USING THE NUMBERS

17. According to By the Numbers, over what period of time did the gap between the full-time minimum wage earnings and the poverty threshold expand the most?
18. According to By the Numbers, about how many Americans used food stamps (now known as SNAP benefits) in the year 2000? How about in the year 2012? (Hint: Use the approximate U.S. population of 300 million to calculate the answers for both years.)

ANSWERS TO QUESTIONS IN CHECKPOINTS

Checkpoint: The Distribution of Income and Wealth

It would clearly improve (make more equal) the before-tax and benefits distribution of income. The impact on the distribution of income after adjusting for current benefits of such a policy would depend on the explicit value of current benefits. Murray suggested that his proposal would cost more for a decade and then begin saving money.

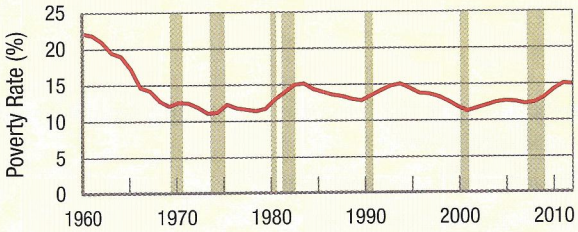
Checkpoint: Poverty

Based on the poverty thresholds, poverty would almost be eliminated by this proposal. In general, the political left would welcome this redistribution except for the elimination of the social safety net. Some people would make bad decisions and not save for retirement or purchase health care coverage, and the political left would still want these services to exist, defeating the idea of the proposal. The political right would worry that once the redistribution scheme is introduced, enough people would reduce their working hours to harm economic growth. Further, the political right would worry that after the redistribution, the safety net would creep back into existence, eroding the benefits of the original idea.

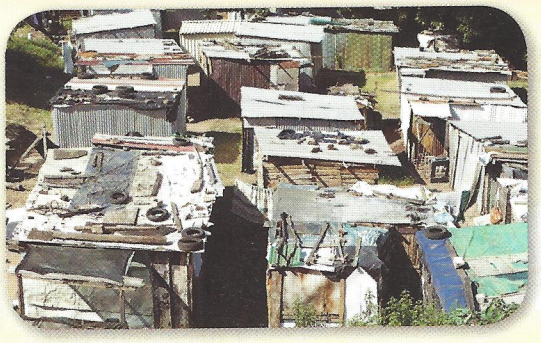
Section 2: Poverty

Poverty is defined differently by each country and by organizations such as the World Bank.

The poverty rate according to the U.S. Census Bureau is the percentage of persons with income below the poverty rate threshold. This includes all money income (before taxes are deducted) and cash benefits and excludes capital gains and noncash benefits.



The poverty rate in the United States dropped in the 1960s and 1970s, and has stabilized since, with minor drops during economic expansion and minor rises during recessions.



Hongqi Zhang (aka Michael Zhang)/ Dreamstime.com

The depth (or severity) of poverty can be measured using one of two approaches:

Income deficit: How far (in dollars) below the poverty threshold.

Ratio of income to poverty: Measured as the ratio of income compared to the poverty threshold.

0.00–0.50: severely poor (about 6% of Americans)

0.51–1.00: poor

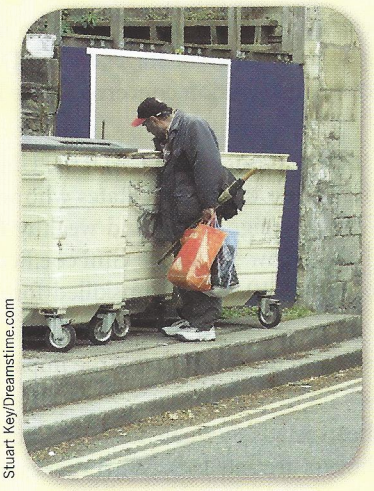
1.01–1.25: near poor

New Method of Measuring Poverty

- includes after-tax money income
- includes noncash benefits (such as food stamps and housing subsidies)
- deducts work-related expenditures (such as transportation and child care) and out-of-pocket medical expenditures

Two Solutions to Reduce Poverty

1. Expand welfare and redistribution programs, and make taxes more progressive.
2. Increase incentives to promote economic growth, which benefits all people, including the poor.



Stuart Key/Dreamstime.com

Rawls: Rawlsian theory states that a society's well-being is only as good as its least fortunate citizen. Therefore, to reduce poverty it advocates for the least amount of income inequality.

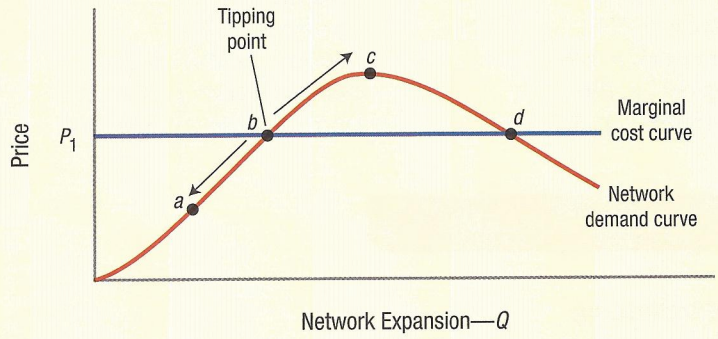
Nozick: This theory is based on the argument that property rights (including income) must be protected to provide incentives for growth, which will reduce poverty.

Joel Stettenheim/CORBIS

Considerable movement occurs between income groups (quintiles). About half of all households in a quintile move to a different quintile each decade.

Section 3: Market Equilibrium for a Network Good

A network demand curve contains a **tipping point** (or **critical mass**), defined as the level of output that allows a network to expand further without significant effort by producers. When a tipping point is reached, the power of network effects propels the demand for a network good to a higher equilibrium point. This is referred to as a **virtuous cycle.** If a network good fails to reach its tipping point or falls below its tipping point, a vicious cycle can result as customers leave the network, further decreasing the value of the network to other users.



Goods can enter a virtuous cycle or a vicious cycle very quickly, especially if there is a competing network in the market.

PSL Images/Alamy

Dropbox enjoyed a virtuous cycle in 2012 when over 50 million people signed up for this service that allows users to access and share files on any computer or mobile device.

Section 4: Competition and Market Structure for Network Goods

Firms engage in a variety of marketing strategies to increase the likelihood of entering a virtuous cycle or to avoid entering a vicious cycle. The pressure to gain and retain customers is enhanced by the low marginal cost of production, which makes customers more valuable the longer they use a firm's product.

