

Chapter 5

Elasticity and its application

Introduction

- Technological innovation would change farming decision?
- This can be explained by **elasticity**
- **Elasticity** shows the degree of responsiveness

Price elasticity

- Price elasticity of demand shows the degree of responsiveness of change in quantity demanded due to change in price
- What determines that? – social, economic, psychological factors

Determinants

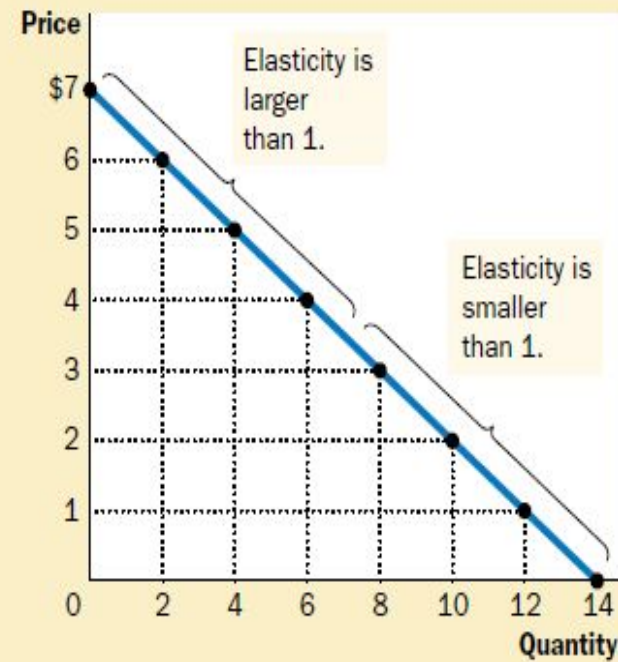
- **Necessary** goods are less responsive than **luxury** goods
- Goods with close **substitutes** are more elastic
- **Time** horizon matters for some of the goods, e.g. increase in gasoline price and its effect

Computation

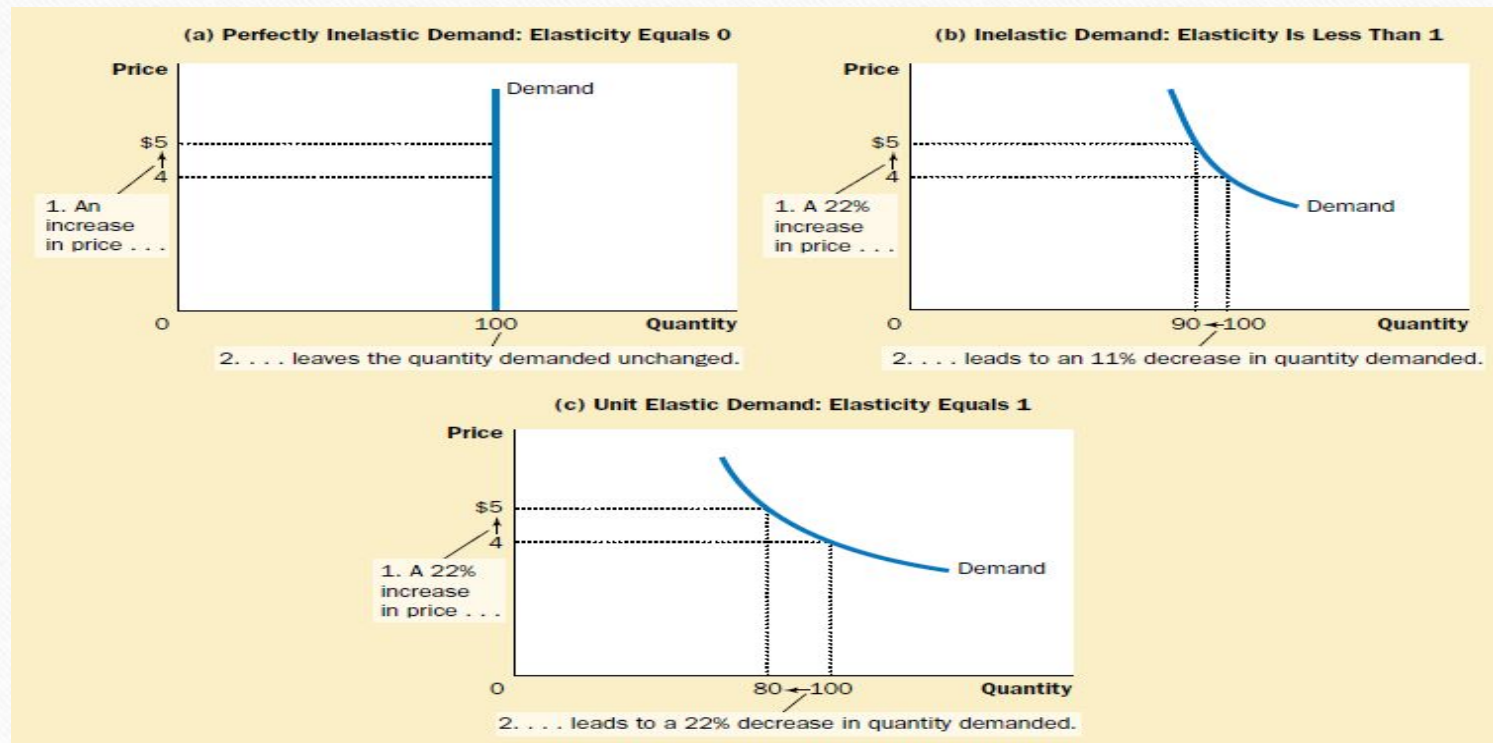
- Price rises from \$4 to \$6, and demand comes down from 120 kg to 80 kg. What is the price elasticity?
- Point A to B and B to A confusion is avoided by mid-point elasticity
- Mid point elasticity: $[(Q_2 - Q_1) / (Q_1 + Q_2) / 2] / [(P_2 - P_1) / (P_1 + P_2) / 2]$

