

Econ-Hub **Rapid Revision Classes**

Market Economics

Demand & Supply Analysis

Unit [2] - BOOK [1]

Theory Recap Material [TRM]

2027 A/L Edition





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Theory Recap **Material** [TRM]
[Input for **Special Practice Questions**: SPQs]

Essentials **01**

‘Market Economics’ as a ‘Microeconomics’ area:

The word micro means small, and microeconomics focuses on the behavior of **individual markets** and the smaller individual units that make up the broader economy: Businesses, consumers, investors, and workers.

Microeconomics is **distinguished from macroeconomics** which focuses on problems in the broader economy like inflation, unemployment and the rate of economic growth.

Market economics is known as a microeconomics area, since the focus of market economics is to study or analyze and understand workings of the market for a **single given product**, in terms of how its **market demand** and **supply determine price**, and how such price is subject to change due to various reasons.

A ‘Market’ in economics

A market from an economic perspective is a concept which has a broad meaning, which can be defined as an institutional mechanism or arrangement which creates a relationship or link between buyers and sellers for the exchange of goods, services, and factors of production.

In simple terms a market is a group of buyers and sellers of a particular good or service. It is an opportunity to mutually exchange ideas with each other in determining price and quantity.

‘Factor’ and ‘Product’ market

The **‘Factor market’** is a market in which the price and employment of production factors are determined, by the derived demand made by firms and supply made by households as factor owners.

The **‘Goods or Product market’** is a market in which the price and distribution of goods and services are determined by the direct demand made by households as consumers and supply made by firms.

A Competitive Market

A competitive market is essentially a market situation or structure in which there are many buyers and many sellers so that each has a negligible (insignificant) impact on the market price.

In a perfectly competitive market, there will be a very large number of firms (and buyers), no barriers to enter (and exit) the market, homogeneous product and perfect market information.

Demand Analysis

Defining Demand (Effective Demand)

Demand in the study of economics is basically discussed in the context of effective demand, rather than latent demand.

Effective demand is the different quantities of a given good, consumers are wanting (*willing*), having the purchasing power to buy (*ability*) and planning to buy, under alternative (*range of*) prices in the market, when all other factors affecting demand are held constant, during a given period of time.

***Latent demand** is the potential demand for a good or a service. Under latent demand, although there is a willingness to buy a good or service among buyers, they lack (don't have) the purchasing power to afford the good or the service.*

'Want' Vs. 'Demand' (Effective Demand)

Wants are the unlimited desire or willingness which exist within human beings to consume goods and services. While consumers have unlimited wants, every consumer must face the problem of relative scarcity [i.e., the limitedness of resources required to attain goods and services, in comparison to said unlimited wants].

Therefore, consumers' will be unable to satisfy all their expressed/preferred wants, by way of purchasing the appropriate goods and services. Accordingly, demand represents only the selected wants among said unlimited wants a consumer has decided to satisfy, during a given point of time.

Human wants are discussed within a broad sphere (range), on the contrary demand as a concept is defined within a much narrow and specific sense. It is also noteworthy, having a want or willingness is only one of the three factors emphasized in demand, along with purchasing power and readiness to buy.

'Individual' Vs. 'Market' demand

Individual demand represents the quantities of a given product, an individual consumer in the market is *wanting, having the purchasing power, and planning to buy, at alternative prices (range of prices) in the market, when all other factors affecting demand remain constant during a given period of time.*

Market demand is the sum of all the quantities of a given product, all consumers operating in the market are *wanting, having the purchasing power, and planning to purchase, at alternative prices (range of prices) in the market, when all other factors affecting demand remain constant during a given period of time.*

Generic Factors Affecting (Determinants of) 'Market Demand':

1) The Product's Own Price (P_x)

Other Factors Affecting Demand:

[AKA: Factors other than product's price OR Conditions of Demand OR Non-price Factors]

2) Price of related products (P_n):

- a. Price of Substitute Goods
- b. Price of Complementary Goods

3) Nominal Income of Consumers (Y)

4) Consumer Taste or Preferences (T)

5) Consumer Expectations (E_x)

6) Social and Demographic Trends or Factors (R)

7) Number of Consumers or Size of the Market (N)

8) Other relevant factors (O):

- a. Natural factors
- b. Human-made factors
- c. Acts of state (Government regulations)

Also, Relevant [1]:

[A] **Quantity demanded (Q_d):**

This is the amount (quantity or number of units) of a good that buyers are willing and able to purchase, **at a specific or given price**.

[B] **Non-price OR Other Factors Affecting Demand:**

These are the factors affecting the demand of a product **other than the given product's own price**. Any other factor or condition affecting demand, in addition to the price of the product under consideration.

[C] **'Constancy Assumption' or 'Ceteris Paribus'**

Which says that only one factor affecting demand is assumed to change when analyzing the functional relationships indicated through the demand function, while all other factors are held constant.

‘Theory of Demand’

The theory of demand refers to a broad concept which analyses and explains the change in demand of a given product in relation to a change in any, and all determinant affecting the market demand of the product.

In simple terms this is the functional relationship between the market demand for a given product and the factors affecting market demand. The theory of demand is generally illustrated using a market demand function:

$$Q_d = f(P, P_n, Y, T, Ex, R, N, O)$$

‘Demand’ Vs. ‘Quantity demanded’

Demand (D) refers to the overall relationship between the quantity demanded and price of a certain product when all other factors affecting demand, apart from price of the own product is held constant, during a given period of time.

Quantity demanded (Qd) essentially refers to the amount of a good that buyers are willing and able to purchase, at a specific price.

In other words, Qd is a specific price: quantity combination, which indicates one point of a certain demand schedule or curve, i.e., the quantity demanded at a given price, while demand is represented by the entire demand curve.

Quantity demanded is generally used to measure the demand for a certain product.

‘Substitute Goods’ Vs. ‘Complementary Goods’

Substitutes goods are two goods for which all other factors affecting demand held constant, during a given period time, there is a **positive or direct relationship** between the price of one product and the demand for the other product.

In practice, a substitute is a good which can replace another to satisfy the same want. Substitutes in a market context are essentially goods that compete or are rival.

Examples:

Butter and margarine, Potatoes and sweet potatoes, Tea and coffee, Movie tickets and drama tickets, Bus travel and train travel.

‘Complementary Goods’

Complementary goods are two goods for which all other factors affecting demand held constant, during a given period time, there is a **negative or indirect relationship** between the price of one product and the demand for the other product.

In a practical sense, a complement is a good which is purchased and used with other goods to satisfy a want.

Complementary goods are also known as goods with a joint demand, especially when two or more complements are bought together.

Examples:

Smart phone and mobile data (or Wi-Fi access), Tea and sugar, gun and bullets, Pen and ink, TV and Satellite Set-top (receiver) Box

‘Normal Goods’ Vs. ‘Inferior Goods’

A normal good is a good for which, all other things factors affecting demand held constant, during a given period of time, there is a **positive or direct relationship** between consumer’s income and demand for the good.

‘Inferior Goods’

An inferior good is a good for which, all other things factors affecting demand held constant, during a given period of time, there is a **Negative or Indirect relationship** between consumer’s income and demand for the good.

The distinction between an inferior good and normal good is highly subjective. The same product can be perceived as an inferior good or normal good depending on (or subject to) the demanders income level (high- or low-income earners). Therefore, a given product cannot be inferior at all income levels, of a given income earner.