Cammeraydave/Dreamstime.com

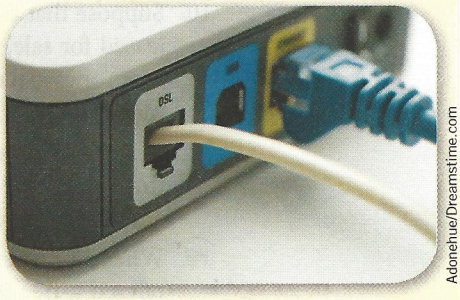
Common strategies used by firms include:

- Teaser strategies
- Lock-in strategies
- Market segmentation by versioning (intertemporal pricing, peak-load pricing, and bundling)

Section 5: Should Network Goods Be Regulated?

Network effects allow successful firms to achieve significant market power, sometimes even a monopoly. To prevent firms from exploiting their market power, governments turn to regulation as a way to limit the abuse of market power.

Poor regulation can sometimes be worse than no regulation. Regulation is not always necessary when the costs of regulation exceed its benefits. The potential of competition itself can prevent monopolies from exploiting their market power.



Adonehue/Dreamstime.com

Interconnection is a common requirement in the regulation of network industries, in which firms are required to give competitors access to each other's **essential facilities** such as telephone wires that allow for DSL broadband service.

to developers. The park appears to be well on its way to self-sufficiency by leasing the land to private firms—Lucas Films has built a large digital animation studio, and other firms have undertaken similar projects. These projects all must maintain the general character of the park and generate rent that will cover the park's expenses in the future. Would this privatization approach work with most of America's other national parks? Why or why not?

12. Nobel Prize–winner Simon Kuznets once suggested that poor nations tend to pollute more as they grow—until they reach a certain level of income per capita—after which they pollute less. Does this observation by Kuznets seem reasonable? Why or why not?

In the News

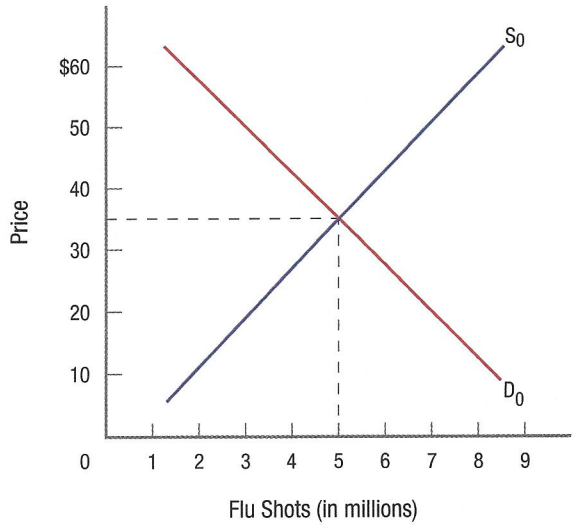
13. In 2009, the Cash for Clunkers program was initiated to encourage consumers to trade in their old inefficient cars for a credit to buy new fuel-efficient cars. What are some of the external benefits from such a policy?

14. One's home (whether a house or an apartment) is typically thought of as one's castle. But not so in the condominiums with homeowners associations (HOAs) in Jefferson County, Colorado. In an older four-unit condo, the HOA voted 3–1 to adopt a no-smoking rule (inside the individual condos) after smokers bought one of the units and smoke permeated the walls of the structure. In 2006, a district judge ruled that the HOA's adoption of no-smoking rules was a reasonable restriction on ownership rights, stating that the rules were designed to prevent the odor of cigarettes from penetrating the walls of neighboring condos.

    Considering that there are a small number of people involved (three nonsmoking units, one smoking), you would think that transaction costs would be minimal. Why do you think the homeowners could not work out an agreement (à la Coase) and ended up in court? According to the Coase theorem, would it have made any difference if the judge had ruled against the HOA?

Solving Problems

15. Suppose the market demand and supply for flu shots is shown in the figure below. Not taking into account the external benefits from flu shots, what is the equilibrium price and quantity of flu shots? Now suppose that every flu shot generates $10 in external benefits (from others being less likely to get sick). Show how this positive externality affects the graph (draw in a new curve). Taking into account external benefits, what would be the new equilibrium price and quantity of flu shots?



In the News

13. A December 13, 2012, article in the *Los Angeles Times*, "Colorado River Water Supply to Fall Short of Demand . . . " highlighted the concern regarding the ability of the Colorado River, the primary source of water for the greater Los Angeles area residents, to fulfill the needs as the river continues to decrease in water flow. Using a market diagram, show what happens to water prices if the supply of water, a natural resource, is fixed each year while demand continues to increase due to population growth. If the article's predictions come true and the supply decreases, show what happens to the price of water.
14. Steve Wynn is a billionaire Las Vegas casino tycoon who built famous hotels such as the Mirage, Bellagio, Wynn, and Encore resorts. In 2012, he announced a plan to invest $4 billion to build his third hotel in Macao, a tiny former Portuguese colony near Hong Kong that has been returned to China ("Wynn Macao Plans to Invest $4 Billion for New Resort," Bloomberg.com, June 5, 2012). The size of the investment surprised analysts, because the gaming market in Macao, while still the world's largest in total revenue, has begun to slow in recent years. What are some market factors influencing the present value of Wynn's future earnings that might justify his decision to build such a lavish resort?

Solving Problems

15. Suppose you win the lottery and are given a choice to collect either the grand prize of $6 million in 20 annual installments of $300,000, or collect an immediate one-time payment of $4 million today. If the interest rate is 5% and that is what you use to discount future earnings, which option should you select to maximize the present value of the winnings?
16. The mayor of your city is considering building a new toll road to reduce congestion. The cost of the toll road is $10 million and is estimated to generate a profit (from tolls collected less expenses collecting the tolls and maintaining the road) of $1.5 million per year. If the discount rate is 10%, how many years would it take before the road is paid for? (Hint: Calculate the present value of the annual profit—for year 1, discount $1.5 million by 10%.)

USING THE NUMBERS

17. According to By the Numbers, in the year 2011 (the last year for which data are reported) approximately what percentage of high school graduates attended college? Approximately what percentage of college graduates attended a graduate program?
18. According to By the Numbers, by approximately what percentage did venture capital funding fall from its peak in 2007 to its lowest point in 2010?

ANSWERS TO QUESTIONS IN CHECKPOINTS

Checkpoint: Land and Physical Capital

To determine whether this investment is worthwhile, you would want to know how much income the store expects to generate over the year, as well as the current market interest rate. Using this information, you can estimate the net present value of the investment to determine whether it is a good idea or not. The higher the market interest rate, the greater the income stream you would require to invest.

Checkpoint: Financial Capital

Bonds are promises to pay back a lender (bondholder) a specific amount on a specific date, while stocks represent actual ownership (to the extent of the number of shares held) in a business. A bondholder does not own any part of the business, and therefore does not influence the day-to-day management of the firm.

