



Demand and Supply

MEGA LECTURE

AS Economics

Demand

- Is the **willingness** and the **ability** to buy certain quantities of the product at certain price level during certain time period.
- Consumers demand good and services which they need for **consumption** like car, house, cell-phone etc.

Demand Schedule

- A table that shows information about Price and Quantity Demanded for a product. This information is used to make the product's **Demand Curve**.

Price Per Unit	Quantity Demanded
100	750
105	710
112	685
118	655
125	630
132	590
135	575

Supply

- Supply is the **willingness** and the **ability** to produce a product in certain quantities at certain price level during certain time period.
- Producers of the product determine its supply.

Supply Schedule

- A table that shows information about Price and Quantity Supplied for a product. This information is used to make the product's **Supply Curve**.

Price Per Unit	Quantity Supplied
100	460
105	510
112	575
118	655
125	690
132	725
135	735

Demand Curve

- Demand curve is a graph that shows the **relationship between price and quantity demanded**.
- Demand curve will always be **downward sloping**.
- Keeping other factors constant, Demand Curve shows how much will be the quantity demanded, by any consumer, at different price levels.

Law of Demand

- The law of Demand states that other factors being constant the price of the product and quantity demanded will have **inverse** relationship; meaning higher the prices lower the quantity demanded and vice versa.

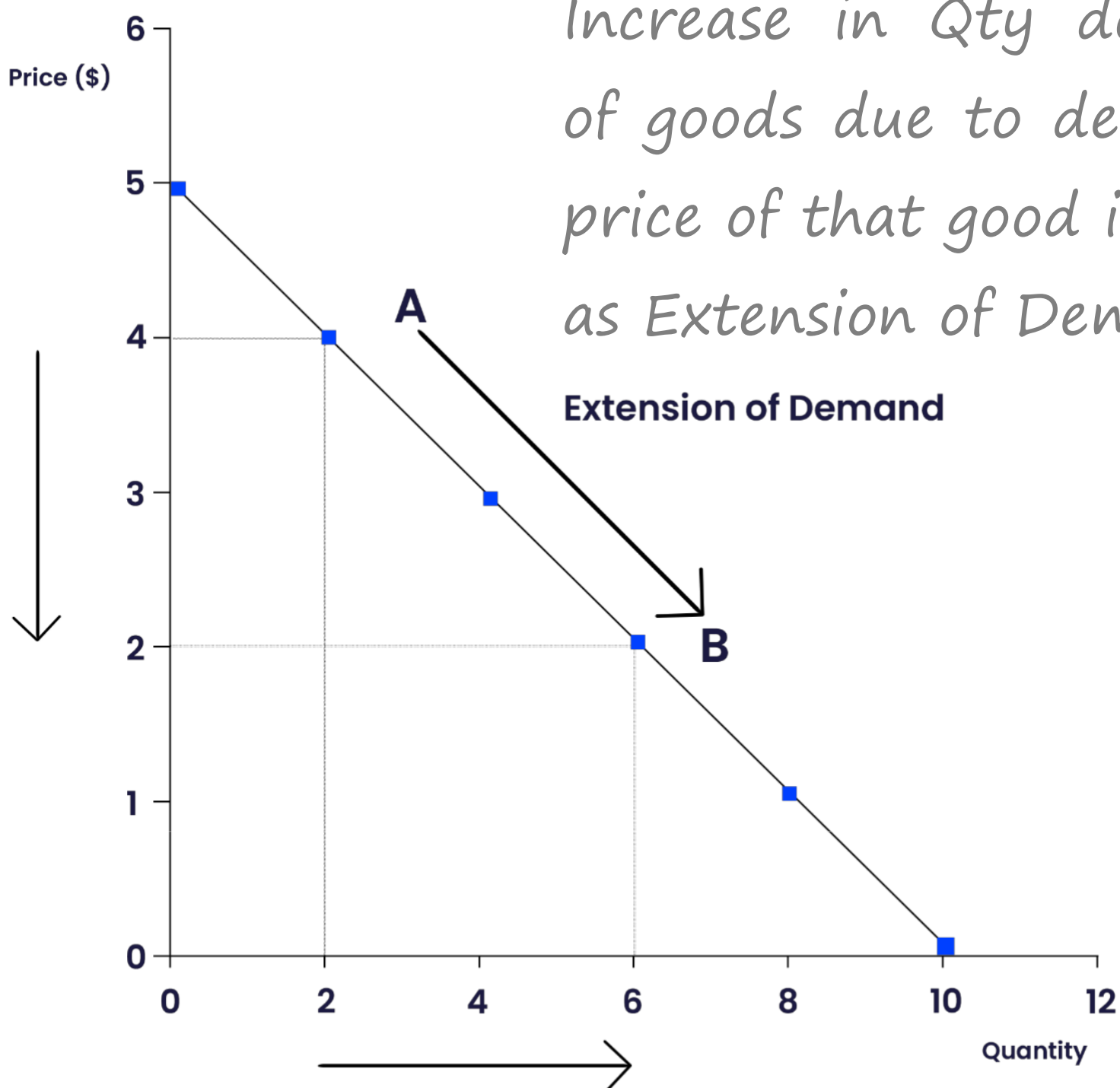
Movement along the Demand Curve

- Change in price of the product cause a movement along the demand curve.
- **Decrease in price** results in extension in quantity demanded and increase in price results in **contraction in quantity demanded**.

Movement along the Demand Curve

Movement along a demand curve occurs when there's a change in relevant variable measured on either axis

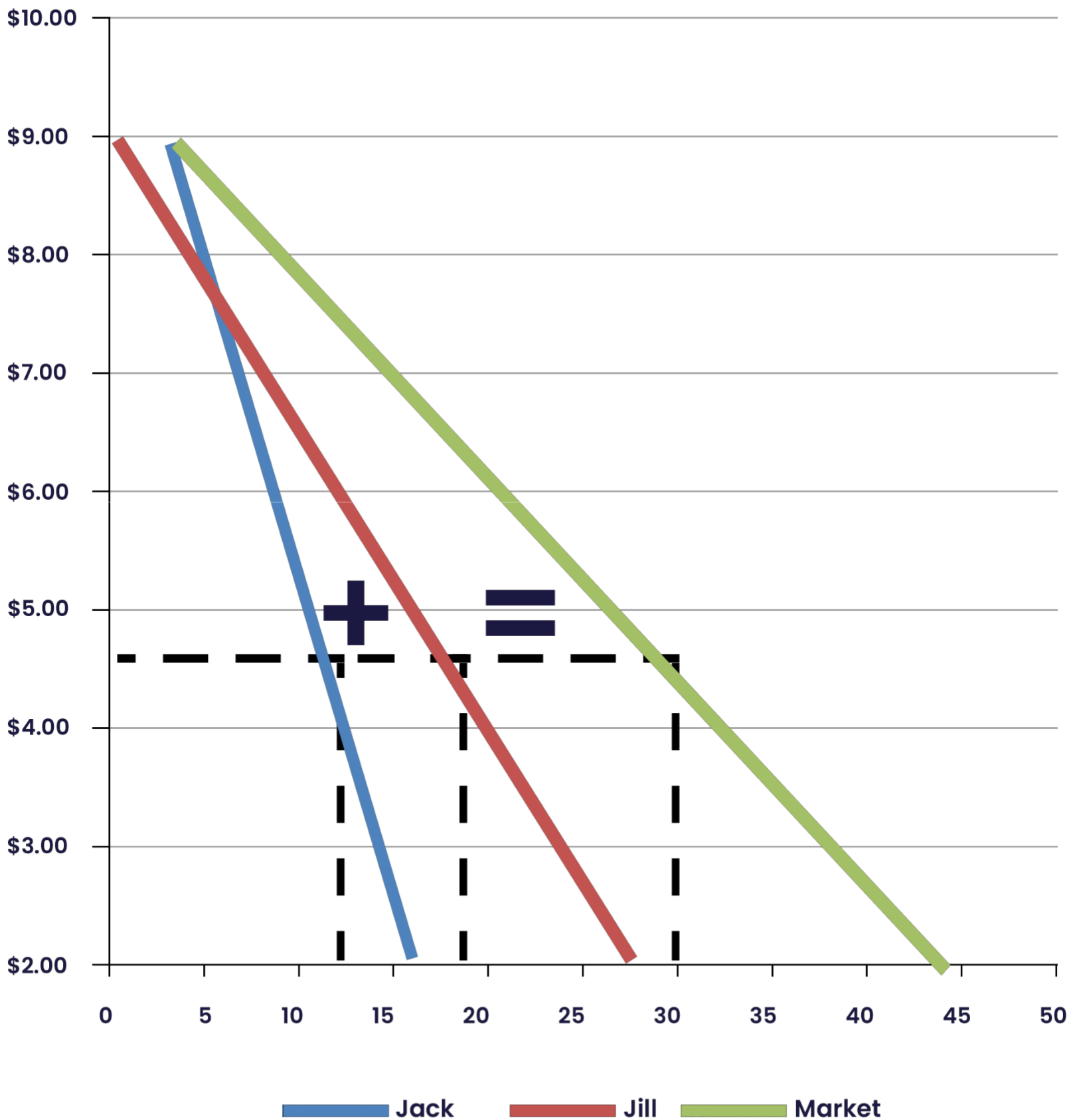
Increase in Qty demanded of goods due to decrease in price of that good is termed as *Extension of Demand*



Market Demand Curve

- Since there are number of consumers who buy any product, the market demand curve is **horizontal summation of individual demand curves**.
- Assuming that there are only two consumers namely A and B in the market for product X, then addition of quantities demanded of X by A and B at different prices will give us the market demand curve for product X.

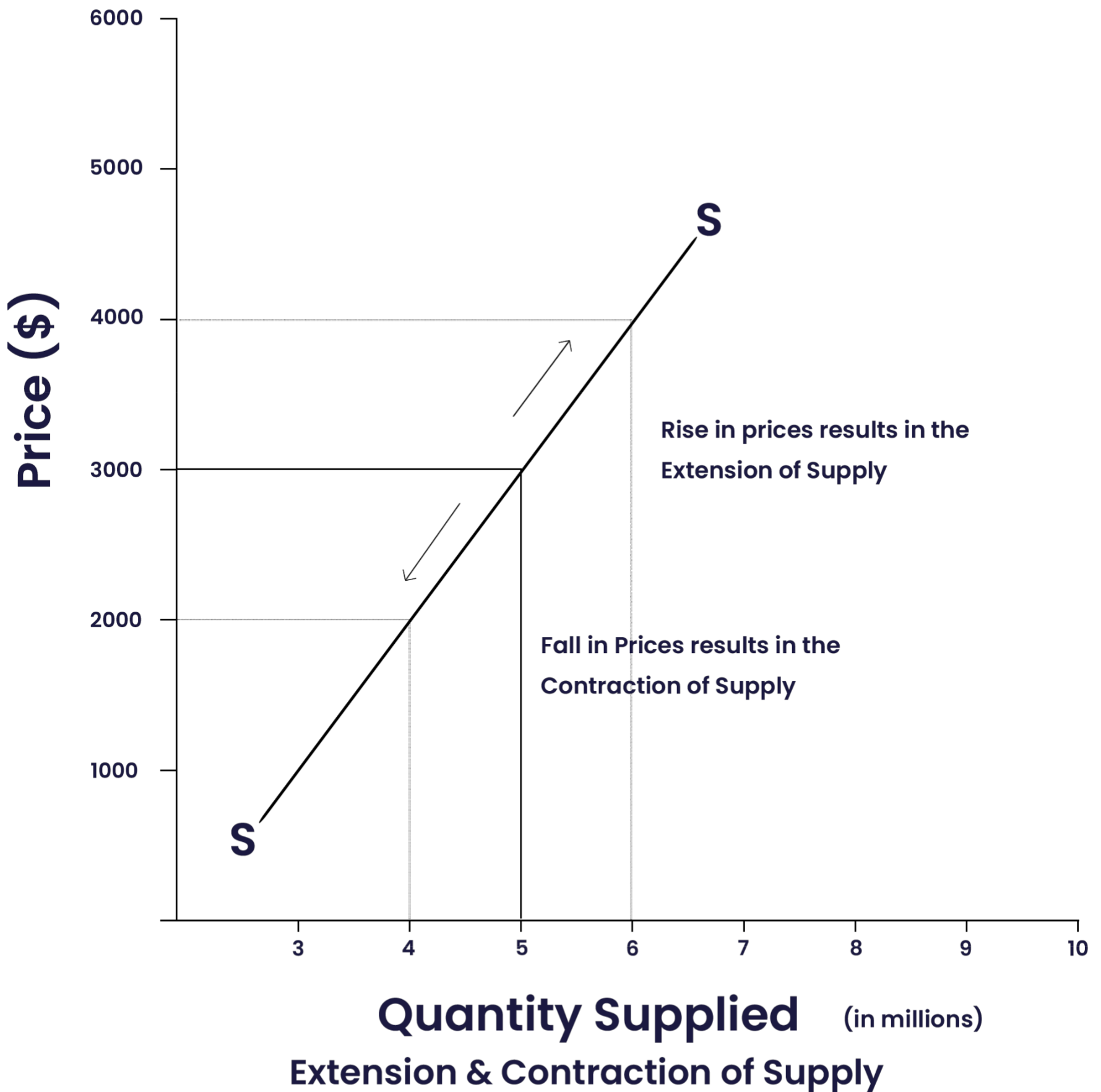
Market Demand Curve



Supply Curve

- Supply curve shows the relationship between **price** and **quantity** supplied.
- Higher the price, higher the quantity supplied.
Therefore the supply curve is always upward sloping.

Movement along the Supply Curve



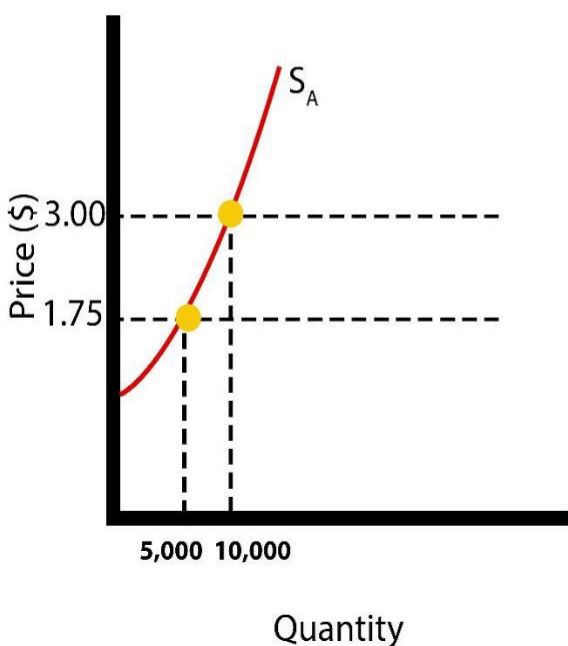
Market Supply Curve

- Since multiple firms produce any product, market supply will be horizontal **summation of individual firms** supply curves.
- Assuming that for product X there are only **three firms** in the market namely A, B and C, then addition of quantities supplied by these 3 firms at **different price** levels will give us our market supply curve.

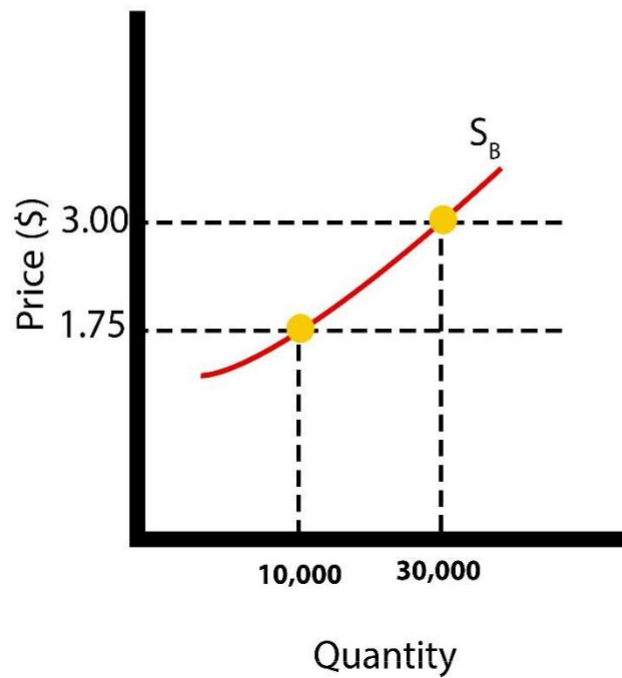
Market Supply

As with market demand, market supply is the horizontal summation of individual firms' supply curves

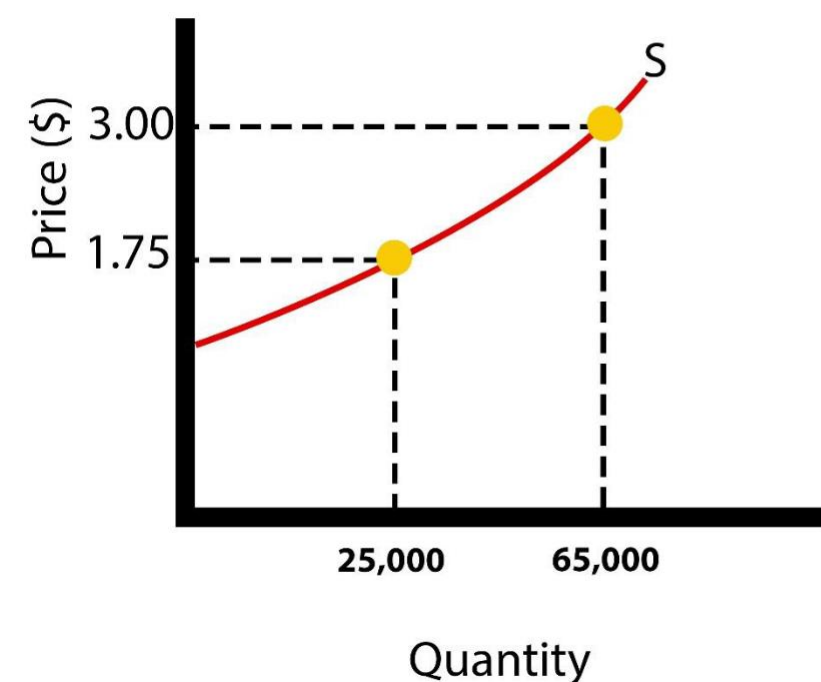
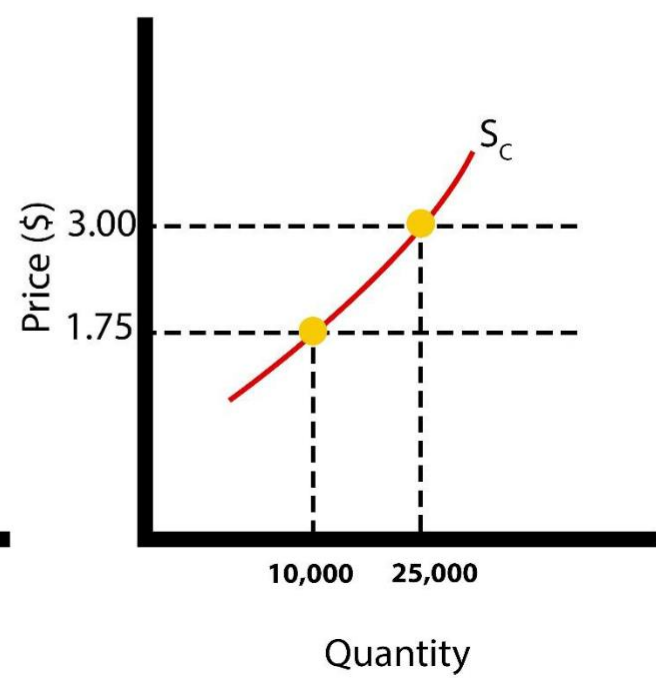
Firm A's Supply