Elasticity along linear curve

- Measured by the ratio of lower segment to upper segment
- Elasticity is not constant along the demand curve

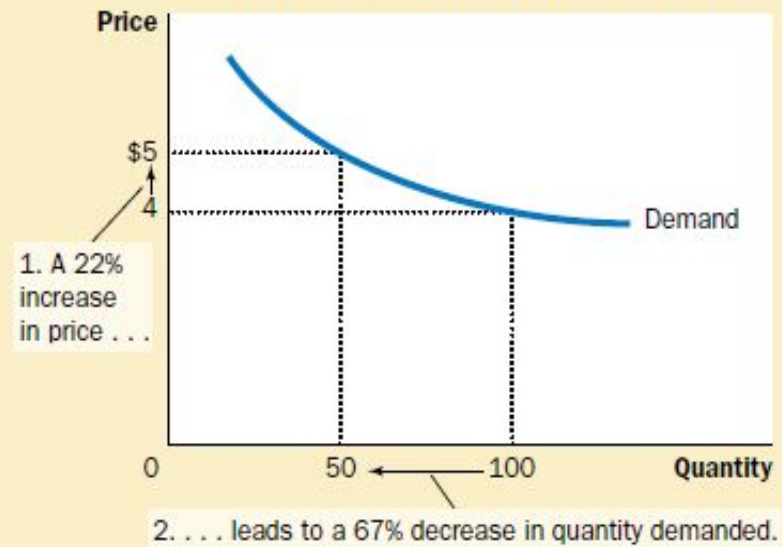


Diagrammatic approach

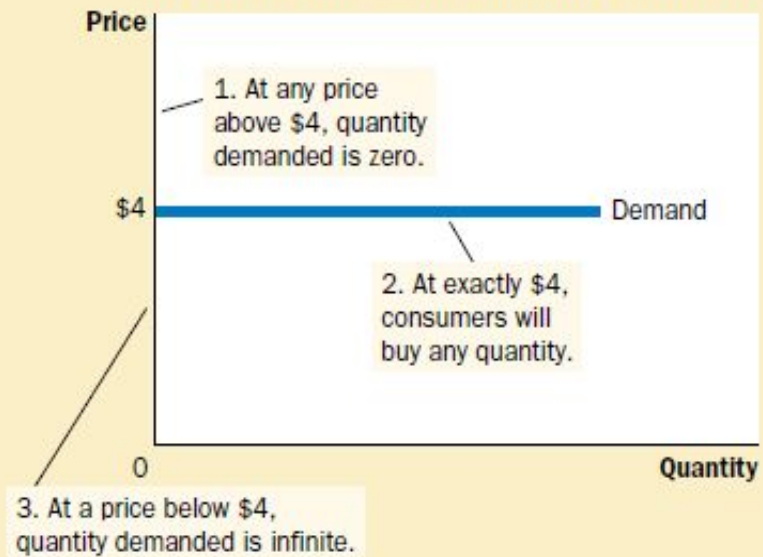


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(d) Elastic Demand: Elasticity Is Greater Than 1



