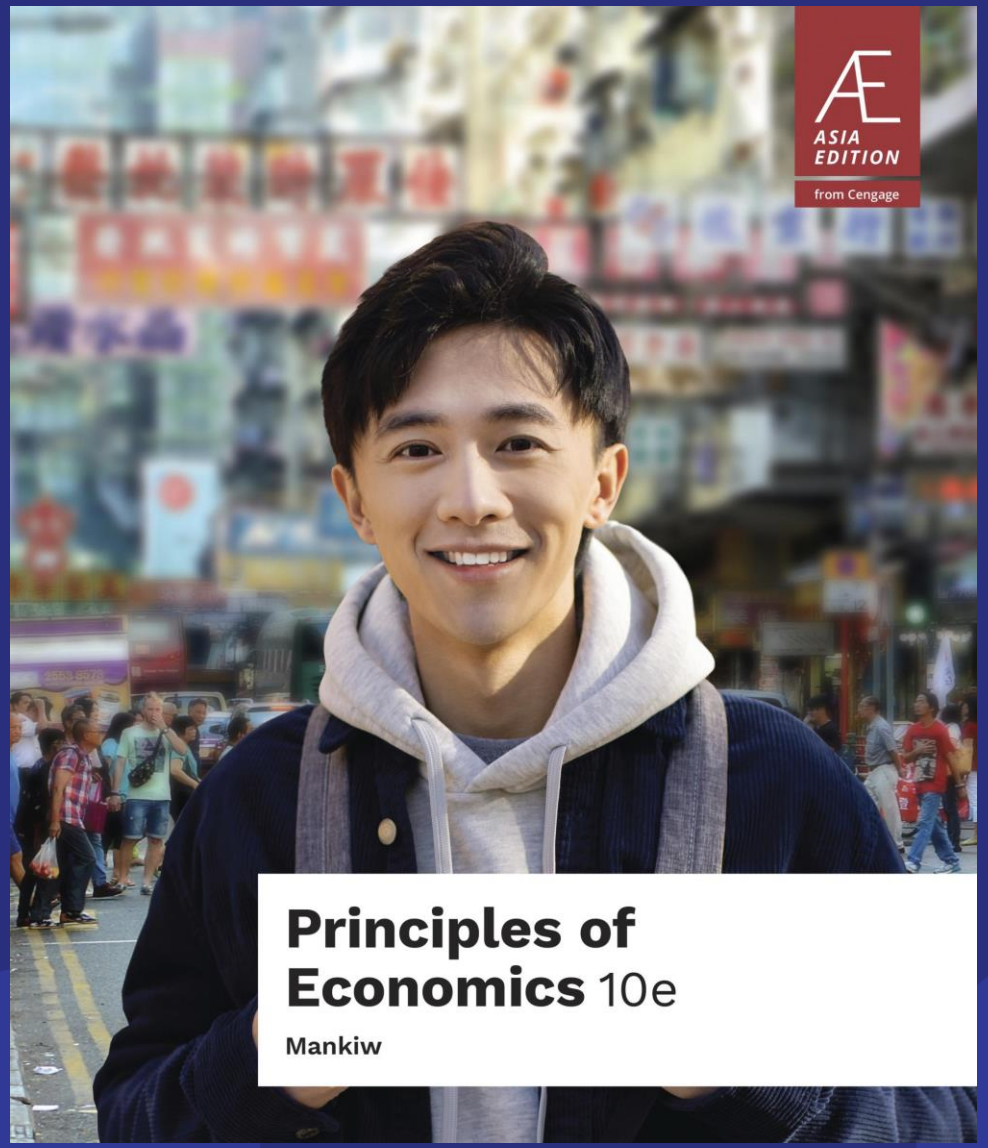


Principles of Economics, 10e

Chapter 22: The Theory of Consumer Choice

Chapter Objectives (1 of 3)

By the end of this chapter, you should be able to:

- Construct a consumer's budget constraint, given information on income and prices.
- Determine how changes in income or price impact the budget constraint.
- Explain the relationship between the slope of the budget constraint and opportunity cost.
- Determine the preference relationship between two consumption bundles using indifference curves.
- List the four properties of indifference curves.

Chapter Objectives (2 of 3)

- Calculate the marginal rate of substitution from a given set of preferences.
- Describe the relationship between utility and preferences.
- Determine if two goods are complements or substitutes using the shape of indifference curves.
- Determine the optimal consumption bundle using a consumer's budget constraints and indifference curves.
- Explain how a consumer optimizes consumption, given that consumer's income and preferences.

Chapter Objectives (3 of 3)

- Determine if a consumer is utility-maximizing, given prices and the marginal utility from consuming different goods.
- Determine if a good is normal or inferior by interpreting a graph representing consumer's preferences and affordability.
- Given a graph of a consumer's budget constraint and indifference curves, identify the income and substitution effects caused by a price change in one of the goods.
- Describe what the direction and magnitude of income and substitution effects must be in order for a good to be classified as a Giffen good.
- Explain how the demand curve is derived graphically from the optimal consumption decisions.

22-1

The Budget Constraint: What a Consumer Can Afford

Representing Consumption Opportunities in a Graph

- Trade-offs
  - 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 now allows more consumption today but reduces future consumption

Budget Constraint

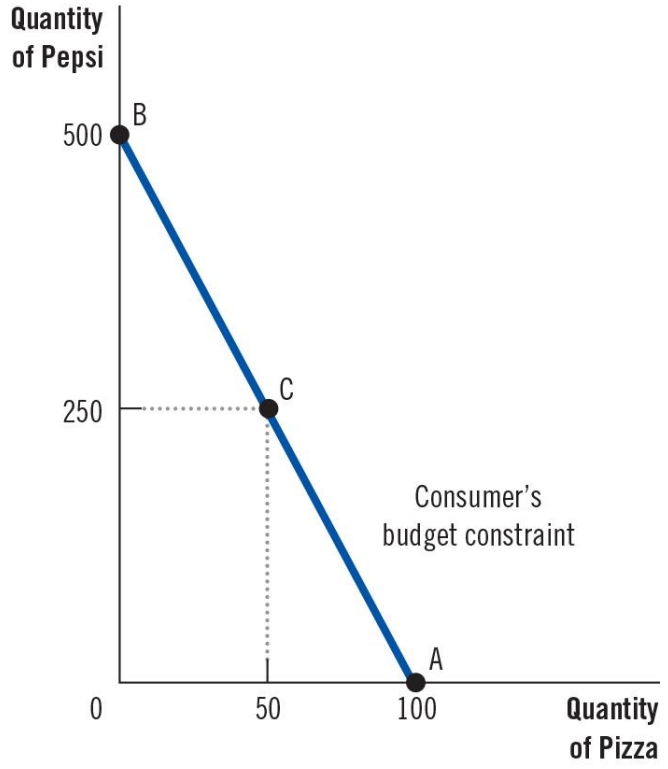
- **Budget constraint***
  - The limit on the consumption bundles that a consumer can afford
- Shows the trade-off between goods
- Slope of the budget constraint
  - Rate at which the consumer can trade one good for the other
  - Relative price of the two goods

*Words accompanied by an asterisk are key terms from the chapter.

Figure 1 The Consumer's Budget Constraint

- The budget constraint shows the bundles of goods that the consumer can buy with a given income. Here, she buys bundles of pizza and Pepsi. The table and graph show what the consumer can afford if her income is $1,000, the price of pizza is $10, and the price of Pepsi is $2.

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

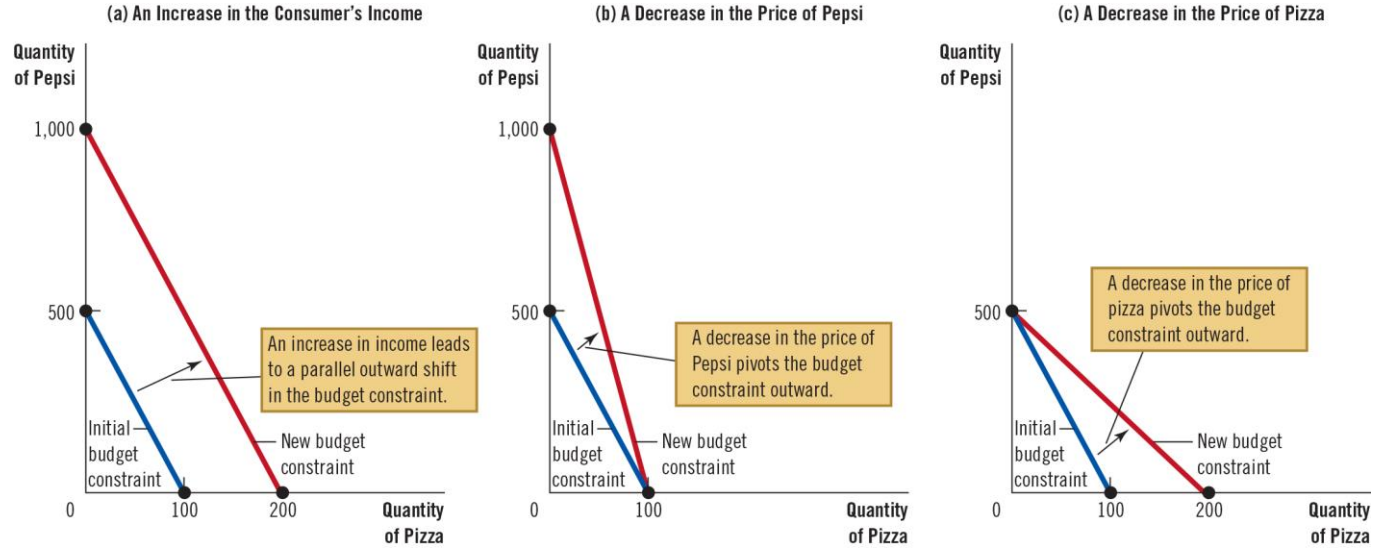


Shifts in the Budget Constraint

- Budget constraint shifts
  - If income changes
  - If relative prices change

Figure 2 Shifts in the Consumer's Budget Constraint

In panel (a), an increase in the consumer's income shifts the budget constraint outward. The slope remains the same because the relative price of pizza and Pepsi has not changed. In panel (b), a decrease in the price of Pepsi shifts the budget constraint outward, while in panel (c), a decrease in the price of pizza shifts the budget constraint outward. In these two cases, the slope changes because the relative price of pizza and Pepsi has changed.



