Elasticity in Economics

Elasticity is an important concept in economics. It is used to measure how responsive demand (or supply) is in response to changes in another variable (such as price).

Price Elasticity of Demand

The most common elasticity, is price elasticity of demand. This measures how demand changes in response to a change in price.

Questions on Elasticity

- If the price of salt increases, will you reduce demand for salt?
- If the price of Akmina mineral water increases, would you reduce demand for Akmina?
- If the price of electricity increases, would you reduce demand?
- If the price of a Vodafone mobile phone increased, would you still buy it?

All these questions relate to the issue of elasticity. Some goods like salt are price inelastic because if the price of salt increases, people will generally keep buying it. e.g. a 10% increase in price, may reduced demand for salt by only 1%.

We say the PED of salt is -1/10 = -0.1

However, if the price of Akmina mineral water increased by 10%, many consumers would buy other types of mineral water. This is because Akmina mineral water has many substitutes – Sırma, Uludağ, Özkaynak etc

Therefore, a 10% increase in the price of Akmina water may reduce demand by 18%. Therefore, the PED of Akmina is -18/10 = -1.8. We say that Akmina has an elastic demand – **it is sensitive to changes in price**.

Price Inelastic demand.

We say demand is inelastic if a change in prices causes a smaller % fall in demand. Examples, include

- Petrol (even it is 10 tl per liter cars will ride)
- Salt (you can not eat without salt)
- Tobacco (addiction no comment)
- Electricity (darkness is not possible, how we will charge our phones?)
- Gas (are we gonna freeze at home?

All these goods are seen as necessary by consumers. If the price of electricity goes up, you will still use it to turn on lights and your TV. You can't plug your TV into the gas socket. Electricity is inelastic because it doesn't have any close substitutes. It is the same for petrol and salt.

Firms with monopoly power will face an inelastic demand curve.

Elastic Goods

This means a change in price leads to a bigger % change in demand. Elastic goods will be anything with many substitutes or luxury items that are expensive to buy e.g.

- IHE Bread, Marmara Simit
- Iphone 11, Ipad
- Jeep, Porsche
- Designer label Clothes, Network Zara

Therefore, a firm could cut price and gain a bigger % increase in demand. These are goods with many substitutes.

E.g. if ERIKLI cut its price by 10%, it may gain an 18% increase in market share (unless other firms also cut prices)

Using Knowledge of Elasticity

If a firm knows that demand for its product is price inelastic, then it can increase price and lead to an increase in revenue. Generally, firms would seek to make their goods more price inelastic, through advertising and highlighting unique selling point.

> **TOTAL REVENUE = P X Q**

- The midpoint formula is preferable when calculating the price elasticity of demand because it gives the same answer regardless of the direction of the change.

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

Example: If the price of M&Ms increases from 2.00 TL to 2.20 TL and the amount you buy falls from 10 to 8 packages, then your elasticity of demand, using the midpoint formula, would be calculated as:

$$\frac{\dfrac{(10-8)}{(10+8)/2}}{\dfrac{(2.20-2.00)}{(2.00+2.20)/2}} = \frac{22\%}{9.5\%} = 2.32$$
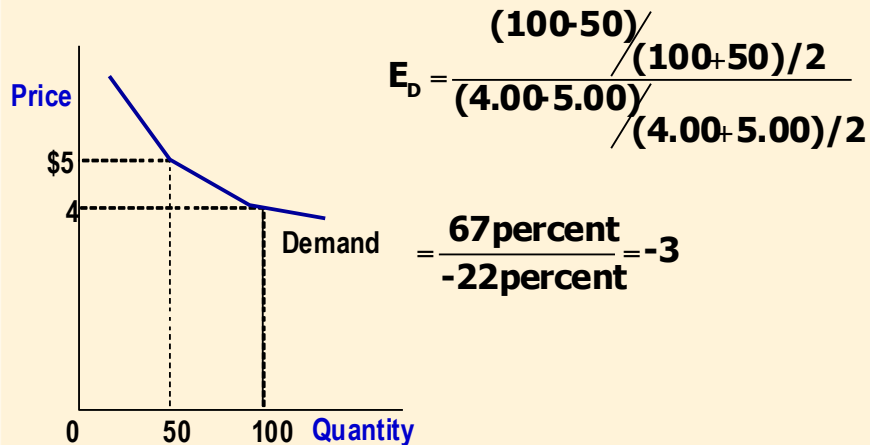
SO THE DEMAND IS ELASTIC because >1