(e) Perfectly Elastic Demand: Elasticity Equals Infinity

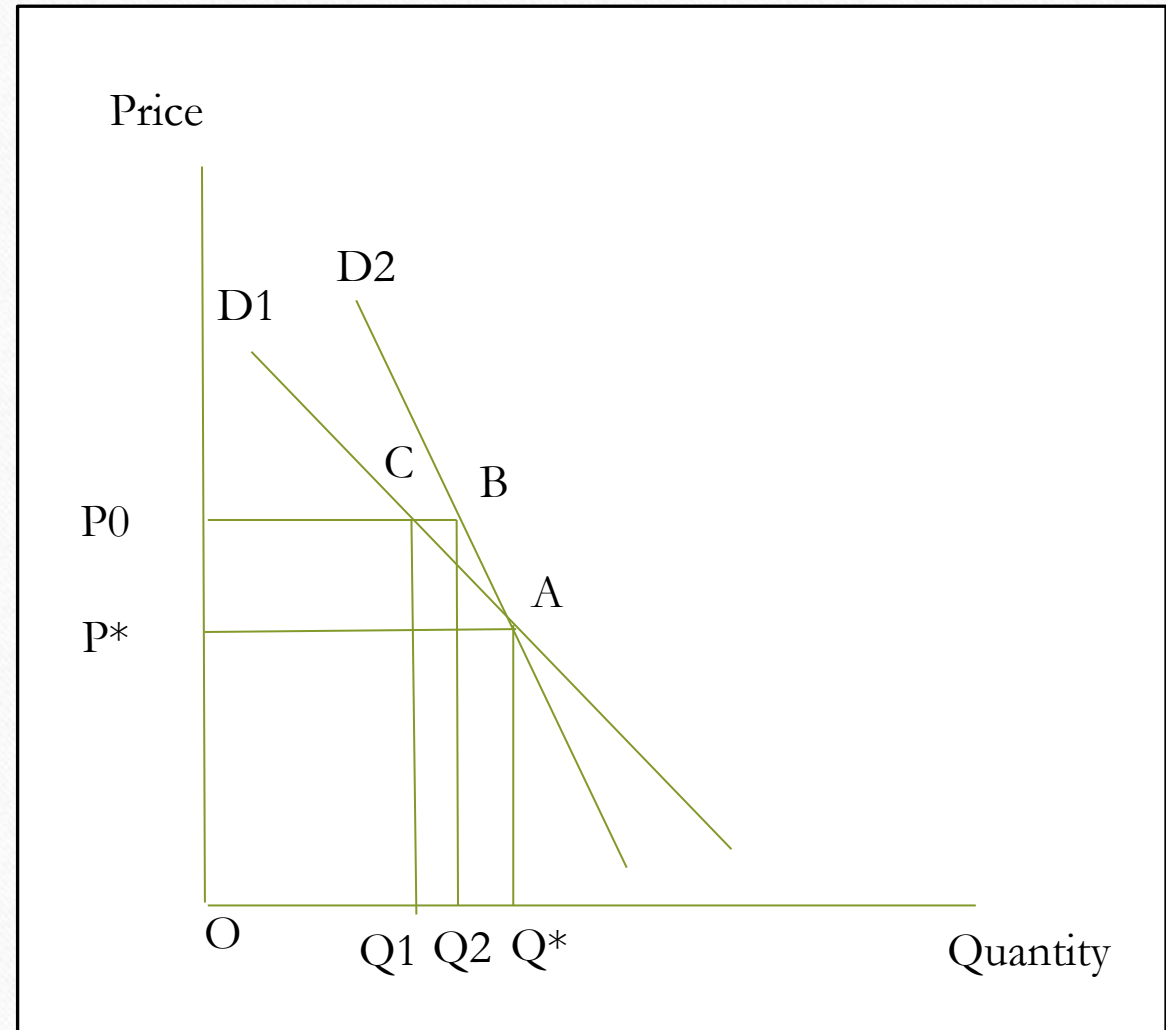


Values of elasticity and demand curve

- Perfectly elastic: $e = \text{infinity}$
- Elastic: $e > 1$
- Unitary elastic: $e = 1$
- Inelastic: $e < 1$
- Perfectly inelastic: $e = 0$

Total revenue and elasticity

- Initial revenue is the area $0Q^*AP^*$
- Due to price rise the D1's revenue is $0Q_1CP_0$ and for D2, it is $0Q_2BP_0$
