## Lecture 6 and 7

The Theory of Consumer Choice

### Content

- Lecture 6
  - ► Theory of consumer utility
  - ► The law of diminishing marginal utility
  - ► Consumer preferences

- Lecture 7
  - ► The budget of the consumer
  - ► Optimal consumption bundle

### Theory of consumer utility

- Utility (U) is an abstract measure of the satisfaction or happiness that a consumer receives from a bundle of goods.
- Consumer prefers one bundle of goods to another if one provides more utility than the other:
  - ► U1 > U2 → Good 1 is preferred than good 2.
- Assumption:
  - ► Transitivity: U1 > U2 > U3  $\rightarrow$  U1 > U3.
  - More is preferred than less.

### Theory of consumer utility

- ► The marginal utility (MU): is the increase in utility that the consumer gets from an additional unit of that good.
  - $\blacktriangleright$  MU = TU'(Q) =  $\Delta$ TU/ $\Delta$ Q
  - ΔTU : Increase in total utility
  - ΔQ: Additional units of good
- Diminishing marginal utility: The more of the good the consumer already has, the lower the marginal utility provided by an extra unit of that good.

## Diminising marginal utility

### UTILITY EXAMPLES

#### Burger 1

Eating the first burger gives the consumer a lot of satisfaction

(utility)



Satisfaction thermometer

#### **Burger 2**

Eating a second burger will not give as much extra satisfaction as the first did (marginal utility)



#### **Burger 3**

Eating a third burger will give even less extra satisfaction then eating the second one (diminishing marginal utility)



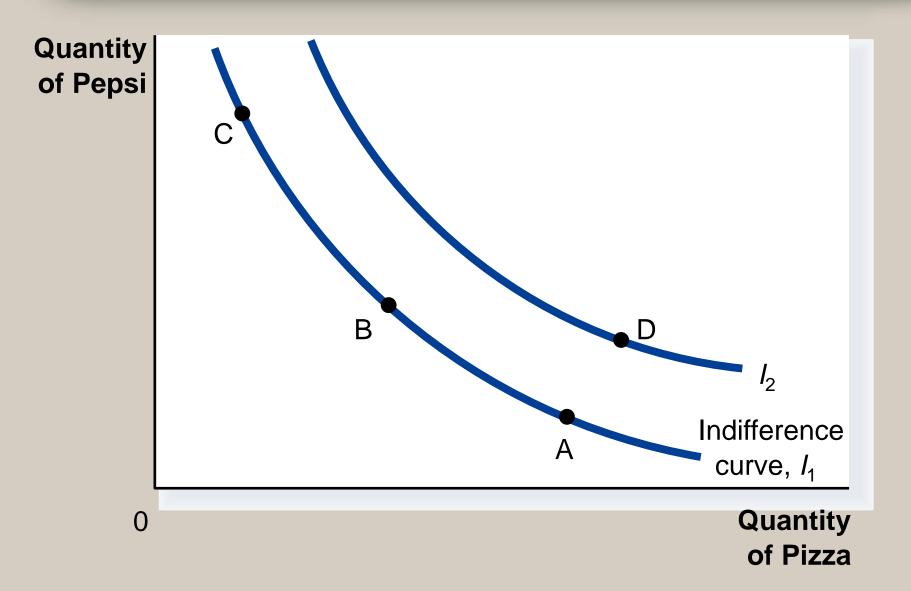
### The Consumer's preference

- A consumer's preference among consumption bundles may be illustrated with indifference curves.
- An *indifference curve* is a curve that shows consumption bundles that give the consumer the same level of satisfaction.
- ► The consumer's preferences allow him to choose among different bundles of pizza and Pepsi:
  - If you offer the consumer two different bundles, he chooses the bundle that best suits his tastes.
  - ▶ If the two bundles suit his tastes equally well, we say that the consumer is indifferent between the two bundles.

# PREFERENCES: WHAT THE CONSUMER WANTS

- A consumer's preference among consumption bundles may be illustrated with indifference curves.
- An *indifference curve* is a curve that shows consumption bundles that give the consumer the same level of satisfaction.

### Figure The Consumer's Preferences

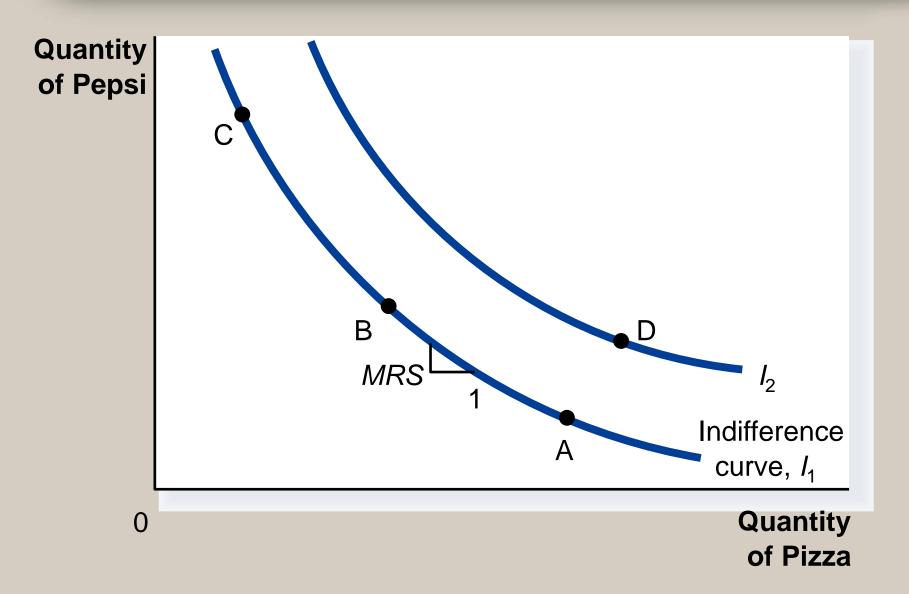


- ► The Consumer's Preferences
  - The consumer is indifferent, or equally happy, with the combinations shown at points A, B, and C because they are all on the same curve.