Standard (Common) Examples:

- Bread – consumers may shift from this relatively cheap, filling food to more expensive three or four course meals or other convenience foods as their incomes increase.
- Margarine – consumers shift from margarine to butter, if their income rises [this might not happen at a higher rate today, due to health concerns]
- Bus transport – consumers switch from buses to their own cars when they can afford to buy their own car.

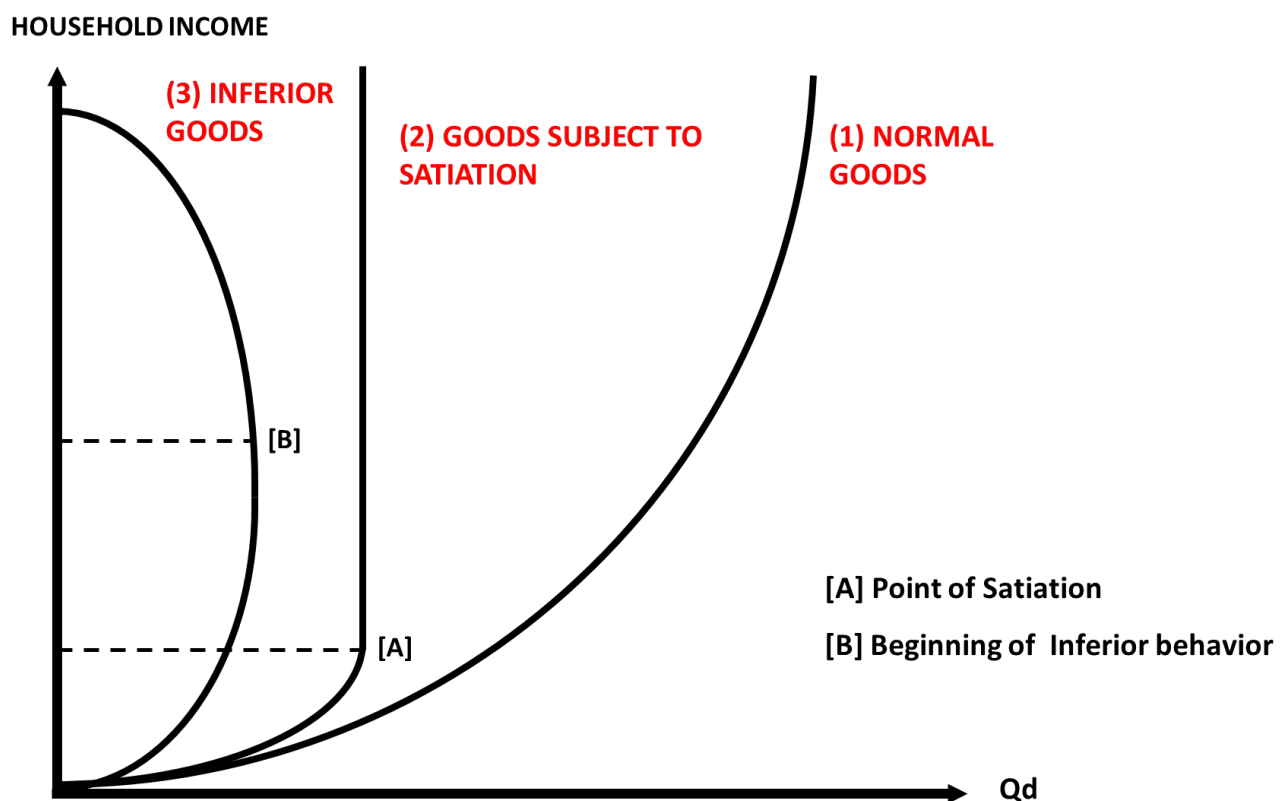
Goods Subject to Satiation

These are goods for which the consumption is limited to a certain level or number of units. The total amount required will be purchased at a certain income level.

The number of units purchased will fully satisfy the consumer needs of this product. After a certain point even if income increases the demand for such goods will not change or increase.

Examples: Salt, basic or essential food items etc

Graphical Illustration: Engle's Curves



Consumer Preferences or Taste (T)

It can be very successfully argued that the most obvious determinant of any consumers demand is taste and preferences.

Economists normally do not try to explain people's tastes because tastes are based on historical and psychological forces that are beyond the domain of study in economics. Although economists take interest in studying what happens when tastes are subject to change.

Social and Demographic Trends (R)

Demographic trends and social conditions are also important factors affecting consumer demand. Demographic trends such as age, gender, health status, education status, social class; rural or urban, religious beliefs social values etc. shall affect the demand for a good or service. Based on the behavior of such factors the demand for a product can increase or decrease.

Demographical trends are identified as a qualitative factor affecting demand where the changes are measured as favorable or unfavorable rather than an increase or decrease.

Consumer Expectation (Ex)

Consumer expectations about the future may affect demand for a good or service at present. For instance, if a consumer is expecting his or her income to increase in the near future, they may choose to save less now and spend more of their current income buying goods, i.e., increase present demand.

In terms of the future price expectations, especially in the case of high valued consumer durables, the relationship between the future price expected and the present demand of such goods tends to be positive or direct in nature.

Natural, Man-created and Acts of State

Certain unexpected favorable and unfavorable natural factors can affect the demand of a product. Droughts, floods, earthquakes, epidemics, tsunami are some examples for such natural factors. Changes or developments in natural factors can directly and indirectly affect the demand for a given product.

Example:

- Increase in demand for generators and lithium-ion battery due to power cuts
- Increase in the demand for facemasks and hand sanitizers due to the COVID 19 Pandemic
- Decrease in the demand for chicken after the bird flu virus.
- Decrease in the demand for fish after the tsunami disaster.

Impact of man-made factors [health hazards, product and process innovations, business ethics, ecological impact etc] and acts of state or government decisions [different rules and regulations, taxation], may be subjective or product specific and both favorable and unfavorable.

'Law of Demand (LoD)'

The law of demand states that there is a negative (indirect) or inverse relationship between price and quantity demanded of a given product, when all other factors affecting demand remain constant, during a given period of time.

Alternatively:

Law of demand states that when the price of a given product increases or is at a higher level the quantity demanded of the product tend to fall or be at a lower level and when the price decreases or is at lower level the quantity demanded of the product will rise or be at a higher level, when other factors affecting demand are held constant, during a given period of time.

ESSENTIALS of LoD

- [1] Functional **Variables**: **Price (P)** and **Quantity demanded (Qd)**

- [2] **Assumptions**:
 - [1] **Other factors (non-price) being constant.**
 - [2] Considering a **given situation** or **point of time**.
 - [3] *Considering the demand for a Normal Good*
 - [4] *Rational consumer behavior*

- [3] **Application**:
Indicates, change in Quantity demanded (ΔQ_d) of a product, in response to a change in Price (ΔP), i.e., if price rises, other things equal, Qd decreases, and vice versa.

- [4] **Reason [Justification]**: The **Price Effect** of a change in price, which is a combination of two sub effects:
 - 1) **Substitution Effect**
 - 2) **Income Effect**

- [5] **Representation**: **Explained or Implied by**:
 - 1) Demand schedule (**inverse schedule**)
 - 2) Demand curve or function (**downwards sloping**)
 - 3) Demand equation (**negative operator**)

Assumed to be a **Linear (Straight-line) model**.

