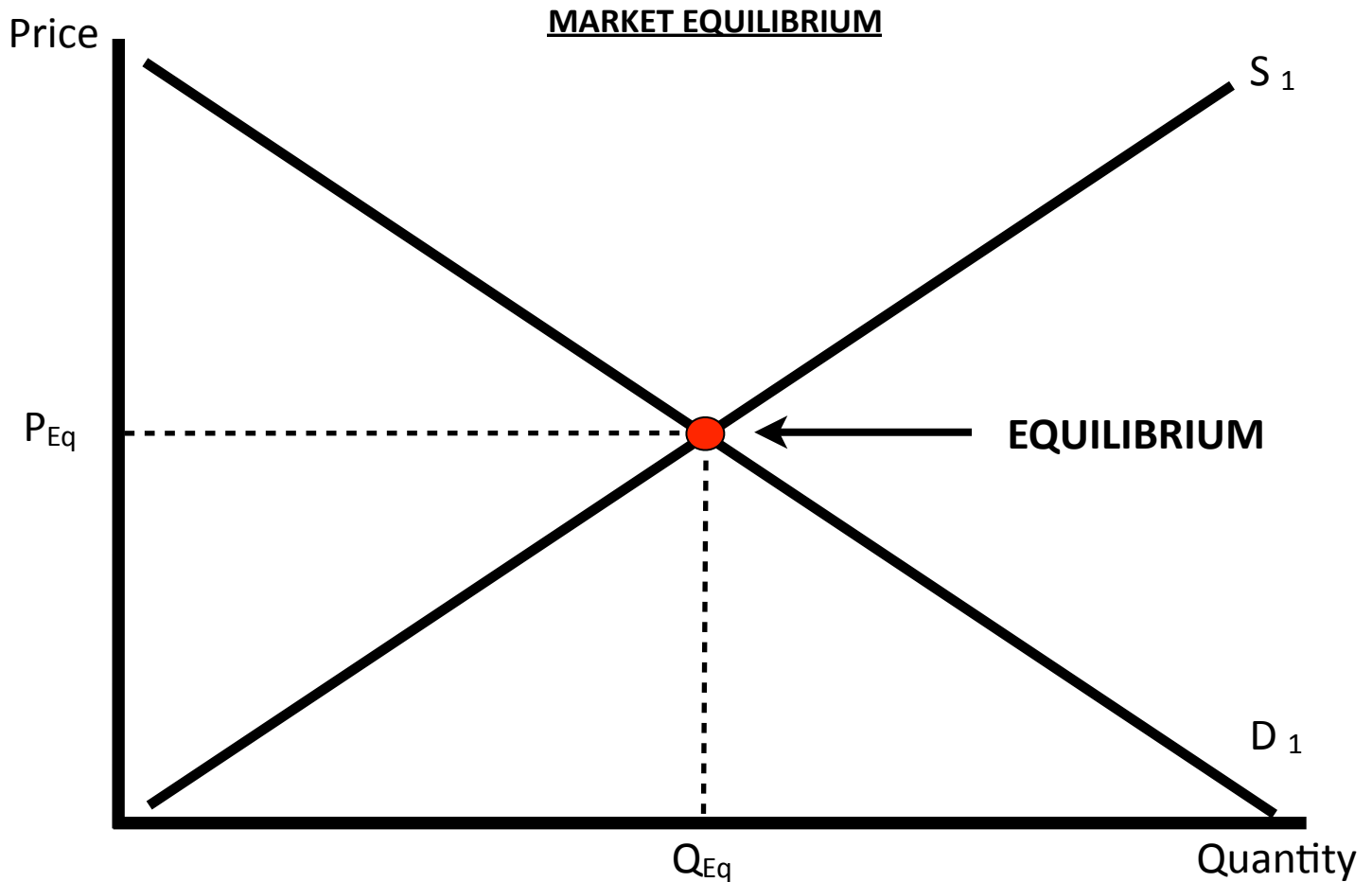


## MARKET EQUILIBRIUM

Having analysed Supply and Demand separately, we now combine them to see how they determine the quantity of a good sold in a market and its price.



From the diagram above we see the market supply curve and the market demand curve together, (not individual firms, these are aggregate demand and supply curves). Notice that there is one point that these curves intersect. This point is known as the markets equilibrium. The price at this intersection is known as the equilibrium price ( $P_{Eq}$ ) and the quantity is called the equilibrium quantity ( $Q_{Eq}$ ).

**Equilibrium Price:** the single price that makes quantity demanded equal to quantity supplied

**Equilibrium Quantity:** the single quantity, both bought and sold, that makes quantity demanded equal to quantity supplied

