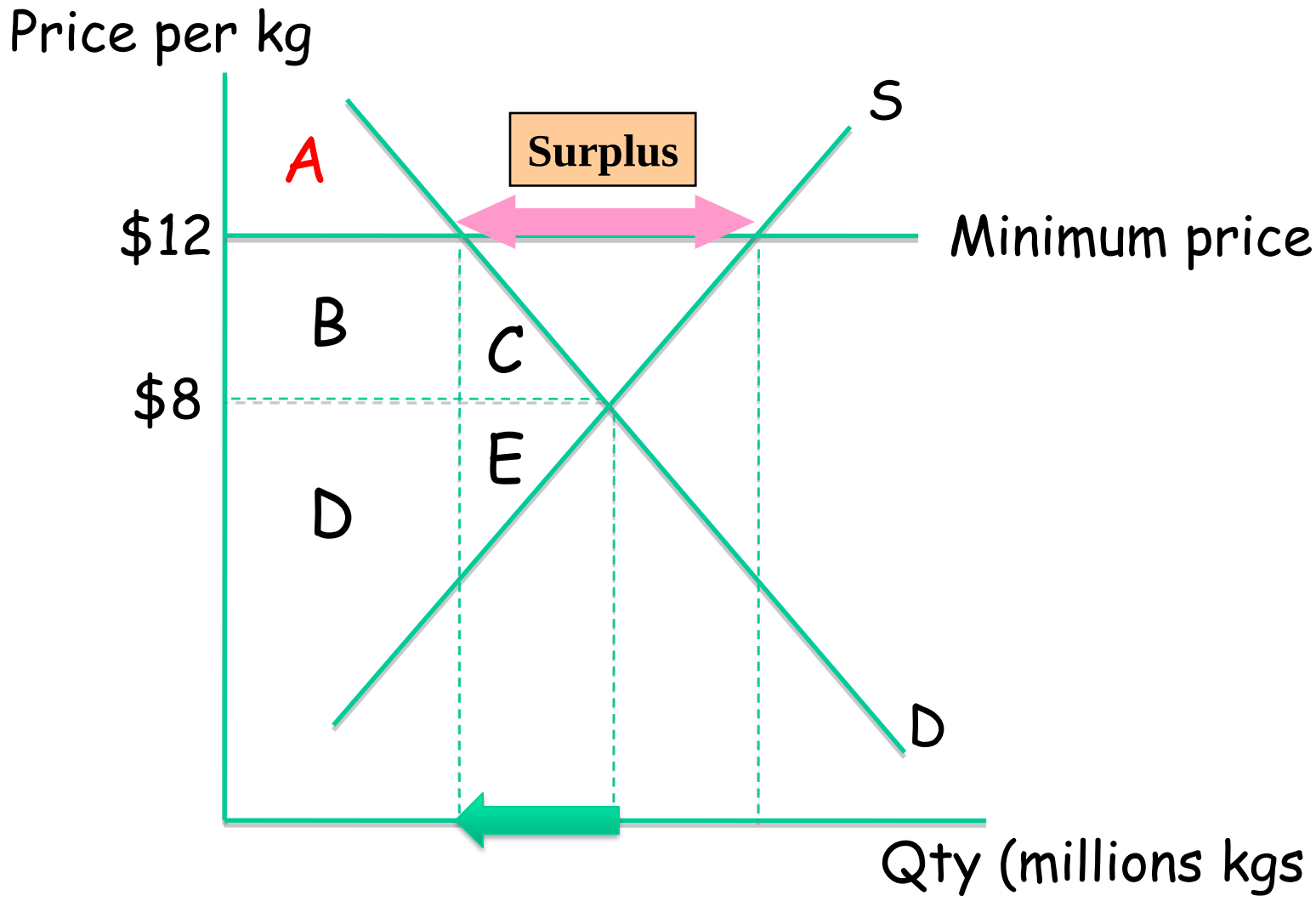
Price Floor - Wool



Wool Price Floor – effect on producer surplus

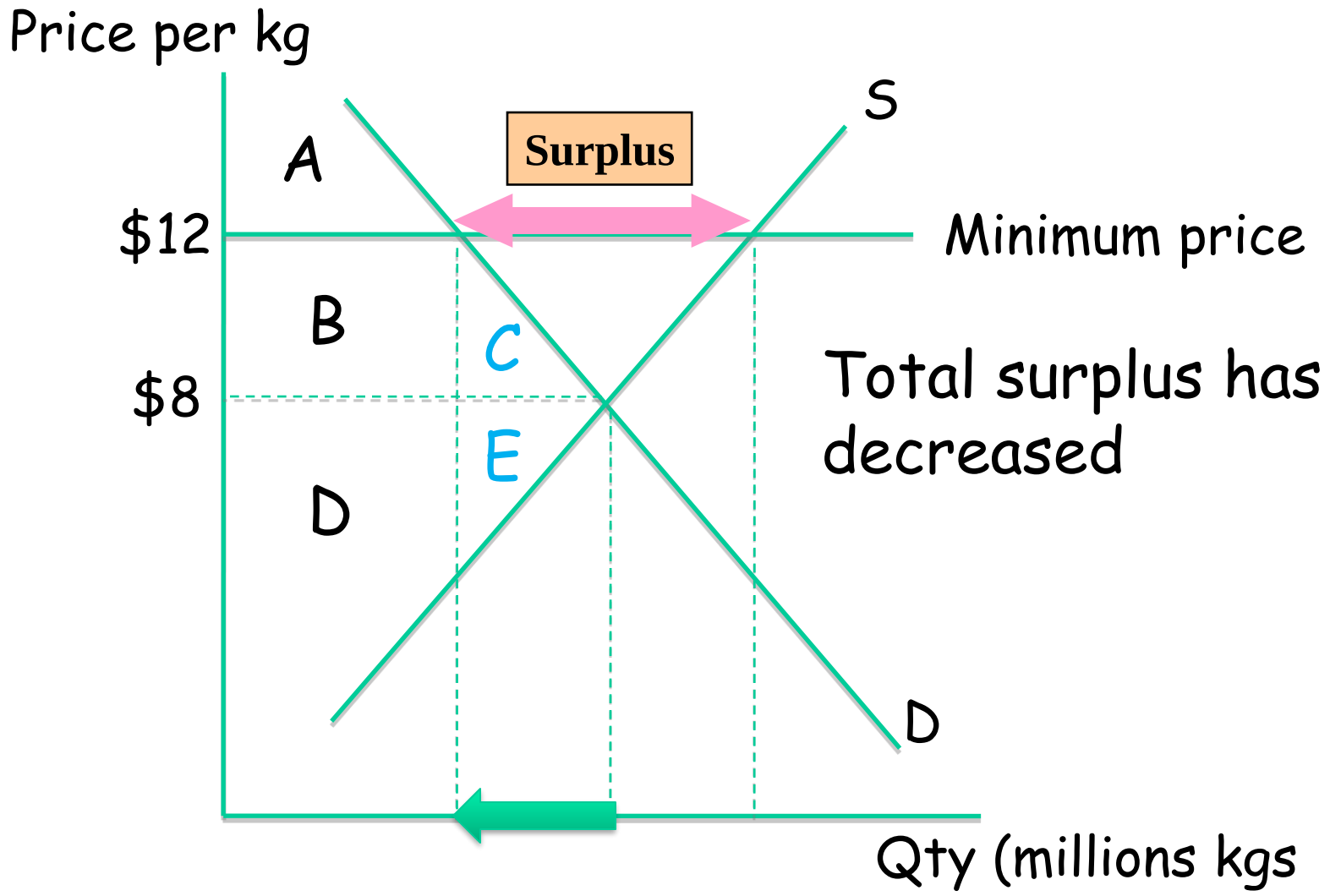


Wool Price Floor – effect on consumer surplus



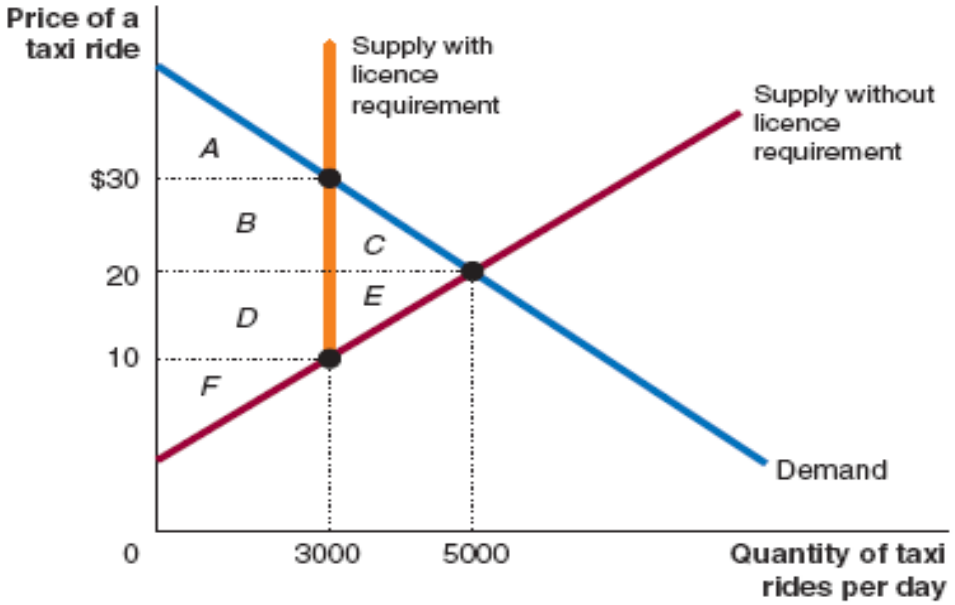
Wool Price Floor

Deadweight loss



- DWL = decrease in total surplus. BOTH ARE INEFFICIENT
- Price ceilings lead to shortage, price floors lead to surplus
- Ceilings may increase CS but loss to PS is > overall reducing TS
- Floors may increase PS but loss to CS is > overall reducing TS