- [6] **Exceptions** (goods or situations) converse to the standard law of demand may exist (Giffen goods, prestige goods, judging quality by price, speculative goods)

Noteworthy: Theory of Demand Vs. Law of Demand

The theory of demand refers to a broad concept which analyses and explains the change in demand of a given product in relation to a change in any, and all determinant affecting the market demand of the product.

In simple terms this is the functional relationship between the market demand for a given product and the factors affecting market demand. The theory of demand is generally illustrated using a market demand function:

$$Q_d = f(P, P_n, Y, T, Ex, R, N, O)$$

Reasons for (Justifying) Law of Demand

The price effect refers to the impact on quantity demanded of a given product, due to a change in its price, while other factors affecting demand are held constant.

The price effects operates through two main forces or sub-effects:

- Substitution Effect
- Income Effect

Substitution effect of a price change is the tendency of consumers to change quantity demanded of a given good as a result of its relative price changing.

When all other factors affecting demand of a product are held constant (*especially price of substitute goods and consumers' nominal income*), when only the price of the product concerned increases, consumers "substitute away" from the product concerned (i.e. decrease quantity demanded), since it becomes relatively expensive and if price decreases, consumers shall 'substitute in favour' (i.e., increase quantity demanded) of the product concerned, since it becomes relatively cheap.

Income effect of a price change is the change in quantity demanded of a product because the change in its price has the effect of changing a consumer's real income.

When all other factors affecting demand of a **normal good** are held constant (*especially consumers money income and price of related products*), when only the price of the product concerned increases, the quantity demanded for the product is decreased, since the consumers' real income decreases (*i.e. consumers' become relatively poor in real terms*), and if price falls, consumers shall increase their quantity demanded, since consumers' real income increases (*i.e. consumers' become relatively richer in real terms*).

Situations Converse to or Defying LoD

[The phenomenon of upward sloping demand curves]

- (A) The principle or case of 'Giffen Goods'
- (B) Goods with a Snob demand
- (C) Judging Quality by Price

[A] Giffen Goods

This is a special type of inferior good. A rise in price leads to an increase in the quantity demanded, when other non-price factors affecting demand are held constant. In other words, the price quantity demanded relationship is positive, thus the demand curve becomes upward sloping from left to right.

With regards to giffen goods a rise in price leads to a rise in quantity demanded because of the substitution effect but a rise in quantity demanded because of the income effect. However, the income effect outweighs the substitution effect, leading to rises in quantity demanded as price rises.

Essentially, for good to become a giffen good, two conditions need to be fulfilled:

- (01) The good should be an **inferior good** (the income effect of a price change should work in against the LoD, i.e., negative income effect)
- (02) The good must be a **staple commodity** on which the **poor spend a high proportion** of their **income**, thus the negative income effect, shall outweigh the substitution effect (making the overall price effect positive or against the LoD)

[B] Goods with 'Snob' appeal

This is where a good is purchased not to make use of its practical use or based on a rational price comparison, simply because of a given individual buyers perception that high priced, exclusive, or super luxury goods will confer status or prestige on them, which only a few people can afford. Therefore, higher the price more the snob demands for such goods.

Such goods are also sometimes termed as Prestige Goods, High Luxury Goods, Ostentatious Consumption or Veblen goods.

Examples: Diamonds, super luxury cars, timepieces, yachts, perfumes etc

[C] Quality Goods: Judging Quality by Price

Certain individuals believe that the higher the price of a certain product, the better the quality of the product and simply the best indicator of a product's quality is the price.

In such a situation an increase in price may lead to an increase demand instead of a decrease instead of a decrease in demand. Therefore, the demand curve in such a situation, shall slope upwards rather than downwards from left to right.

Classification of goods based on

‘Substitution Effect (SE)’ and Income effect (IE)’ of a Price Change

Price Effect of a ‘Normal Good’

Change in Price	Substitution Effect (SE)	Income Effect (IE)	Price Effect (PE)
Increase	Negative ($Q_d \downarrow$)	Positive ($Q_d \downarrow$)	Negative ($Q_d \downarrow$)
Decrease	Negative ($Q_d \uparrow$)	Positive ($Q_d \uparrow$)	Negative ($Q_d \uparrow$)

In terms of a normal good, both the substitution effect and the income effect works towards establishing the negative price effect or law of demand, and generally tend to be equal in power.

Price Effect of an ‘Inferior Good’

Change in Price	Substitution Effect (SE)	Income Effect (IE)	Price Effect (PE)
Increase	Negative ($Q_d \downarrow$)	Negative ($Q_d \uparrow$)	Negative ($Q_d \downarrow$)
Decrease	Negative ($Q_d \uparrow$)	Negative ($Q_d \downarrow$)	Negative ($Q_d \uparrow$)

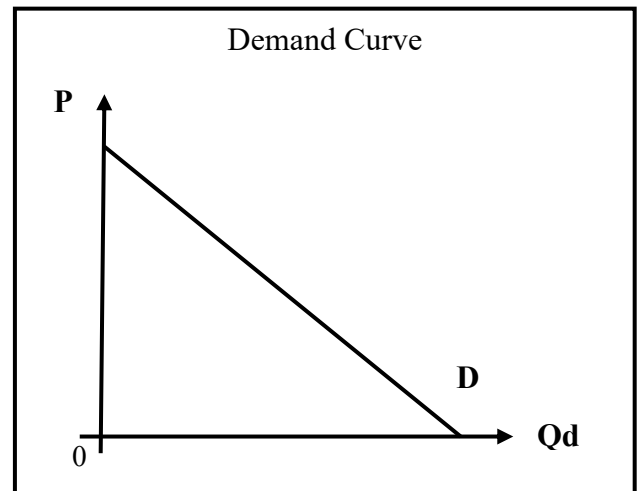
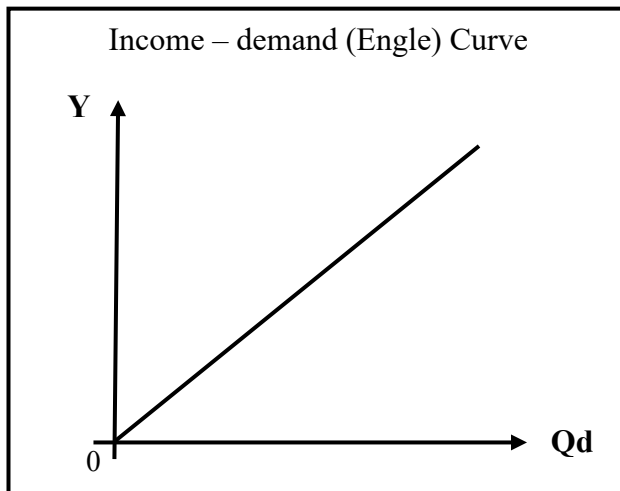
In terms of an inferior good, the substitution effect is in support of law of demand, and the income effect works against the law of demand. The overall price effect is negative or in support of law of demand since supportive substitution effect overpowers the opposing income effect.