Firm B's Supply



Firm C's Supply



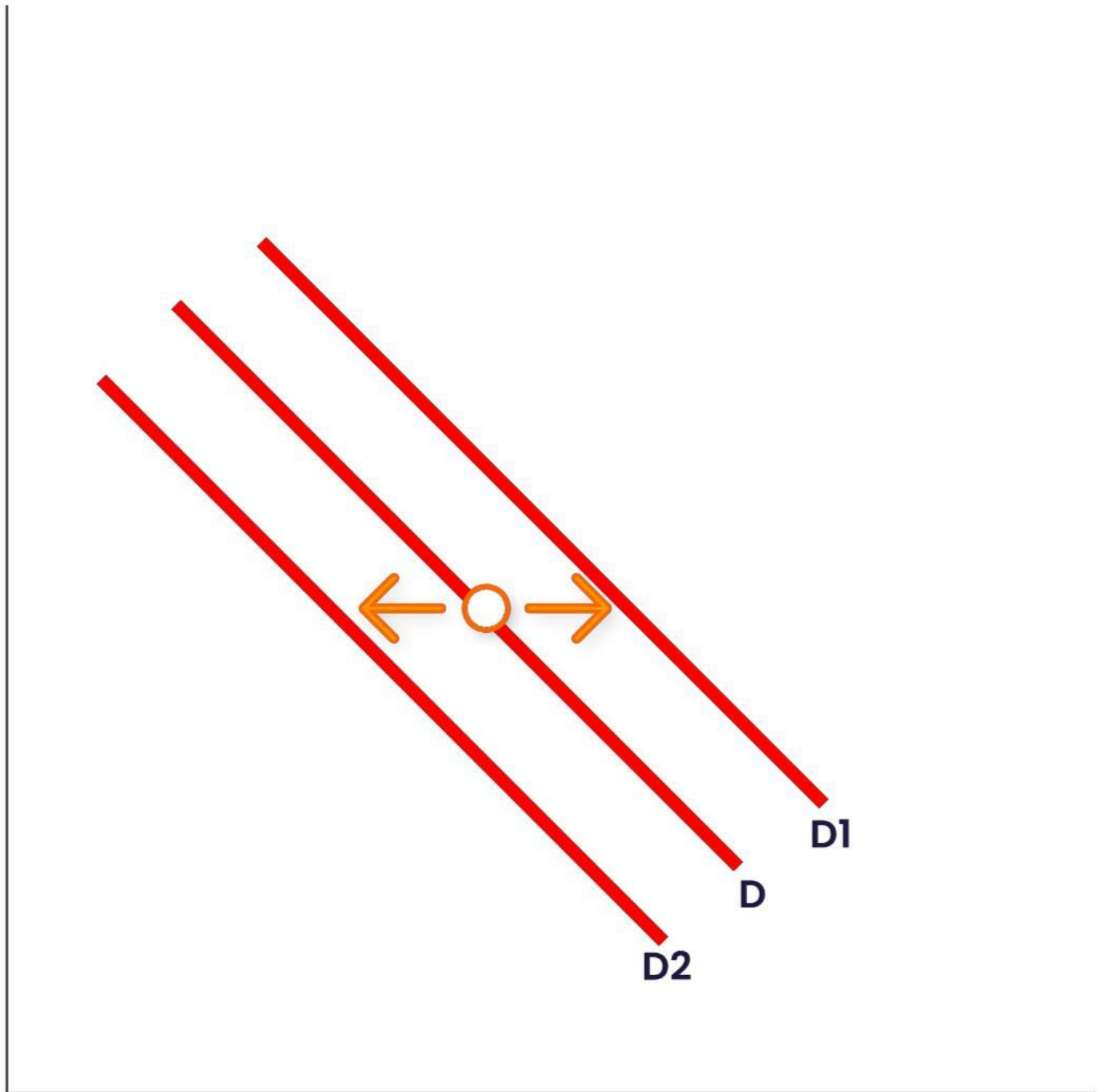
← **Market Supply**

Difference between Movement along the curve and Shift in the Demand Curve

- Movement along demand curve occurs due to changes in the product prices.
- The movement along the curve is termed as extension in demand if **price** is falling and contraction in demand if **price** is rising.
- Any factor that affects demand **apart from the price** of the product results in shift in entire demand curve.

Shifts in Demand Curve

Average house prices



Quantity

Shifts in Demand Curve

Is price the only factor that affect demand?

NO

- 1. Population:** higher the population higher the demand; hence rightward shift in demand curve.
- 2. Income:** higher the income higher the demand; hence rightward shift in demand curve.
- 3. Income Tax:** higher the income tax lower the demand – leftward shift in demand
- 4. Seasonal Effect** – more ice-cream will be demanded in summers meaning a rightward shift in demand curve
- 5. Invention of more substitutes** – demand curve shifts left – for instance Netflix has significantly reduced the demand for movie cinemas

Shifts in Demand Curve

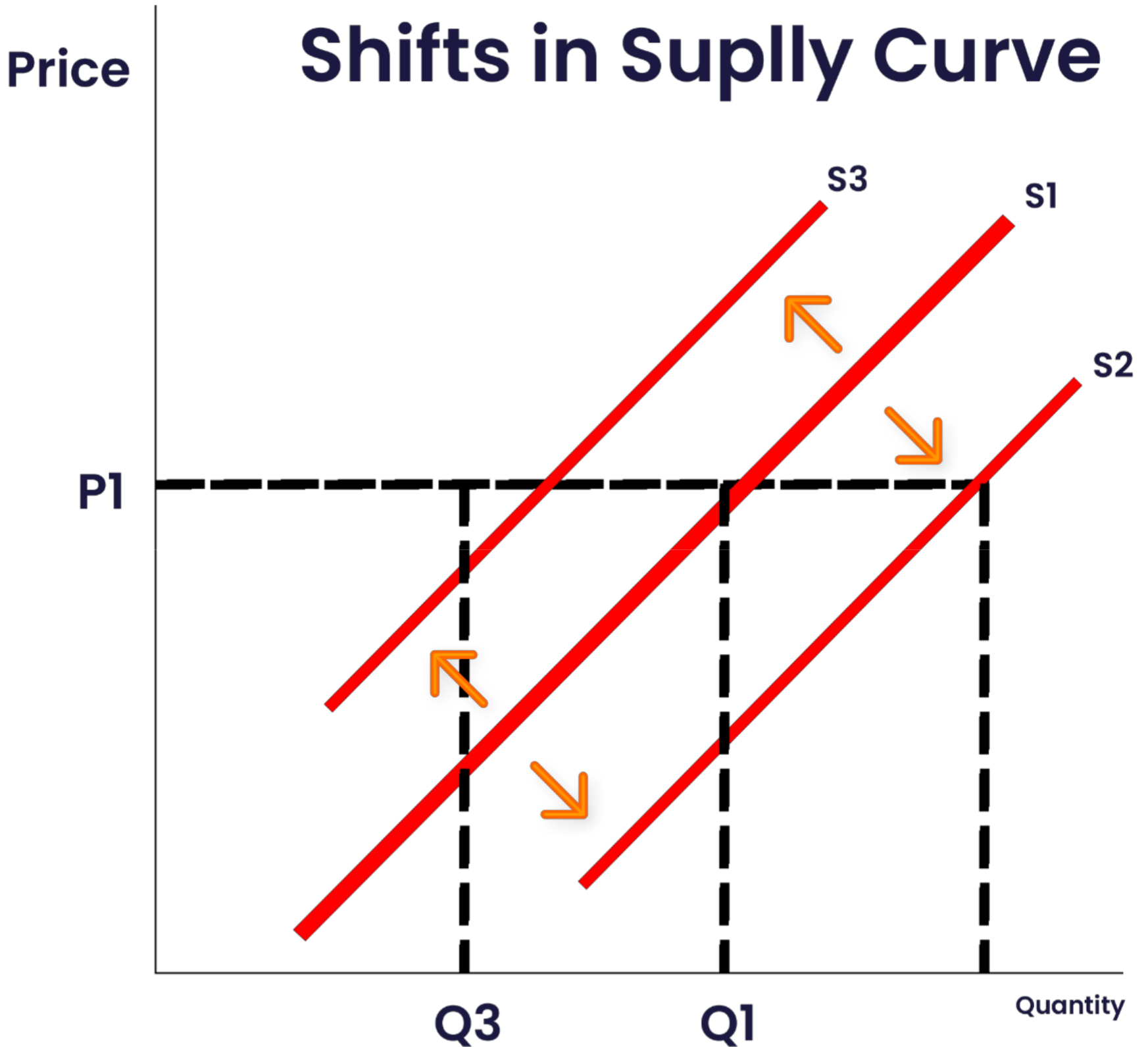
1. Price of Substitute Goods: higher the price of your substitute good, higher the demand for your product. Increase / decrease in the price of substitute products will shift the demand curve to right / left

2. Price of Complementary Good: higher the price of complementary good lower the demand for other good. For instance if fuel gets expensive less people will demand cars. Increase / decrease in the price of complementary products will shift the demand curve to left / right

Difference between movement along the curve and shift in Supply Curve

- Movement along supply curve occurs due to **changes** in the product prices.
- The movement along the curve is termed as **extension** in supply if price is increasing and contraction in supply if price is decreasing.
- Any factor that affects supply apart from the price of the product results in shift in entire supply curve.

Shifts in Supply Curve



Shifts in Supply Curve

- **Costs:** lower the cost of producing a product higher the supply. Decrease / increase in the cost of production will shift the supply curve right / left
- **Technology:** advancement in technology shifts the supply curve to right
- **Subsidies:** are financial payments made by government to producers. Provision of subsidies shift the supply curve to right.
- **Indirect Taxes:** higher the amount of indirect tax lower the supply.

Shifts in Supply Curve

- **Expectations of higher / lower future profits** - will shift the supply curve rightward / leftwards
- **Increase in the production of by-product** - will shift the supply curve rightwards. For instance production of buttermilk due to manufacture of butter. Hence more the production of butter greater the supply of buttermilk.

Direct Versus Indirect Taxes

- **Direct Taxes:** any tax imposed on income, wealth or property example income tax, wealth tax, property tax. **Direct Taxes only affect demand.**
- **Indirect Tax:** any tax imposed on consumption of the product like GST (General Sales Tax), VAT (Value Added tax). **Indirect taxes only affect supply.**

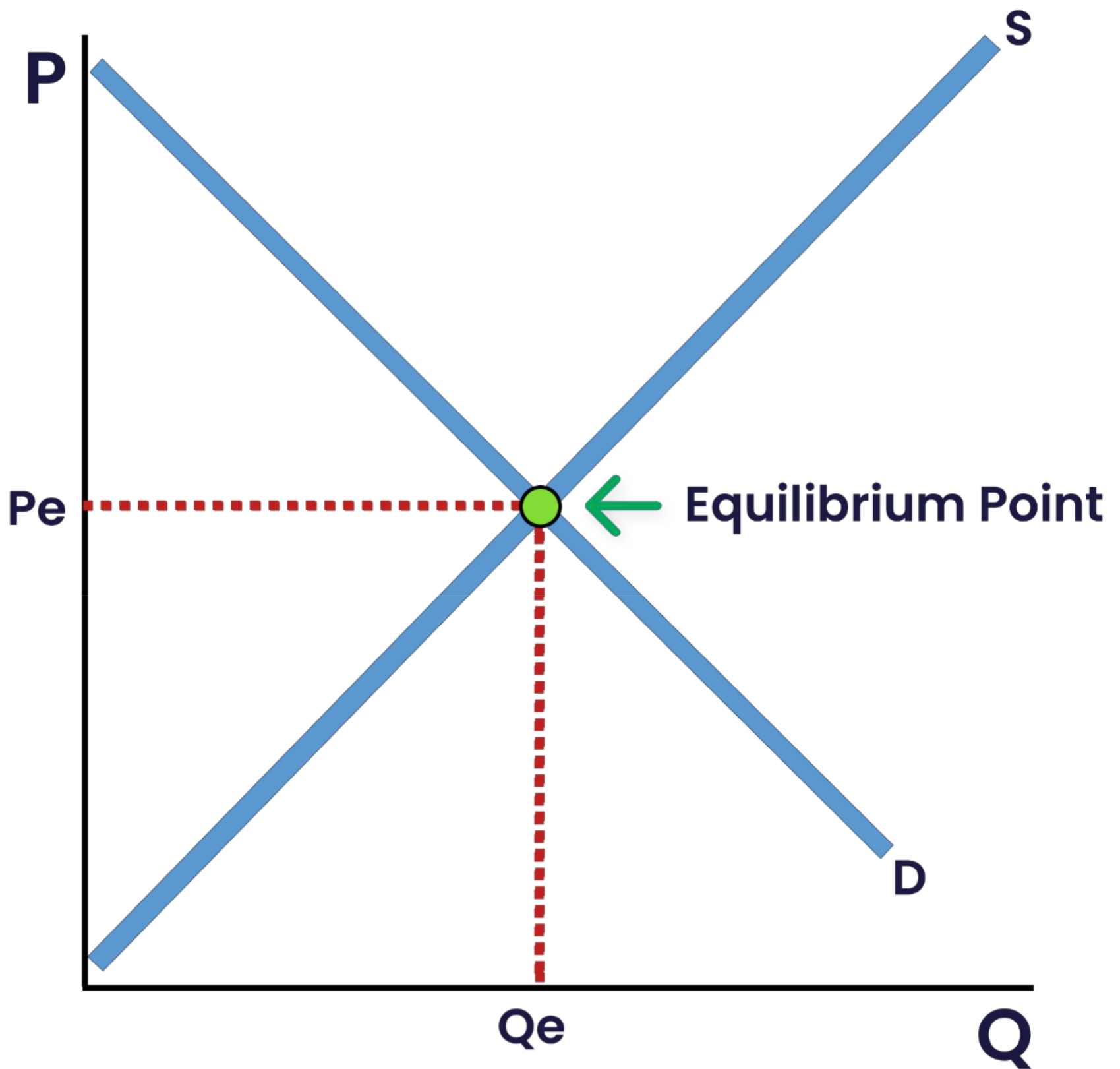
Market Equilibrium

- A situation in which market demand for a product is equal to its market supply. The price of a product in a market is determined by its market demand and market supply curve.
- To show Market Equilibrium we need to draw **market demand** and market supply curve on the same graph.

Market Equilibrium

- The equilibrium point shows the **Equilibrium Price** at which each unit of the good is being sold and **Equilibrium Quantity** which is the total quantity of the good that is being traded in the market.

Market Equilibrium



Changes in Market Equilibrium

- Shifts in supply and demand curves cause market equilibrium to change.

1. Increase in Demand: increase in equilibrium quantity and increase in equilibrium price

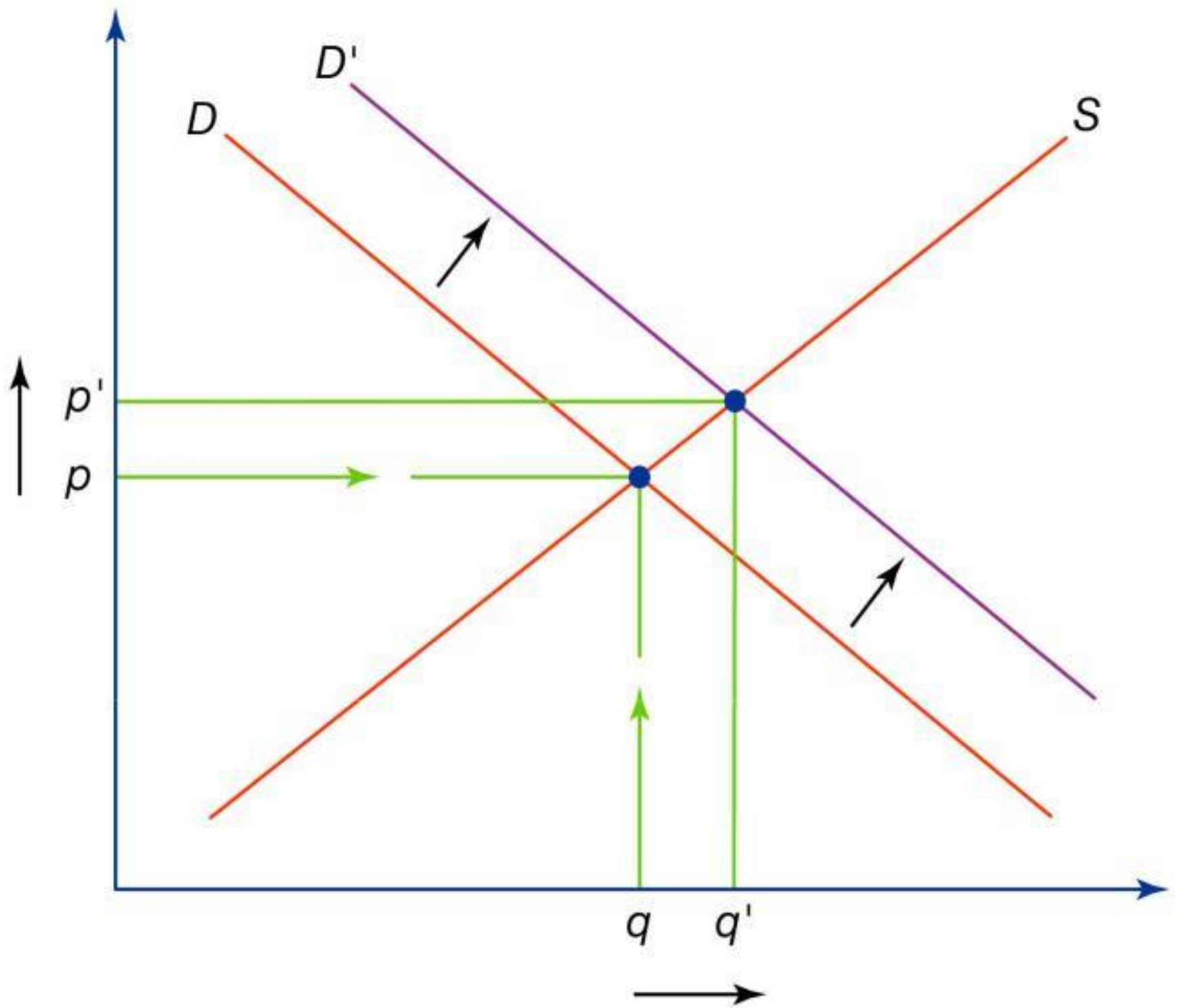
2. Decrease in Demand: decrease in equilibrium quantity and decrease in equilibrium price

