

Scarcity means that society has limited resources and therefore cannot produce all the goods and services people wish to have. Just as each member of a household cannot get everything he or she wants, each individual in society cannot attain the highest standard of living to which he or she might aspire.

Economics is the study of how society manages its scarce resources. In most societies, resources are allocated not by an all-powerful dictator but through the combined choices of millions of households and firms. Economists, therefore, study how people make decisions - how much they work, what they buy, how much they save and how they invest their savings. Economists also study how people interact with one another.

The 10 principles of economics are introduced here to give you an overview of what economics is all about. These 10 principles are mainly distributed into three groups:

A- How people make decisions

1- ***People face trade-offs.*** You may have heard the saying, 'There's no such thing as a free lunch'. To get something that we like, we usually have to give up something else that we also like. Making decisions requires trading off one goal against another.

Efficiency; the property of society getting the most it can from its scarce resources.

Equity; the property of distributing economic prosperity uniformly among the members of society.

2- ***The cost of something is what you give up to get it.*** Because people face trade-offs, making decisions requires comparing the costs and benefits of alternative courses of action. In many cases, however, the cost of some action is not as obvious as it might first appear.

Opportunity cost; the best alternative that must be given up to obtain some item.

3- ***Rational people think at the margin.*** Economists normally assume that people are rational.

Rational people who systematically and purposefully do the best they can to achieve their objectives.

Economists use the term marginal change to describe a small incremental adjustment to an existing plan of action. Keep in mind that margin means 'edge', so marginal changes are adjustments around the edges of what you are doing. Rational people often make decisions by comparing marginal benefits and marginal cost.

4- ***People respond to incentives.*** An incentive is something that induces a person to act, such as the prospect of a punishment or reward. Because rational people make decisions by comparing costs and benefits, they respond to incentives.

(Task1) How people make decisions? Mention your answer in points.

B- How people interact

The first four principles discussed how individuals make decisions. As we go about our lives, many of our decisions affect not only ourselves but other people as well. The next three principles present some key ideas about how people interact with one another.

5- ***Trade can make everyone better off.*** Trade allows countries to specialize in what they do best and to enjoy a greater variety of goods and services. The Chinese, the Japanese, the Germans and the Indonesians are as much our partners in the world economy as they are our competitors.

6- ***Markets are usually a good way to organize economic activity.*** Most countries that once had centrally planned economies have abandoned this system and instead have adopted market economies. In a market economy, the decisions of a central planner are replaced by the decisions of millions of firms and households. Firms decide whom to hire and what to make. Households decide which firms to work for and what to buy with their

incomes. These firms and households interact in the marketplace, where prices and self-interest guide their decisions.

So, market economy is an economy that allocates resources through the decentralized decisions of many firms and households as they interact in markets for goods and services.

7- *Governments can sometimes improve market outcomes.* If the invisible hand of the market is so great, why do we need government? One purpose of studying economics is to refine your view about the proper role and scope of government policy. One reason we need government is that the invisible hand can work its magic only if government enforces the rules and maintains the institutions that are key to a market economy. Most important, markets work only if property rights are enforced so individuals can own and control scarce resources. A farmer won't grow food if she expects her crop to be stolen; a restaurant won't serve meals unless it is assured that customers will pay before they leave; and a film company won't produce movies if too many potential customers avoid paying by making illegal copies.

Property rights: the ability of an individual to own and exercise control over scarce resources.

Consider first the goal of efficiency. Although the invisible hand usually leads markets to allocate resources to maximize the size of the economic pie, this is not always the case. Economists use the term market failure to refer to a situation in which the market on its own fails to allocate resources efficiently. One possible cause of market failure is an externality, which is the uncompensated impact of one person's actions on the wellbeing of a bystander. A positive externality makes the bystander better off. A negative externality makes the bystander worse off. Another possible cause of market failure is market power, which refers to the ability of a single economic actor (or small group of actors) to have a substantial influence on market prices.

C- How the economy as a whole works

8- *A country's standard of living depends on its ability to produce goods and services.* The differences in living standards around the world are staggering. What explains these large

differences in living standards among countries and over time? The answer is surprisingly simple. Almost all variation in living standards is attributable to differences in countries' productivity - that is, the amount of goods and services produced by each hour of a worker's time. In nations where workers can produce a large quantity of goods and services per hour, most people enjoy a high standard of living; in nations where workers are less productive, most people must endure a more meagre existence. Similarly, the growth rate of a nation's productivity determines the growth rate of its average income.

9- ***Prices rise when the government prints too much money.*** This response is defined as inflation, which is an increase in the overall level of prices in the economy.

10- ***Society faces a short-run trade-off between inflation and unemployment.*** While an increase in the quantity of money primarily has the effect of raising prices in the long run, in the short run the story is more complex. Most economists describe the short-run effects of money growth as follows:

- Increasing the amount of money in the economy stimulates the overall level of spending and thus the demand for goods and services.
- Higher demand may over time cause firms to raise their prices, but in the meantime, it also encourages them to hire more workers and produce a larger quantity of goods and services.
- More hiring means lower unemployment. This line of reasoning leads to one final economy-wide trade-off: a short-run trade-off between inflation and unemployment. Although some economists still question these ideas, most accept that society faces a short-run trade-off between inflation and unemployment. This simply means that, over a period of a year or two, many economic policies push inflation and unemployment in opposite directions. This short-run trade-off plays a key role in the analysis of the business cycle, which is fluctuations in economic activity, such as employment and production.

(Task2) translate point 10 above into Kurdish or Arabic language.

Scarcity:

- Scarcity refers to our limited resources and our unlimited wants and needs.
- For an individual, resources include time, money and skill.
- For a country, limited resources include natural resources, capital, labor force and technology.

Needs – Wants:

What are Needs?

Needs are the things that a person has to have to survive.

What are Wants?

Wants are those things that you would like, but do not need to survive.

- Human wants are unlimited.
- We live in a world of limited resources.
- The above leads to scarcity.
- People try to balance needs and wants.

Why do we have Scarcity?

We have Unlimited Wants and Needs. But limited resources create scarcity, so, we need to make Choice.

Causes of Scarcity:

1. Personal Perspective: your own feelings of what is needed or wanted.
2. Poor Distribution of Resources: not using your resources to their potential
3. Rapid Increase in Demand: A sudden rush to use resources can cause a shortage.

Ways we deal with Scarcity?

1. Creating more resources
2. Making better use of our resources

Why is scarcity a fundamental aspect of economics?

