



# **Applications of Demand and Supply**

## **EE311**

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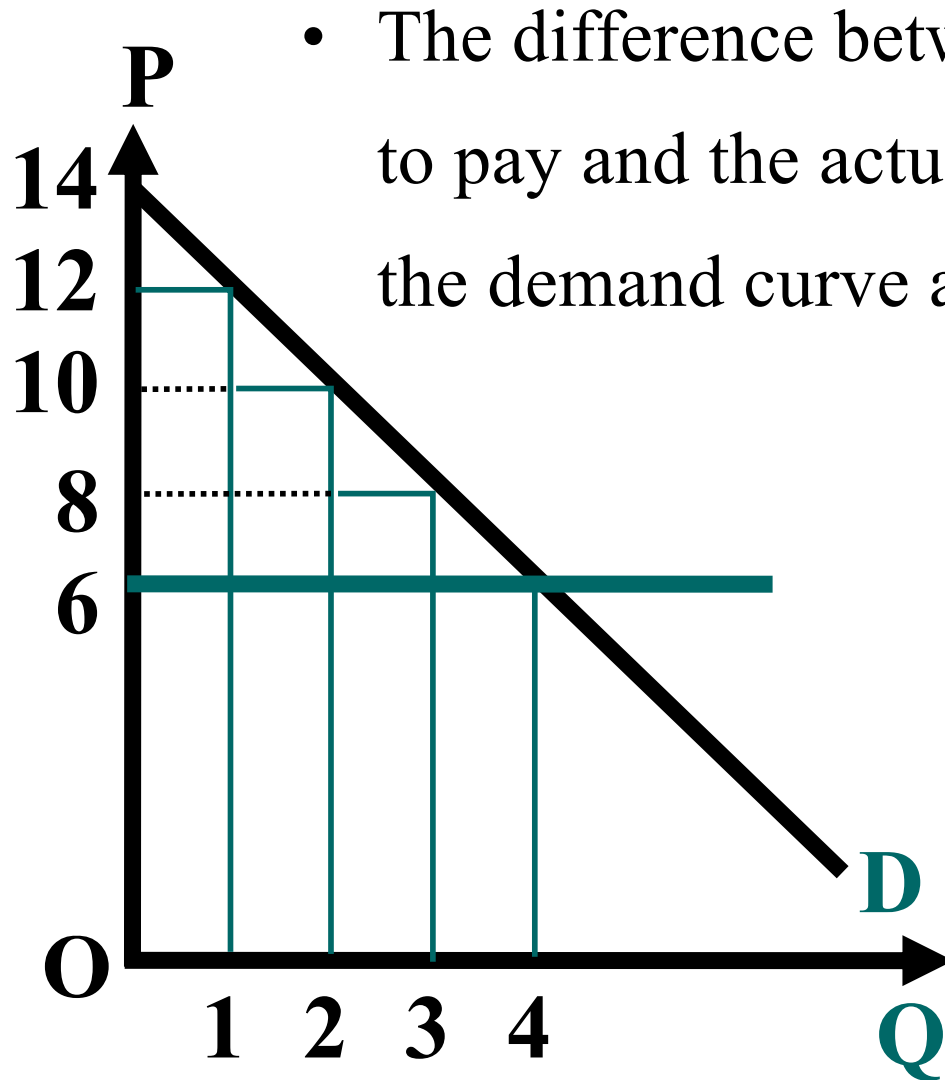
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# Apply Demand and Supply



- Consumer and producer surplus
- Sale Taxes and Subsidies
- Price ceilings
- Price floors
- Price supports
- Import Tariffs and Quotas
- Cobweb model

# Consumer surplus: CS



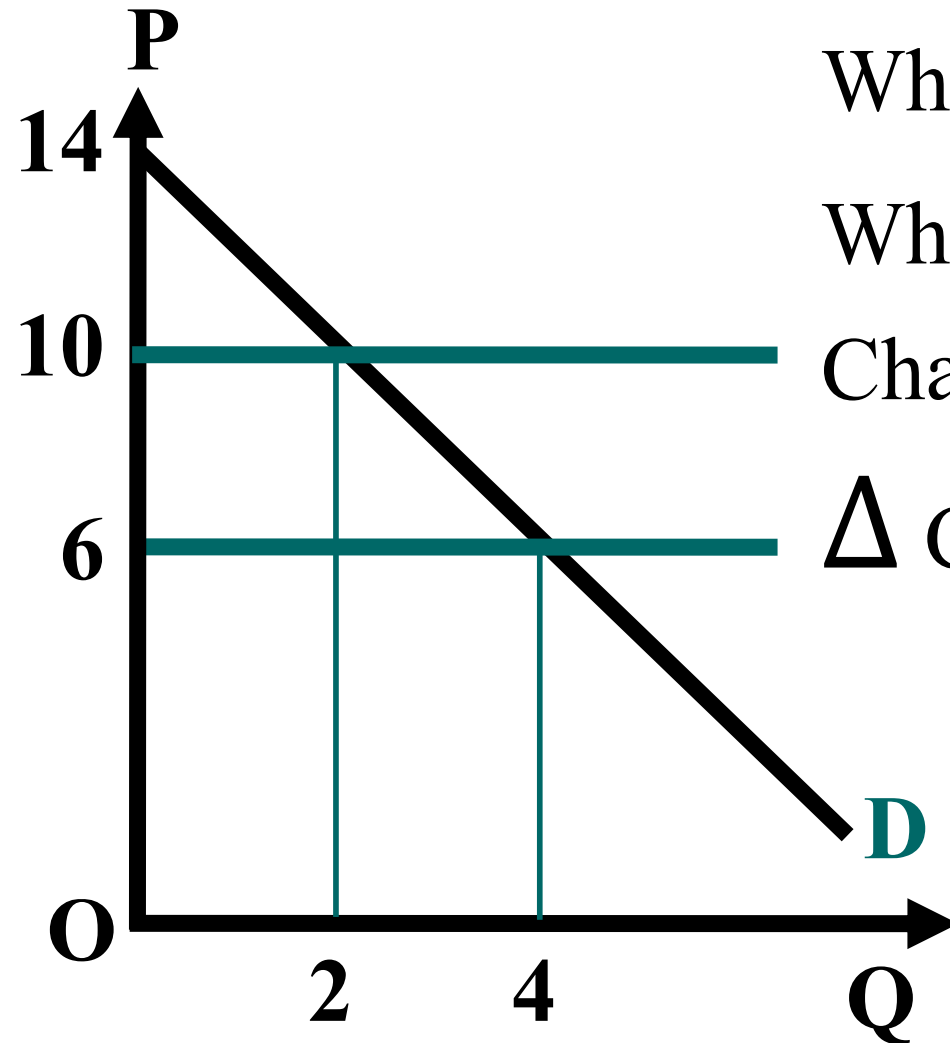
- The difference between the maximum willingness to pay and the actual price paid or area between the demand curve and the price

$$CS = (12-6) + (10-6) + (8-6) + (6-6) = 12$$

For continuous case

$$CS = \quad =$$

# Change in Consumer's welfare



When  $P = 6$ ,  $CS = A + B$

When  $P = 10$ ,  $CS = A$

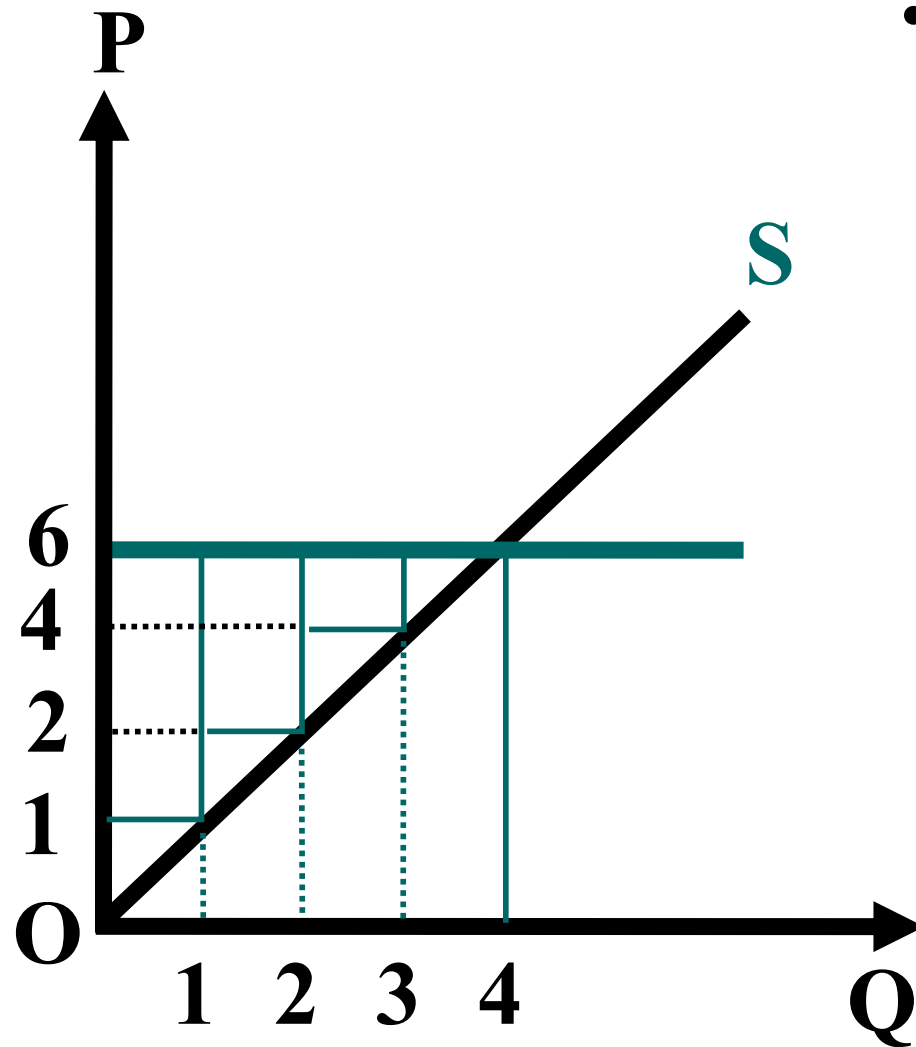
Change in welfare:

$$\Delta CS =$$

=

=

# Producer surplus: PS



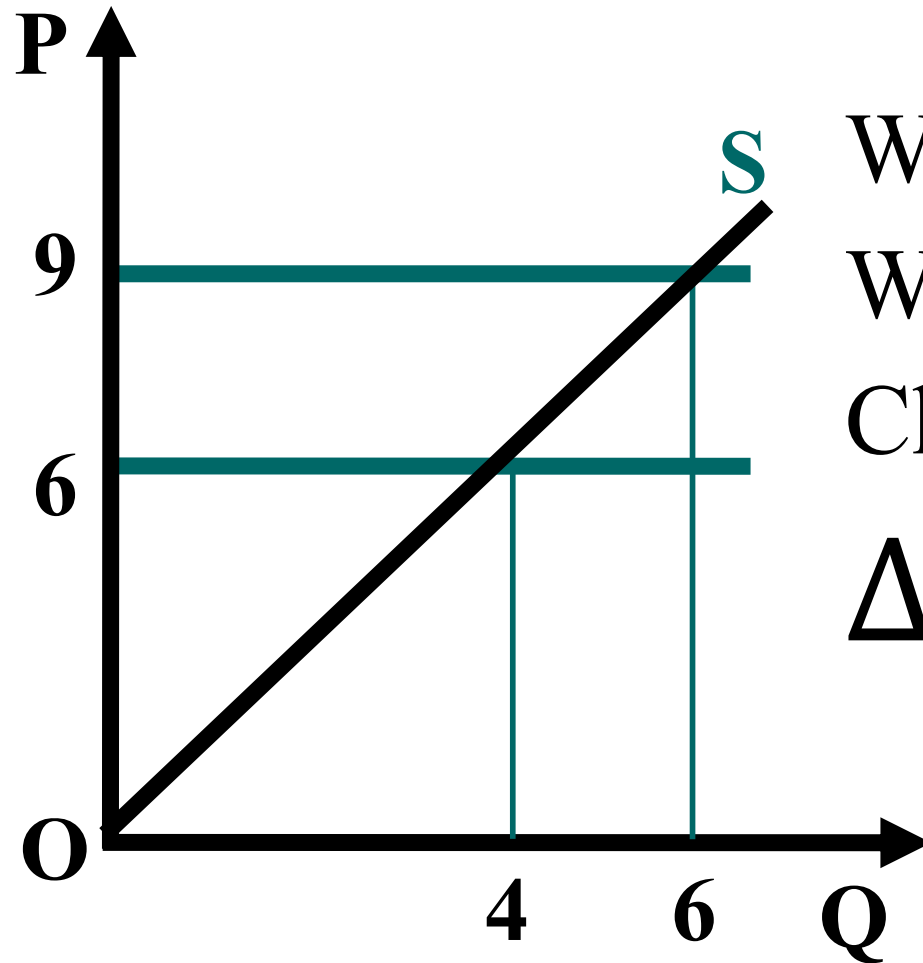
- The difference between the minimum acceptable price and the price actually received or area between the price and the supply curve.

$$PS = (6-1) + (6-2) + (6-3) + (6-4) + (6-6) = 11$$

For continuous case

$$PS =$$

# Change in Producer's welfare



When  $P = 6$ ,  $PS = C$

When  $P = 8$ ,  $PS = C + F$

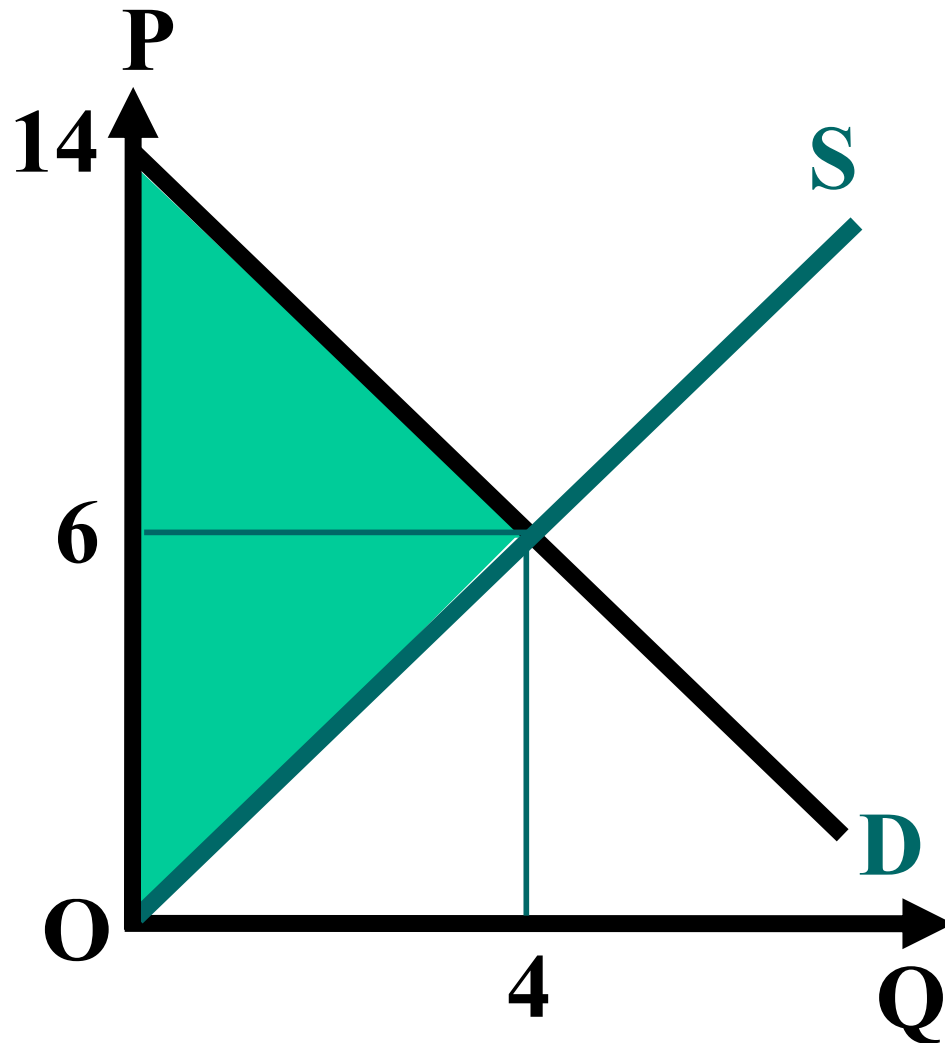
Change in welfare:

$$\Delta PS =$$

=

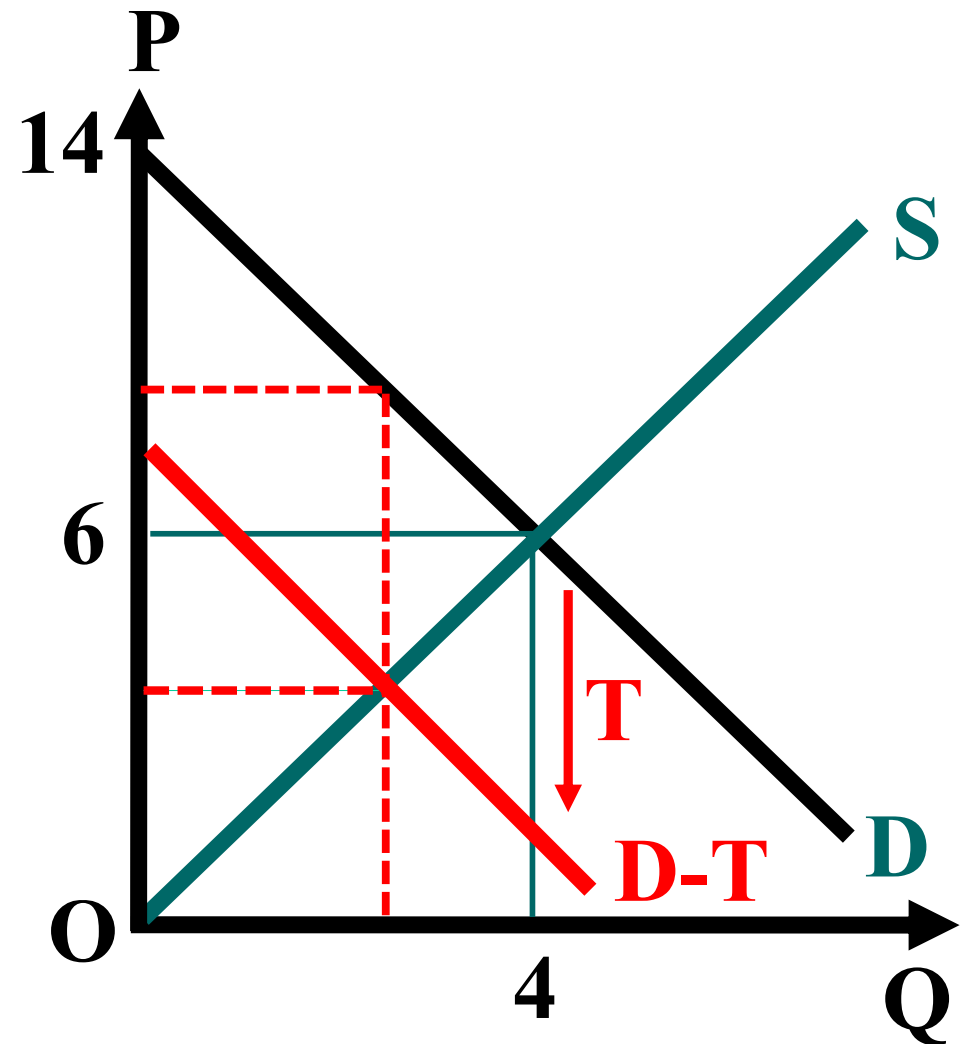
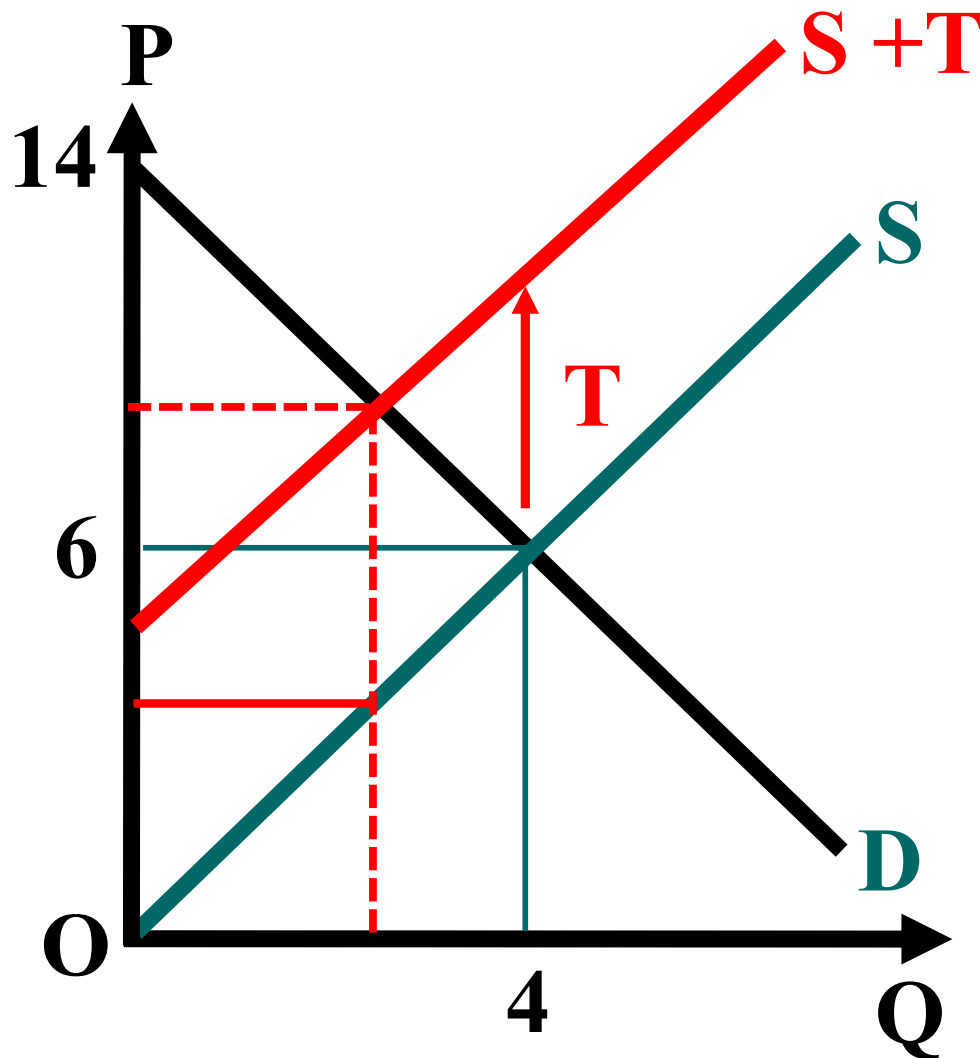
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# Social welfare

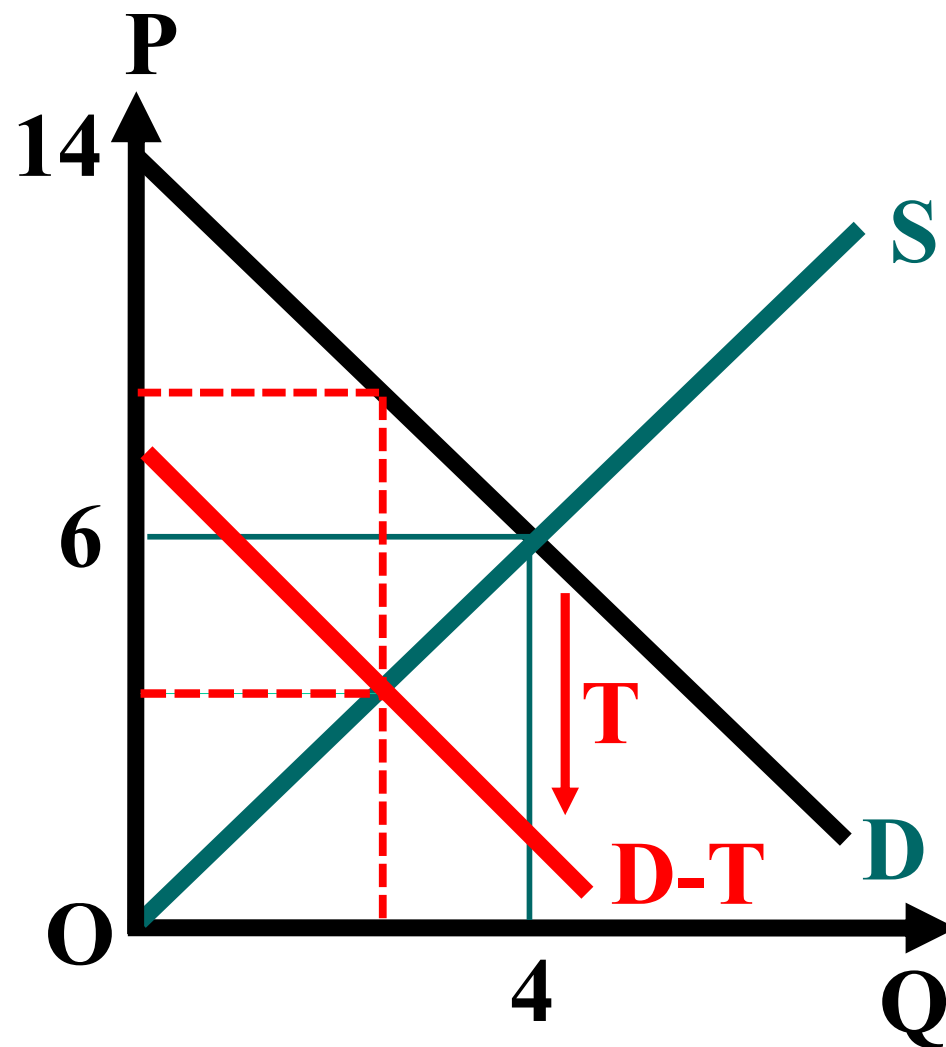
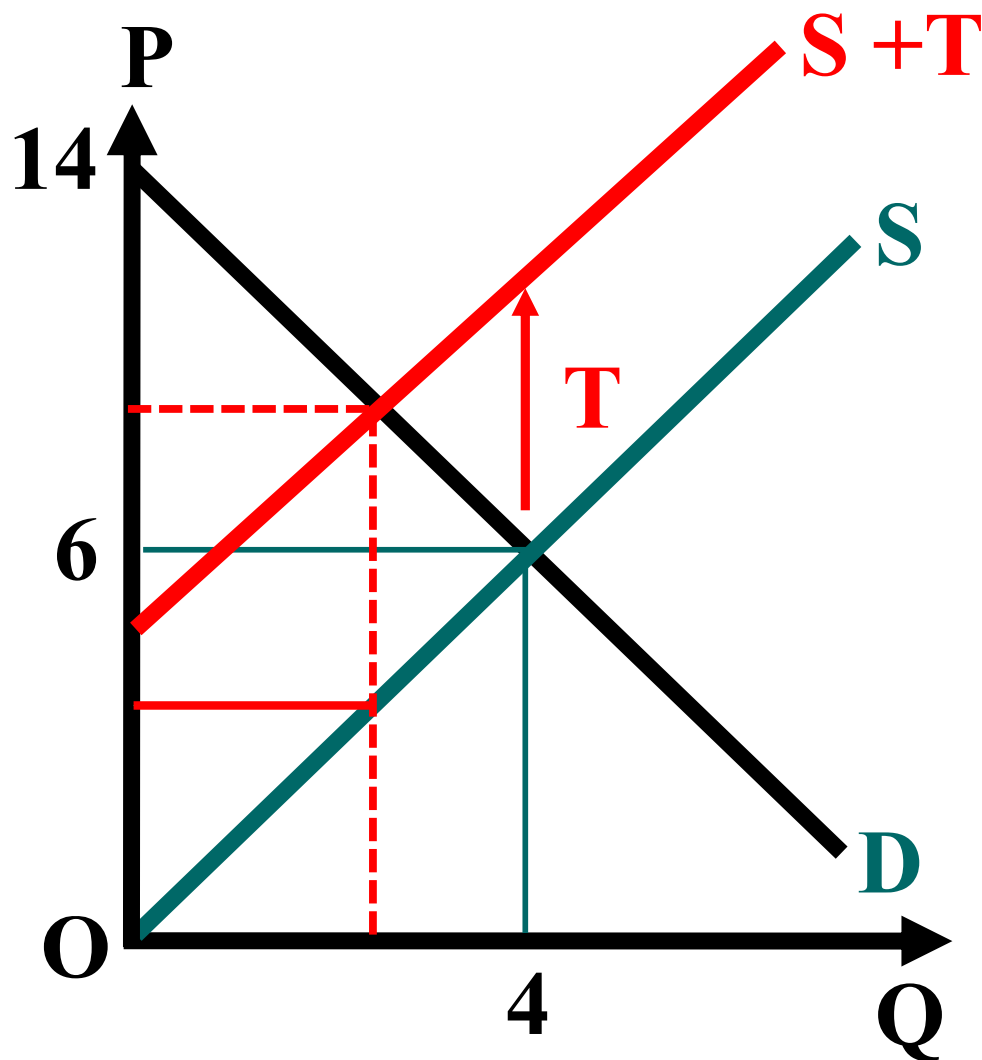