3. Increase in Supply: increase in equilibrium quantity and decrease in equilibrium price

4. Decrease in Supply: decrease in equilibrium quantity and increase in equilibrium price

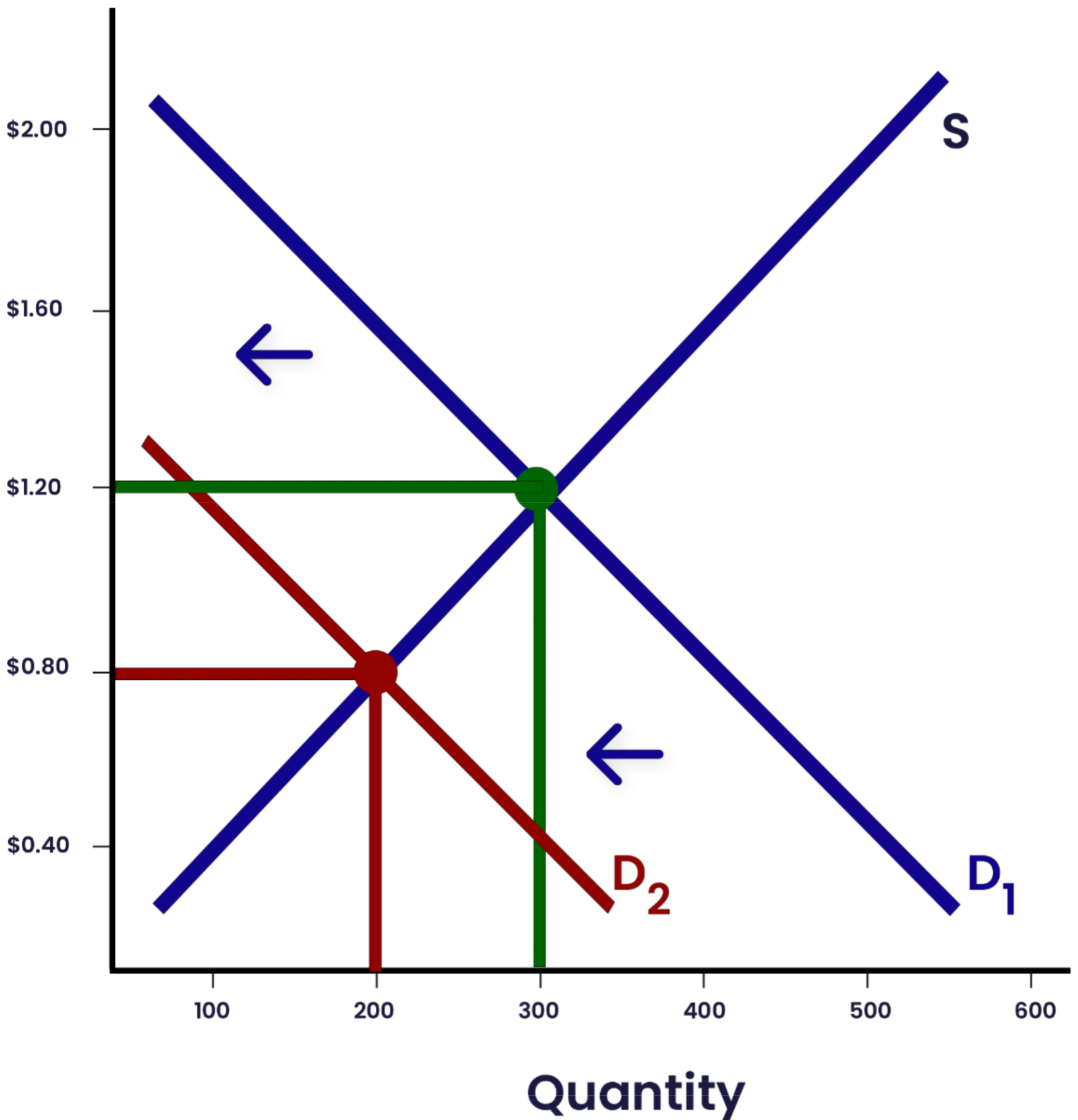
Increase in Demand

A shift in demand

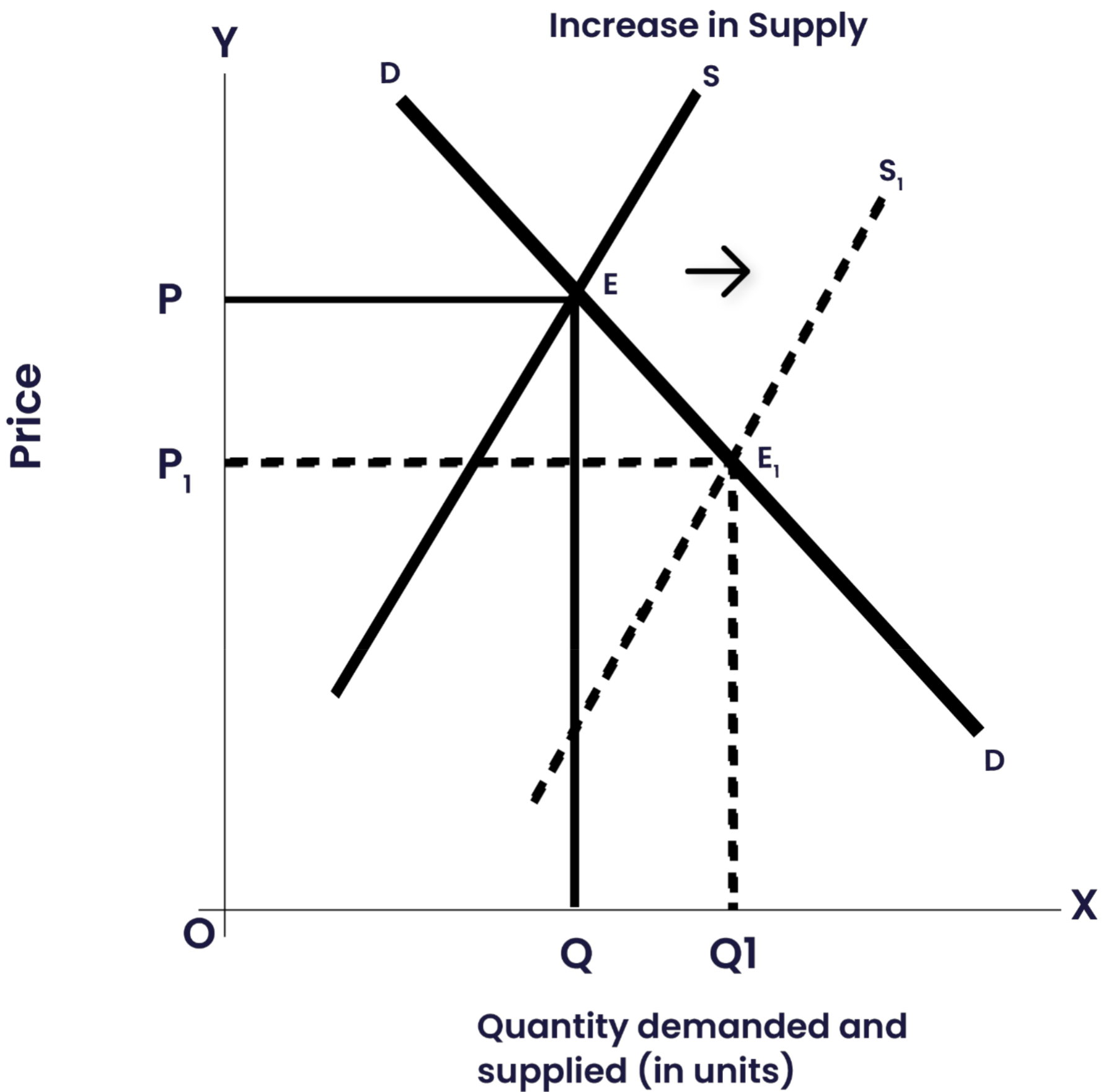


Decrease in Demand

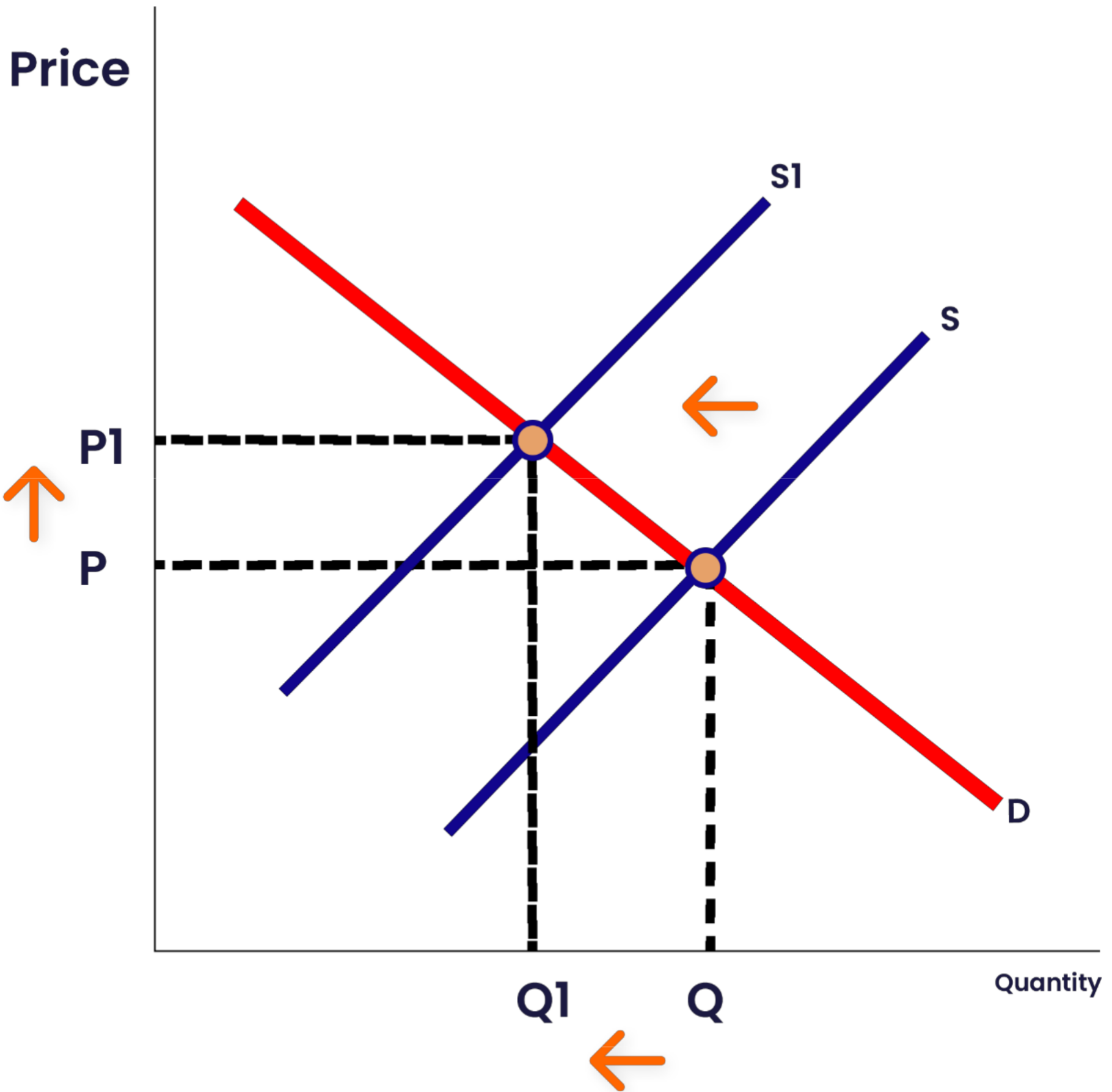
Supply & Demand for Chocolate Bars



Increase in Supply



Decrease in Supply



Price Elasticity of Demand

- A formula that captures the extent of change in quantity demanded of a product due to given change in product price.

Formula of PED

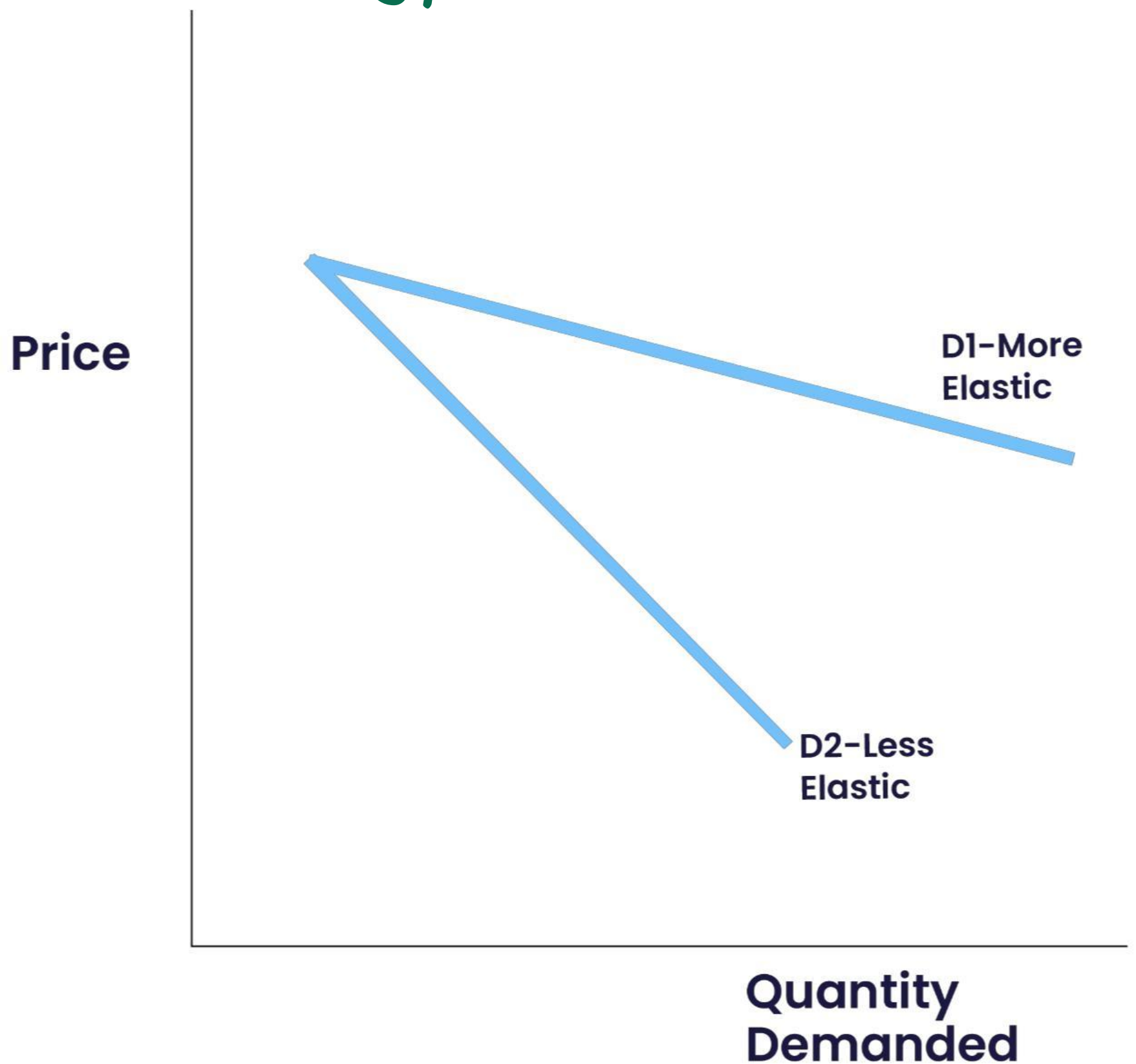
$$PED = \frac{\text{Percentage Change in Quantity demanded}}{\text{Percentage Change in Price}}$$

$$PED = \frac{Q_2 - Q_1}{Q_1} \times \frac{P_1}{P_2 - P_1}$$

More Elastic Demand vs Less Elastic Demand

- If the change in quantity demanded compared to change in price is more than proportionate then it is known as more elastic. Therefore the overall value of more elastic products will **always be greater** than 1.
- If the change in quantity demanded compared to change in price is less than proportionate then it is known as less elastic. Therefore the overall value of less elastic products will **always be less** than 1.

Types of PED



As can be seen through the diagram, D1 being more responsive in terms of quantity demanded for any change in price has higher price elasticity of demand.

How to know if product demand will be more or less elastic?

- **Rule of Thumb:** if a product is a necessity like food item then it would be less elastic and if it is a luxury like expensive phone or watch then it will be more elastic.

Factors that affect PED

1. Necessity or a Luxury: if something is a necessity it will be less elastic and if it is a luxury then it would have more elastic PED.

Factors that affect PED

Since necessities are needed in relatively stable quantities, decrease in price does not cause too much increase in quantity demanded. Similarly when price of the product increases the quantity demanded does not decrease substantially. Like food whether the prices are rising or falling we all demand relatively stable quantities of food items.

Factors that affect PED

2. **Number of Substitutes:** if there are more substitutes then people will be more sensitive to change in price and so the product will have more elastic demand and vice versa.

3. **Proportion of Income Spent on the Good:** if something takes a large proportion of consumers' income like a cellphone or a car then the demand is expected to change much more due to given change in price as compared to something that takes a small proportion of consumers' income like a pen or a chocolate bar.

Factors that affect PED

4. *The urgency of the product:*

If there is urgent demand / need of something then people would not mind paying a higher price and so on. Hence urgent things have price inelastic demand and vice versa.

