C H A P T E R 12

Monopolistic Competition and Oligopoly

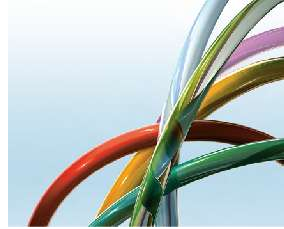### CHAPTER OUTLINE

Prepared by:

Fernando Quijano, Illustrator

- **monopolistic competition**   Market in which firms can enter freely, each producing its own brand or version of a differentiated product.

- **oligopoly**   Market in which only a few firms compete with one another, and entry by new firms is impeded.

- **cartel**   Market in which some or all firms explicitly collude, coordinating prices and output levels to maximize joint profits.

12.1 Monopolistic Competition

The Makings of Monopolistic Competition

A monopolistically competitive market has two key characteristics:

1. Firms compete by selling differentiated products that are highly substitutable for one another but not perfect substitutes. In other words, the cross-price elasticities of demand are large but not infinite.

2. There is free entry and exit: It is relatively easy for new firms to enter the market with their own brands and for existing firms to leave if their products become unprofitable.
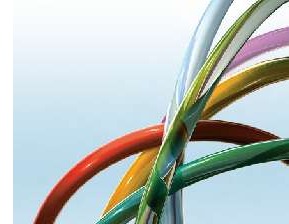
Equilibrium in the Short Run and the Long Run
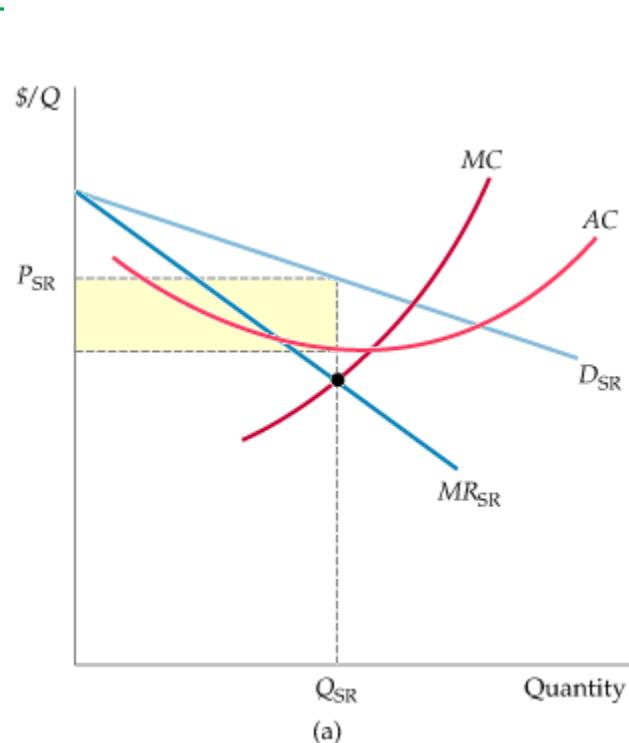
FIGURE 12.1 (1 of 2)

A MONOPOLISTICALLY COMPETITIVE FIRM IN THE SHORT AND LONG RUN

Because the firm is the only producer of its brand, it faces a downward-sloping demand curve.

Price exceeds marginal cost and the firm has monopoly power.

In the short run, described in part **(a)**, price also exceeds average cost, and the firm earns profits shown by the yellow-shaded rectangle.

Equilibrium in the Short Run and the Long Run
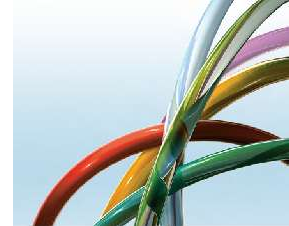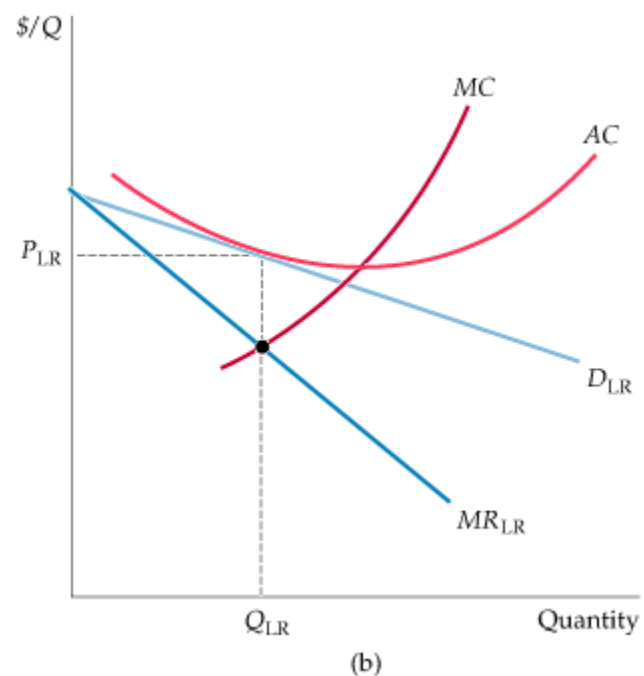
FIGURE 12.1 (2 of 2)

A MONOPOLISTICALLY COMPETITIVE FIRM IN THE SHORT AND LONG RUN

In the long run, these profits attract new firms with competing brands. The firm's market share falls, and its demand curve shifts downward.

In long-run equilibrium, described in part **(b)**, price equals average cost, so the firm earns zero profit even though it has monopoly power.
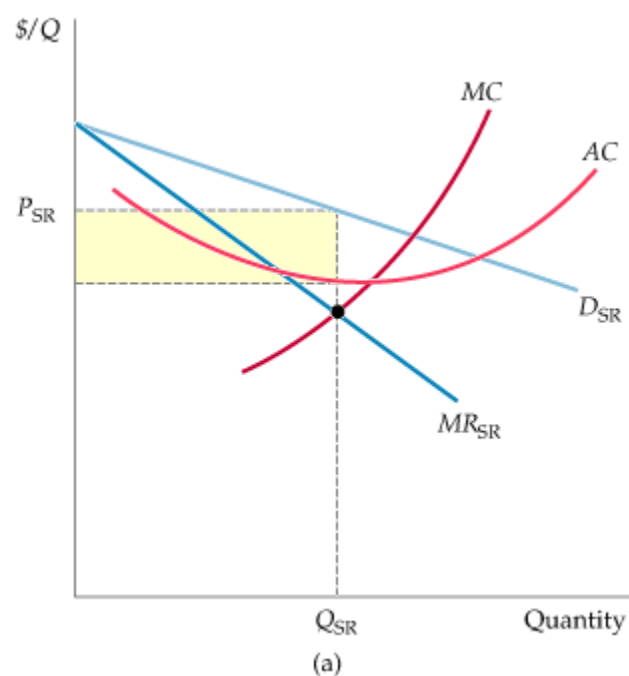
Monopolistic Competition and Economic Efficiency
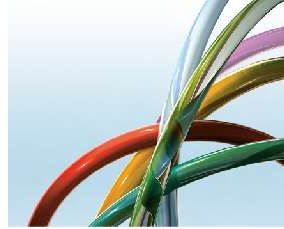
FIGURE 12.2 (1 of 2)