- Social welfare define by the summation of CS and PS is maximize under free market condition with perfect competition
- Consumers and producers are given the same weight

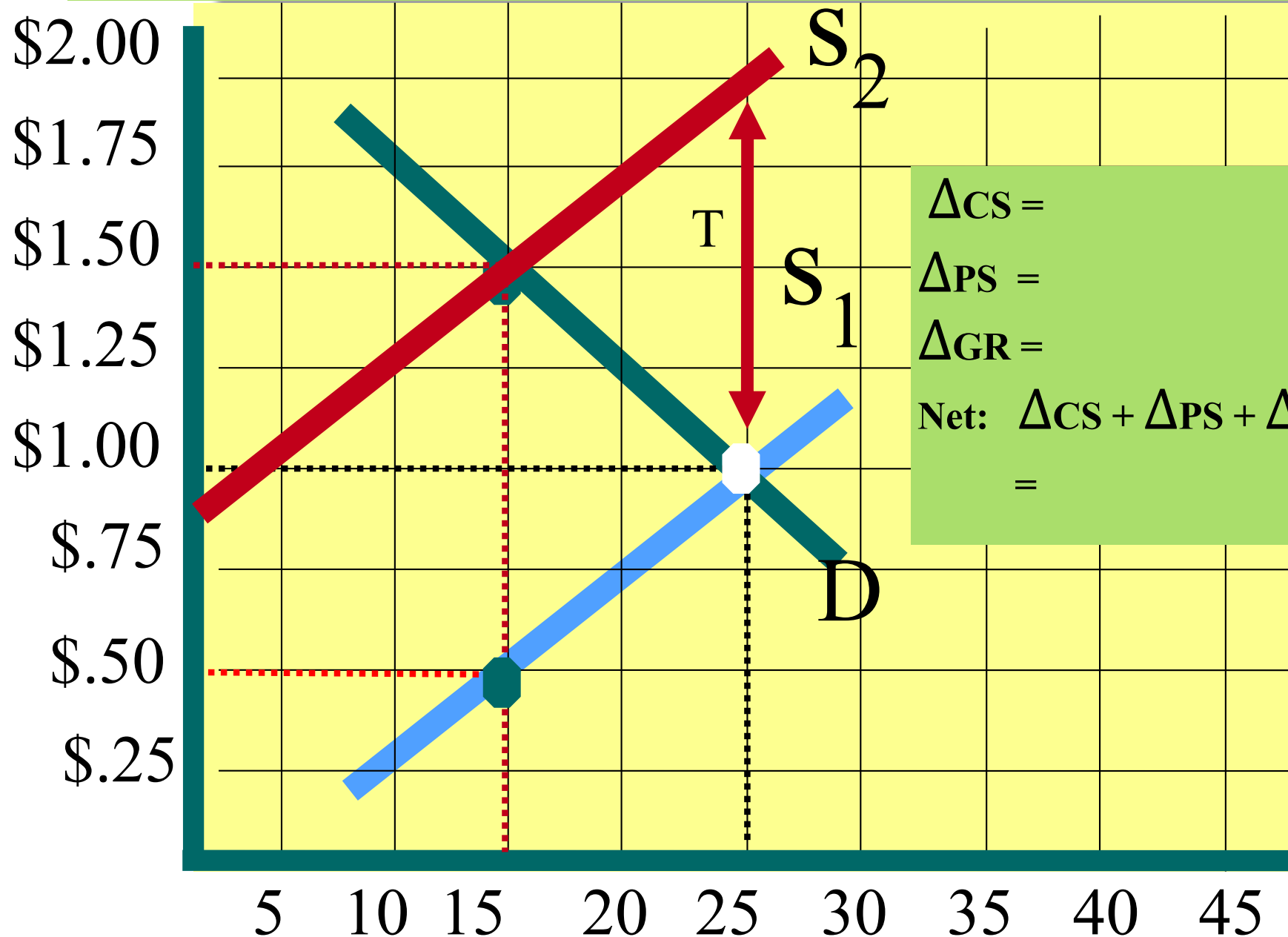
# Exercise: Identify the area of $\Delta CS$



# Exercise: Identify the area of $\Delta PS$



# Tax incidences and inefficiency



$\Delta CS =$   
 $\Delta PS =$   
 $\Delta GR =$   
**Net:  $\Delta CS + \Delta PS + \Delta GR$**   
 =

# Domestic taxes and subsidies



- If the tax is imposed on the producer, the S curve shifts upward by the size of the tax rate.
- Depending on the relative sizes of the price elasticities of demand and supply, consumers and producers share the tax burden.
- The side that has lower (absolute) price elasticity bears more tax incidence.
- Domestic taxes generate tax revenue but create consumption distortion (B) and production distortion (C) which are deadweight losses.

# Domestic taxes and subsidies



- If the tax is imposed on the consumer, the D curve shifts downward by the size of the tax rate.
- If the tax is a unit tax, which side pay the tax first does not change neither the tax incidence borne by each side, nor the deadweight losses.
- Subsidies are negative taxes, hence the impacts are the opposite of the taxes.
- Exercise: Analyze the impacts of a tax imposed on the producer when the S curve is vertical and the D curve is downward sloping.