Price Effect of a ‘Giffen Good’

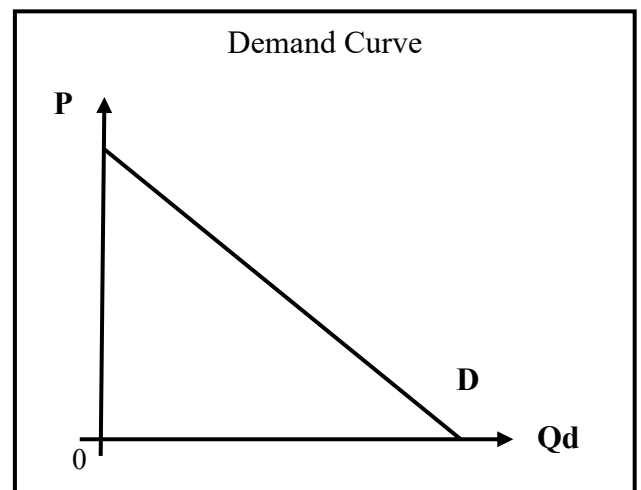
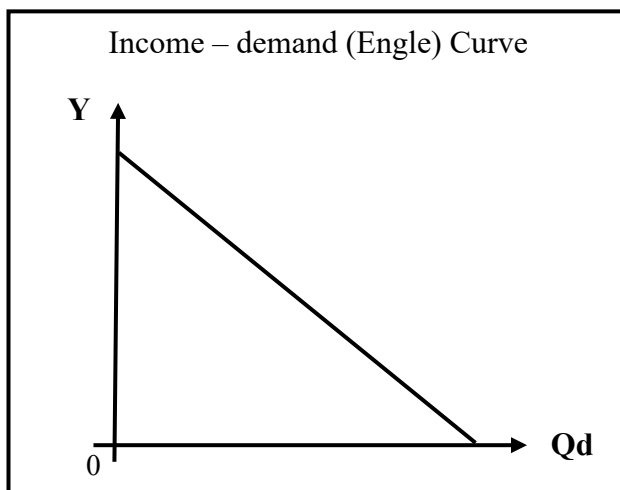
Change in Price	Substitution Effect (SE)	Income Effect (IE)	Price Effect (PE)
Increase	Negative ($Q_d \downarrow$)	Negative ($Q_d \uparrow$)	Negative ($Q_d \uparrow$)
Decrease	Negative ($Q_d \uparrow$)	Negative ($Q_d \downarrow$)	Negative ($Q_d \downarrow$)

In terms of giffen goods the income effect is negative or works against the law of demand and substitution effect is negative or supports the law of demand. The negative income effect overpowers the substitution effect, making the price effect of a giffen good positive or work against the law of demand.

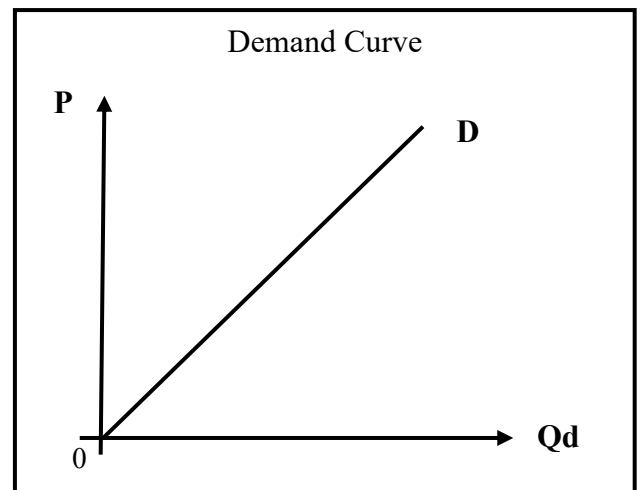
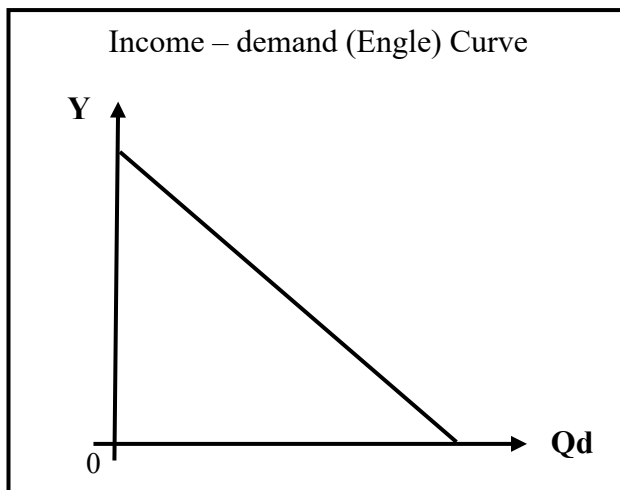
Representing a **Normal Goods**:



Representing an **Inferior Goods**:



Representing a **Giffen Goods**:



Representing L.O.D

[Methods of explaining law of demand]

Law of demand can be explained or represented using three standard methods. These methods also act as different ways in which law of demand is 'implied'

- (A) Demand Schedule
- (B) Demand Curve
- (C) Demand Equation

(A) Demand Schedule

This is a table which represents the numerical relationship between quantities of a given product demanded by the consumers' and alternative prices which may exist in the market, during a given period of time, while the other factors affecting the demand of the product are held constant.

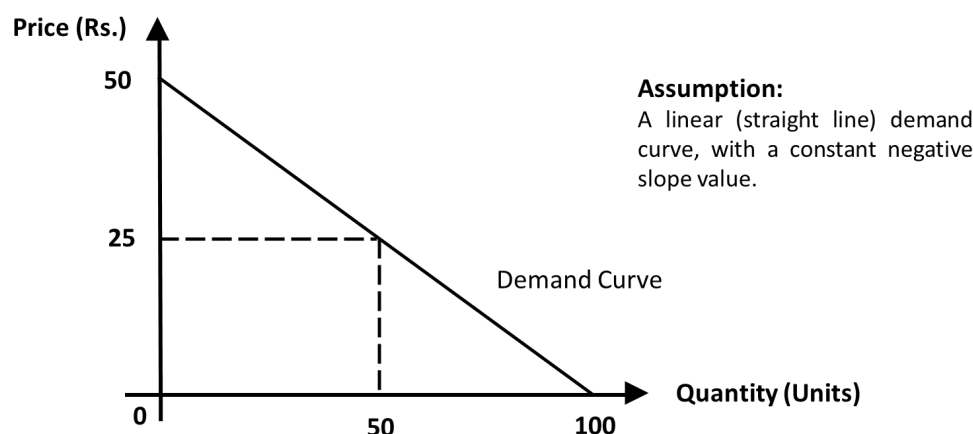
The standard demand schedule consists of two columns namely, Price (P) and Quantity demanded (Qd). The movement upwards and downwards along the (P) and (Qd) columns of the demand schedule for a normal good, shall imply the law of demand.

(B) Demand Curve (Function)

The demand curve refers to a graph that represents the relationship between price and quantity demand of a given product, when other factors affecting demand remain constant at a given point of time.

Generally, this curve is constructed using price in the (Y) or vertical axis and quantity demanded in the (X) or horizontal axis [traditional or typical demand curve approach].

The demand curve pertaining to a normal and standard inferior good, tends to be a curve 'downward sloping from top left to bottom right' or 'negatively sloped', implying the law of demand [AKA the law of downward sloping demand].



(C) Demand Equation

The demand equation refers to an algebraic expression or representation of the functional relationship between price and quantity demanded of a given product, when all other factors affecting demand remain constant at a given point of time.