Checkpoint: Competitive Labor Demand

For many jobs, firms have standardized procedures that each employee follows. Therefore, the difference in productivity between individuals is relatively narrow. While homogeneous labor is a simplification, taking in everyone's difference would make analysis impractical. No, the model explains both since markets exist for each broad category of workers.

Checkpoint: Economic Discrimination

Discrimination in the workplace can be caused by preferences of employers, employees, or customers. If the discriminatory tastes are strictly due to employer preferences, then employers who discriminate will be forced to pay a higher wage for the "preferred" worker. Because employers who do not discriminate are able to hire an equally talented but less preferred worker at a lower wage, these employers will have a cost advantage in production. Over time, discriminating employers may need to reduce their discriminatory tastes or be forced out of business by lower cost competitors. Therefore, market forces tend to dissipate the extent of discrimination.

If the discriminatory tastes lie with the employees or customers, however, firms may be less able to reduce labor discrimination. For example, if employees refuse to work with a certain type of worker, or if customers refuse to buy goods and services from a particular type of worker, hiring these workers may negatively affect the firm's profit. Therefore, firms may choose to maintain segmented markets because the higher cost of labor is needed to prevent a potentially larger loss of revenues if their employees or customers act on their discriminatory tastes by refusing to work for or buy from the firm.

Checkpoint: Labor Unions and Collective Bargaining

Both sides work hard to get the best bargain for their constituents. There are incentives to continue negotiations up to the last moment to get the most and to appear to be driving a hard bargain. Strikes involve costs, and both sides use the threat of imposing these costs as a bargaining chip.

Section 3: Economic Discrimination

Economic discrimination occurs whenever workers of equal ability and productivity are paid different wages or otherwise discriminated against because of their:

- race or color
- religion
- gender
- age
- national origin
- sexual orientation
- disability

Laws Banning Labor Discrimination

- On gender: Equal Pay Act of 1963
- On race/ethnicity: Civil Rights Act of 1964
- On age: Age Discrimination in Employment Act of 1967
- On disabilities: Americans with Disabilities Act of 1990

Firms That Discriminate Must Pay More for Labor

- The supply of "preferred" workers decreases in a segmented market, increasing their wage.
- "Nonpreferred" workers enter a different market, increasing the labor supply and decreasing their wage.
- Firms that hire "nonpreferred" workers enjoy greater profits from a lower cost of labor.

Wavebreakmedia Ltd/Dreamstime.com

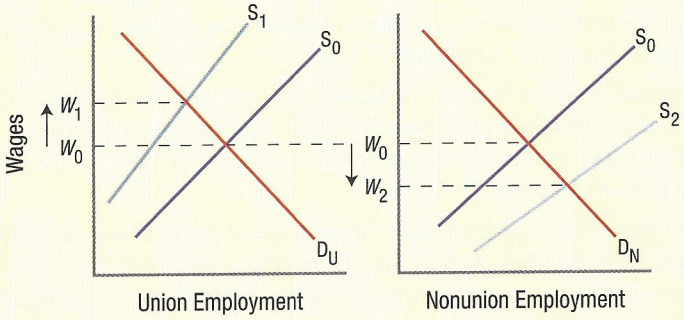
Employers choosing not to discriminate have access to a greater pool of talented labor.

Section 4: Labor Unions and Collective Bargaining

Labor unions are legal associations of employees formed to bargain collectively with employers over the terms and conditions of employment. They use:

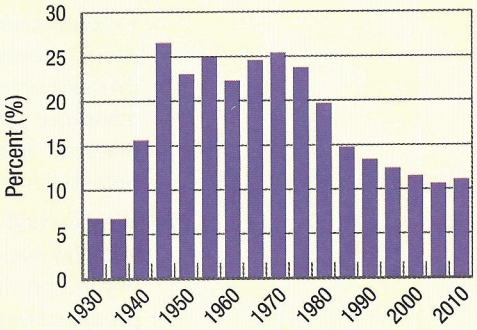
- Strikes
- Threats of strikes
- Other tactics

Unions restrict labor supply, shifting the labor supply to the left, raising wages. Those not in the union are forced to find nonunion jobs, increasing the labor supply in those markets and lowering wages, creating a wage gap of $W_1 - W_2$.



Major Laws Affecting Unions in the United States

- Wagner Act (National Labor Relations Act): protected union workers and their rights
- Taft-Hartley Act: Placed rules on unions to prevent them from becoming too powerful



Union membership has declined since the 1970s. Recent state laws banning collective bargaining among public workers may further reduce union membership.

Section 5: The Changing World of Work

Changes in the U.S. Labor Force

- Two-earner families: more women in labor force
- Immigration growth filling low-wage jobs
- Increase in flex-time workers: workers that are able to set their own work hours

Significant Changes in Careers in the Past 50 Years

- Shift from manufacturing to service industries
- Significant growth in international trade and foreign direct investment
- The introduction of the Internet, which has transformed the manufacturing process

ANSWERS TO QUESTIONS IN CHECKPOINTS

Checkpoint: Monopolistic Competition

Although both hotels are located on Disney property, the Grand Floridian Resort is much closer to the theme parks, and is located on the Monorail for easy transportation throughout the park. Also, the Grand Floridian is an upscale hotel with many fine restaurants and shops, and offers luxurious room amenities. The All-Star Resort, on the other hand, caters to budget conscious families that are willing to forgo some convenience and amenities in exchange for significant savings. Disney differentiates its hotels to cater to different groups of customers with varying willingness-to-pay. The result is a significant price difference between the two hotels.

Checkpoint: Oligopoly

A cartel functions best when its members adhere to the established quotas (which keep prices for drugs high) and also when no external competition exists (allowing the cartel to operate as if it were a monopoly). Competition from noncartel drug traffickers as well as cartel members exceeding their production quotas poses a threat to the cartel's existence, and hence cartels will often use violence to prevent those activities from occurring. When the drug trade is dominated by several large and powerful organizations, the actions of one organization have a significant effect on the others, an example of the mutual interdependence of firms in an oligopoly.

Checkpoint: Game Theory

This is a situation in which each player must develop a coordination strategy to achieve a Nash equilibrium (a connected call). No rule exists for coordination strategies. Instead, such strategies often are formed by experience. For example, the person who calls back might be the one who made the initial call, or the one who typically calls. Or, it might be the one who has more at stake in the call (such as a pesky friend asking to borrow money). With more experience, coordination strategies become easier to implement.

Checkpoint: Applications of Game Theory

This strategy might work in theory if everybody in the class is committed to it. Practically speaking, it's highly unlikely that everyone would stick to the agreement. For example, if you were someone destined to receive a C or a D, and you know that the A and B students promised not to study if you don't study, you would have a strong incentive to break your promise and study hard knowing that an A or a B is now within easier reach. At the same time, those destined for an A or a B might want to insure themselves against the plan by studying to secure the high grade. In the end, the cooperative agreement does not hold, because each player has a dominant strategy to study. This represents a Prisoner's Dilemma because, in the end, everyone studies and the scheme falls apart.