Problem 3

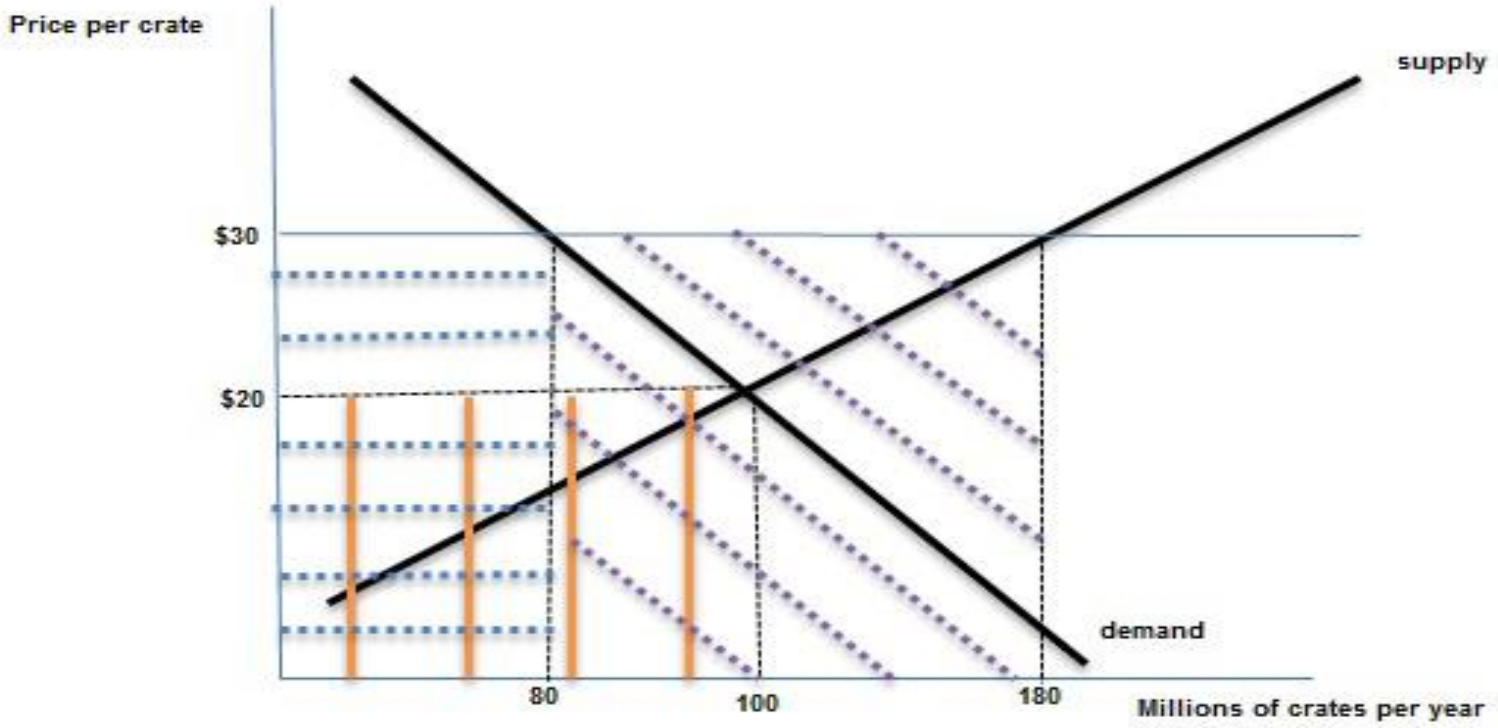


3A) Equilibrium price = 20, equilibrium qty = 5000 (where the market clears)
3B) Price is $30 and quantity is restricted to 3000. Notice what is happening to CS as the price is higher than the market price.
3C) CS= A + B + C and PS = D + E +F (in diagram above)
3D) New diagram to distinguish; CS = A, PS = B+D+F and DWL = C+E

Problem 8

P	Qd	Qs
10	120	20
15	110	60
20	**100**	**100**
25	90	140
30	80	180
35	70	220

8A) The equilibrium quantity is 100 million crates of oranges per year and the price is $20 per crate. The total revenue will be 20 x 100 million= $2000 million. The revenue collected at equilibrium is shown by the area of the rectangle represented by the solid (orange) vertical lines.


Price per crate
supply
$30
$20
demand
80
100
180
Millions of crates per year

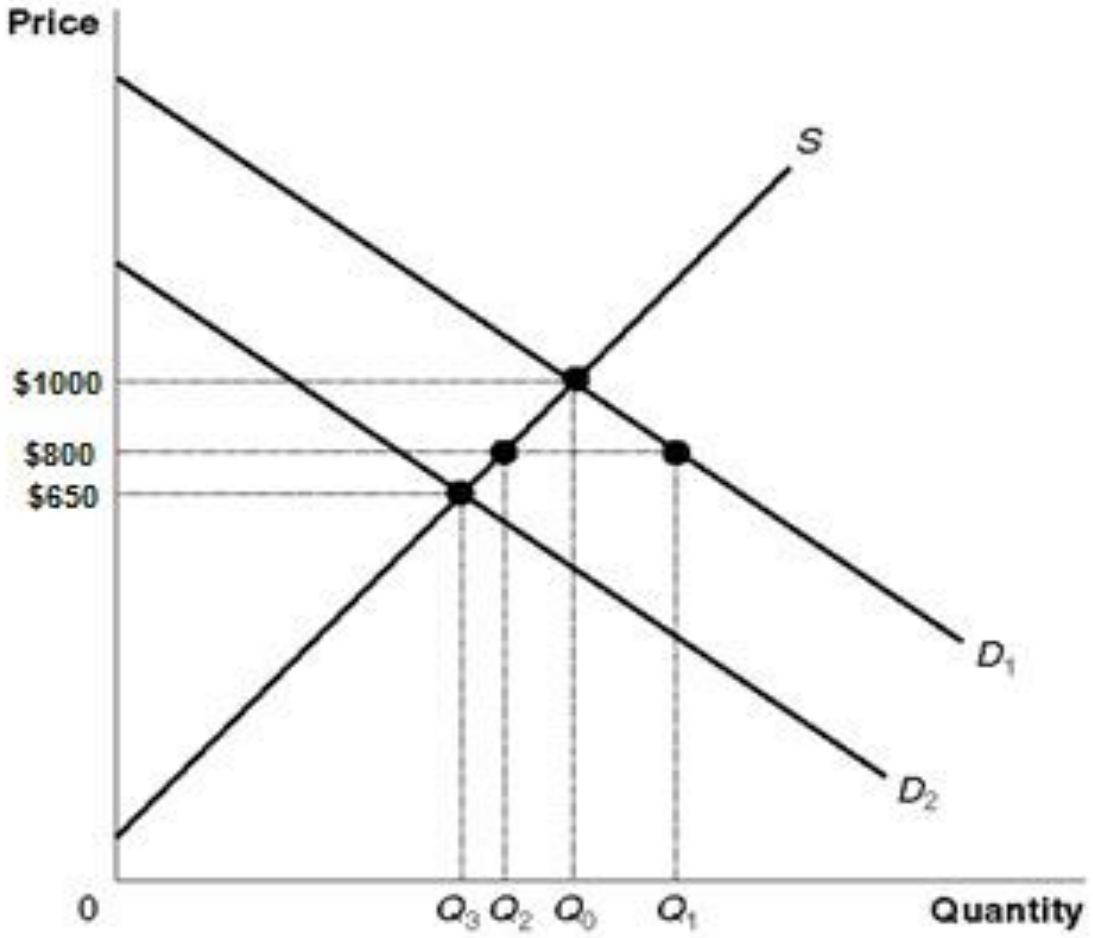
8b) After the imposition of the price floor at $30 per crate, 80 million crates of oranges will be demanded whereas 180 million crates will be supplied, creating a very large surplus of 100 million crates.