Example 1: Russell's Budget Constraint

Russell divides his income of $3,000 between two goods: steak and avocados. Prices are P_S = $10 per steak and P_A = $2.50 per avocado.

A. If Russell spends all his income on steak, how many steaks does he buy?

B. If Russell spends all his income on avocados, how many avocados does he buy?

C. If Russell buys 200 steaks, how many avocados can he buy if he spends all his income?

D. Plot each of the bundles from above on a graph (steaks on the horizontal axis and avocadoes on the vertical axis).

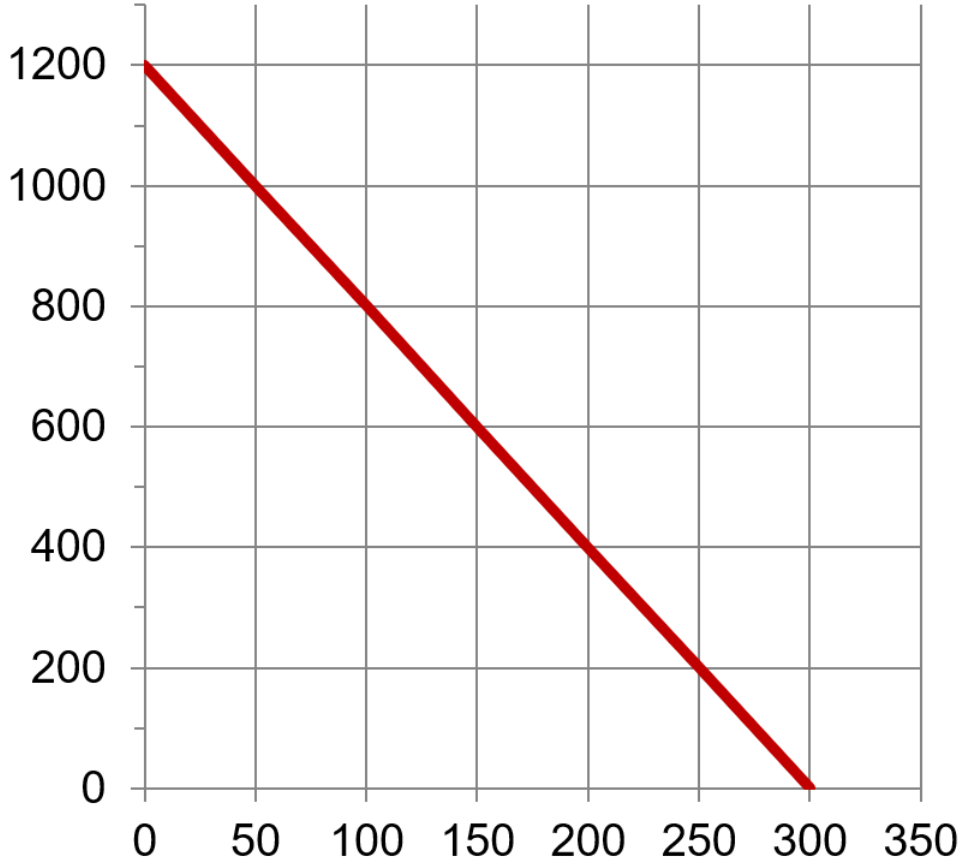
Example 1: Solutions

A. $3,000/$10 = 300 steaks

B. $3,000/$2.50 = 1,200 avocados

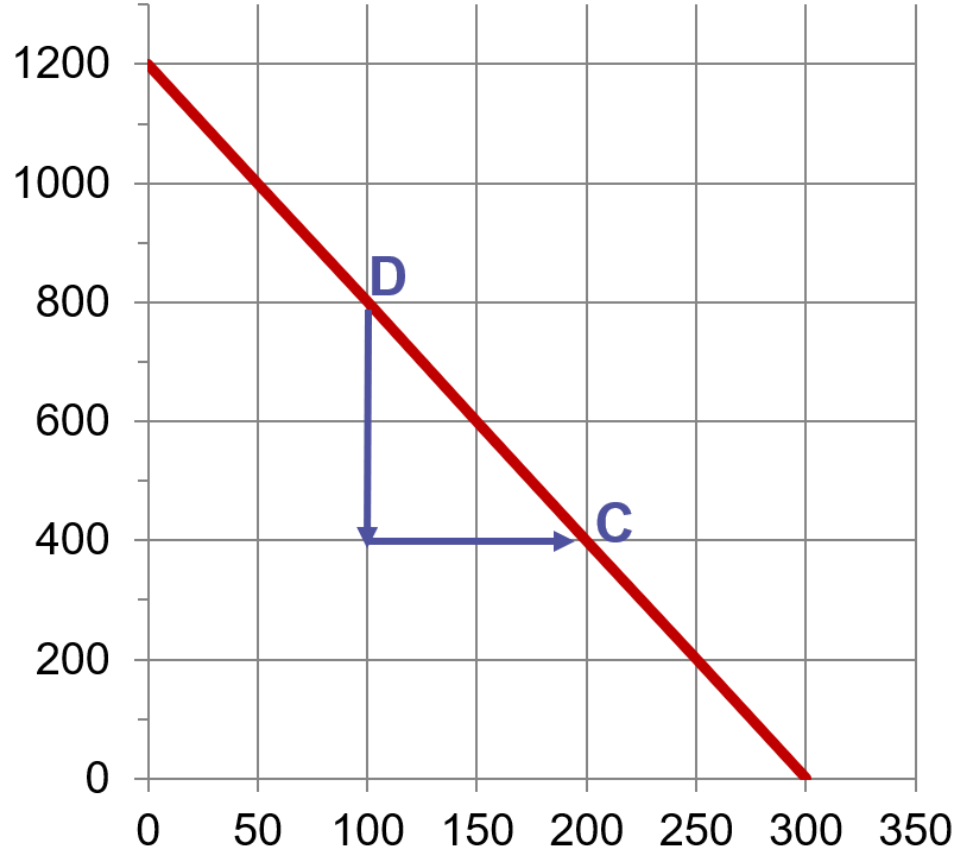
C. 200 steaks cost $2,000, the $1,000 left buys 400 avocados

D. Russell's budget constraint shows the bundles he can afford



Active Learning 1: Slope of the Budget Constraint

- From D to C
  - "Rise" = –400 avocados
  - "Run" = +100 steaks
  - Slope = $P_{Steak} / P_{Avocado} = -4$
- Russell must give up 4 avocados to get one steak
- The slope of the budget constraint equals the relative price of the good on the X axis



22-2

Preferences: What a Consumer Wants

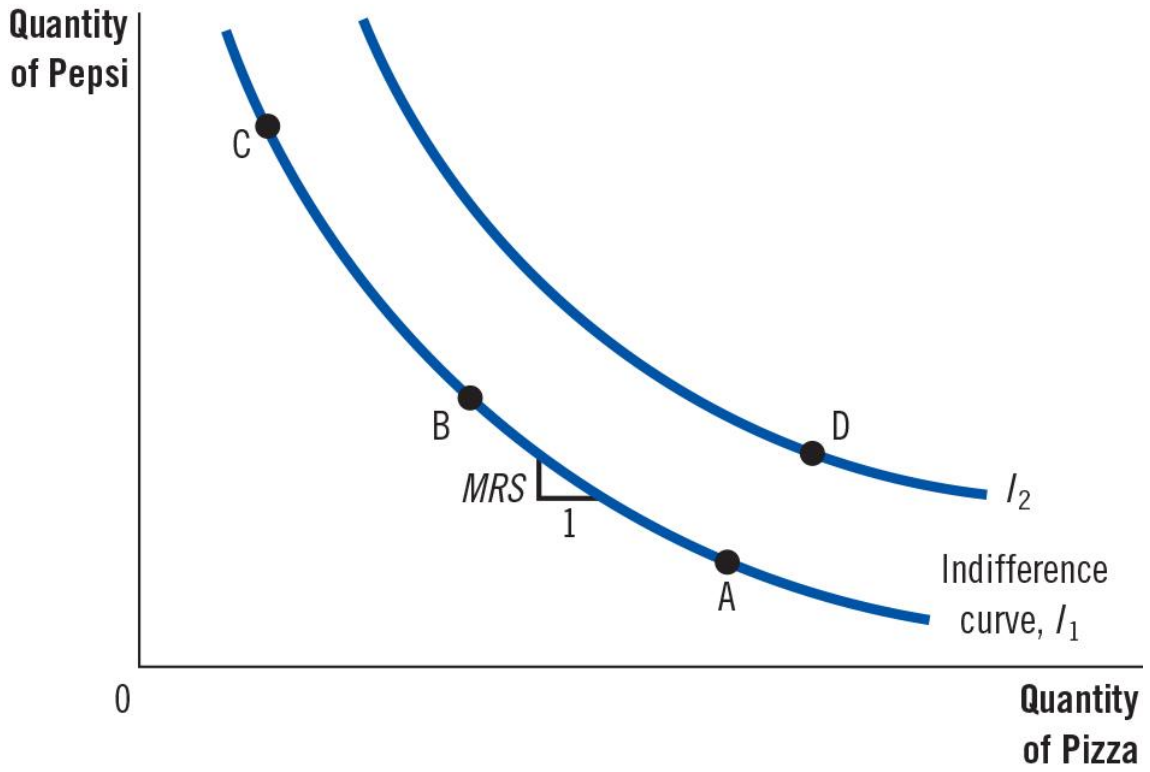
Representing Preferences with Indifference Curves

- **Indifference curve***
  - A curve that shows consumption bundles that give the consumer the same level of satisfaction
- **Marginal rate of substitution***
  - The rate at which a consumer is willing to trade one good for another
  - Slope of the indifference curve (ignore the minus sign)
  - Varies along an indifference curve

*Words accompanied by an asterisk are key terms from the chapter.

Figure 3 The Consumer's Preferences

- The consumer's preferences are represented with indifference curves, which show the combinations of pizza and Pepsi that make the consumer equally satisfied. Because the consumer prefers more of a good, points on a higher indifference curve (I_2) are preferred to points on a lower indifference curve (I_1).
- The marginal rate of substitution (*MRS*) shows the rate at which the consumer is willing to trade Pepsi for pizza.
- It measures the quantity of Pepsi the consumer must receive in exchange for 1 pizza.