More Elastic

Luxury

More Substitutes

*Higher Proportion
of Income*

*Not Urgent / No
Emergency*

Less Elastic

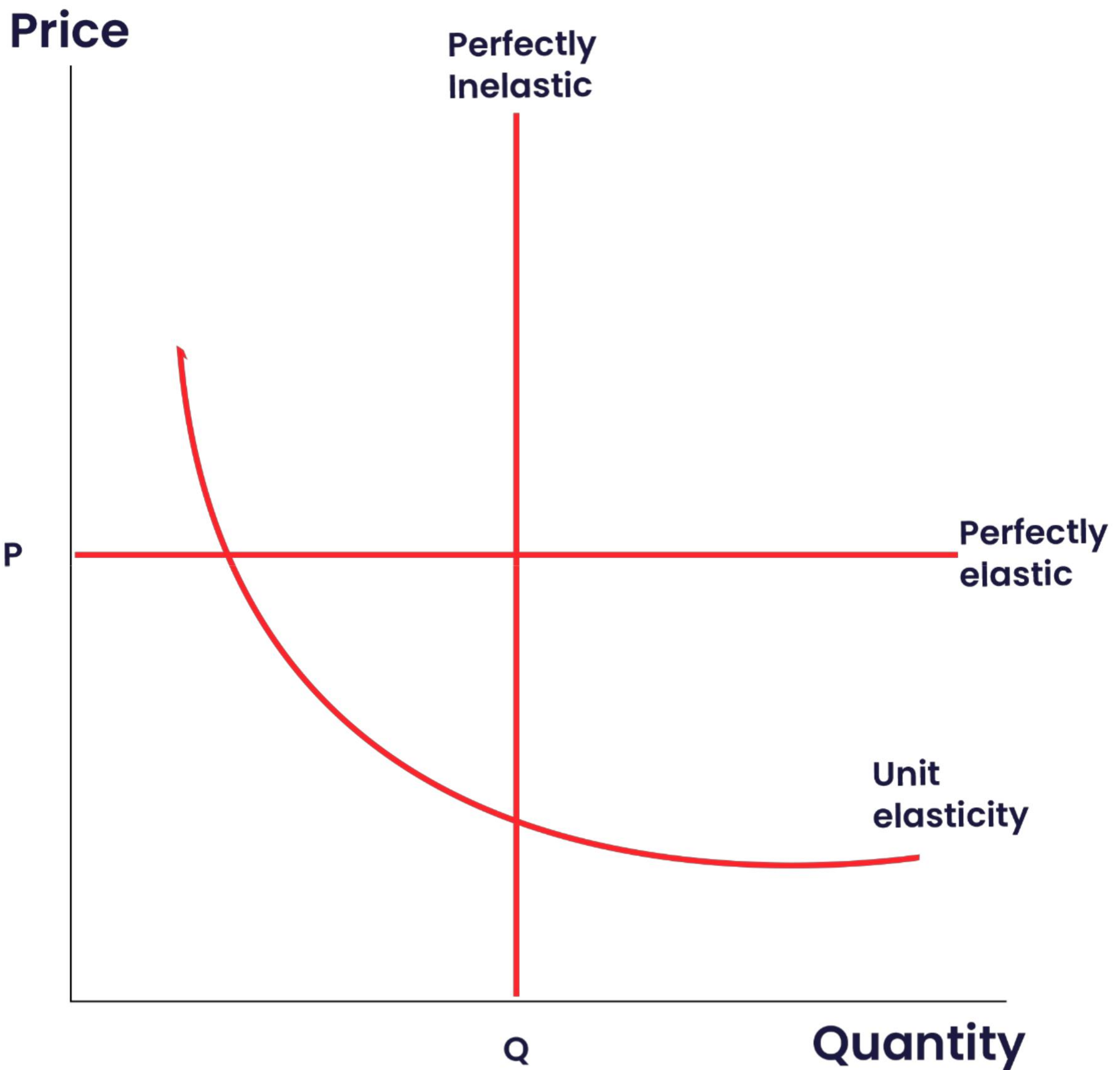
Necessity

Less Substitutes

*Less Proportion of
Income*

*Urgent /
Emergency*

Other Types of PED



Other Types of PED

- **Perfectly Inelastic** demand has PED value of zero. This is because any change in price yields absolutely no change in quantity demanded. Eg **life saving drug** – no matter what the price is people will buy the needed quantities.
- **Perfectly Elastic** demand has PED value of infinity. This is because at certain price level the change in quantity demanded is infinite. Eg when **there are a lot of firms producing the same product** like in perfect competition
- **Unitary Elastic** is when certain change in price yields proportionate change in quantity demanded.

Values of PED

Type	Values
More Elastic	Greater than 1
Less Elastic	Less than 1
Unitary Elastic	Equal to 1
Perfectly Inelastic	Has a value of 0
Perfectly Elastic	Has a value of Infinity

Price Elasticity of Supply

- A formula that captures the extent of change in quantity supplied of a product due to given **change in product price**.

$$\text{Price Elasticity of Supply} = \frac{\% \text{ Change in Quantity Supplied}}{\% \text{ Change in Price}}$$

Formulas of PES

$$PES = \frac{Q_2 - Q_1}{Q_1} \times \frac{P_1}{P_2 - P_1}$$

Types of PES

- If the change in quantity supplied compared to change in price is **more than proportionate** then it is known as more elastic. Therefore the overall value of more elastic products will be greater than 1.
- If the change in quantity supplied compared to change in price is **less than proportionate** then it is known as less elastic. Therefore the overall value of less elastic products will be less than 1.

Note: more than proportionate means that for **2% change** in price the percentage change in quantity demanded is **more than 2%**.

Types of PES

MEGA LECTURE

How to know if a product will be more or less elastic

- **Rule of Thumb:** Easier and less complex it is to produce a good or service more elastic would be its supply and the more difficult or complex a product's production process is like commercial plane, tank etc the more inelastic the supply.

Factors affecting PES

- **Availability of Resources:** more the resources available to produce a product more elastic the supply and vice versa. In the case of Pakistan we have more resources to produce agricultural products so more elastic supply compared to manufactured goods.
- **Locally manufactured versus imported goods:** things produced locally take relatively less time and have more resources available and so have more elastic supply compared to imported goods

Factors affecting PES

- **The complexity of production process:** the more complex the product is the more inelastic the supply for instance producing a car is much more complex than a bicycle therefore the PES of cars is expected to be inelastic in relation to PES of bicycles.

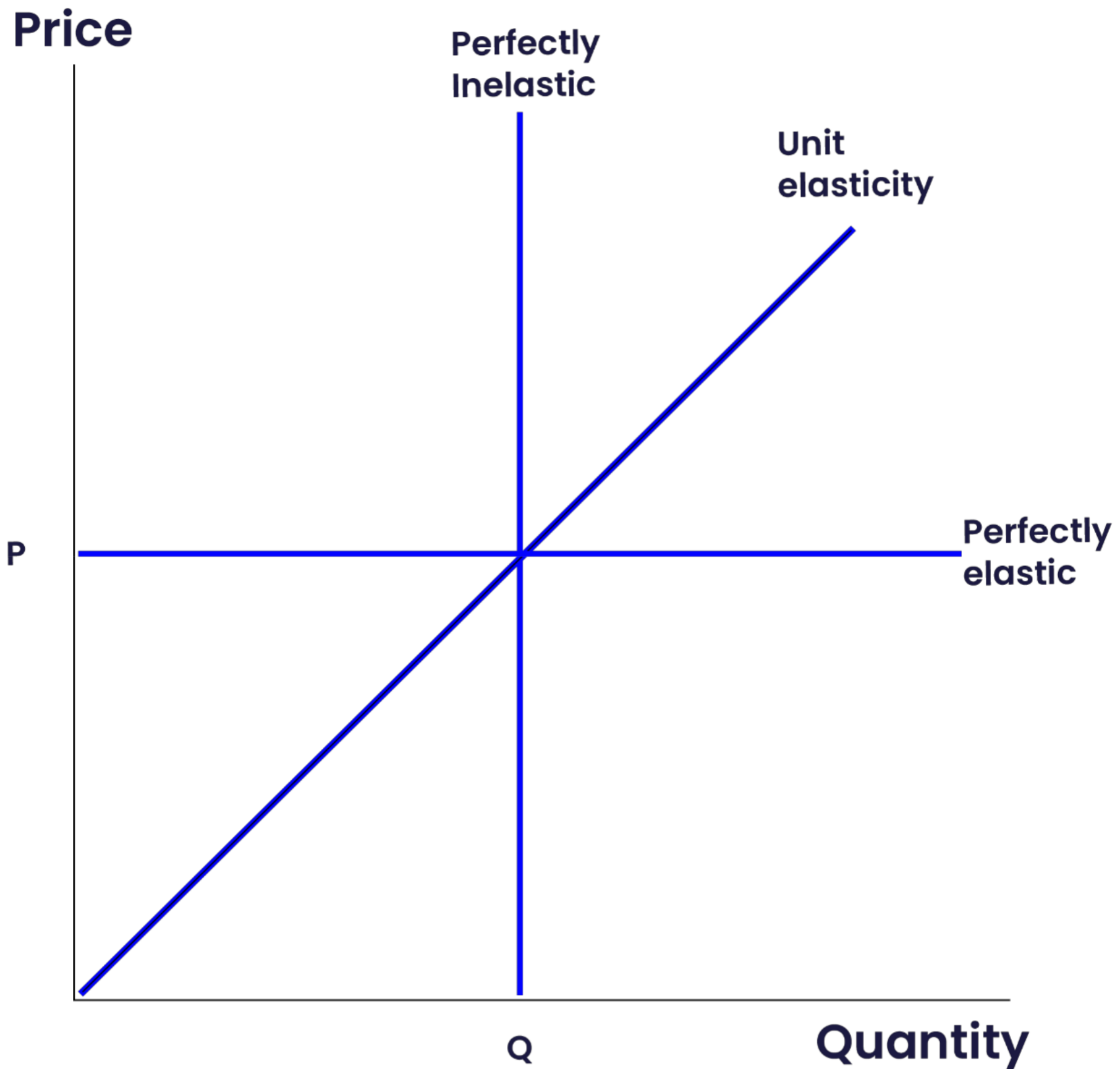
Factors affecting PES

- **Number of Firms producing the product:** greater the number of firms producing a product more elastic the supply and vice versa
- **Storage Possibility:** if the products are perishable and so hard to store the more inelastic the supply and vice versa. Perishable items like food items cannot be stored unlike manufactured goods like books or cell phones etc.

Other Types of PES

- **Perfectly Elastic:** is when for a given price level the change in quantity supplied is infinite. The value of PES in this case is infinity.
- **Perfectly Inelastic:** is when for any price level a fixed quantity is being supplied. Eg no matter how high or low the price is the number of seats in movie theater or stadium are fixed. The value of PES in this case is 0.
- **Unitary Elastic:** is when for certain change in price there is proportionate change in quantity supplied. The value of PES in this case is 1.

Other Types of PES



Income Elasticity of Demand

- A formula that captures the percentage change in quantity demanded of the product due to certain change in consumers' income.

$$YED = \% \text{ CHANGE IN QUANTITY DEMANDED} / \% \text{ CHANGE IN INCOME}$$

Normal vs Inferior Goods

- **Normal:** direct relationship with income; higher the income higher the product demand. Ex usual products like restaurants, movie tickets etc.
- **Inferior:** inverse relationship with income, higher the incomes lower the demand. Ex fast food, cheaper brands for any product.

Normal Goods: More and Less Elastic

- Luxury items are more elastic because a certain **change in income** will result in big change in quantity demanded
- Basic Items: are less elastic because a certain change in income will result in small change in quantity demanded.

Cross Elasticity of Demand

- XED is a formula that calculates the **percentage change in quantity** demanded for one product due to percentage change in price of the other product.
- These products are either **substitute goods** or **complementary goods**.
- Substitute goods will always have a **positive value** for XED and Complementary goods will always have a **negative value** of XED .

Cross Elasticity of Demand

- If the relationship between 2 products is **strong** like Coke and Pepsi or Car and Fuel then the value of XED will be more elastic (greater than 1) and vice versa.

Consumer Surplus

- The economic benefit that consumers gain from their participation in the market is known as consumer surplus
- The **difference** between consumers' willingness to pay for a product and the actual price paid is known as consumer surplus.

$$CS = \text{Willingness to Pay} - \text{Market Price}$$

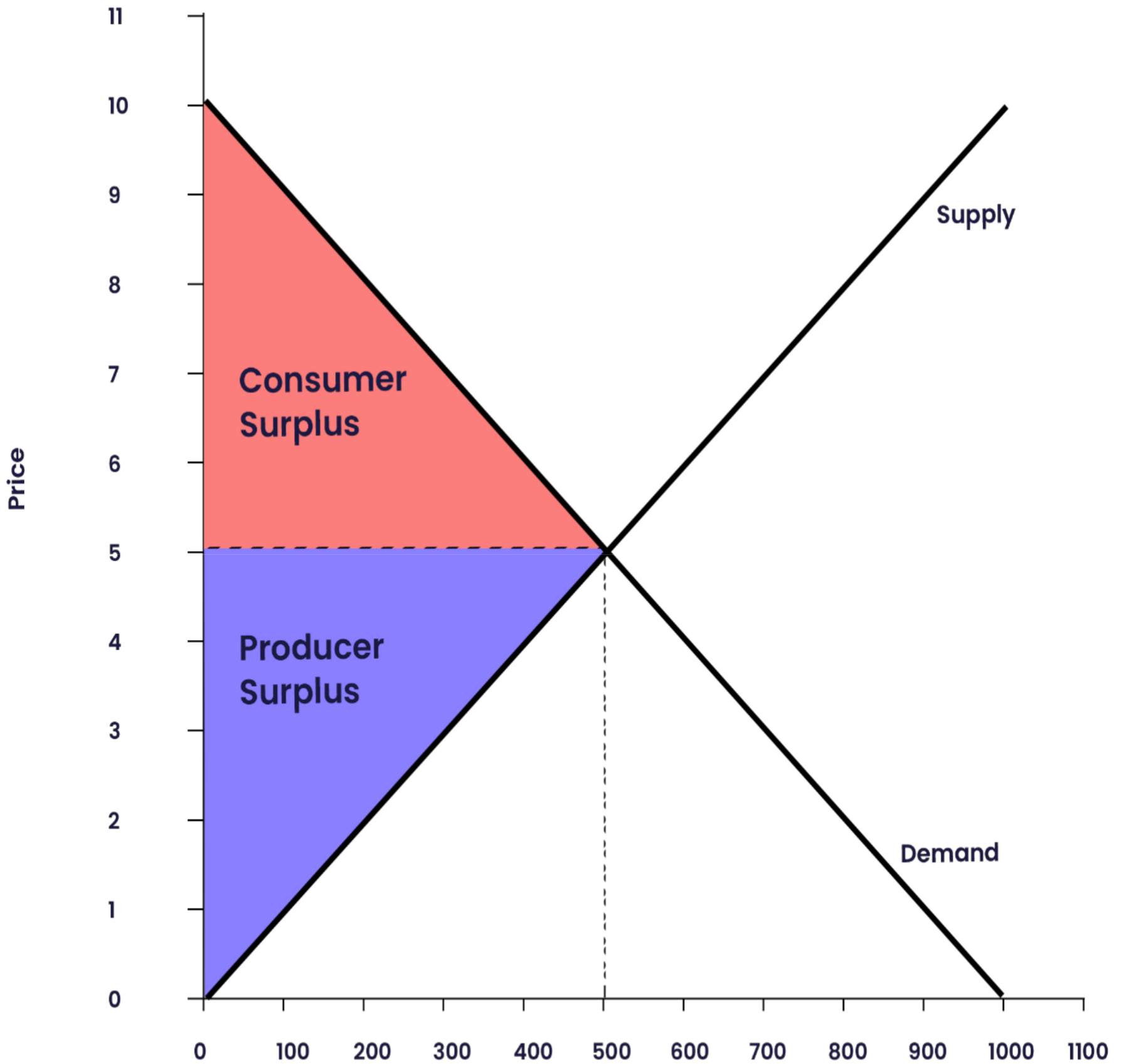
- If, for instance, my willingness to pay for a product is Rs 10 and that product is priced at Rs 5, then my consumer surplus is Rs 5.
- In the absence of markets, I would have paid Rs 10 to acquire the product hence I would not have experienced any consumer surplus.

Producer Surplus

- The economic benefit that producers gain from their participation in the market is known as producer surplus.
- The difference between market price of the product and producers' minimum willingness to sell the product for is known as producer surplus.

$$PS = \text{Market Price} - \text{Minimum Willingness to Sell}$$

Consumer and Producer Surplus



Consumer and Producer Surplus

- The area below the demand curve and above **equilibrium price** is consumer surplus because it calculates the difference between consumers' willingness to pay and what they actually pay.
- Similarly area above the supply curve and below equilibrium price calculates the **difference** between price actually received by producers and minimum compensation to sell the product for.



Consumer and Producer Surplus

- Consumer and producer surplus are indicators of consumers' and producers' well-being.
- Therefore, the impact of government intervention in markets like taxes and subsidies etc is evaluated through changes in consumer and producer surplus.

Consumer and Producer Surplus

- Increase in consumer and producer surplus is indicator of *higher consumers' and producers'* well-being and vice versa.

Price as Allocative Mechanism

- Prices of products play an important role when it comes to **allocation of resources**.
- Relative profits that are determined through changes in prices of goods / services help producers to determine their best possible allocation of resources.

Price as Allocative Mechanism

- Increase in price of any one product while prices of other products have stayed constant are a **signal of higher profits** in production of that product and therefore producers will allocate more resources towards production of that product and vice versa.

Price as Rationing Mechanism

- Prices help ration the products. Higher prices **reduce demand** since less people can afford the products and vice versa.

Hence prices really help reach a balance between demand and supply.

MEGA LECTURE

Prices as Allocative and Rationing Mechanism

- In free market economy prices play the crucial role of resource allocation and distribution of goods/services.