If the government does not purchase the surplus oranges then the revenue received by the producers is equal to the area of the rectangle represented by the dotted horizontal lines. The revenue will be $30 x 80 000 000 = $2400 000 000, or $2.4 billion

8C) If the government purchases the surplus then the farmers will essentially receive the higher floor price of $30 for all of the 180 million crates supplied, so their revenue will be much higher at $30 x 180 000 000 = $5400 000 000, or $5.4 billion.

The government will spend $3 billion ($3000 000 000) to purchase the surplus of 100 million crates. This is shown by the area of the rectangle represented by the dotted angled lines.

Problem 11

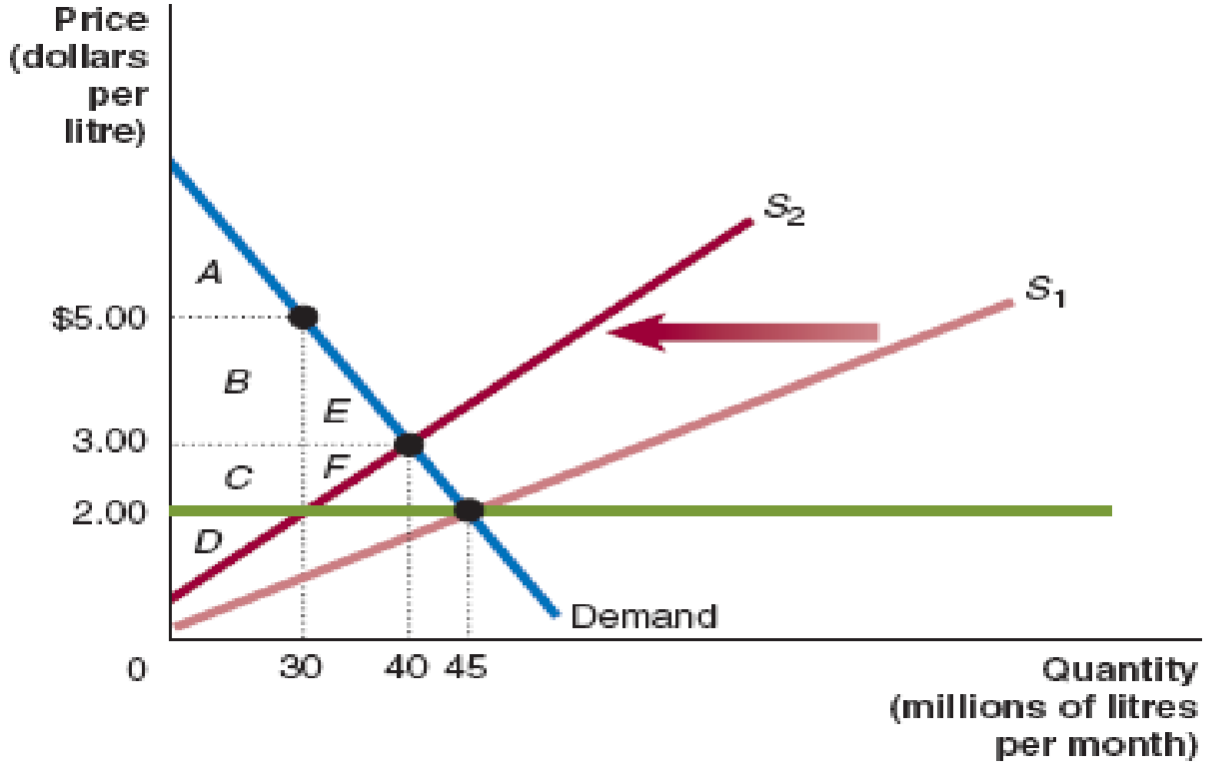


The rent control law will push the price down from $1000 to $800, creating a shortage equal to Q1 – Q2, since only Q2 apartments will be supplied at $800.

The layoffs of workers will shift the demand curve leftward from D1 to D2, which will cause the shortage to shrink.

If the demand curve shifts in far enough, the rent ceiling law will become irrelevant and there will be no shortage because the new equilibrium price will be below $800 as shown in the figure. Q3 will be the new equilibrium quantity.

Q.17


Price (dollars per litre)
S_2
S_1
A
$5.00
B
E
3.00
C
F
2.00
D
Demand
0
30
40
45
Quantity (millions of litres per month)

17a) With no price ceiling, the equilibrium price of petrol would be $3 per litre and the quantity demanded and quantity supplied would both be 40 million litres per month. With a price ceiling and no black market, the price of petrol is $2 per litre, the quantity demanded is 45 million litres, the quantity supplied is 30 million litres, and there is a shortage of 15 million litres

b) Consumer surplus = A + B + C, producer surplus = D, and deadweight loss = E + F.

C) Consumer surplus = A, producer surplus = B + C + D, and deadweight loss = E + F.

4. The government wants to decrease the consumption of alcohol by teenagers by imposing a large tax on ‘alcopops’. (refer also to pp.116-7 & 142-3)

a. Should this tax be placed on buyers or sellers? Explain.

b. Who would pay more of the tax – buyers or sellers? Include a diagram in your answer.

