HSS 201: Economics for Engineers

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The Basics of Demand and Supply

1. Understanding and predicting how changing economic conditions affect market price and production

2. Evaluating the impact of government price controls; production incentives, among others

3. Determining how taxes, subsidies, tariffs affect the consumers and producers

Demand

The demand curve shows how much of a good consumers are wiling to buy as the price per unit of it changes. Mathematically, we can write the relationship between quantity demanded and its price as

$$Q_d = f(P)$$

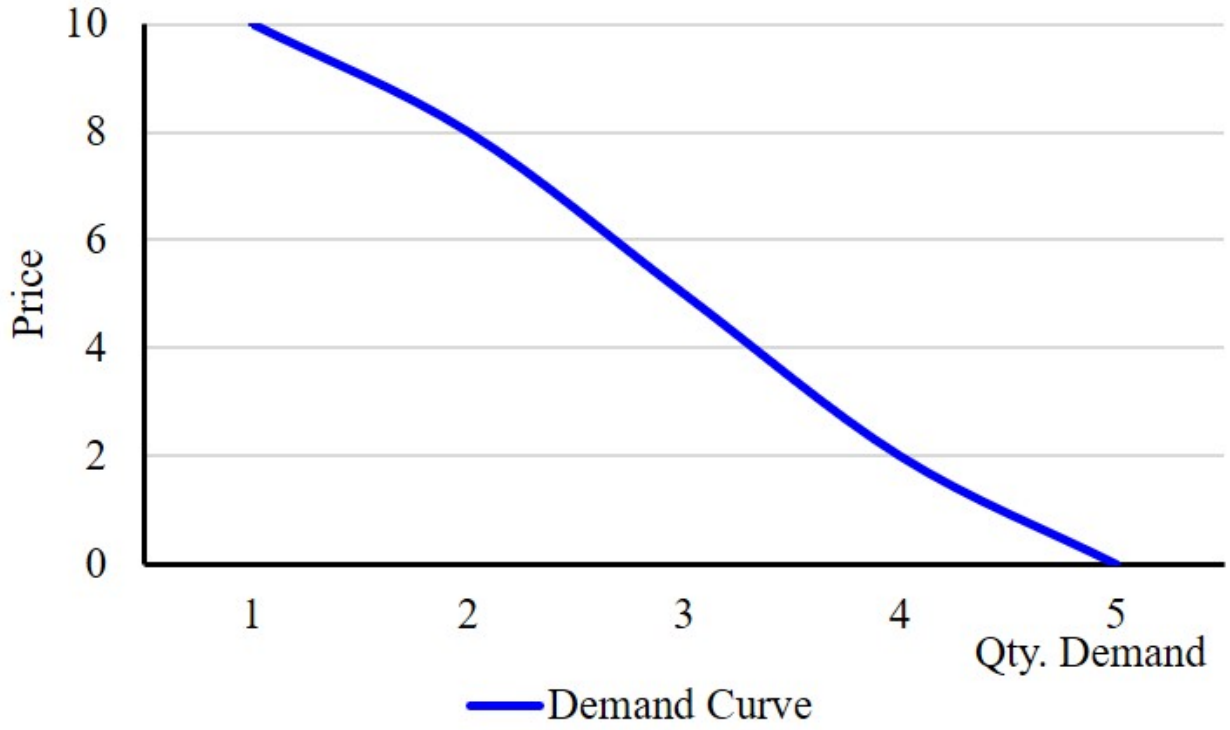
The quantity demanded of any good is the amount of the good that buyers are *willing* and *able* to purchase at any given point of time.

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

Demand Schedule

Price of Cold Drinks	Quantity Demanded of Cold Drinks
0	10
5	8
7	5
10	2
15	0

The Demand Curve



The downward-sloping line relating price and quantity demanded is called the demand curve.

