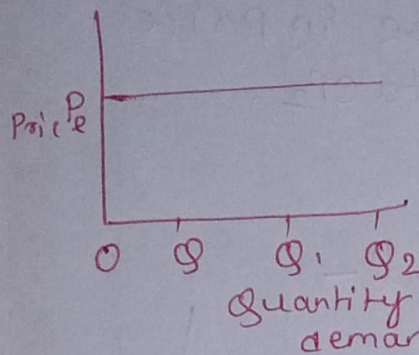
Measurement of Elasticity.

a) Perfectly Elastic Demand —

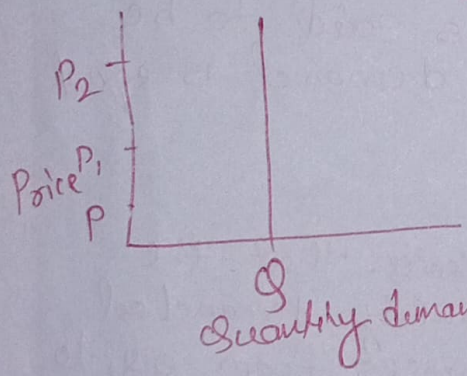
When any quantity can be sold at a given price and when there is no need to reduce price, the demand is said to be perfectly elastic.



from fig the quantity demanded increases from OQ to OQ_1 from OQ_1 to OQ_2 even though there is no change in price. Price is fixed at OP.

b) Perfectly Inelastic Demand —

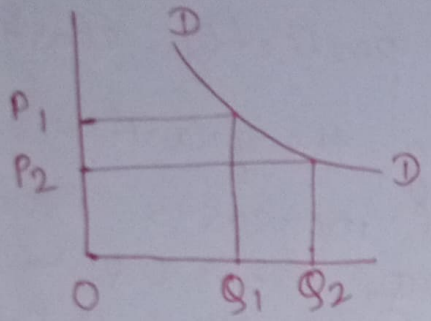
When a significant degree of change in price leads to little or no change in the quantity demanded, then the elasticity is said to be perfectly inelastic.



→ despite the increase in price from OP to OP_1, the quantity demanded has not fallen down.

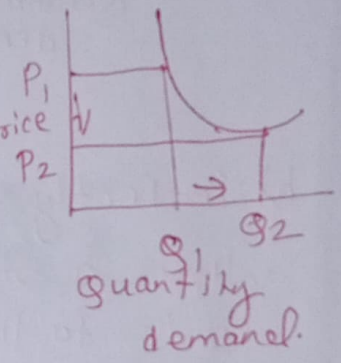
→ The concept of perfectly elastic and perfectly inelastic demand do not manifest in real life.

c) Relatively Elastic Demand – The demand is said to be relatively elastic when the change in demand is more than the change in the price.

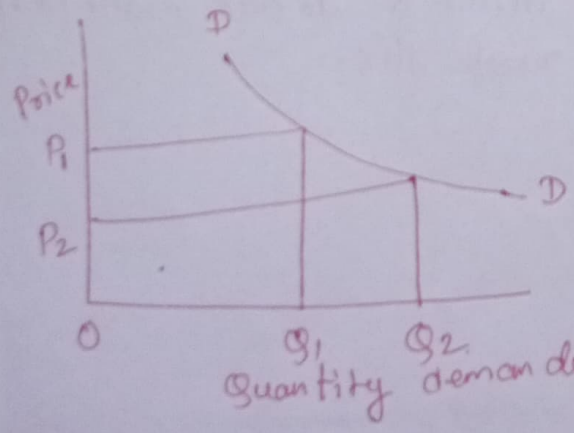


→ reveals that the quantity demanded increases from OQ_1 to OQ_2 because of a decrease in price from OP_1 to OP_2.

d) Relatively Inelastic Demand – The demand is said to be relatively inelastic when the change in demand is less that the change in the price.



e) Unity Elasticity – The elasticity in demand is said to be unity when the change in demand is equal to the change in price.



→ reveals that the quantity demanded increases from OQ_1 to OQ_2 because of a decrease in price from OP_1 to OP_2.

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Elasticity of Demand

File C5-207

Elasticity of demand is an important variation on the concept of demand. Demand can be classified as elastic, inelastic or unitary.

An **elastic** demand is one in which the change in quantity demanded due to a change in price is **large**. An **inelastic** demand is one in which the change in quantity demanded due to a change in price is **small**.