The demand equation tends to be a negative equation, implying the law of demand. The standard demand equation can be presented and further illustrated as given below.

$$Q_{dx} = f(P) \quad \text{Simplified function}$$

$$Q_{dx} = a - b P_x \quad \text{General (Standard) equation}$$

Description of Abbreviations

- [Q_{dx}] - Quantity demanded of product (X) – **Dependent Variable**
- [a] - Quantity demanded at zero price or horizontal intersect of the traditional demand curve
- [b] - **Price Coefficient** or Gradient or Slope of the demand **equation**
[b = $\Delta Q_d \div \Delta P$], reciprocal of slope of traditional demand curve or function
- [P_x] - Price (Market Price) of product (X) – Independent Variable

Alternatively:

Equation for the Standard Demand Curve (Function)

$$\text{Base: } P = f(Q_d)$$

$$P = a - bQ_d$$

- P = **Price** [Dependent Variable]
- a = **Price at zero quantity**
- b = **Slope /Gradient of the Demand Curve** [$\Delta P \div \Delta Q_d$]
- Q_d = **Quantity Demanded** [Independent Variable]

Change in Qd Vs. Change in Demand



There is a very clear and important difference or distinction between a 'Change in Quantity demanded' and a 'Change in Demand'.

This distinction is mainly created based on the differences in the causes for the change and effect of the change on the products demand schedule, curve and equation.

[1] Change in Quantity demanded [ΔQ_d]:

The change in quantity demanded is the change in quantity purchased due to a change in the price of the goods at a given point of time, when all other factors (non-price factors) affecting the demand for good are constant. This reflects a movement along the demand curve.

Change in quantity demanded will NOT result in change in the demand schedule, demand equation or the demand curve.

Increase in Quantity demanded (Qd):

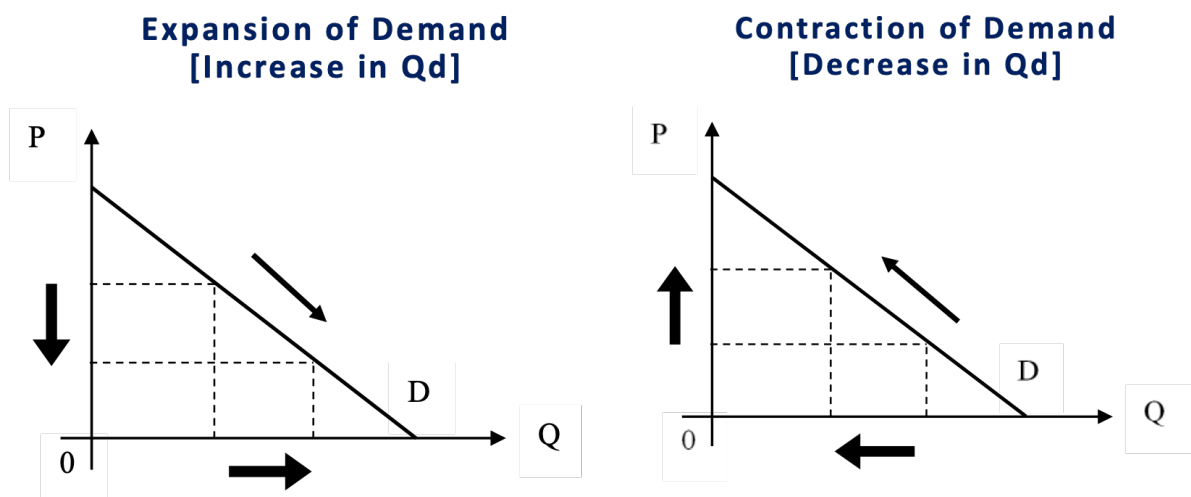
An increase in Qd is essentially caused by a decrease in the given product's own price, while non price factors affecting the demand of the given product are held constant, at a given point of time.

Such an increase in Qd is sometimes referred to as an 'Expansion of Demand'. An increase in Qd will create a movement downwards along the demand curve' from one point to another.

Decrease in Quantity demanded (Qd):

A decrease in Qd is essentially caused by an increase in the given product's own price, while non price factors affecting the demand are held constant, at a given point of time.

Such a decrease in Qd is sometimes referred to as an 'Contraction of Demand'. A decrease in Qd will create a movement upwards along the demand curve' from one point to another.



[2] Change in Demand [ΔD]:

Change in demand is completely different from a change in Q_d . Change in demand refers to an increase or a decrease in demand for a good due to a **change in other determinants of demand**, which were treated as constant (except the price of the own goods, i.e., the **price of the own goods remains constant**).

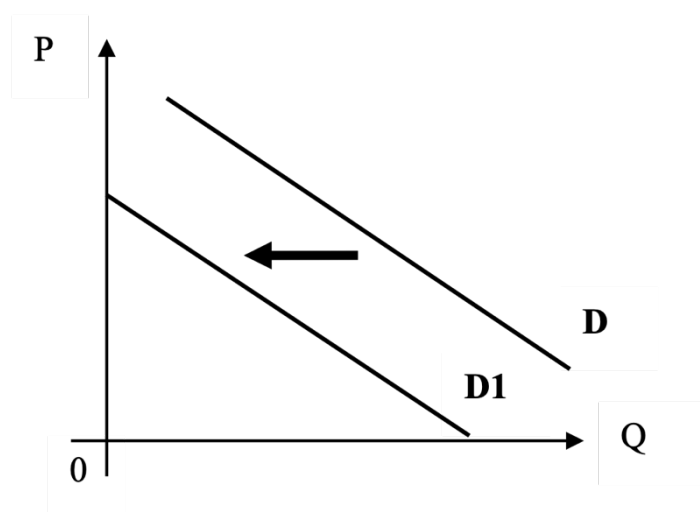
Change in demand is the complete change in the demand schedule, demand curve (or function) and the demand equation. The demand curve can shift to the left (inwards) or to the right (outwards) due to a change in demand. This is due to the changes in other factors which were treated as constant earlier or during another point of time.

[A] A **decrease in demand** represents an **inwards shift (shift to the left)** of the given products entire demand curve [$\Delta D \downarrow$]. A **decrease in demand** is in principle caused by a **change in non-price factors** affecting demand, while the price of the given product is held constant.

Such a decrease in demand can be caused by some of the following changes in non-price factors:

- Increase in the price of complementary goods
- Decrease in the price of substitute goods
- Decrease in consumer income [for a Normal goods]
- Unfavorable changes in consumer taste and preferences
- Decrease in the future price expected, number of consumers etc

Decrease in Demand [$\Delta D \downarrow$]

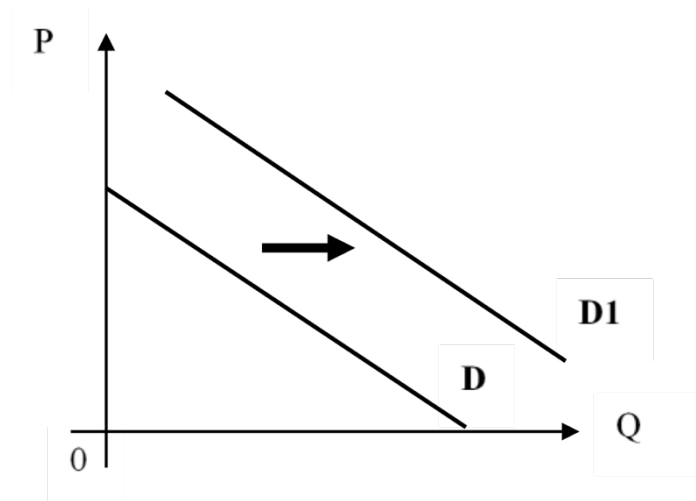


[B] An **increase in demand** represents an **outwards shift (shift to the right)** of the given products entire demand curve [$\Delta D \uparrow$]. The **increase in demand** is in principle caused by a **change in non-price (other) factors** affecting demand, while the price of the given product is held constant.