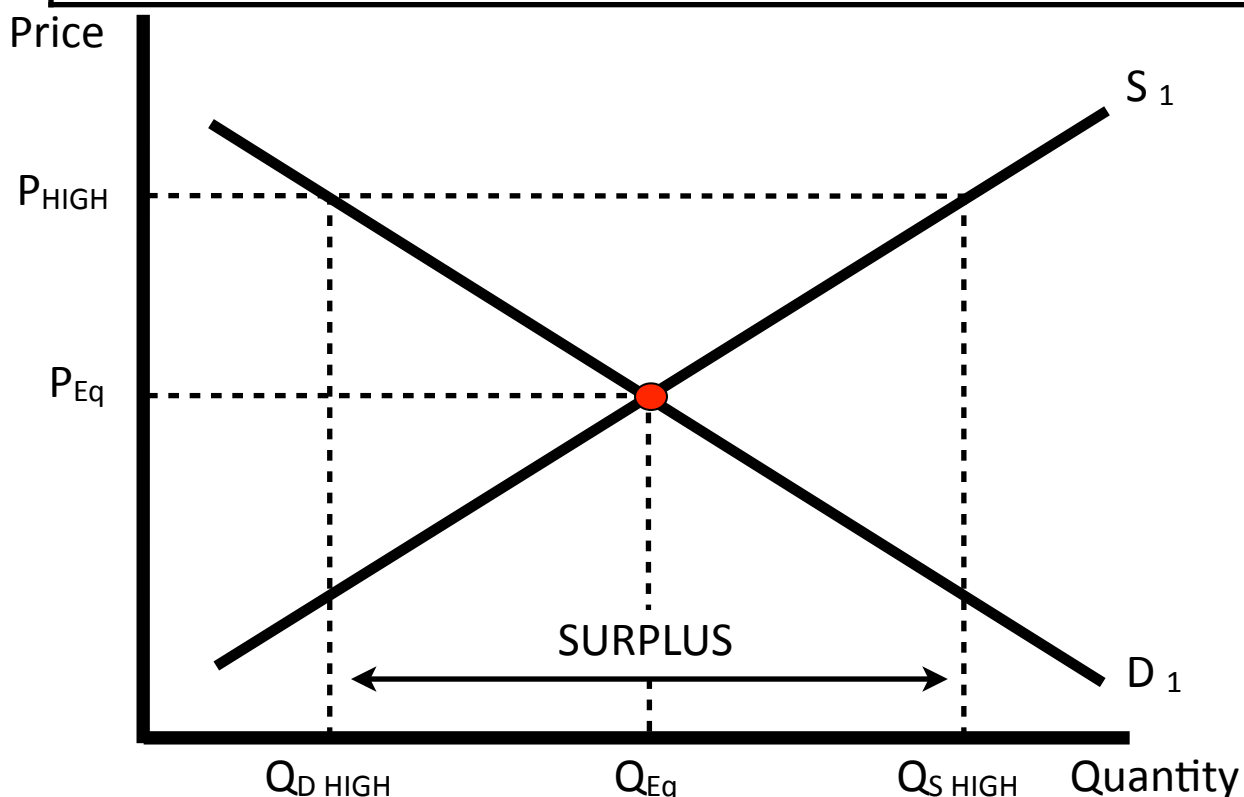
At equilibrium, the quantity of the good that buyers are willing and able to buy exactly matches the quantity that sellers are willing and able to sell.

This price is also known as the market clearing price because at this price buyers have bought all they wish to buy and sellers have sold all they wish to sell.

The fact that this market has come to equilibrium is no accident. The actions of buyers and sellers naturally bring the market into equilibrium and we will see why with the following examples.

### MARKET SURPLUS

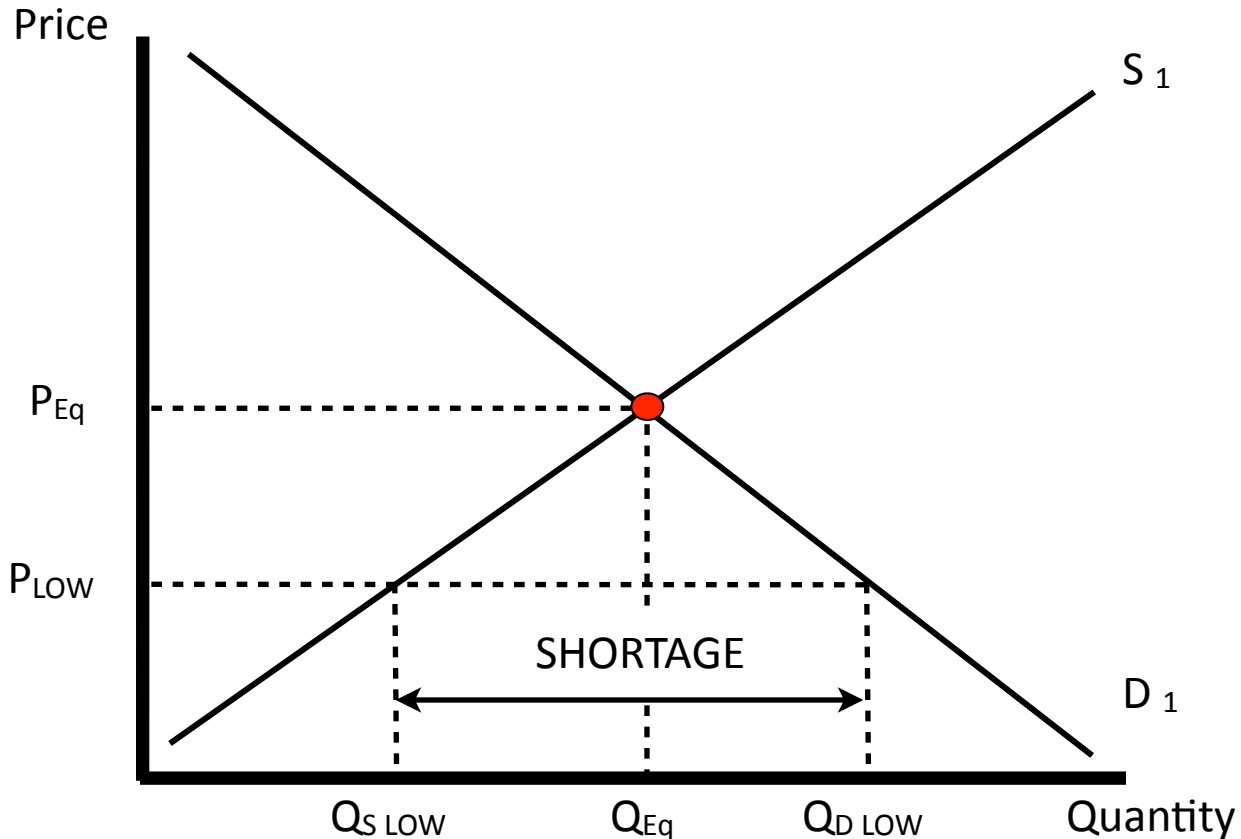
**SURPLUS:** A situation in which quantity supplied is greater than quantity demanded.