The scarcity of resources may lead to widespread problems such as famine, drought and even war. These problems occur when essential goods become scarce due to several factors, including the exploitation of natural resources or poor planning by government economists.

Types of scarcity:

Scarcity generally falls under three categories:

- 1- Demand-induced scarcity. This occurs when the demand for a particular product or resource far exceeds the supply that the economy is able to provide.
- 2- Supply-induced scarcity. This occurs when environmental degradation or other unforeseen factors cause the supply of a resource to decrease significantly despite the demand being within normal limits.
- 3- Structural scarcity. This occurs when there is unequal access to particular resources among members of the population.

Elasticities:

The elasticity is a measure of the responsiveness of quantity demanded or quantity supplied to one of its determinants.

Price elasticity of demand a measure of how much the quantity demanded of a good respond to a change in the price of that good, calculated as the percentage change in quantity demanded divided by the percentage change in price.

Economists calculate the price elasticity of demand as the percentage change in the quantity demanded divided by the percentage change in the price. That is:

$$\text{Price elasticity of demand} = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in price}}$$

For example, suppose that a 10 per cent increase in the price of an ice-cream causes the amount of ice-cream you buy to fall by 20 per cent. We calculate your elasticity of demand as:

$$\text{Price elasticity of demand} = \frac{20\%}{10\%} = 2$$

In this example, the elasticity is 2, reflecting that the change in the quantity demanded is proportionately twice as large as the change in the price.

Because the quantity demanded of a good is negatively related to its price, the percentage change in quantity will always have the opposite sign to the percentage change in price. In this example, the percentage change in price is a positive 10 per cent (reflecting an increase), and the percentage change in quantity demanded is a negative 20 per cent (reflecting a decrease). For this reason, price elasticities of demand are sometimes reported as negative numbers. In this book we follow the common practice of dropping the minus sign and reporting all price elasticities as positive numbers. (Mathematicians call this the absolute value.) With this convention, a larger price elasticity implies a greater responsiveness of quantity demanded to a change in price.

The midpoint method:

A better way to calculate percentage changes and elasticities If you try calculating the price elasticity of demand between two points on a demand curve, you will quickly notice an

annoying problem: the elasticity from point A to point B seems different from the elasticity from point B to point A. For example, consider these numbers:

Point A: Price= \$4 Quantity= 120

Point B: Price= \$6 Quantity= 80

Going from point A to point B, the price rises by 50 per cent, and the quantity falls by 33 per cent, indicating that the price elasticity of demand is 33/50, or 0.66. Going from point B to point A, the price falls by 33 per cent, and the quantity rises by 50 per cent, indicating that the price elasticity of demand is 50/30, or 1.5.

One way to avoid this problem is to use the midpoint method for calculating elasticities. The standard procedure for computing a percentage change is to divide the change by the initial level. By contrast, the midpoint method computes a percentage change by dividing the change by the midpoint (or average) of the initial and final levels. For instance, \$5 is the midpoint of \$4 and \$6. Therefore, according to the midpoint method, a change from \$4 to \$6 is considered a 40 per cent rise, because $(6 - 4)/5 \times 100 = 40$.

Similarly, a change from \$6 to \$4 is considered a 40 per cent fall. Because the midpoint method gives the same answer regardless of the direction of change, it is often used when calculating the price elasticity of demand between two points. In our example, the midpoint between point A and point B is:

Midpoint: Price= \$5 Quantity = 100

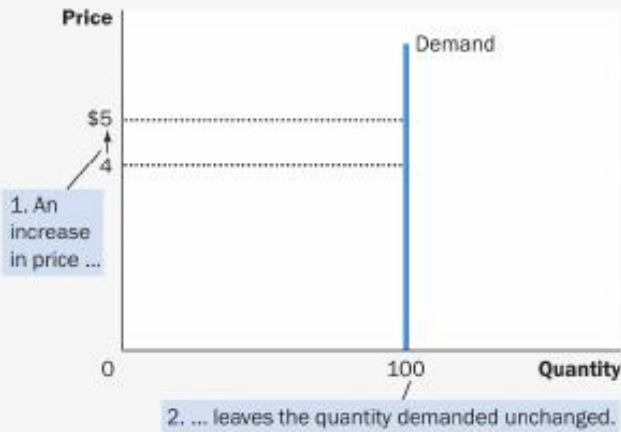
According to the midpoint method, when going from point A to point B, the price rises by 40 per cent and the quantity falls by 40 per cent. Similarly, when going from point B to point A, the price falls by 40 per cent and the quantity rises by 40 per cent. In both directions, the price elasticity of demand equals 1. The following formula expresses the midpoint method for calculating the price elasticity of demand between two points, denoted (Q_1, P_1) and (Q_2, P_2) .

$$\text{Price elasticity of demand} = \frac{(Q_2 - Q_1) / [(Q_1 + Q_2) / 2]}{(P_2 - P_1) / [(P_1 + P_2) / 2]}$$

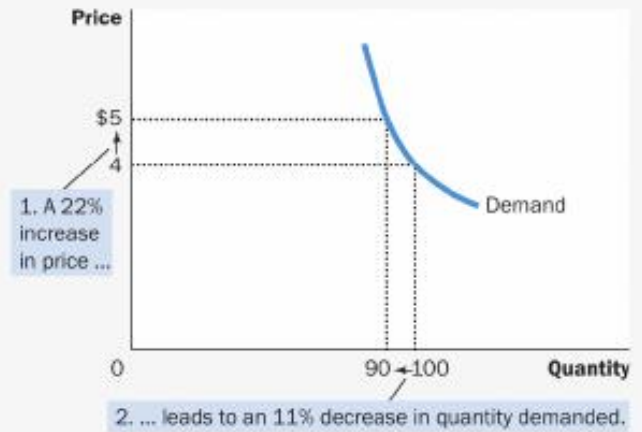
The numerator is the percentage change in quantity computed using the midpoint method, and the denominator is the percentage change in price computed using the midpoint method.

Figure 2 The price elasticity of demand.

