21 The Theory of Consumer Choice

PRINCIPLES OF
ECONOMICS
FOURTH EDITION

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PowerPoint® Slides
by Ron Cronovich

In this chapter, look for the answers to these questions:

- How does the budget constraint represent the choices a consumer can afford?
- How do indifference curves represent the consumer's preferences?
- What determines how a consumer divides her resources between two goods?
- How does the theory of consumer choice explain decisions such as how much a consumer saves, or how much labor she supplies?

Introduction

- Recall one of the Ten Principles: *People face tradeoffs*.
  - Buying more of one good leaves less income to buy other goods.
  - Working more hours means more income and more consumption, but less leisure time.
  - Reducing saving allows more consumption today but reduces future consumption.
- This chapter explores how consumers make choices like these.

The Budget Constraint: What the Consumer Can Afford

- Two goods: pizza and Pepsi
- A "consumption bundle" is a particular combination of the goods, *e.g.*, 40 pizzas & 300 pints of Pepsi.
- **Budget constraint**: the limit on the consumption bundles that a consumer can afford

ACTIVE LEARNING 1:

Budget constraint

The consumer's income: $1000
Prices: $10 per pizza, $2 per pint of Pepsi

A. If the consumer spends all his income on pizza, how many pizzas does he buy?

B. If the consumer spends all his income on Pepsi, how many pints of Pepsi does he buy?

C. If the consumer spends $400 on pizza, how many pizzas and Pepsis does he buy?

D. Plot each of the bundles from parts A-C on a diagram that measures the quantity of pizza on the horizontal axis and quantity of Pepsi on the vertical axis, then connect the dots.

ACTIVE LEARNING 1:

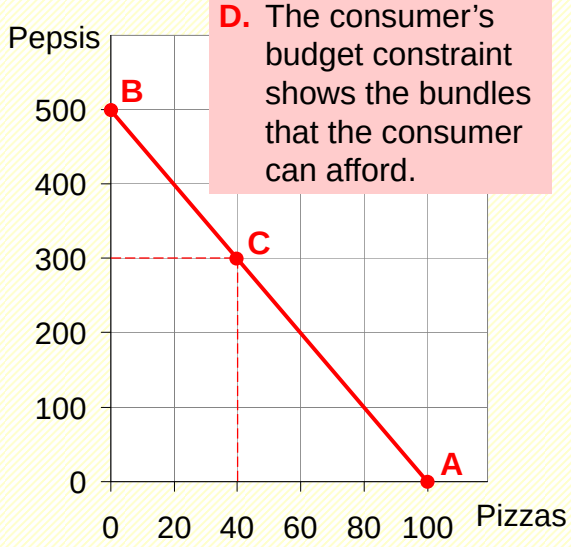
Answers

A. $1000/$10 = 100 pizzas

B. $1000/$2 = 500 Pepsis

C. $400/$10 = 40 pizzas
$600/$2 = 300 Pepsis

D. The consumer's budget constraint shows the bundles that the consumer can afford.



The Slope of the Budget Constraint

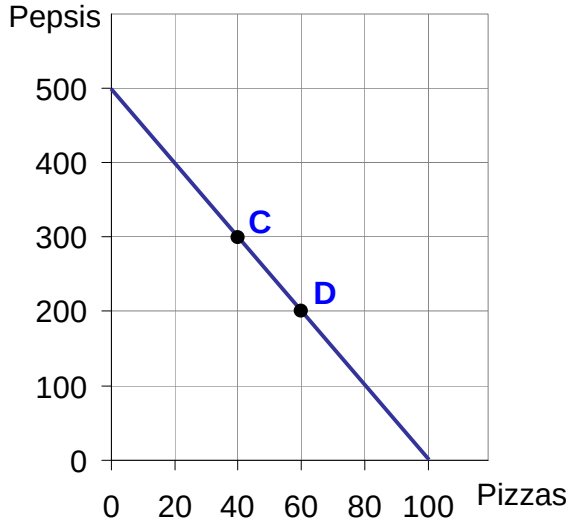
From **C** to **D**,

"rise" = –100 Pepsis

"run" = +20 pizzas

Slope = –5

Consumer must give up 5 Pepsis to get another pizza.



The Slope of the Budget Constraint

- The slope of the budget constraint equals
  - the rate at which the consumer can trade Pepsi for pizza
  - the opportunity cost of pizza in terms of Pepsi
  - the relative price of pizza:

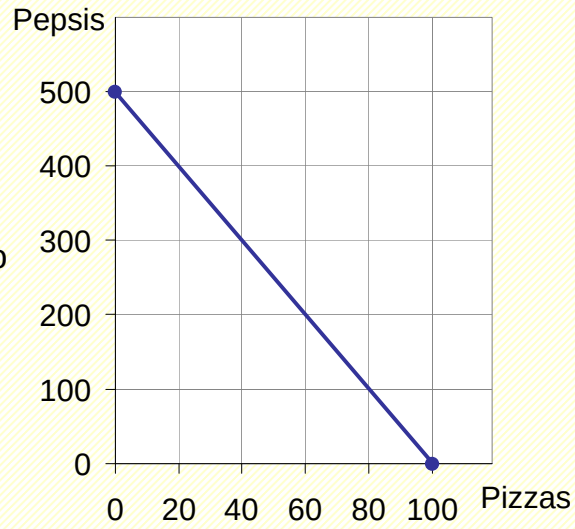
$$\frac{\text{price of pizza}}{\text{price of Pepsi}} = \frac{\$10}{\$2} = 5 \text{ Pepsis per pizza}$$