Four Properties of Indifference Curves (1 of 2)

- Property 1: Higher indifference curves are preferred to lower ones
  - People usually prefer to consume more rather than less
- Property 2: Indifference curves slope downward
  - The slope of an indifference curve = MRS
  - Rate at which a consumer is willing to substitute one good for the other
  - If the quantity of one good decreases, the quantity of the other good must increase for the consumer to be equally happy

Four Properties of Indifference Curves (2 of 2)

- Property 3: Indifference curves do not cross
  - If they cross, two different points on two indifference curves would bring the same satisfaction, contradicts Property #1
- Property 4: Indifference curves are bowed inward
  - The slope of an indifference curve = *MRS*, which depends on the amount of each good the consumer is currently consuming
  - People are more willing to trade away goods that they have in abundance

Figure 4 The Impossibility of Intersecting Indifference Curves

- This situation can never happen.
- According to these indifference curves, the consumer would be equally satisfied at points A, B, and C, even though point C has more of both goods than point A.

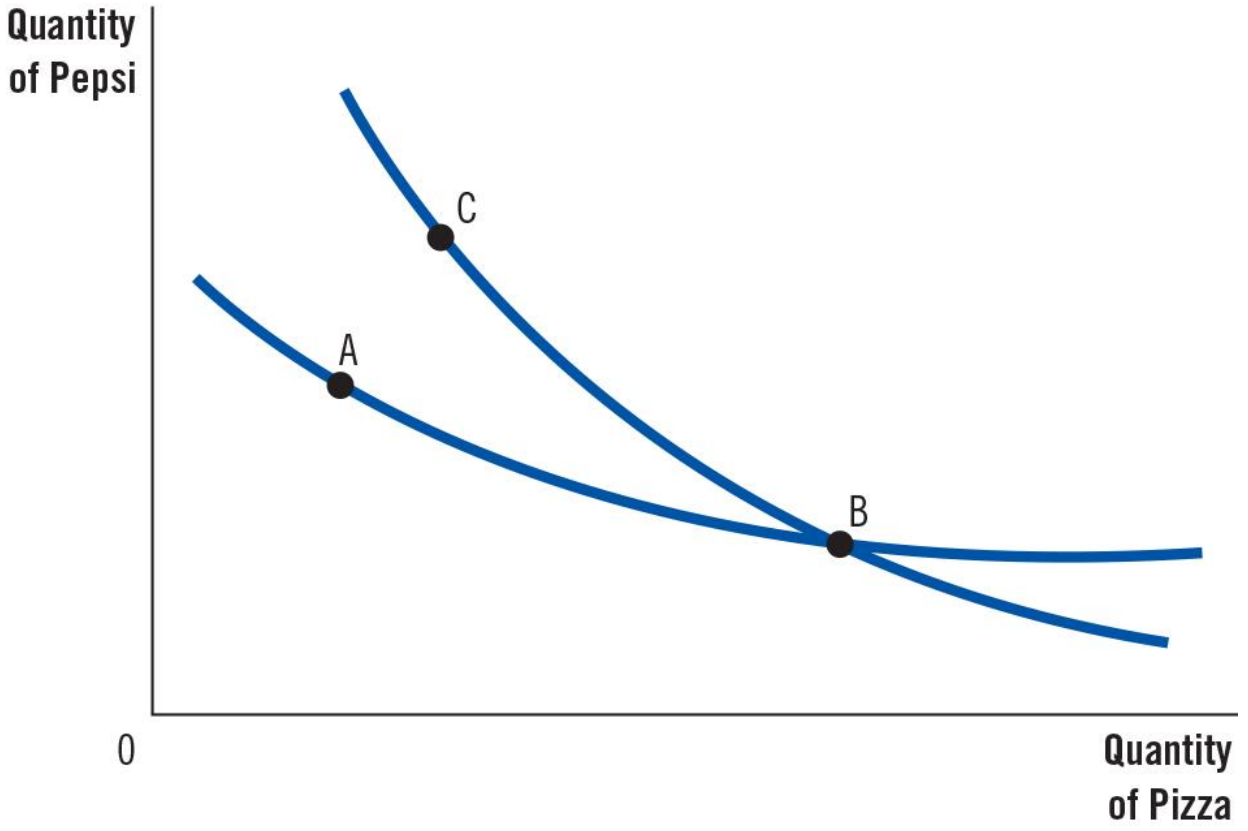
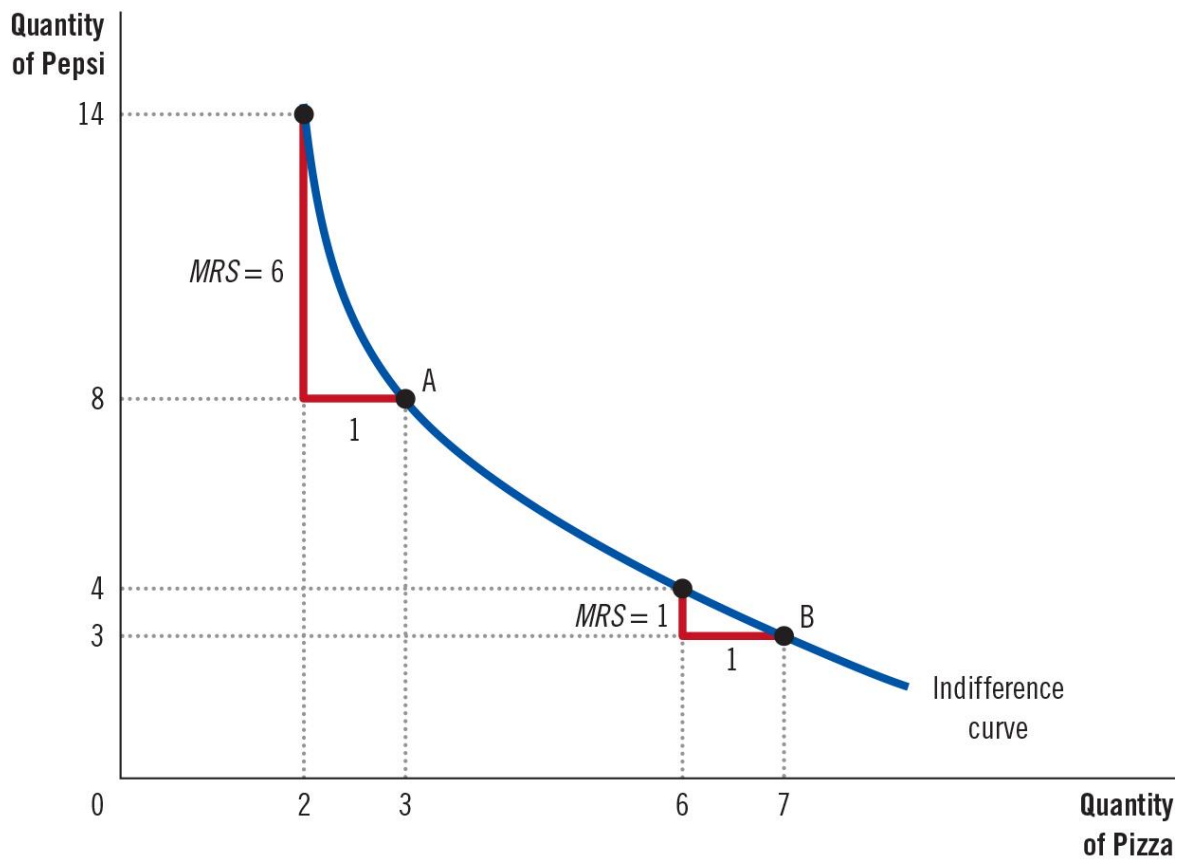


Figure 5 Bowed Indifference Curves

- Indifference curves are usually bowed inward. This shape implies that the marginal rate of substitution (*MRS*) depends on the quantity of the two goods the consumer is currently consuming.
- At point A, the consumer has a little pizza and a lot of Pepsi, so she requires a lot of extra Pepsi to induce her to give up one of the pizzas: The *MRS* is 6 liters of Pepsi per pizza.
- At point B, the consumer has a lot of pizza and a little Pepsi, so she requires only a little extra Pepsi to induce her to give up one of the pizzas: The *MRS* is 1 liter of Pepsi per pizza.



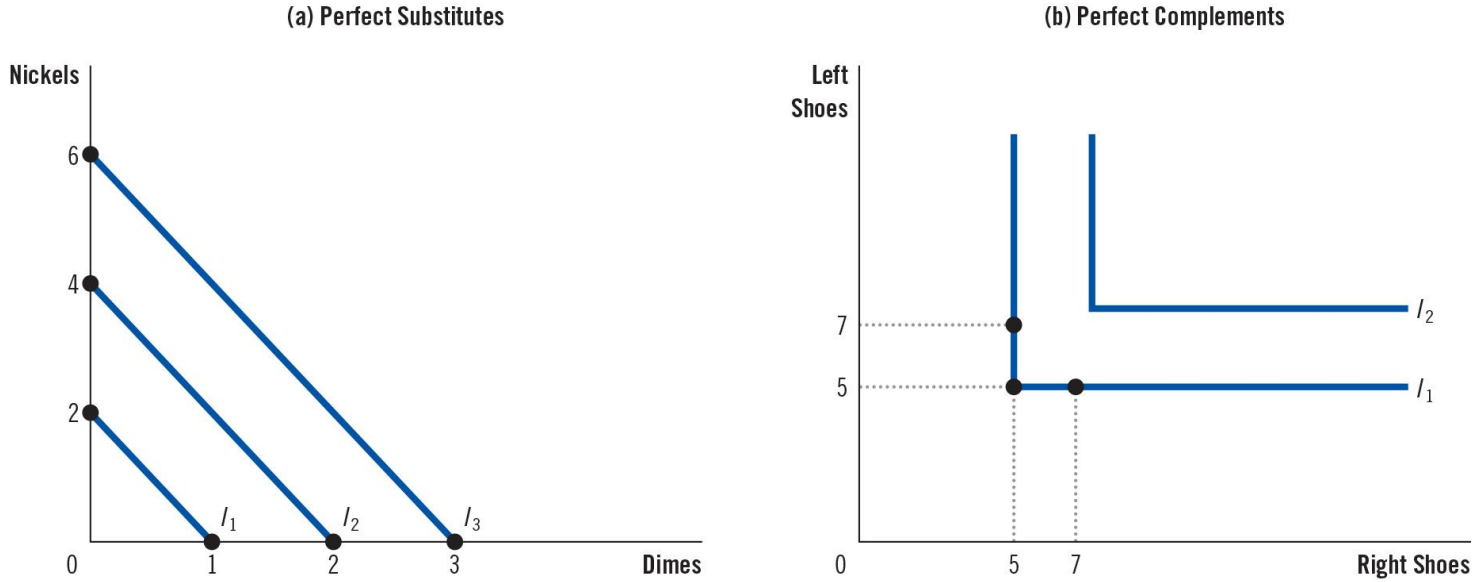
Two Extreme Examples of Indifference Curves

- Shape of an indifference curve
  - Reveals the consumer's willingness to trade one good for the other
- **Perfect substitutes***
  - Two goods with straight-line indifference curves (constant *MRS*)
- **Perfect complements***
  - Two goods with right-angle indifference curves

*Words accompanied by an asterisk are key terms from the chapter.