COMPARISON OF MONOPOLISTICALLY COMPETITIVE EQUILIBRIUM AND PERFECTLY COMPETITIVE EQUILIBRIUM

Under perfect competition, price equals marginal cost.

The demand curve facing the firm is horizontal, so the zero-profit point occurs at the point of minimum average cost.
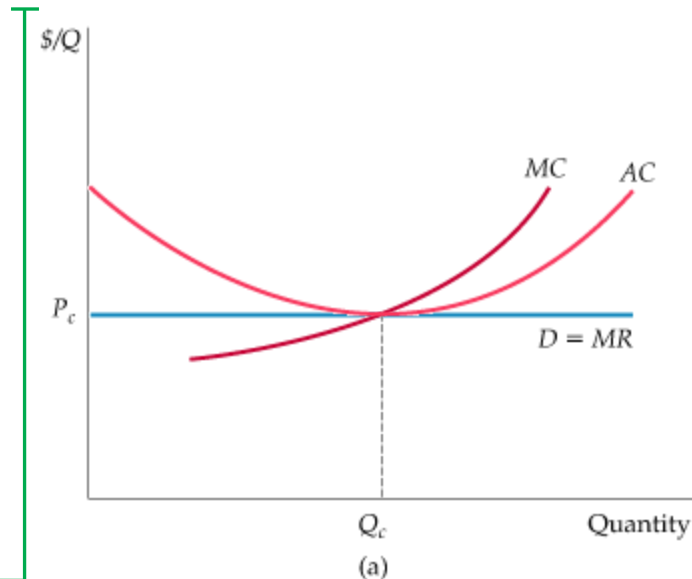
FIGURE 12.2 (2 of 2)

COMPARISON OF MONOPOLISTICALLY COMPETITIVE EQUILIBRIUM AND PERFECTLY COMPETITIVE EQUILIBRIUM
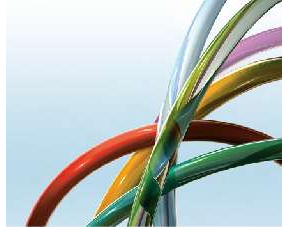
Under monopolistic competition, price exceeds marginal cost.

Thus there is a deadweight loss, as shown by the yellow-shaded area.

The demand curve is downward-sloping, so the zero profit point is to the left of the point of minimum average cost.
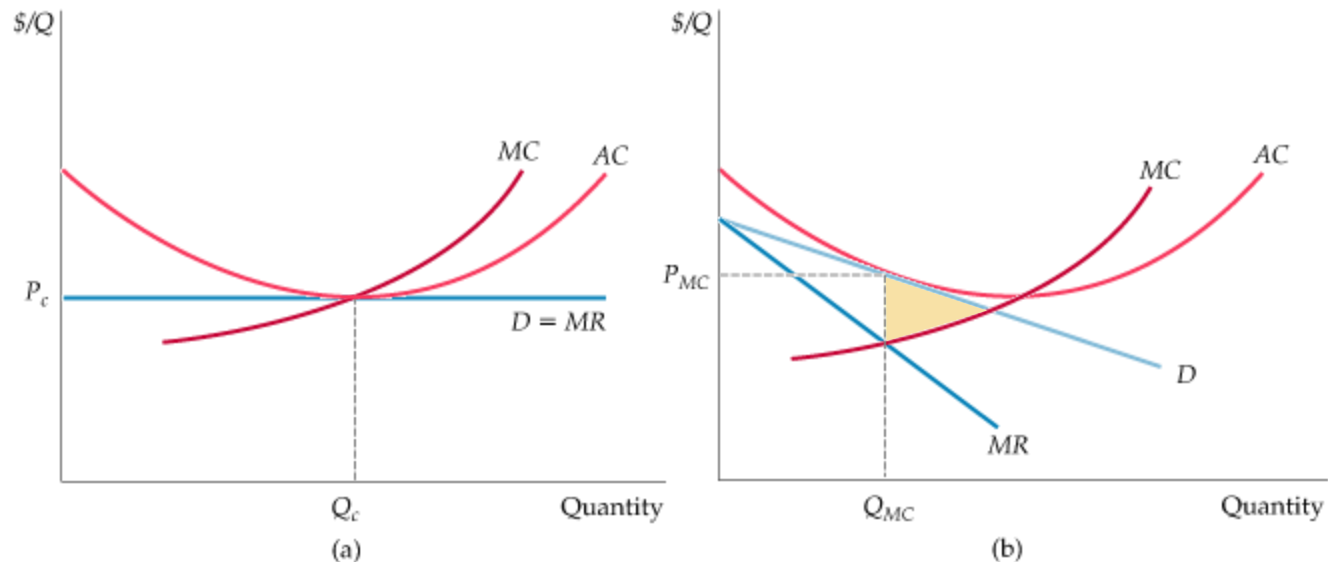
In both types of markets, entry occurs until profits are driven to zero.

Is monopolistic competition then a socially undesirable market structure that should be regulated? The answer—for two reasons—is probably no:

1. In most monopolistically competitive markets, monopoly power is small.

Usually enough firms compete, with brands that are sufficiently substitutable, so that no single firm has much monopoly power. Any resulting deadweight loss will therefore be small. And because firms' demand curves will be fairly elastic, average cost will be close to the minimum.