ACTIVE LEARNING 2:
Exercise

Show what happens to the budget constraint if:

A. Income falls to $800

B. The price of Pepsi rises to $4/pint.

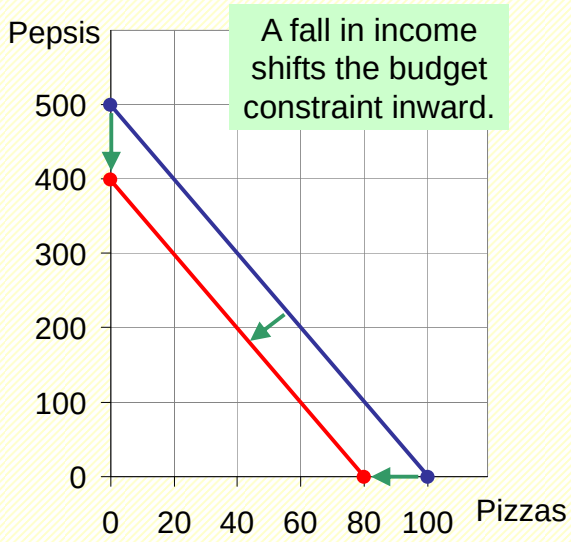


ACTIVE LEARNING 2A:
Answers

Consumer can buy $800/$10 = 80 pizzas

or $800/$2 = 400 Pepsis

or any combination in between.

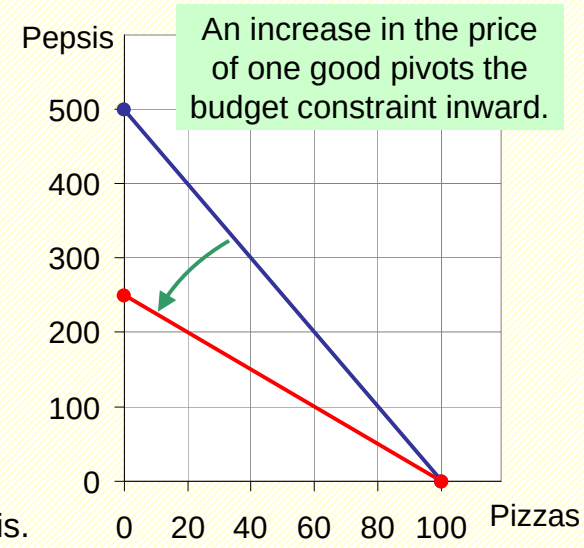


ACTIVE LEARNING 2B:
Answers

Consumer can still buy 100 pizzas.

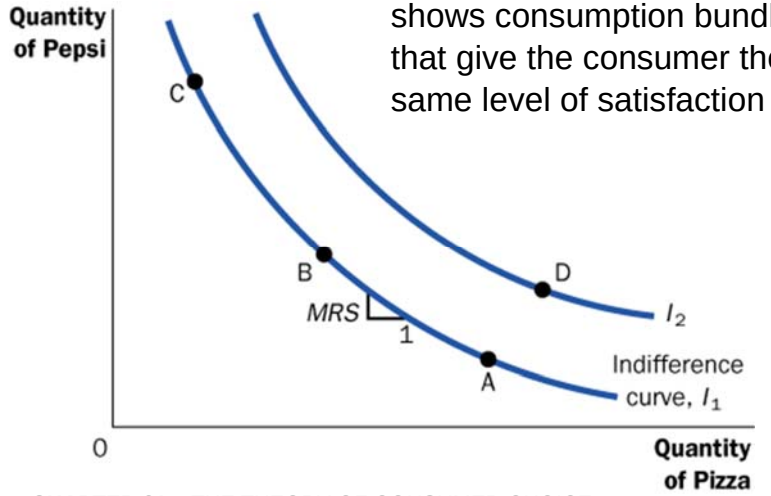
But now, can only buy $1000/$4 = 250 Pepsis.

Notice: slope is smaller, relative price of pizza now only 4 Pepsis.



Preferences: What the Consumer Wants

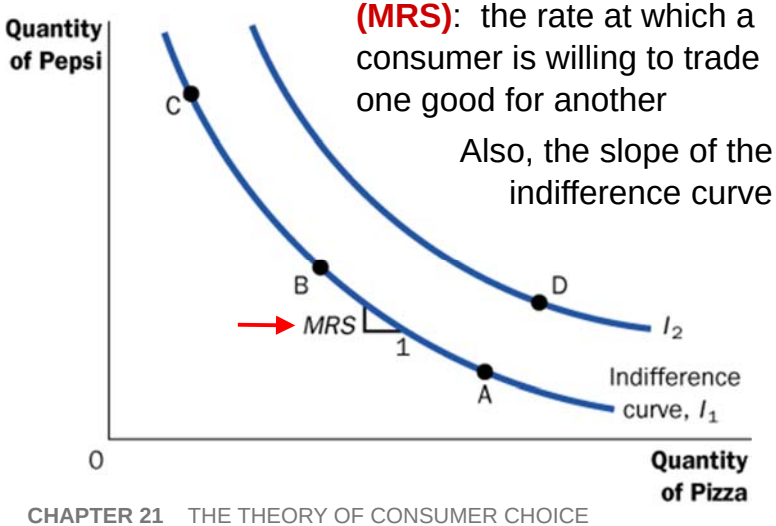
Indifference curve: shows consumption bundles that give the consumer the same level of satisfaction



