EE211
Principles of Microeconomics

Chapter 2 (cont.): Elasticity

Elasticities

- Measures of the magnitude of the **responsiveness** of any variable (such as Q_d or Q_s) to a change in a particular variable (such as P)

Price Elasticity of Demand (E_d)

- Percentage change in quantity demanded in response to one percentage change in price

$$E_d = \frac{\%\Delta Q_d}{\%\Delta P}$$

- Measures sensitivity of quantity demanded to price

Example

P	Q
8	10
6	20
4	30
2	40

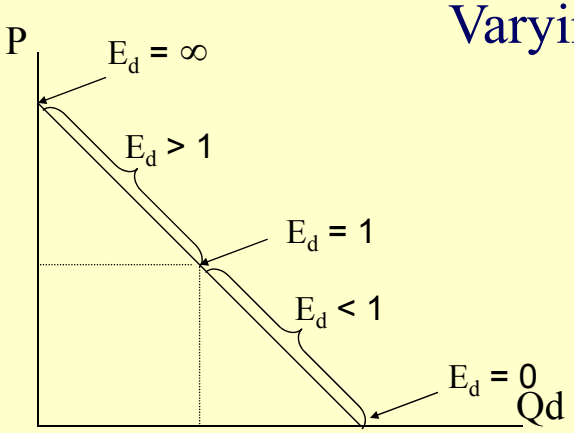
- Find slope, and then elasticity.

Calculating E_d

Interpretation

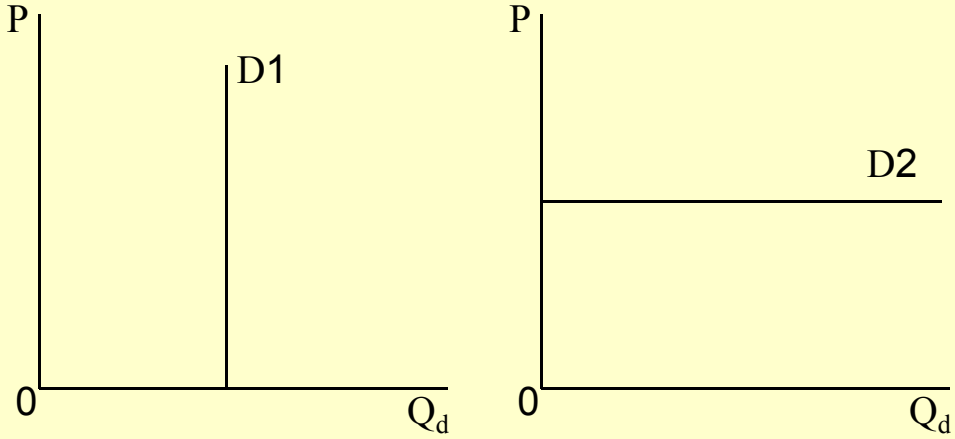
- Elasticity $\neq$ Slope
- Value is always negative: $(-\infty, 0]$

Varying E_d



- A straight-line demand curve has the same slope at every point, but not the same value of E_d.

Constant E_d



Ed = 0: perfectly inelastic

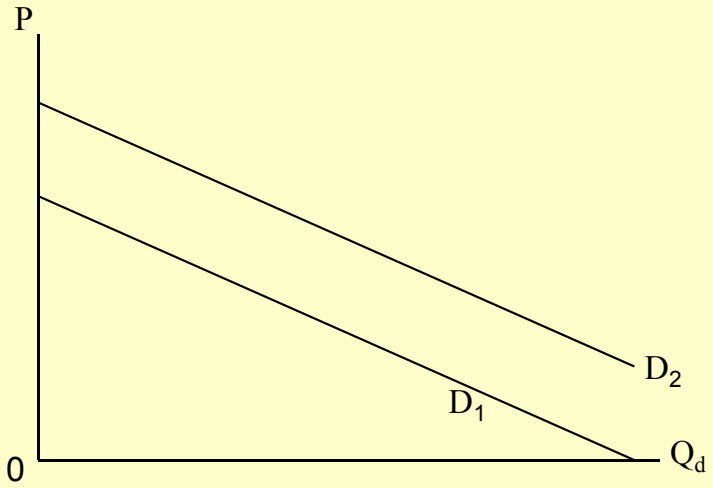
Ed = ∞: perfectly elastic

Example

P	Q
5	200
10	100
20	50
40	25

- Find slope, and then elasticity.

Which one is more elastic?