-
-

- In absence of market forces these functions are performed by central decision making body as in **command / planned economies.**

MEGA LECTURE

Prices as Allocative and Rationing Mechanism

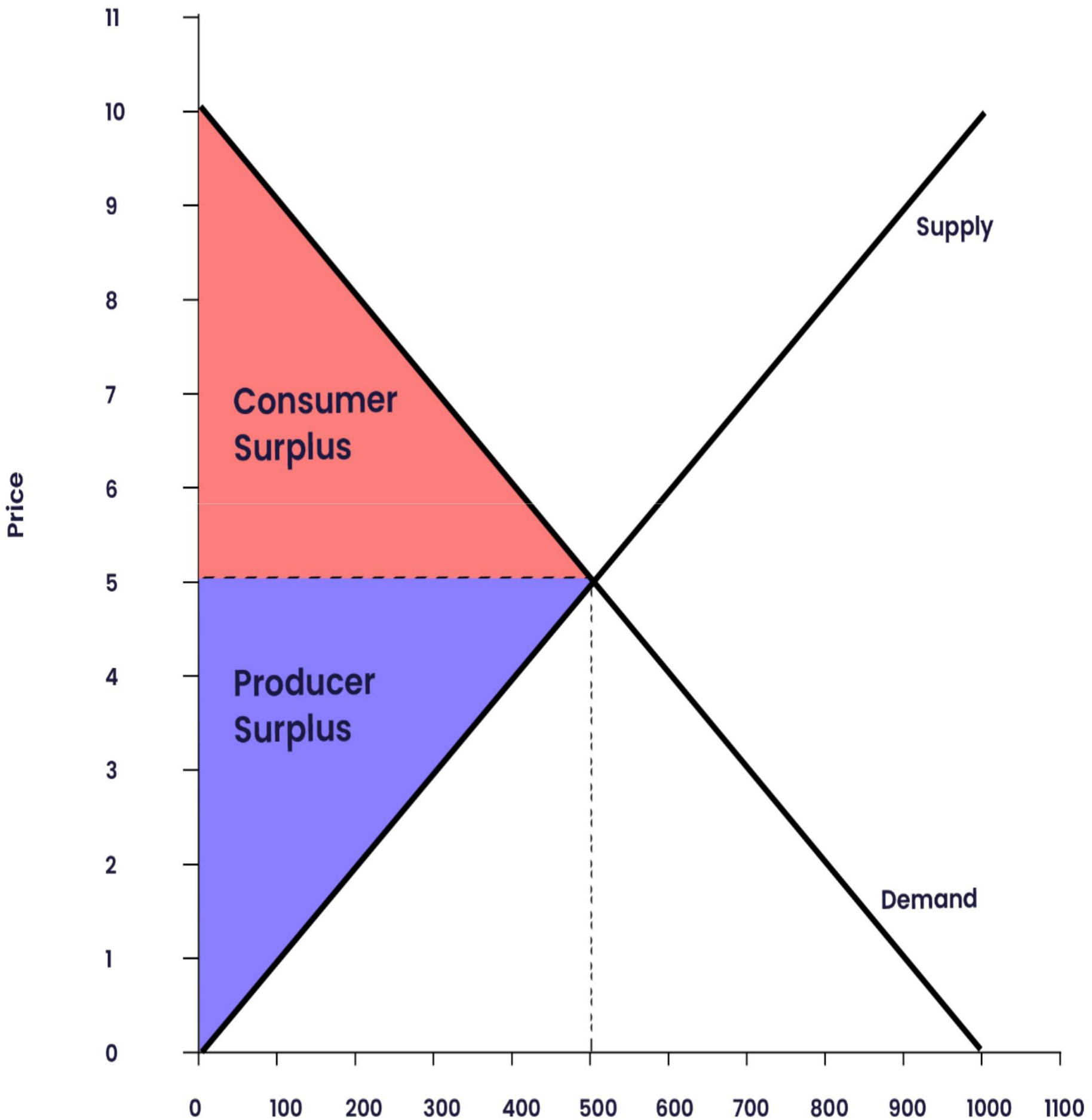
- Though equity (fair distribution) is often **compromised** when prices undertake these functions but the process is fast and efficient without resulting in over or under production of goods because markets are always expected to reach equilibrium.

Changes in Consumer and Producer Surplus

MEGALECTURE

AS Economics

Consumer and Producer Surplus



Graphical Representation of Consumer & Producer Surplus

- Consumer Surplus is total area *below the market demand curve* and above prevailing market price.
- Similarly Producer Surplus is total area *above the market supply curve* and below the prevailing market price.

Consumer and Producer Surplus

Consumer and producer surplus are **indicators** of consumers' and producers' well-being.

- Therefore, impact of government intervention in markets like taxes and subsidies etc is evaluated through changes in consumers and producer surplus.

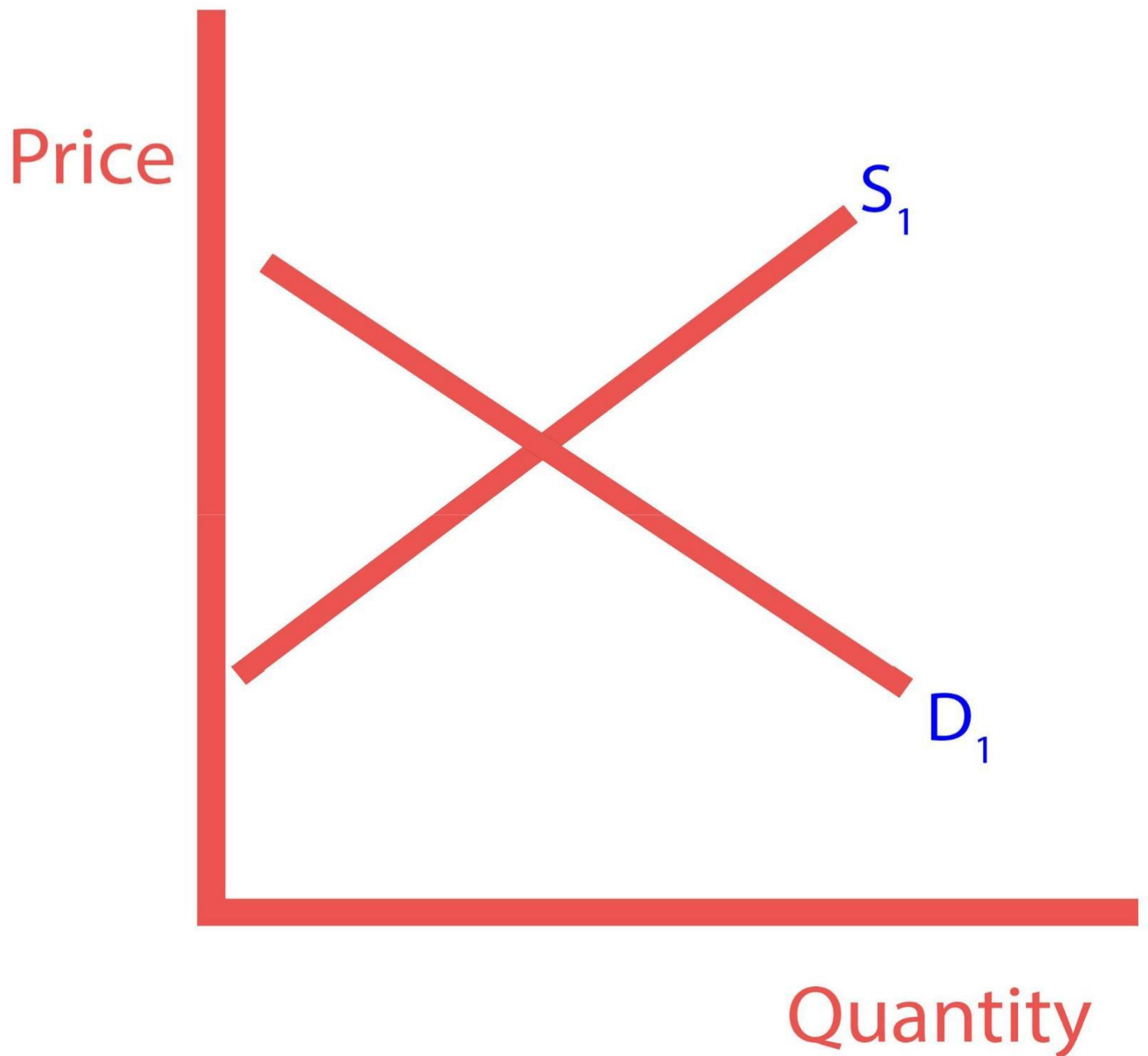
Consumer and Producer Surplus

- Increase in consumer and producer surplus is indicator of **higher consumers' and producers' well-being** and vice versa.

Indirect Tax & Changes in Consumer and Producer Surplus

- Now we will see with the help of a graph how an indirect tax **reduces** both consumer and producer surplus.
- However because indirect tax provides revenue for the government hence it is **not entirely bad**.
- Lastly since indirect tax reduces equilibrium quantity – it is loss of economic output which is known as **deadweight loss**.

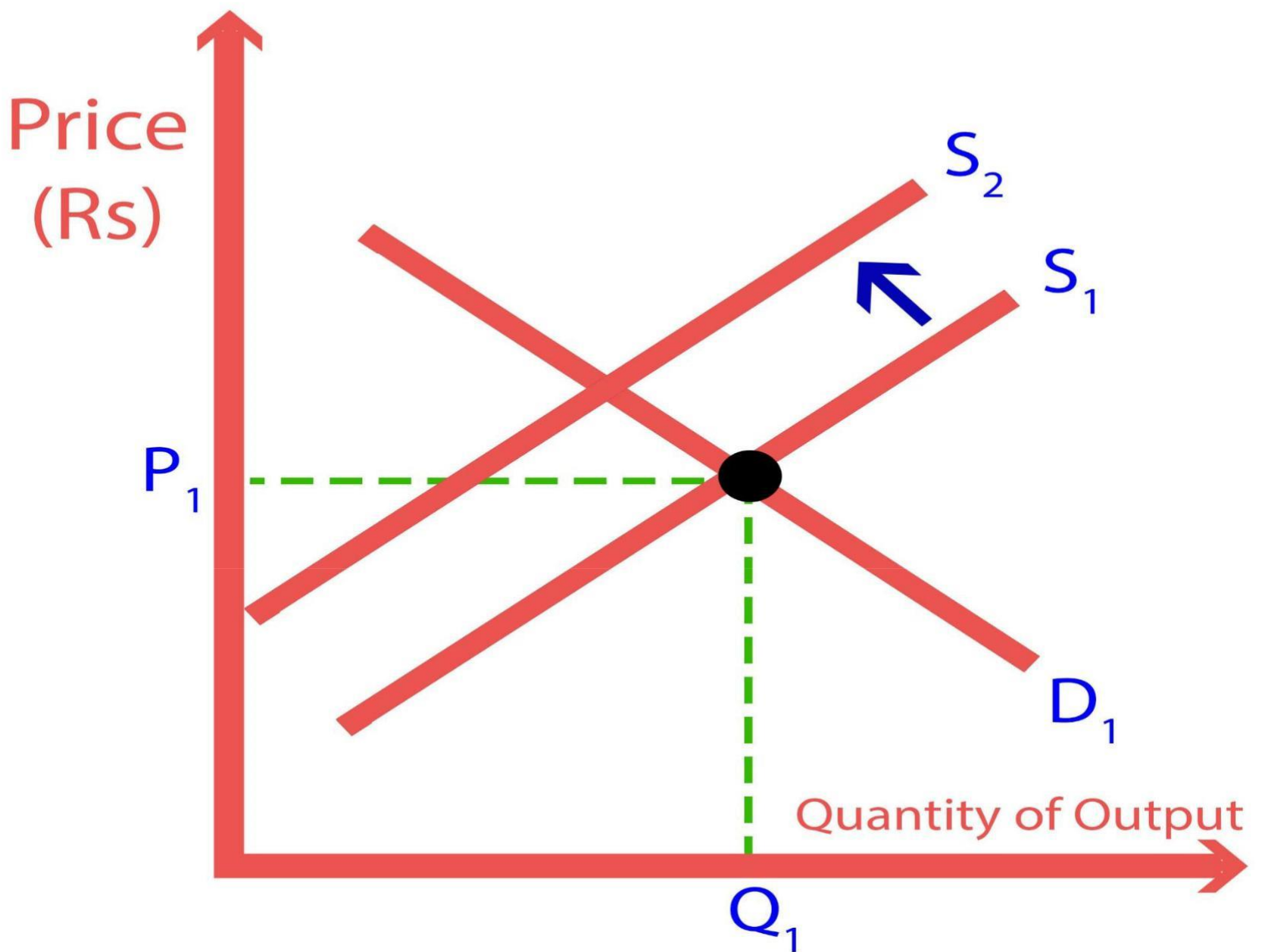
Indirect Tax



D_1 is the original demand curve

S_1 is the original Supply Curve.

Indirect Tax

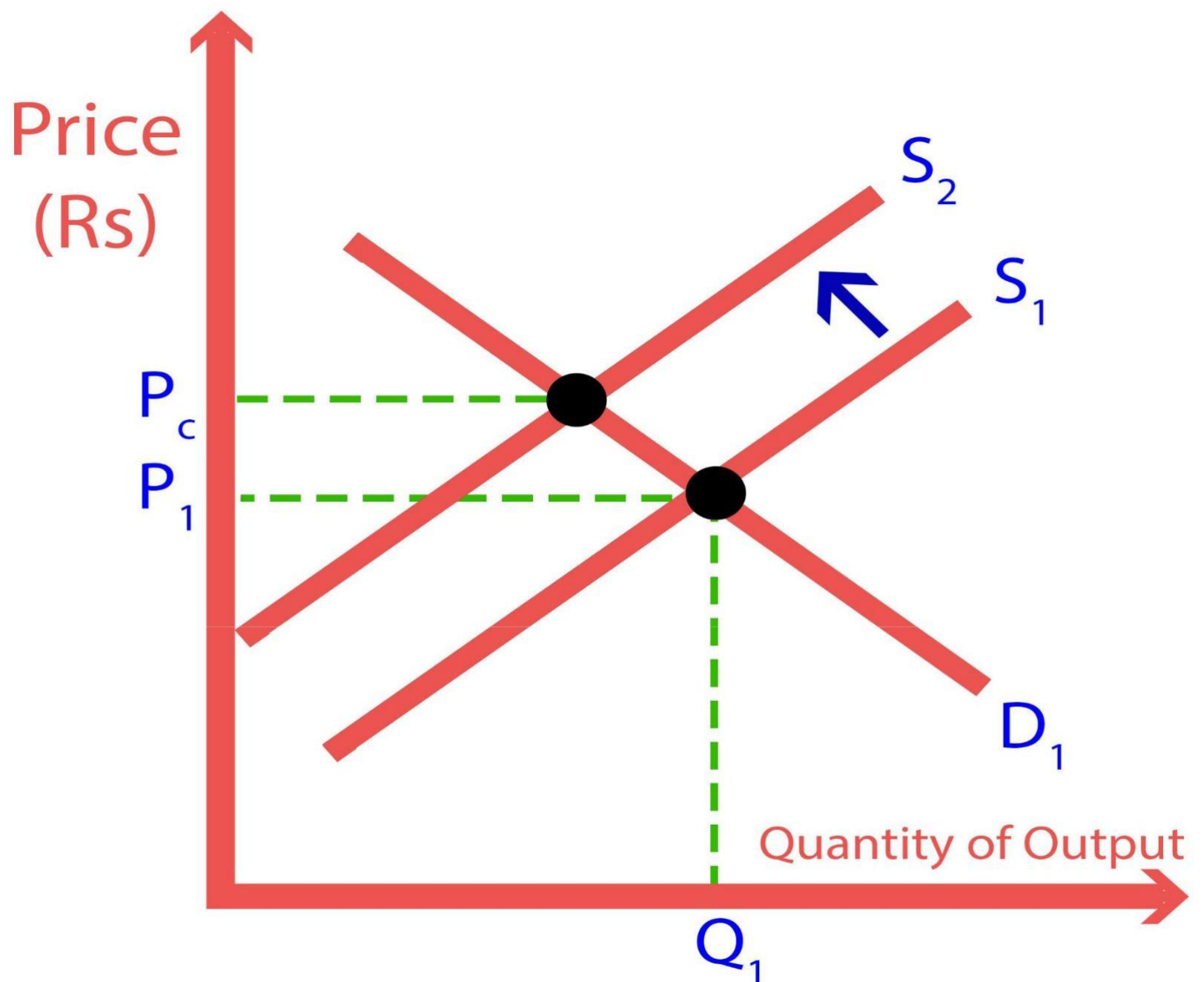


D_1 is the original demand curve

S_1 is the original Supply Curve.

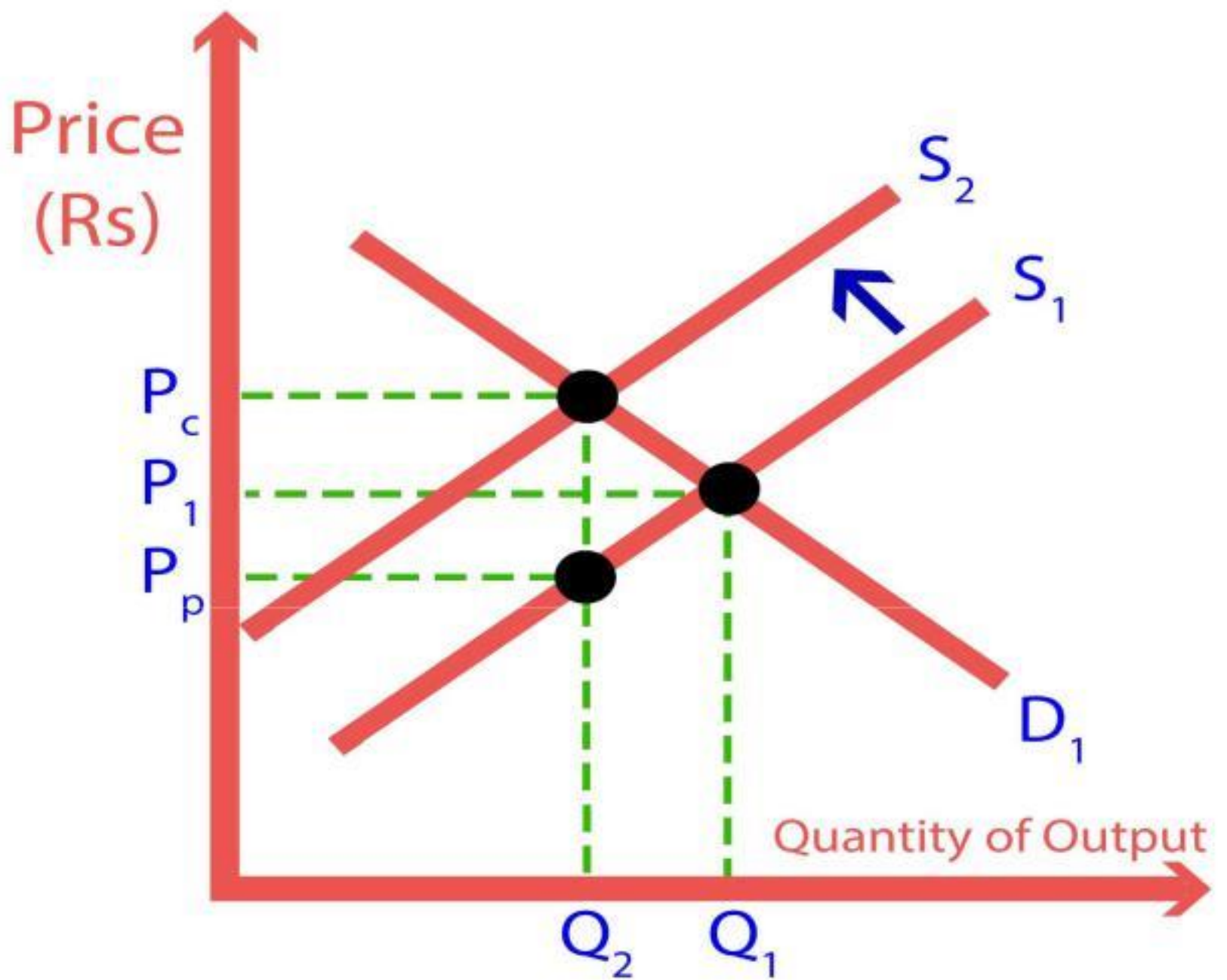
S_2 is the new supply curve after the imposition of tax.