Other Factors Affecting Quantity Demand

1. Income
   - Normal Goods: If the demand of a good *falls* when income *falls*.
     E.g., Sports shoes of Adidas, Basmati rice by India Gate.
   - Inferior Goods: If the demand of a good *falls* when income *rises*.
     E.g., Sports shoes of Power, Mobile phones made by Micromax.
2. Price of Related Goods
   - Substitutes: When a *fall* in the price of one good *reduces* the demand for another good.
     E.g., When price of Samsung LED television increases, we demand LED television made by LG.
   - Complements:When a *fall* in the price of one good *raises* the demand for another good.
     E.g., When price of petrol increases the demand for cars fall.

3. Tastes and Preferences: For instance, a segment of consumers of smart phones only have a preference for Apple iphone while the other segment is happy with budget phones.

4. Expectations: Expectations about the future may affect your demand for a good or service today. For instance, Price of petrol may rise tomorrow hence, by today most people would fill up their cars with petrol.

5. Advertisement and Awareness: A positive advertisement about a product might lead to increase in demand. For instance, RO water purifiers.

6. Demographic Structure: For instance, when population of a society is majorly driven by people between the age group 18-30 it would have a high demand for fast food centers.

    - No. of Buyers: Market demand of a good also depends on the number of buyers.

Why does the Demand Curve Slope Downward?

1. Law of Diminishing Marginal Utility: As more of a product is consumed then the additional utility (satisfaction) that is derived from the product is less. Hence, the consumers are prepared to pay less.
   Consumers will prefer to buy additional unit of a product at a lesser price.

2. Income Effect: Assuming money income is fixed, the effect suggest that as price of a product falls, real income that is what consumers can buy with their money rises and consumers demand for a product increases.

3. Substitution Effect: Assuming two substitute (alternative) goods, if price of one good falls and the price of other remains same. Then consumers will prefer the cheaper product.

4. Entry and Exit of New Consumers

Changes in Demand

1. Movement along the demand curve
   - Other things remaining the same, if price of commodity *falls* its demand *expands*. It is called *extension of demand*
   - Other things remaining the same, if price of commodity *rises* its demand *falls*. It is called *contraction of demand*
2. Shift of the demand curve
   - Keeping price to be constant, if demand for any commodity *increase* we have a *rightward (upward) shift of the demand curve*.
     E.g., Demand curve for Apple iphones will shift rightwards if the individual's income increases.
   - Keeping price to be constant, if demand for any commodity *decrease* we have a *leftward (downward) shift of the demand curve*.
     E.g., Demand curve for Apple iphones will shift leftwards if the individual's income decrease.

Exceptions to the Law of Demand

1. Giffen Goods: Such goods are consumed in greater quantities when their price rises. Giffen goods are inferior goods for which the income effect dominates the substitution effect.

   E.g., "Some historians suggest that potatoes were a Giffen good during the Irish potato famine of the 19^{th} century. Potatoes were such a large part of people's diet that when the price of potatoes rose, it had a large income effect. People responded to their reduced living standard by cutting back on the luxury of meat and buying more of the staple food of potatoes. Thus, it is argued that a higher price of potatoes actually raised the quantity of potatoes demanded." [Mankiw (2008, p. 47)]

   All giffen goods are inferior goods but not all inferior goods are giffen goods.

2. Veblen Effect: The demand for a product increases when its price increases. These are types of luxury goods.

Exceptions to the Law of Demand

3. Snob Effect: The demand for a certain good by individuals of a higher income level is inversely related to its demand by those of a lower income level.

4. Essential Goods: Products which are essential to life will always be demanded irrespective of their price. E.g., Salt, Water.

5. Economic and Non-Economic Shocks: Demand reduces due to war or famine.

Elasticity of Demand

Imagine a situation where the price of tomatoes has increased. It is an easy understanding to answer that consumers would demand less of tomatoes. But by how much would this demand fall? To answer this we require the concept called *elasticity*.

Elasticity measures the extent till which demand change.

An elasticity measures the sensitivity of one variable to another. Specifically, *it is a number that tells us the percentage change that will occur in one variable in response to a 1% increase in another variable*.

