Ways to Measure Elasticity

1. Percentage Method
2. Total Expenditure (Outlay) Method
3. Geometric Method

Percentage Method

The value of elasticity is computed by dividing the relative change in quantity demanded with the relative change in price.

Total Expenditure Method

Price	Quantity	Total Expenditure	Value of Price Elasticity
10	1	10	$e_p > 1$
9	2	18	
8	3	24	
7	4	28	
6	5	30	$e_p = 1$
5	6	30	
4	7	28	$e_p < 1$
3	8	24	
2	9	18	
1	10	10	

Total Expenditure Method

1. If with a fall in price the total expenditure increases or with a rise in price, the total expenditure falls, in that case the elasticity of demand is greater than one; i.e., $e_p > 1$. We have *elastic* demand.

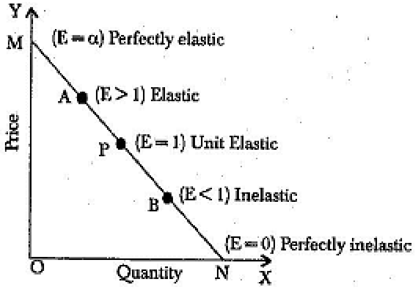
2. If with a rise or fall in the price, the total expenditure remains the same, the demand will be unitary elastic; i.e., $e_p = 1$

3. If with a fall in price, the total expenditure also falls, and with a rise in price the total expenditure also rises, the demand is said to be less elastic; i.e., $e_p < 1$. We have *inelastic* demand.

Geometric Method

It is measured by:

$$\text{Ed at a point} = \frac{\text{Lower segment}}{\text{Upper segment}}$$



Some Review Questions

1. For each of the following pair of goods, would you expect a more elastic demand? Why?
   - NCERT textbooks or books of Tintin
   - Cocunut water or water
2. You have the following information about good X and good Y:
   - Income elasticity of good X is -3
   - Cross price elasticity of good X w.r.t. price of good Y is 2

   Would an increase in income and a decrease in the price of good Y unambiguously decrease the demand for good X? Why or why not?
3. Two drivers— Hardik Pandya and K. L. Rahul—each drive up to a petrol pump. Before looking at the price, each places an order. Mr. Pandya says, “I’d like 10 litres of petrol.” Mr. Rahul says, “I’d like Rs.1000 worth of petrol.” What is each driver’s price elasticity of demand?

4. Consider public policy aimed at smoking:
   - Studies indicate that the price elasticity of demand for cigarettes is about 0.4. If a pack of cigarettes currently costs Rs. 2 and the government wants to reduce smoking by 20%, by how much should it increase the price?
   - Studies also find that teenagers have a higher price elasticity than do adults. Why might this be true?
5. Smriti has decided always to spend one-third of her income on clothing.
   - What is her income elasticity of clothing demand?
   - What is her price elasticity of clothing demand?
   - If Smriti's tastes change and she decides to spend only one-fourth of her income on clothing, how does her demand curve change? What is her income elasticity and price elasticity now?
6. If a 3% increase in the price of corn flakes causes a 6% decline in the quantity demanded, what is the elasticity of demand?

7. Answer in True or False. Also, explain your answers
    - The elasticity of demand is the same as the slope of the demand curve.
    - The cross-price elasticity will always be positive.
8. Consider the following information and answer the following questions: Suppose that business travellers and vacationers have the following demand for airline tickets from Mumbai to Jaipur

Price	**Quantity Demanded**	
	Business Travellers	Tourist
4000	2100	1000
5250	2000	800
6320	1900	600
7780	1800	400

As the price of tickets rises from 5250 to 6320, what is the price elasticity of demand for (i) business travelers and (ii) tourist?

Supply

The supply curve shows the quantity of a good that producers are willing to sell at a given price, holding constant any other factors that might affect the quantity supplied.

$$Q_s = f(P)$$

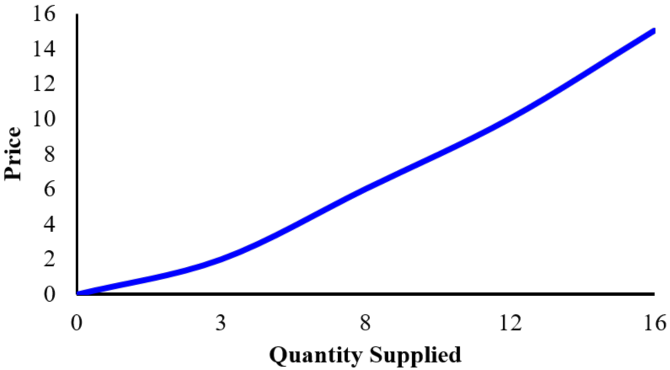
The quantity supplied of any good is the amount of the good that sellers are *willing* and *able* to produce and sell at any given point of time.

