Elasticity

Elasticity is a term used to describe how sensitive a good or service's supply or demand is to changes in its price or other economic variables.
It is used to examine how price variations impact the quantity desired or provided and to gauge how sensitive customers or producers are to price variations.
Elasticities cannot be inferred by slope alone.The general rule for elasticities is that the elasticity can be calculated as the ratio of the length of the straight-line or tangent segment below the demand point to the length of the segment above the point

Elasticity Of Demand

The term "elasticity of demand" describes how responsive a good or service's quantity sought is to changes in its price. It gauges how responsive consumers are to price changes. Demand elasticity can either be unitary, inelastic, elastic, perfectly elastic, perfectly inelastic.
The formula for estimating demand's elasticity is:
Elasticity of Demand = (% Change in Demanded Quantity) / (Percentage Change in Price)

$$Ed = \frac{\%\Delta\ IN\ QD}{\%\Delta\ IN\ P}$$

To Calculate,

Percentage Change in Quantity Demanded = (New Quantity Demanded - Original Quantity Demanded) / (New Quantity Demanded + Original Quantity Demanded)

Percentage Change in Price = (New Price - Original Price) / (New Quantity Price + Original Quantity Price)

The various forms of demand elasticity are as follows:
1. Demand is said to be elastic: if a little change in price causes a disproportionately big change in the amount desired. Elastic demand is calculated as follows:
    Elasticity > 1.
    $$Ed>1 => \Delta QD > \Delta P$$

2. Unit Elastic Demand is considered to be unit elastic if a change in price causes an equivalent proportionate change in the amount sought. Elasticity = 1 is the equation for unit elastic demand.
    $$Ed = 1 => \Delta QD = \Delta P$$

3. Inelastic Demand is considered to be inelastic if a change in price has little effect on the quantity being desired. Elasticity < 1 is the formula for inelastic demand.
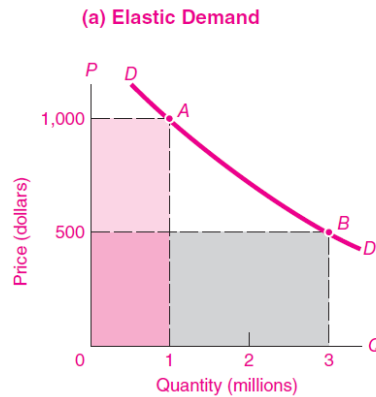 $$Ed<1 => \Delta QD < \Delta P$$

4. Perfectly Inelastic Demand that is "completely inelastic" is one in which a change in price has no effect on the quantity being desired. Elasticity = 0 is the equation for perfectly inelastic demand.
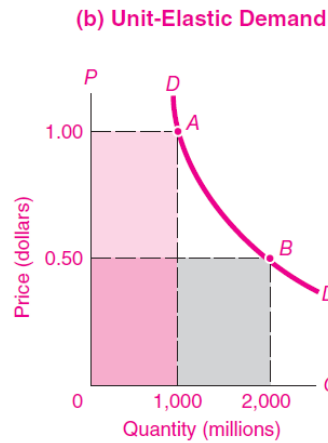
$$Ed = 0 => \Delta QD = 0, \Delta P = \infty$$

5. Demand is considered to be completely elastic if a little change in price causes an infinitely large change in the quantity desired. Elasticity $=\infty$ is the equation for perfectly elastic demand.

$$Ed = \infty => \Delta QD = \infty, \Delta P = 0$$
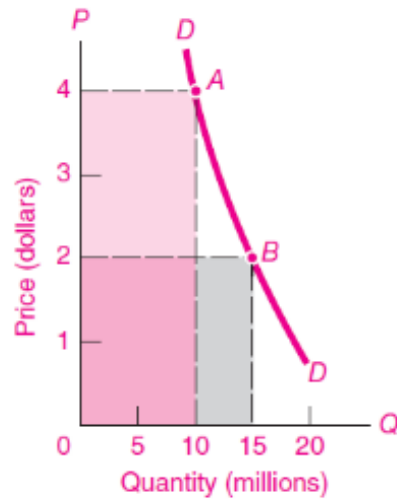
$$Ed > 1 => \Delta QD > \Delta P$$