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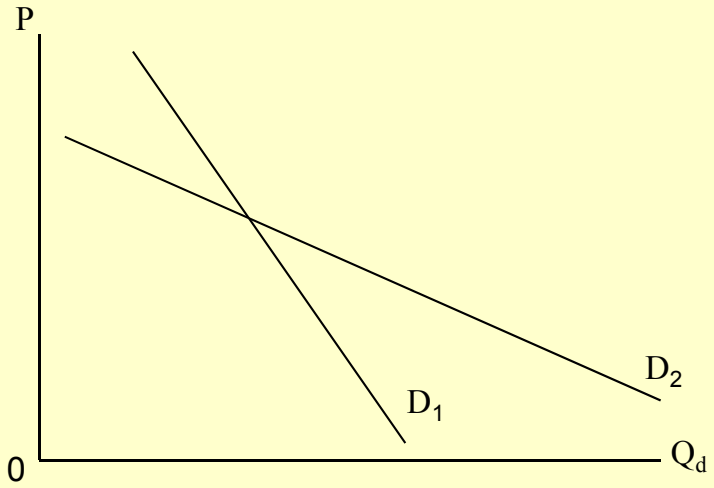

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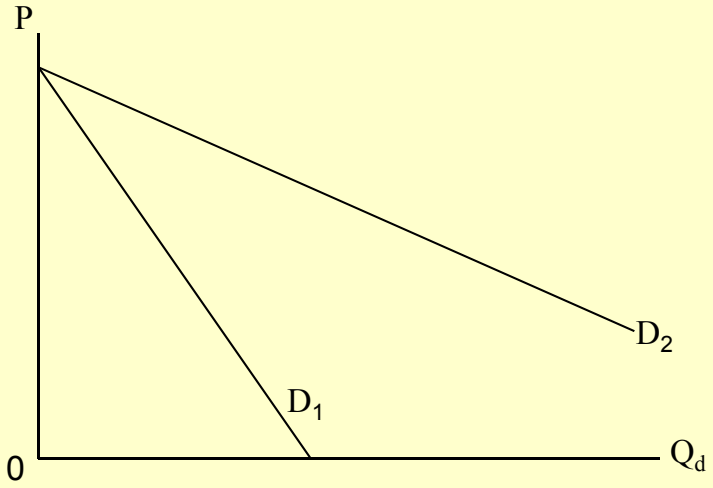


Elasticity and Total Expenditure

Determinants of Price Elasticity of Demand

- Availability of substitutes
- Necessities
- Price of the goods relative to income
- Time: short run vs long run

Income Elasticity of Demand (E_y)

- Percentage change in quantity demanded in response to one percentage change in income

$$E_y = \frac{\%\Delta Q_d}{\%\Delta Y}$$

- $E_y > 0$: normal goods
- $E_y < 0$: inferior goods

Cross Price Elasticity of Demand (E_c)

- Percentage change in quantity demanded for X in response to one percentage change in price of other commodity, Y

$$E_c = \frac{\%\Delta Q_x}{\%\Delta P_y}$$

- $E_c > 0$: X and Y are substitutes.
- $E_c < 0$: X and Y are complements.
- $E_c = 0$: X and Y are unrelated.

Price Elasticity of Supply (E_s)

- Percentage change in quantity supplied for X in response to one percentage change in its own price

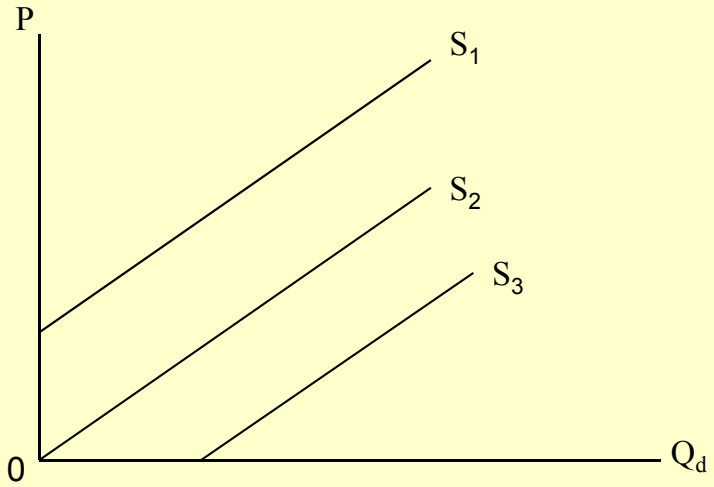
$$E_s = \frac{\%\Delta Q_s}{\%\Delta P}$$

