PRINCIPLES OF

ECONOMICS

ELEVENTH EDITION

CASE · FAIR · OSTER

PEARSON

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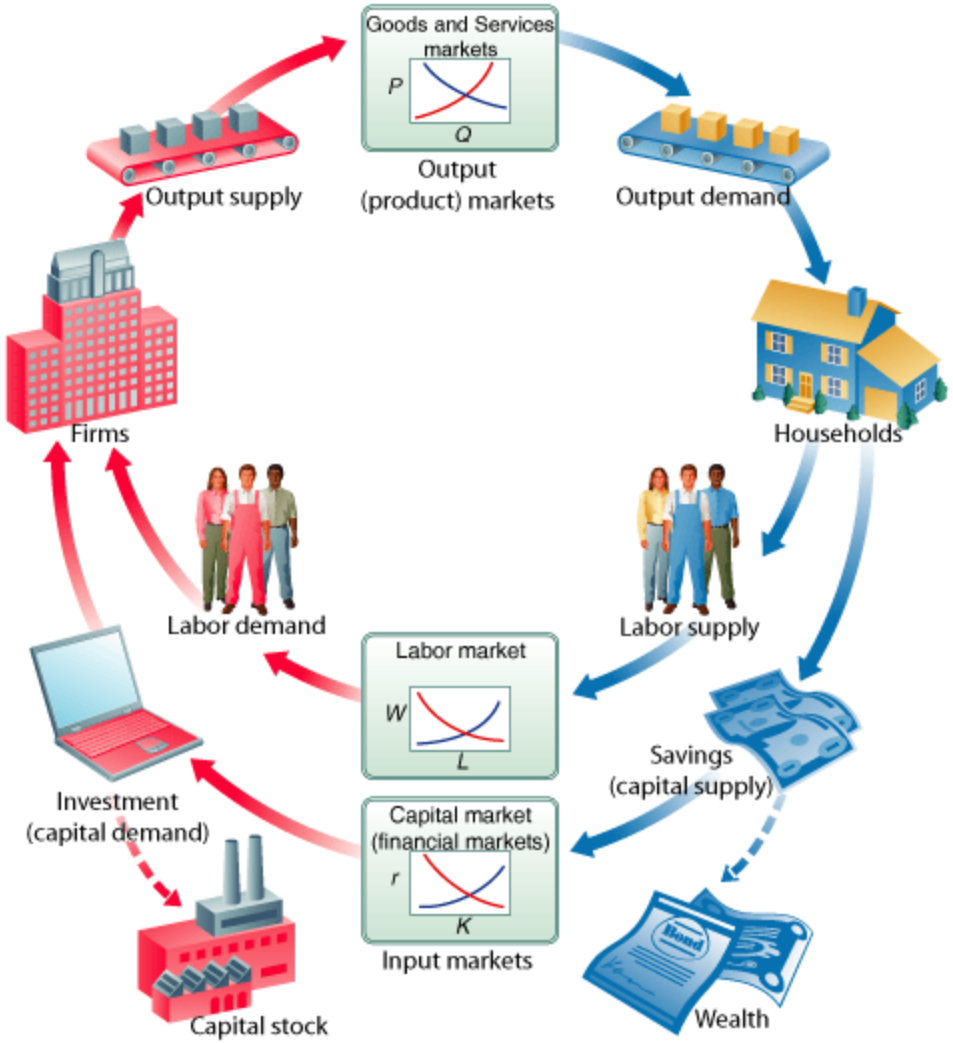
PART II

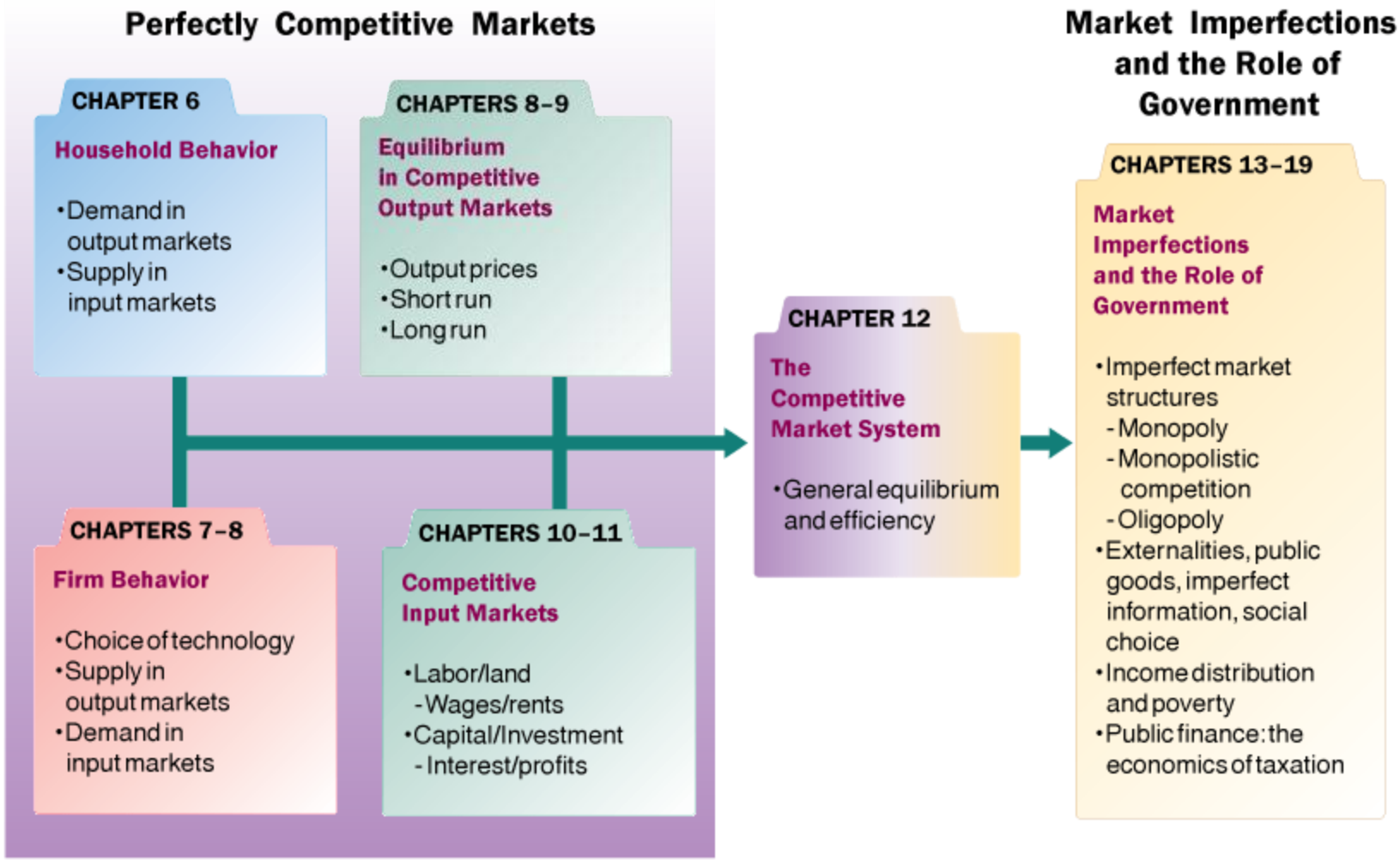
The Market System

Choices Made by Households and Firms



▲ **FIGURE II.1 Firm and Household Decisions**

Households demand in output markets and supply labor and capital in input markets. To simplify our analysis, we have not included the government and international sectors in this circular flow diagram. These topics will be discussed in detail later.