(a) Elastic Demand

$$Ed = 1 => \Delta QD = \Delta P$$

(b) Unit-Elastic Demand

Ed<1 => $\Delta QD < \Delta P$

(c) Inelastic Demand

Perfectly InElastic Demand: Ed =0 => $\Delta QD=0$, $\Delta P = \infty$,
Perfectly Elastic Demand: Ed = ∞ => $\Delta QD' = \infty$, $\Delta P =0$

Perfectly inelastic demand

Perfectly elastic demand
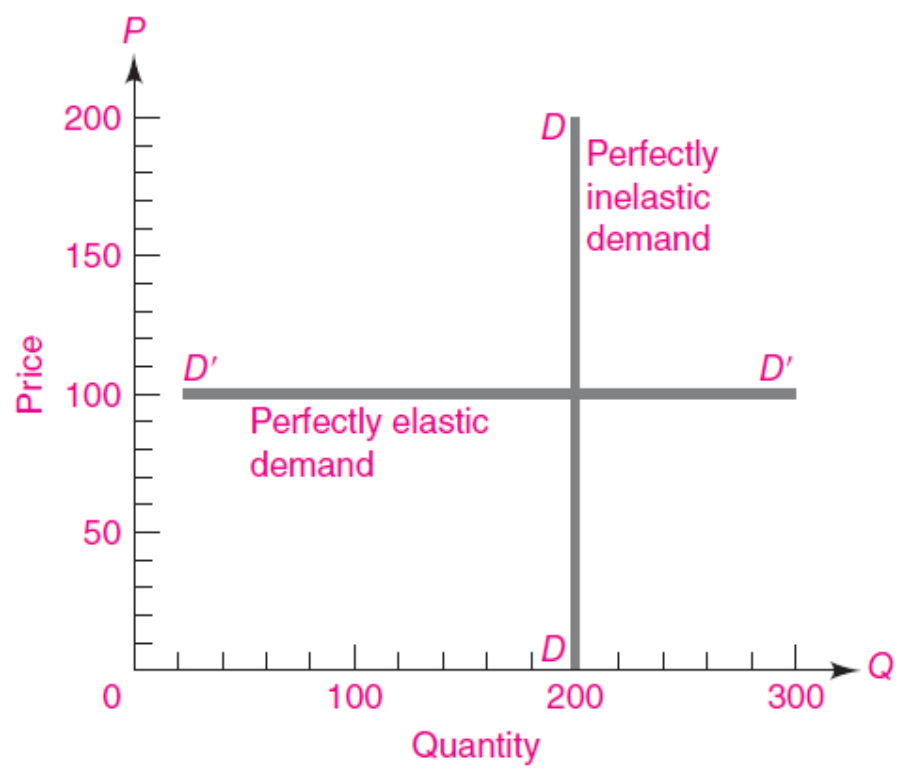
Elasticity Of Income

The term "elasticity of income" describes how responsively consumer demand for a commodity or service is to variations in income levels. It gauges how much the purchasing power of consumers varies with changes in their income levels.

The formula for estimating Income elasticity is:
Elasticity of Income = (% Change in Demanded Quantity) / (Percentage Change in Income)

$$EI = \frac{\%\Delta\ IN\ QD}{\%\Delta\ IN\ I}$$

The various forms of income elasticity are as follows:

1. Normal Good: A good is considered to be a normal good if an increase in income results in an increase in demand for that good. A typical good has the following formula: Elasticity > 0.
2. An inferior good is one whose income elasticity is negative, meaning that it will see a decline in demand for a good as income rises. Elasticity < 0 is the formula for an inferior good.