The formula used here for computing elasticity of demand is:

$$\frac{(Q1 - Q2) / (Q1 + Q2)}{(P1 - P2) / (P1 + P2)}$$

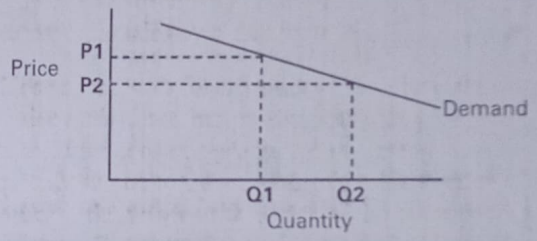
If the formula creates an *absolute value* greater than 1, the demand is elastic. In other words, quantity changes faster than price. If the value is less than 1, demand is inelastic. In other words, quantity changes slower than price. If the number is equal to 1, elasticity of demand is unitary. In other words, quantity changes at the same rate as price.

Elastic Demand

Elasticity of demand is illustrated in Figure 1. Note that a change in price results in a *large* change in quantity demanded. An example of products with an elastic demand is consumer durables. These are items that are purchased infrequently, like a washing machine or an automobile, and can be postponed if price rises. For example, automobile rebates have been very successful in increasing automobile sales by reducing price.

Close substitutes for a product affect the elasticity of demand. If another product can easily be substituted for your product, consumers will quickly switch to the other product if the price of your product rises or the price of the other product declines. For example, beef, pork and poultry are all meat products. The declining price of poultry in recent years has caused the consumption of poultry to increase, at the expense of beef and pork. So products with close substitutes tend to have elastic demand.

Figure 1. Elastic Demand



An example of computing elasticity of demand using the formula is shown in Example 1. When the price decreases from $10 per unit to $8 per unit, the quantity sold increases from 30 units to 50 units. The elasticity coefficient is 2.25.

Example 1. Elastic Demand Example

P1 = $10
P2 = $8
Q1 = 30
Q2 = 50

$$\frac{(Q1 - Q2) / (Q1 + Q2)}{(P1 - P2) / (P1 + P2)} = \frac{(50 - 30) / (50 + 30)}{(\$10 - \$8) / (\$10 + \$8)} = \frac{20 / 80}{\$2 / \$18} = \frac{1 / 4}{1 / 9} = \frac{1 \times 9}{4 \times 1} = \frac{9}{4} = 2.25$$

Reviewed November 2020

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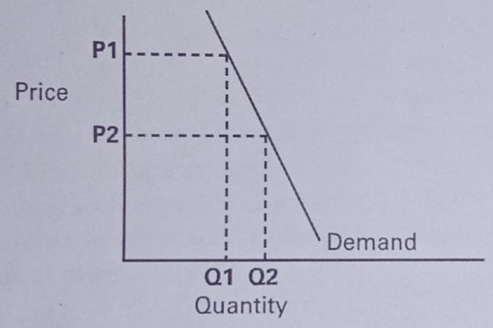
Inelastic Demand

Inelastic demand is shown in Figure 2. Note that a change in price results in only a *small* change in quantity demanded. In other words, the quantity demanded is not very responsive to changes in price. Examples of this are necessities like food and fuel. Consumers will not reduce their food purchases if food prices rise, although there may be shifts in the types of food they purchase. Also, consumers will not greatly change their driving behavior if gasoline prices rise.

Figure 2. Inelastic Demand



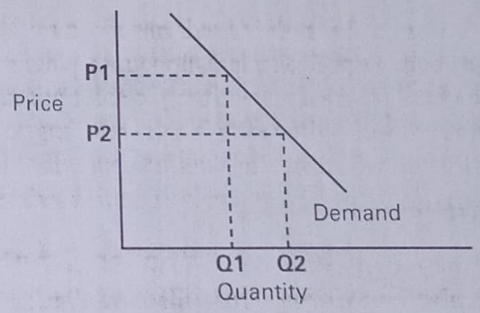
An example of computing inelasticity of demand using the formula above is shown in Example 2. When the price decreases from $12 to $6 (50%), the quantity of demand increases from 40 to only 50 (25%). The elasticity coefficient is .33.

This does not mean that the demand for an individual producer is inelastic. For example, a rise in the price of gasoline at all stations may not reduce gasoline sales significantly. However, a rise of an individual station's price will significantly affect that station's sales.

Unitary Elasticity

If the elasticity coefficient is equal to one, demand is unitarily elastic as shown in Figure 3. For example, a 10% quantity change divided by a 10% price change is one. This means that a 1% change in quantity occurs for every 1% change in price.

Figure 3. Unitary Elasticity



For more information on economic and business analysis concepts, visit the Ag Decision Maker website, www.extension.iastate.edu/agdm/vdanalysis.html.

Example 2. Inelastic Demand Example

P1 = $12
P2 = $6
Q1 = 40
Q2 = 50

$$\frac{(Q1 - Q2) / (Q1 + Q2)}{(P1 - P2) / (P1 + P2)} = \frac{(50 - 40) / (50 + 40)}{(\$12 - \$6) / (\$12 + \$6)} = \frac{10 / 90}{\$6 / \$18} = \frac{1 / 9}{1 / 3} = \frac{1 \times 3}{9 \times 1} = \frac{3}{9} = .33$$

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