ABSOLUTE VALUE IS USED

- Inelastic Demand
    - Quantity demanded does not respond strongly to price changes.
    - **Price elasticity of demand is less than one.**
- Elastic Demand
    - Quantity demanded responds strongly to changes in price.
    - **Price elasticity of demand is greater than one**

ANOTHER EXAMPLE :

Computing the Price Elasticity of Demand

$$E_D = \frac{(100\text{-}50)\big/(100\text{+}50)/2}{(4.00\text{-}5.00)\big/(4.00\text{+}5.00)/2}$$

$$= \frac{67\,percent}{-22\,percent} = -3$$

Demand is price elastic

Figure 1 The Price Elasticity of Demand

(a) Perfectly Inelastic Demand: Elasticity Equals 0

Price

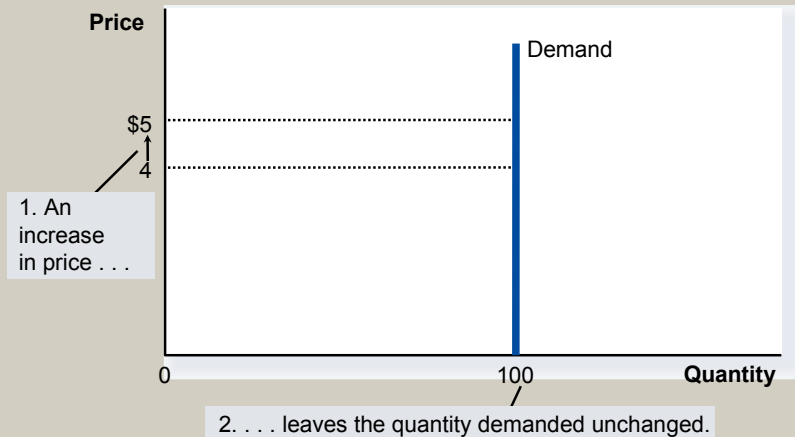Demand

$5

4

1. An increase in price . . .

0

100

Quantity

2. . . . leaves the quantity demanded unchanged.

Figure 1 The Price Elasticity of Demand

(b) Inelastic Demand: Elasticity Is Less Than 1
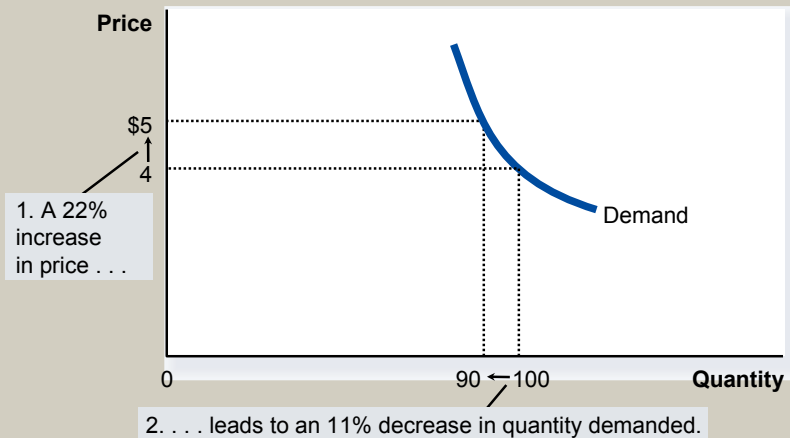
Price

$5

4

1. A 22% increase in price . . .

0   90 100   Quantity

Demand

2. . . . leads to an 11% decrease in quantity demanded.

Figure 1 The Price Elasticity of Demand

(d) Elastic Demand: Elasticity Is Greater Than 1

Price

$5

4

Demand

1. A 22% increase in price . . .

0   50   100   Quantity
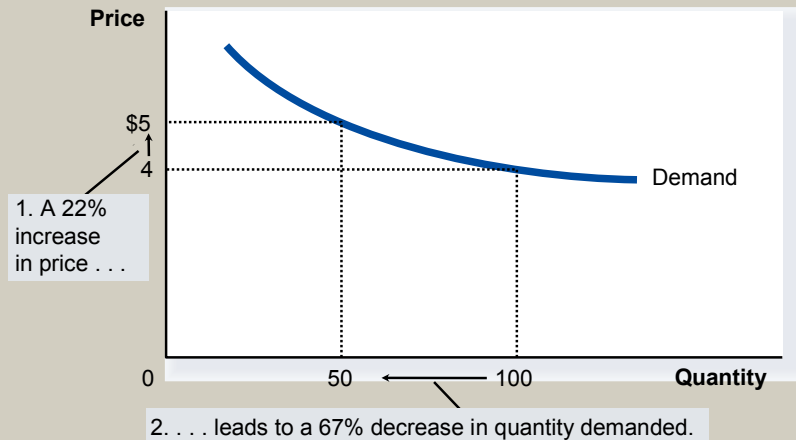
2. . . . leads to a 67% decrease in quantity demanded.