3. Luxury Good: A good is referred to as a luxury good if its demand rises above proportionately with an increase in income and its income elasticity is greater than 1.

4. A good is considered a need if the demand for it rises less than proportionally as income rises and its income elasticity is less than 1.

Cross Elasticity

Cross elasticity of demand refers to the responsiveness of the demand for one good to changes in the price of another good. It measures the degree to which changes in the price of one good affect the demand for another good.

The different types of cross elasticity of demand are:

1. Positive Cross Elasticity of Demand: If an increase in the price of one good leads to an increase in the demand for another good, the two goods are said to have a positive cross elasticity of demand. This type of cross

elasticity occurs between complementary goods, where an increase in the price of one good leads to a decrease in the demand for the other good.

2. Negative Cross Elasticity of Demand: If an increase in the price of one good leads to a decrease in the demand for another good, the two goods are said to have a negative cross elasticity of demand. This type of cross elasticity occurs between substitutes, where an increase in the price of one good leads to an increase in the demand for the other good.

The formula for cross elasticity of demand is:

Cross Elasticity of Demand = (Percentage Change in Quantity Demanded of Good A) / (Percentage Change in Price of Good B)

$$CE = \frac{\%\Delta\ IN\ QD\ of\ Ga}{\%\Delta\ IN\ P\ of\ Gb}$$

Elasticity Of Supply

Elasticity of supply refers to the responsiveness of the quantity supplied of a good or service to changes in its price. It measures the degree to which changes in the price of a good or service affect the quantity supplied.

The formula for elasticity of supply is:

Elasticity of Supply = (Percentage Change in Quantity Supplied) / (Percentage Change in Price)

$$Es = \frac{\%\Delta\ IN\ QS}{\%\Delta\ IN\ P}$$

The types of elasticity of supply are:

1. Elastic Supply: This occurs when the quantity supplied of a good or service is highly responsive to changes in price. In this case, a small change in price will result in a large change in the quantity supplied.
$$ES > 1 => \Delta Qs > \Delta P$$

2. Inelastic Supply: This occurs when the quantity supplied of a good or service is not very responsive to changes in price. In this case, a change in price will result in only a small change in the quantity supplied.

$$ES <1 => \Delta Qs < \Delta P$$

Elastic Supply	Inelastic Supply
$\Delta Qs > \Delta P (E>1)$	$\Delta Qs < \Delta P (E<1)$
Long Run	Short Run
▲ Capacity/Size	▼
Degree of F.O.M	Difficult

Factor mobility refers to the ability to move factors of production—labor, capital, or land—out of one production process into another. Factor mobility may involve the movement of factors between firms within an industry, as when one steel plant closes but sells its production equipment to another steel firm.

3. Perfectly Elastic Supply: This occurs when an infinitely large quantity of a good or service can be supplied at a given price. In this case, a zero change in price will result in a very large change in the quantity supplied.

$$ES = \infty => \Delta Qs = \infty, \Delta P = 0$$

4. Perfectly Inelastic Supply: This occurs when the quantity supplied of a good or service does not change at all in response to changes in price. In this case, the supply is considered to be perfectly inelastic.

$$ES = 0 => \Delta Qs = 0, \Delta P = \infty$$

5. Unit elastic supply refers to a situation in which a percentage change in the price of a good or service results in an equal percentage change in the quantity supplied. This means that the elasticity of supply is equal to 1.

$$ES = 1 => \Delta Qs = \Delta P$$

Consumer Behaviour

The process by which the consumer decides to buy a product or decides not to buy a product. It involves all the activities of searching for products, evaluating the alternatives, making a choice, purchasing the product, using or consuming the product and disposing the product.

Consumer behavior encompasses mental and physical activities that consumers engage in when searching for, evaluating, purchasing, and using products and services

Utility

Utility refers to the satisfaction, pleasure, or usefulness that a person derives from consuming a good or service. It is a subjective measure of the value that a consumer places on a good or service, and is different for each individual.