▲ **FIGURE II.2 Understanding the Microeconomy and the Role of Government**

To understand how the economy works, it helps to build from the ground up. We start in Chapters 6–8 with an overview of **household** and **firm** decision making in simple perfectly competitive markets.

In Chapters 9–11, we see how firms and households interact in **output markets** (product markets) and **input markets** (labor/land and capital) to determine prices, wages, and profits. Once we have a picture of how a simple, perfectly competitive economy works, we begin to relax assumptions.

Chapter 12 is a pivotal chapter that links perfectly competitive markets with a discussion of market imperfections and the role of government.

In Chapters 13–19, we cover the three noncompetitive market structures (monopoly, monopolistic competition, and oligopoly), externalities, public goods, uncertainty and asymmetric information, and income distribution as well as taxation and government finance.

perfect knowledge The assumption that households possess a knowledge of the qualities and prices of everything available in the market and that firms have all available information concerning wage rates, capital costs, technology, and output prices.

perfect competition An industry structure in which there are many firms, each being small relative to the industry and producing virtually identical products, and in which no firm is large enough to have any control over prices.

homogeneous products Undifferentiated outputs; products that are identical to or indistinguishable from one another.

Household Behavior and Consumer Choice

6

CHAPTER OUTLINE

Household Choice in Output Markets

Every household must make three basic decisions:

1. How much of each product, or output, to demand
2. How much labor to supply
3. How much to spend today and how much to save for the future

The Determinants of Household Demand

Several factors influence the quantity of a given good or service demanded by a single household:

- The price of the product
- The income available to the household
- The household's amount of accumulated wealth
- The prices of other products available to the household
- The household's tastes and preferences
- The household's expectations about future income, wealth, and prices

The Budget Constraint

budget constraint The limits imposed on household choices by income, wealth, and product prices.

TABLE 6.1 Possible Budget Choices of a Person Earning $1,000 per Month after Taxes

Option	Monthly Rent	Food	Other Expenses	Total	Available?
A	$ 400	$250	$350	$1,000	Yes
B	600	200	200	1,000	Yes
C	700	150	150	1,000	Yes
D	1,000	100	100	1,200	No

choice set *or* **opportunity set** The set of options that is defined and limited by a budget constraint.

Preferences, Tastes, Trade-Offs, and Opportunity Cost

Within the constraints imposed by limited incomes and fixed prices, households are free to choose what they will and will not buy.

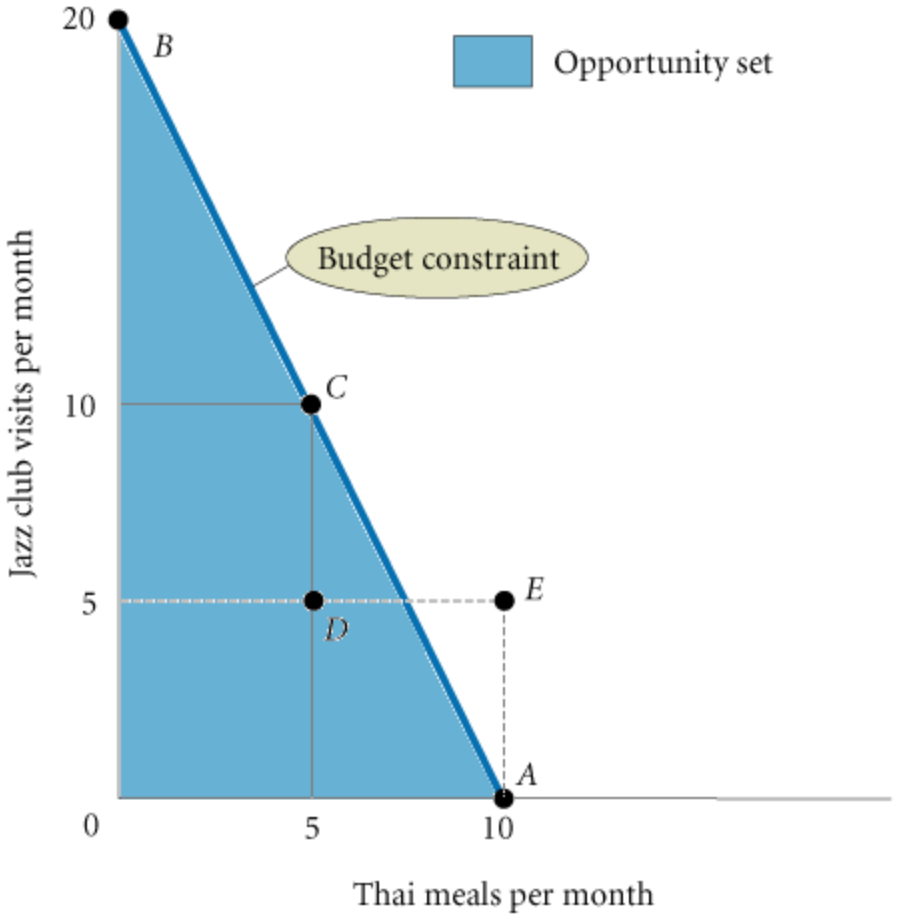
Whenever a household makes a choice, it is weighing the good or service that it chooses against all the other things that the same money could buy.

As long as a household faces a limited budget—and all households ultimately do—the real cost of any good or service is the value of the other goods and services that could have been purchased with the same amount of money.

The Budget Constraint More Formally

▶ **FIGURE 6.1 Budget Constraint and Opportunity Set for Ann and Tom**

A budget constraint separates those combinations of goods and services that are available, given limited income, from those that are not.
The available combinations make up the opportunity set.



real income The set of opportunities to purchase real goods and services available to a household as determined by prices and money income.