# Exercise

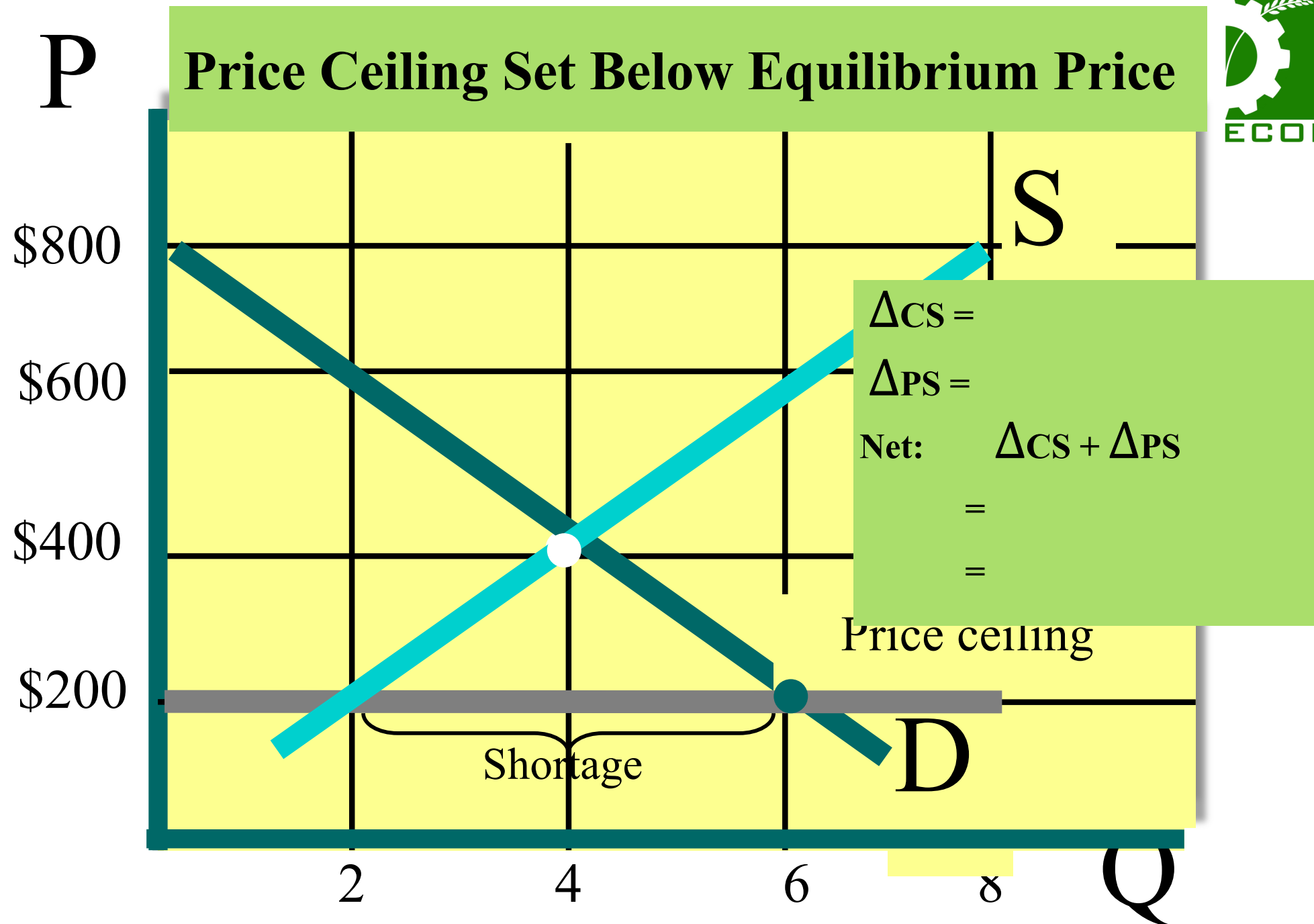


1. Analyze the impact of a specific sale tax imposed on the supplier with a normal downward sloping demand curve. Which side should bear more tax burden? What kind of distortion is created? Explain.
2. Analyze the impact of a specific production subsidy on equilibrium price and production, welfare change of the consumer, producer, and the society. What kind of distortion is created? Explain.

# Price ceilings



- Legally established maximum prices sellers can charge.
- They are used to help consumers.
- A price ceiling will have no impact when it is set above the equilibrium price.
- Examples: Tuition fees and bus fees.



# Price ceilings are counterproductive



- If  $B > A$ , consumers are worse off.
- Deadweight losses:  $B =$  consumption distortion,  $C =$  production distortion
- Black markets: economic rents
- Less maintenance
- Less investment
- Discrimination