Suppose the price being charged for the good in question is above the market price. This is represented in the diagram above, where the inflated price of  $P_{HIGH}$  is being charged. At the price  $P_{HIGH}$ , the quantity demanded,  $Q_{D HIGH}$  is far less than the quantity supplied  $Q_{S HIGH}$ . This results in a surplus of goods on the market. More has been supplied than was demanded. When there is a surplus in the market the sellers respond by cutting their prices. Falling prices increases the quantity demanded and decrease the quantity supplied. The price will continue to fall until it reaches the equilibrium price of  $P_{Eq}$ . At this point there is no more market pressure to change price as all that is being supplied is being bought.

**MARKET SHORTAGE**

**SHORTAGE:** A situation where the quantity supplied is less than the quantity demanded.



Suppose the price being charged for the good in question is below the market price. This is represented in the diagram above where the consumer is being charged the price  $P_{LOW}$ . At the price  $P_{LOW}$ , the quantity demanded,  $Q_{D\ LOW}$ , is far greater than the quantity supplied,  $Q_{S\ LOW}$ . There is a shortage of the good. Consumers are unable to buy all that they want at the current price. With too many buyers chasing too few goods, sellers can respond to the shortage by raising their prices without losing sales. As the price rises, quantity demanded falls, quantity supplied rises and the market reaches equilibrium.

Thus the activities of many buyers and many sellers always push market price towards the equilibrium price. Once the market reaches its equilibrium, all buyers and sellers are satisfied and there is no upward or downward pressure on the price.

**Market Equilibrium:** is where quantity demanded equals quantity supplied and there is no tendency for prices to change.

### **STEPS INVOLVED IN ANALYSING CHANGES IN MARKET EQUILIBRIUM**

In order to assess where the new equilibrium price and quantity lie following a change in supply or demand, we always do the following

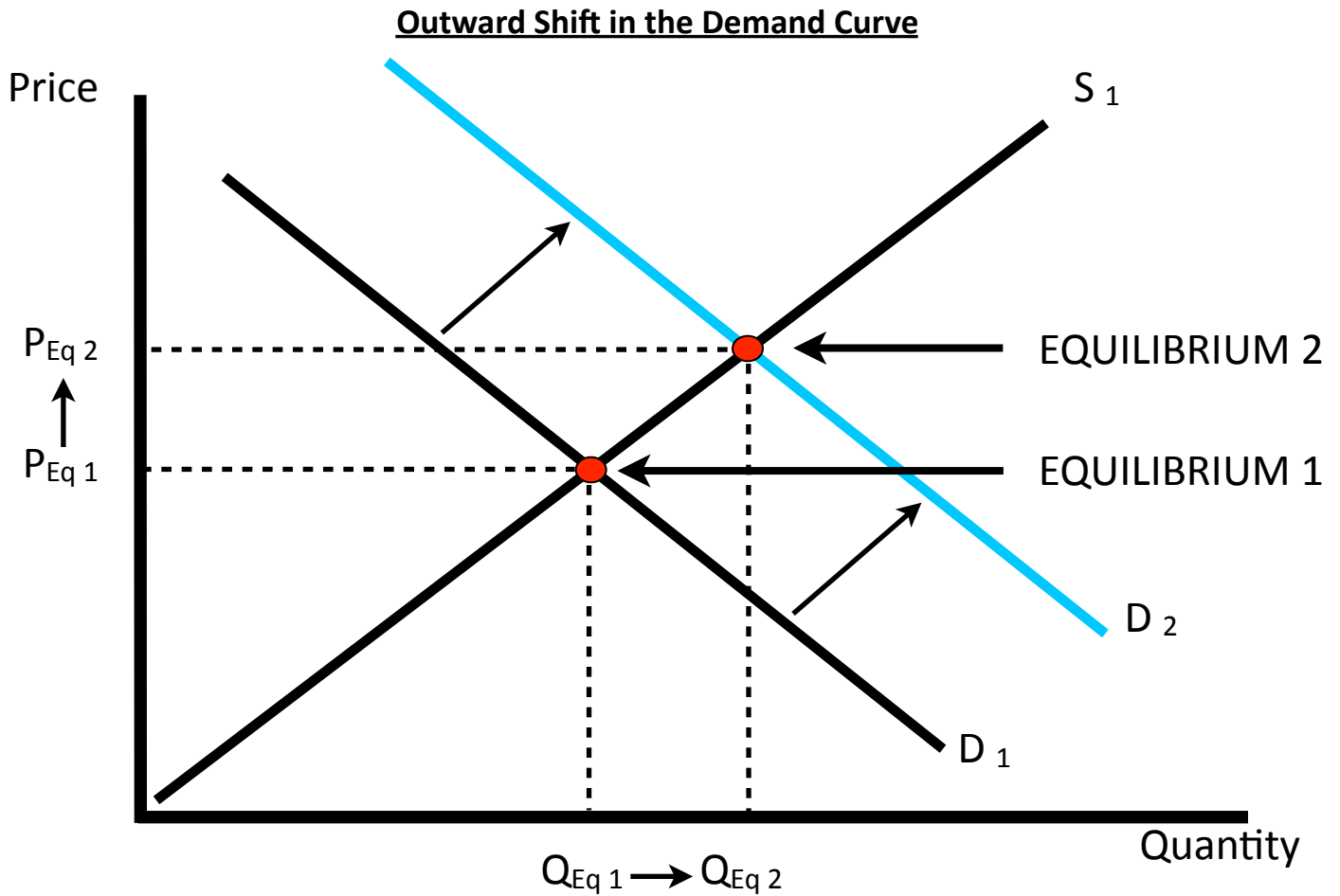
- 1) First we decide whether the change affects the supply or the demand curve. (This is done by checking the supply and demand functions)
- 2) We decide whether the curve shifts inwards or outwards.
- 3) We use the supply and demand diagram to compare the initial and the new equilibrium. This shows how the shift affects the equilibrium price and quantity.