2. Any inefficiency must be balanced against an important benefit from monopolistic competition: product diversity.

Most consumers value the ability to choose among a wide variety of competing products and brands that differ in various ways. The gains from product diversity can be large and may easily outweigh the inefficiency costs resulting from downward-sloping demand curves.

EXAMPLE 12.1 **MONOPOLISTIC COMPETITION IN THE MARKETS FOR COLAS AND COFFEE**

The markets for soft drinks and coffee illustrate the characteristics of monopolistic competition. Each market has a variety of brands that differ slightly but are close substitutes for one another.

TABLE 12.1	ELASTICITIES OF DEMAND FOR COLAS AND COFFEE	
	BRAND	**ELASTICITY OF DEMAND**
Colas	RC Cola	–2.4
	Coke	–5.2 to –5.7
Ground coffee	Folgers	–6.4
	Maxwell House	–8.2
	Chock Full o' Nuts	–3.6

With the exception of RC Cola and Chock Full o' Nuts, all the colas and coffees are quite price elastic. With elasticities on the order of −4 to −8, each brand has only limited monopoly power. This is typical of monopolistic competition.

12.2 Oligopoly
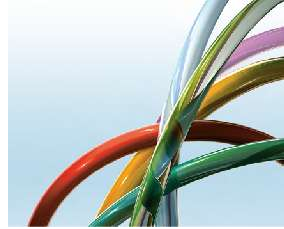
In oligopolistic markets, the products may or may not be differentiated.

What matters is that only a few firms account for most or all of total production.

In some oligopolistic markets, some or all firms earn substantial profits over the long run because barriers to entry make it difficult or impossible for new firms to enter.

Oligopoly is a prevalent form of market structure. Examples of oligopolistic industries include automobiles, steel, aluminum, petrochemicals, electrical equipment, and computers.

Scale economies may make it unprofitable for more than a few firms to coexist in the market; patents or access to a technology may exclude potential competitors; and the need to spend money for name recognition and market reputation may discourage entry by new firms. These are "natural" entry barriers—they are basic to the structure of the particular market. In addition, incumbent firms may take *strategic actions* to deter entry.

Managing an oligopolistic firm is complicated because pricing, output, advertising, and investment decisions involve important strategic considerations, which can be highly complex.

Equilibrium in an Oligopolistic Market
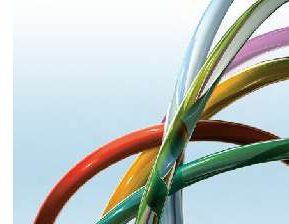
In an oligopolistic market, however, a firm sets price or output based partly on strategic considerations regarding the behavior of its competitors.

With some modification, the underlying principle to describe an equilibrium when firms make decisions that explicitly take each other's behavior into account is the same as the equilibrium in competitive and monopolistic markets: *When a market is in equilibrium, firms are doing the best they can and have no reason to change their price or outpu*t.

NASH EQUILIBRIUM

● **Nash equilibrium**   Set of strategies or actions in which each firm does the best it can given its competitors' actions.

Nash Equilibrium: Each firm is doing the best it can given what its competitors are doing.

● **duopoly**   Market in which two firms compete with each other.

The Cournot Model

● **Cournot model**   Oligopoly model in which firms produce a homogeneous good, each firm treats the output of its competitors as fixed, and all firms decide simultaneously how much to produce.

FIGURE 12.3

FIRM 1'S OUTPUT DECISION

Firm 1's profit-maximizing output depends on how much it thinks that Firm 2 will produce.

If it thinks Firm 2 will produce nothing, its demand curve, labeled $D_1(0)$, is the market demand curve. The corresponding marginal revenue curve, labeled $MR_1(0)$, intersects Firm 1's marginal cost curve MC_1 at an output of 50 units.

If Firm 1 thinks that Firm 2 will produce 50 units, its demand curve, $D_1(50)$, is shifted to the left by this amount. Profit maximization now implies an output of 25 units.

Finally, if Firm 1 thinks that Firm 2 will produce 75 units, Firm 1 will produce only 12.5 units.
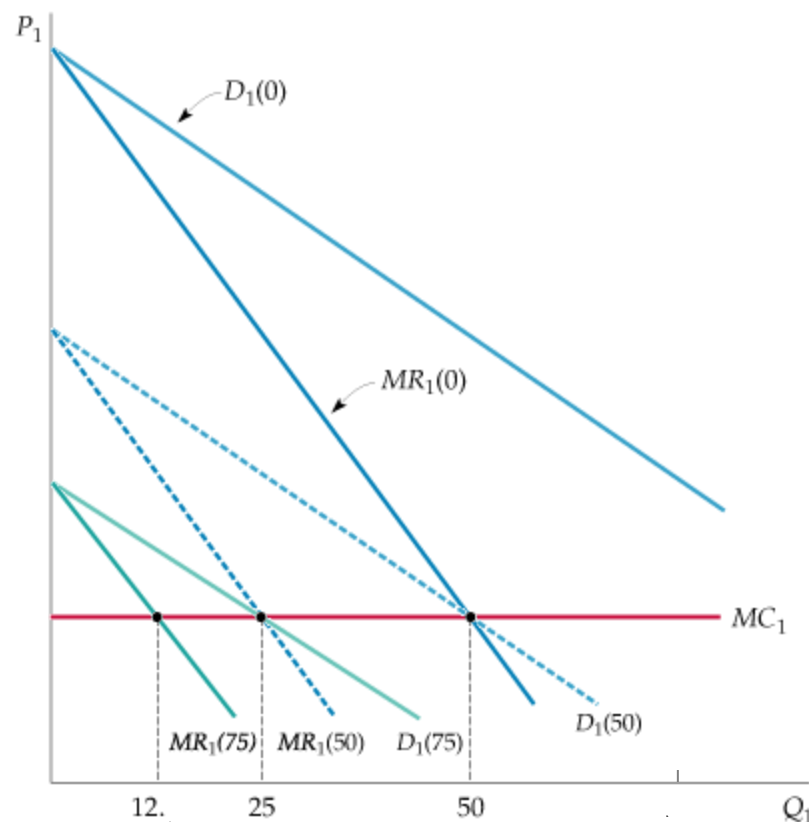
REACTION CURVES

● **reaction curve**   Relationship between a firm's profit-maximizing output and the amount it thinks its competitor will produce.