# Exercises



1. What is the purpose of price ceilings on bus fees?
2. Why may bus fee controls be counterproductive?

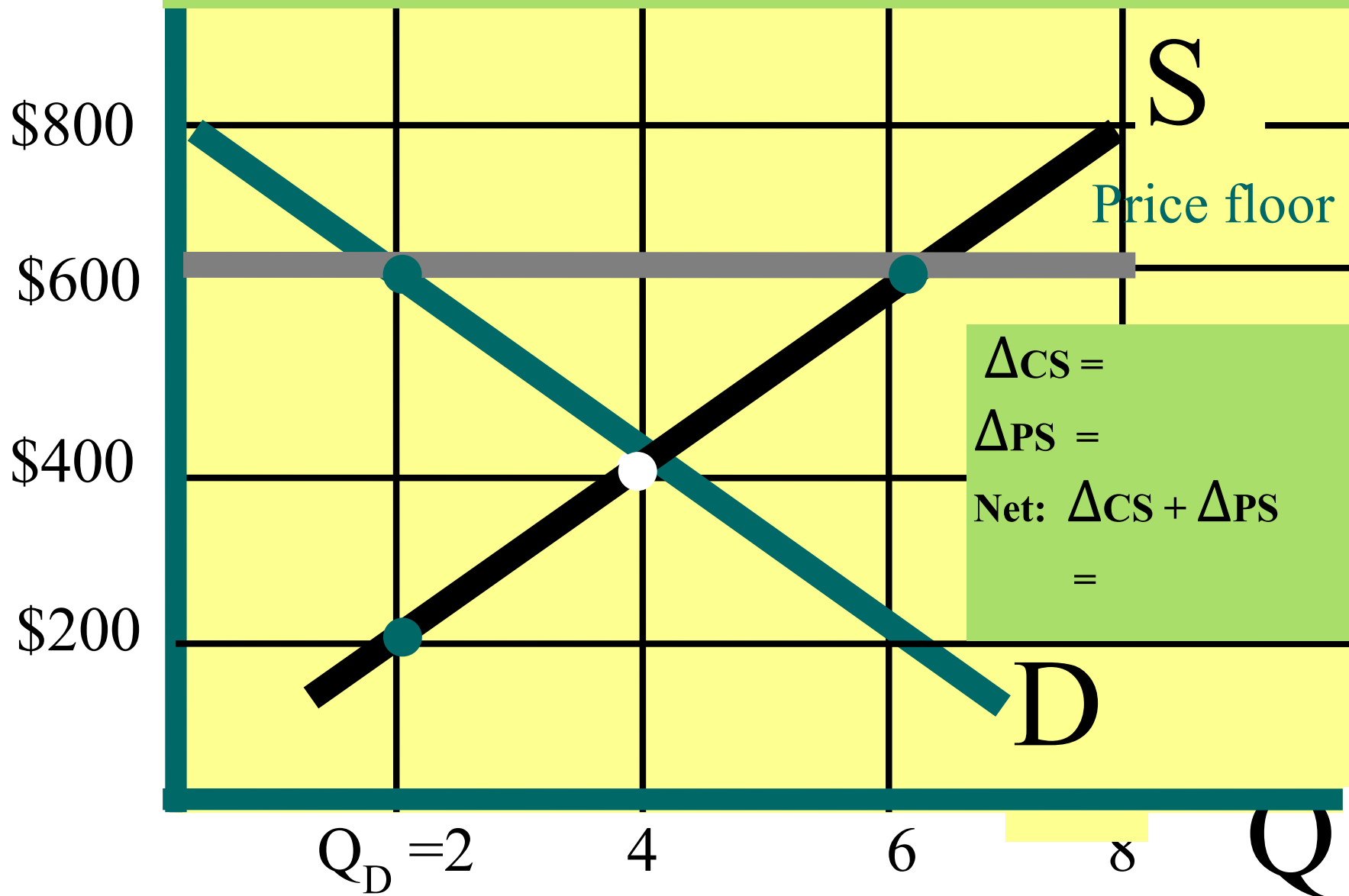
# Price floors

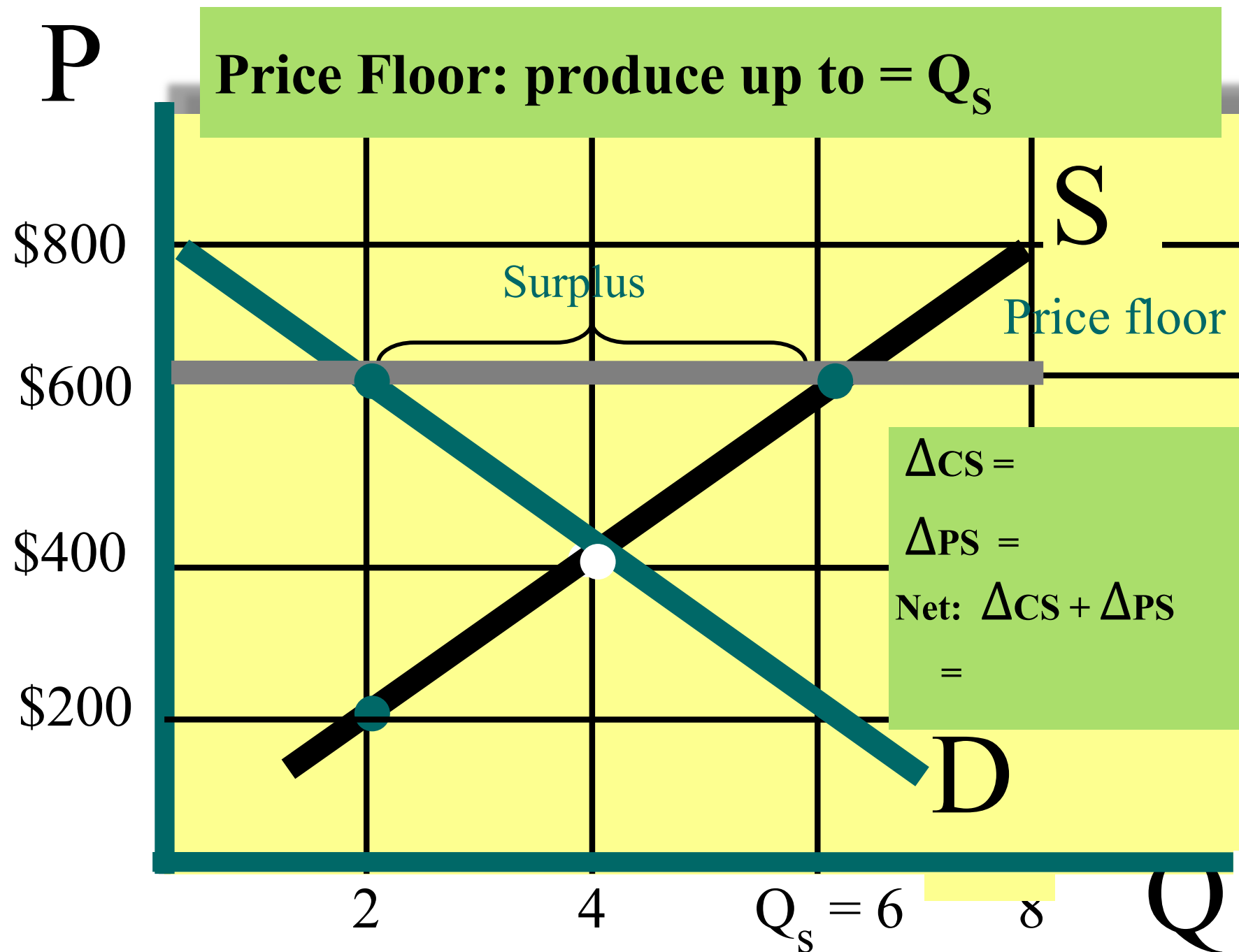


- A legally established minimum price a seller can be paid
- They are used to help producers.
- Examples: Minimum wage, Agricultural price supports, Agricultural pledging program

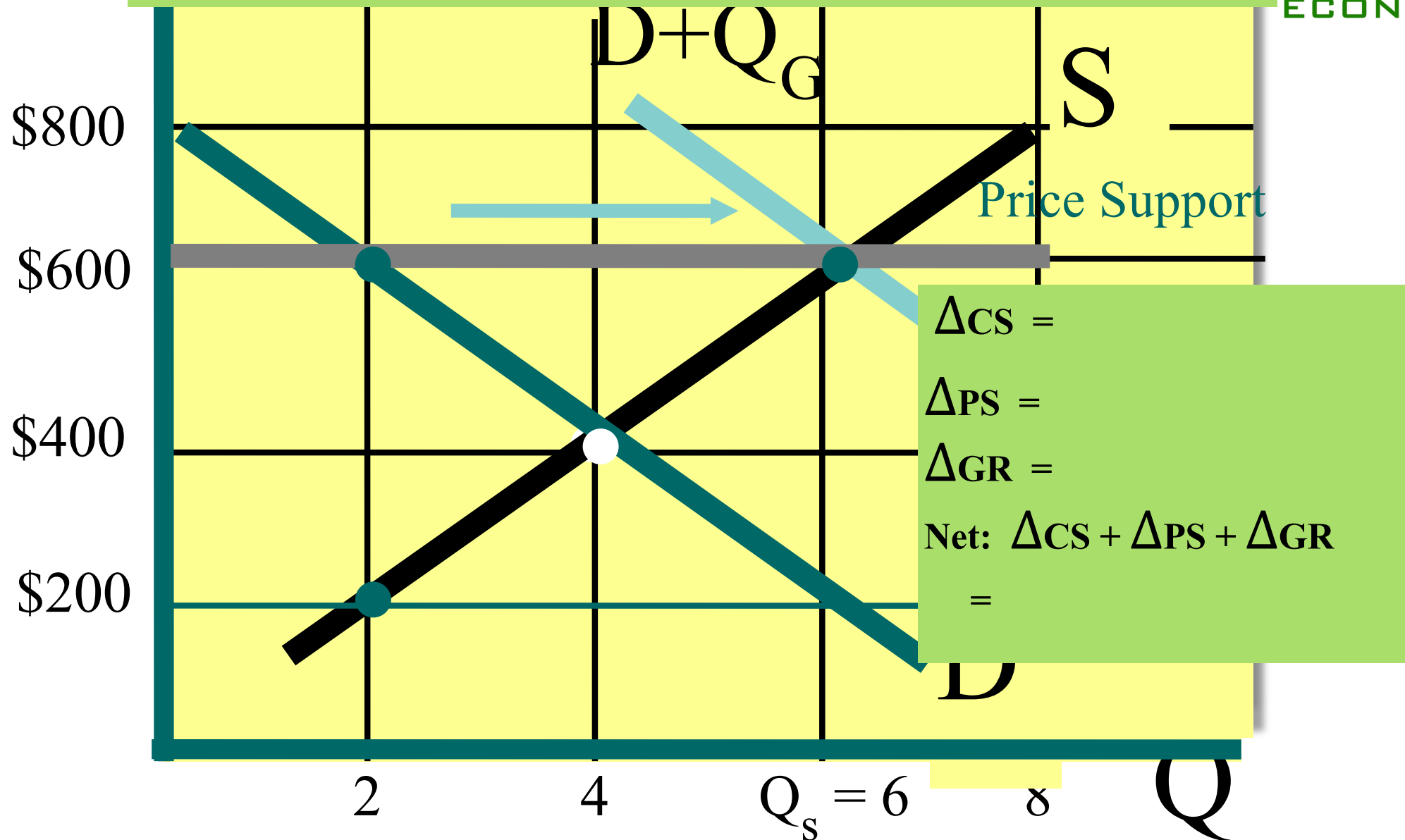
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Price Floor: produce only =  $Q_D$