There are two types of utility: cardinal utility and ordinal utility.

Cardinal Utility: This type of utility is expressed in numerical terms, and measures the exact amount of satisfaction or pleasure that a person derives from consuming a good or service. Cardinal utility is a more precise measure of utility, and is used in economic models and theories that use quantitative data.

Ordinal Utility: This type of utility is expressed in terms of rankings, and measures the relative satisfaction or pleasure that a person derives from consuming different goods and services. Ordinal utility does not measure the exact amount of satisfaction, but rather the order in which goods and services are ranked in terms of their level of satisfaction. This type of utility is often used in microeconomic theories and models that do not require precise numerical measurements.

MARGINAL UTILITY: Marginal utility refers to the change in total utility resulting from a one-unit increase in the consumption of a good. It measures the additional satisfaction a consumer derives from consuming one more unit of a

good. The marginal utility decreases as the quantity of a good consumed increases, due to the law of diminishing marginal utility.

The formula for marginal utility (MU) is:
$$MU = \Delta U / \Delta Q$$

TOTAL UTILITY: Total utility refers to the total satisfaction or happiness a consumer derives from consuming a good or service. It is a cumulative measure of the utilities obtained from each unit of the good consumed.

The formula for total utility (TU) is the sum of the utilities obtained from each unit of the good consumed:
$$TU = U1 + U2$$
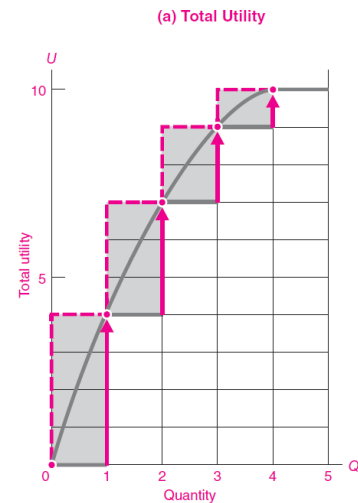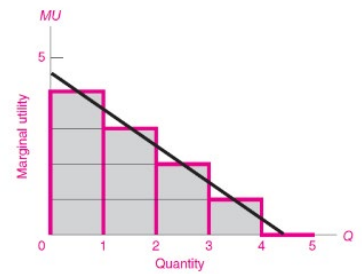
(a) Total Utility

(1) Quantity of a good consumed Q	(2) Total utility U	(3) Marginal utility MU
0	0	
		4
1	4	
		3
2	7	
		2
3	9	
		1
4	10	
		0
5	10	

Relationship Between Margin and Total Utility

The relationship between marginal utility and total utility can be described as follows: as a consumer consumes more units of a good, the marginal utility derived from each additional unit decreases, leading to a decrease in total utility. The relationship can be demonstrated mathematically using the following formula:

Total Utility (TU) = Sum of Marginal Utilities (MU)

$$TU = MU_1 + MU_2 + MU_3 + ... + MU_n$$

where MU_1, MU_2, MU_3, ..., MU_n represent the marginal utilities derived from consuming the first, second, third, ..., nth units of the good, respectively.

Consumer Equilibrium

Consumer equilibrium refers to a state where a consumer has reached the maximum satisfaction (utility) from the combination of goods and services purchased with a given amount of money. It occurs when the consumer has allocated their limited income in such a way that the marginal utility (additional satisfaction) of the last unit of money spent on each good is equal across all goods.

The consumer equilibrium can be calculated using the following formula:

$$MU(x) / P(x) = MU(y) / P(y) = ... = MU(n) / P(n)$$

Where:

$MU(x)$, $MU(y)$, ..., $MU(n)$ represent the marginal utility (additional satisfaction) of the last unit of each good (x, y, ..., n) consumed.

$P(x)$, $P(y)$, ..., $P(n)$ represent the price of each good (x, y, ..., n).