FIGURE 12.4

REACTION CURVES AND COURNOT EQUILIBRIUM

Firm 1's reaction curve shows how much it will produce as a function of how much it thinks Firm 2 will produce. (The xs at Q2 = 0, 50, and 75 correspond to the examples shown in Figure 12.3.)

Firm 2's reaction curve shows its output as a function of how much it thinks Firm 1 will produce.

In Cournot equilibrium, each firm correctly assumes the amount that its competitor will produce and thereby maximizes its own profits. Therefore, neither firm will move from this equilibrium.
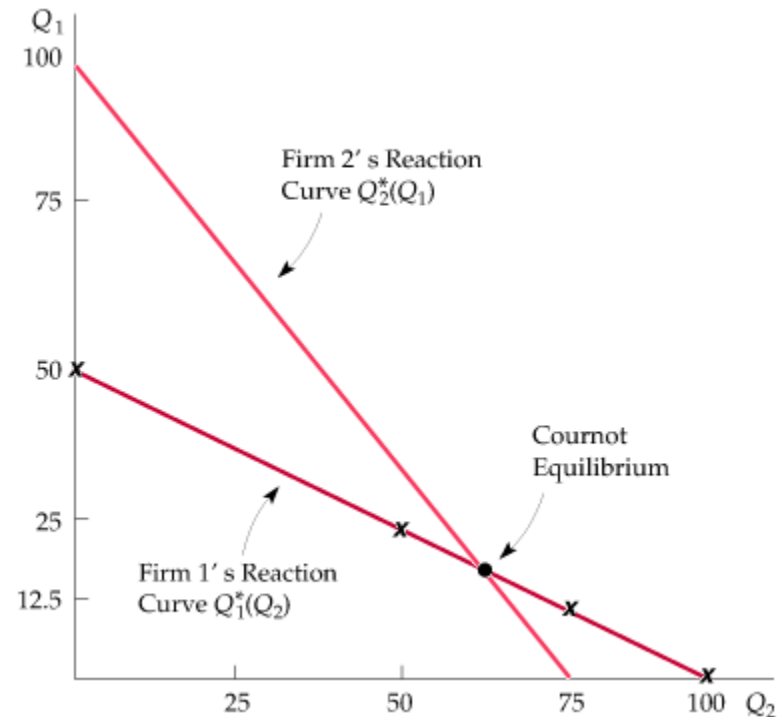
COURNOT EQUILIBRIUM

● **Cournot equilibrium**   Equilibrium in the Cournot model in which each firm correctly assumes how much its competitor will produce and sets its own production level accordingly.

Cournot equilibrium is an example of a Nash equilibrium (and thus it is sometimes called a *Cournot-Nash equilibrium*).

In a Nash equilibrium, each firm is doing the best it can given what its competitors are doing.

As a result, no firm would individually want to change its behavior. In the Cournot equilibrium, each firm is producing an amount that maximizes its profit *given what its competitor is producing*, so neither would want to change its output.

The Linear Demand Curve—An Example
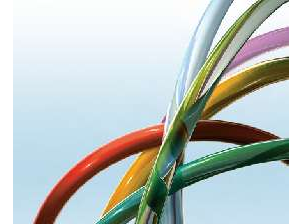
Two identical firms face the following market demand curve $P = 30 - Q$
Also, $MC_1 = MC_2 = 0$

Total revenue for firm 1: $R_1 = PQ_1 = (30 - Q)Q_1 = 30Q_1 - Q_1^2 - Q_2Q_1$

then $MR_1 = \Delta R_1 \ /\Delta Q_1 = 30 - 2Q_1 - Q_2$

Setting MR_1 = 0 (the firm's marginal cost) and solving for Q_1, we find

Firm 1's reaction curve: $Q_1 = 15 - \dfrac{1}{2}Q_2$ **(12.1)**

By the same calculation, *Firm 2's reaction curve:* $Q_2 = 15 - \dfrac{1}{2}Q_2$ **(12.2)**

Cournot equilibrium: $Q_1 = Q_2 = 10$

Total quantity produced: $Q = Q_1 + Q_2 = 20$

If the two firms collude, then the total profit-maximizing quantity is:

Total revenue for the two firms: $R = PQ = (30 - Q)Q = 30Q - Q^2$, then $MR_1 = \Delta R/\Delta Q = 30 - 2Q$

Setting MR = 0 (the firm's marginal cost) we find that total profit is maximized at $Q = 15$.

Then, $Q_1 + Q_2 = 15$ is the *collusion curve*.

If the firms agree to share profits equally, each will produce half of the total output:

$$Q_1 = Q_2 = 7.5$$

FIGURE 12.5

### DUOPOLY EXAMPLE

The demand curve is $P = 30 - Q$, and both firms have zero marginal cost. In Cournot equilibrium, each firm produces 10.
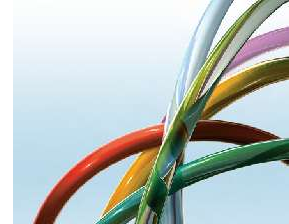
The collusion curve shows combinations of Q_1 and Q_2 that maximize total profits.

If the firms collude and share profits equally, each will produce 7.5.