Section 3: Game Theory

Game theory is the study of strategic decision making when multiple players each act in their own interests.

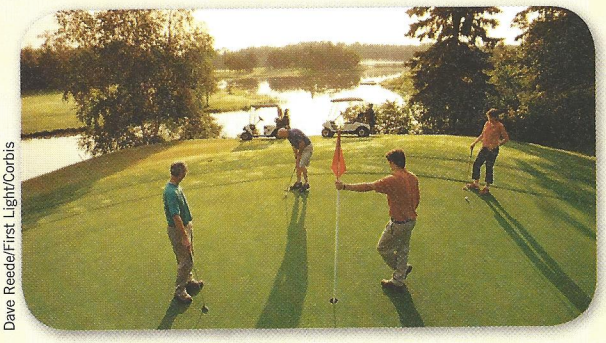
Components of a Game

Players

Information

Strategy choices

Outcomes and payoffs



Dave Reede/First Light/Corbis

Golf is a sequential-move game, in which players take their shots one at a time.

Nash equilibrium is an outcome that results from all players responding optimally to all other players' actions to maximize their expected payoffs. In a Nash equilibrium, no player wishes to deviate unilaterally from that outcome.

Solving for a Nash equilibrium requires analyzing a game table for best responses to the other player's possible actions.

		Player 2	
		Left	Right
Player 1	Top	8, 4	2, 6
	Down	6, 3	7, 5

Player 1's best response to "Left" is "Top" = 8.

Player 1's best response to "Right" is "Down" = 7.

Player 2's best response to "Top" is "Right" = 6.

Player 2's best response to "Down" is "Right" = 5.

One Nash equilibrium = "Down", "Right" = (7, 5).

Section 4: Applications of Game Theory

A **Prisoner's Dilemma** occurs when optimal noncooperative play results in an outcome that is inferior to another for both players.

Ways to Overcome the Prisoner's Dilemma

Collusion: This is illegal in most cases, although international cartels exist, such as the OPEC oil cartel and the De Beers diamond cartel. Also, free trade agreements are a legal form of cooperation between countries.

Tacit collusion: Occurs when one player takes the lead, and everyone else follows. This strategy is more effective when games are repeated, allowing for the possibility of retaliation should other players not cooperate.

Richard Baker/In Pictures/Corbis

American Airlines was the first major airline to charge for checked baggage. Almost all other airlines followed, allowing the airlines to achieve a mutually beneficial outcome.

Trigger Strategies Used in Repeated Games

Grim trigger: When one player defects, the other refuses to cooperate again (no forgiveness).

Trembling hand trigger: Players forgive certain instances of defection as "mistakes" before retaliation is taken.

Tit-for-tat trigger: Essentially an eye-for-an-eye: If one player defects, the other player punishes this player until cooperation resumes.

Chicken games occur when opposing players have an incentive to maintain a tough stance; however, if neither player refuses to back down, the worst outcome for both players occurs.

11. Sally owns the only cake shop in town (she is a monopolist). At a quantity of five, the marginal cost of producing one more cake is $12, while the marginal revenue from selling one more cake is $10. In order for Sally to maximize profits, should she increase or decrease output? Should she increase or decrease prices? Explain.
12. Airlines that compete against one another have at times merged with each other to create a larger airline. What are some factors that would determine whether such a merger would constitute an uncompetitive environment according to antitrust law?

In the News

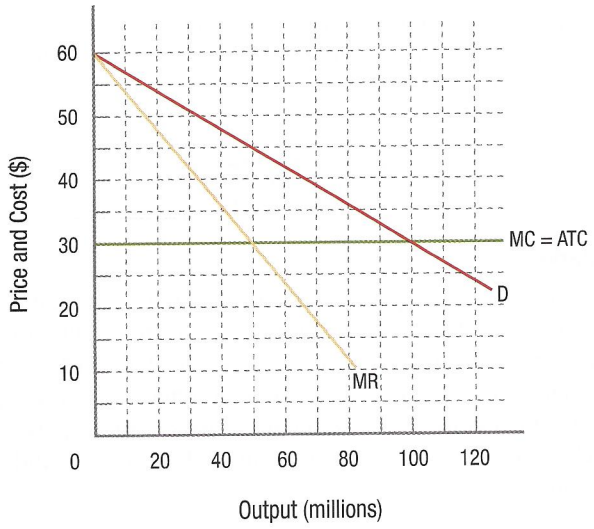
13. In July 2012, a court found several electronics manufacturers guilty of price-fixing LCD television and computer panels in one of the largest price-fixing cases in history ("What the $1.1 Billion LCD Price-Fixing Settlement Means for You," *CNN Money*, July 16, 2012). The alleged actions involved many major manufacturers, including Toshiba, Samsung, and Sharp. The total settlement that manufacturers paid to compensate victims of the scheme came to an astounding $1.12 billion. What potential benefits do companies gain by working together to fix prices on a good? Why do companies choose to engage in such unlawful behavior despite the risk of being caught and having to pay significant fines?
14. Being number one in any business attracts a lot of attention. As *The Economist* (December 17, 2005) noted,

    > *As soon as a firm climbs above the sharp elbows of its rivals, it starts getting pelted with the eggs of anti-business activities. People who hate big business aim high. So while big, bad Wal-Mart is pilloried, Target has in the past couple of years blithely cut the benefits of its non-union workers. And when was the last time you saw an anti-globalization mob destroy a Burger King outlet?*

    Describe some of the benefits of being number two in a large industry. In terms of total revenues (sales), name the number one and two firms in the following industries: major auto manufacturers, major drug manufacturers, and major integrated oil and gas.

Solving Problems

15. Using the figure for a monopoly firm below, answer the following questions.
    a. What will be the monopoly price, output, and profit for this firm?



    b. If this monopolist could perfectly price discriminate, what would profit equal?
    c. If this industry were competitive, what would be the price, output, and profit?
    d. How large (in dollars) is the deadweight loss from this monopolist?

Section 3: Price Discrimination

Price discrimination is charging different prices for the same product in the attempt to grab more surplus from consumers.

Conditions for Price Discrimination to Work Best

1. Firm must have market power (i.e., cannot be a price taker).
2. Market can be segmented into different consumer groups.
3. Seller must be able to prevent arbitrage.

Three Forms of Price Discrimination

Perfect (first-degree) price discrimination: Seller charges exactly what consumers are willing to pay, and extracts all consumer surplus.

Second-degree price discrimination: Prices differ based on the quantity being purchased.