# The Marginal Rate of Substitution

- ► The slope at any point on an indifference curve is the marginal rate of substitution
  - ▶ It is the rate at which a consumer is willing to trade one good for another.
  - ► It is the amount of one good that a consumer requires as compensation to give up one unit of the other good.
  - $\triangleright$  MRS =  $-\Delta Y/\Delta X$

### Figure 2 The Consumer's Preferences



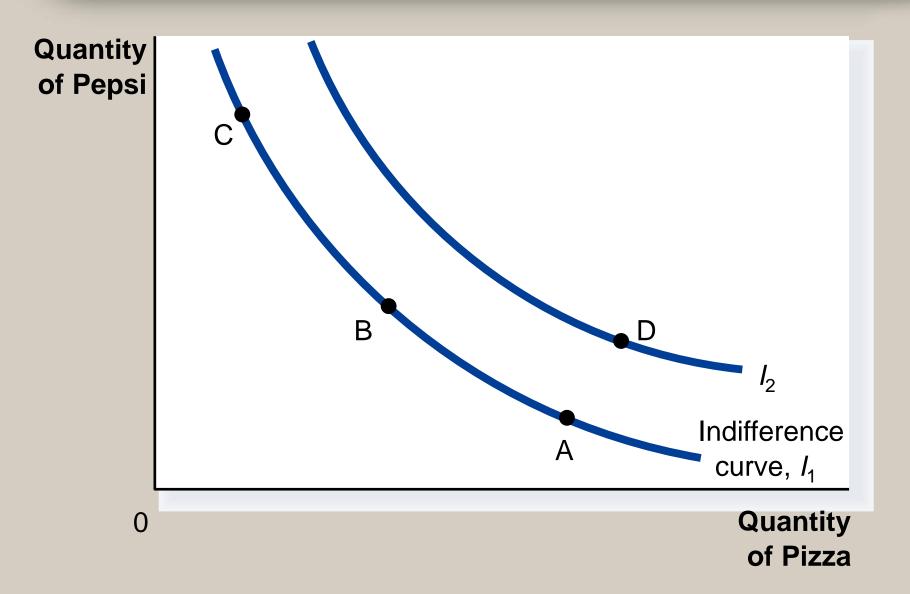
## Four Properties of Indifference Curves

- Higher indifference curves are preferred to lower ones.
- Indifference curves are downward sloping.
- Indifference curves do not cross.
- Indifference curves are bowed inward.

## Four Properties of Indifference Curves

- Property 1: Higher indifference curves are preferred to lower ones.
  - Consumers usually prefer more of something to less of it.
  - Higher indifference curves represent larger quantities of goods than do lower indifference curves.

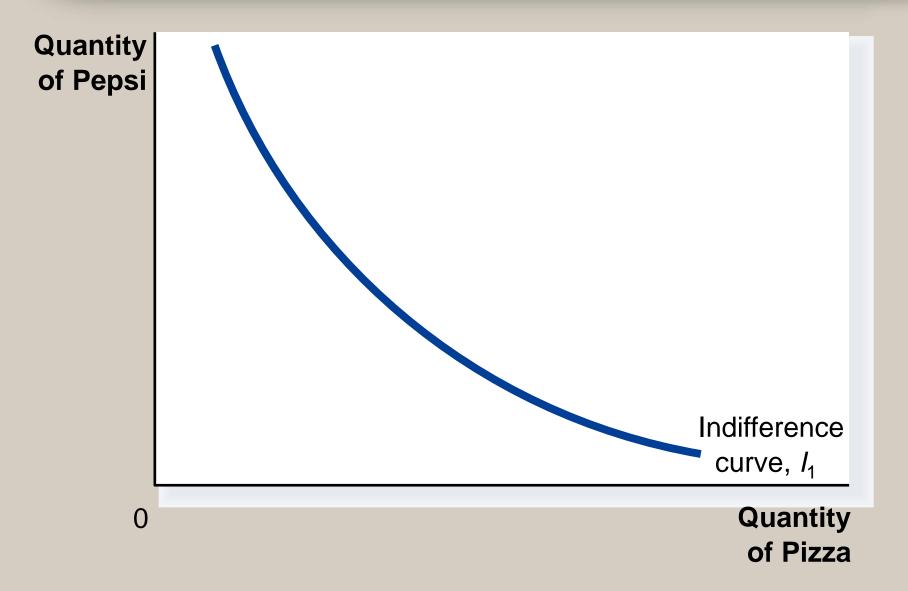
### Figure 2 The Consumer's Preferences



## Four Properties of Indifference Curves

- Property 2: Indifference curves are downward sloping.
  - A consumer is willing to give up one good only if he or she gets more of the other good in order to remain equally happy.
  - If the quantity of one good is reduced, the quantity of the other good must increase.
  - For this reason, most indifference curves slope downward.