Also shown is the competitive equilibrium, in which price equals marginal cost and profit is zero.
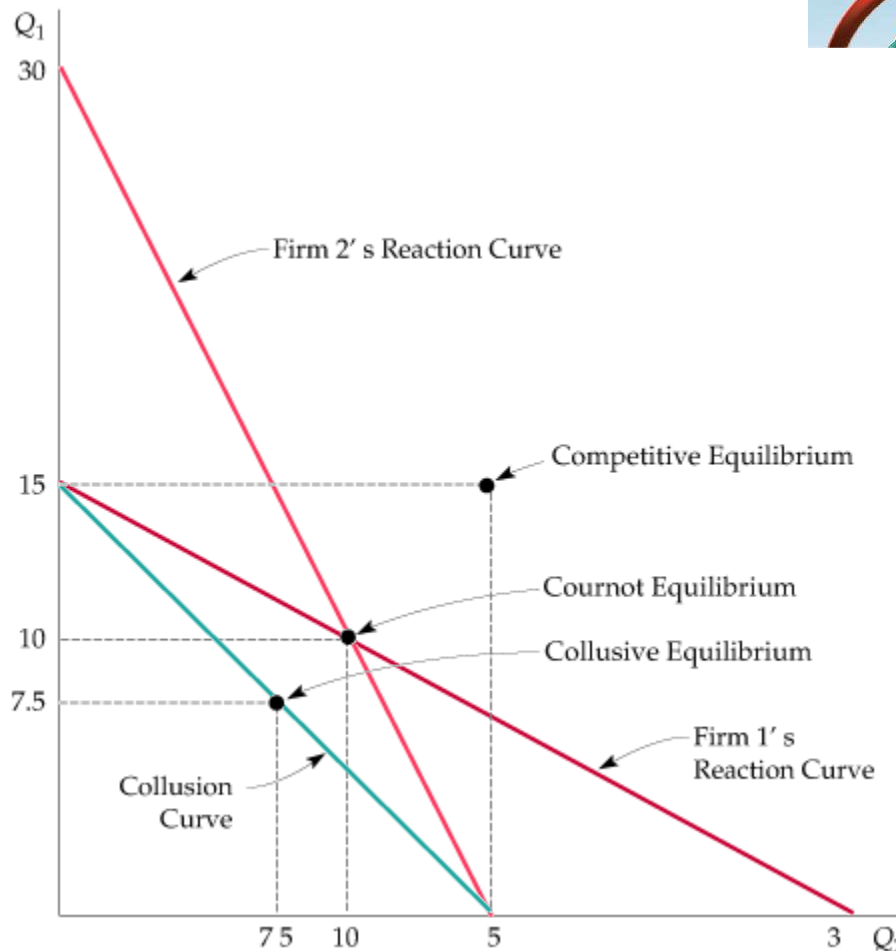
First Mover Advantage—The Stackelberg Model

● **Stackelberg model**   Oligopoly model in which one firm sets its output before other firms do.

Suppose Firm 1 sets its output first and then Firm 2, after observing Firm 1's output, makes its output decision. In setting output, Firm 1 must therefore consider how Firm 2 will react.

$P = 30 - Q$

Also, $MC_1 = MC_2 = 0$

Firm 2's reaction curve: $Q_2 = 15 - \dfrac{1}{2}Q_1$ **(12.2)**

Firm 1's revenue: $R_1 = PQ_1 = 30Q_1 - Q_1^2 - Q_2Q_1$ **(12.3)**

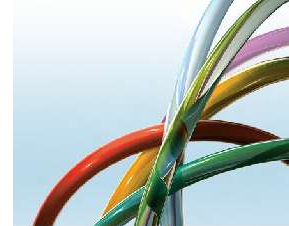$$R_1 = 30Q_1 - Q_1^2 - Q_1\left(15 - \frac{1}{2}Q_1\right) = 15Q_1 - \frac{1}{2}Q_1^2$$

$$MR_1 = \Delta R_1/\Delta Q_1 = 15 - Q_1 \qquad \textbf{(12.4)}$$

Setting $MR_1 = 0$ gives $Q_1 = 15$, and $Q_2 = 7.5$

We conclude that Firm 1 produces twice as much as Firm 2 and makes twice as much profit. *Going first gives Firm 1 an advantage.*

12.3 Price Competition

Price Competition with Homogeneous Products—The Bertrand Model

● **Bertrand model**   Oligopoly model in which firms produce a homogeneous good, each firm treats the price of its competitors as fixed, and all firms decide simultaneously what price to charge.

Let's return to the duopoly example of the last section.

$$P = 30 - Q$$

$$MC_1 = MC_2 = \$3$$

$Q_1 = Q_2 = 9$, and in Cournot equilibrium, the market price is \$12, so that each firm makes a profit of \$81.

Now suppose that these two duopolists compete by simultaneously choosing a *price* instead of a quantity.

Nash equilibrium in the Bertrand model results in both firms setting price equal to marginal cost: $P_1 = P_2 = \$3$. Then industry output is 27 units, of which each firm produces 13.5 units, and both firms earn zero profit.

In the Cournot model, because each firm produces only 9 units, the market price is \$12. Now the market price is \$3. In the Cournot model, each firm made a profit; in the Bertrand model, the firms price at marginal cost and make no profit.

Price Competition with Differentiated Products
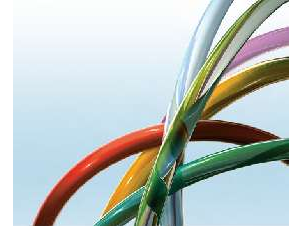
Suppose each of two duopolists has fixed costs of $20 but zero variable costs, and that they face the same demand curves:

Firm 1's demand:

$$Q_1 = 12 - 2P_1 + P_2$$

Firm 2's demand:

$$Q_2 = 12 - 2P_2 + P_1$$

CHOOSING PRICES

Firm 1's profit:

$$\pi_1 = P_1 Q_1 - 20 = 12P_1 - 2P_1^2 - 20$$

Firm 1's profit maximizing price:

$$\Delta\pi_1 / \Delta P_1 = 12 - 4P_1 + P_2 = 0$$

Firm 1's *reaction curve*:

$$P_1 = 3 + \frac{1}{4}P_2$$

Firm 2's *reaction curve*:

$$P_2 = 3 + \frac{1}{4}P_1$$

FIGURE 12.6

NASH EQUILIBRIUM IN PRICES

Here two firms sell a differentiated product, and each firm's demand depends both on its own price and on its competitor's price. The two firms choose their prices at the same time, each taking its competitor's price as given.

Firm 1's reaction curve gives its profit-maximizing price as a function of the price that Firm 2 sets, and similarly for Firm 2.

The Nash equilibrium is at the intersection of the two reaction curves: When each firm charges a price of $4, it is doing the best it can given its competitor's price and has no incentive to change price.

