

# Engineering Economics

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# **Lecture 6**

## **Elasticity of Demand and Supply**

# Elasticity of Demand and Supply

## □ Elasticity

- When studying how some event or policy affects a market, we should discuss not only the direction of the effects but their magnitude as well.
- Elasticity is a measure of how much buyers and sellers respond to changes in market conditions.
- Elasticity is a measure of the responsiveness of quantity demanded or quantity supplied to changes of one of its determinants.

# Elasticity of Demand and Supply

## 📌 The Elasticity of Demand

- The elasticity of demand measures how much the quantity demanded responds to a change in determinants of demand.
- The elasticity of demand may be defined as the ratio of the relative change in quantity demand and relative changes in one of the determinants of demand.
- Elasticity of Demand = 
$$\frac{\text{relative change in quantity demanded}}{\text{relative change in determinants of demanded}}$$

# Elasticity of Demand and Supply

## ❑ The Elasticity of Demand

- There are three kinds of elasticity of demand. They are,

1. Price Elasticity of Demand
2. Income Elasticity of Demand
3. Cross Price Elasticity of Demand

# Elasticity of Demand and Supply

## ❏ The Price Elasticity of Demand

- The price elasticity of demand may be defined as the ratio of the relative change in quantity demanded to relative change in price.
- Price Elasticity of Demand,  $\epsilon^P = \frac{\text{relative change in quantity demanded}}{\text{relative change in price}}$

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

$$\epsilon^P = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

# Elasticity of Demand and Supply

## ❑ The Price Elasticity of Demand

- There are five types of price elasticity of demand. They are,

1. Relatively Elastic Demand
2. Relatively Inelastic Demand
3. Unitary Elastic Demand
4. Perfectly Elastic Demand
5. Perfectly Inelastic Demand

# Elasticity of Demand and Supply

## 📌 The Price Elasticity of Demand

### 1. *Relatively Elastic Demand*

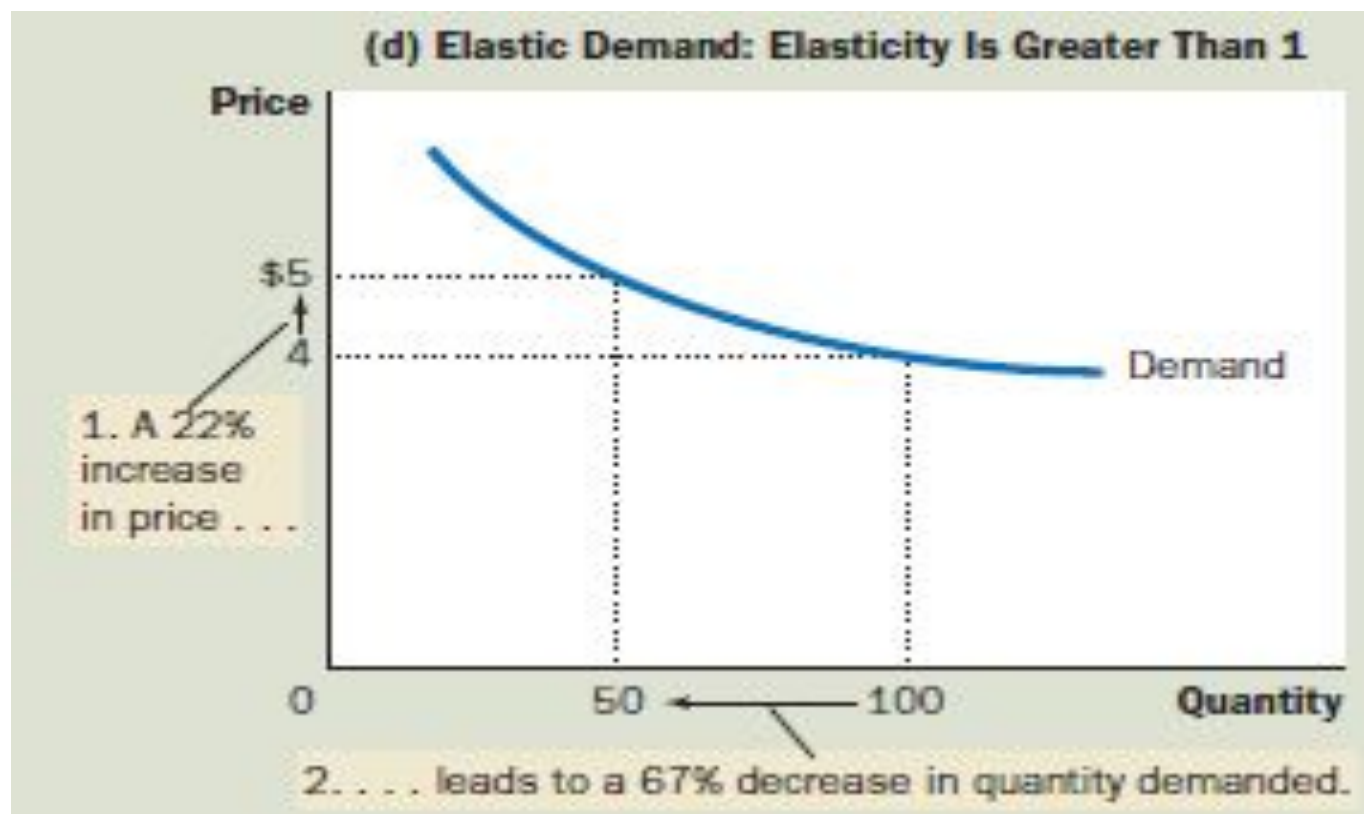
- When the relative change in quantity demand is more than the relative changes in price, it is known as relatively elastic demand.
- In this case price elasticity of demand would be more than one ( $\epsilon^P > 1$ ).
- For example, demand for Pizza.



