Chapter 4

Individual and Market Demand

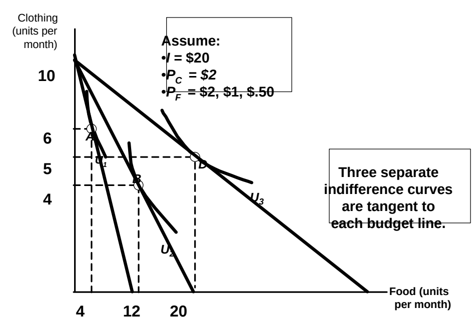
Topics to be Discussed

- Individual Demand
- Income and Substitution Effects
- Market Demand
- Consumer Surplus

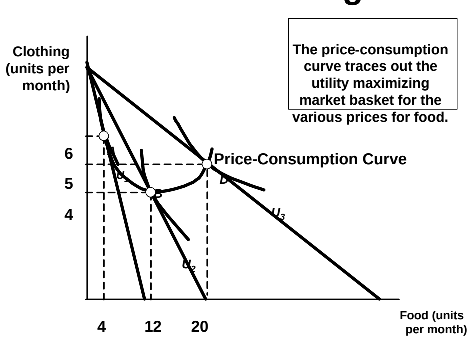
Individual Demand

- Price Changes
  - Using the figures developed in the previous chapter, the impact of a change in the price of food can be illustrated using indifference curves.

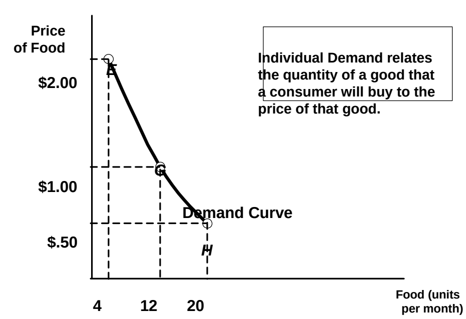
Effect of a Price Change



Effect of a Price Change



Effect of a Price Change



Individual Demand

The Individual Demand Curve

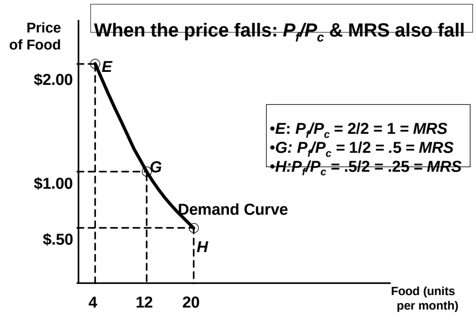
- Two Important Properties of Demand Curves
  1) The level of utility that can be attained changes as we move along the curve.

Individual Demand

The Individual Demand Curve

- Two Important Properties of Demand Curves
  2) At every point on the demand curve, the consumer is maximizing utility by satisfying the condition that the *MRS* of food for clothing equals the ratio of the prices of food and clothing.

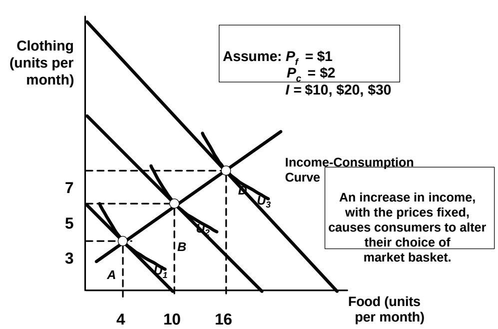
Effect of a Price Change



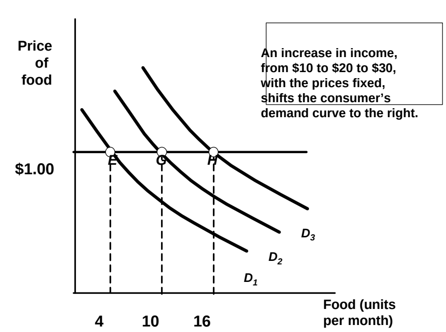
Individual Demand

- Income Changes
  - Using the Food-Clothing example developed in chapter 3, the impact of a change in income can be illustrated using indifference curves.

Effects of Income Changes



Effects of Income Changes



Individual Demand

- Income Changes
  - The income-consumption curve traces out the utility-maximizing combinations of food and clothing associated with every income level.

Individual Demand

- Income Changes
  - An increase in income shifts the budget line to the right, increasing consumption along the income-consumption curve.
  - Simultaneously, the increase in income shifts the demand curve to the right.

Individual Demand

Normal Good vs. Inferior Good

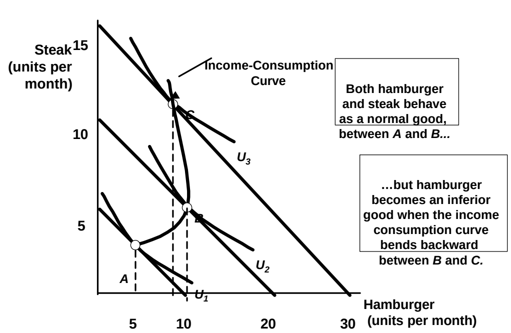
- Income Changes
  - When the income-consumption curve has a positive slope:
    - The quantity demanded increases with income.
    - The income elasticity of demand is positive.
    - The good is a normal good.