- Value = $[0, \infty)$

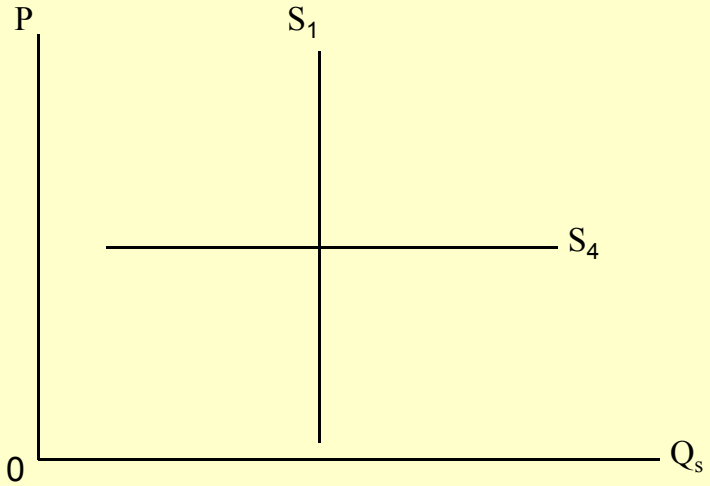
Calculating E_s

Interpretation

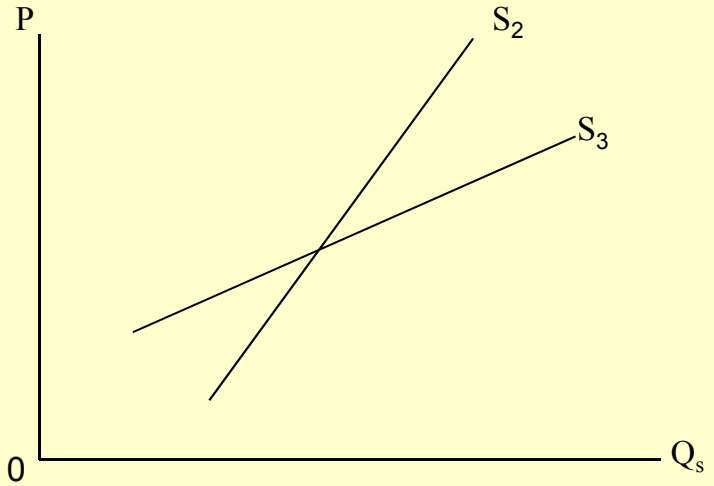
Which one is more elastic?



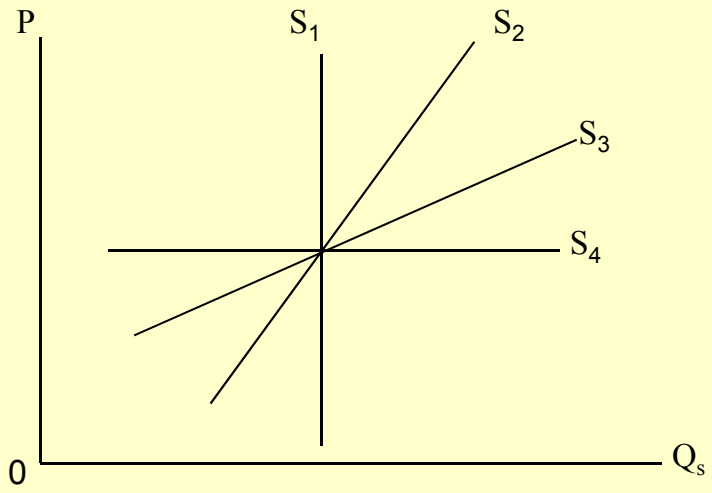
Which one is more elastic?



Which one is more elastic?



Which one is more elastic?



Determinants of Price Elasticity of Supply

- Substitution and Production Costs
- Substitutes and switching cost
- Time: short-run vs long-run