Law of Supply: *Ceteris paribus* (other thing reaming the same), when the price of a good falls, the quantity supplied of the good falls and when the price of a good rises, the quantity of the good rises.

Supply Schedule

Price of Cold Drinks	Quantity Supplied of Cold Drinks
0	0
2	3
6	8
10	12
15	16

The Supply Curve



The upward-sloping line relating price and quantity demanded is called the supply curve.

Assumptions to the Law of Supply

1. No change in the cost of factors of production such as wages, interest charges, cost of raw materials, among others
2. No change in technology
3. No change in the expected price of good supplied: If the seller expects that price of good x will increase in the future it will put some of its current production into storage and supply less to the market today
4. No change in the number of sellers in the market
5. No change in the price of related goods: For example, if the price of jackets increase instead of sweaters, producers would tend to produce more of jackets than sweaters. In other words, producers would shift their resources from sweaters to production of jackets
6. No change in the goal of the firm

Why does the Supply Curve Slope Upward?

1. Law of Diminishing Marginal Productivity: Marginal retunrs (additional output) falls with a every additional labor employed, *beyond a certain level*.

2. If price rises, sellers would sell more from their old stock. As a result of it supply increases, as well as, profit also improves.

Exceptions to the Law of Supply

1. Perishable Goods: For instance, Litches is a highly perishable good. So, to clear of stock, the fruit seller vendor is ready to sell of litches once it starts to perish at any given price
2. Future expectations about change in price
3. Agricultural Products: As agricultural production is heavily dependent upon climatic conditions, therefore supply of such commodites may not be responsive to price. For example, due to unforeseen changes in weather, the production of agricultural products is low, then their supply cannot be increased even at higher prices
4. Goods sold through auction

Changes in Supply

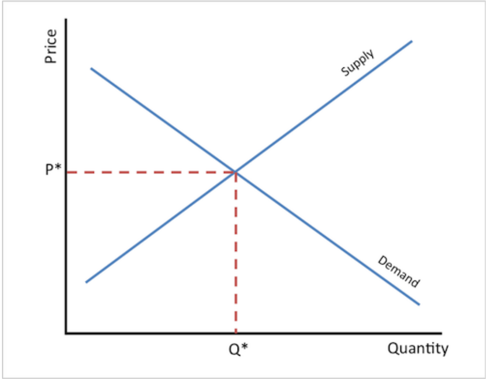
1. Movement along the supply curve
   - Other things remaining the same, if price of commodity *falls* its supply *falls*. It is called *contraction of supply*
   - Other things remaining the same, if price of commodity *rises* its supply *rises*. It is called *extension of supply*
2. Shift of the supply curve
   - Keeping price to be constant, if supply for any commodity *increase* we have a *rightward shift of the supply curve*.
     E.g., Supply curve forgood x will shift to right if the cost of production falls.
   - Keeping price to be constant, if supply for any commodity *decrease* we have a *leftward shift of the supply curve*.
     E.g.,Supply curve forgood x will shift to left if the cost of production rises.

Market Equilibrium

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

The equilibrium price is sometimes called the market-clearing price because, at this price, everyone in the market has been satisfied: Buyers have bought all they want to buy, and sellers have sold all they want to sell.

Market Equilibrium



Market Mechanism: Adam Smith's Invisible Hand

The *unobservable* market force that helps the demand and supply of goods in a free market to reach equilibrium automatically is the invisible hand.

Price per Pizza	**Qty. Demanded**	**Qty. Supplied**	**Surplus/ Shortage**	**Effect on Price**
250	80	280	Surplus of 200	Falls
220	140	240	Surplus of 100	Falls
150	200	200	**Equilibrium**	**Same**
120	260	160	Shortage of 100	Rises
100	320	120	Shortage of 200	Rises

A shortage creates a upward pressure on price and a surplus creates downward pressure on price.

The equilibrium reached is also called the Walrasian Equilibrium and it is achieved through *tatonnment process*.

Distortions to Equilibrium Price and Quantity Levels

1. Price Floors: It is *minimum* prices (above the equilibrium price level) set by the government for certain commodities and services that it believes are being sold in an unfair market with too low of a price and thus their producers deserve some assistance.

   E.g., Agricultural Commodities

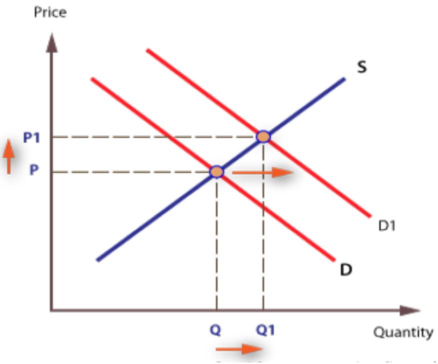
2. Price Ceilings: It is *maximum* prices set by the government for particular goods and services that they believe are being sold at too high of a price and thus consumers need some help purchasing them.