Figure 6 Perfect Substitutes and Perfect Complements

When two goods are perfectly substitutable, such as nickels and dimes, the indifference curves are straight lines, as shown in panel (a). When two goods are perfectly complementary, such as left shoes and right shoes, the indifference curves are right angles, as shown in panel (b).



22-3

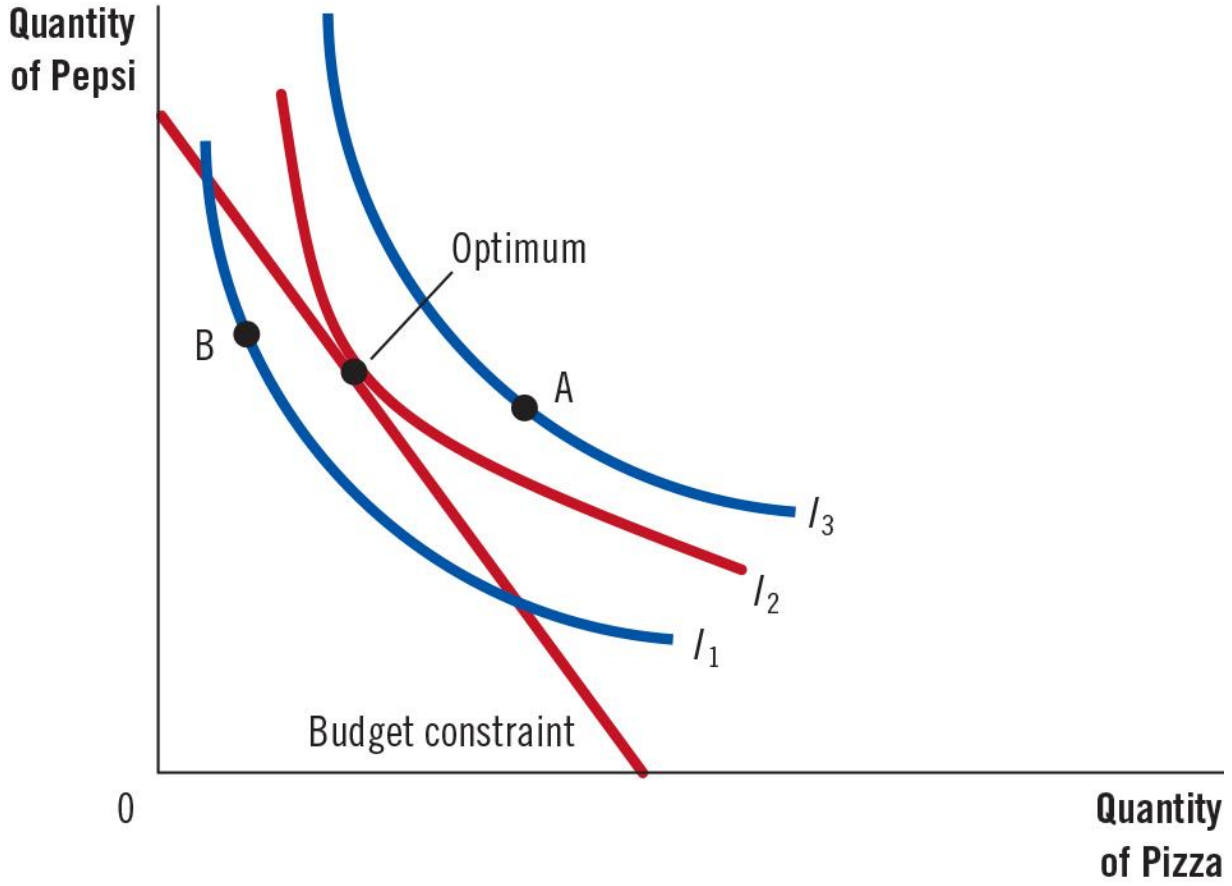
Optimization: What a Consumer Chooses

The Consumer's Optimal Choices

- The consumer's optimal choices
  - The best possible combination of the two goods
  - The combination on the highest possible indifference curve on or below the budget constraint
- Optimum: *MRS* = Relative price
  - The best bundle of the two goods that the consumer can afford
  - The point on the budget constraint that touches the highest possible indifference curve

Figure 7 The Consumer's Optimum

- The consumer chooses the point on her budget constraint that lies on the highest indifference curve.
- Here, the highest indifference curve the consumer can reach is I_2.
- The consumer prefers point A, which lies on indifference curve I_3, but she can't afford this bundle of pizza and Pepsi.
- By contrast, point B is affordable, but because it lies on a lower indifference curve, she doesn't prefer it.
- At the optimum, the marginal rate of substitution equals the relative price of the two goods.



How Changes in Income Affect the Consumer's Choices

- **Normal good***
  - Good for which an increase in income raises the quantity demanded
- **Inferior good***
  - Good for which an increase in income reduces the quantity demanded
- A change in income
  - Shifts the budget constraint
  - Move on a different indifference curve

*Words accompanied by an asterisk are key terms from the chapter.

Figure 8 An Increase in Income

- When the consumer's income rises, the budget constraint shifts outward.
- If both goods are normal goods, the consumer responds to the increase in income by buying more of both of them.
- Here, the consumer buys more pizza and more Pepsi.

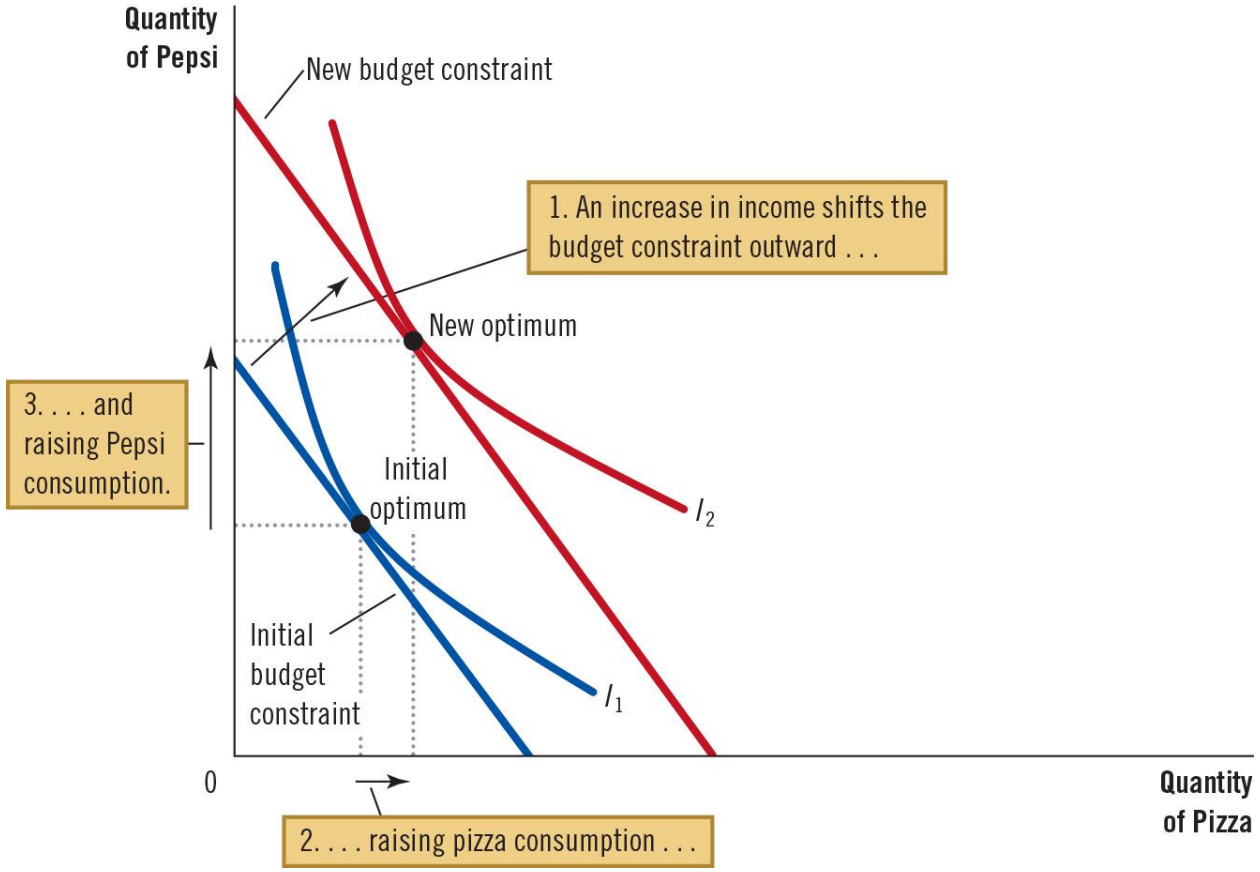
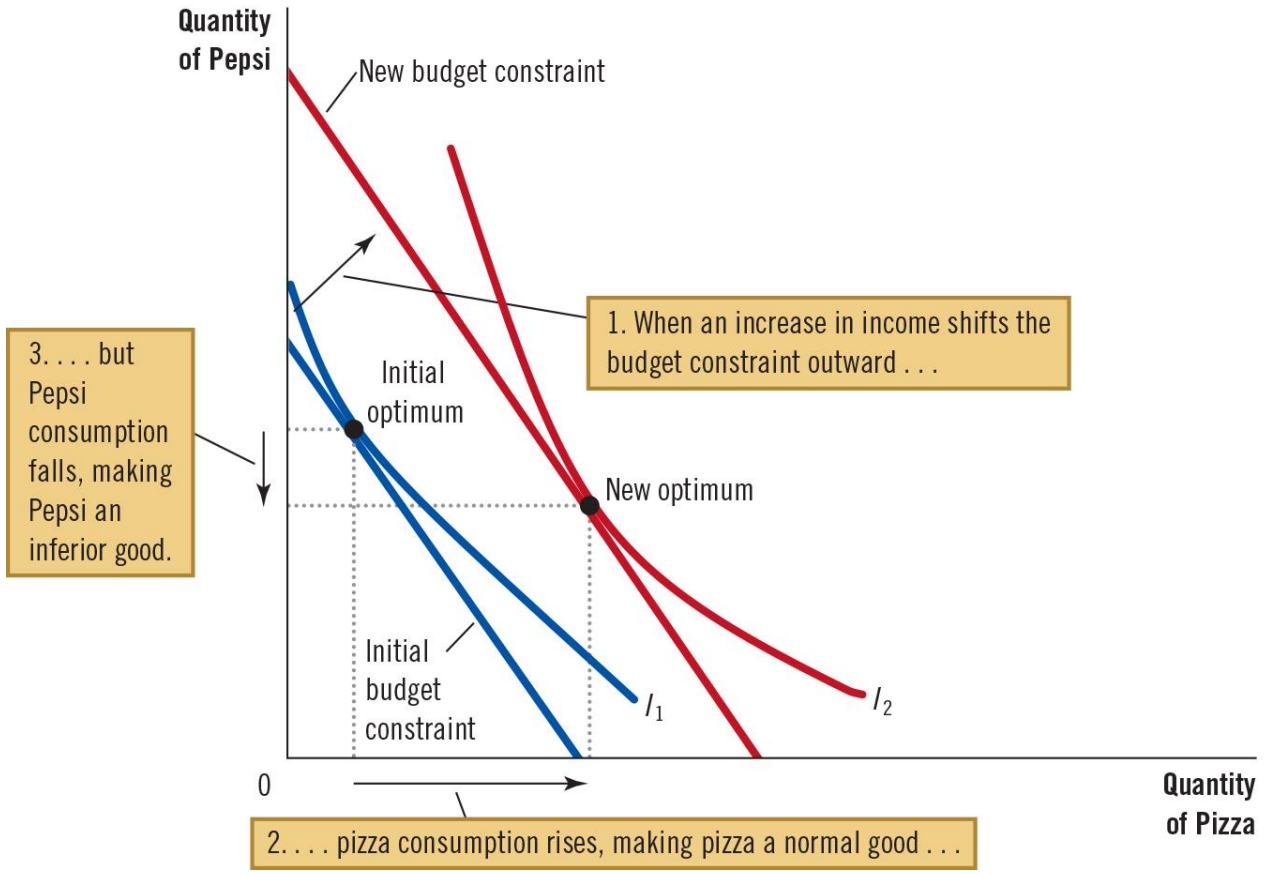