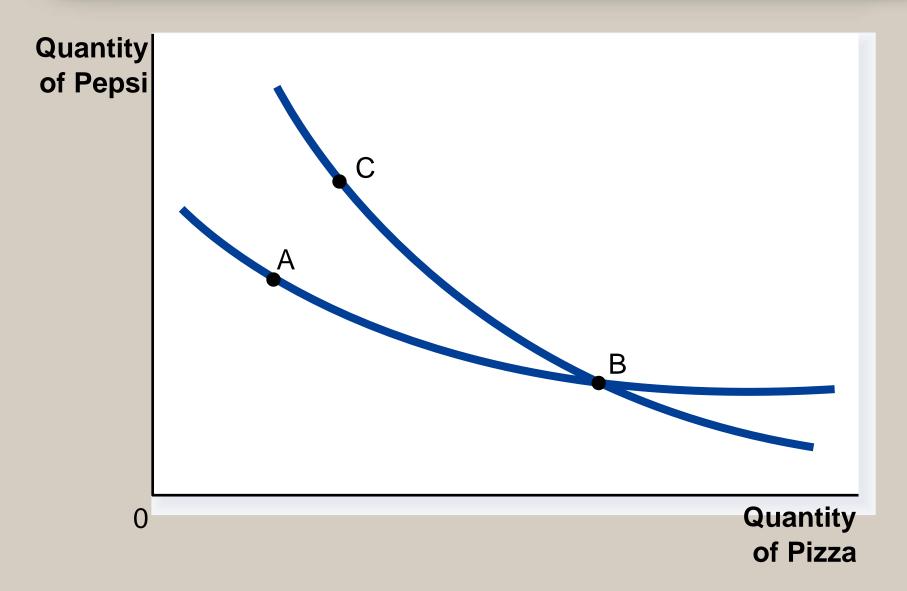
### Figure 2 The Consumer's Preferences



### Four Properties of Indifference Curves

- Property 3: Indifference curves do not cross.
  - Points A and B should make the consumer equally happy.
  - Points B and C should make the consumer equally happy.
  - This implies that A and C would make the consumer equally happy.
  - But C has more of both goods compared to A.

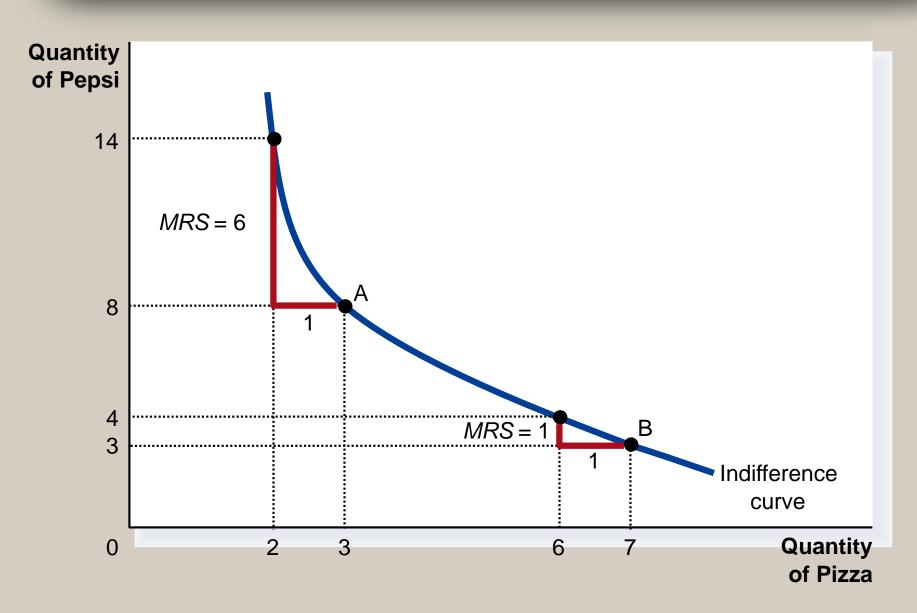
## Figure 3 The Impossibility of Intersecting Indifference Curves



### Four Properties of Indifference Curves

- Property 4: Indifference curves are bowed inward.
  - People are more willing to trade away goods that they have in abundance and less willing to trade away goods of which they have little.
  - These differences in a consumer's marginal substitution rates cause his or her indifference curve to bow inward.

### Figure 4 Bowed Indifference Curves



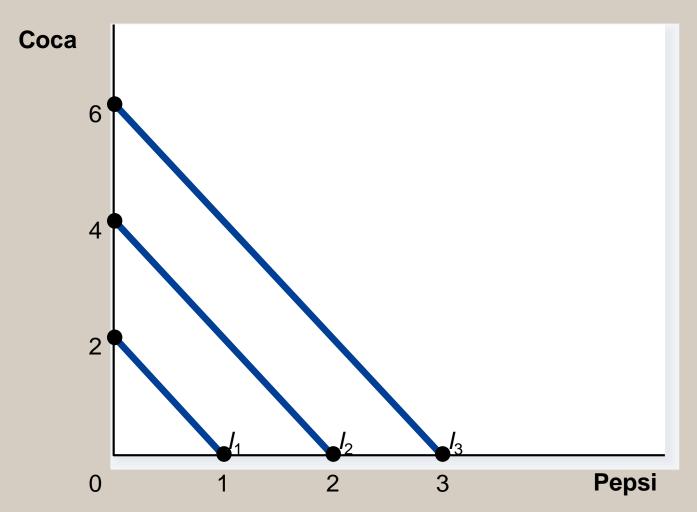
- Perfect substitutes
- Perfect complements

#### ► Perfect Substitutes

- ► Two goods with straight-line indifference curves are perfect substitutes.
- ► The marginal rate of substitution is a fixed number.