Preferences: What the Consumer Wants

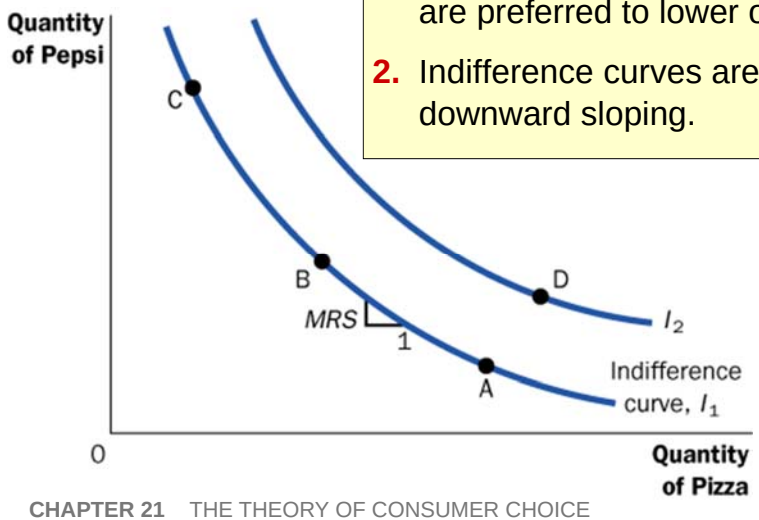
Marginal rate of substitution (MRS): the rate at which a consumer is willing to trade one good for another

Also, the slope of the indifference curve



Four Properties of Indifference Curves

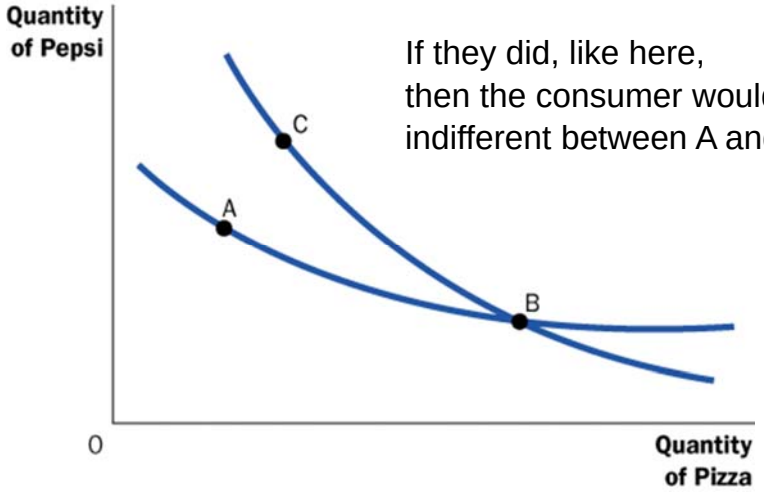
1. Higher indifference curves are preferred to lower ones.
2. Indifference curves are downward sloping.



Four Properties of Indifference Curves

3. Indifference curves do not cross.

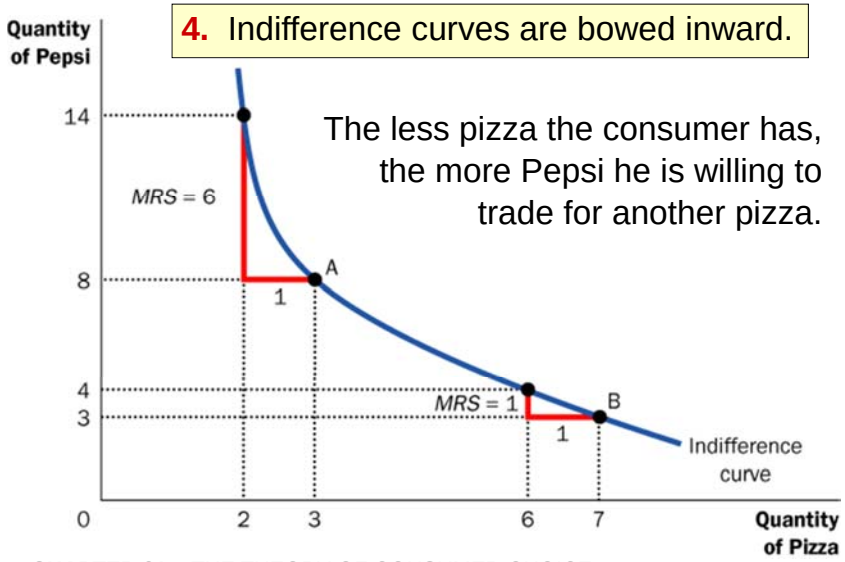
If they did, like here, then the consumer would be indifferent between A and C.



Four Properties of Indifference Curves

4. Indifference curves are bowed inward.

The less pizza the consumer has, the more Pepsi he is willing to trade for another pizza.