Such an increase in demand can be caused by some of the following changes in non-price factors:

- Decrease in the price of complementary goods
- Increase in the price of substitute goods
- Increase in consumer income [for a Normal goods]
- Favorable changes in consumer taste and preferences
- Increase in the future price expected, number of consumers etc

Increase in Demand [$\Delta D \uparrow$]





Defining Supply (Effective Supply)

Supply in the study of economics is essentially 'Effective Supply'.

Supply refers to different quantities of a given product a producer has the **resources** and technology to produce (ability), has the **potential to earn profits** by supplying (willingness) and has **planned to produce and supply**, under alternative (range of) prices in the **market prices**, when **all other factors** affecting supply remain **constant**, during a given **period of time**.

Alternatively:

Supply of a good refers to the amount of goods that firms or producers are willing to make and sell at different sets of alternative prices in a given period of time.

[Source: P. Perera, p. 140]

Latent Supply is the potential supply, where the supplier has the ability but doesn't have the profit potential. In economics supply is always discussed linked to the dimensions of **price** and **time**.

'Institutional (Firm's) Supply' Vs. 'Market Supply'

Individual supply is the quantities of a **given product**, an individual firm operating in the market *has the ability to produce, has the potential to earn profits by supplying and has planned to produce and supply, under alternative market prices, while other factors affecting supply remain constant, during a given period of time.*

Market supply is the **sum** (or total) of the **quantities** of a **given product**, all the firms operating in the market *has the ability to produce, has the potential to earn profits by supplying and has planned to produce and supply, under alternative market prices, while other factors affecting supply remain constant, during a given period of time.*

Individual Firm's Vs. Market Supply Curve:

- Market supply curve is derived or obtained by horizontally adding (horizontal summation) of individual supply curves constructed for each firm.
- Market supply curve is influenced by the total number of producers in the market during a given period of time, in addition to all the other factors affecting an individual supply curve.
- When price changes the proportion of change in market supply is larger in comparison to a change in individual supply, therefore the market supply curve is flatter than the individual supply curve.

Source: P. Perera, p. 143; 2020

Generic Factors Affecting (Determinants of) 'Market Supply':

1) The Product's Own Price (P_x)

Other Factors Affecting Supply:

[AKA: Factors other than product's price OR Non-price Factors OR Conditions of Supply]

- 2) Price of related products (P_n): Price of Production Substitutes
- 3) Cost of Production (C) or Price of production inputs in the factor market
- 4) Technology (T): Basic production technology or methodology
- 5) Expectations of producers (E_x)
- 6) Government decisions or regulations (G)
- 7) Number of sellers or producers (N)
- 8) Other relevant factors (O): Natural and human-made factors

Supply (S) and Quantity Supplied (Q_s)

Supply (S) refers to the overall relationship between the quantity supplied and price of a certain product when all other factors affecting supply, apart from price of the own product is held constant, during a given period of time.

Quantity supplied (Q_s) essentially refers to the amount of a good that sellers are willing and able to supply or release to the market, at a specific price.

In other words, Q_s is a specific price: quantity combination, which indicates one point of a certain supply schedule or curve, i.e., the quantity supplied at a given price, while supply is represented by the entire supply curve.

Price of Related Products [P_n]

Primary Factor/Product:

'Production Substitutes' or 'Goods Substitutable in Production'

Concept:

Two goods which can be produced by employing similar resources and basic production technology (i.e., goods with high mobility of resources of among them)

Relationship:

The relationship between a change in the price of a production substitute and the supply of the product under consideration tends to be indirect or negative.

Additional:

Secondary Factors/Products:

Price of goods which are jointly or mutually produced [AKA: byproducts, or complementary goods in production, e.g., leather created in beef production]

Relationship:

The relationship between a change in the price of a production complement and the supply of the product under consideration tends to be direct or positive.

Cost of Production [C]

- ✓ Frequently subject to change, when the price of production factors within factor markets tends to change
- ✓ The supply (supply curve) of a profit motivated producer represents minimum expected price by the producer, while remaining profitable on the supply.
- ✓ A change in cost of production, while the market price of the product is held constant leads to an **indirect** or **negative** affect on the producer's profitability and thus **supply** of the given product.

Technology [T]

- ✓ Methodology which specifies how resources should be used within the process of producing a given product (AKA: Superior Scientific Knowledge).
- ✓ Changes: Favorable (Advancement, improvement)
Unfavorable (Obsolete, outdated, inefficient)
- ✓ Changes in technology shall affect the level of efficiency, causing an increasing or decreasing impact on cost of production.
- ✓ Ultimately either increasing or decreasing supply (shifting the supply curve towards the left or right).

Producer Expectations [Ex]

- ✓ Changes in producer expectations on a broad range of factors such as future price, profits, sales volumes, market dynamics etc, tends to affect the present supply of a given product.
- ✓ Producer expectation on future price of the product is a major influence on its present supply.
- ✓ Response of Producers/Suppliers (present Supply):
 - ✓ Depend on the nature of the product.
 - ✓ Mainly classified into Basic or Nontechnical products and Industrial or Technology based products.

With regards to Basic products the relationship between a change in future price expected and the present supply to the market tends to indirect of negative, while with regards to industrial or technology-based products this relationship tends be positive or direct.

‘Law of Supply (LoS)’

The standard law of supply states that there is a positive (or direct) relationship between price and quantity supplied of a given product, when all other factors affecting supply remain constant, during a given period of time.

Alternatively:

Law of supply states that when the price of a given product increases or is at a higher level the quantity supplied of the product tend to rise or be at a higher level and when the price decreases or is at lower level the quantity supplied of the product will fall or be at a lower level, when other factors remain constant, during a given period of time.

Reason for (Justifying) Law of Supply

The supply curve of a product tends to be upwards or positively sloping due to two main reasons:

- (1) Rise in Marginal Cost of Production** [Ability to Produce]
 - (1) The law of Increasing (Marginal) Opportunity Cost
 - Job specify (non-homogeneous) resources
 - Differences in production methods
 - (2) Diminishing Marginal Product
- (2) Profit Motive of Individual Firms** [Willingness to Produce]

Perfect Your Knowledge on L.o.S:

[1] Rise in Marginal Cost (MC) of Production:

Marginal cost of production increases with an increase in quantity produced. When output expands, marginal cost shall increase due to two reasons:

(1) The law of Increasing Opportunity Cost

This law states that as the production of one good increases, the opportunity cost of producing an additional unit of that good (i.e., the number of units of another product which is forgone) tends to increase.

This is because resources are non-homogeneous or job specific, i.e., the resources suitable in the production of one product may not be equally suitable to produce another product (not perfectly substitutable). Also the production methods tend to change from one product to another.

(2) Diminishing Marginal Product (or returns):

In the short run of production, when attempting to increase output by increase a variable input one unit at a time, while holding certain other inputs fixed, the marginal product of each unit of variable input shall diminish eventually. Diminishing marginal product tends to increase the firms marginal cost of production.

Thus, producers may be **able** to increase the quantity supplied of a product if price of the good increases and increases enough to offset the diminishing returns.