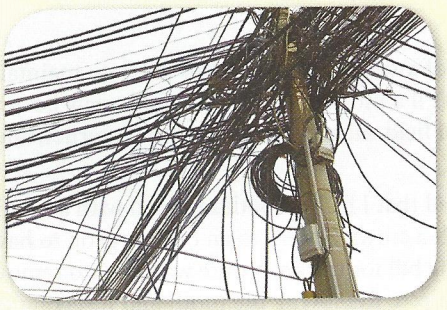
Third-degree price discrimination: Prices differ based on consumer characteristics, such as age (e.g., kids and senior discounts), status (e.g., student or military discounts), or flexibility (e.g., airline pricing).

Francis Dean/Corbis

Shopping at Costco might save you money, but you often need to buy in bulk, an example of second-degree price discrimination.

Section 4: Regulation and Antitrust

A **natural monopoly** has large economies of scale such that one firm is more efficient than multiple firms. The profit maximizing point occurs where MC (and ATC) is falling. To prevent exploitation of market power, natural monopolies are often regulated.



mood/board/Corbis

Besides economies of scale, most people prefer just one electric company as a monopolist, rather than multiple electric companies each with its own power lines.

Antitrust laws are designed to promote competition and prevent monopolies from developing.

Two Major Antitrust Laws

Sherman Act of 1890: outlawed trusts and cartels—restraint of trade and monopolization.

Clayton Act of 1914: outlawed some forms of price discrimination and mergers that would significantly reduce competition.

Ways to Measure Market Power

Concentration ratios: adding up the market shares of the 4 or 8 largest firms in an industry, and ranges from 0 to 100.

HHI index: sum of the square of market shares of all firms in an industry, and ranges from 0 (perfect competition) to 10,000 (monopoly). HHI values over 1,800 are concentrated industries where mergers are likely to be challenged.

James Leynse/Corbis

A **contestable market** looks like a monopoly but does not act like one because the threat of entry keeps prices low. Low-fare airlines that serve unique routes still offer low prices if they fear new entrants.

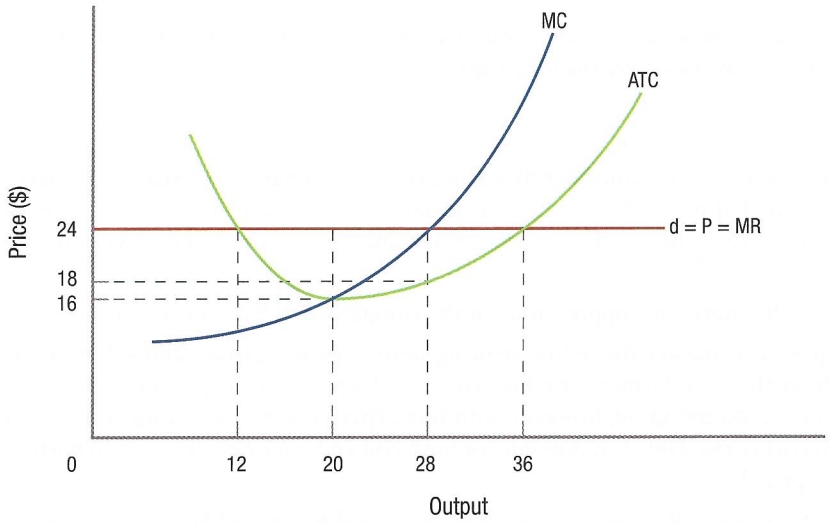
12. In this chapter we suggested that whenever market price fell below average variable costs, the firm would shut down. At that point revenue is not covering its variable costs and the firm is losing more money than if it just shut down and lost fixed costs. Clearly, shutting the firm is more complicated than that. Under what circumstances might the firm continue to operate even though prices are below average variable costs?

In The News

13. A January 25, 2012, article in *The New York Times* describes how more states are attempting to pass legislation to collect sales tax on Internet sales (sometimes dubbed the *Amazon Tax*) even when the seller does not have a physical presence in that state. Given the intense competition between online retailers and physical (brick-and-mortar) stores, how would such laws affect competition? Would brick-and-mortar stores be better off? How about customers? Why or why not?
14. An April 19, 2012, article by Art Carden in *Forbes* entitled "Let's Be Blunt: It's Time to End the Drug War" argues that legalizing marijuana is a key solution to ending the drug war. He argues that turning the industry into a competitive market would force cost-inefficient drug cartels to exit the market. Using what you know about competitive markets and firm entry and exit, explain the economics behind the author's theory.

Solving Problems

15. Use the following figure for a firm in a perfectly competitive market.



a. What is the output that maximizes the firm's profit?
b. At the profit-maximizing output, calculate total revenue and total cost.
c. If the firm maximizes profit, how much profit does it earn?
d. What will likely happen to market demand or market supply in the long run?
e. What will likely happen to the market price in the long run?

11. The Finger Lakes region in New York State produces wine. The climate favors white wines, but reds have been produced successfully in the past 15 years. Categorize the following costs incurred by one winery as either fixed or variable:
    a. the capital used to buy 60 acres of land on Lake Seneca
    b. the machine used to pick some varieties of grapes at the end of August and the beginning of September
    c. the salary of the chief vintner, who is employed year-round
    d. the wages paid to workers who bind the grape plants, usually in April, and usually over a period of three to four days
    e. the wages paid to the same workers who pick the grapes at the end of August or early September
    f. the costs of the chemicals sprayed on the grapes in July
    g. the wages of the wine expert who blends the wine in August and September, after the grapes have been picked
    h. the cost of the building where wine tastings take place from April to October
    i. the cost of the wine used in the wine tasting
12. If marginal cost is less than average total cost, are average total costs rising or falling? Alternatively, if marginal cost is more than average total cost, are average total costs rising or falling? Explain how this example might apply to a basketball player attempting to achieve a high average *points per game*.

In The News

13. Twenty-five years ago, coffee was a commodity product. Coffee brands such as Maxwell House ("good to the last drop") and Folger's advertised on television, but the difference between the brands was minimal. Not very satisfying, but no great pressure for change, either. In the 1990s, after touring coffeehouses in Rome, Howard Schultz brought the concept of upscale coffee to the United States and Starbucks was born ("Starbucks to Open 1,500 More Cafes in the U.S.," *The Seattle Times*, December 5, 2012). In 2012, over 13,000 Starbucks existed in the United States alone. How could a company such as Starbucks make any money in a highly competitive market like coffee? What factors did Howard Schultz need to consider before venturing into this business?
14. When J. P. Morgan Chase, one of the largest banks in the world, admitted to an embarrassing $9 billion trading loss in 2012, policymakers rushed to propose new regulations to prevent banks from taking risky bets ("J. P. Morgan Loss Spurs Scrutiny of Fed Governance," *Wall Street Journal*, May 14, 2012). Clearly, memories of bank bailouts by taxpayers in 2008 made the sentiment stronger. How do new regulations affect the costs of doing business? Do regulations represent a fixed or variable cost?