Indirect Tax



At the original equilibrium point, P_1 is the original equilibrium price and Q_1 is original equilibrium quantity

Indirect Tax

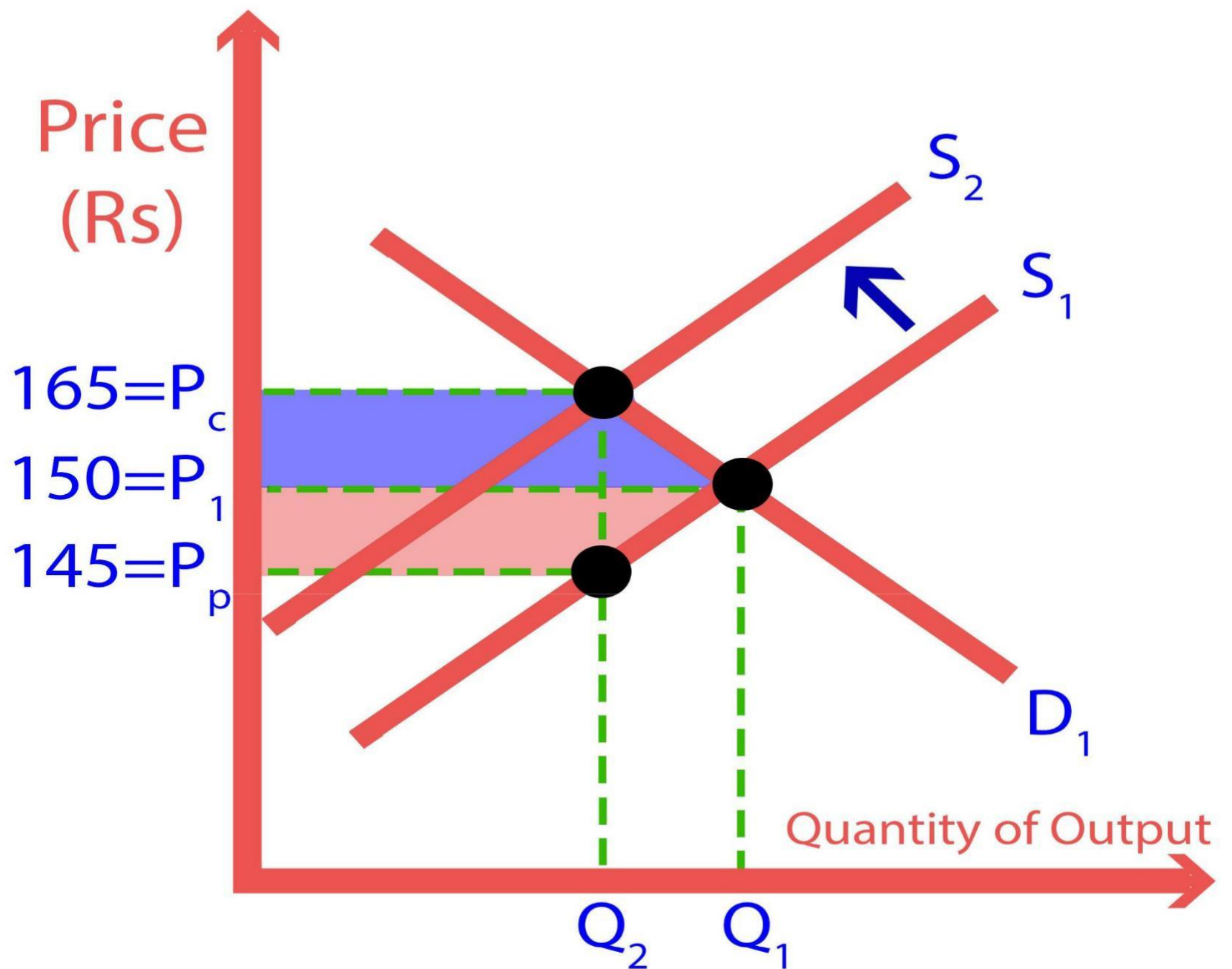


P_c is the new price paid by consumers.

P_p is the new price received by Producers.

And Q_2 is the new equilibrium quantity.

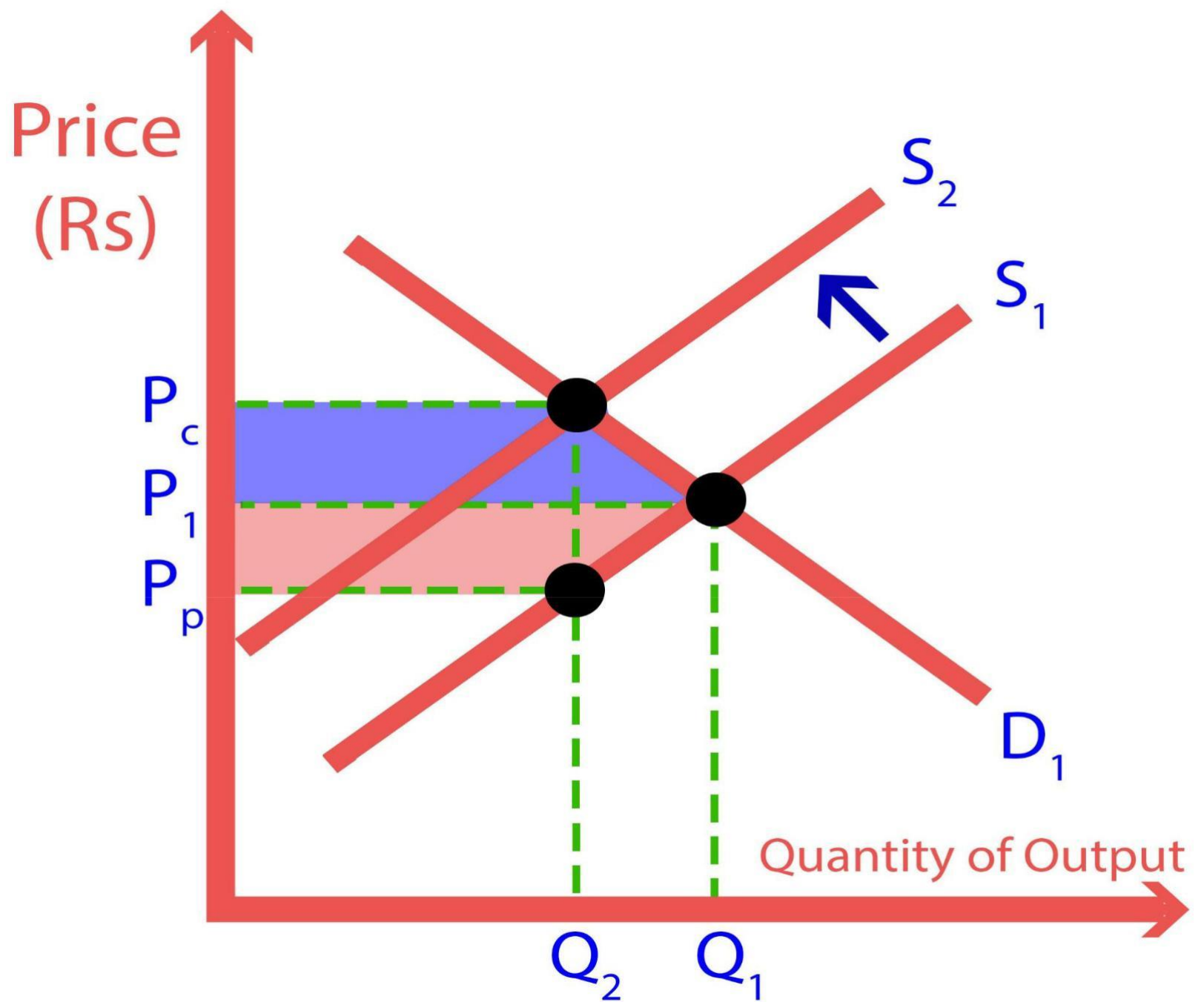
Indirect Tax



P_c is the new price paid by consumers which is higher than the previous equilibrium price of Rs 150.

P_p is the new price received by Producers which is lower than previous equilibrium price of Rs 150.

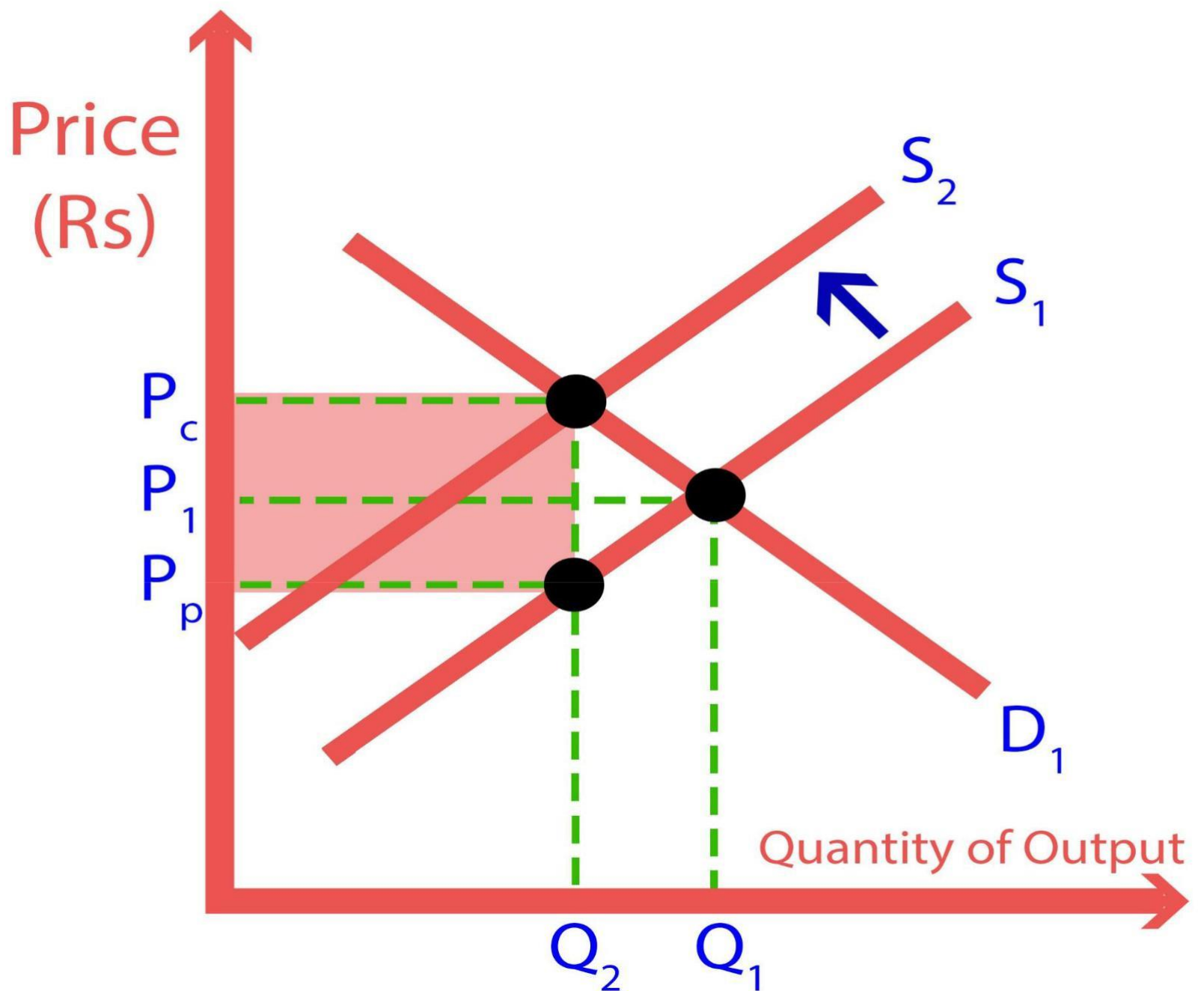
Indirect Tax



The blue shaded trapezium shows loss of consumer surplus.

The red shaded trapezium represents the loss of producer surplus.

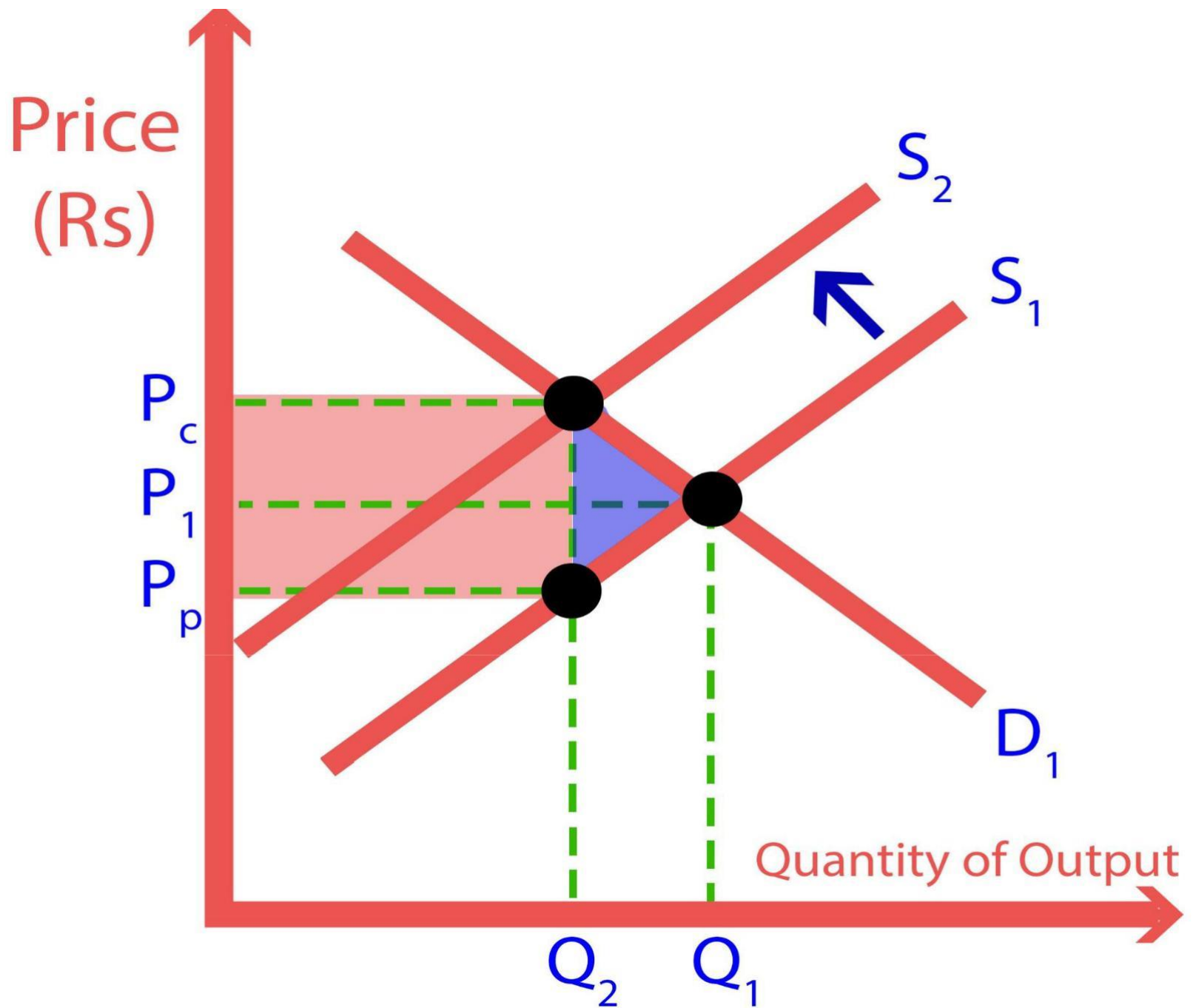
Indirect Tax



The red shaded region represents the total tax revenue received by the government by the imposition of tax.

Total amount of tax is calculated as Per unit tax which in our example is Rs 20 multiplied by new equilibrium quantity which is Q_2 .

Indirect Tax



The red shaded region represents the total tax revenue received by the government by the imposition of tax.

Calculated as Per unit tax which in our example is The blue shaded triangle shows **deadweight loss**.