[2] Profit Motive of Individual Firms

The price level tends to determine the level of profits to the firm. Higher the price, when other factors remain constant, grater the incentive to produce and supply more of the product. Accordingly , if the price of the product rises it becomes more profitable and producers are more willing to produce and increase the quantity supplied of the product.

ESSENTIALS OF LoS

- [1] **Functional Variables:** Price (P) and **Quantity supplied** (Qs)
- [2] **Application:** Indicates, change in Quantity supplied (ΔQ_s) of a product, in response to a change in Price (ΔP), i.e. if price rises, other things equal, Qs increases.
- [3] **Assumptions:**
- [1] **Other factors remain constant**
 - [2] Considering a **given point of time**
 - [3] *Rational producer behavior*
- [4] **Reasons [Justification]:**
- Rising Marginal Cost** [Law of Increasing Opportunity Cost, Diminishing marginal product, i.e., Ability]
- Profit Motive** of Firm [Incentive of higher profits with rise in price, i.e., Willingness]
- [5] **Representation:** Implied by:
- A. The supply schedule [positive]
 - B. The supply curve [upwards sloping]
 - C. The supply equation [positive operator]
 - Assumed to be a **Linear model**

Noteworthy: Theory of Supply Vs. Law of Supply

The theory of supply refers to a broad concept which analyses and explains the change in supply of a given product in relation to a change in any determinant affecting the supply of the product.

In simple terms this is the functional relationship between the market supply for a given product and all the factors affecting market supply (may also be referred to as a general function of supply or market supply function).

$$Q_s = f(P, P_n, C, T, Ex, G, N, O)$$

[1] SUPPLY SCHEDULE

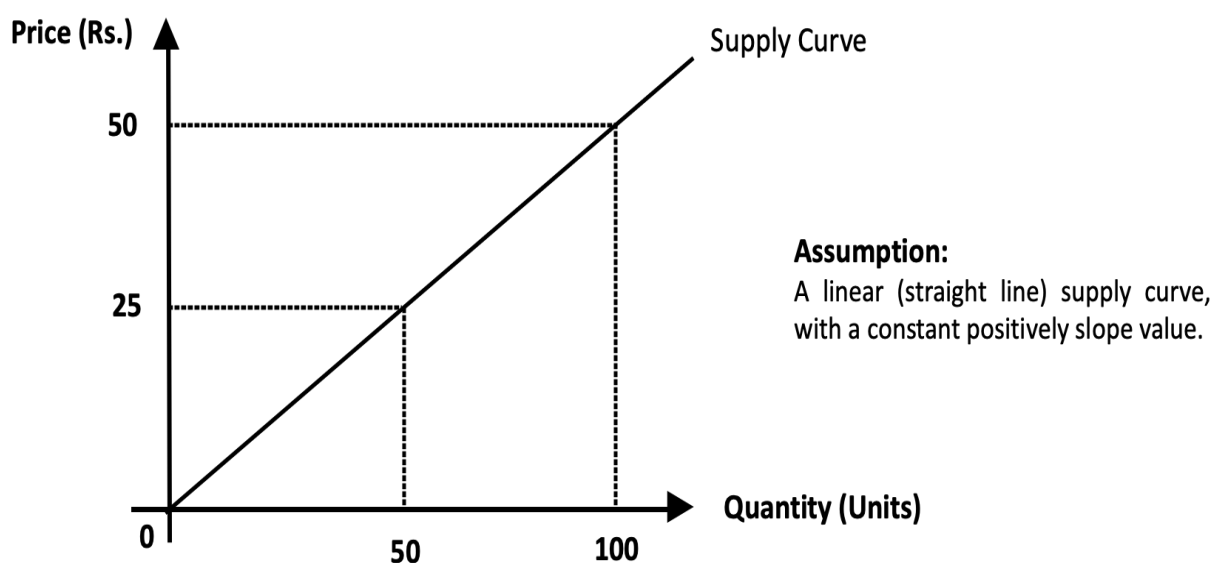
The supply schedule refers to a table that shows the relationship between the price of a good and the quantity supplied, when other factors affecting supply remain constant at a given point of time. Generally, this schedule consists of two columns namely price (P) and quantity supplied (Qs). A movement upwards or downwards within the schedule, implies the LoS.

Price (Rs)	Qs (Units)
00	00
25	50
50	100

[2] SUPPLY CURVE

The supply curve refers to a graph that represents the relationship between price and quantity supplied of a given product, when other factors affecting supply remain constant at a given point of time.

Generally, this curve is constructed using price in the (Y) or vertical axis and quantity supplied in the (X) or horizontal axis. Due to this, the supply curve tends to be upwards sloping from left to right, implying the positive or direct relationship between price and quantity supplied, i.e., law of supply (law of upward sloping supply).



[3] SUPPLY EQUATION

The supply equation refers to a mathematical expression which represents the relationship between price and quantity supplied of a given product, when all other factors affecting supply remain constant at a given point of time.

The supply function is known as a positive function, implying the direct or positive relationship between price and quantity supplied of a product, i.e. the law of supply. The standard supply equation can be presented and further illustrated as follows

$$Q_{sx} = a + b P_x$$

Description of Abbreviations

- [Q_{sx}] - Quantity supplied of product (X) – **Dependent Variable**
- [a] - Quantity supplied at zero price or horizontal intersect of the traditional supply curve
- [b] - **Price Coefficient** or Gradient or Slope of the supply **equation**
[b = ΔQ_s ÷ ΔP], reciprocal of slope of traditional supply curve or function
- [P_x] - Price (Market Price) of product (X) – Independent Variable

Change in Q_s Vs. Change in Supply



There is a very clear and important difference or distinction between a 'Change in Quantity supplied' and a 'Change in Supply'. This distinction is mainly created based on the differences in the causes for the change and effect of the change on the product's supply schedule, curve and equation.

[1] Change in Quantity supplied [ΔQ_s]:

The change in quantity supplied is the change in quantity supplied due to a change in the price of the good at a given point of time, when all other factors (non-price factors) affecting the supply of the good are constant. This is where a comparison is made between different points on the supply curve, and it reflects a movement along the supply curve.

Change in quantity supplied will NOT result in change in the supply schedule, supply equation or the supply curve.

[A] Increase in Quantity Supplied [$\uparrow Q_s$]

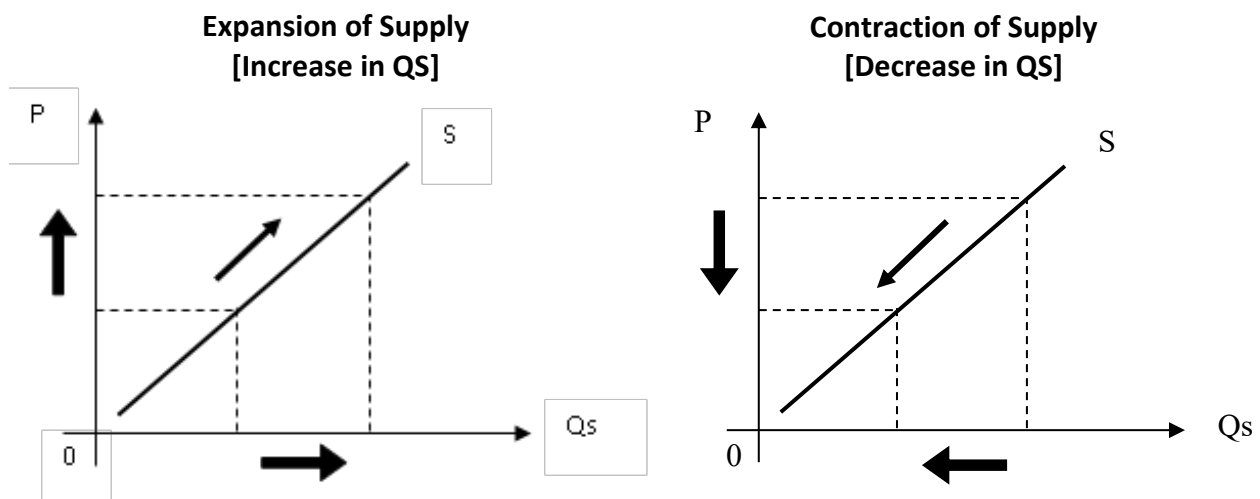
An increase in Q_s is essentially caused by an increase in the given product's own price, while non price factors affecting the supply of the given product are held constant, at a given point of time.