Solving Problems

15. Suppose you pay $10 to watch a movie at the local cineplex, and afterward you sneak into the next theater to watch a second movie without paying. What is your marginal cost of watching the second movie? What is the average cost of watching the two movies? After the movies, you go to the batting cages and stand in for two rounds of pitches, each round costing $2. What is your marginal cost of batting the second round? What is the average cost of batting two rounds?

11. Critics of marginal utility analysis argue that it is unrealistic to assume that people make the mental calculus of marginal utility per dollar for large numbers of products. But when you are making a decision to either go to a first-run movie or to buy a used DVD of last summer's blockbuster, does this analysis seem so complex? Is it a reasonable representation of your thought process?

12. A common practice at many supermarkets is to show the customer's total "savings" on their purchase at the bottom of the receipt. Such savings include the total discounts from goods purchased along with savings from coupons used. How would listing the total savings on a receipt influence an individual's consumption habits? Of what type of behavioral factor does this strategy take advantage?

In the News

13. Richard Layard, in his book *Happiness: Lessons from a New Science,* states that once a country's annual income exceeds $20,000 per capita, there is little relationship between happiness and income. But if you are poor, more money does make you happier. Does this fact suggest that the marginal utility from more income above $20,000 per capita is small?

14. In the summer of 2009, Chrysler announced that beginning with its 2010 models it was dropping the current lifetime powertrain (engine and transmission parts) warranty and replacing it with a five-year, 100,000-mile guarantee. *The Wall Street Journal* (August 20, 2009) reported that "Chrysler spokesman Rick Deneau said that the decision was driven by market research that showed customers prefer warranties with a fixed time period." The new five-year warranty was transferable if the vehicle was sold, while the prior lifetime warranty applied only to the original owner.

    Given marginal utility analysis, does it seem reasonable that consumers really prefer a five-year, 100,000-mile warranty to a lifetime warranty? What customers actually benefit from this new warranty?

Solving Problems

15. Assume a consumer has $20 to spend and for both products the marginal utilities are shown in the table below:

Quantity	MU_A	MU_B
1	20	30
2	10	10
3	5	2

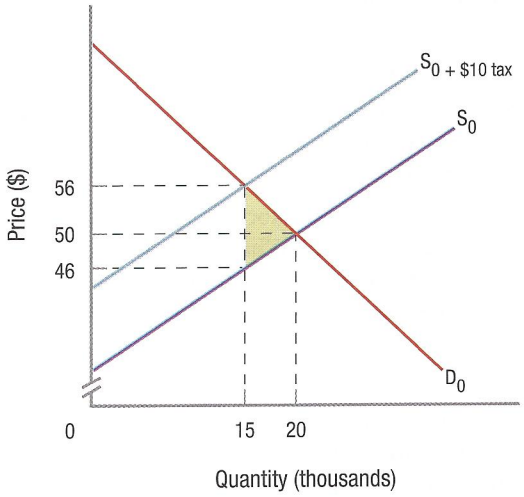
Assume that each product sells for $5 per unit.

a. How many units of each product will the consumer purchase?

b. Assume the price of product B rises to $10 per unit. How will this consumer allocate her budget now?

c. If the prices of both products rise to $10 per unit, what will be the budget allocation?

16. Suppose the demand and supply for imported Kobe beef is as shown in the figure below. Now assume that the U.S. government imposes an import tax of $10 per pound on Kobe beef.



a. How does the market price change with the imposition of the $10 per pound tax?

b. Do the buyers or the sellers of Kobe beef bear the greater burden of the tax?

c. How much tax revenue does the government collect from this market?

d. Calculate the approximate value of deadweight loss created in this market from the tax.

USING THE NUMBERS

17. According to By the Numbers, how much greater is the elasticity of demand for food in Canada than in the United States? How about Mexico compared to the United States?

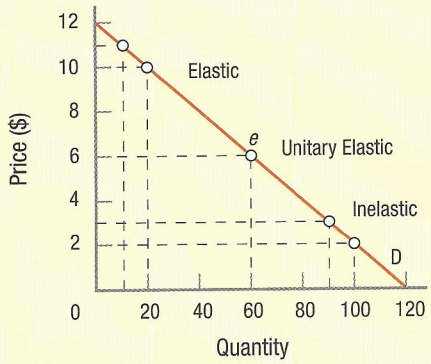
18. According to By the Numbers, what type of alternative-fuel car generated the highest sales in the year 2012? Which type of alternative-fuel car generated the second highest sales?

Section 2: Total Revenue and Other Measures of Elasticity

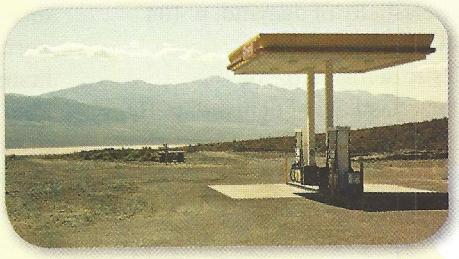
Total revenue is calculated as price × quantity demanded.

Total revenue increases when price rises on an inelastic good or is lowered on an elastic good.

Total revenue decreases when price rises on an elastic good or is lowered on an inelastic good.



Elasticity and total revenue vary along a straight-line demand curve. Total revenue is maximized at the point where demand is unitary elastic.



Martyn Goddard/Corbis

When competition is nearly nonexistent, sellers can raise prices and increase total revenue because the good is inelastic.

Cross elasticity of demand measures how responsive quantity demand for one good is to a change in the price of another good: $E_{ab} = \%\Delta Q_a / \%\Delta P_b$

$E_{ab} > 0$: Goods a and b are substitutes

$E_{ab} < 0$: Goods a and b are complements

$E_{ab} = 0$: Goods a and b are unrelated

Income elasticity of demand measures how quantity demand responds to changes in income: $E_Y = \%\Delta Q / \%\Delta \text{Income}$

$0 < E_Y < 1$: normal good

$E_Y > 1$: luxury good

$E_Y < 0$: inferior good

Section 3: Elasticity of Supply

The **elasticity of supply** measures the extent to which businesses react to price changes.

The **elasticity of supply** formula is virtually identical to that of demand:

$E_S = \%\Delta \text{Quantity Supplied} / \%\Delta \text{Price}$

The base and midpoint methods both are still used to calculate % changes.

The **time horizon** affects the elasticity of supply: the longer the period, the more a firm is able to adjust to changing prices, and therefore the more elastic the good.

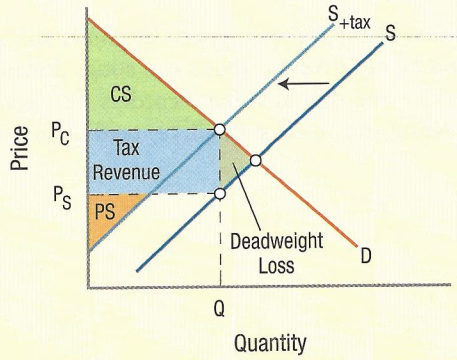
Short run: a time period in which plant capacity is fixed and the number of firms in an industry does not change.