   E.g., Petroleum Prices, Monthly rent of residential houses

Changes in Equilibrium Price and Quantiy

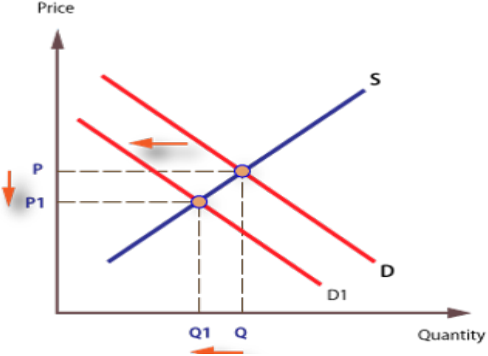
1. Shifts of the Demand curve
2. Shifts of the Supply curve
3. Shifts in both Demand and Supply Curve

Shift in the Demand Curve



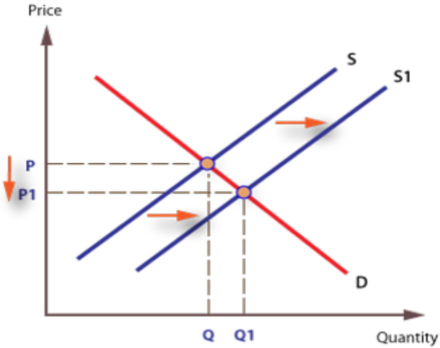
Increase in demand, causes the demand curve to shift right. Thus, at price level ‘p’ there is an excess demand (or shortage). As a result price increases. As price increases to P1, demand falls along the new demand curve to Q1.

Shift in the Demand Curve



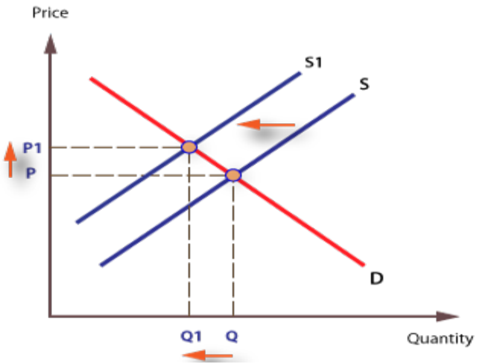
Decrease in demand, causes the demand curve to shift left. Thus, at price level 'p' there is an excess supply (or surplus). As a result price falls. As price decreases to P1, demand rises along the new demand curve to Q1.

Shift in the Supply Curve



Increase in supply, causes the supply curve to shift right. Thus, at price level 'p' there is an excess supply (or surplus). As a result price falls. As price decreases to P1, supply falls along the new supply curve to Q1.

Shift in the Supply Curve



Decrease in supply, causes the supply curve to shift left. Thus, at price level 'p' there is an excess demand (or shortage). As a result price increases. As price increases to P1, supply increases along the new supply curve to Q1.

Some Practice Questions

1. Suppose the demand curve for a product is given by

$$Q = 10 - 2P + P_s$$

   where P is the price of the product and P_s is the price of a substitute good and it is equal to Rs. 2

   - Suppose, P = Rs. 1. What is the price elasticity of demand? What is the cross-price elasticity of demand?
   - Suppose the price of the good, P, goes to 2. Now what is the price elasticity of demand? What is the cross-price elasticity of demand?

2. Suppose the demand for natural gas is perfectly inelastic. What would be the effect, if any, of natural gas price controls?

Some Practice Questions

3. The market for pendrives has the following supply and demand curves given by $P = 2Q_S \& P = 42 - Q_D$, respectievly. What will be the equilibrium price and quanity? If price is 14, what would be the equilibrium quantity?

4. The demand function for a good X is $Q_d = 1800 - 20P + 0.06M - 50P_R$, where M is the consumer income and P_R is the price of related good Y. is good X is a normal or an inferior good? Good X and Y are substitutes or complements?

5. Lovers of classical music persuade government to impose a price ceiling of Rs. 400 per concert ticket. As a result of this policy, do more or fewer people attend classical music concerts?

Some Practice Questions

6. The market price for chewing gum is competitive with a price of Rs. 5 per pack and quantity of 100,000 packs. Which of the following events would lead to new equilibrium price of Rs. 4 and quantity of 80000 packs?

    - an increase in price of other kinds of candy
    - an increase in the price of ingredients used to make chewing gum
    - a decrease in the the number of young people in the population
    - an agreement by workers in the chewing gum industry to work for lower wages
    - an improvement in chewing gum production technology