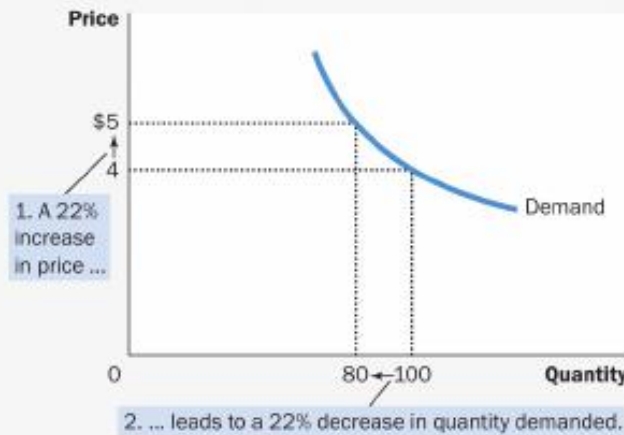
(a) Perfectly inelastic demand: elasticity equals 0



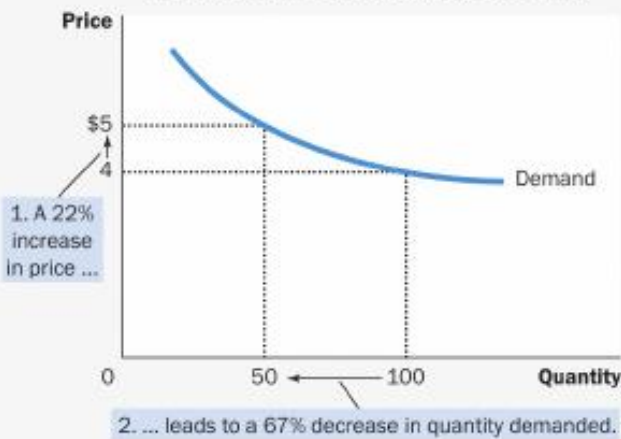
(b) Inelastic demand: elasticity is less than 1



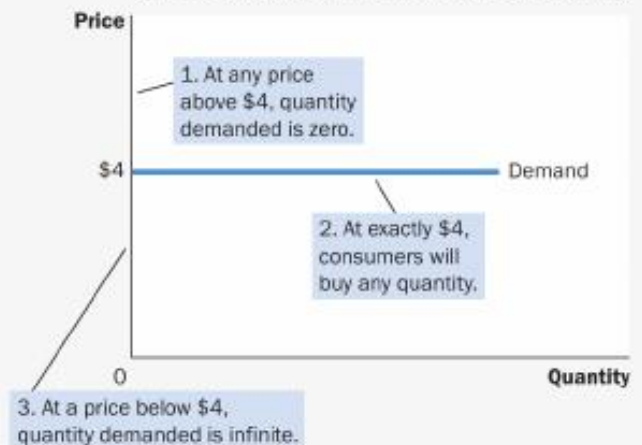
(c) Unit elastic demand: elasticity equals 1



(d) Elastic demand: elasticity is greater than 1



(e) Perfectly elastic demand: elasticity equals infinity

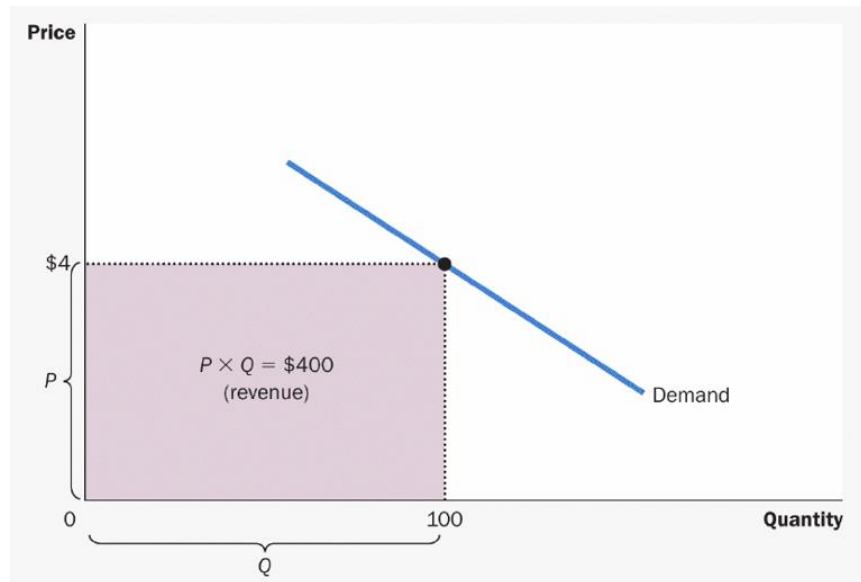


In each panel the demand curve passes through the point: Price = \$4 and Quantity = 100. The price elasticity of demand determines whether the demand curve is steep or flat as it passes through this point. Note that all percentage changes are calculated using the midpoint method.

Total revenue and the price elasticity of demand:

When studying changes in supply or demand in a market, one variable we often want to study is total revenue (in a market), the amount paid by buyers and received by sellers of the good. In any market, total revenue is $P \times Q$, the price of the good times the quantity of the good sold. We can show total revenue graphically, as in Figure 5.2. The height of the box under the demand curve is P , and the width is Q . The area of this box, $P \times Q$, equals the total revenue in this market. In Figure 3, where $P = \$4$ and $Q = 100$, total revenue is $\$4 \times 100$, or $\$400$.

Figure 3 Total Revenue



The area of the box under the demand curve, $P \times Q$, equals the total amount paid by buyers, as well as the total revenue received by sellers. Here, at a price of $\$4$, the quantity demanded is 100, and total revenue is $\$400$.

How does total revenue change as one moves along the demand curve? The answer depends on the price elasticity of demand. If demand is inelastic, as in Figure 4, then an increase in the price causes an increase in total revenue. Here an increase in price from $\$1$ to $\$3$ causes the quantity demanded to fall from 100 to 80, so total revenue rises from $\$100$ to $\$240$. An increase in price raises $P \times Q$ because the fall in Q is proportionately smaller than the rise in P .

We obtain the opposite result if demand is elastic: An increase in the price causes a decrease in total revenue. In Figure 5 for instance, when the price rises from $\$4$ to $\$5$, the quantity demanded falls from 50 to 20, and so total revenue falls from $\$200$ to $\$100$.

Because demand is elastic, the reduction in the quantity demanded is so great that it more than offsets the increase in the price. That is, an increase in price reduces $P \times Q$ because the fall in Q is proportionately greater than the rise in P .