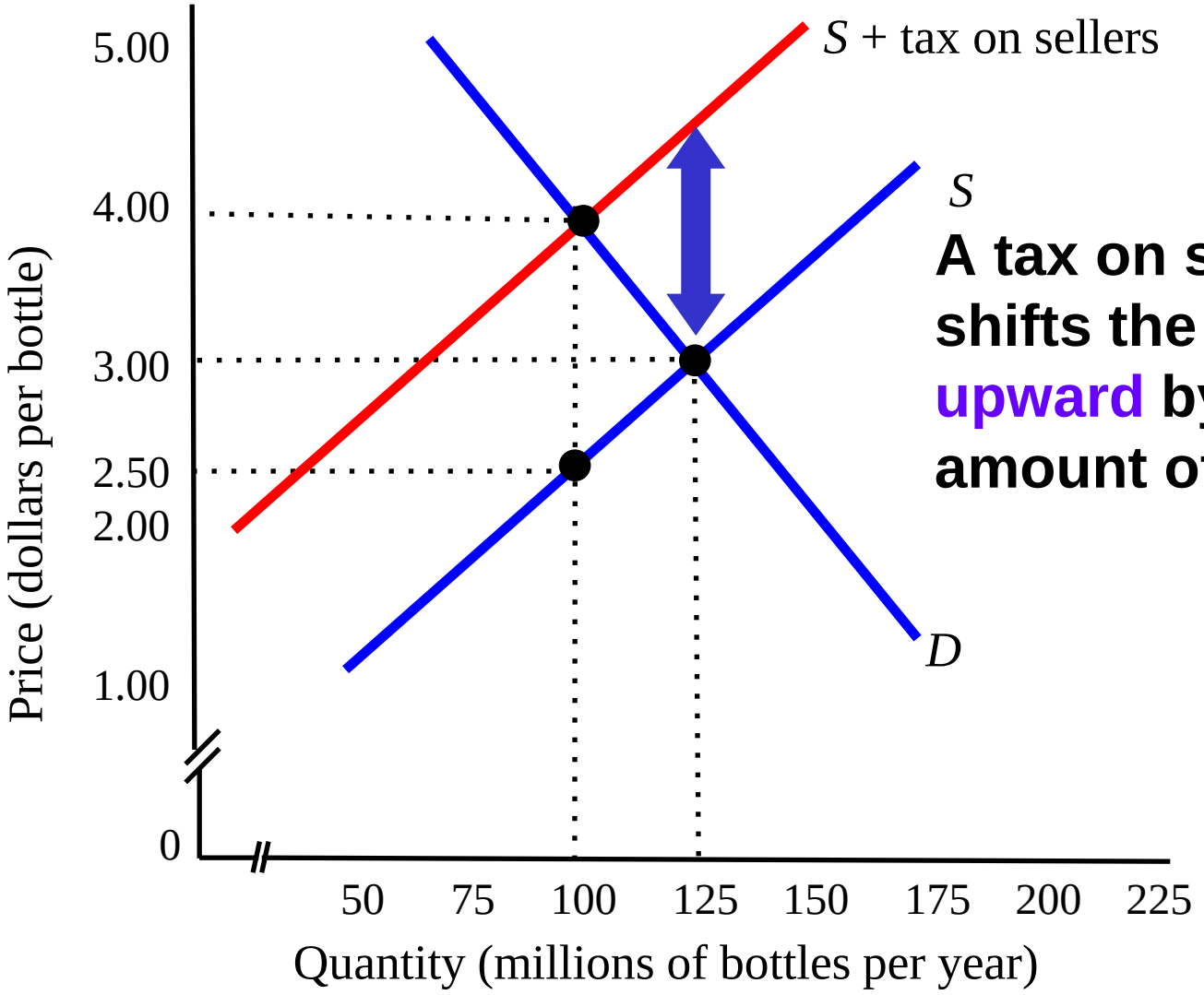
c. In what way could this tax be considered ‘efficient’?

d. Is it better to tax goods that are elastic or inelastic?

Should the tax be imposed on buyers or sellers?