Figure 9 An Inferior Good

- A good is inferior if the consumer buys less of it when her income rises.
- Here, Pepsi is an inferior good: When the consumer's income increases and the budget constraint shifts outward, the consumer buys more pizza but less Pepsi.

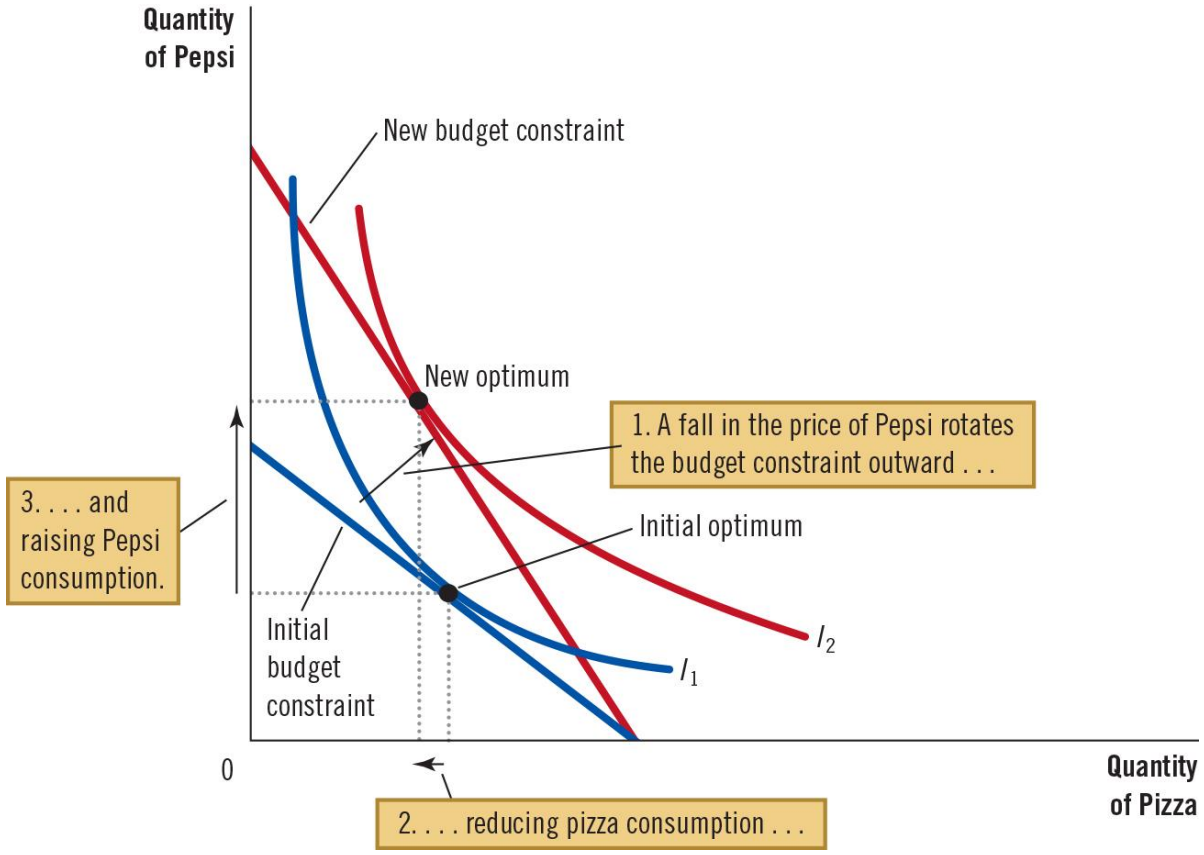


How Changes in Prices Affect the Consumer's Choices

- Price of one good falls
  - Rotates the budget constraint
  - Changes the optimum

Figure 10 A Change in Price

- When the price of Pepsi falls, the consumer's budget constraint shifts outward and changes slope.
- The consumer moves from the initial optimum to the new optimum, which changes her purchases of both pizza and Pepsi.
- In this case, the quantity of Pepsi consumed rises, and the quantity of pizza consumed falls.



Income and Substitution Effects

- **Income effect***
  - The change in consumption that results when a price change moves the consumer to a higher or lower indifference curve
- **Substitution effect***
  - The change in consumption that results when a price change moves the consumer along a given indifference curve to a point with a new marginal rate of substitution
    - To a point with a new marginal rate of substitution

*Words accompanied by an asterisk are key terms from the chapter.

Figure 11 Income and Substitution Effects

- The effect of a change in price can be broken down into an income effect and a substitution effect.
- The substitution effect—the movement along an indifference curve to a point with a different marginal rate of substitution— is the change from point A to point B along indifference curve I_1.
- The income effect—the shift to a higher indifference curve—is the change from point B on indifference curve I_1 to point C on indifference curve I_2.

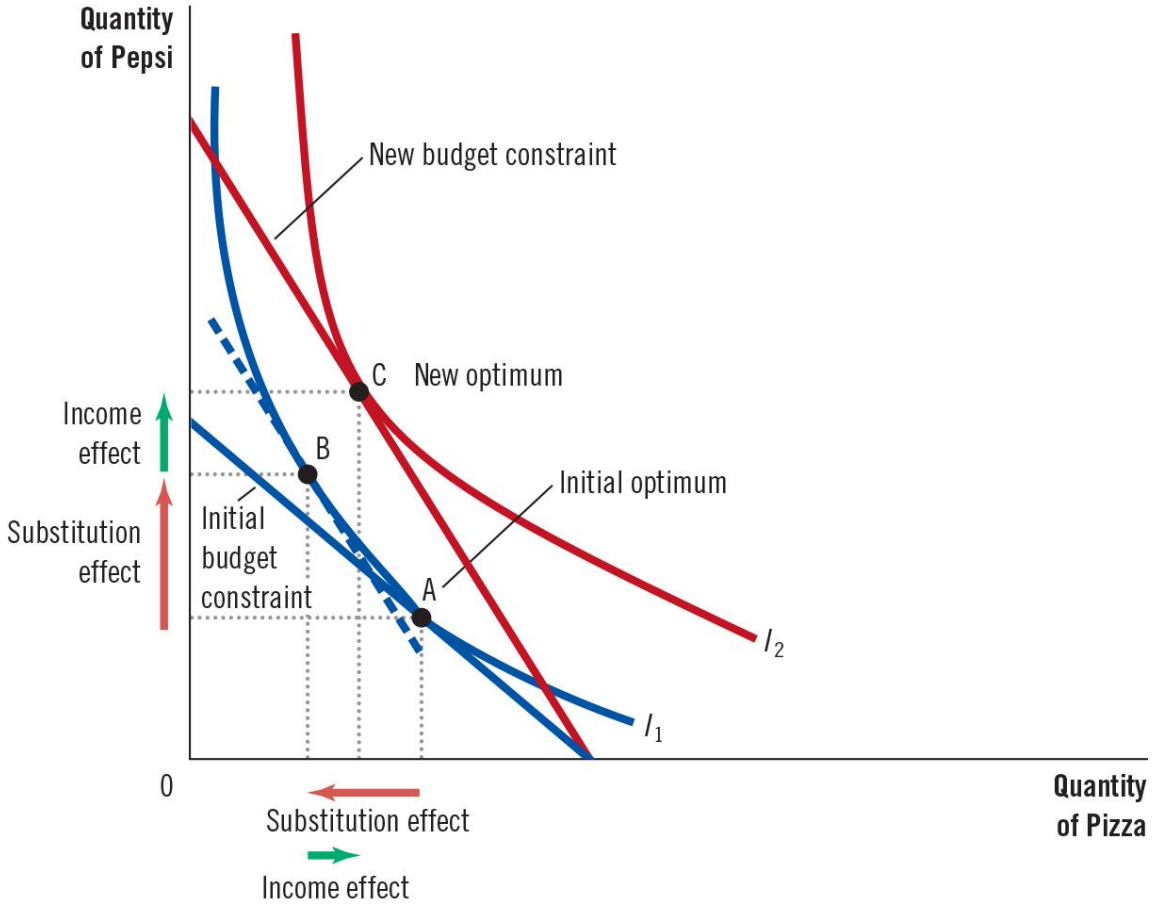


Table 1 Income and Substitution Effects When the Price of Pepsi Falls

Good	Income Effect	Substitution Effect	Total Effect
Pepsi	Consumer is richer, so she buys more Pepsi.	Pepsi is relatively cheaper, so consumer buys more Pepsi.	Income and substitution effects act in the same direction, so consumer buys more Pepsi.
Pizza	Consumer is richer, so she 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.