Also shown is the collusive equilibrium: If the firms cooperatively set price, they will choose $6.
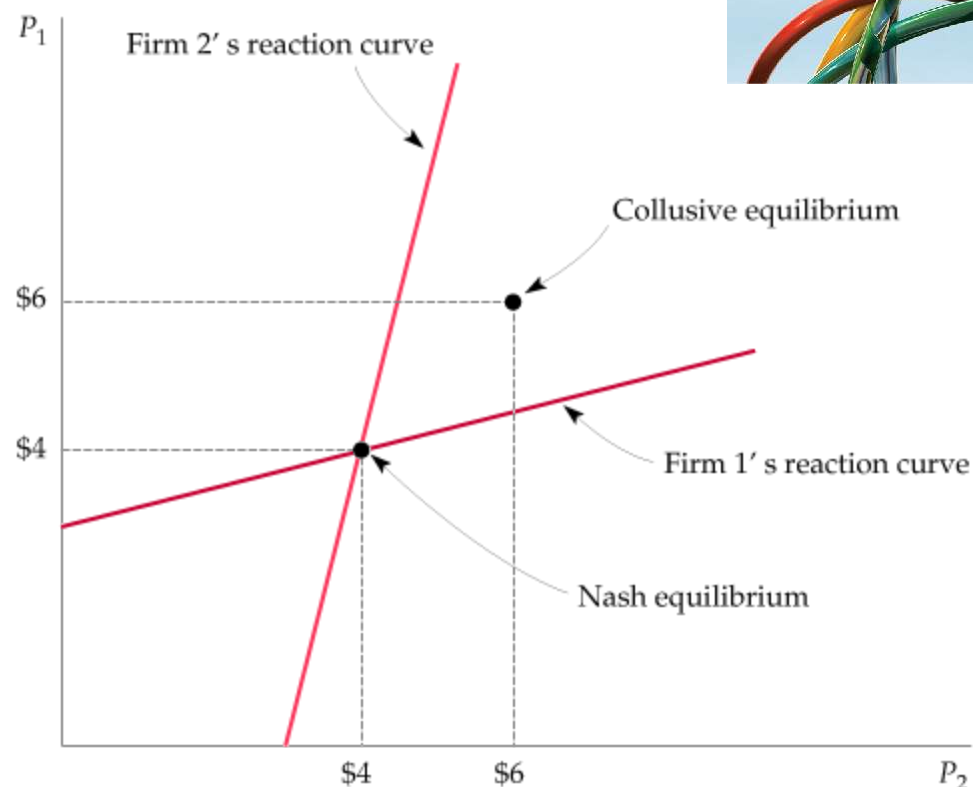
The firms have the same costs, so they will charge the same price P. Total profit is given by
$\pi T = \pi_1 + \pi_2 = 24P - 4P_2 + 2P_2 - 40 = 24P - 2P_2 - 40$.
This is maximized when $\pi_T/P = 0$. $\pi_T/P = 24 - 4P$, so the joint profit-maximizing price is
$P = \$6$. Each firm's profit is therefore
$\pi_1 = \pi_2 = 12P - P^2 - 20 = 72 - 36 - 20 = \$16$

EXAMPLE 12.2   A PRICING PROBLEM FOR PROCTER & GAMBLE

P&G's demand curve for monthly sales: $Q = 3375P^{-3.5}(P_U)^{.25}(P_K)^{.25}$

Assuming that P&G's competitors face the same demand conditions, *with what price should you enter the market, and how much profit should you expect to earn*?

TABLE 12.2	P&G'S PROFIT (IN THOUSANDS OF DOLLARS PER MONTH)							
	COMPETITOR'S (EQUAL) PRICES ($)							
P& G's Price ($)	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80
1.10	−226	−215	−204	−194	−183	−174	−165	−155
1.20	−106	−89	−73	−58	−43	−28	−15	−2
1.30	−56	−37	−19	2	15	31	47	62
1.40	−44	−25	−6	12	29	46	62	78
1.50	−52	−32	−15	3	20	34	52	68
1.60	−70	−51	−34	−18	−1	14	30	44
1.70	−93	−76	−59	−44	−28	−13	1	15
1.80	−118	−102	−87	−72	−57	−44	−30	−17

$1.40 is the price at which your competitors are doing the best *they* can, so it is a Nash equilibrium. As the table shows, in this equilibrium you and your competitors each make a profit of $12,000 per month. If you could *collude* with your competitors, you could make a larger profit. You would all agree to charge $1.50, and each of you would earn $20,000.

12.4 Competition versus Collusion: The Prisoners' Dilemma
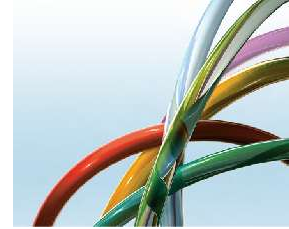
In our example, there are two firms, each of which has fixed costs of $20 and zero variable costs. They face the same demand curves:

Firm 1's demand: $Q_1 = 12 - 2P_1 + P_2$

Firm 2's demand: $Q_2 = 12 - 2P_2 + P_1$

We found that in Nash equilibrium each firm will charge a price of $4 and earn a profit of $12, whereas if the firms collude, they will charge a price of $6 and earn a profit of $16.

$$\pi_2 = P_2 Q_2 - 20 = (4)[(12 - (2)(4) + 6] - 20 = \$20$$
$$\pi_1 = P_1 Q_1 - 20 = (6)[12 - (2)(6) + 4] - 20 = \$4$$

So if Firm 1 charges $6 and Firm 2 charges only $4, Firm 2's profit will increase to $20. And it will do so at the expense of Firm 1's profit, which will fall to $4.

PAYOFF MATRIX

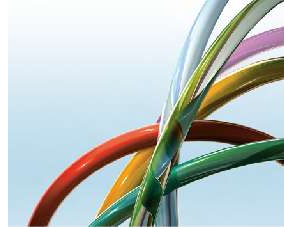● **noncooperative game**   Game in which negotiation and enforcement of binding contracts are not possible.

● **payoff matrix**   Table showing profit (or payoff) to each firm given its decision and the decision of its competitor.

TABLE 12.3	PAYOFF MATRIX FOR PRICING GAME		
		FIRM 2	
		CHARGE $4	CHARGE $6
Firm 1	Charge $4	$12, $12	$20, $4
	Charge $6	$4, $20	$16, $16

THE PRISONERS' DILEMMA

● **prisoners' dilemma**   Game theory example in which two prisoners must decide separately whether to confess to a crime; if a prisoner confesses, he will receive a lighter sentence and his accomplice will receive a heavier one, but if neither confesses, sentences will be lighter than if both confess.