# P Price Support: government buys the surplus



# Exercises

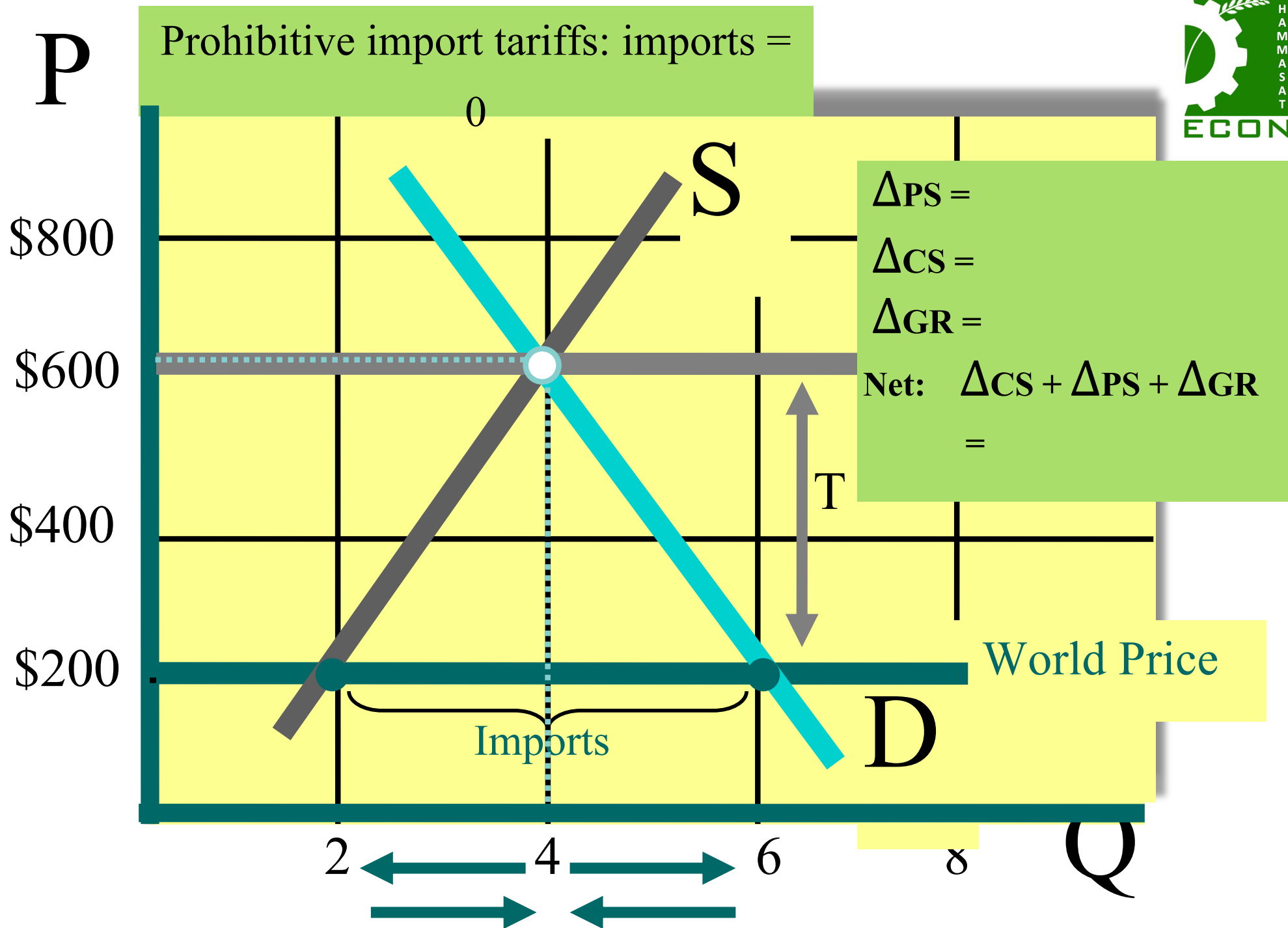


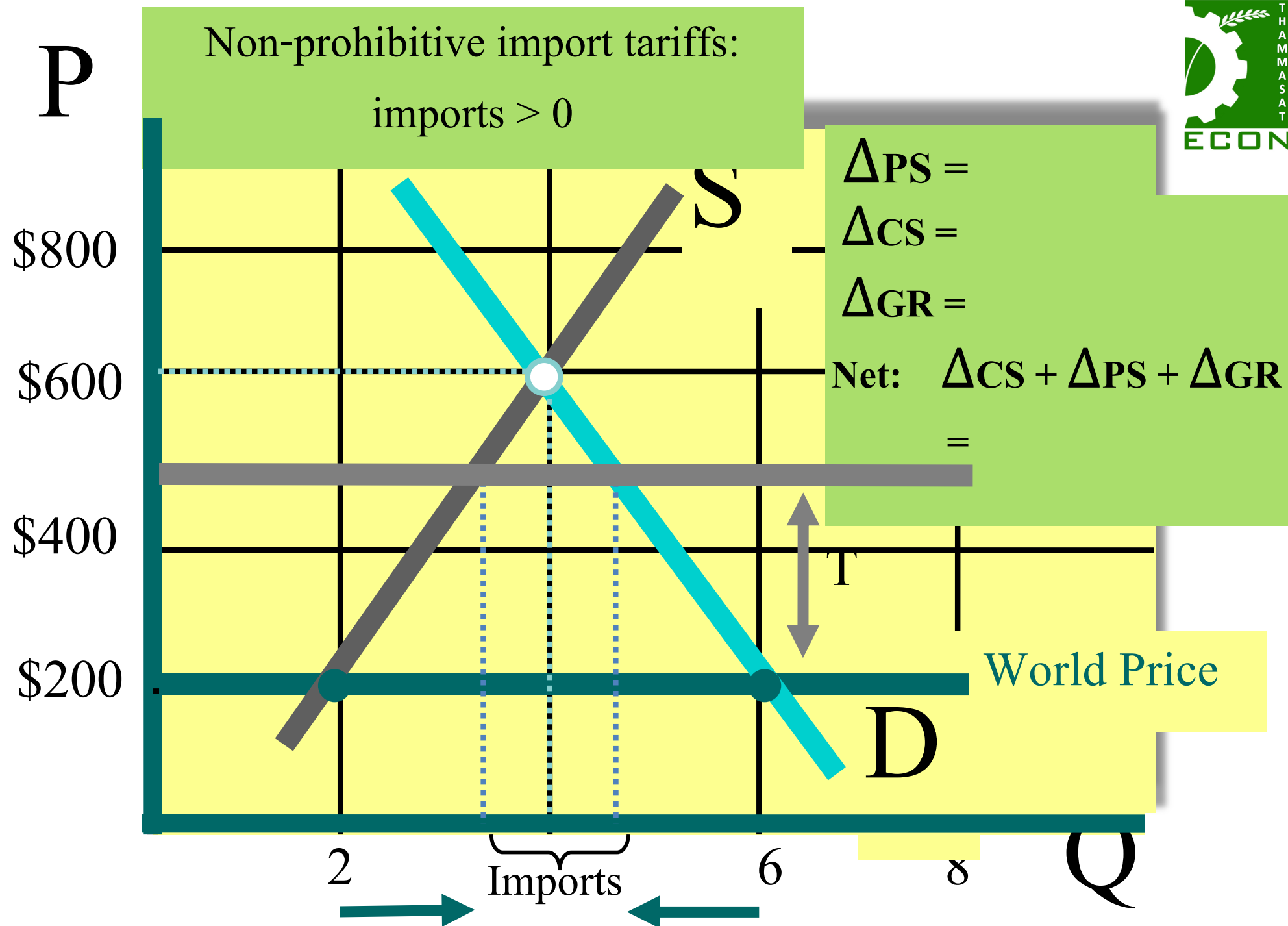
1. Why may rice pledging program be inefficient?
2. Compare its impacts with the price guarantee program.

# Import tariffs



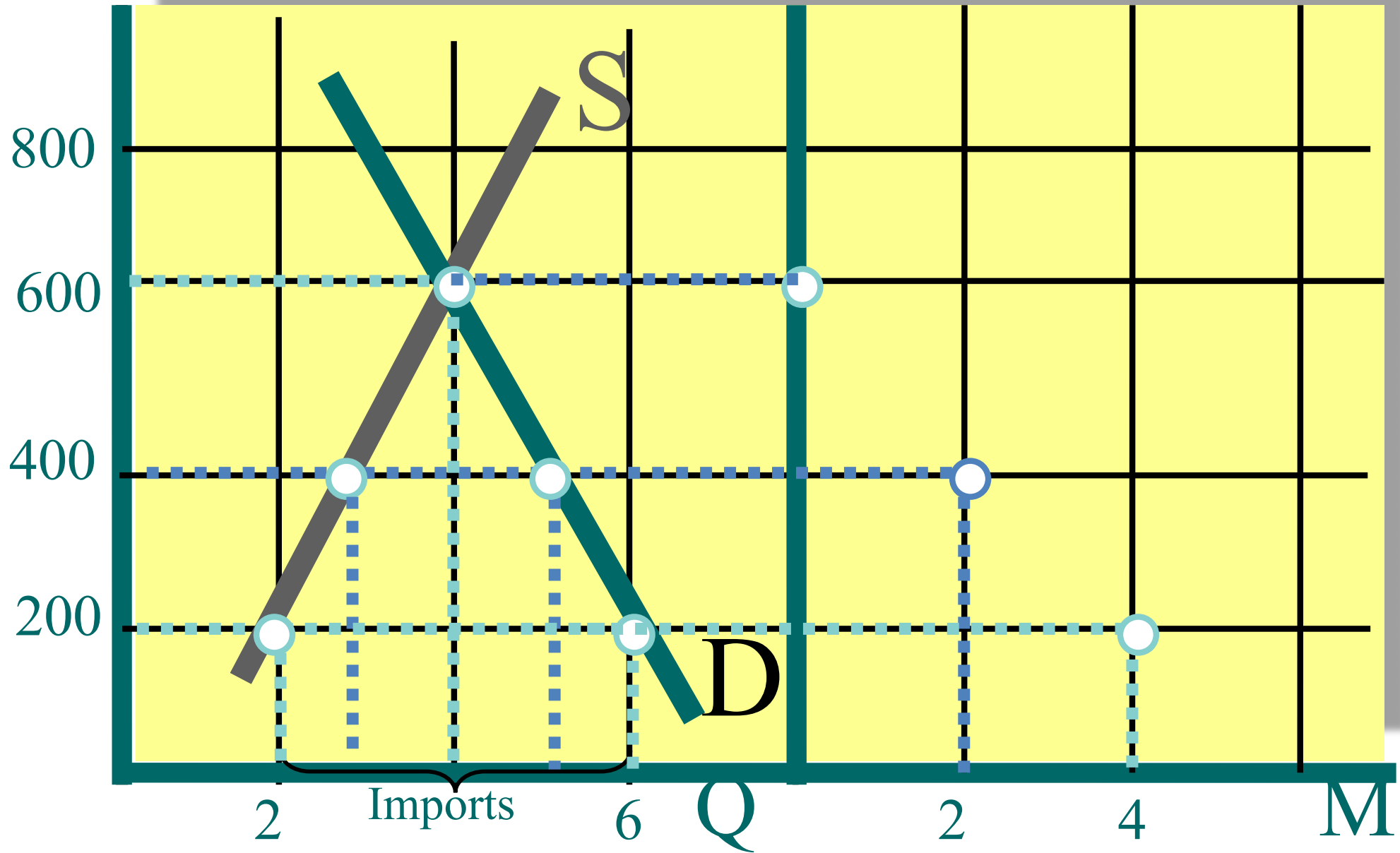
- Import tariffs are taxes imposed on imported goods to protect domestic producers
- An import tariff will increase the price of the imported good by the size of the tax.
- Domestic producers will charge their price at the same level as the imported good and can produce more.
- Consumer will consume less since the price is higher and imports are less.