### Figure 5 Perfect Substitutes and Perfect Complements

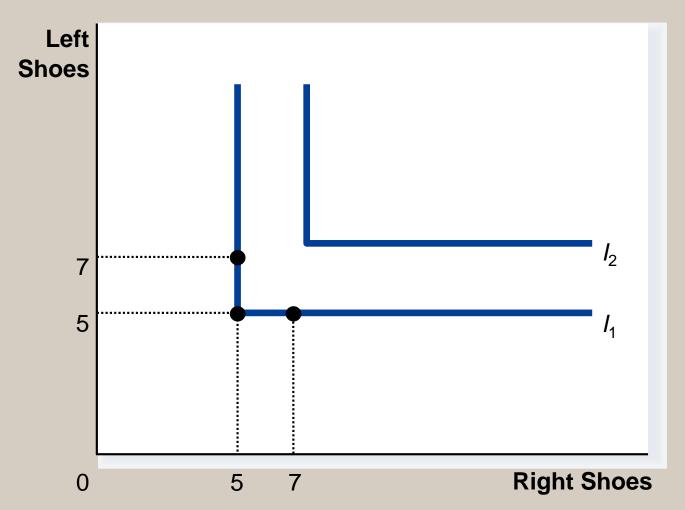




- ► Perfect Complements
  - Two goods with right-angle indifference curves are perfect complements.

### Figure 5 Perfect Substitutes and Perfect Complements





## THE BUDGET CONSTRAINT: WHAT THE CONSUMER CAN AFFORD

- ➤ The *budget constraint* depicts the limit on the consumption "bundles" that a consumer can afford.
  - ► People consume less than they desire because their spending is constrained, or limited, by their income.
- ► The budget line shows the various combinations of goods the consumer can afford given his or her income and the prices of the two goods

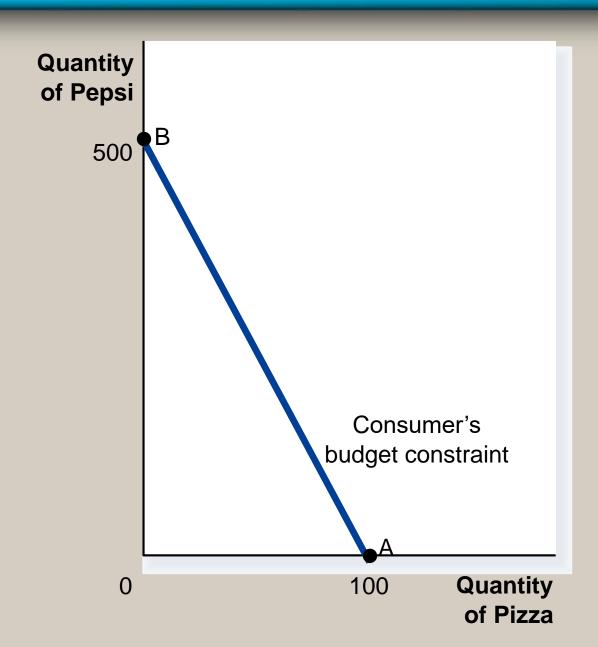
## The Consumer's Budget Constraint

Pints of Pepsi	Number of Pizzas	Spending on Pepsi	Spending on Pizza	Total Spending
0	100	\$ 0	\$1,000	\$1,000
50	90	100	900	1,000
100	80	200	800	1,000
150	70	300	700	1,000
200	60	400	600	1,000
250	50	500	500	1,000
300	40	600	400	1,000
350	30	700	300	1,000
400	20	800	200	1,000
450	10	900	100	1,000
500	0	1,000	0	1,000

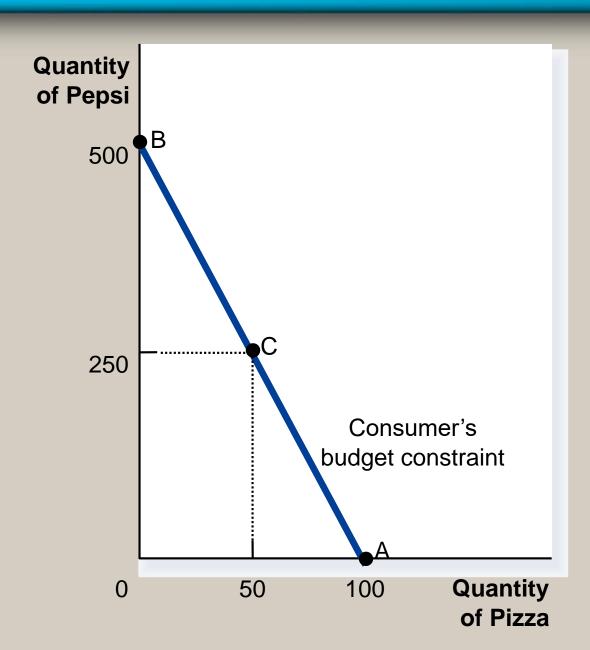
## THE BUDGET CONSTRAINT: WHAT THE CONSUMER CAN AFFORD

- ► The Consumer's Budget Constraint
  - Any point on the budget constraint line indicates the consumer's combination or tradeoff between two goods.
  - For example, if the consumer buys no pizzas, he can afford 500 pints of Pepsi (point B). If he buys no Pepsi, he can afford 100 pizzas (point A).