TABLE 12.4	PAYOFF MATRIX FOR PRISONERS' DILEMMA	
	PRISONER B	
	CONFESS	**DON'T CONFESS**
Prisoner A Confess	−5, −5	−1, −10
Don't confess	−10, −1	−2, −2

If Prisoner *A* does not confess, he risks being taken advantage of by his former accomplice. After all, *no matter what Prisoner* A *does, Prisoner* B *comes out ahead by confessing.* Likewise, Prisoner *A* always comes out ahead by confessing, so Prisoner *B* must worry that by not confessing, she will be taken advantage of. Therefore, both prisoners will probably confess and go to jail for five years. Oligopolistic firms often find themselves in a prisoners' dilemma.

EXAMPLE 12.3   PROCTER & GAMBLE IN A PRISONERS' DILEMMA

We argued that P&G should expect its competitors to charge a price of $1.40 and should do the same. But P&G would be better off if it and its competitors all charged a price of $1.50.

TABLE 12.5	PAYOFF MATRIX FOR PRICING PROBLEM	
	UNILEVER AND Kao	
	CHARGE $1.40	**CHARGE $1.50**
P&G Charge $1.40	$12, $12	$29, $11
Charge $1.50	$3, $21	$20, $20

Since these firms are in a prisoners' dilemma, it doesn't matter what Unilever and Kao do. P&G makes more money by charging $1.40.

12.5 Implications of the Prisoners' Dilemma for Oligopolistic Pricing

Does the prisoners' dilemma doom oligopolistic firms to aggressive competition and low profits? Not necessarily. Although our imaginary prisoners have only one opportunity to confess, most firms set output and price over and over again, continually observing their competitors' behavior and adjusting their own accordingly. This allows firms to develop reputations from which trust can arise. As a result, oligopolistic coordination and cooperation can sometimes prevail.

Price Rigidity

● **price rigidity**   Characteristic of oligopolistic markets by which firms are reluctant to change prices even if costs or demands change.

● **kinked demand curve model**   Oligopoly model in which each firm faces a demand curve kinked at the currently prevailing price: at higher prices demand is very elastic, whereas at lower prices it is inelastic.

FIGURE 12.7

THE KINKED DEMAND CURVE

Each firm believes that if it raises its price above the current price P^*, none of its competitors will follow suit, so it will lose most of its sales.
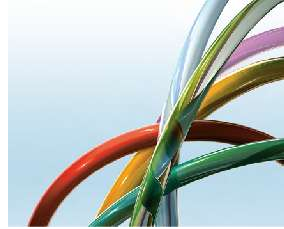
Each firm also believes that if it lowers price, everyone will follow suit, and its sales will increase only to the extent that market demand increases.

As a result, the firm's demand curve D is kinked at price P^*, and its marginal revenue curve MR is discontinuous at that point.

If marginal cost increases from MC to MC', the firm will still produce the same output level Q^* and charge the same price P^*.
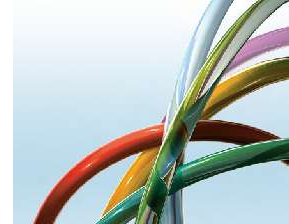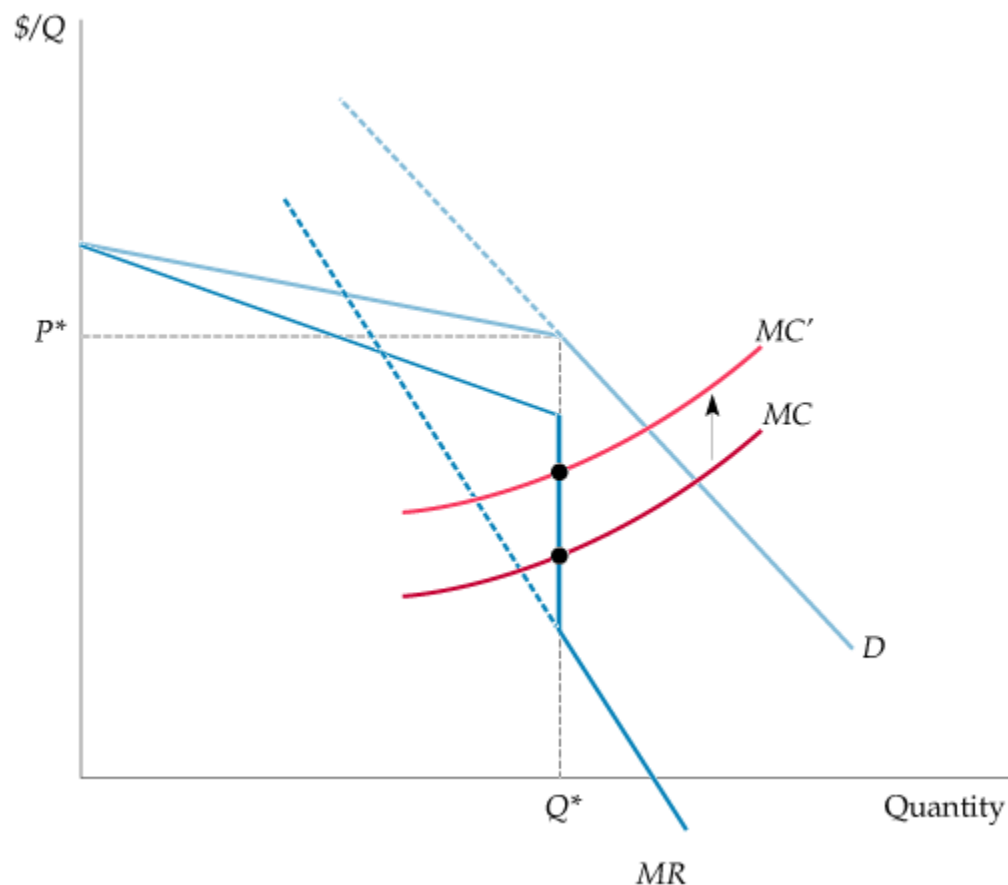
Price Signaling and Price Leadership

- **price signaling**   Form of implicit collusion in which a firm announces a price increase in the hope that other firms will follow suit.

- **price leadership**   Pattern of pricing in which one firm regularly announces price changes that other firms then match.

In some industries, a large firm might naturally emerge as a leader, with the other firms deciding that they are best off just matching the leader's prices, rather than trying to undercut the leader or each other.

Price leadership can also serve as a way for oligopolistic firms to deal with the reluctance to change prices, a reluctance that arises out of the fear of being undercut or "rocking the boat."