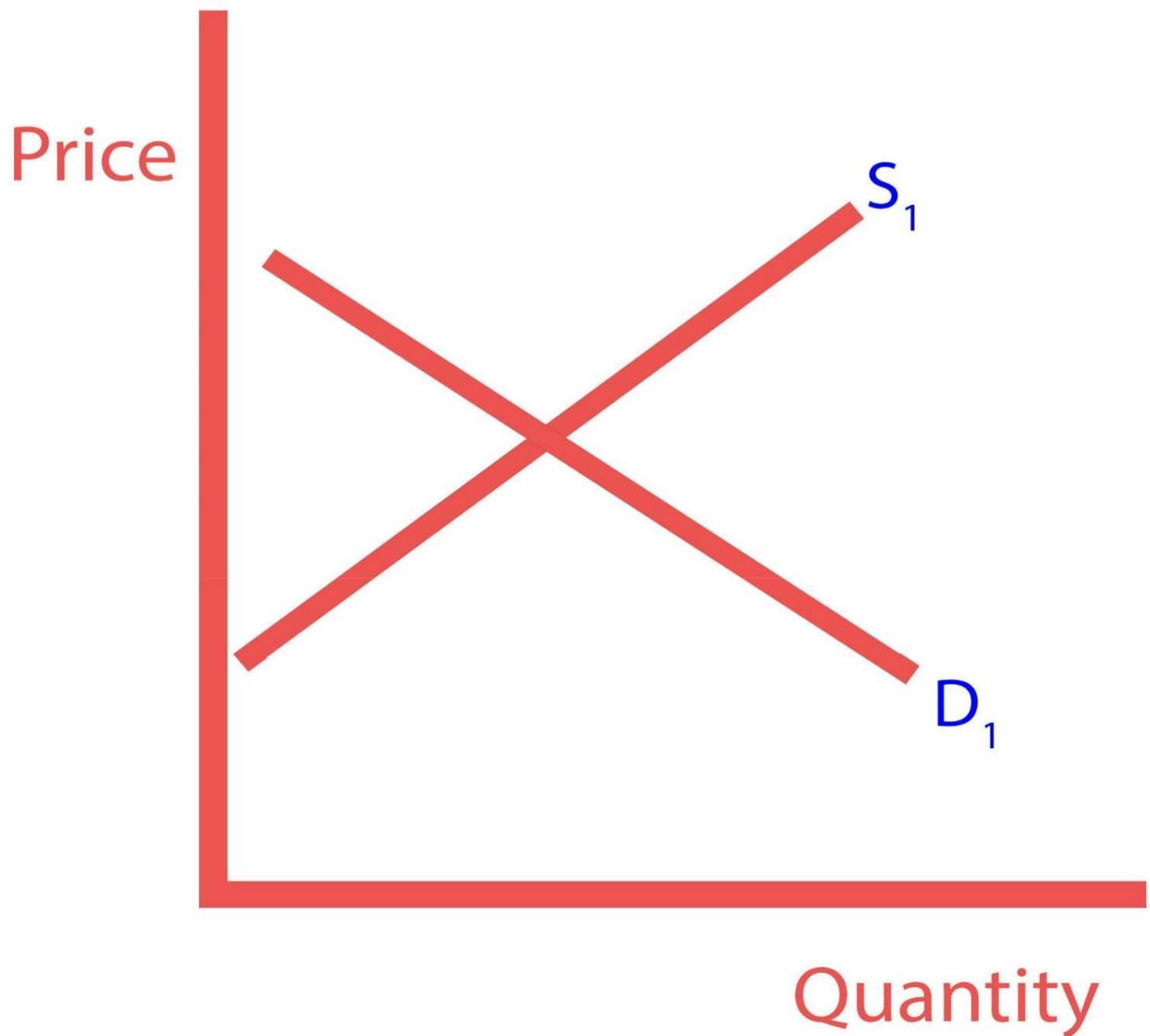
Subsidy & Consumer and Producer Surplus

- Now with the help of graphs we will see how subsidy increases both consumer and producer surplus.
- However this increase in consumer and producer surplus comes at the **expense** of government expenditure.
- Because government spends more amount on the subsidy compared to the combined gain of consumer and producer surplus the

difference is shown as deadweight loss.

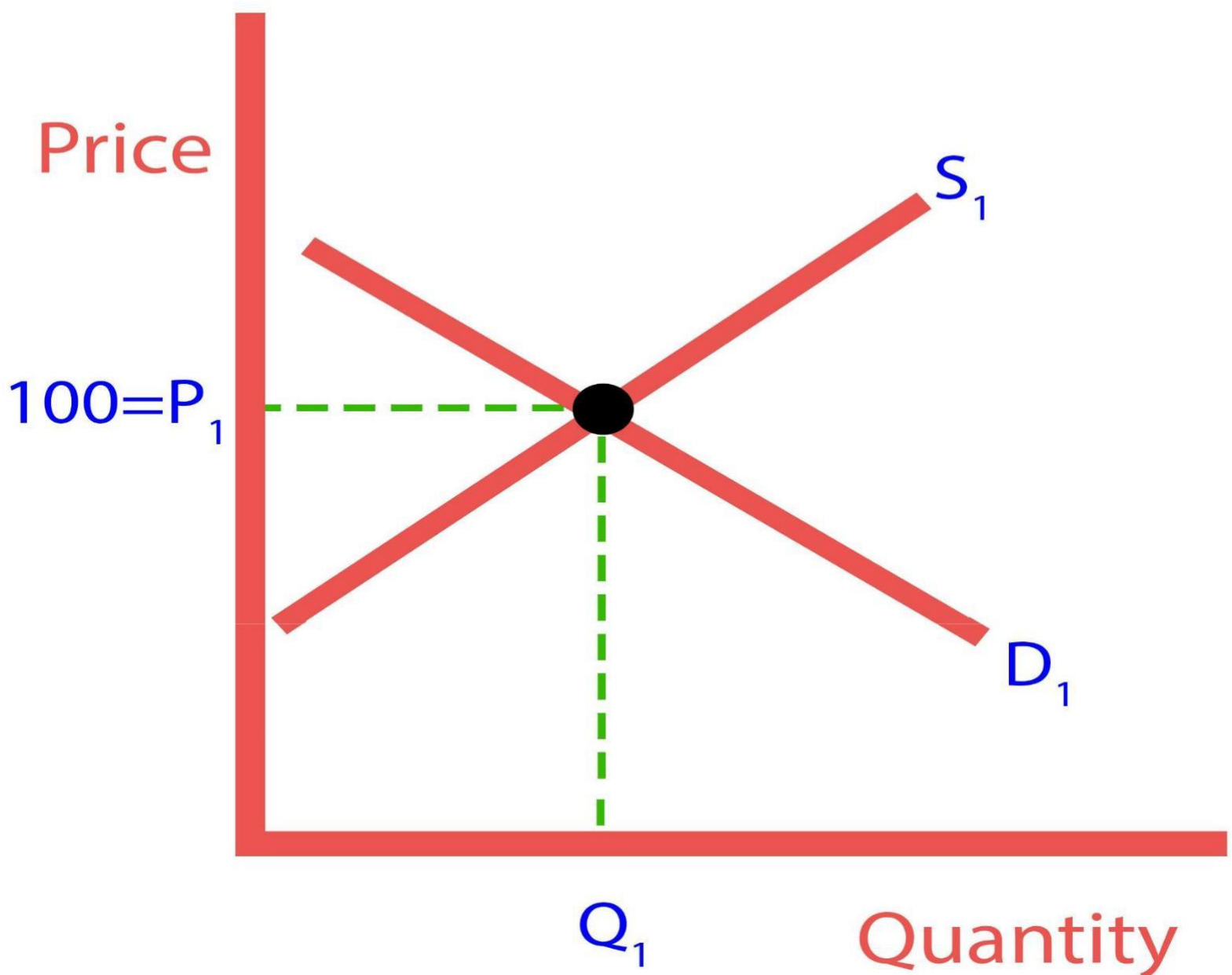
MEGA LECTURE

Subsidy



D_1 is the original demand curve and
 S_1 is the original supply curve.

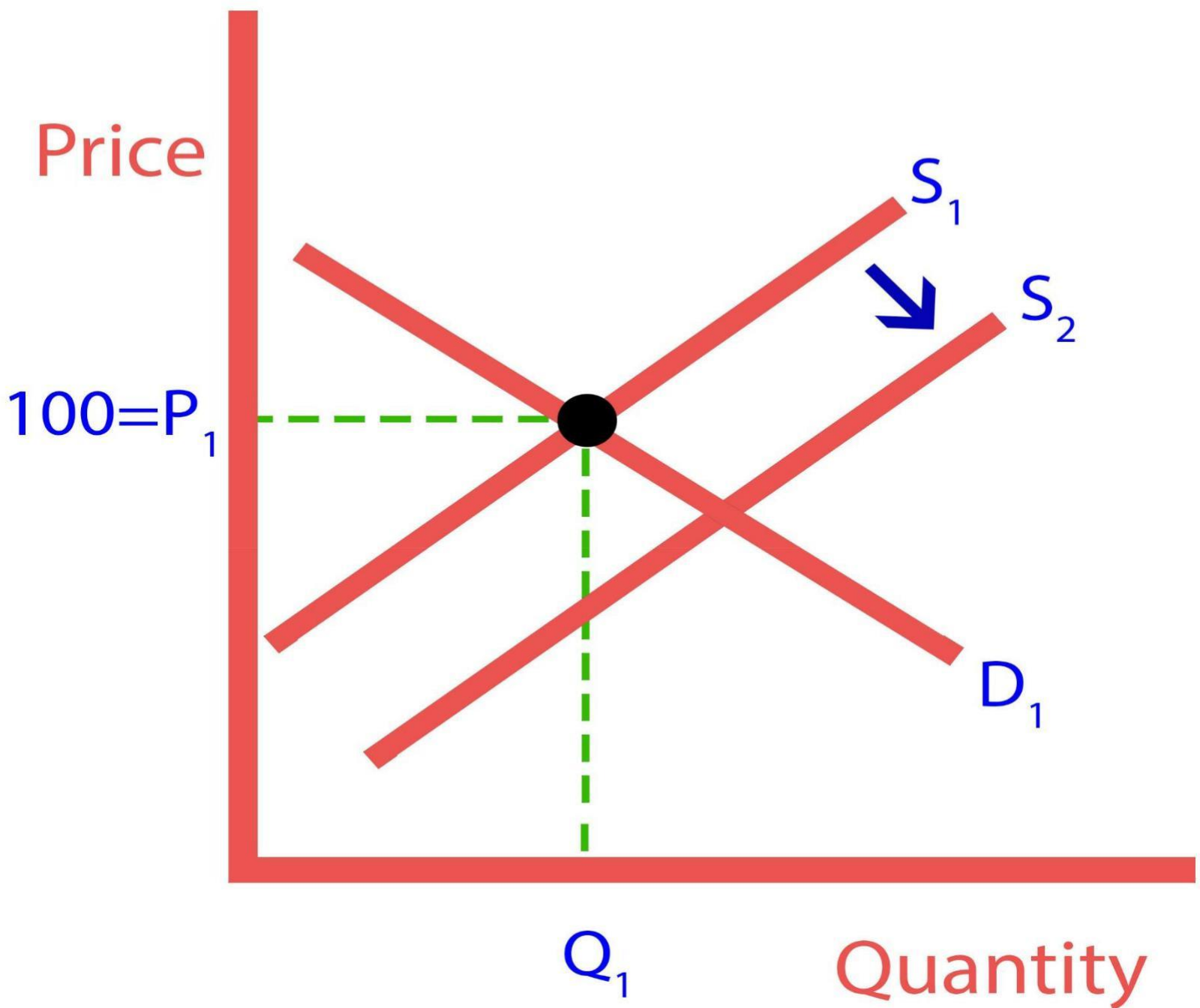
Subsidy



D_1 is the original demand curve and S_1 is the original supply curve.

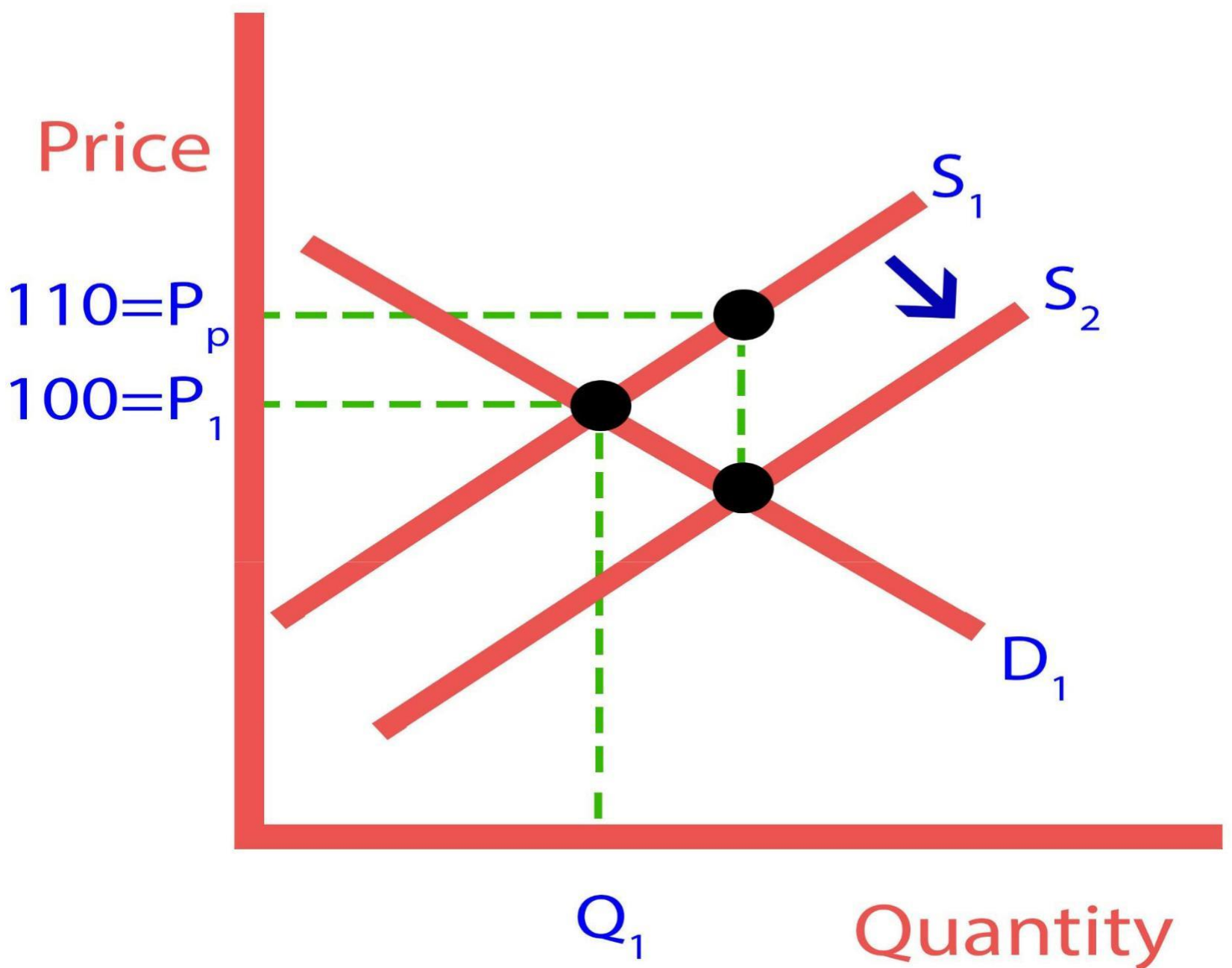
P_1 is the original equilibrium price and Q_1 is the original equilibrium quantity.

Subsidy



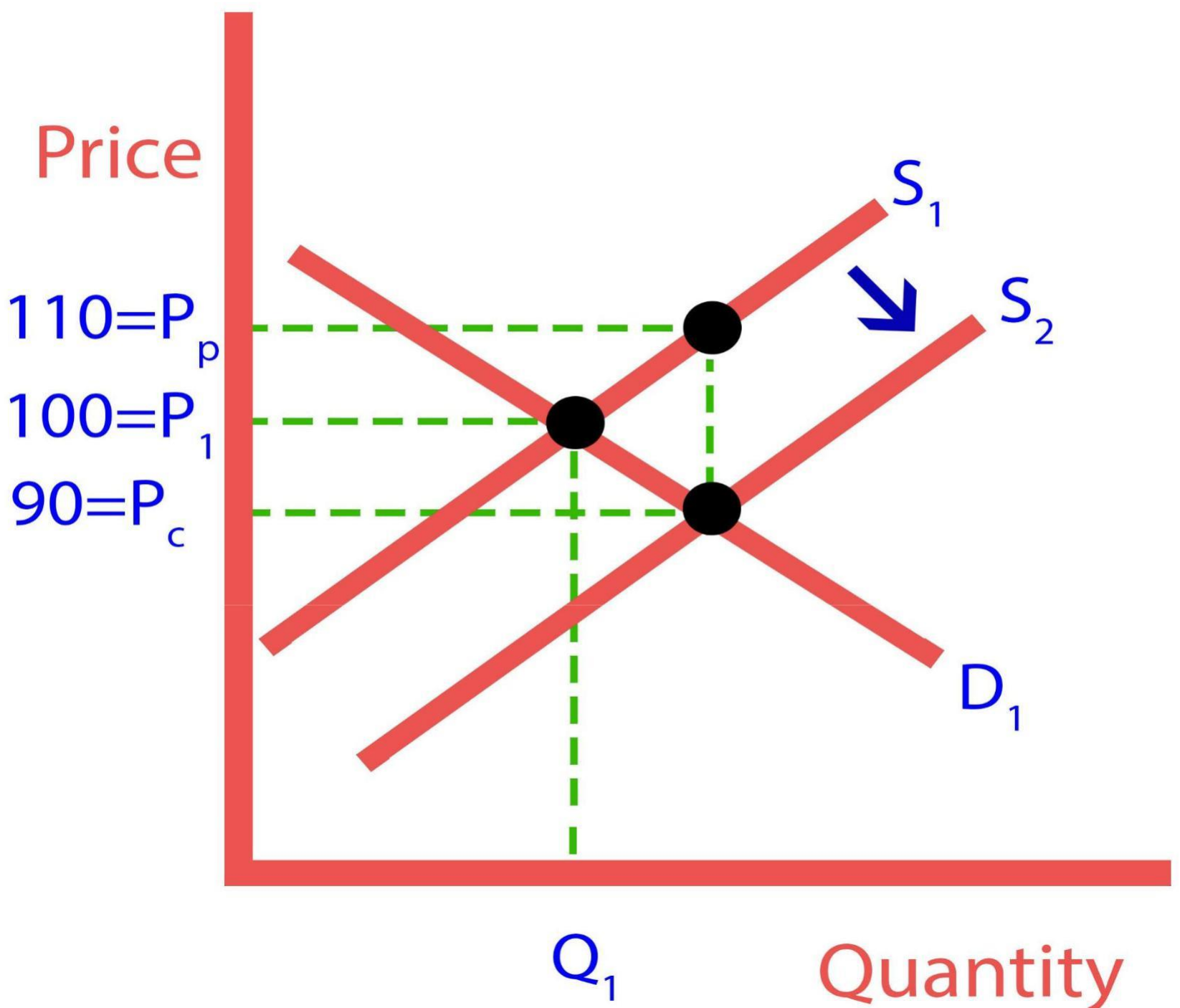
S_2 is the new supply curve after the provision of subsidy.

Subsidy



P_p is the price received by producers after the provision of subsidy which is higher than the price previously received by producers which was Rs 100.