### **EXAMPLE 1**

Suppose that the temperature one summer is very hot. How does this affect the equilibrium price and quantity for ice-cream.

### **ANSWER**

- 1) First we see whether the demand or the supply curve is affected. We see that unplanned factors is part of the demand curve. So the demand curve is going to shift.
- 2) Is it going to shift inwards or outwards? Well hot days would make people want more ice-cream, so the demand curve is going to shift outwards.
- 3) We look at the diagram overleaf to see the effect that this has had on equilibrium price and quantity.



We can see from the diagram above, following an outward shift in the demand curve from  $D_1$  to  $D_2$ , holding all else constant, both the equilibrium price and quantity has risen. Price has risen from  $P_{Eq 1}$  to  $P_{Eq 2}$  and equilibrium quantity has risen from  $Q_{Eq 1}$  to  $Q_{Eq 2}$ .

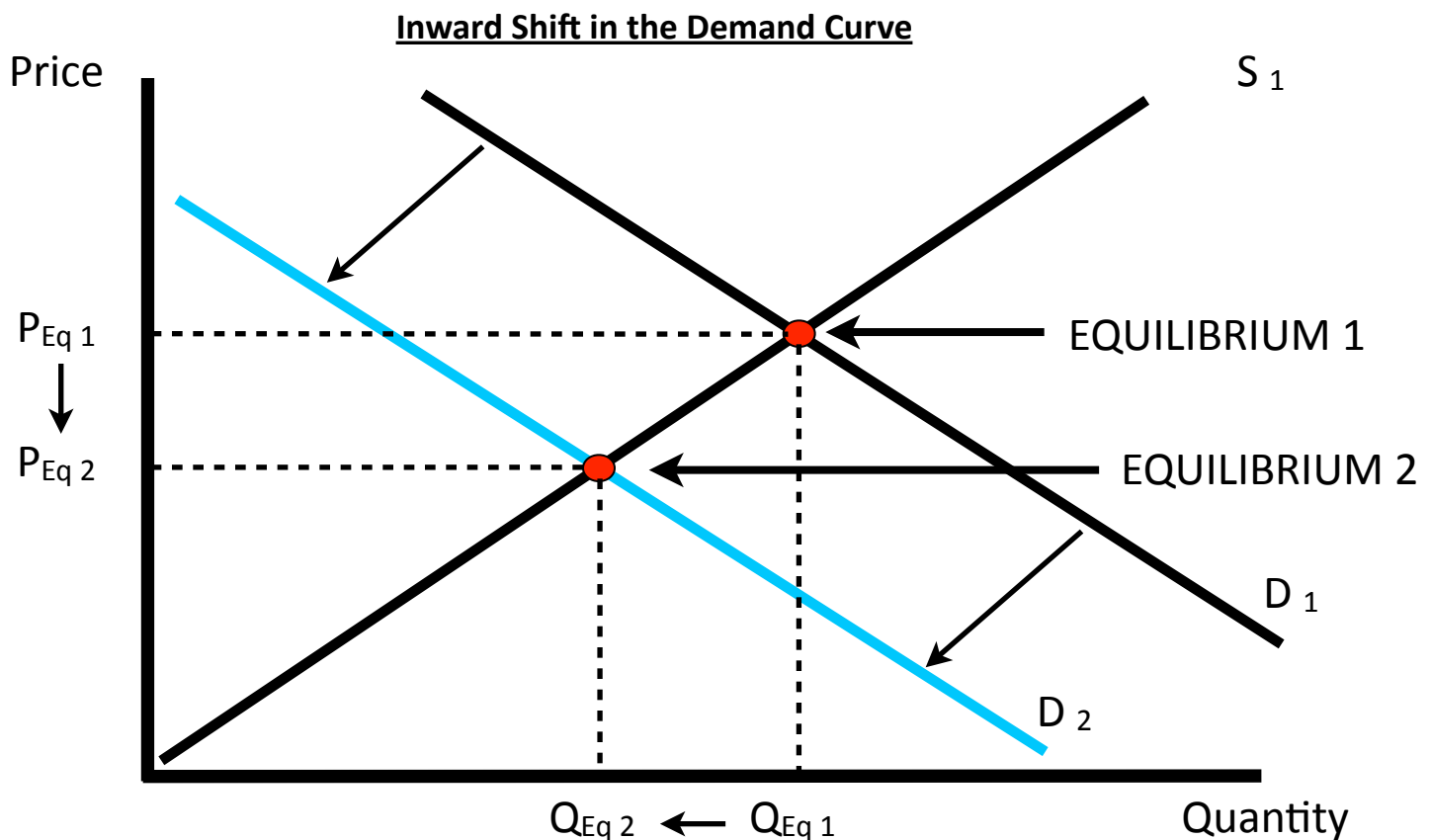
This result, a rise in equilibrium price and quantity, is always the result we find when demand shifts outwards, holding all other factors constant.