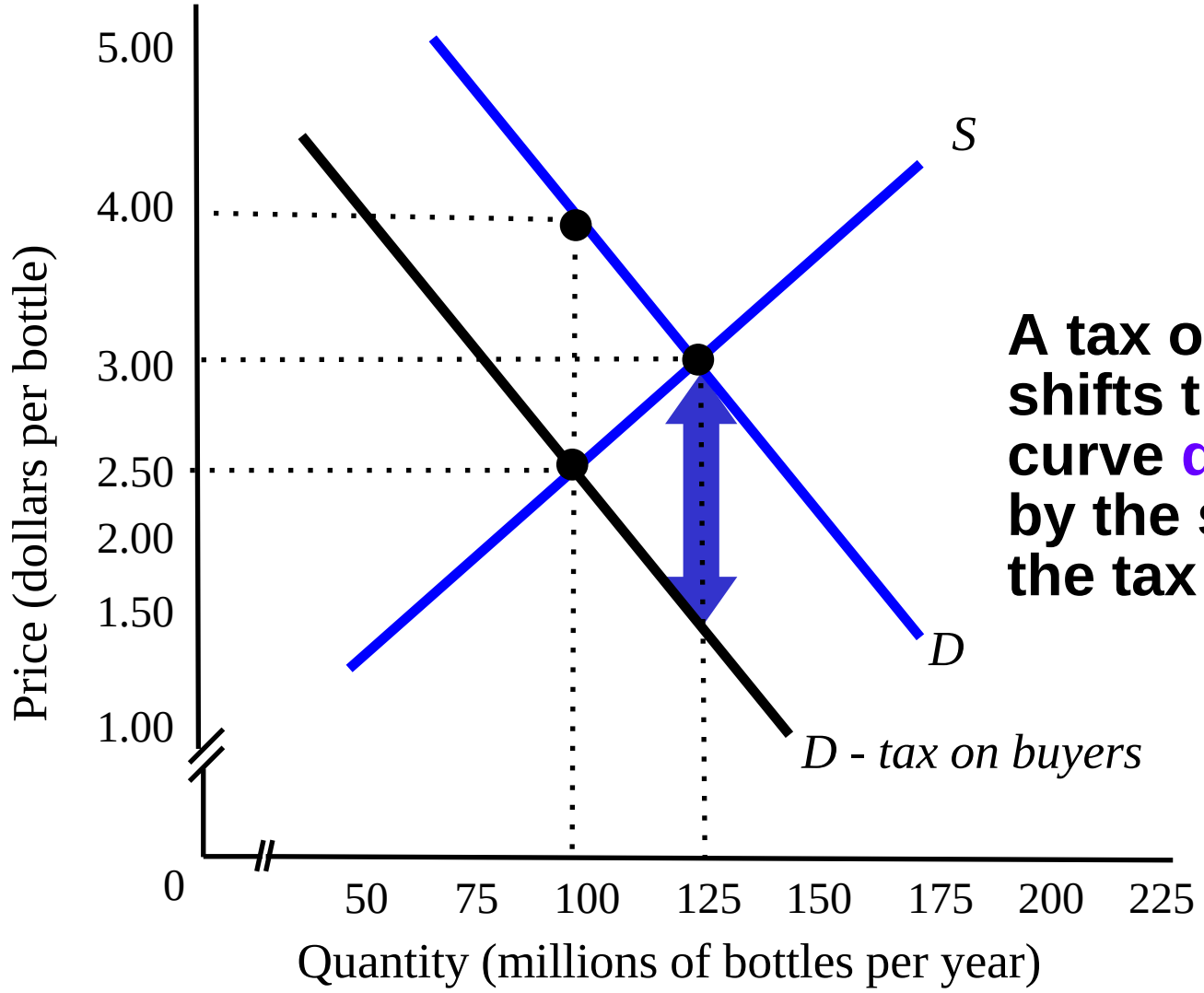
- Taxes can be levied on buyers or sellers
- It doesn't matter who the tax is levied on, shifting the D or S curve by the same amount has the same effect and are equivalent
- A tax on sellers will decrease supply
- A tax on buyers will decrease demand

A Tax on Sellers



A tax on sellers shifts the S curve upward by the amount of the tax

A Tax on Buyers



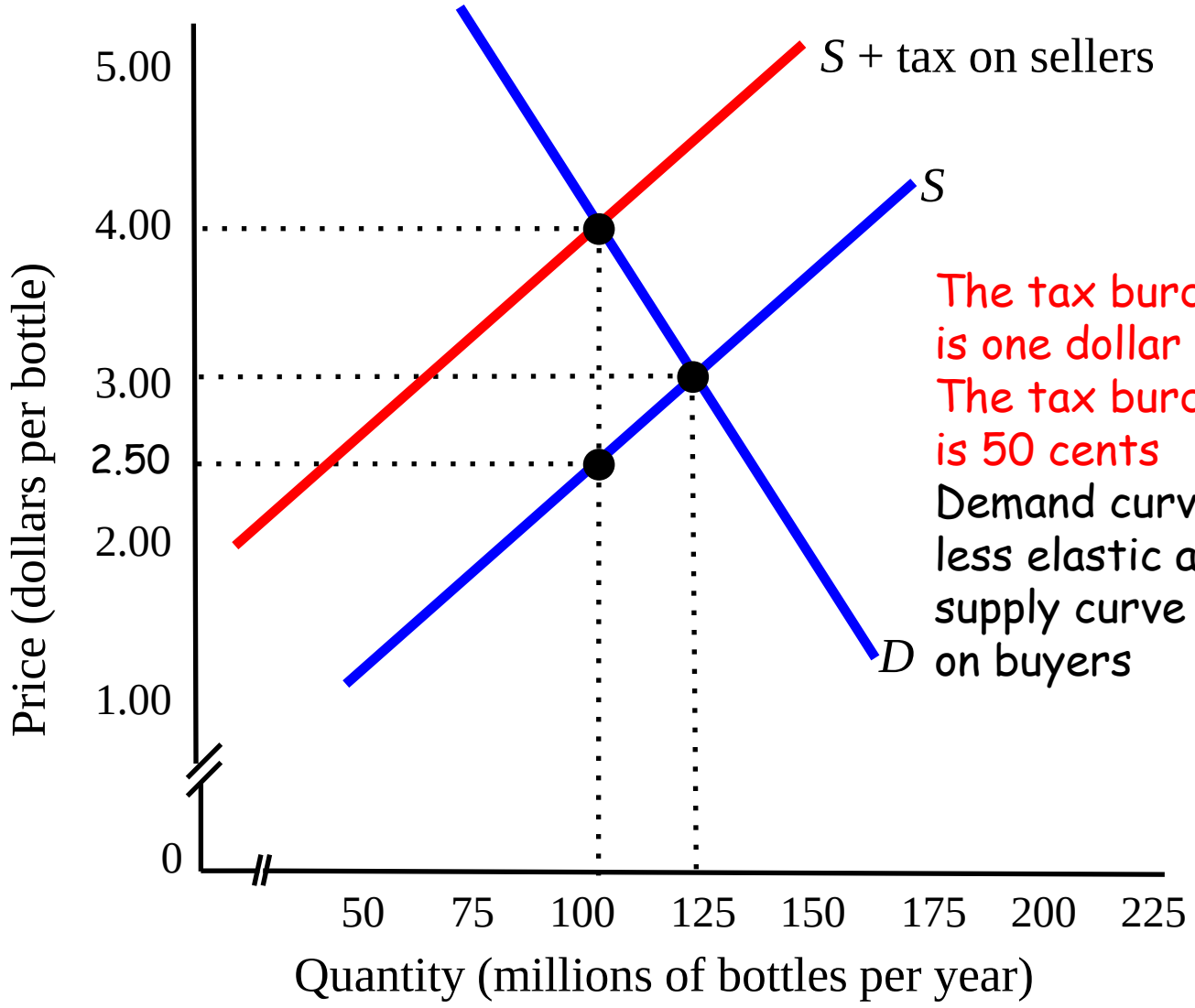
A tax on buyers shifts the D curve downward by the size of the tax