- TR will be higher for less elastic demand



Income elasticity of demand

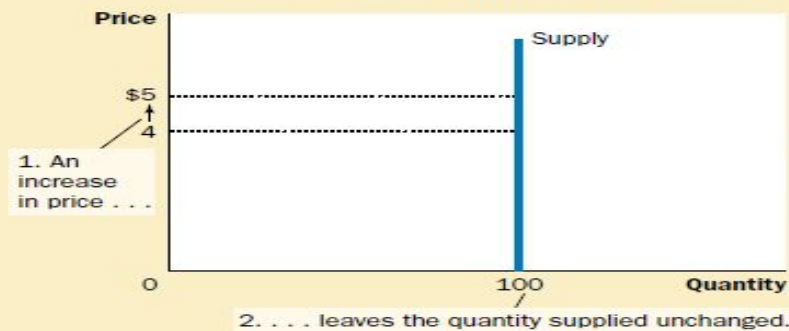
- Percentage change in quantity demanded due to percentage change in income
- Cross price elasticity: elasticity for related goods (substitutes, complements)

Elasticity of supply

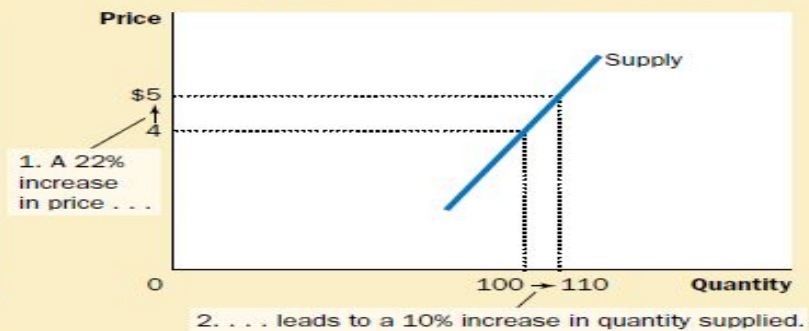
- Percentage change in quantity supplied due to percentage change in price
- Determinants
 - Substitutes
 - Time horizon