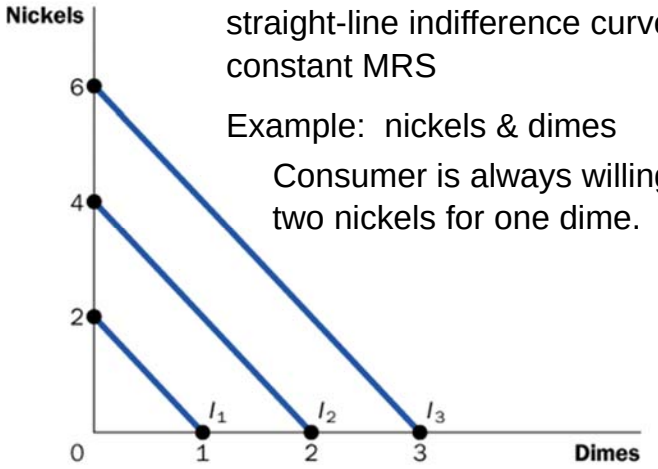


One Extreme Case: Perfect Substitutes

Perfect substitutes: two goods with straight-line indifference curves, constant MRS

Example: nickels & dimes

Consumer is always willing to trade two nickels for one dime.



Another Extreme Case: Perfect Complements

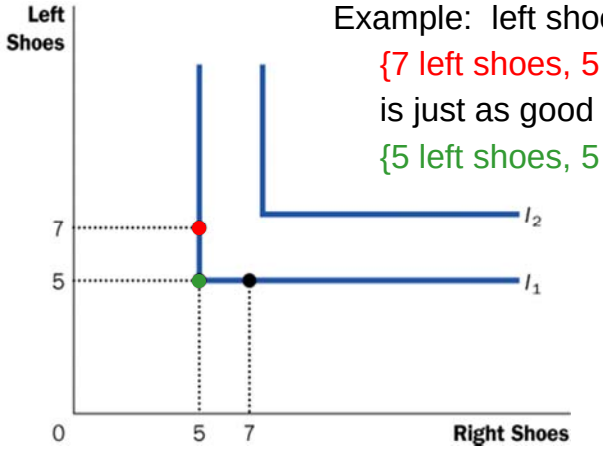
Perfect substitutes: two goods with right-angle indifference curves

Example: left shoes, right shoes

{7 left shoes, 5 right shoes}

is just as good as

{5 left shoes, 5 right shoes}

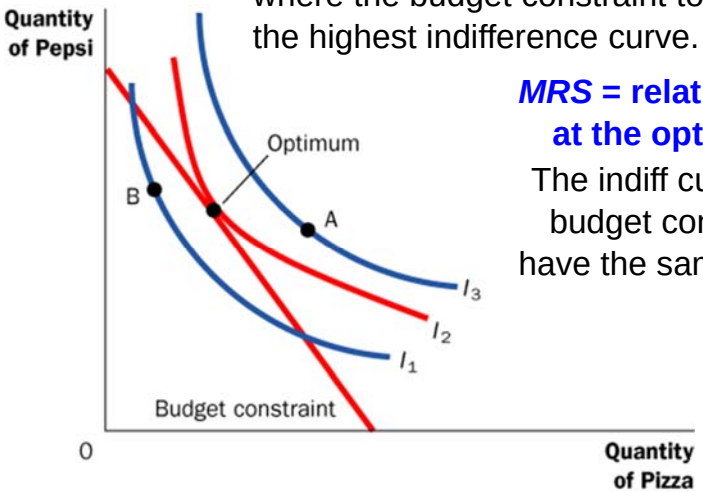


Optimization: What the Consumer Chooses

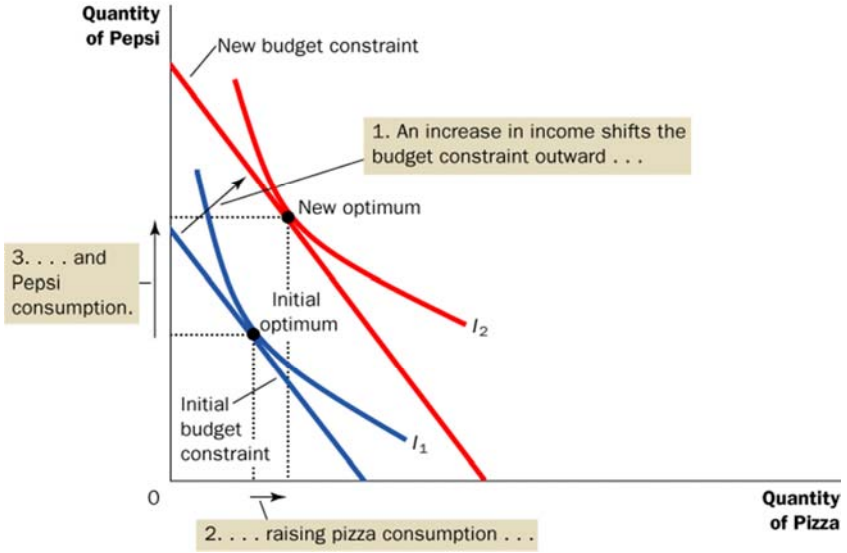
The optimal bundle is at the point where the budget constraint touches the highest indifference curve.

***MRS* = relative price at the optimum:**

The indiff curve and budget constraint have the same slope.