Types of Elasticity

1. Price Elasticity
2. Income Elasticity
3. Cross-Price Elasticity

Price Elasticity of Demand

It is measured by:

$$e_p = \frac{\Delta Q/Q}{\Delta P/P}$$

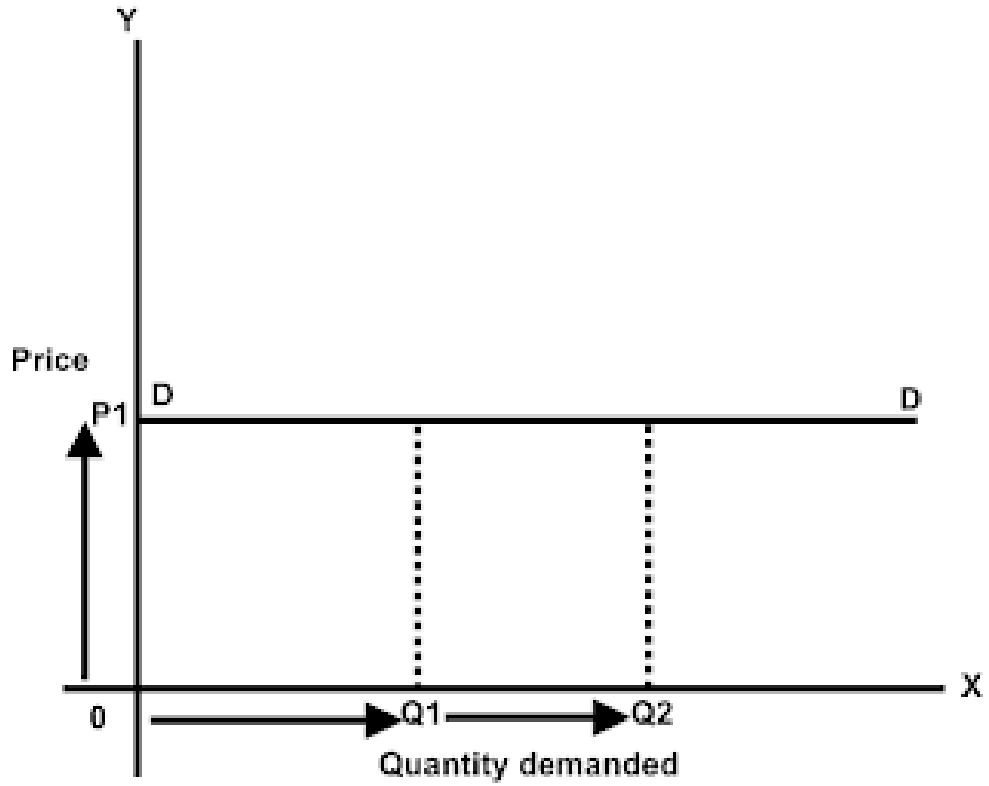
$$= \frac{P}{Q}\frac{\Delta Q}{\Delta P}$$