Such an increase in Q_s is sometimes referred to as an 'Expansion of Supply'. An increase in Q_s will create an 'upwards movement along the supply curve' from one point to another.

[B] Decrease in Quantity Supplied [$\downarrow Q_s$]

A decrease in Q_s is essentially caused by a decrease in the given product's own price, while non price factors affecting the supply of the given product are held constant, at a given point of time.

Such a decrease in Q_s is sometimes referred to as an 'Contraction of Supply'. A decrease in Q_s will create a 'downwards movement along the supply curve' from one point to another.



[2] Change in Supply [ΔS]

A change in supply is a shift of a product's entire supply curve, in principle caused by a change in non-price factors (other factors) affecting supply, when the product's own price is held constant, during a given period of time. Basically, the quantity supplied at each price (at the same price) is subject to change.

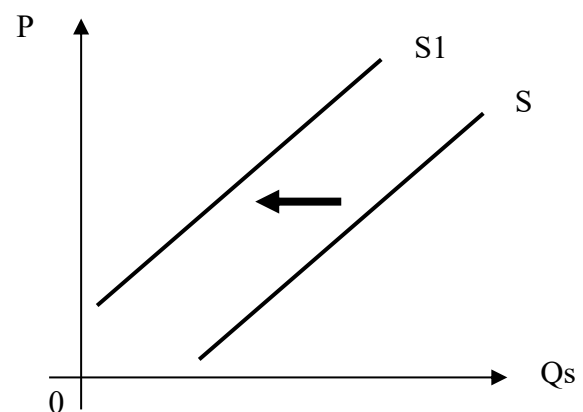
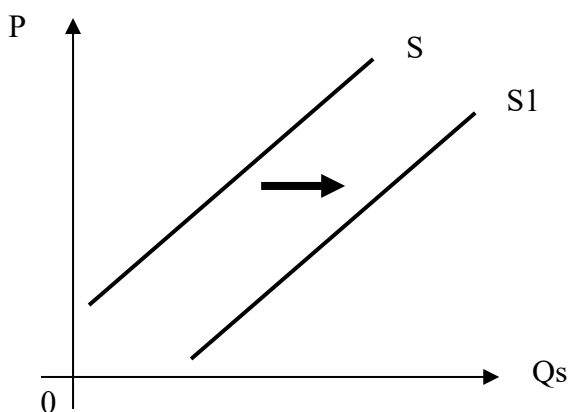
[A] A **decrease in supply** is a **leftwards shift** of the supply curve [$\Delta S \downarrow$], which is caused by a change in non-price factors affecting supply, while price of the given product is held constant. Such a decrease in Supply can be caused by some of the following changers in non-price factors:

- Increase in the price of a production substitute
- Increase in the price of production factors (or cost of production)
- Obsolescence in production technology
- Decrease in the number of sellers or producers
- Increase in the tax charged by the government from producers''
- Decrease in subsidies provided by the government to producers'
- Expected increase in the product in the near future (i.e. a basic product)

[B] An **increase in supply** represents a **shift to the right** of the given products entire supply curve [$\Delta S \uparrow$]. An **increase in supply** is in principle caused by a **change in non-price (other) factors** affecting supply, while the price of the given product is held constant.

Such an increase in supply can be caused by some of the following changers in non-price factors:

- Decrease in the price of production factors (cost of production)
- Decrease in the price of production substitutes
- Production technology becoming advanced or improving
- Increase in the number of producers or firms
- Favorable changes in government decisions (removing production taxes and providing production subsidies)



Supplementary Note [1]

[1] Price Effect & Types of Goods

The **price effect** (or consequence) refers to the impact on quantity demanded of a given product, due to a change in its price, while other factors affecting demand are held constant. The principal **reason** for the **Law of Demand** (or why a demand curve tends to be downwards or negatively sloping) is the price effect. The price effect operates through two sub effects namely, Substitution effect and Income effect

(1) Substitution effect (SE) of a change in price:

When other factors affecting demand of a product remain constant, when only the price of the product changes consumers 'substitute away' or 'Substitute towards' the product concerned (i.e., decrease or increase quantity demanded), since it becomes relatively expensive or cheap (based on a relative price comparison).

(2) Income effect (IE) of a change in price:

When other factors affecting demand of a normal good remains constant, when only the price of the product changes, the quantity demanded for the product is decreases or increases, since the consumers' real income decreases or increases (i.e., consumers become relatively poor or rich in real terms)

Price Effect & Types of Good:

Good	SE	>/<	IE	PE
Normal	Negative	=	Positive	Negative
Inferior	Negative	>	Negative	Negative
Giffen	Negative	<	Negative	Positive

[2] Expansion, Contraction & Shift

Expansions and Contractions [ΔQ]

Concept	Increase in Q_d	Decrease in Q_d
AKA	Expansion of Demand	Contraction of Demand
Cause	Decrease (Fall) in Price	Increase (Rise) in Price
Effect	Downwards movement along the curve	Upwards movement along the curve
Assumption	All other factors affecting demand are held constant	

Concept	Increase in Q_s	Decrease in Q_s
AKA	Expansion of Supply	Contraction of Supply
Cause	Increase (Rise) in Price	Decrease (Fall) in Price
Effect	Upwards movement along the curve	Downwards movement along the curve
Assumption	All other factors affecting supply are held constant	

Shift of Curves or Functions [ΔD or ΔS]

Cause	Increase in Demand	Decrease in Demand
Price of Substitutes	Increase	Decrease
Price Complements	Decrease	Increase
Consumer Income (Normal good)	Increase	Decrease
Taste (or Preferences) and Fashions	Favorable	Unfavorable
Expectations of Future Price	Increase	Decrease
Social Demographic Trends	Favorable	Unfavorable
Number of Consumers	Increase	Decrease
Effect	Rightwards (Outwards) Shift of the curve	Leftwards (Inwards) Shift of the curve
Assumption	The product's own price is held constant	

Cause	Increase Supply	Decrease in Supply
Cost of Production	Decrease	Increase
Price of production substitutes	Decrease	Increase
Technology	Improvement /Advancement	Obsolete Deterioration
Expectations of Future Price	Decrease	Increase
Government Policies	Subsidies Reduced tax Deregulation	Taxes Reduced subsidies Regulations
Number of Sellers	Increase	Decrease
Natural Factors	Favorable	Unfavorable
Time	Short – term	Long – term
Effect	Rightwards Shift of the curve	Leftwards Shift of the curve
Assumption	The product's own price is held constant	

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