The Equation of the Budget Constraint

In general, the budget constraint can be written

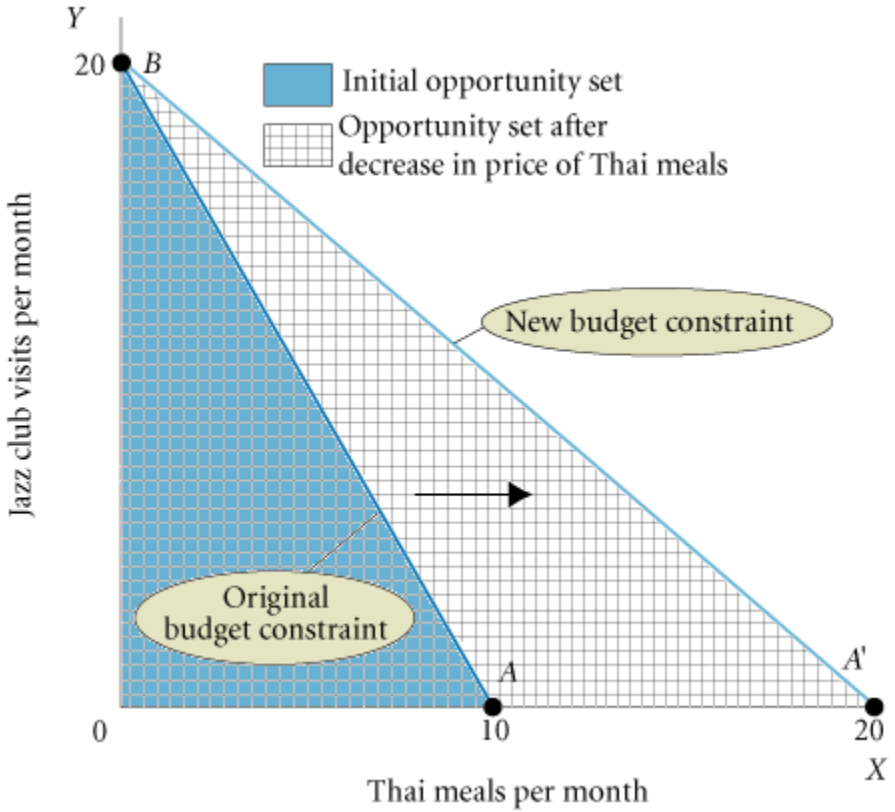
$$P_X X + P_Y Y = I,$$

where P_X = the price of X, X = the quantity of X consumed, P_Y = the price of Y, Y = the quantity of Y consumed, and I = household income.

Budget Constraints Change When Prices Rise or Fall

▶ **FIGURE 6.2 The Effect of a Decrease in Price on Ann and Tom's Budget Constraint**

When the price of a good decreases, the budget constraint swivels to the right, increasing the opportunities available and expanding choice.



The Basis of Choice: Utility

utility The satisfaction a product yields.

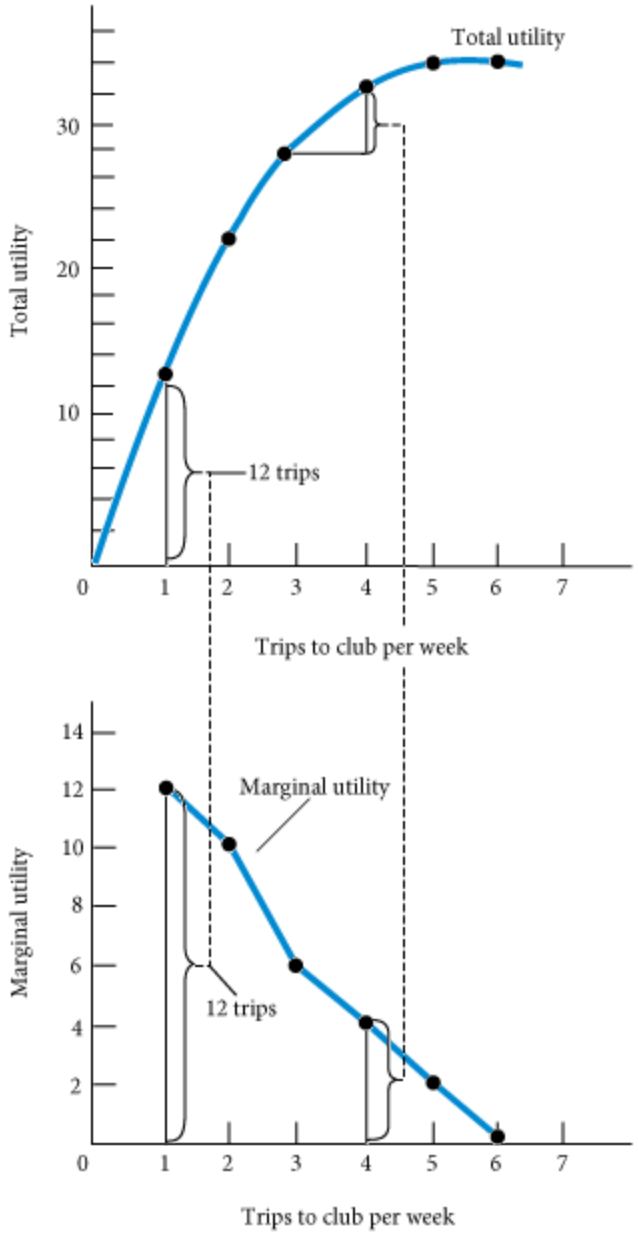
Diminishing Marginal Utility

marginal utility (*MU*) The additional satisfaction gained by the consumption or use of *one more* unit of a good or service.

total utility The total amount of satisfaction obtained from consumption of a good or service.

law of diminishing marginal utility The more of any one good consumed in a given period, the less satisfaction (utility) generated by consuming each additional (marginal) unit of the same good.

TABLE 6.2 Total Utility and Marginal Utility of Trips to the Club per Week		
Trips to Club	**Total Utility**	**Marginal Utility**
1	12	12
2	22	10
3	28	6
4	32	4
5	34	2
6	34	0



▶ **FIGURE 6.3 Graphs of Frank's Total and Marginal Utility**

Marginal utility is the additional utility gained by consuming one additional unit of a commodity—in this case, trips to the club.
When marginal utility is zero, total utility stops rising.

Allocating Income to Maximize Utility

TABLE 6.3 Allocation of Fixed Expenditure per Week Between Two Alternatives

(1) Trips to Club per Week	(2) Total Utility	(3) Marginal Utility (*MU*)	(4) Price (*P*)	(5) Marginal Utility per Dollar (*MU*/*P*)
1	12	12	$3.00	4.0
2	22	10	3.00	3.3
3	28	6	3.00	2.0
4	32	4	3.00	1.3
5	34	2	3.00	0.7
6	34	0	3.00	0

(1) Basketball Games per Week	(2) Total Utility	(3) Marginal Utility (*MU*)	(4) Price (*P*)	(5) Marginal Utility per Dollar (*MU*/*P*)
1	21	21	$6.00	3.5
2	33	12	6.00	2.0
3	42	9	6.00	1.5
4	48	6	6.00	1.0
5	51	3	6.00	0.5
6	51	0	6.00	0

The Utility-Maximizing Rule

In general, utility-maximizing consumers spread out their expenditures until the following condition holds:

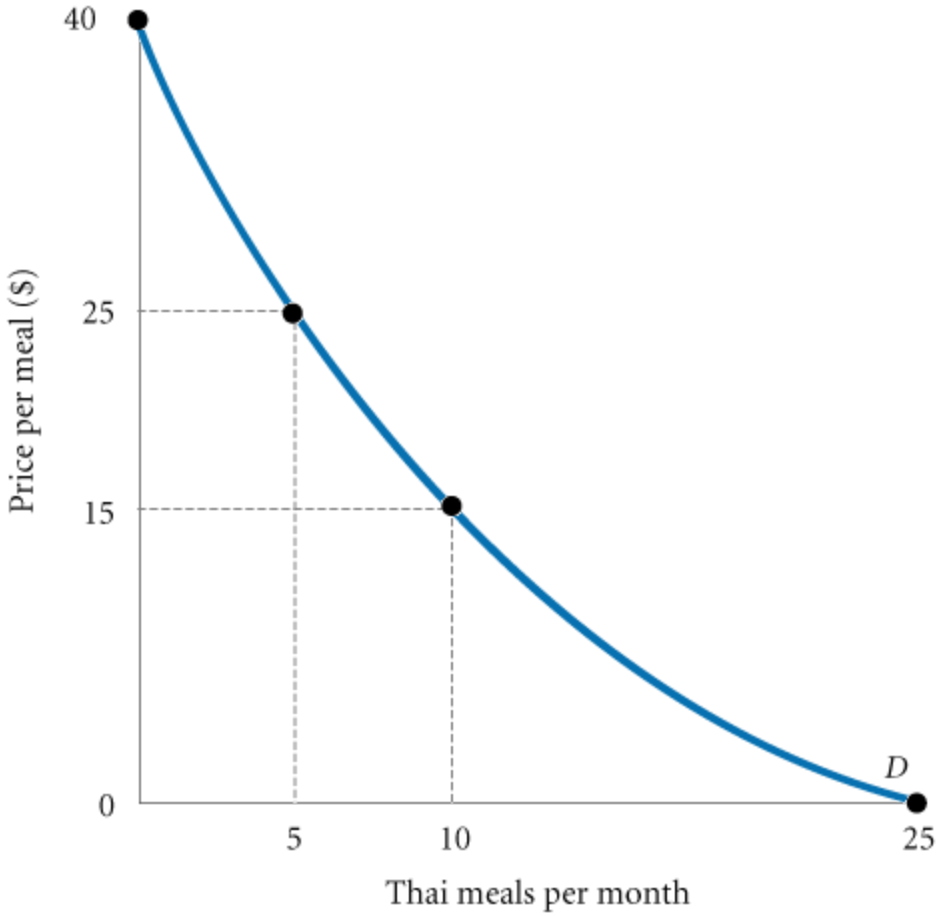
$$\text{utility-maximizing rule: } \frac{MU_X}{P_X} = \frac{MU_Y}{P_Y} \text{ for all goods,}$$

where MU_X is the marginal utility derived from the last unit of X consumed, MU_Y is the marginal utility derived from the last unit of Y consumed, P_X is the price per unit of X, and P_Y is the price per unit of Y.

utility-maximizing rule Equating the ratio of the marginal utility of a good to its price for all goods.

diamond/water paradox A paradox stating that (1) the things with the greatest value in use frequently have little or no value in exchange and (2) the things with the greatest value in exchange frequently have little or no value in use.

Diminishing Marginal Utility and Downward-Sloping Demand



◀ **FIGURE 6.4 Diminishing Marginal Utility and Downward-Sloping Demand**

At a price of $40, the utility gained from even the first Thai meal is not worth the price.

However, a lower price of $25 lures Ann and Tom into the Thai restaurant 5 times a month. (The utility from the sixth meal is not worth $25.)

If the price is $15, Ann and Tom will eat Thai meals 10 times a month—until the marginal utility of a Thai meal drops below the utility they could gain from spending $15 on other goods.

At 25 meals a month, they cannot tolerate the thought of another Thai meal even if it is free.

Where Do Foodies Live?

If the price of restaurant meals is overall higher in big cities, then you might expect young people in those cities to spend more on those meals as a percent of their income than similar people in the suburbs.

The answer must then lie with the preferences of those young people; with their utility curves.

People reveal their preferences in part by where they choose to live.

On average, we will see more “foodies” living in San Francisco or New York than we will find in many other parts of the country.

THINKING PRACTICALLY

1. If demand for living in cities is driven today mostly by availability of amenities, can you predict which cities in the United States are likely to thrive versus flounder?

Income and Substitution Effects

The Income Effect

Price changes affect households in two ways. First, if we assume that households confine their choices to products that improve their well-being, then a decline in the price of any product, *ceteris paribus*, will make the household unequivocally better off.

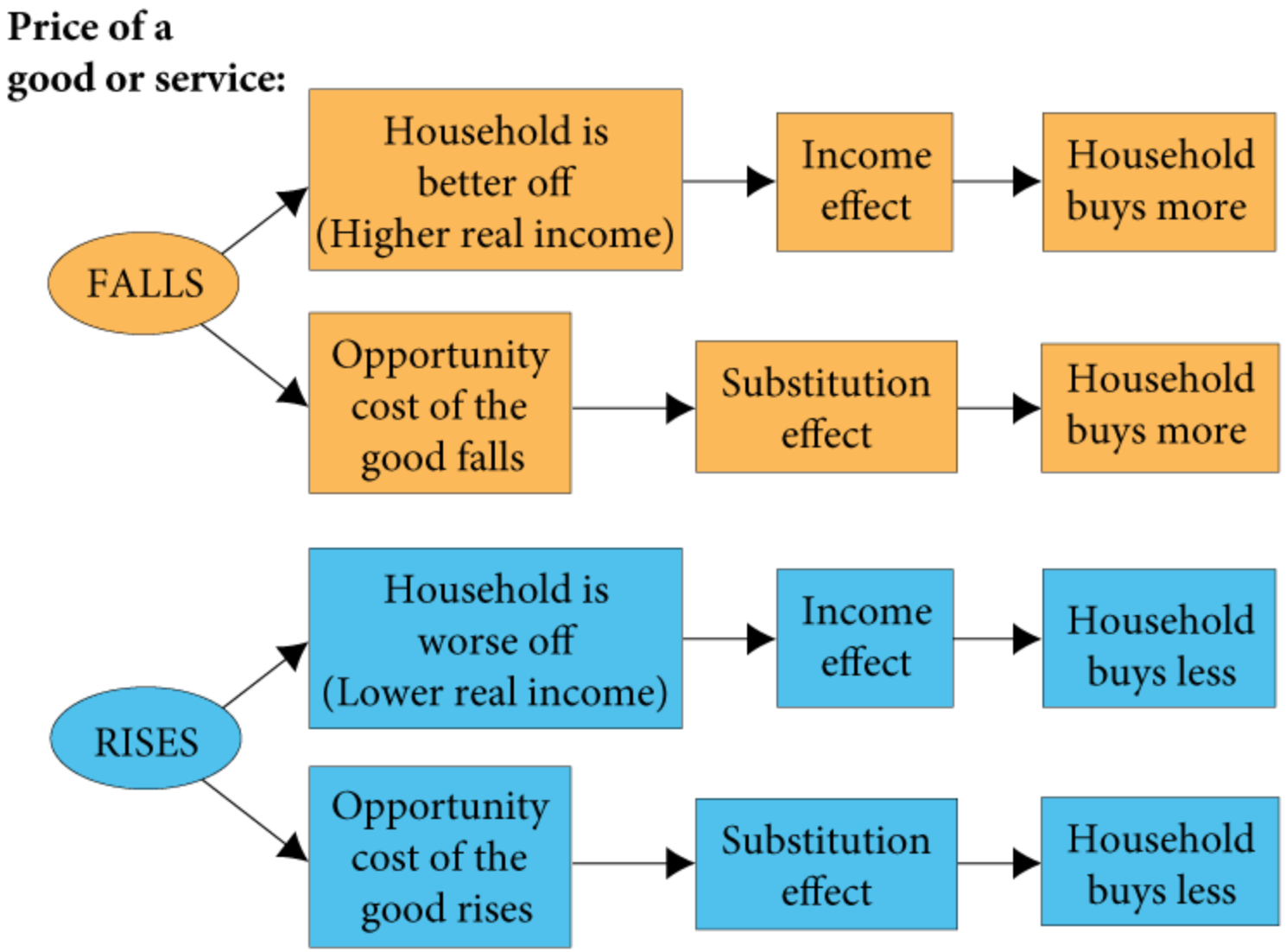
In other words, if a household continues to buy the same amount of every good and service after the price decrease, it will have income left over. That extra income may be spent on the product whose price has declined, hereafter called good *X*, or on other products.

