4.1 Responsiveness as elasticities

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- Consists in analyzing the responsiveness of consumers to price changes.

Price elasticity of demand

$$\text{Price elasticity of demand} = \varepsilon_d = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in price}}$$

or, using a shortened expression,

$$\varepsilon_d = \frac{\%\Delta Q}{\%\Delta P}$$

Example
If 10% price increase reduces the quantity demanded by 20%(use - 20% for calculation), the elasticity = -2 *we can omit negative sign

- Use midpoint of the price values and the corresponding midpoint of the quantity values.
- If you are reading it from a graph, you would put -average price in your calculations if the graph is declining
- When referring to high or low elasticity we use the absolute value of the number
- Arc elasticity can also be used to describe this
- At *high* prices, elasticity is *large* and at *low* prices it is *small*

Extreme Cases
If the demand curve is horizontal or vertical the elasticity will not decrease going from high to low prices, it is said to have zero elasticity

- Horizontal : infinite

Determinants of price elasticity

1. Tastes
2. Ease with which we can substitute alternative goods or services for it
3. Time dimension to responsiveness

Key Terms
Price elasticity of demand: measured as the percentage change I quantity demanded, divided by the percentage change in price

Elastic: demand is elastic if the price elasticity is greater than unity

Inelastic: id the value lies between 1 and zero

Unit elastic: If the value is exactly 1

4.2 Price elasticities and public policy

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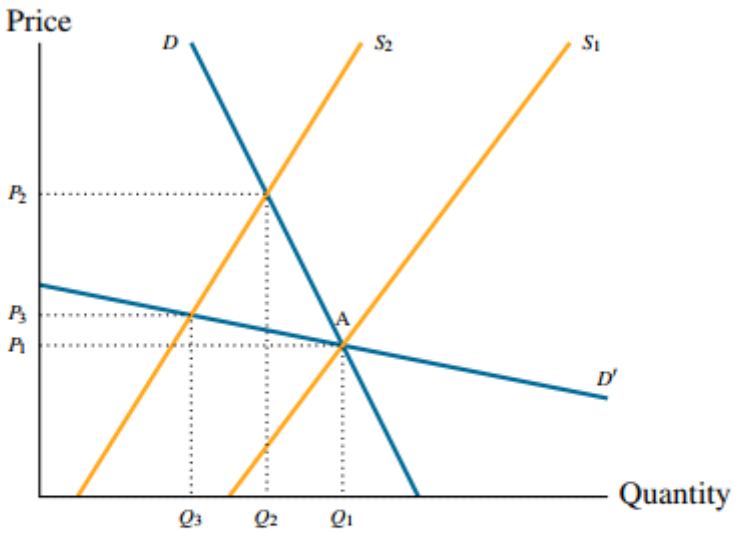
Price elasticity and expenditure

- Expenditure is greatest at the midpoint, and the mid-price corresponds to the mid-quantity on the horizontal axis
- By lowering a price we induce an increase in quantity demanded
- Rule:
  "A price *decline (*quantity increase) on an *elastic segment* of a demand curve necessarily *increases revenu*e, and a *price increase* (quantity decline) on an *inelastic* segment also *increases* revenue."

Figure 4.5: The impact of elasticity on quantity fluctuations



In the lower part of the demand curve D, demand is inelastic: At the point A, a shift in supply from S_1 to S_2 induces a large percentage increase in price, and a small percentage decrease in quantity demanded. In contrast, for the demand curve D' that goes through the original equilibrium, the region A is now an *elastic* region, and the impact of the supply shift is contrary: The $\%\Delta P$ is smaller and the $\%\Delta Q$ is larger.

Note: *"The price changes that go into measuring elasticities are changes in price relative to inflation"*

4.4 Cross-Price elasticities-cable or satellite

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Key Terms:
Cross-price elasticity of demand: percentage change in the quantity demanded of a product divided by the percentage change in the price of another

Cross-price elasticity demand

$$\varepsilon_{d(x,y)} = \frac{\text{percentage change in quantity demanded of x}}{\text{percentage change in price of good y}} = \frac{\%\Delta Q_x}{\%\Delta P_y}$$

Example
If price of cable-supply services decline, by how much will the demand for satellite-supply services change?

→ The percentage change in satellite subscribers will be negative in response to a decline in the price of cable; a negative divided by a negative = positive. They are substitute products. VS an e-book and tablets are complimentary and price and quantity movements are in opposite directions and the elasticity will then be negative

4.5 The income elasticity of demand

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Key Terms

Income elasticity of demand: percentage change in quantity demanded divided by a percentage change in income

Luxury good/service: one's income elasticity equals or exceeds unity

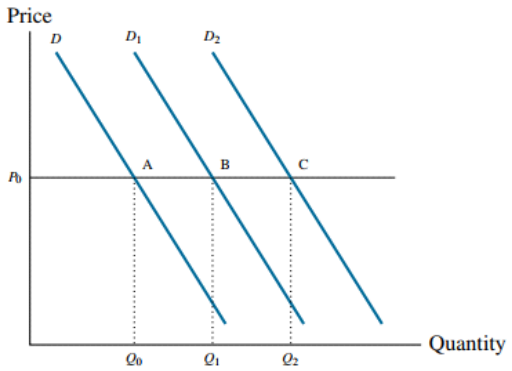
Necessity good/service: one's income elasticity is greater than zero and less than unity

Inferior goods: have negative income elasticity

The income elasticity of demand

- Percentage measure of how far the demand curve shifts in response to a change in income

Figure 4.6: Income elasticity and shifts in demand



At the price P_0, the income elasticity measures the percentage horizontal shift in demand caused by some percentage income increase. A shift from A to B reflects a lower income elasticity than a shift to C. A leftward shift in the demand curve in response to an income increase would denote a negative income elasticity – an inferior good.