# Elasticity of Demand and Supply

## □ The Price Elasticity of Demand

### 1. *Relatively Elastic Demand*



# Elasticity of Demand and Supply

## 📌 The Price Elasticity of Demand

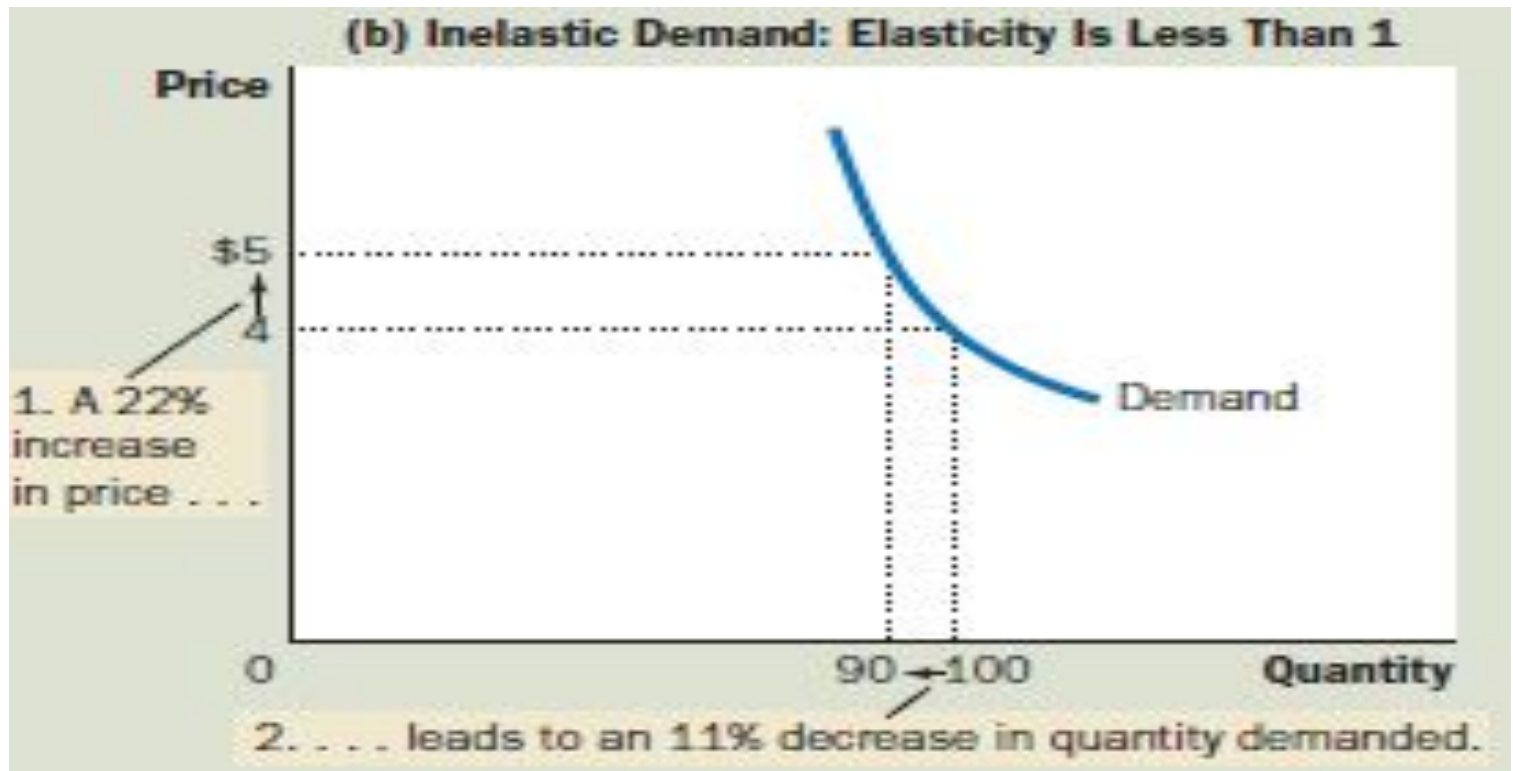
### 2. *Relatively Inelastic Demand*

- When the relative change in quantity demand is less than the relative changes in price, it is known as relatively inelastic demand.
- In this case price elasticity of demand would be less than one ( $\epsilon^P < 1$ ).
- For example, demand for Rice.