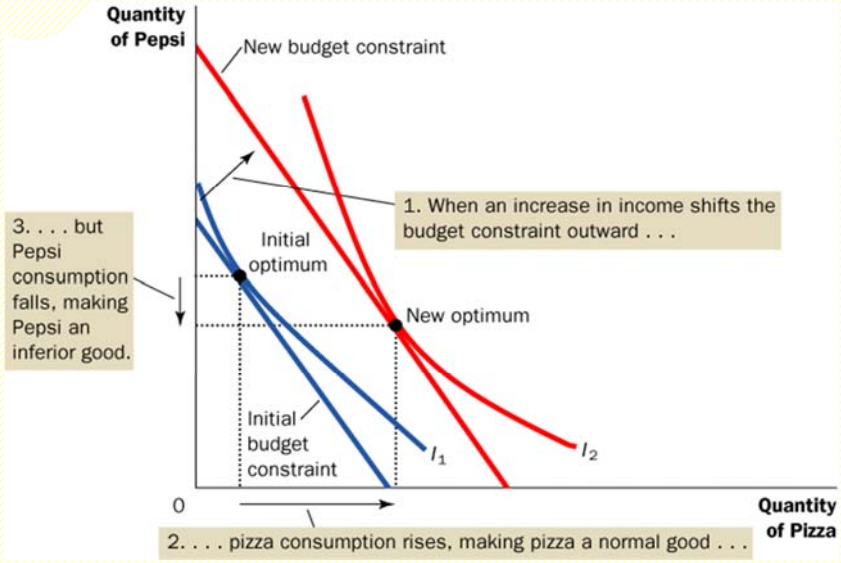
The Effects of an Increase in Income



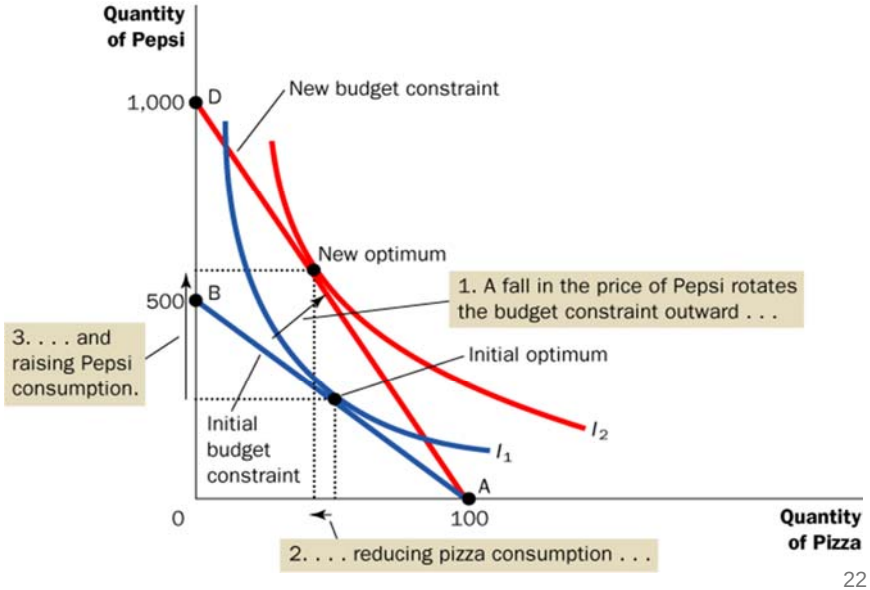
ACTIVE LEARNING 3:
Inferior vs. normal goods

- An increase in income increases the quantity demanded of **normal goods** and reduces the quantity demanded of **inferior goods**.
- Suppose pizza is a normal good but Pepsi is an inferior good.
- Use a diagram to show the effects of an increase in income on the consumer's optimal bundle of pizza and Pepsi.

ACTIVE LEARNING 3:
Answers



The Effects of a Price Change

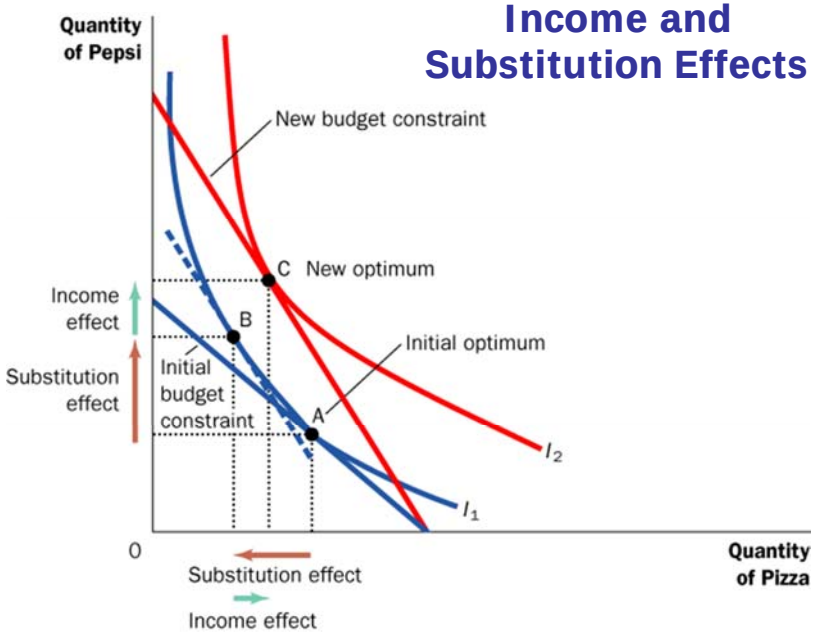


The Income and Substitution Effects

A fall in the price of Pepsi has two effects on the optimal consumption of both goods.