Although the examples in these two figures are extreme, they illustrate some general rules:

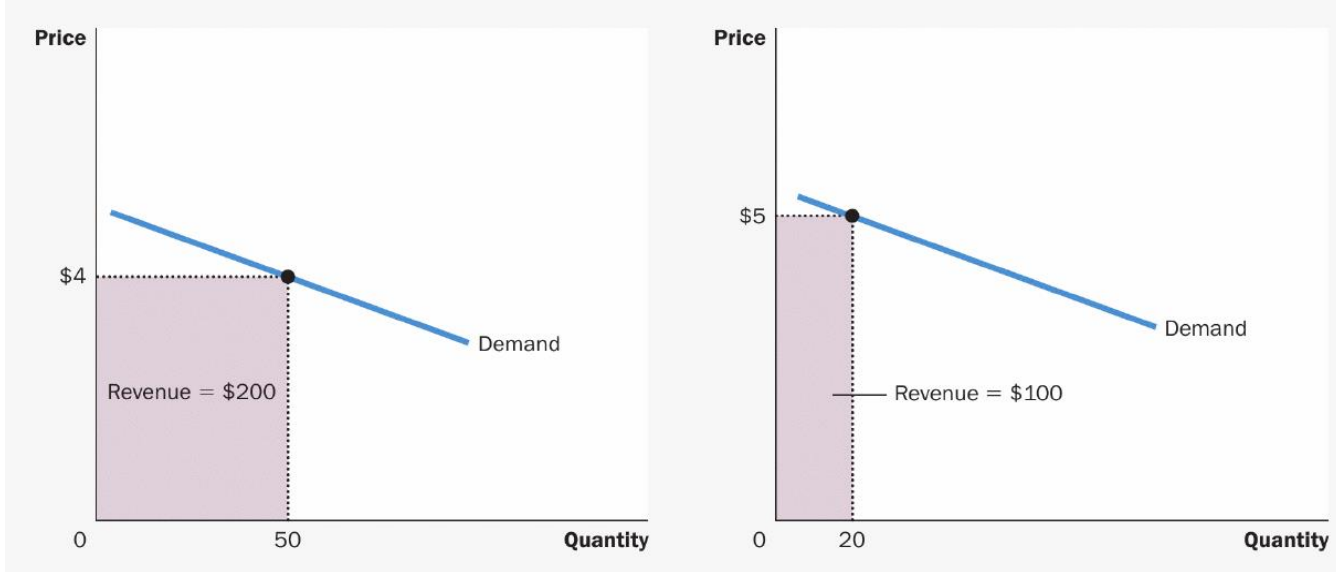
- When a demand curve is inelastic (a price elasticity less than 1), a price increase raises total revenue and a price decrease reduces total revenue.
- When a demand curve is elastic (a price elasticity greater than 1), a price increase reduces total revenue and a price decrease raises total revenue.
- In the special case of unit elastic demand (a price elasticity exactly equal to 1), a change in the price does not affect total revenue.

Figure 4 How total revenue changes when price changes: Inelastic demand



With an inelastic demand curve, an increase in the price leads to a proportionately smaller decrease in quantity demanded. Therefore, total revenue (the product of price and quantity) increases. Here, an increase in the price from \$1 to \$3 causes the quantity demanded to fall from 100 to 80, and total revenue rises from \$100 to \$240.

Figure 5 How total revenue changes when price changes: Elastic demand

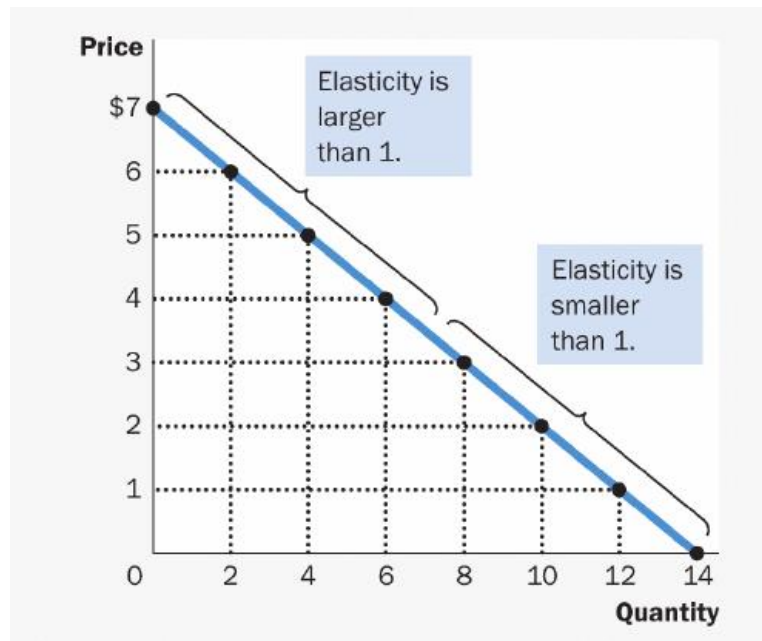


With an elastic demand curve, an increase in the price leads to a proportionately larger decrease in quantity demanded. Therefore, total revenue (the product of price and quantity) decreases. Here, an increase in the price from \$4 to \$5 causes the quantity demanded to fall from 50 to 20, so total revenue falls from \$200 to \$100.

Elasticity and total revenue along a linear demand curve

Let's examine how elasticity varies along a linear demand curve, as shown in Figure 6. We know that a straight line has a constant slope. Slope is defined as 'rise over run', which here is the ratio of the change in price ('rise') to the change in quantity ('run'). In this case, the demand curve's slope is constant because each \$1 increase in price causes the same two unit decrease in the quantity demanded.

Figure 6 Elasticity along a linear demand curve



The slope of a linear demand curve is constant, but its elasticity is not. The price elasticity of demand is calculated using the demand schedule in Table 1 and the midpoint method. At points with a low price and high quantity, the demand curve is inelastic. At points with a high price and low quantity, the demand curve is elastic.

Table 1 Calculating the elasticity of a linear demand curve

Price (\$)	Quantity	Total revenue (price x quantity)	% change in price	% change in quantity	Elasticity	Description
0	14	\$0				
1	12	12	200	15	0.1	Inelastic
2	10	20	67	18	0.3	Inelastic
3	8	24	40	22	0.6	Inelastic
4	6	24	29	29	1.0	Unit elastic
5	4	20	22	40	1.8	Elastic
6	2	12	18	67	3.7	Elastic
7	0	0	15	200	13.0	Elastic

These numbers illustrate the relationship between total revenue and elasticity. When the price is \$1, for instance, demand is inelastic and a price increase to \$2 raises total revenue. When the price is \$5, demand is elastic and a price increase to \$6 reduces total revenue.

Between \$3 and \$4, demand is exactly unit elastic and total revenue is the same at these two prices.