### Figure The Consumer's Budget Constraint



### Figure The Consumer's Budget Constraint



## THE BUDGET CONSTRAINT: WHAT THE CONSUMER CAN AFFORD

- The *slope* of the budget constraint line equals the relative price of the two goods, that is, the price of one good compared to the price of the other.
- It measures the rate at which the consumer can trade one good for the other.

# OPTIMIZATION: WHAT THE CONSUMER CHOOSES

- Consumers want to get the combination of goods on the highest possible indifference curve.
- Nowever, the consumer must also end up on or below his budget constraint.

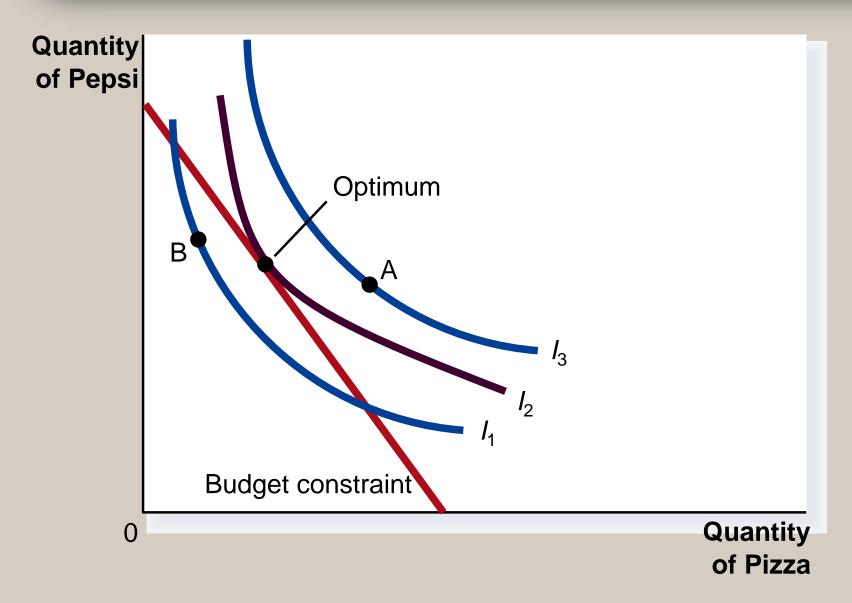
### The Consumer's Optimal Choices

- Combining the indifference curve and the budget constraint determines the consumer's optimal choice.
- Consumer optimum occurs at the point where the *highest* indifference curve and the budget constraint are tangent.

### The Consumer's Optimal Choice

- The consumer chooses consumption of the two goods so that the marginal rate of substitution equals the relative price.
- At the consumer's optimum, the consumer's valuation of the two goods equals the market's valuation.

### Figure The Consumer's Optimum



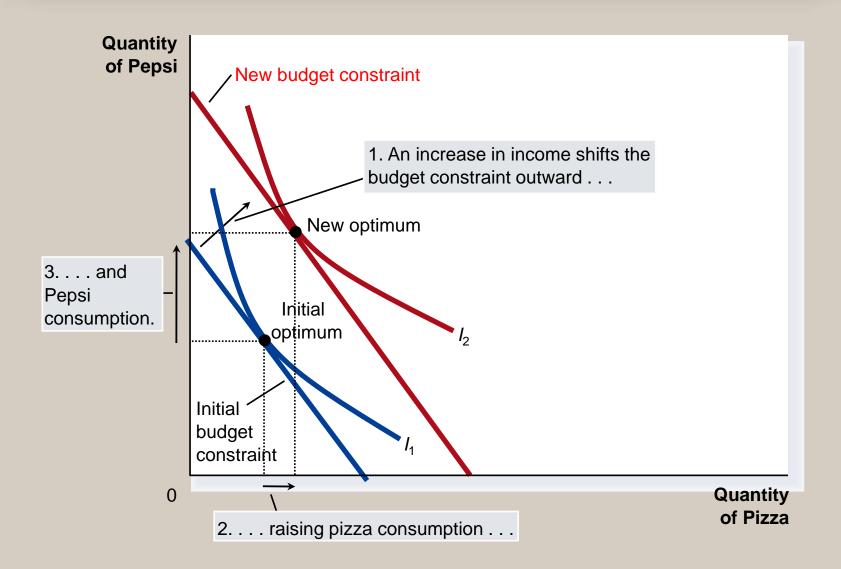
## How Changes in Income Affect the Consumer's Choices

- An increase in income can shift the budget constraint outward.
  - The consumer is able to choose a better combination of goods on a higher indifference curve.
  - But there are two cases: Normal goods and inferior goods