Active Learning 2: Substitution Effect in Two Cases

- Do you think the substitution effect would be bigger for substitutes or complements?

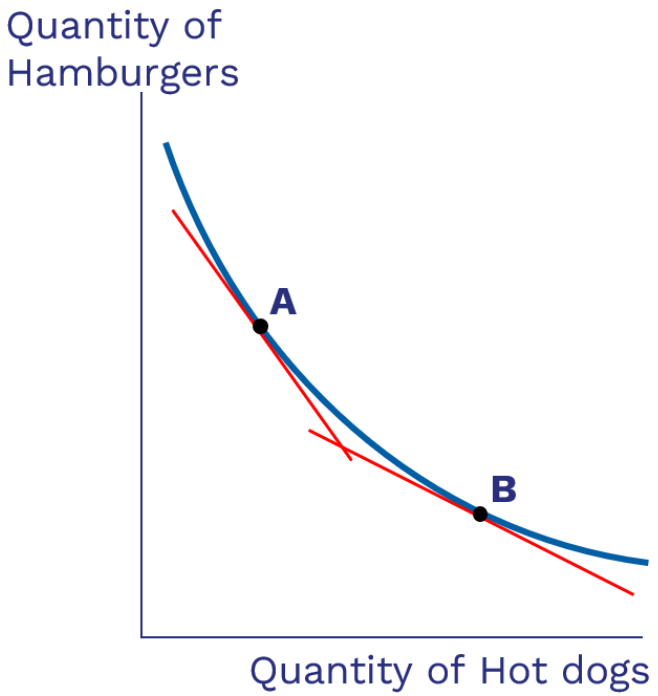
A. Draw an indifference curve for hamburgers and hot dogs.

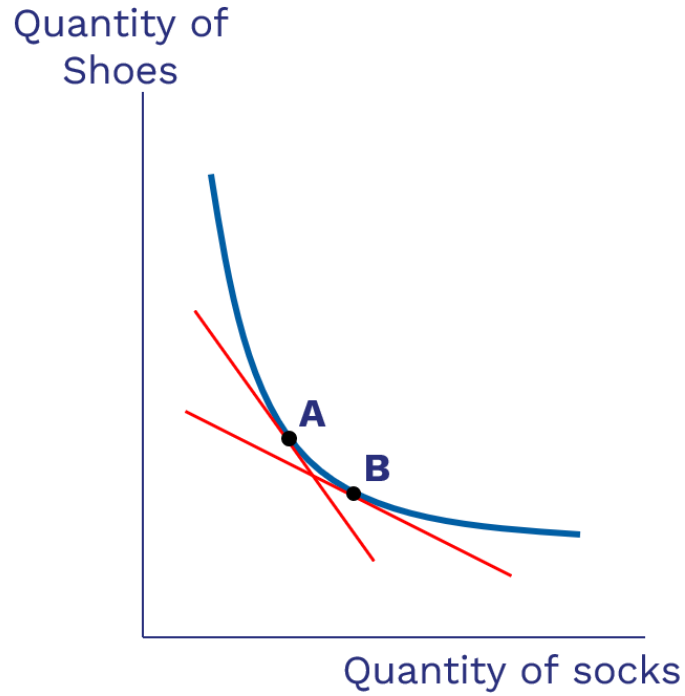
B. On a separate graph, draw an indifference curve for shoes and socks.

C. On each graph, show the effects of a relative price change (keeping the consumer on the initial indifference curve).

Active Learning 2: Answers

- In both graphs, the relative price changes by the same amount. But the substitution effect is bigger for substitutes than for complements.





Deriving the Demand Curve (1 of 2)

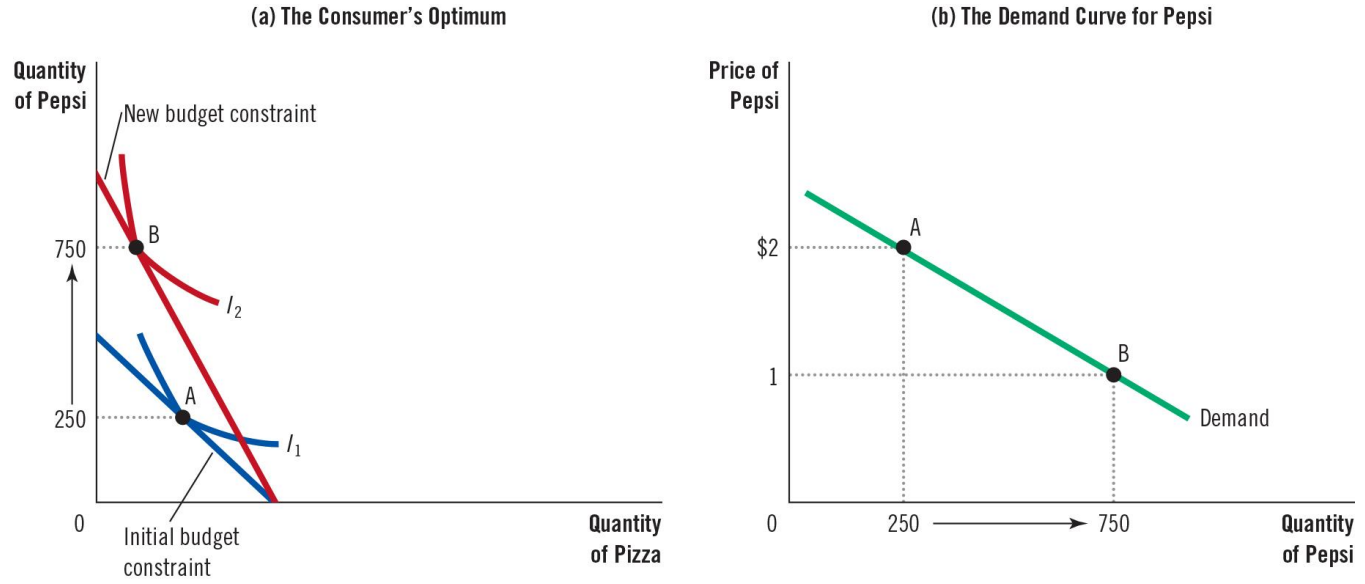
- The demand curve
  - Reflects the consumption decisions
  - Shows the quantity demanded of a good for any given price
  - Is a summary of the optimal decisions that arise from the budget constraint and indifference curves

Deriving the Demand Curve (2 of 2)

- Initial optimum point
  - Initial price of the good
  - Initial quantity of the good
- A change in price of the good (new price)
  - New optimum point
  - New optimum quantity

Figure 12 Deriving the Demand Curve

Panel (a) shows that when the price of Pepsi falls from $2 to $1, the consumer's optimum moves from point A to point B, and the quantity of Pepsi consumed rises from 250 to 750 liters. The demand curve in panel (b) reflects this relationship between the price and the quantity demanded.



22-4

Three Applications

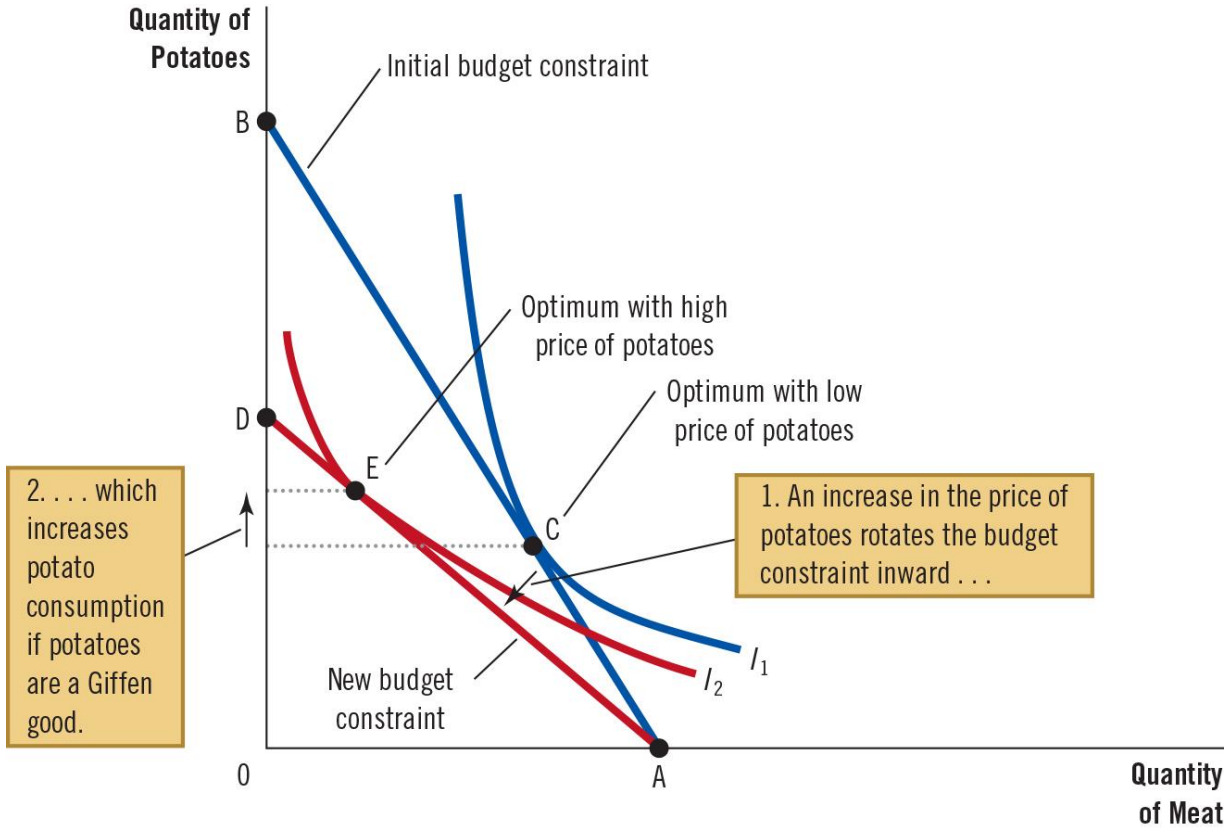
Do All Demand Curves Slope Downward?