Taxes

- Equivalence of tax on buyers and sellers
  - A tax on buyers has the same effect as a tax on sellers
  - In both cases the equilibrium quantity decreases by the ***same amount*** and equilibrium P rises by the ***same amount***

- Who pays more of the tax – the buyer or the seller?
  - It depends . . . on the **elasticity** of demand and supply

A Tax on Sellers – Inelastic D: tax burden more on buyers

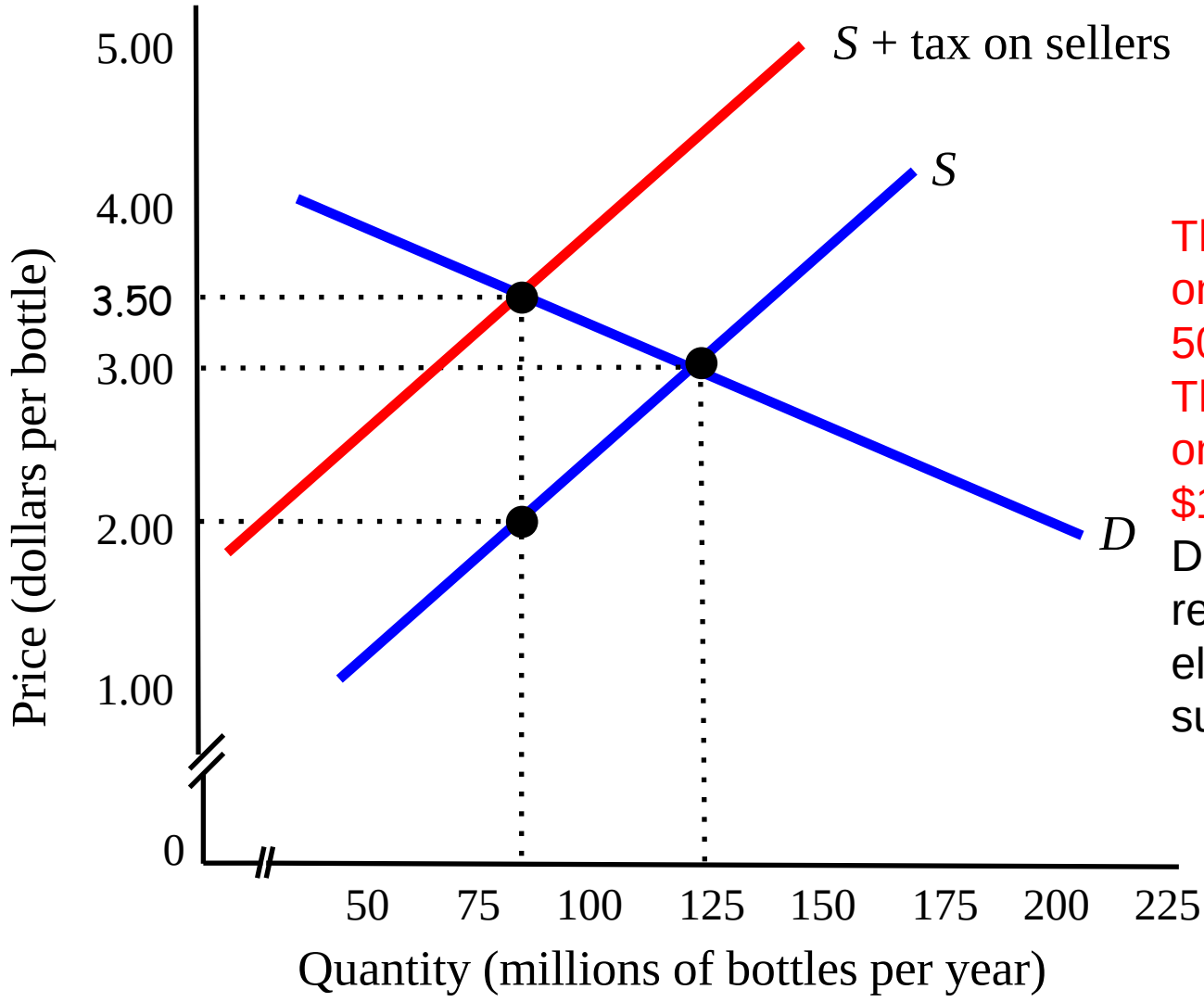


The tax burden on the buyer is one dollar

The tax burden on the seller is 50 cents

Demand curve is relatively less elastic as compared to supply curve so more burden on buyers

A Tax on Sellers – Elastic D: more burden on sellers



The tax burden on the buyer is 50 cents
The tax burden on the seller is $1
D curve is relatively more elastic than supply curve.

Taxes and Efficiency

- After a tax, consumers will pay more and consume less
- Consumer surplus will decrease
- A Tax on Sellers –
  Inelastic D: loss in consumer surplus
- After a tax, producers will receive less and sell less
- Producer surplus will decrease

The Incidence of Tax

- Who pays more of the tax – the buyer or the seller?
- Buyer pays more if demand is less elastic as compared to supply
- Seller pays more if demand is more elastic as compared to supply

c. In what way could this tax be considered 'efficient'?