The linear demand curve illustrates that the price elasticity of demand need not be the same at all points on a demand curve. A constant elasticity is one possibility, but it is not always the case, and it is never the case for a linear demand curve.

Other demand elasticities:

In addition to the price elasticity of demand, economists also use other elasticities to describe the behavior of buyers in a market.

The income elasticity of demand:

Economists use the income elasticity of demand to measure how the quantity demanded changes as consumer income changes. The income elasticity is the percentage change in quantity demanded divided by the percentage change in income. That is:

$$\text{Income elasticity of demand} = \frac{\text{Percentage change in quantity demand}}{\text{Percentage change in income}}$$

(Task3) Translate the following paragraphs into Kurdish or Arabic language:

As is known, most goods are normal goods: Higher income raises quantity demanded. Because quantity demanded and income move in the same direction, normal goods have positive income elasticities. A few goods, such as bus rides, are inferior goods:

Higher income lowers the quantity demanded. Because quantity demanded and income move in opposite directions, inferior goods have negative income elasticities.

Even among normal goods, income elasticities vary substantially in size. Necessities, such as food and clothing, tend to have small income elasticities because consumers choose to buy some of these goods even when their incomes are low. Indeed, a long-established empirical regularity is Engel's Law (named after the statistician who discovered it): As a family's income rises, the percentage of its income spent on food declines, indicating an income elasticity less

than one. By contrast, luxuries such as jewelry and recreational goods tend to have large income elasticities because consumers feel that they can do without these goods altogether if their income is too low.

The cross-price elasticity of demand

Economists use the cross-price elasticity of demand to measure how the quantity demanded of one good changes as the price of another good changes. It is calculated as the percentage change in quantity demanded of good 1 divided by the percentage change in the price of good 2. That is:

$$\text{Cross-price elasticity of demand} = \frac{\text{Percentage change in quantity of good 1}}{\text{Percentage change in price of good 2}}$$

Whether the cross-price elasticity is a positive or negative number depends on whether the two goods are substitutes or complements. Substitutes are goods that are typically used in place of one another, such as hamburgers and hot dogs. An increase in hot dog prices induces people to barbecue more hamburgers instead. Because the price of hot dogs and the quantity of hamburgers demanded move in the same direction, the cross-price elasticity is positive. Conversely, complements are goods that are typically used together, such as computers and software. In this case, the cross-price elasticity is negative, indicating that an increase in the price of computers reduces the quantity of software demanded.

(Task4) Define price elasticity of demand. Explain the relationship between total revenue and the price elasticity of demand.

Price elasticity of supply

Is a measure of how much the quantity supplied of a good respond to a change in the price of that good, calculated as the percentage change in quantity supplied divided by the percentage change in price?

In most markets, a key determinant of the price elasticity of supply is the time period being considered. Supply is usually more elastic in the long run than in the short run. Over short periods of time, firms cannot easily change the size of their factories to make more or less of a good. Thus, in the short run, the quantity supplied is not very responsive to changes in the price. Economists calculate the price elasticity of supply as the percentage change in the quantity supplied divided by the percentage change in the price. That is:

$$\text{Price elasticity of supply} = \frac{\text{Percentage change in quantity supplied}}{\text{Percentage change in price}}$$

For example, suppose that an increase in the price of milk from \$0.95 to \$1.05 a litre raises the amount that dairy farmers produce from 9250 to 10 750 litres per month. Using the midpoint method, we calculate the percentage change in price as:

$$\text{Percentage change in price} = (1.05 - 0.95) / 1.00 \times 100 = 10\%$$

Similarly, we calculate the percentage change in quantity supplied as:

$$\text{Percentage change in quantity supplied} = (10\,750 - 9250) / 10\,000 \times 100 = 15\%$$

In this case, the price elasticity of supply is:

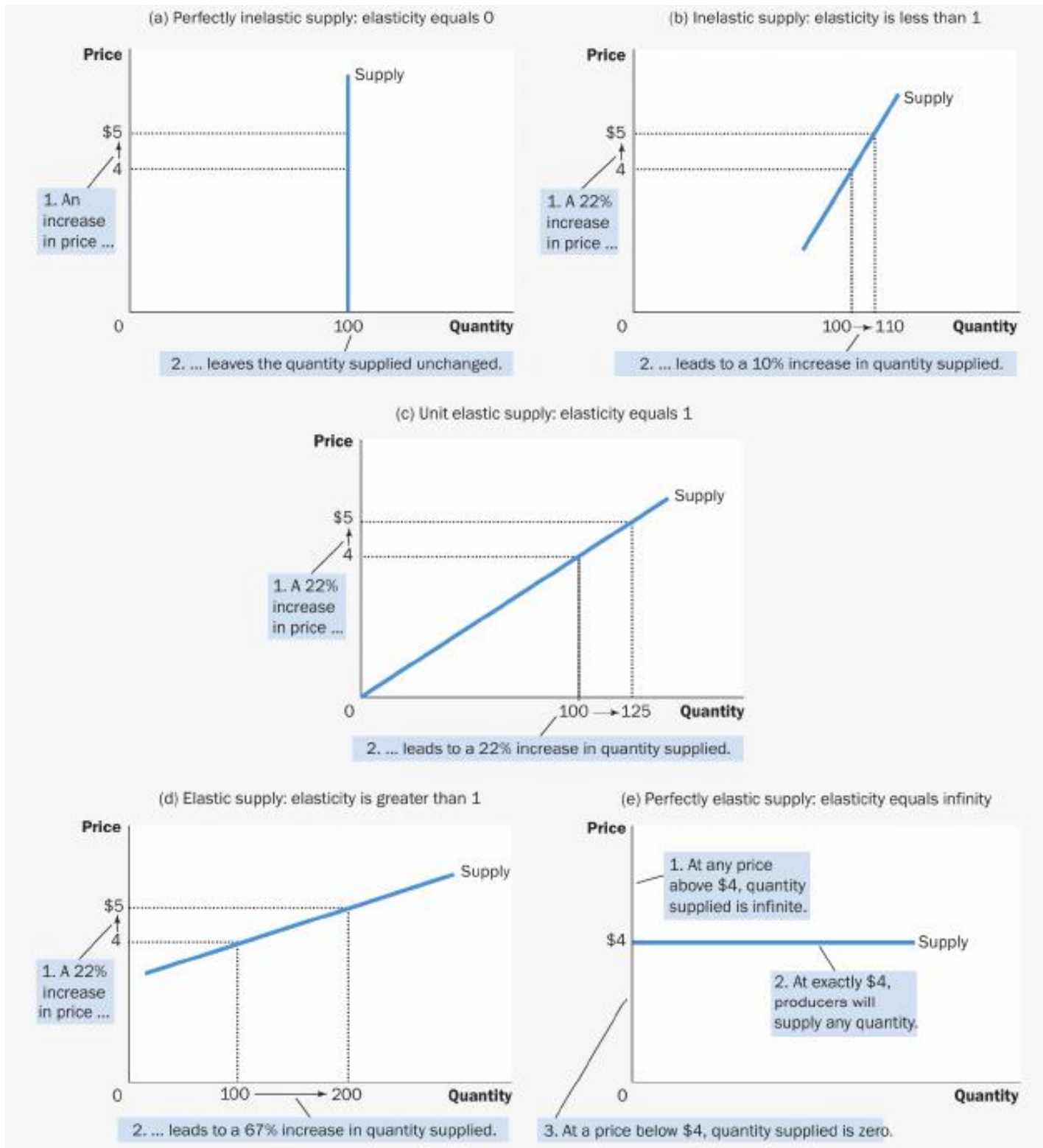
$$\text{Price elasticity of supply} = \frac{15\%}{10\%} = 1.5$$