**EXAMPLE 2**

What would happen to the equilibrium price and quantity of a good if the price of a substitute fell.

**ANSWER**

- 1) First we see whether the demand or the supply curve is affected. We see that price of related goods is part of the demand function, so the demand curve is going to shift.
- 2) Is it going to shift inwards or outwards? Well, a substitute good is a good that can fulfill the same function as the good in question. If the price of a substitute good falls, people will switch away from the good in question and buy more of the substitute. Therefore the demand curve will shift inwards.
- 3) We look at the diagram below to see the effect that this has had on equilibrium price and quantity.



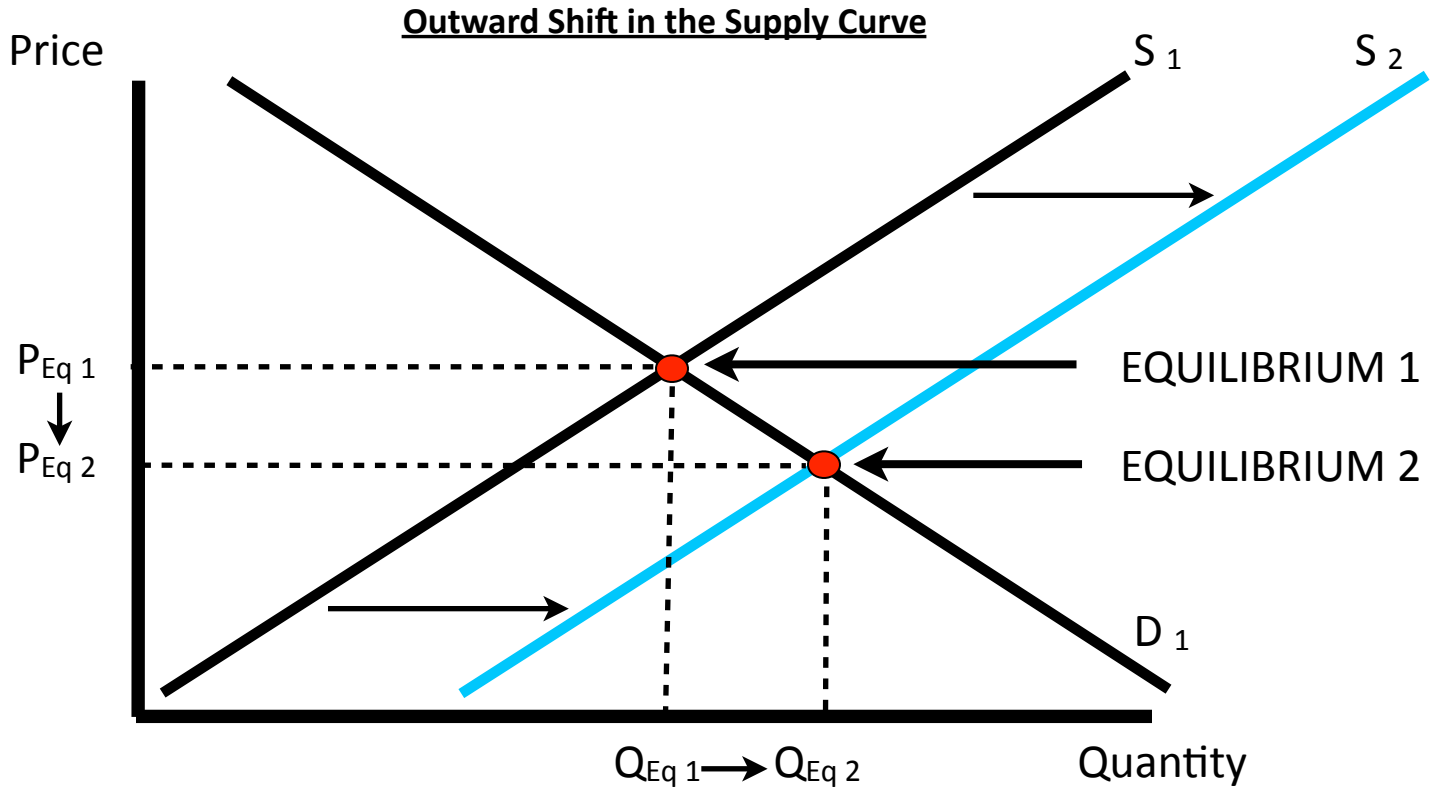
We can see from the diagram overleaf that, due to the reduction in the price of a substitute good, the demand curve for this good has shifted inwards ( moving the demand curve from  $D_1$  to  $D_2$ ). This inward shift in demand has caused equilibrium price to fall from  $P_{Eq 1}$  to  $P_{Eq 2}$ . It has also caused equilibrium quantity to fall from  $Q_{Eq 1}$  to  $Q_{Eq 2}$ . This result, a fall in equilibrium price and quantity, is always the result we find when demand shifts inwards, holding all other factors constant.