The change in consumption of *X* due to this improvement in well-being is called the *income effect of a price change*.

The Substitution Effect

When the price of a product falls, that product also becomes *relatively* cheaper. That is, it becomes more attractive relative to potential substitutes. A fall in the price of product *X* might cause a household to shift its purchasing pattern away from substitutes toward *X*. This shift is called the *substitution effect of a price change*.

Everything works in the opposite direction when a price rises, *ceteris paribus*. When the price of a product rises, that item becomes more expensive relative to potential substitutes and the household is likely to substitute other goods for it.



▲ **FIGURE 6.5 Income and Substitution Effects of a Price Change**
For normal goods, the income and substitution effects work in the same direction. Higher prices lead to a lower quantity demanded, and lower prices lead to a higher quantity demanded.

Substitution and Market Baskets

If we go back to the utility-maximizing rule that you learned in this chapter, we see Mr. Smith comparing the marginal utility of each product he consumes relative to its price in deciding what bundle to buy.

When we artificially restrict Mr. Smith's ability to substitute goods, we almost inevitably give him a more expensive bundle.

THINKING PRACTICALLY

1. An employer decides to transfer one of her executives to Europe. "Don't worry," she says, "I will increase your salary so that you can afford exactly the same things in your new home city as you can buy here."
   Is this the right salary adjustment?

Household Choice in Input Markets

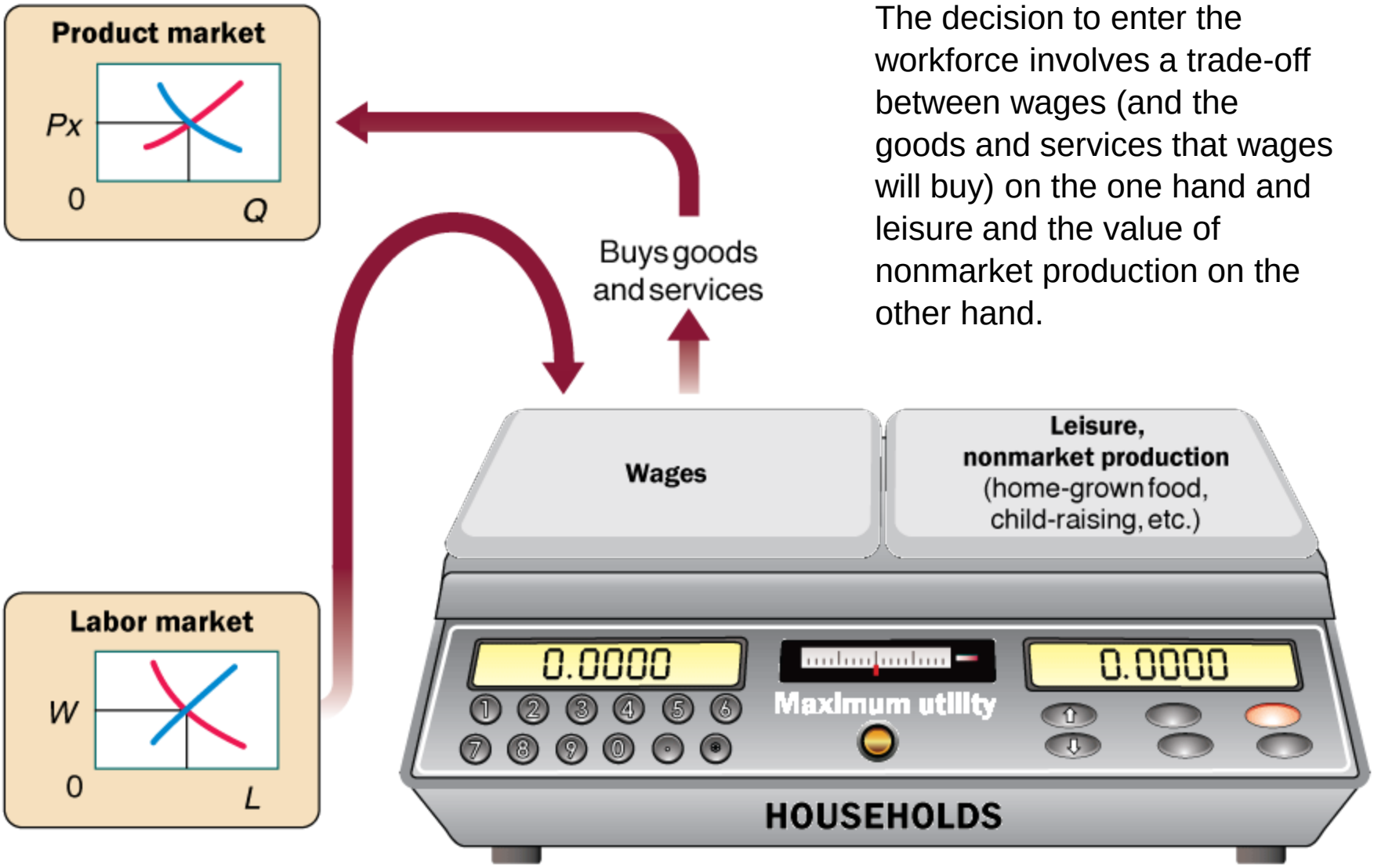
The Labor Supply Decision

As in output markets, households face constrained choices in input markets. They must decide:

1. Whether to work
2. How much to work
3. What kind of a job to work at

In essence, household members must decide how much labor to supply. The choices they make are affected by:

1. Availability of jobs
2. Market wage rates
3. Skills they possess
4. Only 168 hours in a week



▼ **FIGURE 6.6 The Trade-Off Facing Households**

The decision to enter the workforce involves a trade-off between wages (and the goods and services that wages will buy) on the one hand and leisure and the value of nonmarket production on the other hand.