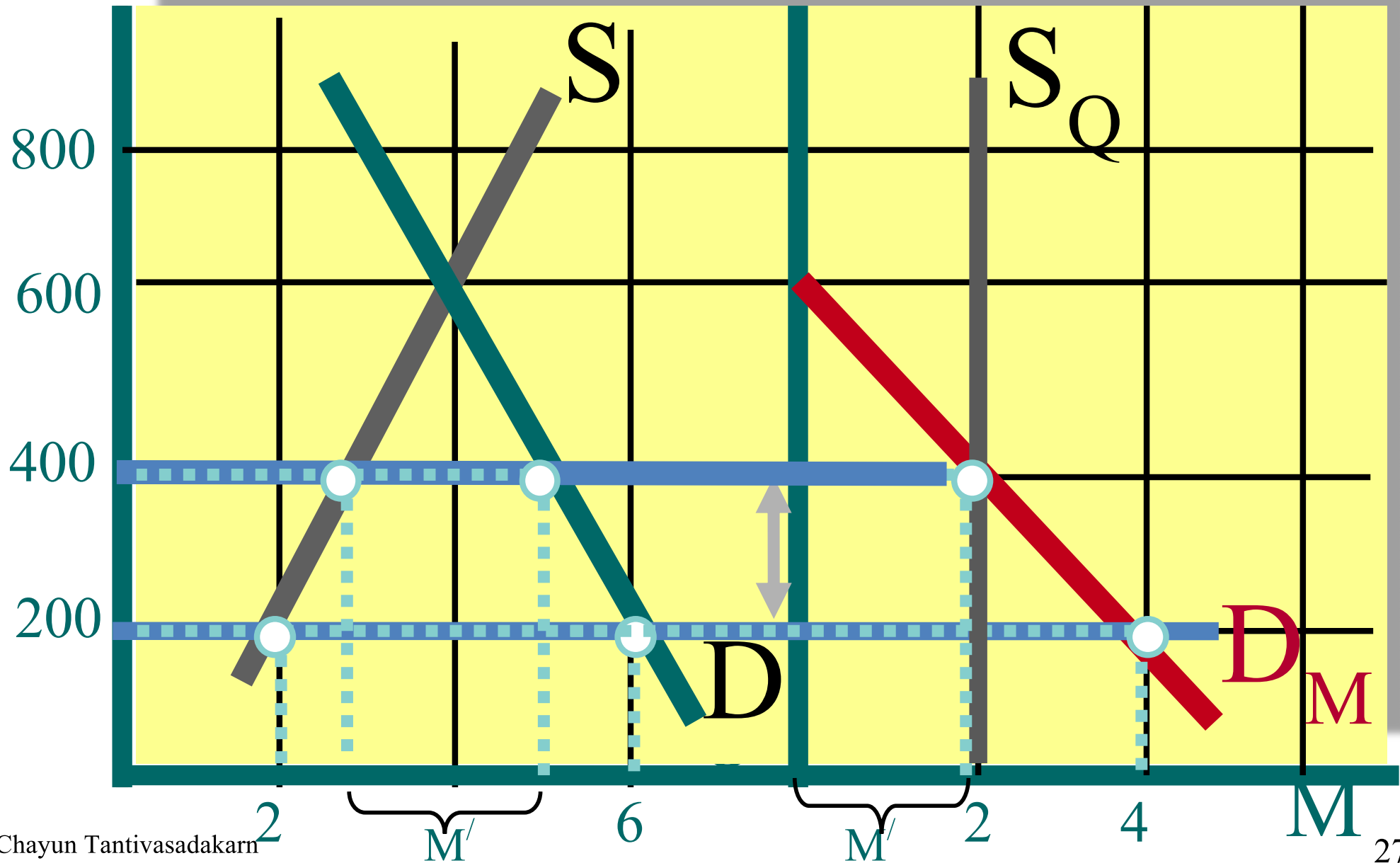
# Derivation of import demand curve

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# Impacts of an import quota



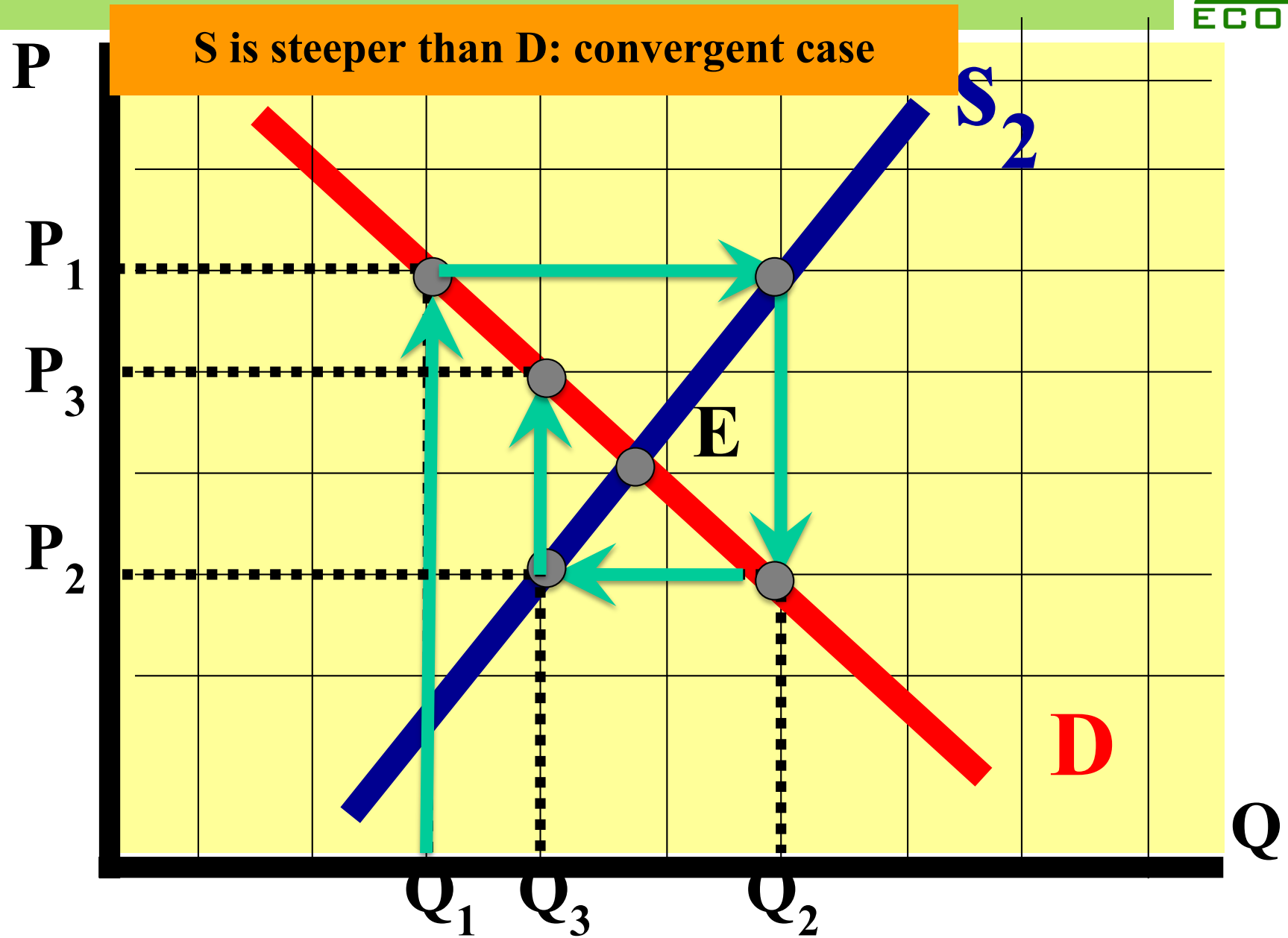
# Impacts of import quotas

- $\Delta PS = A$
- $\Delta CS = -[A + C + R + B]$
- $\Delta GR = 0$  if the quota is given freely  
= R if the government uses open bid
- Lucky importers welfare = R or 0
- Net welfare =  $-[C + B]$
- Rent seeking activities and corruption
- Worsening distribution of income

## Cobweb model

- Agricultural products, especially livestock, often suffer from cyclical price and output fluctuation
- Cobweb model explain this phenomenon by assuming that farmers need to choose the output level before the actual price is realize
- Farmers use the price in the past to form the expected price in the future. But consumer buy according to the current price
- The time lag between consumers and farmers causes the fluctuation

# Cobweb model



# Cobweb model