Subsidy

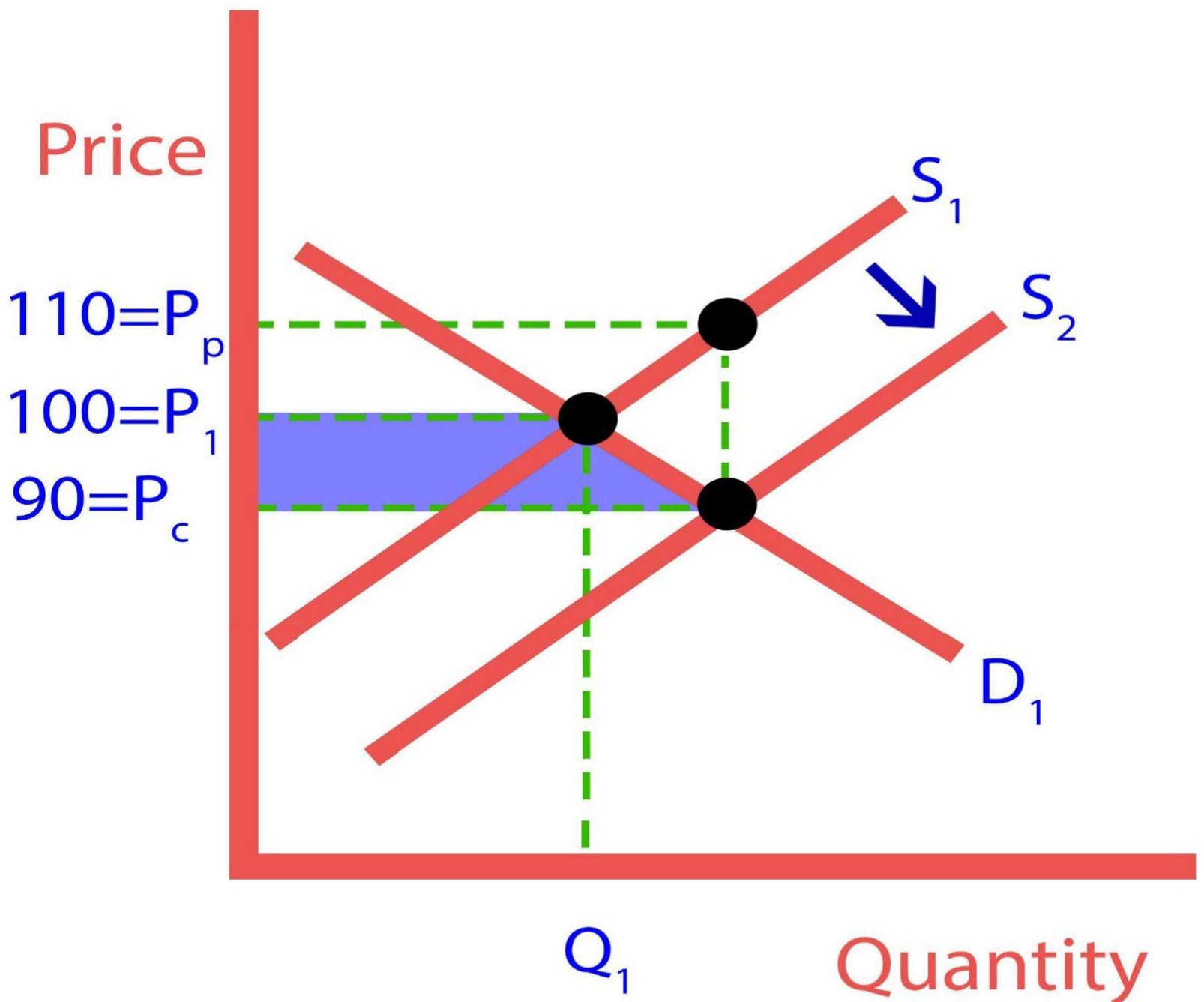


P_c is the new price paid by consumers which is lower than the price previously paid by consumers. Hence it shows that

consumers *benefitted* from the provision of subsidies.

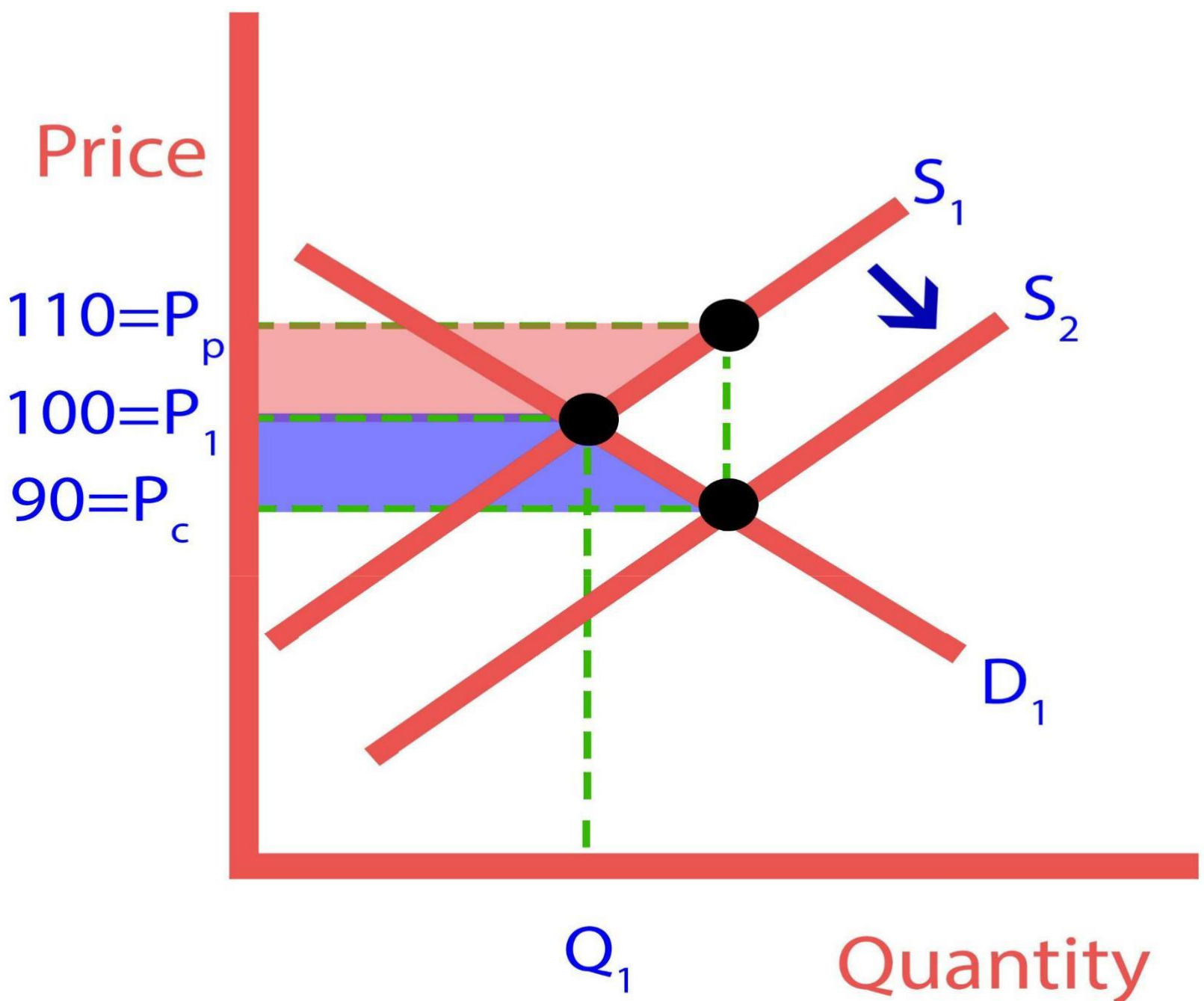
MEGA LECTURE

Subsidy



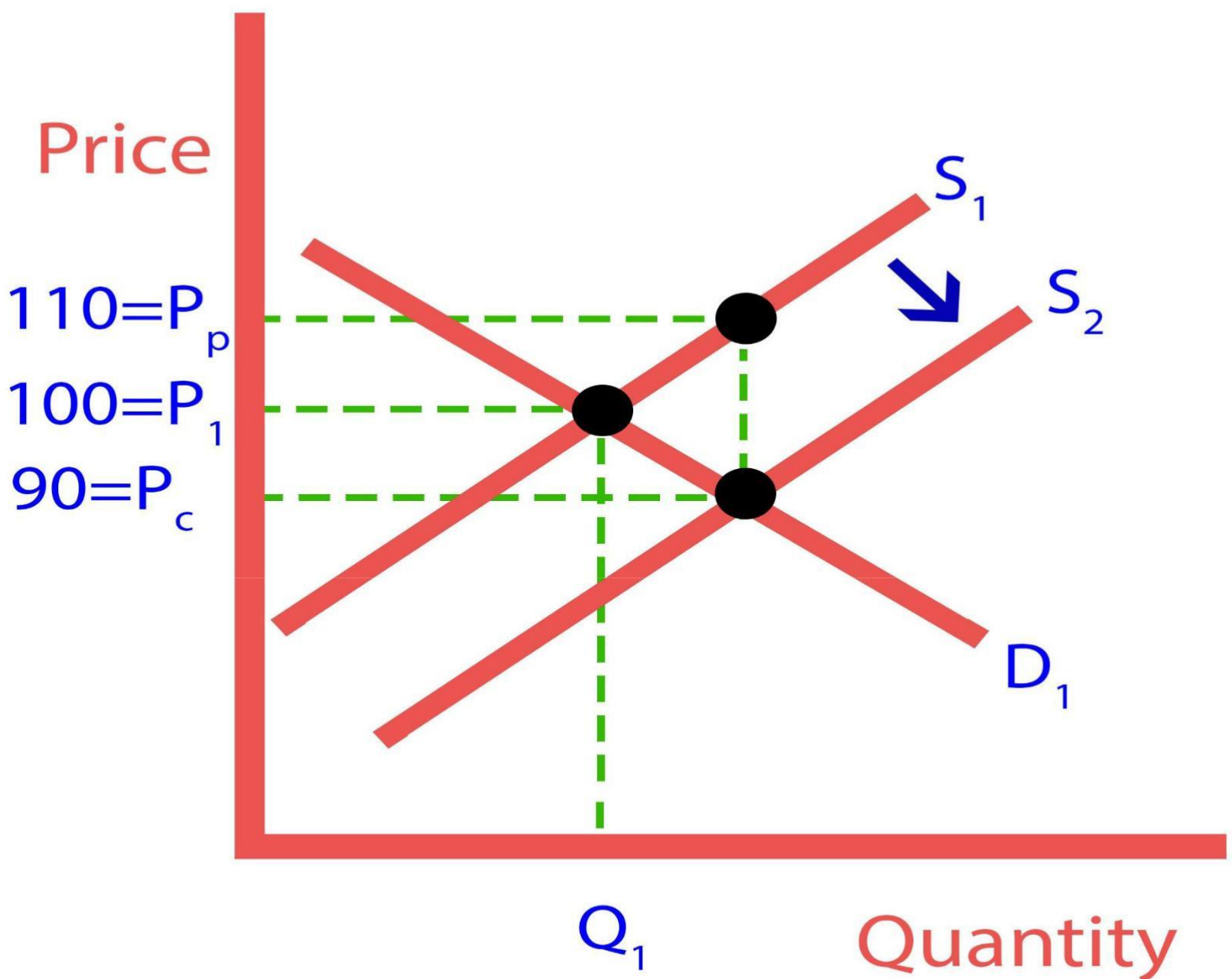
The *blue shaded region* represents the *gain* of consumer surplus.

Subsidy



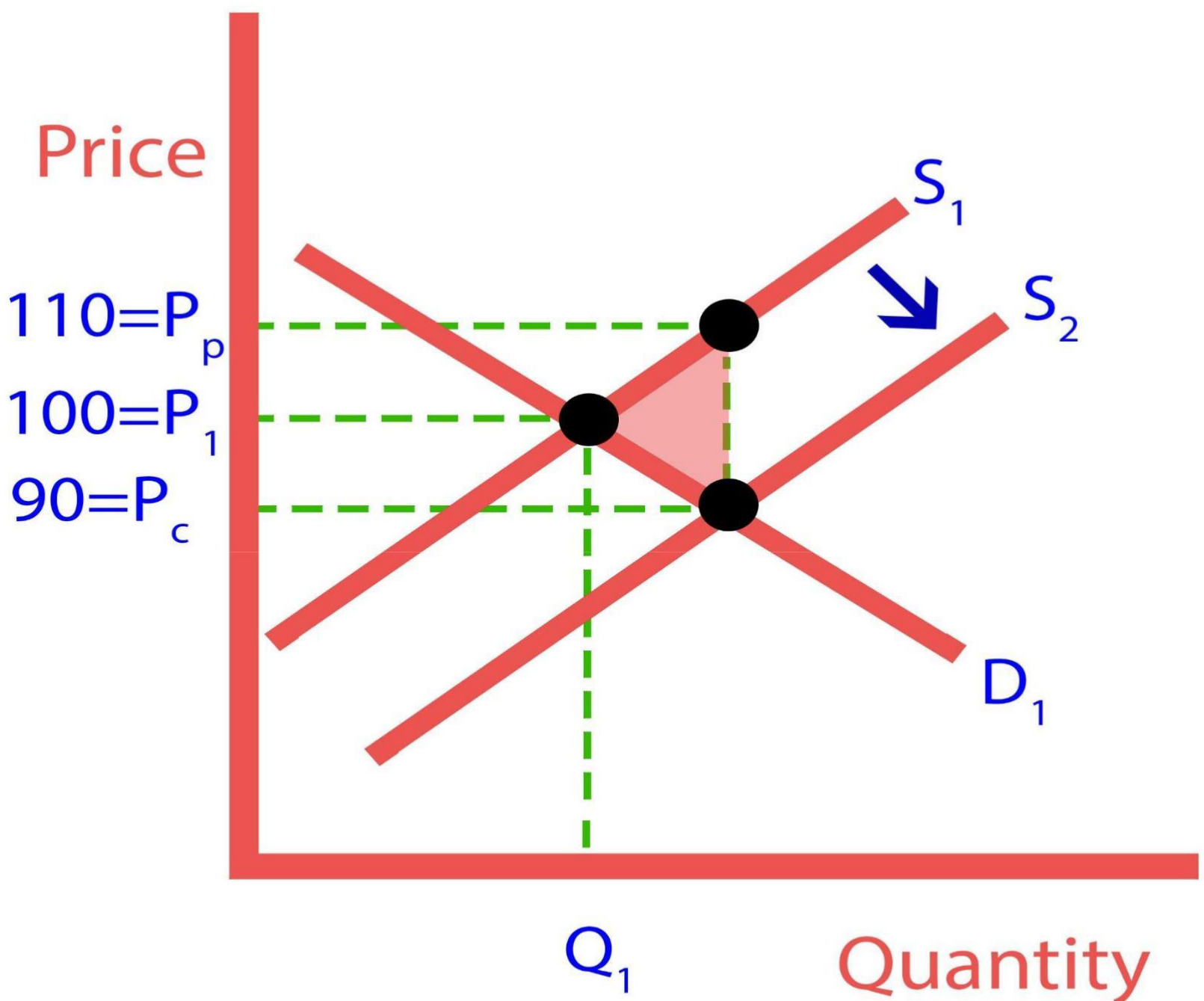
The *red shaded region* represents the gain of producer surplus.

Subsidy



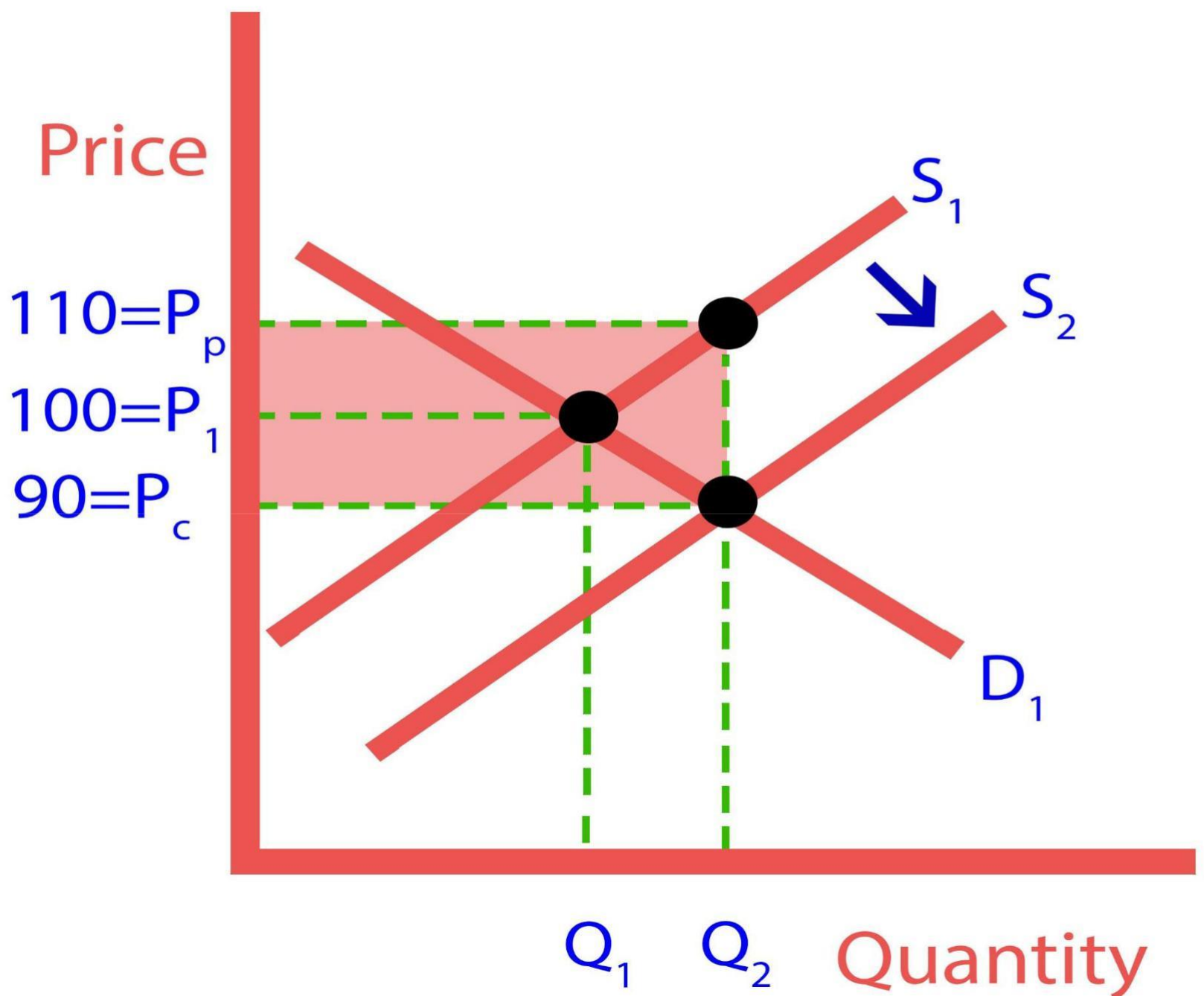
Now we will show the *deadweight loss* that arises from subsidies.

Subsidy



The red shaded triangle shows the deadweight loss that arises from *provision of subsidies*.

Subsidy



The red shaded rectangle shows the cost incurred by the government from the provision of subsidies.



This is calculated by *multiplying the per unit amount of subsidy with the new equilibrium quantity*

MEGA LECTURE