### **EXAMPLE 3**

What would happen to the equilibrium price and quantity of a good if the number of sellers in the industry increased?

### **ANSWER**

- 1) First we see whether the demand or the supply curve is affected. We see that number of sellers is in the supply function and as such it is the supply curve that is going to shift.
- 2) Is it going to shift inwards or outwards? The fact that there are more sellers in the market means that more of the good will be supplied and as such this caused an outward shift of the supply curve.
- 3) We look at the diagram below to see the effect that this has had on equilibrium price and quantity.



We can see from the diagram above that following an outward shift in the supply curve (from  $S_1$  to  $S_2$ ), holding all else constant, equilibrium price falls from  $P_{Eq 1}$  to  $P_{Eq 2}$  and equilibrium quantity increases from  $Q_{Eq 1}$  to  $Q_{Eq 2}$ . The result that we see here, a reduction in equilibrium price and an increase in equilibrium quantity, is always true with an outward shift in the supply curve, holding all other factors constant.

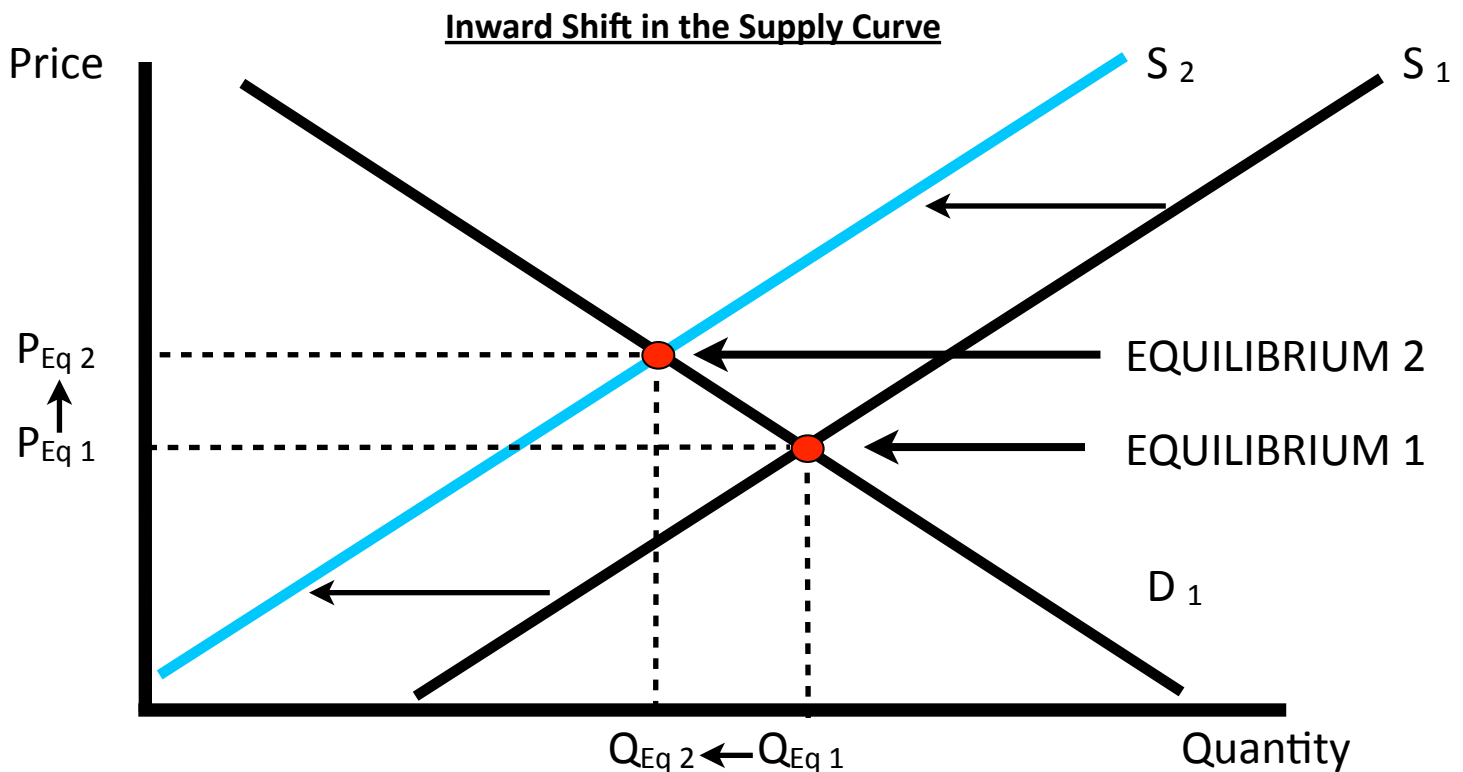