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

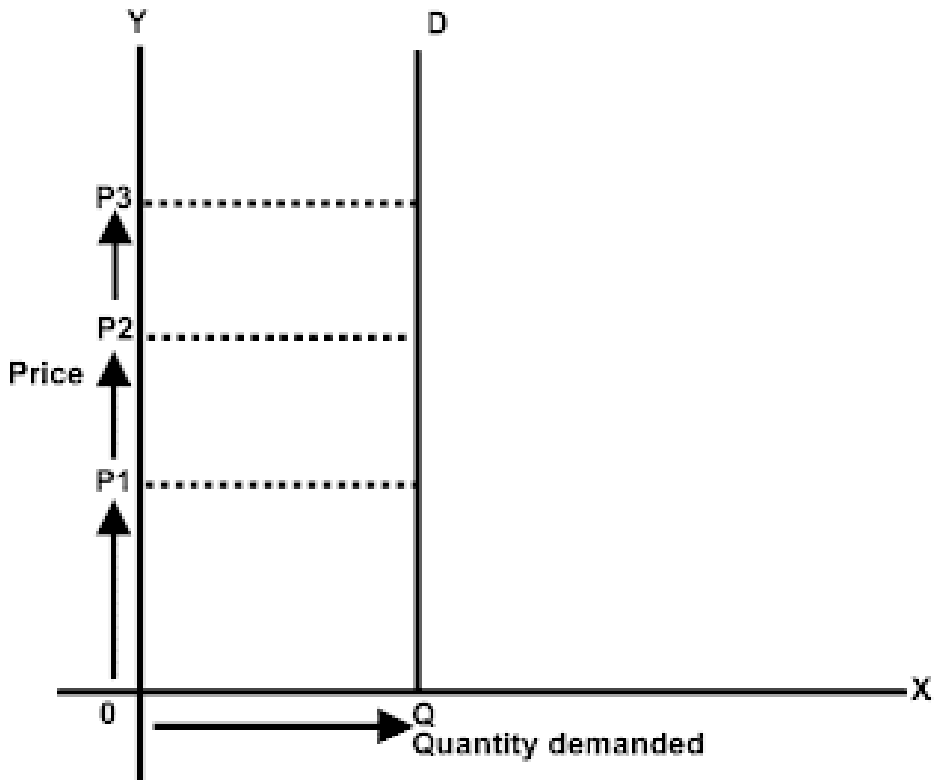
The price elasticity of demand is usually a *negative* number as price and quantity demanded are inversely related. Hence, to compare the magnitude of elasticity we take the absolute value.

1. If $e_p > 1$ holds; we have *elastic* demand. E,g., Luxury Goods
2. If $e_p < 1$ holds; we have *inelastic* demand. E.g., Goods which are essential; Salt, Medicines

Perfectly Elastic Demand; $e_p = \infty$



Perfectly Inelastic Demand; $e_p = 0$



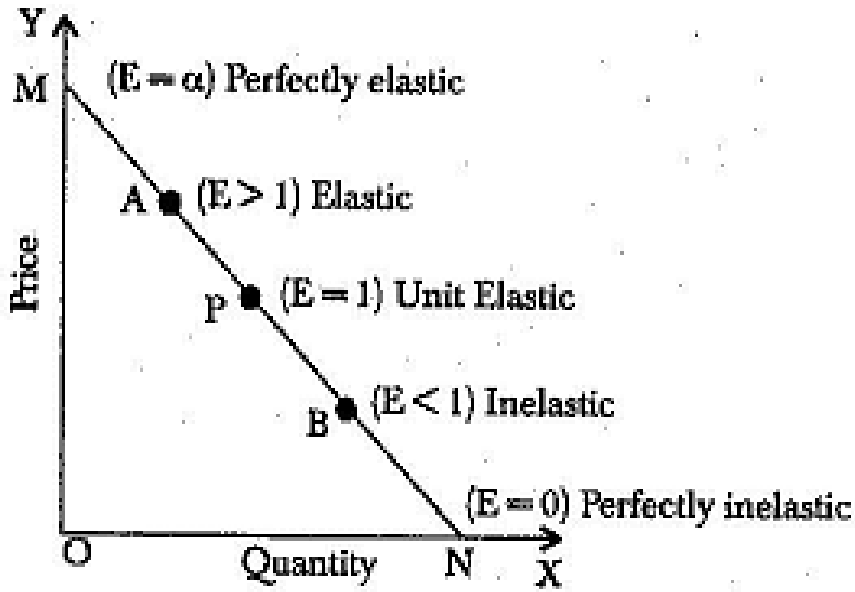
Price Elasticity of Demand

When there are *close substitutes* a price increase will cause the consumer to buy less of the good and more of the substitute. Demand will then be *highly price elastic*.

When there are *no close substitutes*, demand will tend to be *price inelastic*.

Difference between Slope of the Demand Curve and Elasticity

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



Difference between Slope of the Demand Curve and Elasticity

The price elasticity of demand is different at each point on a demand curve with constant slope. The reason is that slope and elasticity are different concepts.

Slope measures the steepness or flatness of a line in terms of the measurement units for price and quantity. Elasticity measures the relative response of quantity to changes in price.