# Elasticity of Demand and Supply

## □ The Price Elasticity of Demand

### 2. *Relatively Inelastic Demand*



# Elasticity of Demand and Supply

## The Price Elasticity of Demand

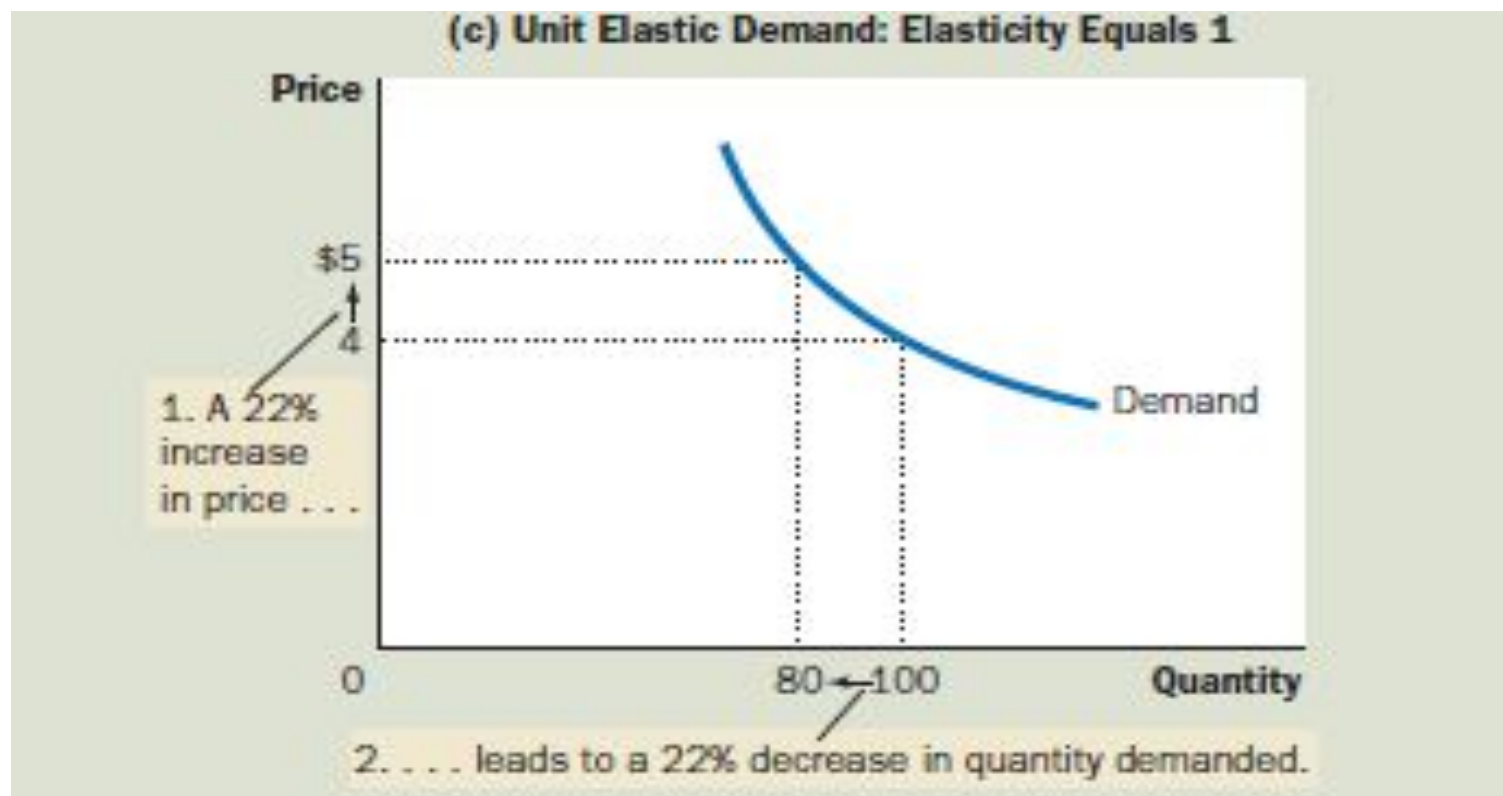
### 3. *Unitary Elastic Demand*

- When the relative change in quantity demand is exactly equal to the relative changes in price, it is known as unitary elastic demand.
- In this case price elasticity of demand would be equal to one ( $\epsilon^P = 1$ ).
- For example, demand for Recreation.