**EXAMPLE 4**

What would happen to the equilibrium price and quantity of a good if the government raised the tax on the production of goods.

**ANSWER**

- 1) First we see whether the demand or the supply curve is affected. We see that taxes are in the supply function, so the supply curve is going to shift.
- 2) Is it going to shift inwards or outwards? An increase in taxes would make it more expensive to produce goods and as such cause supply to be reduced. This results in an inward shift in the supply curve.
- 3) We look at the diagram below to see the effect that this has had on equilibrium price and quantity.



We can see from the diagram above that, following an inward shift in the supply curve (shift from  $S_1$  to  $S_2$ ), the equilibrium quantity falls from  $Q_{Eq1}$  to  $Q_{Eq2}$ , and the equilibrium price rises from  $P_{Eq1}$  to  $P_{Eq2}$ . When the supply curve shifts inwards, holding all other factors constant, equilibrium price will always rise and equilibrium quantity will always fall.

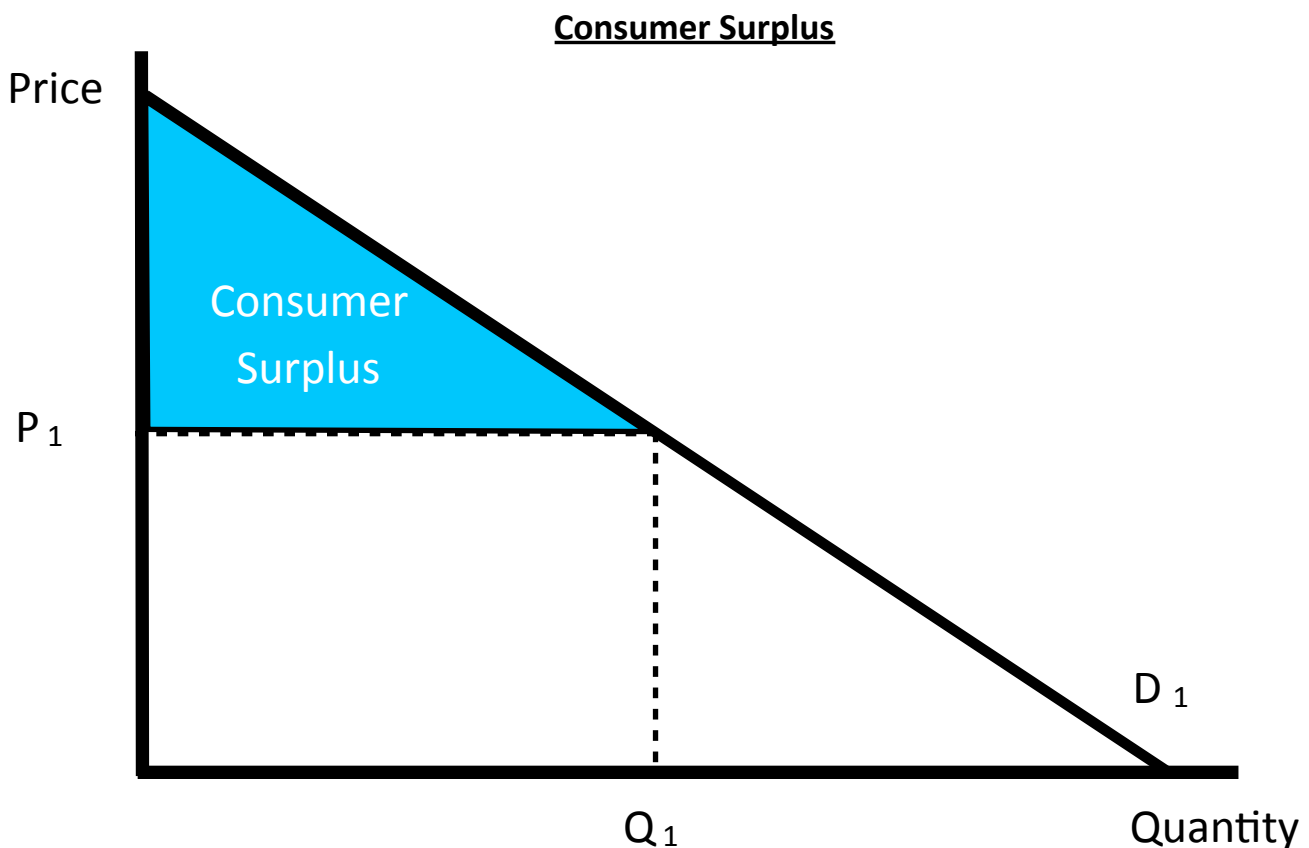
## CONSUMER SURPLUS

**CONSUMER SURPLUS:** The benefit to consumers due to the difference between what consumers actually pay's to consume a good and what they would have been willing to pay, rather than go without the good.