- **Income effect**
  A fall in the price of Pepsi boosts the purchasing power of the consumer's income, allowing him to reach a higher indifference curve.
- **Substitution effect**
  A fall in the price of Pepsi makes pizza more expensive relative to Pepsi, causes consumer to buy less pizza & more Pepsi.

Income and Substitution Effects



ACTIVE LEARNING 4:
Income & substitution effects

- The two goods are skis and ski bindings.
- Suppose the price of skis falls.
  Determine the effects on the consumer's demand for both goods if
  - income effect > substitution effect
  - income effect < substitution effect
- Which case do you think is more likely?

ACTIVE LEARNING 4:
Answers

A fall in the price of skis

- Income effect:
  demand for skis rises
  demand for ski bindings rises
- Substitution effect:
  demand for skis rises
  demand for ski bindings falls
- The substitution effect is likely to be small, because skis and ski bindings are complements.

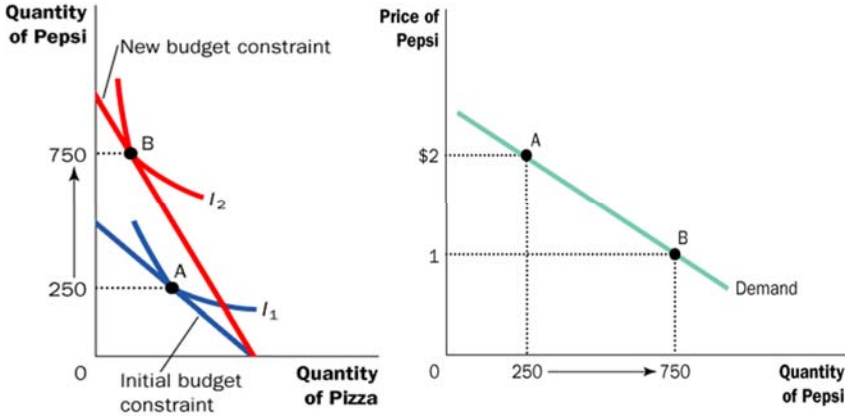
The Substitution Effect for Substitutes and Complements

- The substitution effect is huge when the goods are very close substitutes.
  - If Pepsi goes on sale, people who are nearly indifferent between Coke and Pepsi will buy mostly Pepsi.
- The substitution effect is tiny when goods are nearly perfect complements.
  - If software becomes more expensive relative to computers, people are not likely to buy less software and use the savings to buy more computers.

Deriving the Demand Curve for Pepsi

Left graph: price of Pepsi falls from $2 to $1

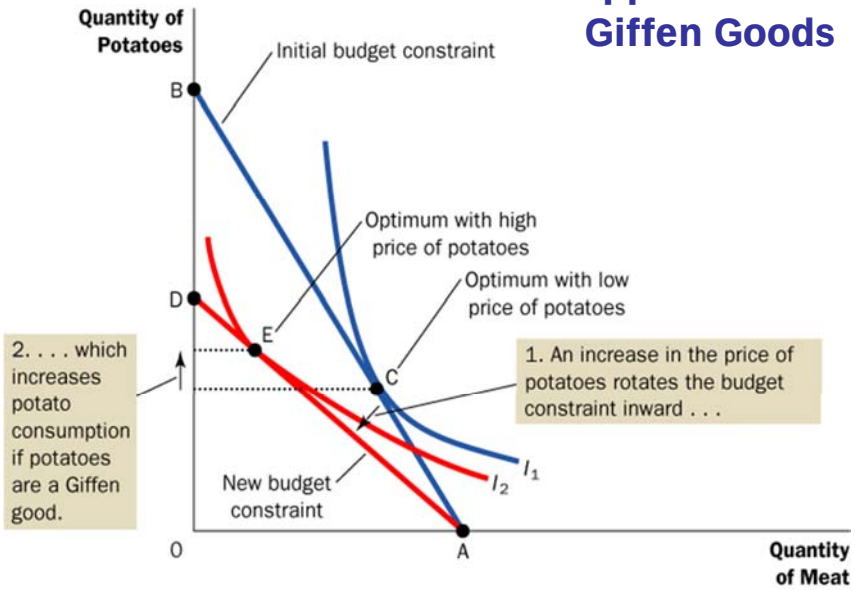
Right graph: Pepsi demand curve



Application 1: Giffen Goods

- Do all goods obey the *Law of Demand*?
- Suppose the goods are potatoes and meat, and potatoes are an inferior good.
- If price of potatoes rises,
  - substitution effect: buy less potatoes
  - income effect: buy more potatoes
- If income effect > substitution effect, then potatoes are a **Giffen good**, a good for which an increase in price raises the quantity demanded.