$$\eta_d = \frac{\text{percentage change in quantity demanded}}{\text{percentage change in income}} = \frac{\%\Delta Q}{\%\Delta I}$$

Example

If a monthly income increases by 10% and the quantity of magazines purchased increases by 15%, then the income elasticity of demand for magazines is 1.5 in value (15/10)

4.6 Elasticity of supply

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It measures the responsiveness if quantity supplied to change in the price

$$\varepsilon_s = \frac{\text{percentage change in quantity supplied}}{\text{percentage change in price}} = \frac{\%\Delta Q}{\%\Delta P}$$

→ The more responsive is supply to a give price change, the larger will be the elasticity value
→ The flatter supply curves have a greater elasticity than more "vertical" curves at a given price and quantity combination. Aka the flatter curve has a larger value than a more vertical supply

4.7 Elasticities and tax incidence

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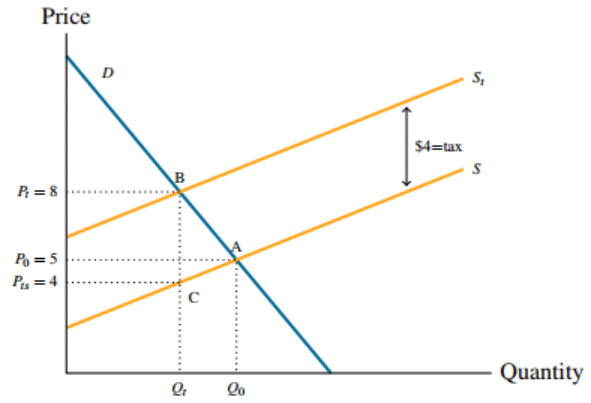
Key Terms
Tax Incidence: describes hoe the burden of a tax is shared between buyer and seller

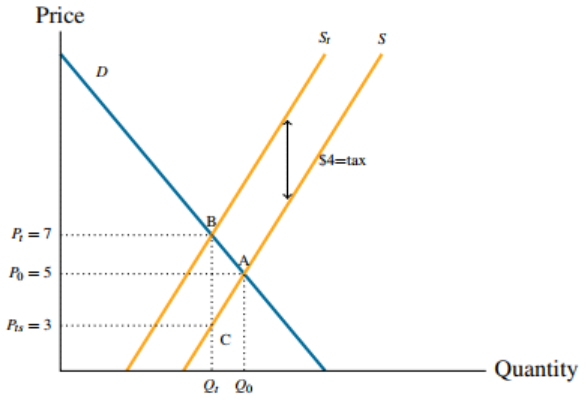
Figure 4.7: Tax incidence with elastic supply



The imposition of a specific tax of $4 shifts the supply curve vertically by $4. The final price at B (P_t) increases by $3 over the equilibrium price at A. At the new quantity traded, Q_t, the supplier gets $4 per unit ($P_{ts}$), the government gets $4 also and the consumer pays $8. The greater part of the incidence is upon the buyer, on account of the relatively elastic supply curve: His price increases by $3 of the $4 tax.

In this case, consumer pays $ and seller falls by 1$ therefore the incidence of taxes falls mainly on the consumer

Figure 4.8: Tax incidence with inelastic supply



The imposition of a specific tax of $4 shifts the supply curve vertically by $4. The final price at B (P_t) increases by $2 over the no-tax price at A. At the new quantity traded, Q_t, the supplier gets $3 per unit ($P_{ts}$), the government gets $4 also and the consumer pays $7. The incidence is shared equally by suppliers and demanders.

Since it is less elastic than the previous graph, when the supply curve shifts up by 4$ the price received by the supplier is lower than in the previous graph and the price paid by the consumer does not rise much. Therefore we can say that the incidence is different.

→ Conclusion:
The more elastic is supply; the greater is the price increase in response to a given tax
The more elastic is the curve; the more incidence falls onto the consumer
The more inelastic; the more it falls onto the supplier

Statutory incidence
If the supplier did not collect the revenue and gave it to the government (employees) the demanders will have to do it which would cause a shift in the demand curve.

Tax revenues and tax rates

Elasticity is a good concept to know the impact of higher or lower taxes on government revenue (changes in demand)

- Inelastic: tax rate increase that increases the price and must increase total expenditure; government will get a higher share
- Elastic: tax rate increase leads to a higher price which will decrease total expenditure; government will get a smaller share

4.8 Technical tricks with elasticities

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$$\varepsilon_d = \frac{\%\Delta Q}{\%\Delta P} = \frac{\Delta Q/Q}{\Delta P/P} = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}.$$

The first term is obtained by the slope of demand curve and second is the point of the cure that interests us

→ We can obtain the value of the elasticity at a particular point on the demand curve instead of a range of value or an arc

Note: Pay attention to invert the slope value if the equation is given as P=b+3/4Q then slope for calculation would be 4/3

Summary

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KEY TERMS

Price elasticity of demand is measured as the percentage change in quantity demanded, divided by the percentage change in price.

Demand is elastic if the price elasticity is greater than unity. It is **inelastic** if the value lies between unity and 0. It is **unit elastic** if the value is exactly one.

Cross-price elasticity of demand is the percentage change in the quantity demanded of a product divided by the percentage change in the price of another.

Income elasticity of demand is the percentage change in quantity demanded divided by a percentage change in income.

Luxury good or service is one whose income elasticity equals or exceeds unity.

Necessity is one whose income elasticity is greater than zero and is less than unity.

Inferior goods have a negative income elasticity.

Elasticity of supply is defined as the percentage change in quantity supplied divided by the percentage change in price.

Tax Incidence describes how the burden of a tax is shared between buyer and seller.

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