This is the benefit that buyers receive from participating in a market.

Essentially, Consumer Surplus is the amount a buyer is willing to pay for a good minus the amount he actually pays for it, rather than go without it.

Consumer Surplus can also be measured graphically. It is the area below the demand curve and above the price. See the diagram below.



We can see from the diagram above, that there are many consumers willing to pay a price higher than  $P_1$  but end up only having to pay the price  $P_1$ . This difference is the benefit to the consumer for participating in a market. The total amount of Consumer Surplus is the blue shaded region in the diagram above.

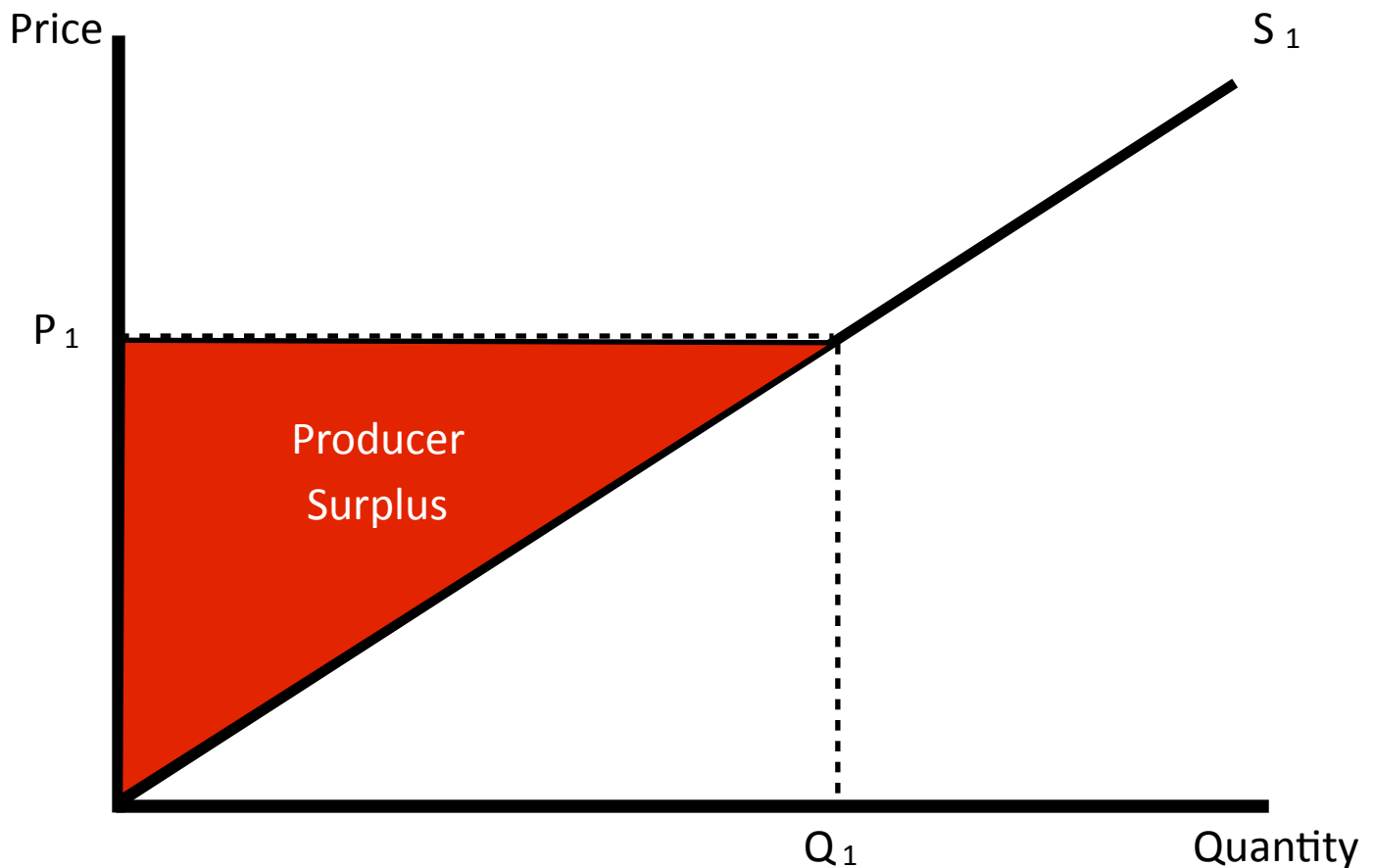
## Producer Surplus

**PRODUCER SURPLUS:** is the amount a seller is paid minus the cost of production.

It is the benefit to the seller of participating in a market.

Producer Surplus can be represented graphically. It is the area above the supply curve and below the price. See the diagram below.

## Producer Surplus



We can see from the diagram above, that there are many producers willing to sell goods for a lower price than  $P_1$  but end up receiving the price  $P_1$ . This is the benefit to them for participating in a market. The total amount of Producer Surplus is the red shaded region in the diagram above.