Application 1: Giffen Goods



Application 2: Wages and Labor Supply

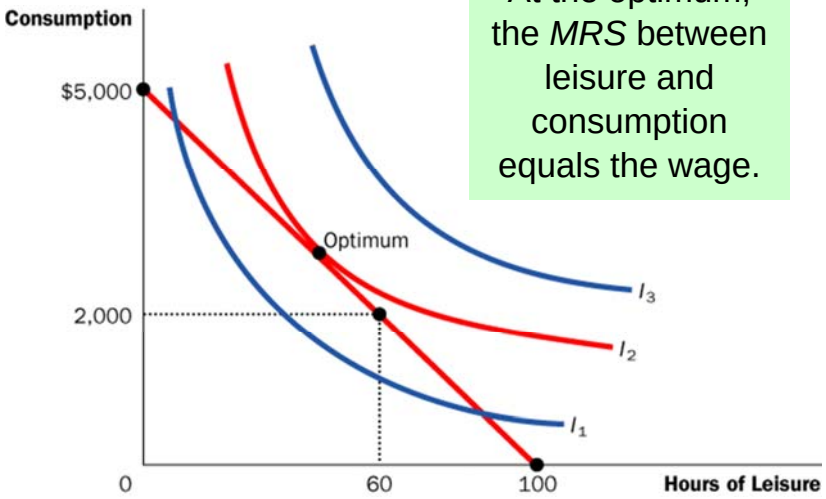
Budget constraint

- Shows a person's tradeoff between consumption and leisure.
- Depends on how much time she has to divide between leisure and working.
- The relative price of an hour of leisure is the amount of consumption she could buy with an hour's wages.

Indifference curve

- Shows "bundles" of consumption and leisure that give her the same level of satisfaction.

Application 2: Wages and Labor Supply



At the optimum, the *MRS* between leisure and consumption equals the wage.

Application 2: Wages and Labor Supply

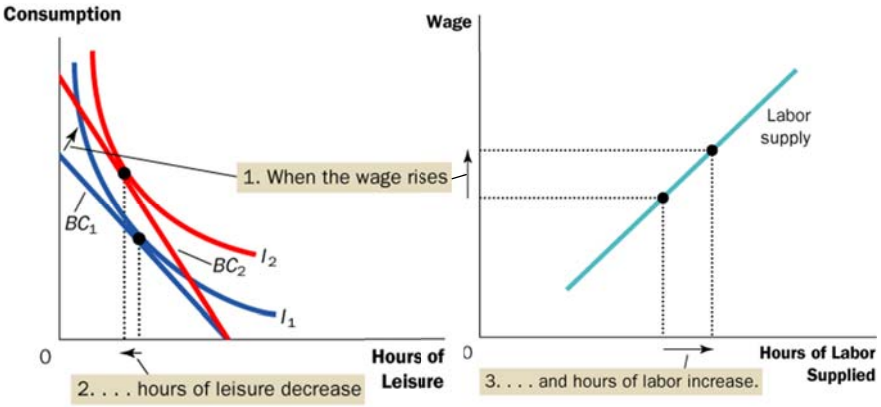
An increase in the wage has two effects on the optimal quantity of labor supplied.

- *Substitution effect (SE)*: A higher wage makes leisure more expensive relative to consumption. The person chooses less leisure, *i.e.,* increases quantity of labor supplied.
- *Income effect (IE)*: With a higher wage, she can afford more of both "goods." She chooses more leisure, *i.e.,* reduces quantity of labor supplied.

Application 2: Wages and Labor Supply

For this person, *SE > IE*

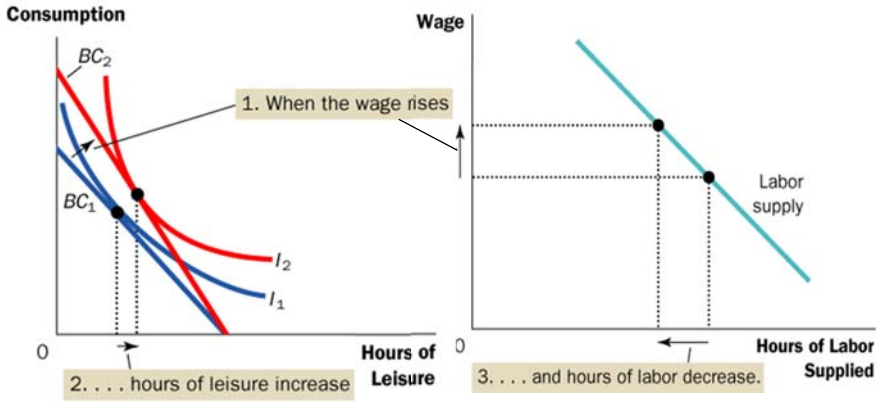
So her labor supply increases with the wage



Application 2: Wages and Labor Supply

For this person, *SE < IE*

So his labor supply falls when the wage rises



Could This Happen in the Real World???

Cases where the income effect on labor supply is very strong:

- Over last 100 years, technological progress has increased labor demand and real wages.

  The average workweek fell from 6 to 5 days.

- When a person wins the lottery or receives an inheritance, his wage is unchanged – hence no substitution effect.

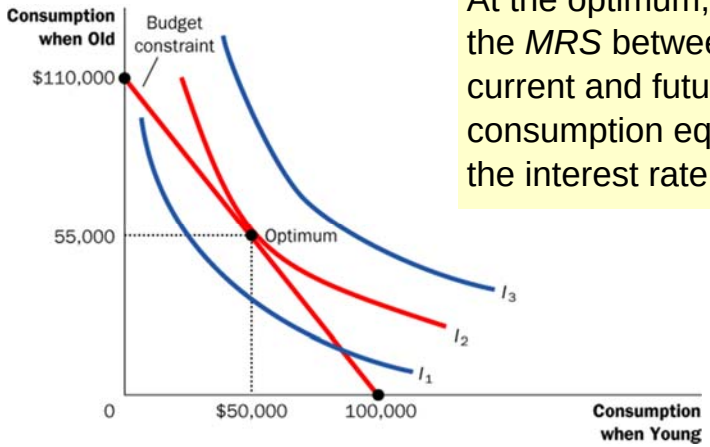
  But such persons are more likely to work fewer hours, indicating a strong income effect.