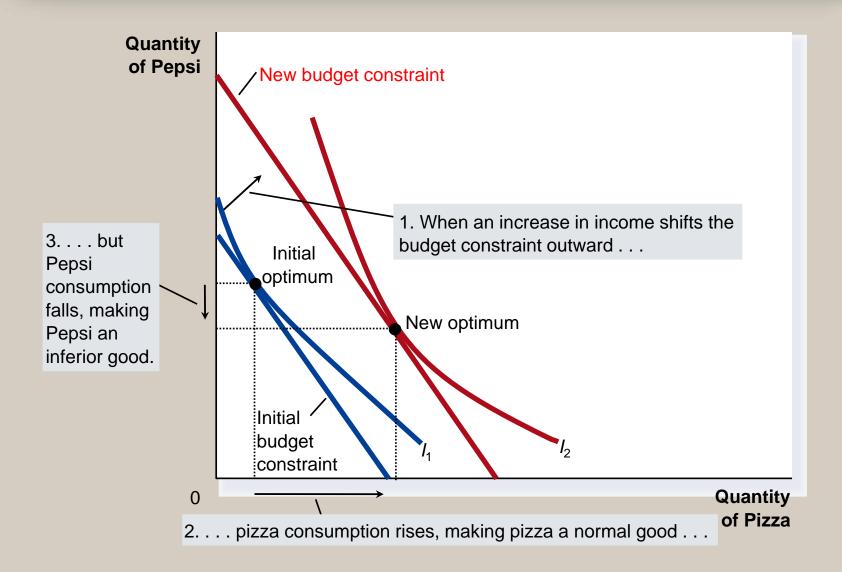
## How Changes in Income Affect the Consumer's Choices

- Normal versus Inferior Goods
  - ▶ If a consumer buys more of a good when his or her income rises, the good is called a normal good.
  - ▶ If a consumer buys less of a good when his or her income rises, the good is called an *inferior good*.

#### Figure An Increase in Income



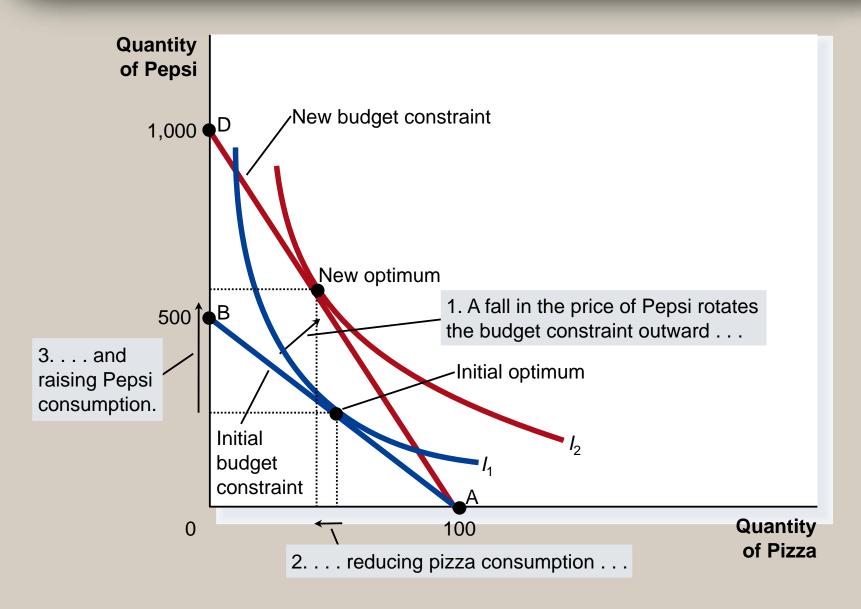
#### Figure An Inferior Good



# How Changes in Prices Affect Consumer's Choices

A fall in the price of any good rotates the budget constraint outward and changes the slope of the budget constraint.

#### Figure A Change in Price



#### Income and Substitution Effects

- ► A price change has two effects on consumption.
  - ► An income effect
  - ► A substitution effect

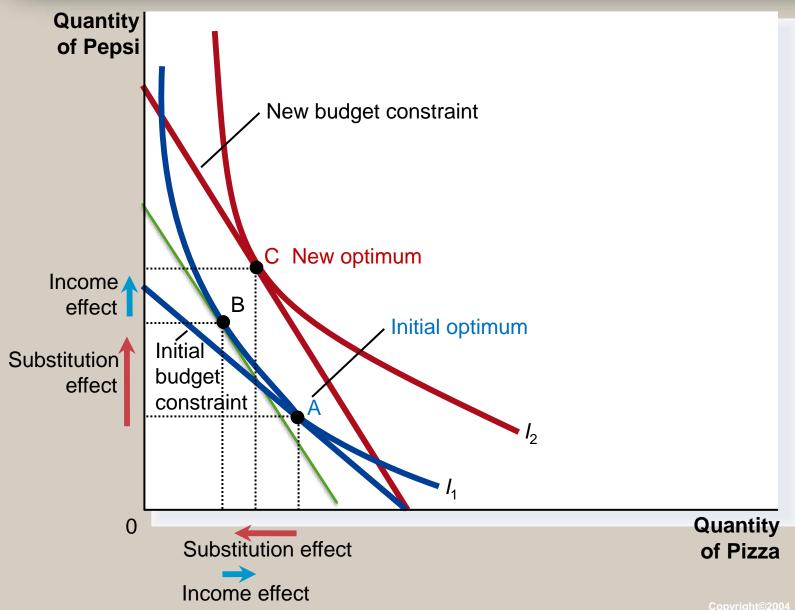
#### Income and Substitution Effects

- ► The Income Effect
  - The *income effect* is the change in consumption that results when a price change moves the consumer to a higher or lower indifference curve.
- ► The Substitution Effect
  - ► The substitution effect is the change in consumption that results when a price change moves the consumer along an indifference curve to a point with a different marginal rate of substitution.