Long run: a time period long enough for firms to alter their plant capacity or for firms to enter or leave the industry.

Section 4: Taxes and Elasticity

The **incidence of taxation** refers to who bears the economic burden of a tax.

The more elastic the demand or inelastic the supply, the greater the incidence of a tax on sellers. The more inelastic the demand or elastic the supply, the greater the incidence of a tax on consumers.

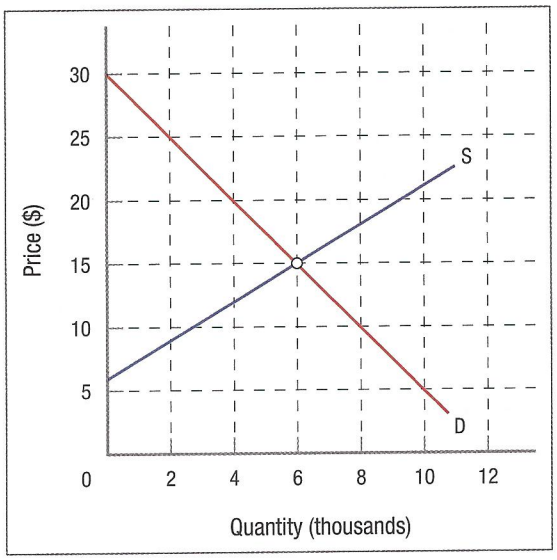


A new tax collected on sellers shifts the supply curve to the left. The intersection of S_{+tax} and D is the price consumers pay, P_C. P_S is the price sellers receive. The difference between P_C and P_S is the tax per unit.

The tax created a deadweight loss shown in gray, along with a reduction in consumer surplus (CS) and producer surplus (PS). The government collects tax revenue shown as the area in blue.

Solving Problems

15. Consider the market shown in the graph below.



a. Compute the consumer surplus.

b. Compute the producer surplus.

Now assume that government puts a price floor on this product at $20 a unit.

c. Compute the new consumer surplus.

d. Compute the new producer surplus.

e. What group would tend to have their advocates or lobbyists support price floors?

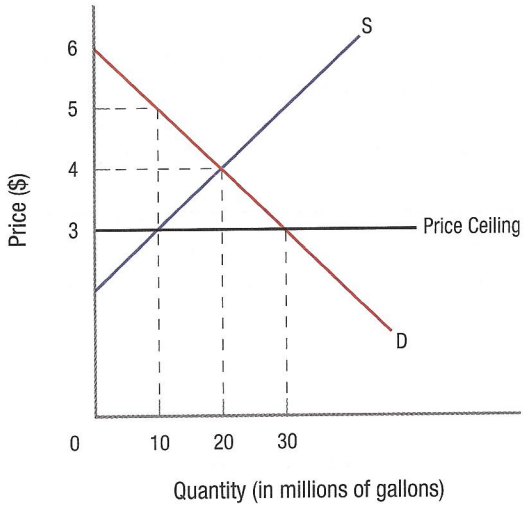
16. Suppose the U.S. government places a price ceiling on the sale of gasoline at $3 per gallon in the figure below.

a. How much of a shortage or surplus of gasoline would result?

b. Calculate the effects of this policy in terms of the changes in consumer surplus and producer surplus.

c. How much deadweight loss is created?

d. What would happen if the price ceiling is raised to $6 per gallon?



Markets can sometimes fail to produce the socially optimal output. Reasons for **market failure** include:

Lack of competition

When a firm faces little to no competition, it has an incentive to raise prices.

Existence of external benefits or costs

Markets tend to provide too little of products that have external benefits, and too much of products with external costs.

Tim Pannell/Corbis

Planting trees creates external benefits.

Corbis

Talking loudly on your phone creates external costs.

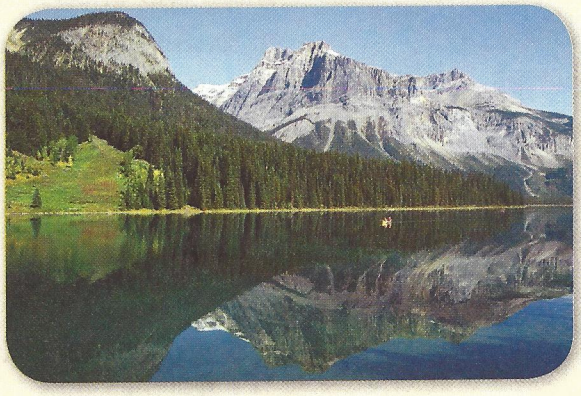
A mismatch of information

Asymmetric information occurs when either a buyer or a seller knows more about a product than the other.

Existence of public goods

Public goods are nonrival and nonexclusive. This means:

- My consumption does not diminish your ability to consume.
- Once a good is provided for one person, others cannot be excluded from enjoying it.



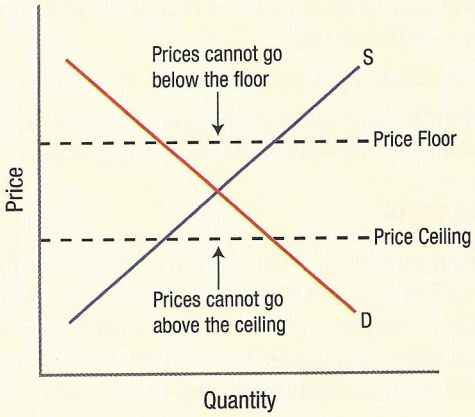
Susan E. Degginger/Alamy

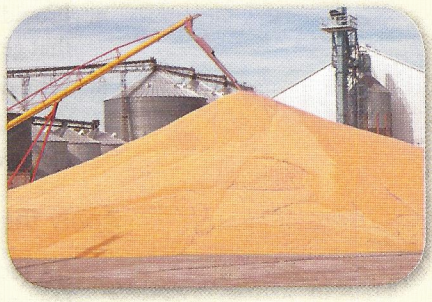
Ecological conservation is a public good. Once people devote time and resources to saving the environment, everybody benefits from it, even if one does not contribute to the costs of maintaining it.

Section 3: Price Ceilings and Price Floors

A **price floor** is a minimum price for a good. A binding price floor appears above equilibrium and causes a surplus.

A **price ceiling** is a maximum price for a good. A binding price ceiling appears below equilibrium and causes a shortage.