# Elasticity of Demand and Supply

## □ The Price Elasticity of Demand

### 3. *Unitary Elastic Demand*



# Elasticity of Demand and Supply

## 📌 The Price Elasticity of Demand

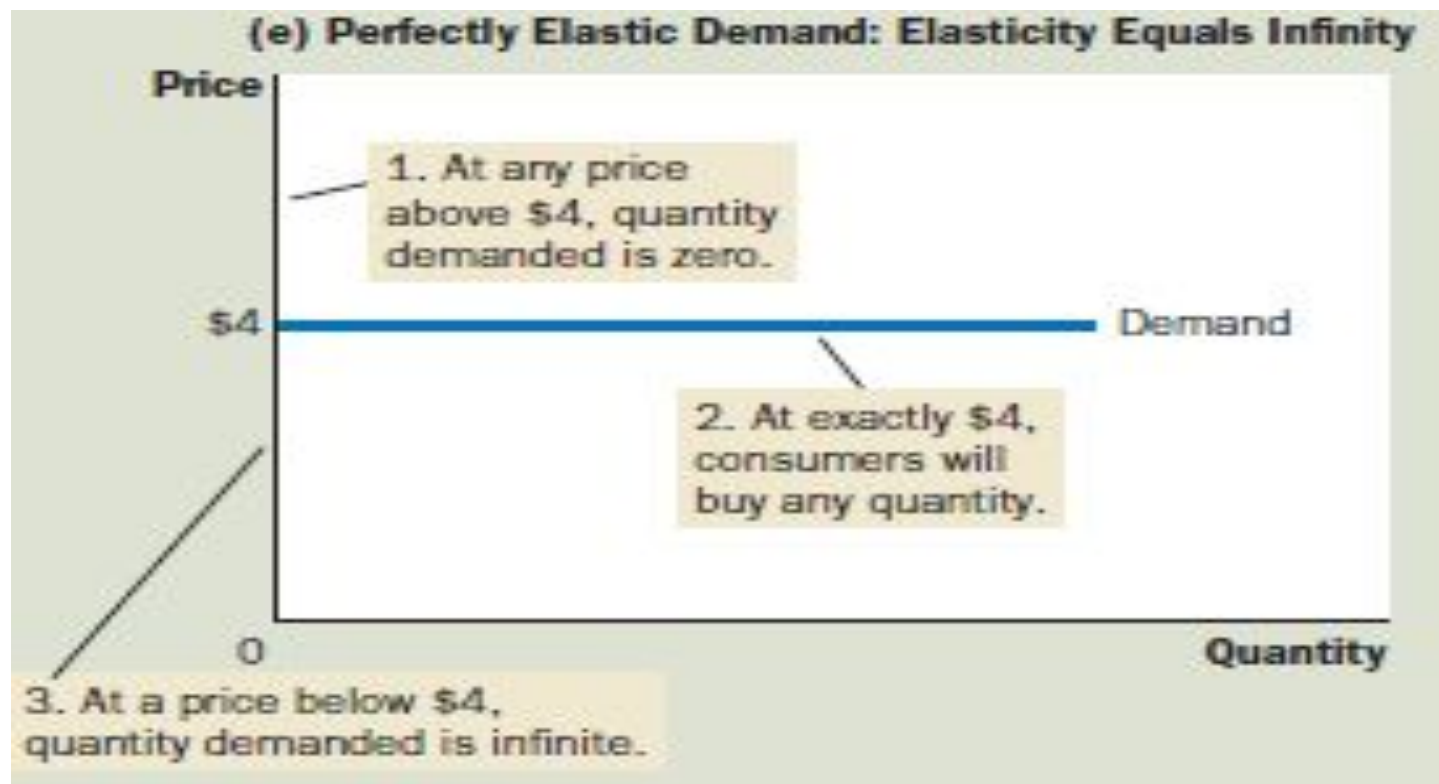
### 4. *Perfectly Elastic Demand*

- Perfectly elastic demand occurs as the price elasticity of demand approaches infinity and the demand curve becomes horizontal, reflecting the fact that very small changes in the price lead to huge changes in the quantity demanded.
- In this case price elasticity of demand would be equal to infinity ( $\epsilon^P = \infty$ ).
- For example, demand for Loan at low interest.