The Price of Leisure

Trading one good for another involves buying less of one and more of another, so households simply reallocate *income* from one good to the other.

"Buying" more leisure, however, means reallocating time between work and nonwork activities.

For each hour of leisure that you decide to consume, you give up one hour's wages.

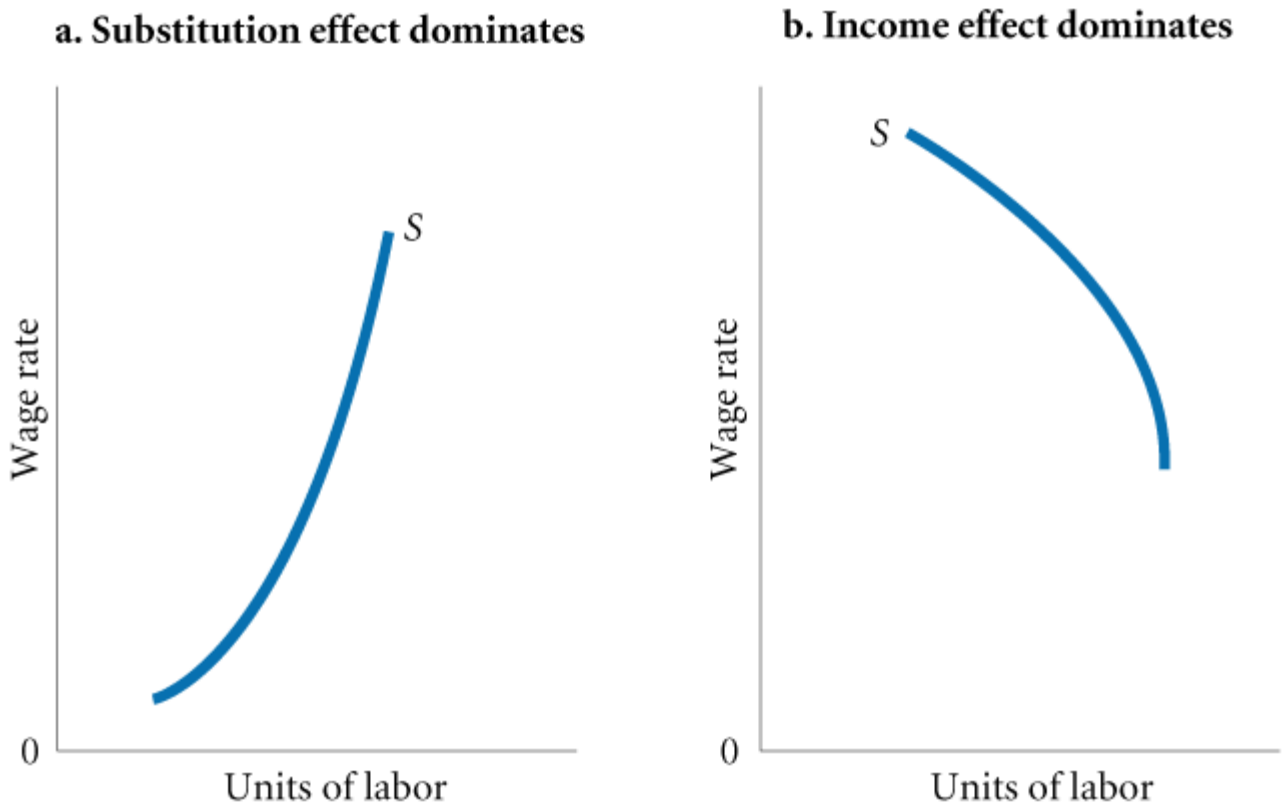
Thus, the wage rate is the *price of leisure*.

Income and Substitution Effects of a Wage Change

labor supply curve A curve that shows the quantity of labor supplied at different wage rates. Its shape depends on how households react to changes in the wage rate.

▼ **FIGURE 6.7 Two Labor Supply Curves**

When the substitution effect outweighs the income effect, the labor supply curve slopes upward (a).
When the income effect outweighs the substitution effect, the result is a "backward-bending" labor supply curve: The labor supply curve slopes downward (b).



Saving and Borrowing: Present versus Future Consumption

Just as changes in wage rates affect household behavior in the labor market, changes in interest rates affect household behavior in capital markets.

Most empirical evidence indicates that saving tends to increase as the interest rate rises. In other words, the substitution effect is larger than the income effect.

financial capital market The complex set of institutions in which suppliers of capital (households that save) and the demand for capital (firms wanting to invest) interact.

A Review: Households in Output and Input Markets

We now have a rough sketch of the factors that determine output demand and input supply. (You can review these in Figure II.1.)

In the next three chapters, we turn to firm behavior and explore in detail the factors that affect output supply and input demand.

REVIEW TERMS AND CONCEPTS

budget constraint

choice set *or* opportunity set

diamond/water paradox

financial capital market

homogeneous products

labor supply curve

law of diminishing marginal utility

marginal utility (*MU*)

perfect competition

perfect knowledge

real income

total utility

utility

utility-maximizing rule

CHAPTER 6 APPENDIX

Indifference Curves

Assumptions

We base the following analysis on four assumptions:

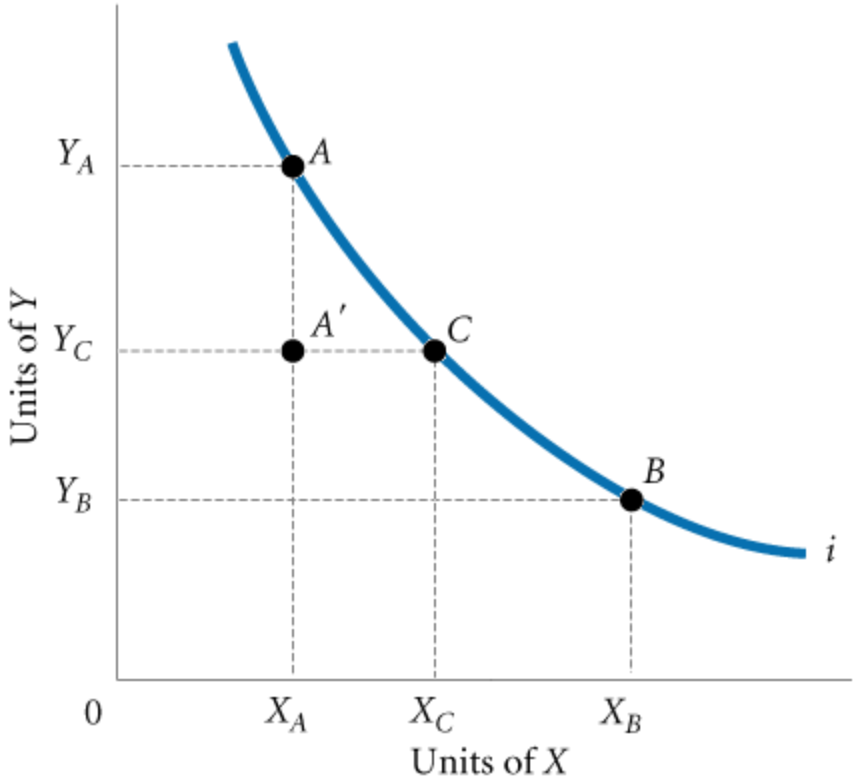
1. We assume that this analysis is restricted to goods that yield positive marginal utility, or, more simply, that "more is better."