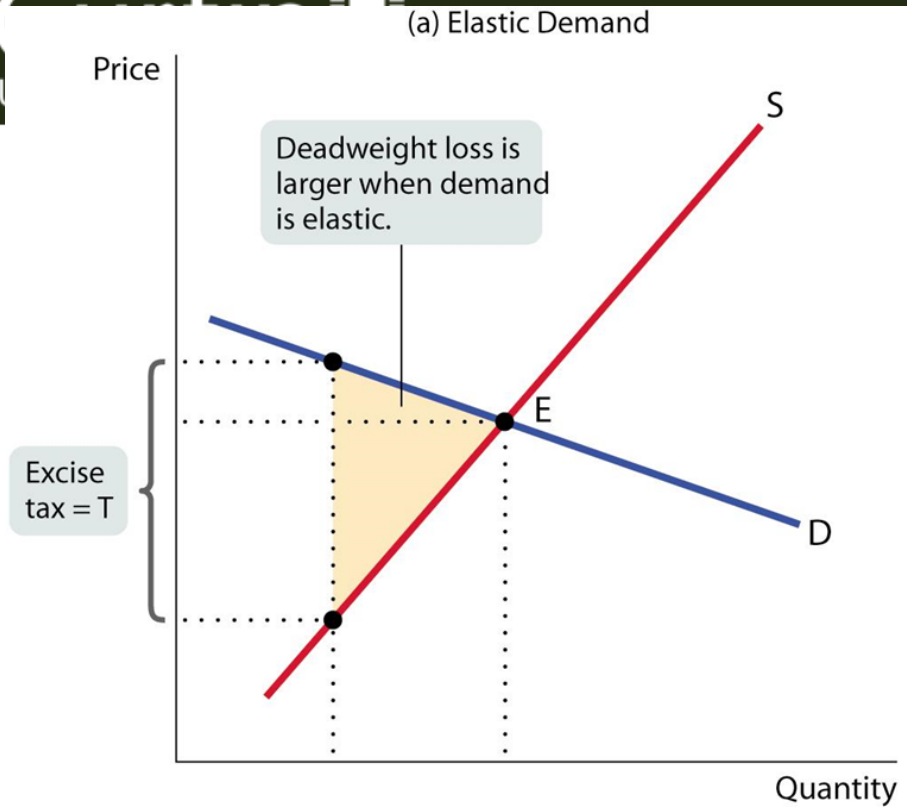
- What about the efficiency of a tax?
  - How does a tax affect consumer & producer surplus?
  - Will total surplus increase or decrease?

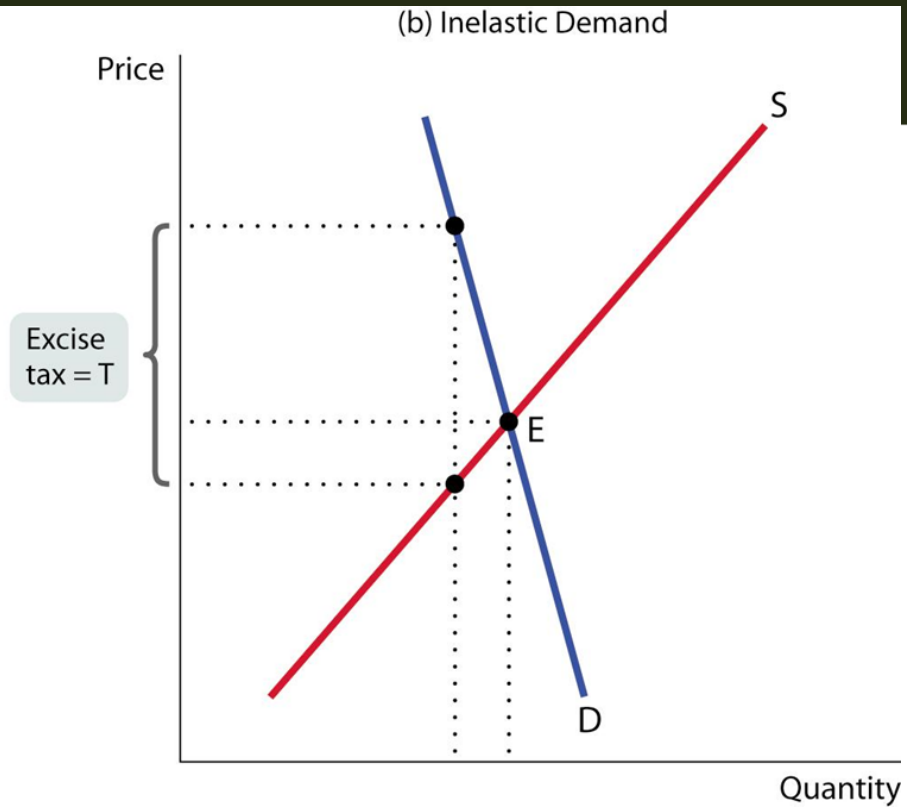
Taxes and Efficiency

- The tax results in a deadweight loss – a decrease in total surplus
- It is inefficient due to the DWL.
- But the tax raises revenue which is re-spent in the economy

d. Is it better to tax goods that are elastic or inelastic?

- What goods should we tax?
- Objective should be to
  - ***MAXIMISE TAX REVENUE and***
  - ***Decrease the DEADWEIGHT LOSS***
- Therefore tax goods that are relatively inelastic


(a) Elastic Demand
Price
S
Deadweight loss is larger when demand is elastic.
E
Excise tax = T
D
Quantity


(b) Inelastic Demand
Price
S
Excise tax = T
E
D
Quantity