#### Income and Substitution Effects

- ► A Change in Price: Substitution Effect
  - A price change first causes the consumer to move from one point on an indifference curve to another on the same curve.
    - ▶ Illustrated by movement from point A to point B.
- ► A Change in Price: Income Effect
  - After moving from one point to another on the same curve, the consumer will move to another indifference curve.
    - Illustrated by movement from point B to point C.

#### Figure Income and Substitution Effects



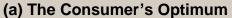
## Table 1 Income and Substitution Effects When the Price of Pepsi Falls

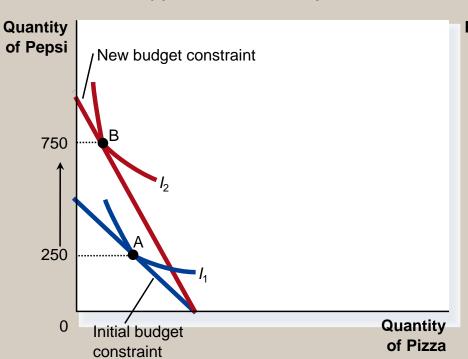
Good	Income Effect	<b>Substitution Effect</b>	Total Effect
Pepsi	Consumer is richer, so he buys more Pepsi.	Pepsi is relatively cheaper, so consumer buys more Pepsi.	Income and substitution effects act in same direction, so consumer buys more Pepsi.
Pizza	Consumer is richer, so he buys more pizza.	Pizza is relatively more expensive, so consumer buys less pizza.	Income and substitution effects act in opposite directions, so the total effect on pizza consumption is ambiguous.

## Deriving the Demand Curve

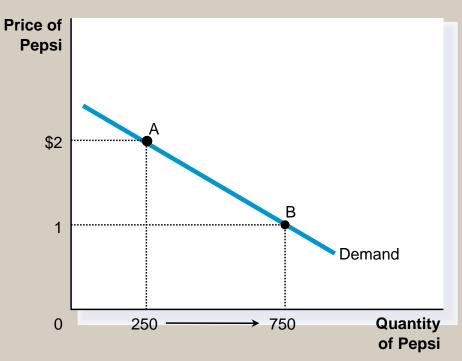
A consumer's demand curve can be viewed as a summary of the optimal decisions that arise from his or her budget constraint and indifference curves.

#### Figure 11 Deriving the Demand Curve





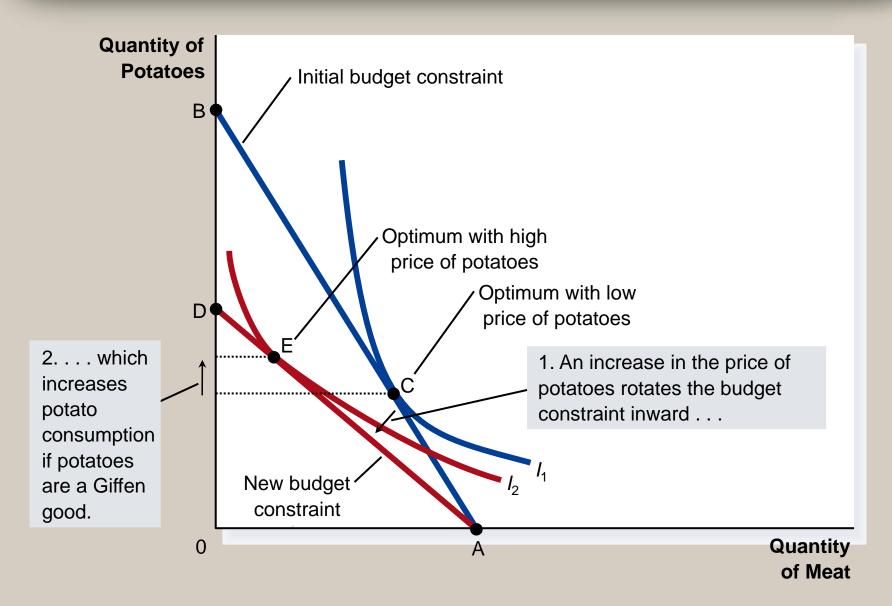
#### (b) The Demand Curve for Pepsi



### **APPLICATIONS**

- Do all demand curves slope downward?
  - Demand curves can sometimes slope upward.
  - This happens when a consumer buys more of a good when its price rises.