Figure 1 The Price Elasticity of Demand

(d) Elastic Demand: Elasticity Is Greater Than 1

Price

$5

4

Demand

1. A 22% increase in price . . .

0   50   100   **Quantity**

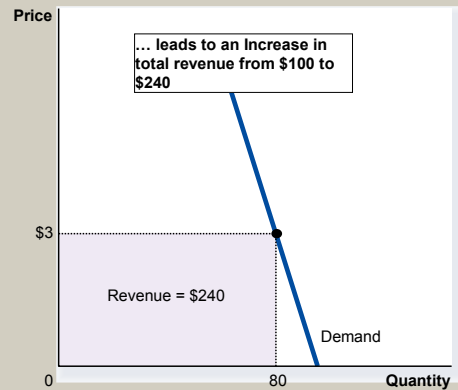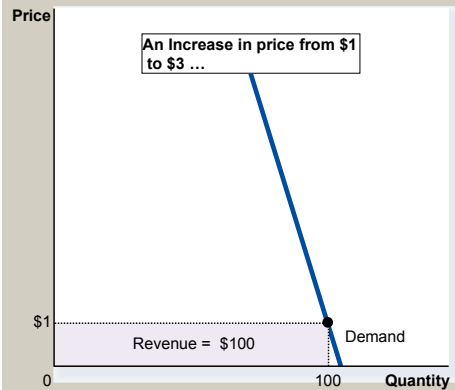2. . . . . leads to a 67% decrease in quantity demanded.
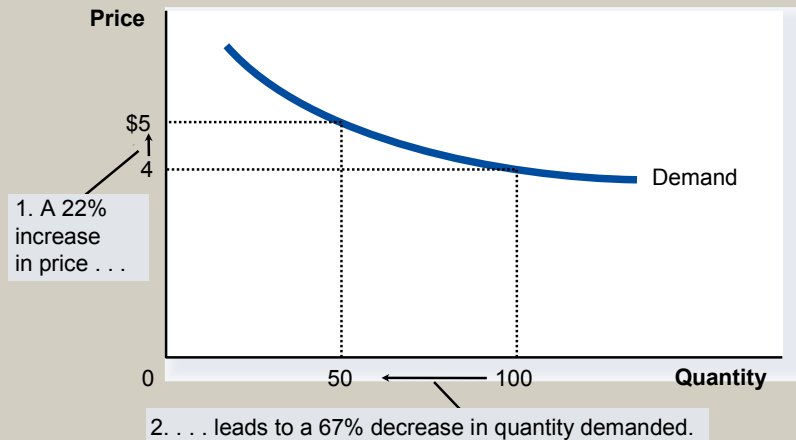
TOTAL REVENUE :
IN INELASTIC DEMAND

Elasticity and Total Revenue along a Linear Demand Curve

- With an inelastic demand curve, an increase in price leads to a decrease in quantity that is proportionately smaller. Thus, *total revenue increases*.

Figure 3 How Total Revenue Changes When Price Changes: Inelastic Demand

Price

An Increase in price from $1 to $3 …

$1

Revenue = $100

Demand

0   100   Quantity

Price

… leads to an Increase in total revenue from $100 to $240

$3

Revenue = $240

Demand

0   80   Quantity

IN ELASTIC DEMAND

Elasticity and Total Revenue along a Linear Demand Curve

- With an elastic demand curve, an increase in the price leads to a decrease in quantity demanded that is proportionately larger. Thus, *total revenue decreases*.

Figure 4 How Total Revenue Changes When Price Changes: Elastic Demand

Price

An Increase in price from $4 to $5 …

$4

Demand

Revenue = $200

0   50   Quantity

Price

… leads to an decrease in total revenue from $200 to $100

$5

Demand

Revenue = $100

0   20   Quantity