Different supply curves

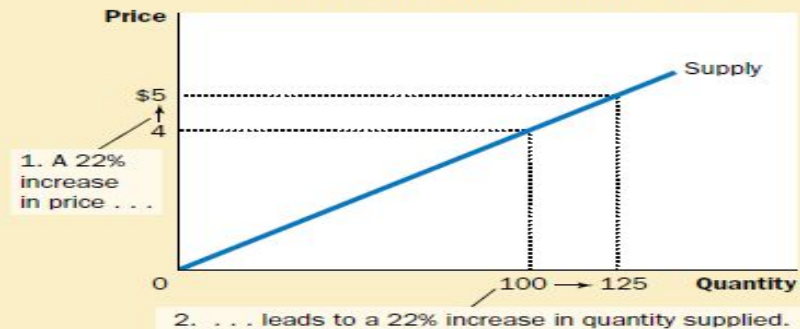
(a) Perfectly Inelastic Supply: Elasticity Equals 0



(b) Inelastic Supply: Elasticity Is Less Than 1

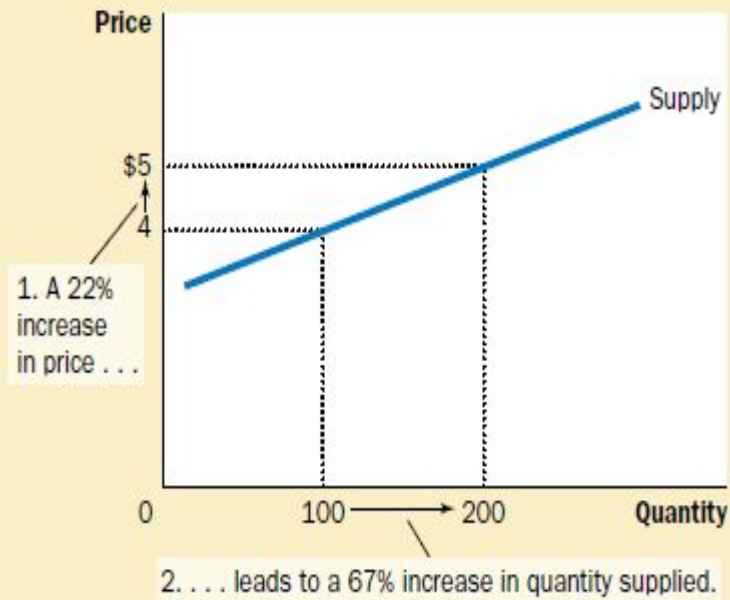


(c) Unit Elastic Supply: Elasticity Equals 1

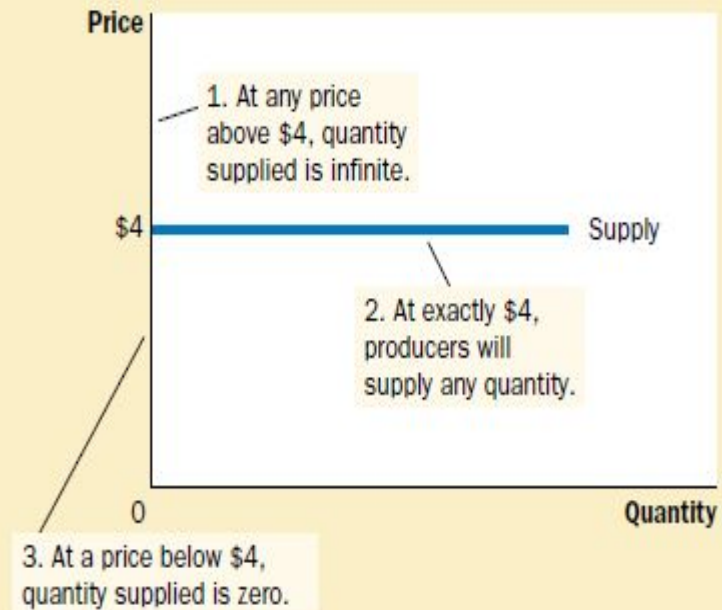


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(d) Elastic Supply: Elasticity Is Greater Than 1



(e) Perfectly Elastic Supply: Elasticity Equals Infinity



Discussion

- OPEC's oil price incident – price increases in 70s and reduces in 80s – back to 1970 price in 1990
- Demand and supply are inelastic in the short-run but supply is flexible in the long-run

Education is important