In this example, the elasticity of 1.5 is greater than 1, which reflects the fact that the quantity supplied moves proportionately more than the price.

The variety of supply curves

Because the price elasticity of supply measures the responsiveness of quantity supplied to a change in price, it is reflected in the appearance of the supply curve. Figure 7 shows the price elasticities of supply.

Figure 7 shows the price elasticities of supply.



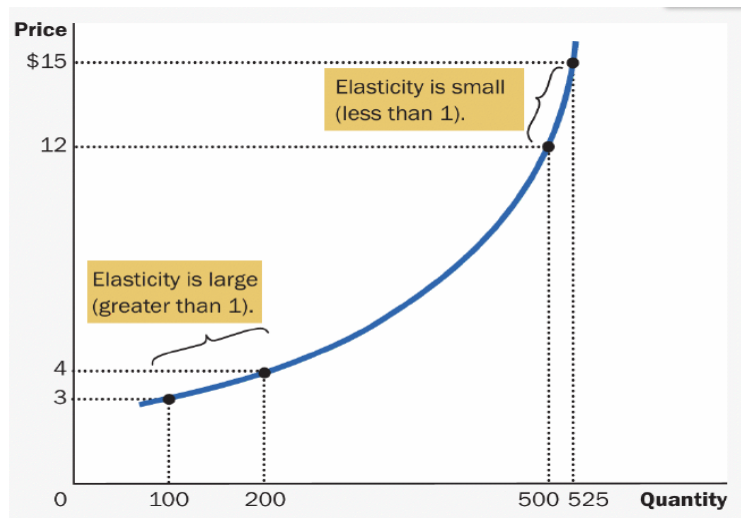
The price elasticity of supply determines whether the supply curve is steep or flat. Note that all percentage changes are calculated using the midpoint method.

We have five cases illustrated in figure 7. In the extreme case of a zero elasticity, as shown in panel (a), supply is perfectly inelastic and the supply curve is vertical. In this case, the quantity supplied is the same regardless of the price. As the elasticity rises, the supply curve gets flatter, which shows that the quantity supplied responds more to changes in the price. At the opposite extreme, shown in panel (e), supply is perfectly elastic. This occurs as the price elasticity of supply approaches infinity and the supply curve is horizontal, meaning that very small changes in the price lead to very large changes in the quantity supplied.

In some markets, the elasticity of supply is not constant but varies over the supply curve. Figure 8 shows a typical case for an industry in which firms have factories with a limited capacity for production. For low levels of quantity supplied, the elasticity of supply is high, indicating that firms respond substantially to changes in the price. In this region of the supply curve, firms have additional capacity for production, such as plant and equipment sitting idle for all or part of the day. Small increases in price make it profitable for firms to begin using this idle capacity. As the quantity supplied rises, firms begin to reach capacity.

Once capacity is fully used, further increases in production require the construction of new factories. To induce firms to incur this extra expense, the price must rise substantially, so supply becomes less elastic.

Figure 8 How the price elasticity of supply can vary



(Task5) Translate the following paragraph:

Because firms often have a maximum capacity for production, the elasticity of supply may be very high at low levels of quantity supplied and very low at high levels of quantity supplied. Here, an increase in price from \$3 to \$4 increases the quantity supplied from 100 to 200. Because the increase in quantity supplied of 100 per cent is larger than the increase in price of 33 per cent, the supply curve is elastic in this range. In contrast, when the price rises from \$12 to \$15, the quantity supplied rises from 500 to only 525. Because the increase in quantity supplied of 5 per cent is smaller than the increase in price of 25 per cent, the supply curve is inelastic in this range.

Figure 8 presents a numerical example of this phenomenon. When the price rises from \$3 to \$4 (a 29 per cent increase according to the midpoint method), the quantity supplied rises from 100 to 200 (a 67 per cent increase). Because quantity supplied changes proportionately more than the price, the supply curve has an elasticity greater than 1. In contrast, when the price rises from \$12 to \$15 (a 22 per cent increase), the quantity supplied rises from 500 to 525 (a 5 per cent increase). In this case, quantity supplied moves proportionately less than the price, so the elasticity is less than 1.

• METHODS OF MEASURING THE PRICE ELASTICITY OF DEMAND

The methods of price elasticity of demand was introduced by A.F Marshall in Economics. There are five methods which are used to measure the elasticity of demand.

1. Slope Method
2. Percentage Method
3. Point Method
4. Total Expenditure Method
5. ARC Method

1. Explain about Slope method?

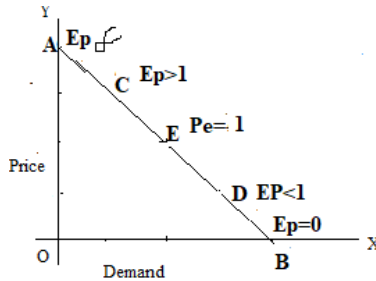
Slope Method: under this, the value of elasticity of demand is estimated on the basis of slope of demand curve. Also we can see this, various slopes of demand curves in the types of price elasticity of demand.