Individual Demand

Normal Good vs. Inferior Good

- Income Changes
  - When the income-consumption curve has a negative slope:
    - The quantity demanded decreases with income.
    - The income elasticity of demand is negative.
    - The good is an inferior good.

An Inferior Good



Individual Demand

- Engel Curves
  - Engel curves relate the quantity of good consumed to income.
  - If the good is a normal good, the Engel curve is upward sloping.
  - If the good is an inferior good, the Engel curve is downward sloping.

Consumer Expenditures in the United States

Expenditure ($) on:	Less than $10,000	1,000-19,000	20,000-29,000	30,000-39,000	40,000-49,000	50,000-69,000	70,000-and above
	Income Group (1997 $)						
Entertainment	700	947	1274	1514	2054	2654	4300
Owned Dwellings	1116	1725	2253	3243	4454	5793	9898
Rented Dwellings	1957	2170	2371	2536	2137	1540	1266
Health Care	1031	1697	1918	1820	2052	2214	2642
Food	2656	3385	4109	4888	5429	6220	8279
Clothing	859	978	1363	1772	1778	2614	3442

Income and Substitution Effects

- A fall in the price of a good has two effects: *Substitution & Income*
  - Substitution Effect
    - Consumers will tend to buy more of the good that has become relatively cheaper, and less of the good that is now relatively more expensive.

Income and Substitution Effects

- A fall in the price of a good has two effects: *Substitution & Income*
  - Income Effect
    - Consumers experience an increase in real purchasing power when the price of one good falls.

Income and Substitution Effects

- Substitution Effect
  - The substitution effect is the change in an item's consumption associated with a change in the price of the item, *with the level of utility held constant.*

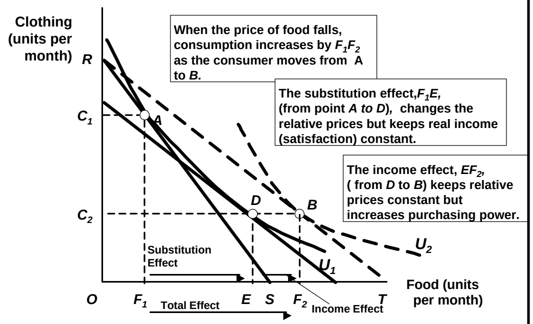
Income and Substitution Effects

- Income Effect
  - The income effect is the change in an item's consumption brought about by the increase in purchasing power, *with the price of the item held constant.*

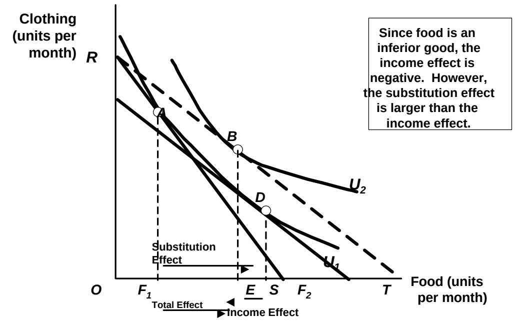
Income and Substitution Effects

- Income Effect
  - Even with inferior goods, the income effect is rarely large enough to outweigh the substitution effect.

Income and Substitution Effects: Normal Good



Income and Substitution Effects: Inferior Good



Income and Substitution Effects

- A Special Case--The Giffen Good
  - The income effect may theoretically be large enough to cause the demand curve for a good to slope upward.
  - This rarely occurs and is of little practical interest.

Market Demand

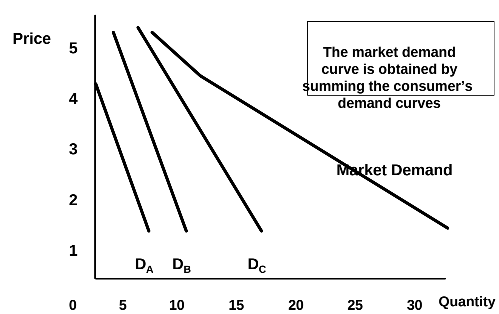
From Individual to Market Demand

- Market Demand Curves
  - A curve that relates the quantity of a good that all consumers in a market buy to the price of that good.

Determining the Market Demand Curve

Price ($)	Individual *A* (units)	Individual B (units)	Individual C (units)	Market (units)
1	6	10	16	32
2	4	8	13	25
3	2	6	10	18
4	0	4	7	11
5	0	2	4	6

Summing to Obtain a Market Demand Curve



Market Demand

- Two Important Points
  1) The market demand will shift to the right as more consumers enter the market.
  2) Factors that influence the demands of many consumers will also affect the market demand.