#### Figure 12 A Giffen Good



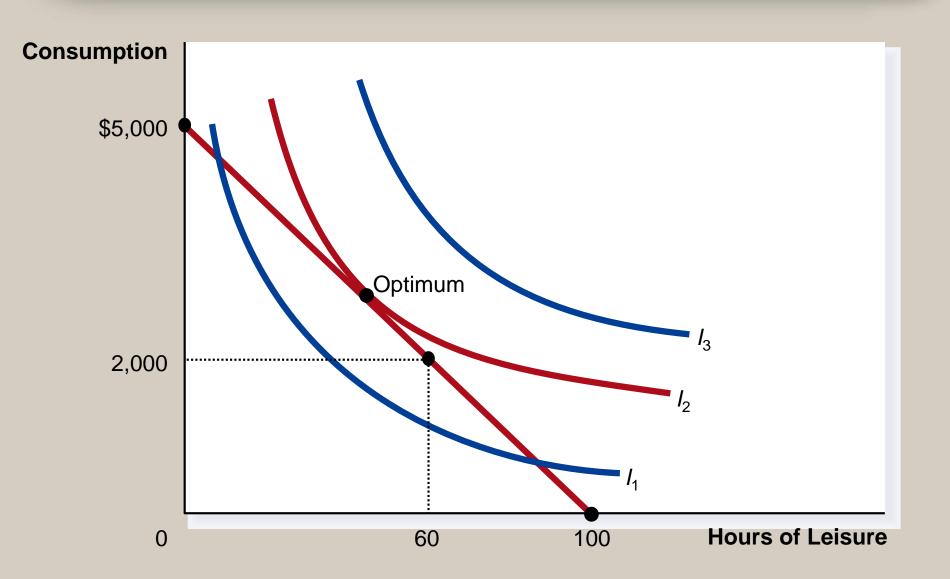
### **APPLICATIONS**

- How do wages affect labor supply?
  - If the substitution effect is greater than the income effect for the worker, he or she works more.
  - If income effect is greater than the substitution effect, he or she works less.

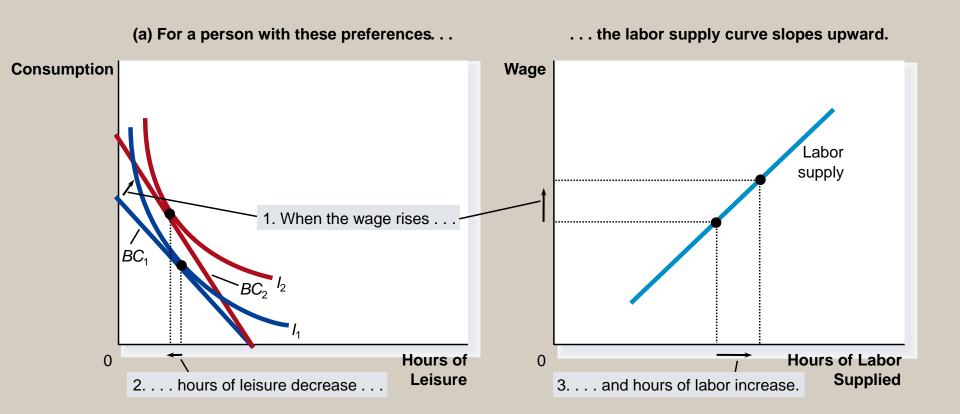
## Giffen goods

- ► Economists use the term Giffen good to describe a good that violates the law of demand.
- ▶ Giffen goods are goods for which an increase in the price raises the quantity demanded.
- ► The income effect dominates the substitution effect.
- ► They have demand curves that slope upwards.

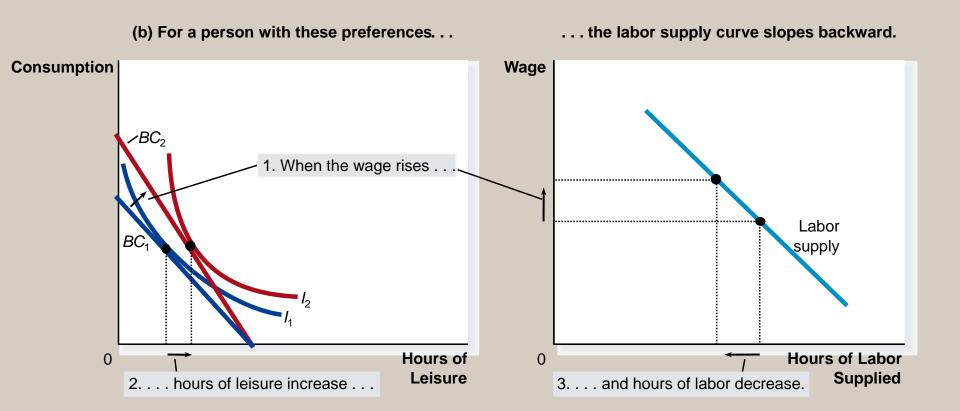
### Figure The Work-Leisure Decision



#### Figure An Increase in the Wage



#### Figure An Increase in the Wage



- A consumer's budget constraint shows the possible combinations of different goods he can buy given his income and the prices of the goods.
- ► The slope of the budget constraint equals the relative price of the goods.
- ► The consumer's indifference curves represent his preferences.

- ► Points on higher indifference curves are preferred to points on lower indifference curves.
- The slope of an indifference curve at any point is the consumer's marginal rate of substitution.
- The consumer optimizes by choosing the point on his budget constraint that lies on the highest indifference curve.

- ▶ When the price of a good falls, the impact on the consumer's choices can be broken down into an income effect and a substitution effect.
- ► The income effect is the change in consumption that arises because a lower price makes the consumer better off.
- The income effect is reflected by the movement from a lower to a higher indifference curve.

- ► The substitution effect is the change in consumption that arises because a price change encourages greater consumption of the good that has become relatively cheaper.
- ► The substitution effect is reflected by a movement along an indifference curve to a point with a different slope.

- The theory of consumer choice can explain:
  - Why demand curves can potentially slope upward.
  - ► How wages affect labor supply.