- a) If the demand curve slope is parallel to X- axis , then value of elasticity of demand is infinite($E_p = \infty$)
- b) If the demand curve slope is parallel to Y-axis, then value of elasticity is zero($E_p = 0$)
- c) If the demand curve slope is near to X-axis, then value of elasticity is more than one($E_p > 1$)
- d) If the demand curve slope is near to Y-axis, then value of elasticity is less than one($E_p < 1$)
- e) If the demand curve slope is rectangular hyperbola, then value of elasticity is equal to one ($E_p = 1$).

2. Explain about Percentage Method? (See the price elasticity of demand)

3. What is Point Method?

Point Method: It is used to know the price elasticity of demand at any point on demand line. Point elasticity of demand can be measured from the following formula. Under this, the lower segment of demand curve divided by upper segment of demand curve.



$$\text{Point Method (Ep)} = \frac{\text{Lower Segment of the Demand Curve}}{\text{Upper Segment of the Demand Curve}}$$

here we have to identify, at which point we have to know PE of demand.

To know the elasticity of demand at point E, then...

$$\text{PE at Point 'E'} = \frac{EB}{EA} = \frac{5}{5} = \frac{1}{1} = 1 \quad (\text{Ep}=1)$$

$$\text{PE at Point 'D'} = \frac{DB}{DA} = \frac{2.5}{7.5} = \frac{1}{3} = 0.33 \quad (\text{Ep}<1)$$

$$\text{PE at Point 'C'} = \frac{CB}{CA} = \frac{7.5}{2.5} = \frac{3}{1} = 3 \quad (\text{Ep}>1)$$

$$\text{PE at Point A} = \frac{AB}{AO} = \frac{10}{0} = \infty$$

$$\text{PE at Point B} = \frac{B0}{10} = \frac{0}{10} = 0$$

1. Explain about outlay method?

Outlay Method: under this method, considered expenditure of the consumer. It is measured on the basis of change in total outlay following a change in the price of a commodity. Total expenditure is equal to quantity purchased of a good multiplied by its unit price. According to this method, there is three types of elasticity. They are.

1. Elastic demand
2. Inelastic demand
3. Unitary elastic demand

1. If total expenditure increase with fall in price and decrease with rise in the price then price elasticity is elastic or relative elastic. $Ep > 1$
2. If total expenditure remains the same with a rise or fall in the price, then price elasticity is unitary. $Ep = 1$
3. If total expenditure decrease with a fall in the price and increase with rise in price, then elasticity is in elastic or relatively in elastic. $Ep < 1$.

Expenditure method table

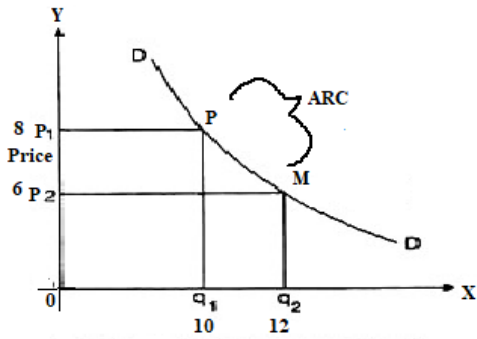
Price (Rs.per kg)	Quantity demanded(kg)	Total Revenue(Rs.) (TR=PXQ)	Elasticity(Ep)
6	10	60	} $Ep > 1$ Elastic
5	20	100	
4	30	120	} $Ep = 1$ Unitary
3	40	120	
2	50	100	} $Ep < 1$ Inelastic
1	60	60	

<i>Price</i>	<i>Total Expenditure</i>	<i>Nature of Elasticity</i>
<i>Falls</i> <i>Rises</i>	<i>Increase</i> <i>Decrease</i>	<i>Elastic</i>
<i>Falls</i> <i>Rises</i>	<i>Unchanged</i> <i>Unchanged</i>	<i>Unitary</i>
<i>Falls</i> <i>Rises</i>	<i>Decreases</i> <i>Increases</i>	<i>Inelastic</i>

5. How do measure price elasticity of demand with ARC method?

ARC Method: It is also known as ‘mid -point formula’ under this method, elasticity has to be measured between two points on the same demand curve. It is called ARC method.

$$\begin{aligned}
 E_p \text{ (ARC)} &= \frac{\frac{\text{change in quantity demanded}}{\text{average quantity demanded}}}{\frac{\text{change in price}}{\text{average price}}} \\
 &= \frac{\frac{\Delta Q}{\frac{Q_1 + Q_2}{2}}}{\frac{\Delta P}{\frac{P_1 + P_2}{2}}} \\
 &= \frac{\Delta Q}{\Delta P} \times \frac{P_1 + P_2}{Q_1 + Q_2} \\
 &= \frac{Q_2 - Q_1}{P_2 - P_1} \times \frac{P_1 + P_2}{Q_1 + Q_2}
 \end{aligned}$$



ARC Elasticity of Demand

$$\begin{aligned}
 &= \frac{Q_2 - Q_1}{P_2 - P_1} \times \frac{P_1 + P_2}{Q_1 + Q_2} \\
 &= \frac{\Delta Q}{\Delta P} \times \frac{P_1 + P_2}{Q_1 + Q_2}
 \end{aligned}$$

Any two points on a demand curve make an arc. The area between P and M on the DD curve in the above diagram is an **ARC** which measures elasticity over a certain range of price and quantities. On any two points of a demand curve, the elasticity coefficients are likely to be different depending upon the method of computation. Consider the price-quantity combinations P and M as given in Table.

ARC elasticity Table:

Point	Price	Quantity
P	8	10
M	6	12

P1=8, P2=6, dp=2; Q1= 10, Q2=12,dQ=2 find the Elasticity through ARC?

$$2/2=8+6/10+12, 1=16/22, 1=16/22=0.7 \text{ } E_{P\text{ARC}} \text{ is less than one } (E_p < 1)$$

What is Advertising Elasticity of Demand?

Advertising Elasticity of Demand (AED)

is a measure of effectiveness of increase in expenditure of advertising in increasing demand of a product. AED is always **positive**, meaning that the demand always increases with increase in advertising expenditure. **Whereas values of this ratio below 1** mean that the increase in demand is less than the increase in advertising expenditure, **while values greater than 1** indicate that the rise in demand is more than the rise in expenditure.

While this is a good way to estimate expected rise in advertising costs for growth in demand or the expected growth with rise in expense toward advertising, this is not the most accurate way. This ratio assumes that several other factors that may affect demand are constant, which cannot be the case in real life.

The formula is

$$AED = \frac{\% \text{ change in demand}}{\% \text{ change in advertising expenditure}} = \frac{\frac{\Delta d}{d}}{\frac{\Delta e}{e}}$$

This ratio can lie between 0 and ∞ (infinity).