Market Demand

- Elasticity of Demand

Recall: Price elasticity of demand measures the percentage change in the quantity demanded resulting from a 1-percent change in price.

$$E_P = \frac{\Delta Q/Q}{\Delta P/P} = \frac{\Delta Q / \Delta P}{Q / P}$$

Price Elasticity and Consumer Expenditure

Demand	*If Price Increases, Expenditures:*	*If Price Decreases, Expenditures:*
Inelastic (E_p <1)	**Increase**	**Decrease**
Unit Elastic (E_p = 1)	**Are unchanged**	**Are unchanged**
Elastic (E_p >1)	**Decrease**	**Increase**

Market Demand

- Point Elasticity of Demand
  - For large price changes (e.g. 20%), the value of elasticity will depend upon where the price and quantity lie on the demand curve.

Market Demand

- Point Elasticity of Demand
  - Point elasticity measures elasticity at a point on the demand curve.
  - Its formula is:

$$E_P = \frac{P}{Q}\frac{\Delta Q}{\Delta P}$$

Market Demand

- Problems Using Point Elasticity
  - We may need to calculate price elasticity over portion of the demand curve rather than at a single point.
  - The price and quantity used as the base will alter the price elasticity of demand.

Market Demand

Point Elasticity of Demand (An Example)

- Assume
  - Price increases from \$8 to \$10 quantity demanded falls from 6 to 4
  - Percent change in price equals: \$2/\$8 = 25% or \$2/\$10 = 20%
  - Percent change in quantity equals: -2/6 = -33.33% or -2/4 = -50%

Market Demand

Point Elasticity of Demand (An Example)

- Elasticity equals:

  -33.33/25 = -1.33 or -50/20 = -2.5
- **Which one is correct?**

Market Demand

- Arc Elasticity of Demand
  - Arc elasticity calculates elasticity over a range of prices
  - Its formula is:

$$E_P = (\Delta Q/\Delta P)(\overline{P}/\overline{Q})$$
$$\overline{P} = \text{the average price}$$
$$\overline{Q} = \text{the average quantity}$$

An Example:

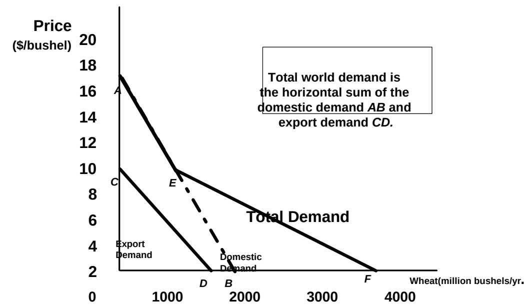
The Aggregate Demand For Wheat

- The demand for U.S. wheat is comprised of domestic demand and export demand.

The Aggregate Demand For Wheat

- The domestic demand for wheat is given by the equation:
  - $Q_{DD} = 1700 - 107P$
- The export demand for wheat is given by the equation:
  - $Q_{DE} = 1544 - 176P$

The Aggregate Demand For Wheat

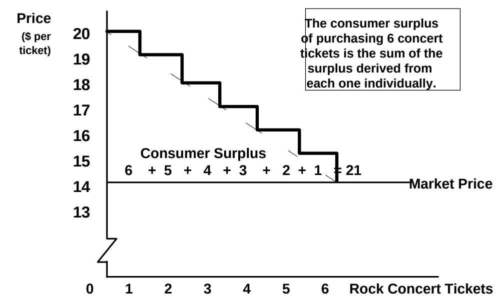


Consumer Surplus

■ Consumer Surplus

- The difference between the maximum amount a consumer is willing to pay for a good and the amount actually paid.

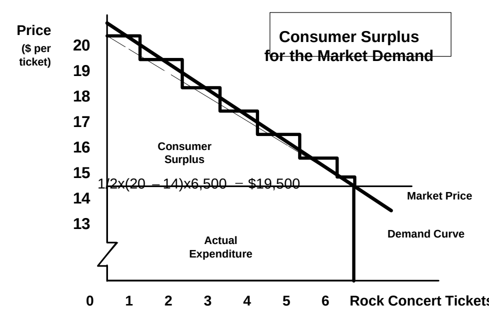
Consumer Surplus



Consumer Surplus

■ The stepladder demand curve can be converted into a straight-line demand curve by making the units of the good smaller.

Consumer Surplus



Consumer Surplus

■ Combining consumer surplus with the aggregate profits that producers obtain we can evaluate:

1) Costs and benefits of different market structures

2) Public policies that alter the behavior of consumers and firms

Summary

■ Individual consumers' demand curves for a commodity can be derived from information about their tastes for all goods and services and from their budget constraints.

■ Engel curves describe the relationship between the quantity of a good consumed and income.

Summary

- Two goods are substitutes (complements) if an increase (decrease) in the price of one good leads to an increase in the quantity demanded of the other.
- The effect of a price change on the quantity demanded can be broken into a substitution effect and an income effect.

Summary

- The market demand curve is the horizontal summation of the individual demand curves for all consumers.
- The percent change in quantity demanded that results from a one percent change in price determines elasticity of demand.