2. The **marginal rate of substitution** is defined as MU_X/MU_Y, or the ratio at which a household is willing to substitute *X* for *Y*. We assume a diminishing marginal rate of substitution.

3. We assume that consumers have the ability to choose among the combinations of goods and services available.

4. We assume that consumer choices are consistent with a simple assumption of rationality.

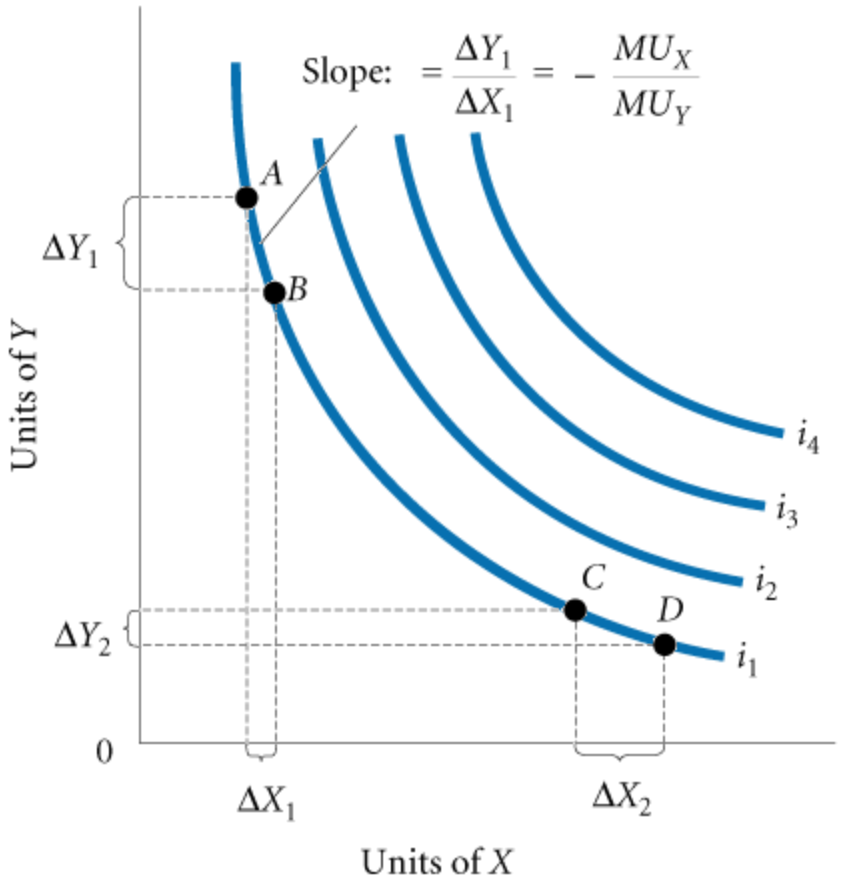
Deriving Indifference Curves



◀ **FIGURE 6A.1 An Indifference Curve**

An indifference curve is a set of points, each representing a combination of some amount of good *X* and some amount of good *Y*, that all yield the same amount of total utility.
The consumer depicted here is indifferent between bundles *A* and *B*, *B* and *C*, and *A* and *C*. Because "more is better," our consumer is unequivocally worse off at *A′* than at *A*.

Properties of Indifference Curves



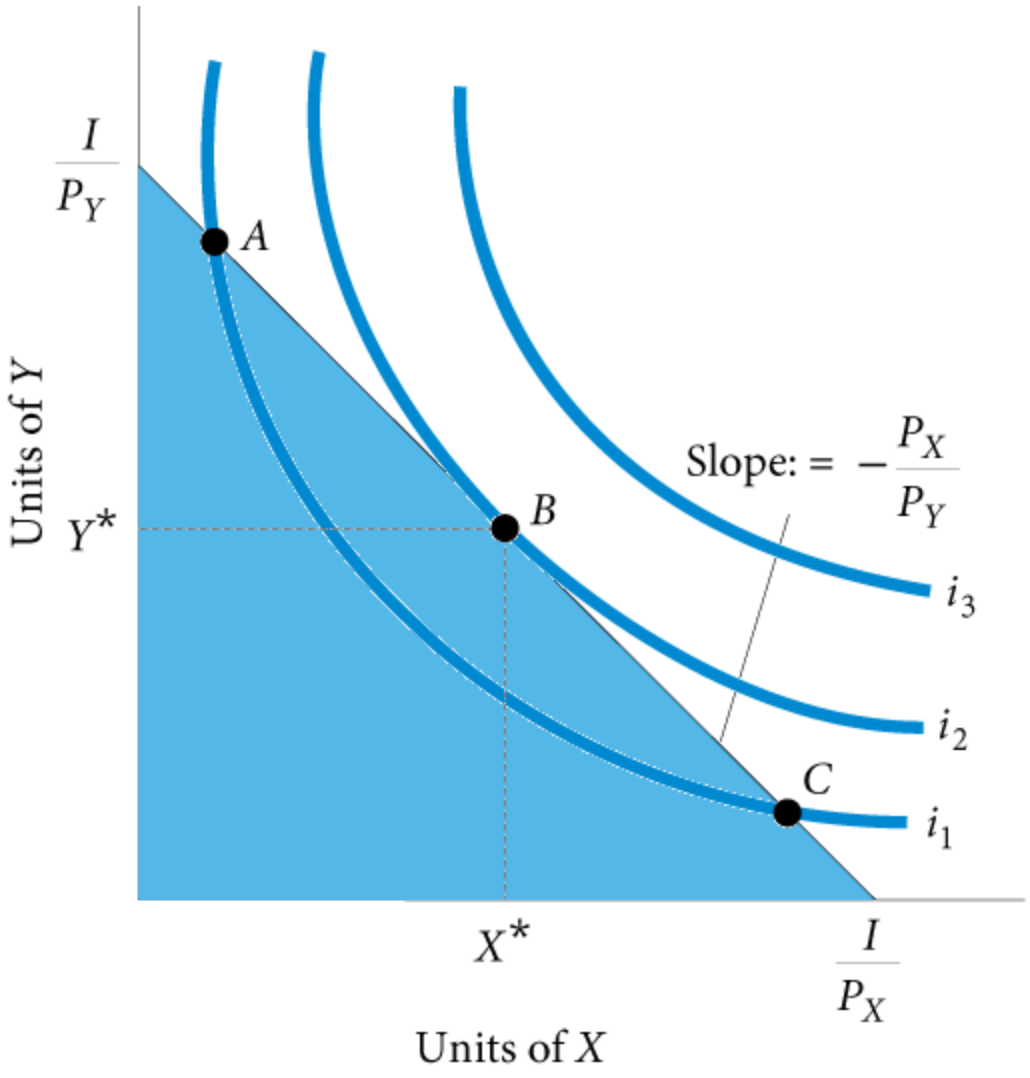
◀ **FIGURE 6A.2 A Preference Map: A Family of Indifference Curves**
Each consumer has a unique family of indifference curves called a preference map. Higher indifference curves represent higher levels of total utility.