# Elasticity of Demand and Supply

## □ The Price Elasticity of Demand

### 4. *Perfectly Elastic Demand*



# Elasticity of Demand and Supply

## 📌 The Price Elasticity of Demand

### 5. *Perfectly Inelastic Demand*

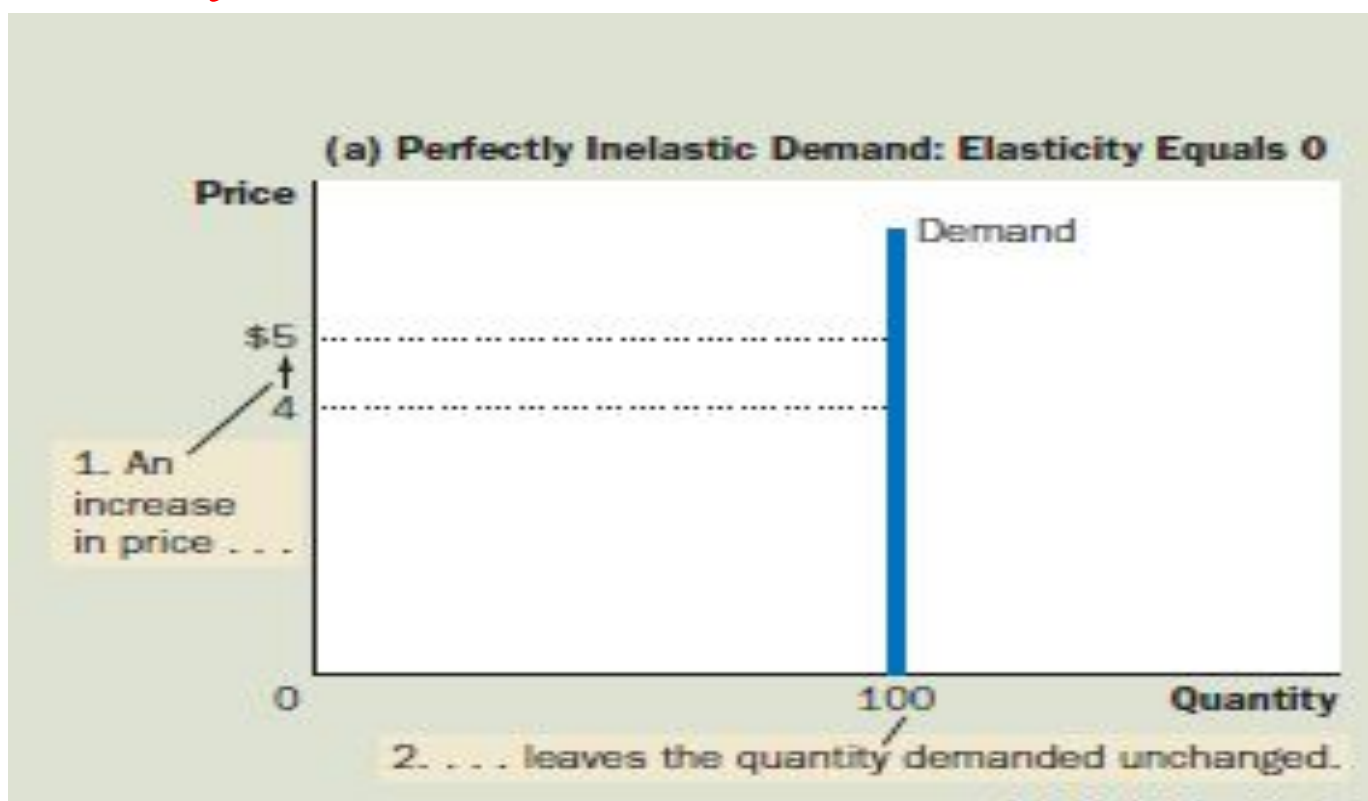
- When the price for a product changes –increases or decreases even when there is no change in quantity demanded, it is known as perfect inelastic demand.
- In this case price elasticity of demand would be equal to zero ( $\epsilon^P = 0$ ).
- For example, demand for Salt.



# Elasticity of Demand and Supply

## □ The Price Elasticity of Demand

### 5. *Perfectly Inelastic Demand*



# Elasticity of Demand and Supply

## ❑ The Price Elasticity of Demand

**Example:** If the price of an ice cream cone increases from \$2.00 to \$2.20 and the amount you buy falls from 10 to 8 cones the your elasticity of demand, using the **midpoint formula**, would be calculated as:

## ❑ Find the price elasticity of demand when,

Price Per Unit	Quantity
10	0
9	10

# Readings

- ❑ **N. G. Mankiw- Principles of Microeconomics, 5th Edition, Chapter – 5.**
- ❑ **Roger A. Arnold- Microeconomics, 10th Edition, Chapter – 6.**



**Thank You**