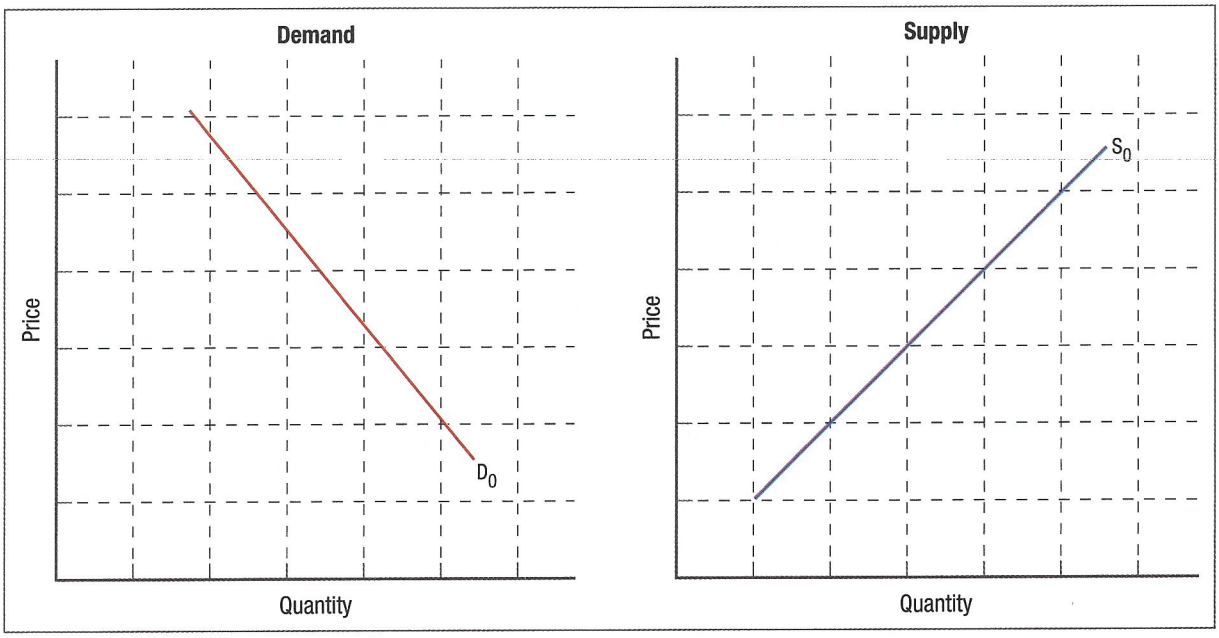


Phil Augustavo/iStockphoto

A literal mountain of surplus corn caused by agricultural price floors.

- Show a decrease in quantity demanded.
- What causes demand to change?
- What causes quantity demanded to change?

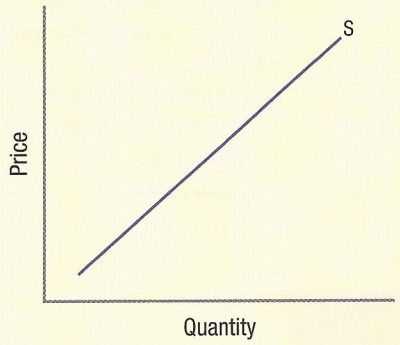
b. On the Supply panel:
- Show an increase in supply and label it S_1.
- Show a decrease in supply and label it S_2.
- Show an increase in quantity supplied.
- Show a decrease in quantity supplied.
- What causes supply to change?
- What causes quantity supplied to change?



10. Several medical studies have shown that drinking red wine in moderation is good for the heart. How would such a study affect the public's demand for wine? Would it have an impact on the type of grapes planted in new vineyards?
11. Assume initially that the demand and supply for premium coffees (one-pound bags) are in equilibrium. Now assume Starbucks introduces the world to premium blends, and so demand rises substantially. Describe what will happen in this market as it moves to a new equilibrium. If a hard freeze eliminates Brazil's premium coffee crop, what will happen to the price of premium coffee?
12. Over the past decade, cruise ship companies have dramatically increased the number of mega-ships (those that carry 3,000 passengers or more), increasing the supply of cruises. At the same time, the popularity of cruising has increased among consumers, increasing demand. Explain how these two effects can coincide with a decrease in the average price of cruise travel.

Section 3: Supply

Supply analysis works the same way as demand, but looking at the market from the firm's point of view.



The **law of supply** states that as prices increase, firms want to supply more, and vice versa. It leads to an upward-sloping supply curve.


Philip Gostelow/Aurora Photos/Corbis

Determinants of Supply: How Supply Curves Shift

- ↑ Production technology: Supply shifts right.
- ↑ Cost of resources: Supply shifts left.
- ↑ Price of other commodities: Supply shifts left.
- ↑ Price expectations: Supply shifts left.
- ↑ Number of sellers: Supply shifts right.
- ↑ Taxes: Supply shifts left.
- ↑ Subsidies: Supply shifts right.

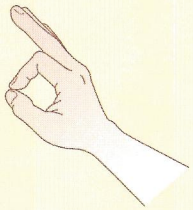
Section 4: Market Equilibrium

Market equilibrium occurs at the price at which the quantity supplied is equal to quantity demanded; in other words, where demand intersects supply.

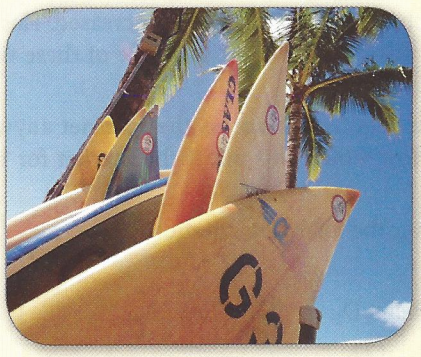
How does equilibrium change?

Which curve slopes up and which slopes down? Two tricks to aid in memory:

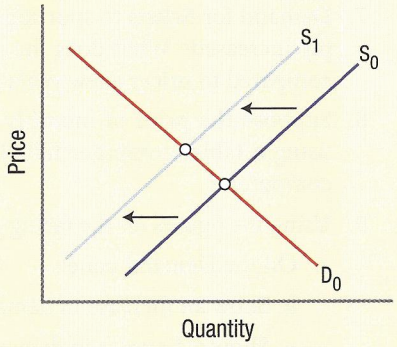
- S"up"ply contains the word "up" for upward-sloping.
- Only the fingers on your right hand can make a "d" for demand. Hold that hand up in front of you!



A shift in demand or supply will change equilibrium price and quantity.


Neil Emmerson/Robert Harding World Imagery/Corbis

Higher oil prices raise the cost of resins used to produce surfboards.



Supply of surfboards shifts left, raising equilibrium price and lowering equilibrium quantity.

Summary of Demand and Supply Shifts on Equilibrium Price and Quantity:

D shifts right:	P↑	Q↑
D shifts left:	P↓	Q↓
S shifts right:	P↓	Q↑
S shifts left:	P↑	Q↓