$$MU_X \cdot \Delta X = -(MU_Y \cdot \Delta Y)$$

When we divide both sides by MU_Y and by ΔX, we obtain

$$\frac{\Delta Y}{\Delta X} = -\left(\frac{MU_X}{MU_Y}\right)$$

The slope of an indifference curve is the ratio of the marginal utility of *X* to the marginal utility of *Y*, and it is negative.



◀ **FIGURE 6A.3 Consumer Utility-Maximizing Equilibrium**

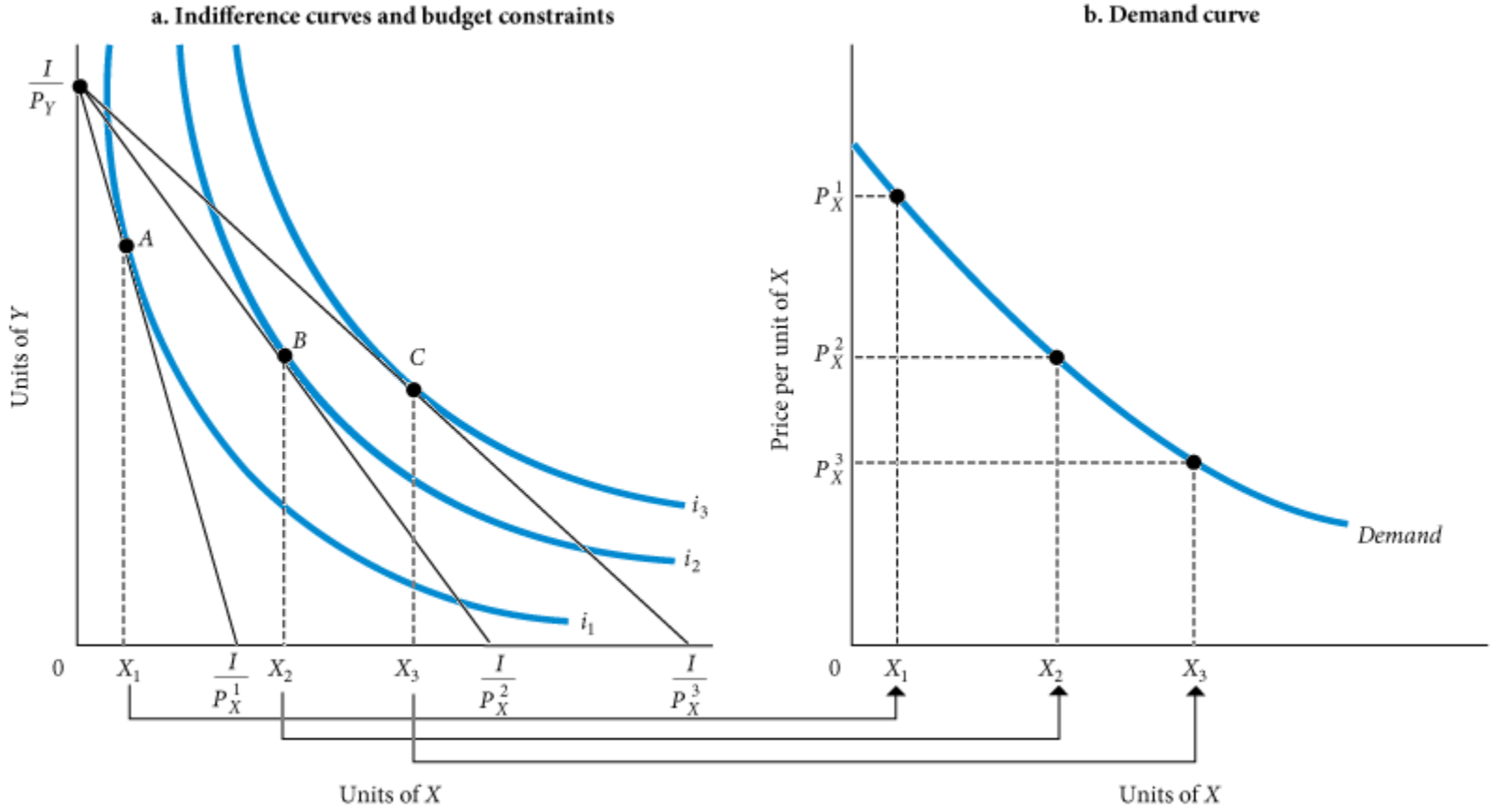
Consumers will choose the combination of *X* and *Y* that maximizes total utility. Graphically, the consumer will move along the budget constraint until the highest possible indifference curve is reached. At that point, the budget constraint and the indifference curve are tangent. This point of tangency occurs at *X** and *Y** (point *B*).

$$\underbrace{-\frac{MU_X}{MU_Y}}_{\text{slope of indifference curve}} = \underbrace{-\frac{P_X}{P_Y}}_{\text{slope of budget constraint}}$$

By multiplying both sides of this equation by MU_Y and dividing both sides by P_X, we can rewrite this utility-maximizing rule as

$$\frac{MU_X}{P_X} = \frac{MU_Y}{P_Y}$$

Deriving a Demand Curve from Indifference Curves and Budget Constraints



▲ **FIGURE 6A.4 Deriving a Demand Curve from Indifference Curves and Budget Constraint**

Indifference curves are labeled i_1, i_2, and i_3; budget constraints are shown by the three diagonal lines from I/P_Y to I/P^1_X, I/P^2_X and I/P^3_X. Lowering the price of X from P^1_X to P^2_X and then to P^3_X swivels the budget constraint to the right. At each price, there is a different utility-maximizing combination of X and Y. Utility is maximized at point A on i_1, point B on i_2, and point C on i_3.
Plotting the three prices against the quantities of X chosen results in a standard downward-sloping demand curve.

Indifference curve

Marginal rate of substitution

Preference map