- Law of demand
  - When the price of a good rises, people buy less of it
  - Downward slope of the demand curve
- **Giffen good***
  - An increase in the price of the good raises the quantity demanded
  - If the income effect dominates the substitution effect, the demand curve slopes upward

*Words accompanied by an asterisk are key terms from the chapter.

Figure 13 A Giffen Good

- In this example, when the price of potatoes rises, the consumer's optimum shifts from point C to point E.
- In this case, the consumer responds to the higher price of potatoes by buying less meat and more potatoes.



How Do Wages Affect Labor Supply?

- Budget constraint shows a person's trade-off between leisure and consumption
- Increase in wage, budget constraint shifts outward (steeper)
  - If person enjoys less leisure: Work more
    - Upward-sloping labor supply curve
    - Substitution effect dominates
  - If person enjoys more leisure: Work less
    - Backward-sloping labor supply curve
    - Income effect dominates

Figure 14 The Work-Leisure Decision

- This figure shows Jasmine's budget constraint for deciding how much to work, her indifference curves for consumption and leisure, and her optimum.

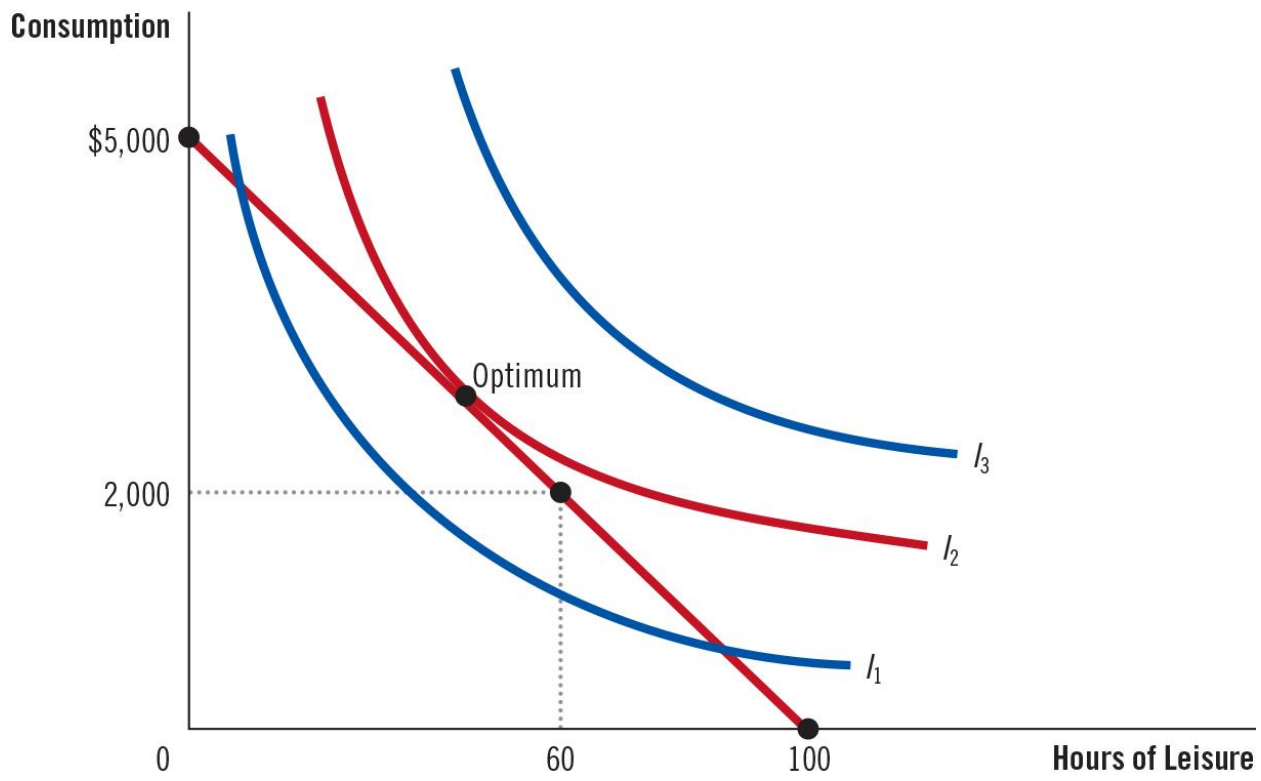


Figure 15 An Increase in the Wage (1 of 2)

The two panels of this figure show how a person might respond to an increase in the wage. The graphs on the left show the consumer's initial budget constraint, BC_1, and new budget constraint, BC_2, as well as the consumer's optimal choices over consumption and leisure. The graphs on the right show the resulting labor-supply curve. Because hours worked equal the total hours available minus hours of leisure, any change in leisure implies an opposite change in the quantity of labor supplied. In panel (a), when the wage rises, consumption rises, and leisure falls, resulting in a labor-supply curve that slopes upward.

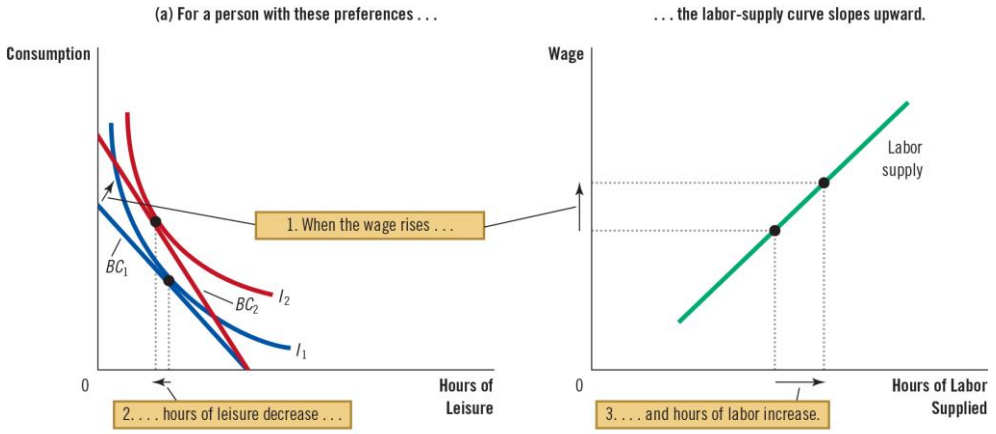


Figure 15 An Increase in the Wage (2 of 2)

The two panels of this figure show how a person might respond to an increase in the wage. The graphs on the left show the consumer's initial budget constraint, BC_1, and new budget constraint, BC_2, as well as the consumer's optimal choices over consumption and leisure. The graphs on the right show the resulting labor-supply curve. Because hours worked equal the total hours available minus hours of leisure, any change in leisure implies an opposite change in the quantity of labor supplied. In panel (b), when the wage rises, both consumption and leisure rise, resulting in a labor-supply curve that slopes backward.

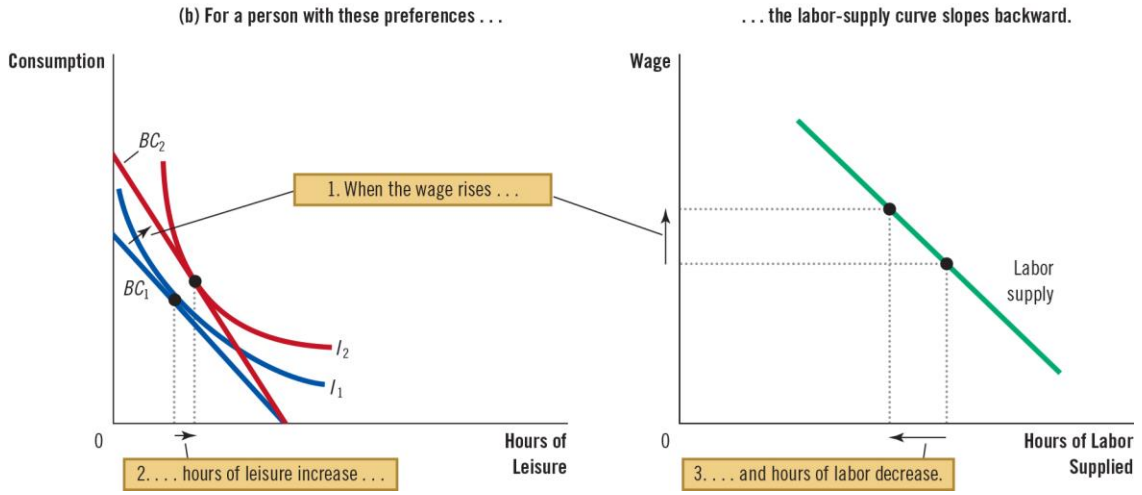
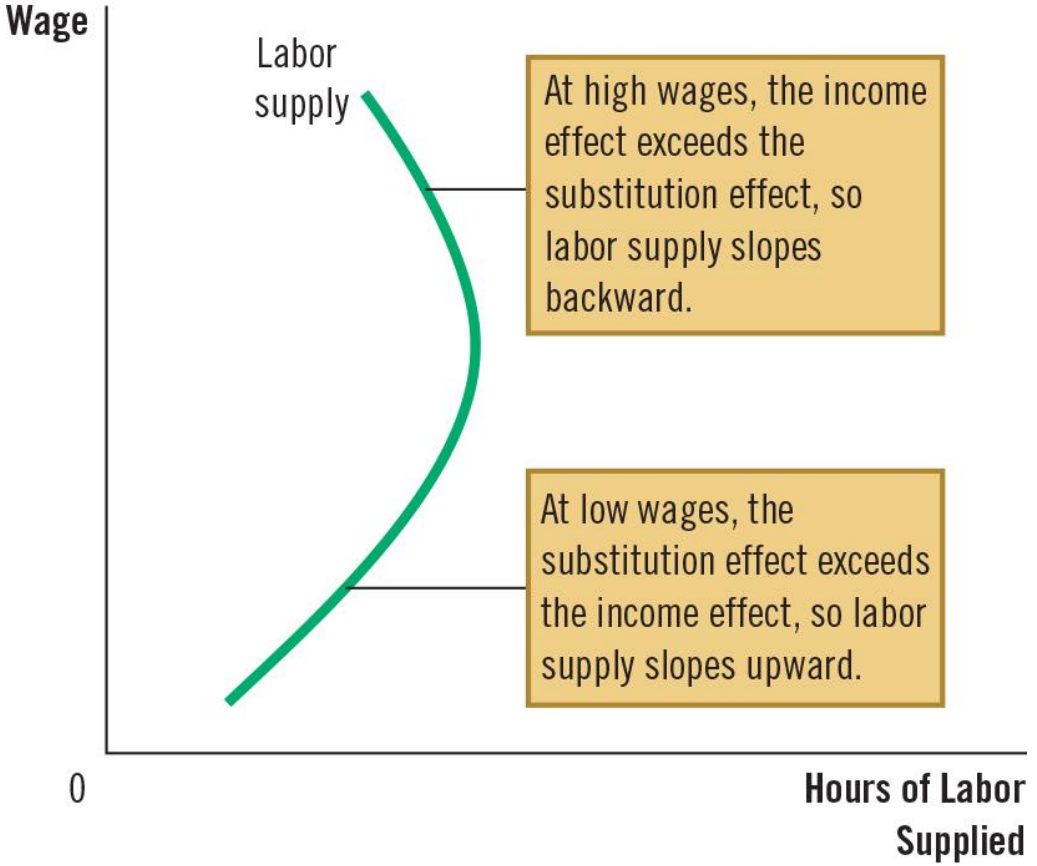