In this article:

- Advertising Elasticity of Demand Factors
- Examples of Advertising elasticity of demand

Advertising Elasticity of Demand Factors

The demand of a certain good/service depends on, apart from expense on advertising, the following to name a few factors:

1. Income of the people of the region (state of economy): Expensive advertising may not yield very good results if the region has been recently hit by an economic crisis where people have been laid off on a large scale and are struggling to make ends meet; or in a region with generally low income.
2. Price of the product: No matter how much money is put in the advertising, if a similar product is in the market for a lower price that may take away from the success of the advertising.
3. Quality/Appeal of the ad: High expense doesn't always mean high quality in terms of audio-visual or content. Or the ad just may lack appeal for the demographic the product is for.

All these factors can alter the demand of the product, and hence the AED. Thus, AED may not be the most accurate measure of effectiveness of increase in advertising expenditure.

Examples of Advertising elasticity of demand

Let us take an example of Pizza chain. If the pizza outlet spends money on promotion of an existing variant of Pizza, then the demand of that Pizza can increase and stay at that level even after the promotions are over.

On the other hand, the impact of an offer regarding a discount offer at a pizza outlet may be drastically high but the same may not be true for an offer at a jewellery store

Factors Affecting Price Elasticity of Demand

1-Relative need for the product: The need of every individual is not the same for the same product. A product that is luxury for an individual may be a necessity for another person.

For example, a laptop may be a luxury product for an ordinary individual, while a necessity for a computer engineer. Thus, price elasticity differs across people due to their different needs.

2-Availability of substitute goods: the availability of substitutes has major impact on the demand for a product. If substitutes are easily available at relatively low prices, the demand for the product would be more elastic and vice versa.

For example, if the price of tea rises, people may opt for coffee.

3-Impact of income: The amount of income that consumers spend on purchasing a particular product also influences the price elasticity of demand. If consumers spend a large sum on a product, the demand for the product would be elastic.

For example, if the price of salt is raised by 50%, the demand would still be inelastic as consumers would keep on purchasing. Conversely, if the price of a home theatre system is raised by 25%, the demand for the system would be more elastic.

4-Time under consideration: It majorly influences the price elasticity of demand. Demand for a product remains inelastic in the short run due to failure to postpone demand.

For example, if the price of electricity goes up, people may find it difficult to cut its consumption; thus, the demand would remain less elastic. However, in case of a continuous increase in the price, people would gradually reduce the consumption of electricity by finding various ways, such as using CFL bulbs. In such a case, the demand would be more elastic.

5-Perishability of the product: If products are perishable in nature, the demand for such products would be inelastic as their consumption cannot be postponed.

For example, if the prices of vegetables that are used regularly are raised, the consumption would not decrease. Thus, the demand would be inelastic. Similarly, if products such as medicines are to be used in an emergency, the demand for them would not decrease.

6-Addiction: Some products, such as cigarettes and other tobacco-based products, have inelastic demand.

For instance, smokers may be willing to pay extra for cigarettes even in case of a price rise. Thus, the demand would remain the same.

7-Number of uses: If a commodity has multi-use, the demand will be less elastic. (for ex. Electricity) and for single used elasticity will be more. In recently, china electronic good possesses multiuse where more demand for those goods.

(Task) What are the factors affecting PED?

What is the Importance of Elasticity of Demand?

1-In the Determination of Output Level:

For making production profitable, it is essential that the quantity of goods and services should be produced corresponding to the demand for that product. Since the changes in demand is due to the change in price, the knowledge of elasticity of demand is necessary for determining the output level.

2-In the Determination of Price:

The elasticity of demand for a product is the basis of its price determination. The ratio in which the demand for a product will fall with the rise in its price and vice versa can be known with the knowledge of elasticity of demand.

If the demand for a product is inelastic, the producer can charge high price for it, whereas for an elastic demand product he will charge low price. Thus, the knowledge of elasticity of demand is essential for management in order to earn maximum profit.

3-In Price Discrimination by Monopolist:

Under monopoly discrimination the problem of pricing the same commodity in two different markets also depends on the elasticity of demand in each market. In the market with elastic demand for his commodity, the discriminating monopolist fixes a low price and in the market with less elastic demand, he charges a high price.

4-In Price Determination of Factors of Production:

The concept of elasticity for demand is of great importance for determining prices of various factors of production. Factors of production are paid according to their elasticity of demand. In other words, if the demand of a factor is inelastic, its price will be high and if it is elastic, its price will be low.

5-In Demand Forecasting:

The elasticity of demand is the basis of demand forecasting. The knowledge of income elasticity is essential for demand forecasting of producible goods in future. Long- term production planning and management depend more on the income elasticity because management can know the effect of changing income levels on the demand for his product.

6-In Dumping:

A firm enters foreign markets for dumping his product on the basis of elasticity of demand to face foreign competition.

7-In the Determination of Prices of Joint Products:

The concept of the elasticity of demand is of much use in the pricing of joint products, like wool and mutton, wheat and straw, cotton and cotton seeds, etc. In such cases, separate cost of production of each product is not known.

8-In the Determination of Government Policies:

The knowledge of elasticity of demand is also helpful for the government in determining its policies. Before imposing statutory price control on a product, the government must consider the elasticity of demand for that product.

The government decision to declare public utilities those industries whose products have inelastic demand and are in danger of being controlled by monopolist interests depends upon the elasticity of demand for their products.

9-Helpful in Adopting the Policy of Protection:

The government considers the elasticity of demand of the products of those industries which apply for the grant of a subsidy or protection. Subsidy or protection is given to only those industries whose products have an elastic demand. As a consequence, they are unable to face foreign competition unless their prices are lowered through subsidy or by raising the prices of imported goods by imposing heavy duties on them.

10-In the Determination of Gains from International Trade:

The gains from international trade depend, among others, on the elasticity of demand. A country will gain from international trade if it exports goods with less elasticity of demand and import those goods for which its demand is elastic.

In the first case, it will be in a position to charge a high price for its products and in the latter case it will be paying less for the goods obtained from the other country. Thus, it gains both ways and shall be able to increase the volume of its exports and imports.

(Task6) Define price elasticity of supply. Explain why the price elasticity of supply might be different in the long run than in the short run.

Reference: Joshua Gans, Stephen King, Martin Byford, N. Gregory Mankiw. 2021. Principles of Microeconomics, 8th Edition, Cengage Learning Australia Pty Limited.