Application 3: Interest Rates and Saving

- A person lives for two periods.
  - Period 1: young, works, earns $100,000
    consumption = $100,000 minus amount saved
  - Period 2: old, retired
    consumption = saving from Period 1
    plus interest earned on saving
- The interest rate determines the relative price of consumption when young in terms of consumption when old.

Application 3: Interest Rates and Saving

Budget constraint shown is for 10% interest rate.



At the optimum, the *MRS* between current and future consumption equals the interest rate.

ACTIVE LEARNING 5:
Effects of an interest rate increase

- Suppose the interest rate rises.
- Determine the income and substitution effects on current and future consumption, and on saving.

ACTIVE LEARNING 5:
Answers

The interest rate rises.

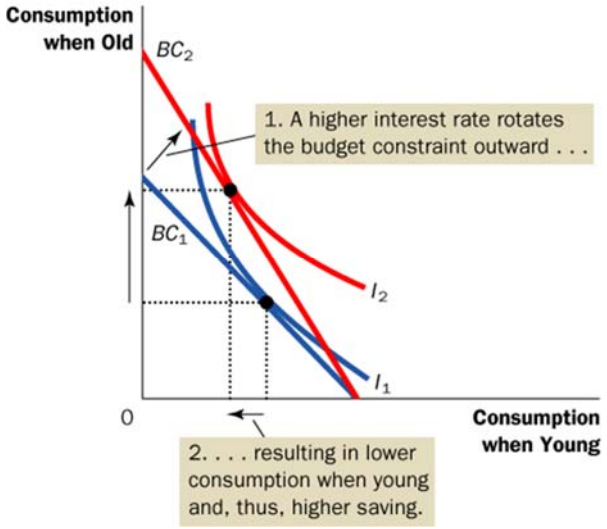
Substitution effect

- Current consumption becomes more expensive relative to future consumption.
- Current consumption falls, saving rises, future consumption rises.

Income effect

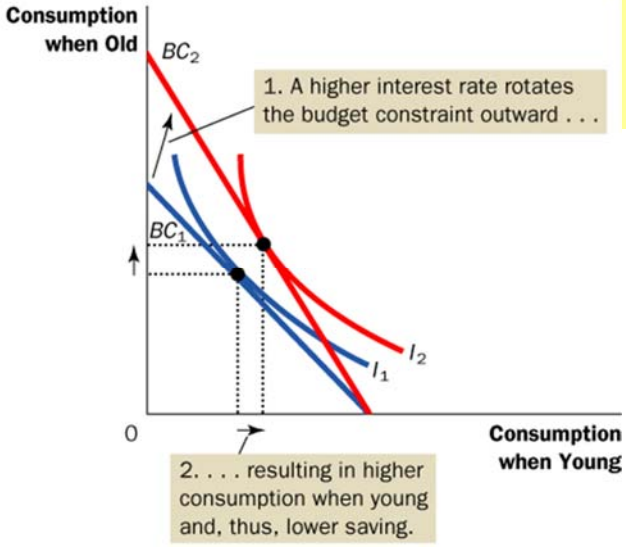
- Can afford more consumption in both the present and the future. Saving falls.

Application 3: Interest Rates and Saving



In this case, *SE* > *IE* and saving rises

Application 3: Interest Rates and Saving



In this case, *SE* < *IE* and saving falls

CONCLUSION:
Do People Really Think This Way?

- Most people do not make spending decisions by writing down their budget constraints and indifference curves.
- Yet, they try to make the choices that maximize their satisfaction given their limited resources.
- The theory in this chapter is only intended as a metaphor for how consumers make decisions.
- It does fairly well at explaining consumer behavior in many situations, and provides the basis for more advanced economic analysis.

CHAPTER SUMMARY

- A consumer's budget constraint shows the possible combinations of different goods she can buy given her income and the prices of the goods. The slope of the budget constraint equals the relative price of the goods.
- An increase in income shifts the budget constraint outward. A change in the price of one of the goods pivots the budget constraint.

CHAPTER SUMMARY

- A consumer's indifference curves represent her preferences. An indifference curve shows all the bundles that give the consumer a certain level of happiness. The consumer prefers points on higher indifference curves to points on lower ones.
- The slope of an indifference curve at any point is the marginal rate of substitution – the rate at which the consumer is willing to trade one good for the other.

CHAPTER SUMMARY

- The consumer optimizes by choosing the point on her budget constraint that lies on the highest indifference curve. At this point, the marginal rate of substitution equals the relative price of the two goods.
- When the price of a good falls, the impact on the consumer's choices can be broken down into two effects, an income effect and a substitution effect.

CHAPTER SUMMARY

- The income effect is the change in consumption that arises because a lower price makes the consumer better off. It is represented by a movement from a lower indifference curve to a higher one.
- The substitution effect is the change that arises because a price change encourages greater consumption of the good that has become relatively cheaper. It is represented by a movement along an indifference curve.

CHAPTER SUMMARY

- The theory of consumer choice can be applied in many situations. It can explain why demand curves can potentially slope upward, why higher wages could either increase or decrease labor supply, and why higher interest rates could either increase or decrease saving.