Figure 16 A Backward-Bending Labor-Supply Curve

- Here, the labor-supply curve slopes upward at low wages because the substitution effect dominates the income effect.
- But as the wage rises, the income effect starts to dominate the substitution effect, and the labor-supply curve bends backward.



How Do Interest Rates Affect Household Saving? (1 of 2)

- The interest rate determines the relative price of consumption when young in terms of consumption when old
- Income decision: Consume today or save for future
- Bundle of goods
  - Consumption today and consumption in the future
  - Relative price = Interest rates
  - Optimum: Budget constraint & indifference curves

How Do Interest Rates Affect Household Saving? (2 of 2)

- Increase in interest rates
  - Budget constraint shifts outward (steeper)
  - Consumption in the future rises
- If consuming less today: Substitution effect dominates, save more
- If consuming more today: Income effect dominates, save less

Figure 17 The Consumption-Saving Decision

- This figure shows the budget constraint for a person deciding how much to consume in the two periods of his life, the indifference curves representing his preferences, and the optimum.

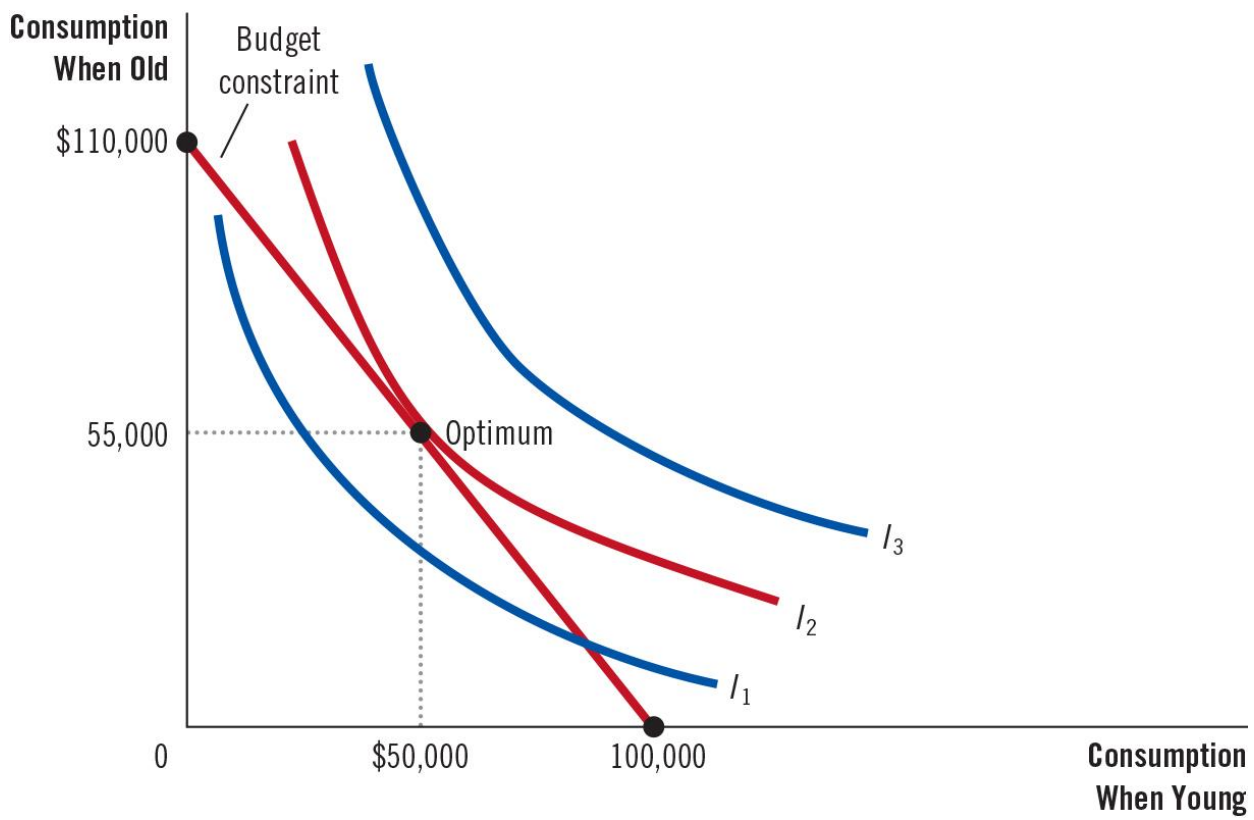
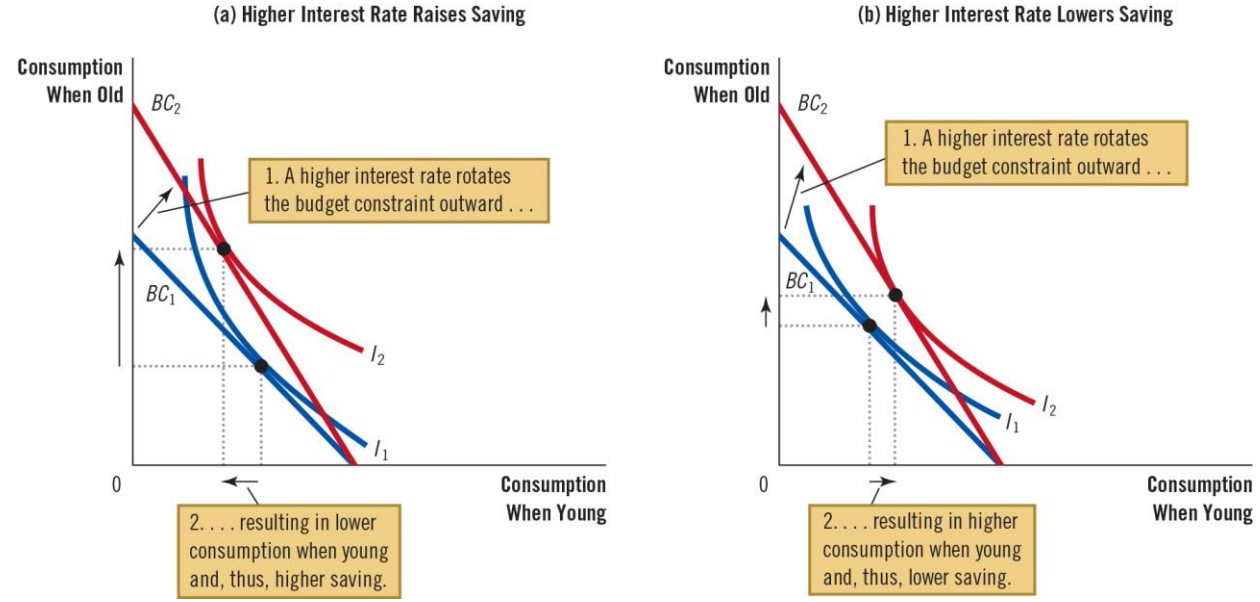


Figure 18 An Increase in the Interest Rate

In both panels, an increase in the interest rate shifts the budget constraint outward. In panel (a), consumption when young falls, and consumption when old rises. The result is an increase in saving when young. In panel (b), consumption in both periods rises. The result is a decrease in saving when young.



22-5

Conclusion: Do People Really Think This Way?

Conclusion

- The theory of consumer choice does not try to present a literal account of how people make decisions
- It is a model and should be viewed as a metaphor for how consumers make decisions
- Consumers know that their choices are constrained by their financial resources
- Given those constraints, they do the best they can to achieve the highest level of satisfaction

Think-Pair-Share Activity

Your wealthy aunt dies and leaves you a great deal of money IF you get married, have children, stay with your spouse and raise your children, don't become dependent on drugs or alcohol, and if you continuously have a full-time job.

A. Why might your aunt include the requirement that you continuously have a full-time job?

B. Does the evidence about how people behave after they receive an inheritance suggest that your aunt's concerns are well founded? Explain.

C. What does this evidence suggest about the slope of the labor-supply curve? Explain.

Self-Assessment

- Draw your indifference curve for deciding how to allocate time between work and leisure. If your wages increase, would your consumption fall? (Hint: Think about income and substitution effects.)

Summary

Click the link to review the objectives for this presentation.

Link to Objectives