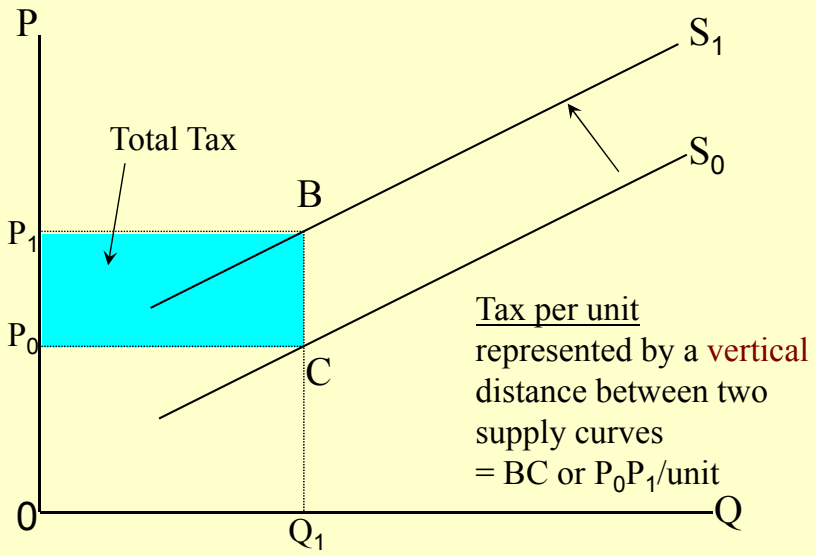
Application: Taxes

- Ad valorem Tax or Sales Tax
- Specific Tax or Unit Tax

Specific Tax

- A specific amount is collected per unit of output.
- Such as 50 satang on each litre of gasoline sold in Thailand.

Effect of a Specific Tax Imposed on Producers



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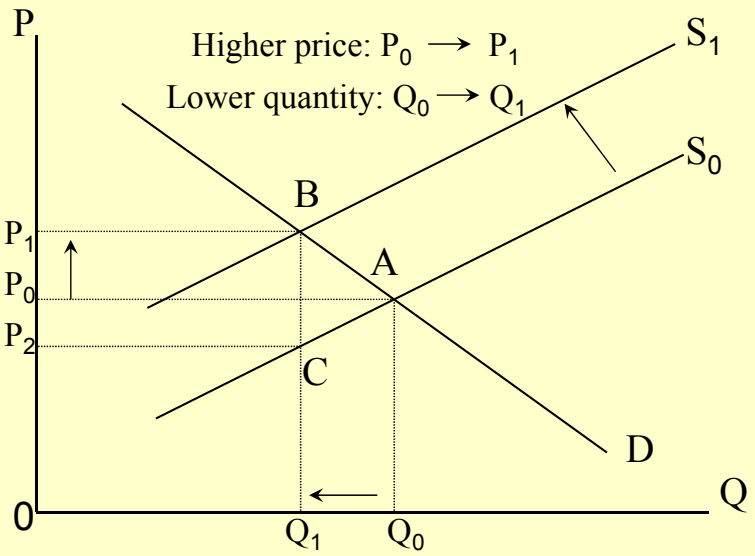
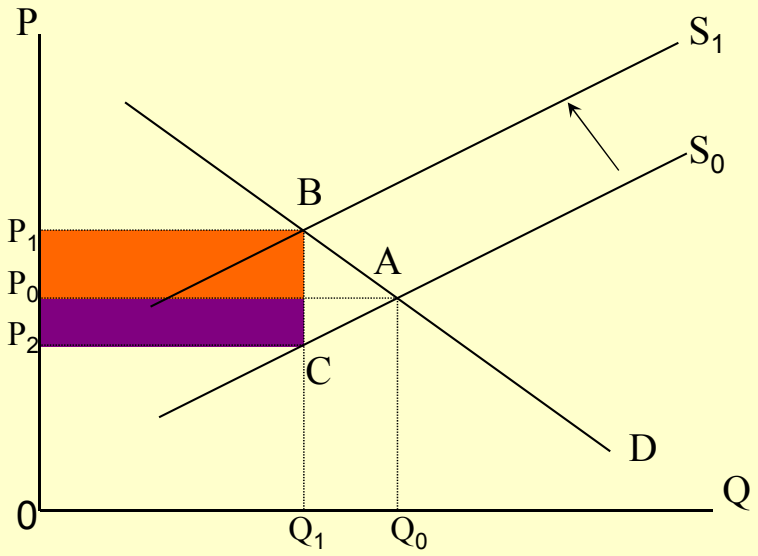


Distribution of Tax Burden



Distribution of Tax Burden

- Consider the new equilibrium quantity (Q_1) we can disaggregate tax burden borne by consumers and producers as follow:
  - Tax borne by *consumers* in form of higher price and, in turn, higher expenditures.
  - Tax borne by *producers* in form of lower revenue.

Distribution of Tax Burden

- The distribution of the burden of a sales tax between consumers and producers depends on the relative elasticities of the demand for and the supply of the product.

Distribution of Tax Burden

- $E_d = E_s$, then
- $E_d > E_s$, then
- $E_d < E_s$, then
- It is independent of who actually remits the tax to the government.

Ad valorem Tax

- Collected on a basis of a given 'proportion'.
- Such as VAT 7% on sales.

Effect of Ad valorem Tax Imposed on Producers