EXAMPLE 12.4

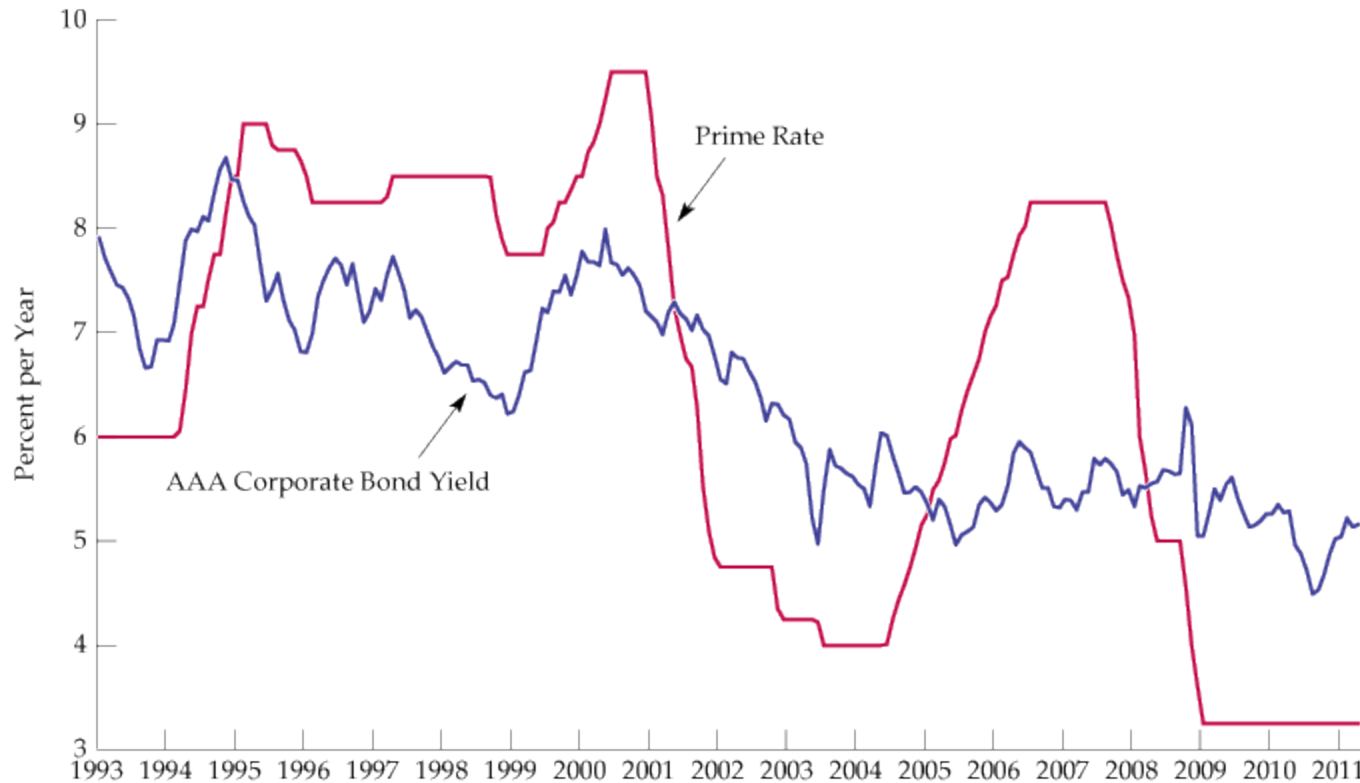# PRICE LEADERSHIP AND PRICE RIGIDITY IN COMMERCIAL BANKING


FIGURE 12.8

PRIME RATE VERSUS CORPORATE BOND RATE

The prime rate is the rate that major banks charge large corporate customers for short-term loans. It changes only infrequently because banks are reluctant to undercut one another. When a change does occur, it begins with one bank, and other banks quickly follow suit.

The corporate bond rate is the return on long-term corporate bonds. Because these bonds are widely traded, this rate fluctuates with market conditions.

EXAMPLE 12.5   THE PRICES OF COLLEGE TEXTBOOKS

Most textbooks sold in the United States have retail prices in the $200 range. In fact even other microeconomics textbooks—which are clearly inferior to this one—sell for around $200. Publishing companies set the prices of their textbooks, so should we expect competition among publishers to drive down prices? Partly because of mergers and acquisitions over the last decade or so, college textbook publishing is an oligopoly.
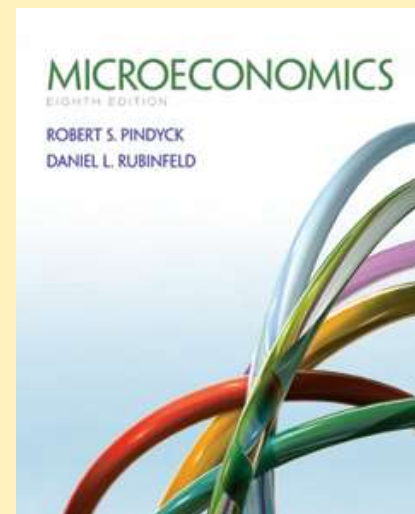
These publishers have an incentive to avoid a price war that could drive prices down. The best way to avoid a price war is to avoid discounting and to increase prices in lockstep on a regular basis. The retail bookstore industry is also highly concentrated, and the retail markup on textbooks is around 30 percent. Thus a $200 retail price implies that the publisher is receiving a net (wholesale) price of about $150. The elasticity of demand is low, because the instructor chooses the textbook, often disregarding the price. On the other hand, if the price is too high, some students will buy a used book or decide not to buy the book at all.
In fact, it might be the case that publishers could earn more money by *lowering* textbook prices. So why don't they do that? First, that might lead to a dreaded price war. Second, publishers might not have read this book!

The Dominant Firm Model

● **dominant firm** Firm with a large share of total sales that sets price to maximize profits, taking into account the supply response of smaller firms.

FIGURE 12.9

PRICE SETTING BY A DOMINANT FIRM

The dominant firm sets price, and the other firms sell all they want at that price. The dominant firm's demand curve, D_D, is the difference between market demand D and the supply of fringe firms S_F.

The dominant firm produces a quantity Q_D at the point where its marginal revenue MR_D is equal to its marginal cost MC_D.

The corresponding price is P^*.

At this price, fringe firms sell Q_F

so that total sales equal Q_T.
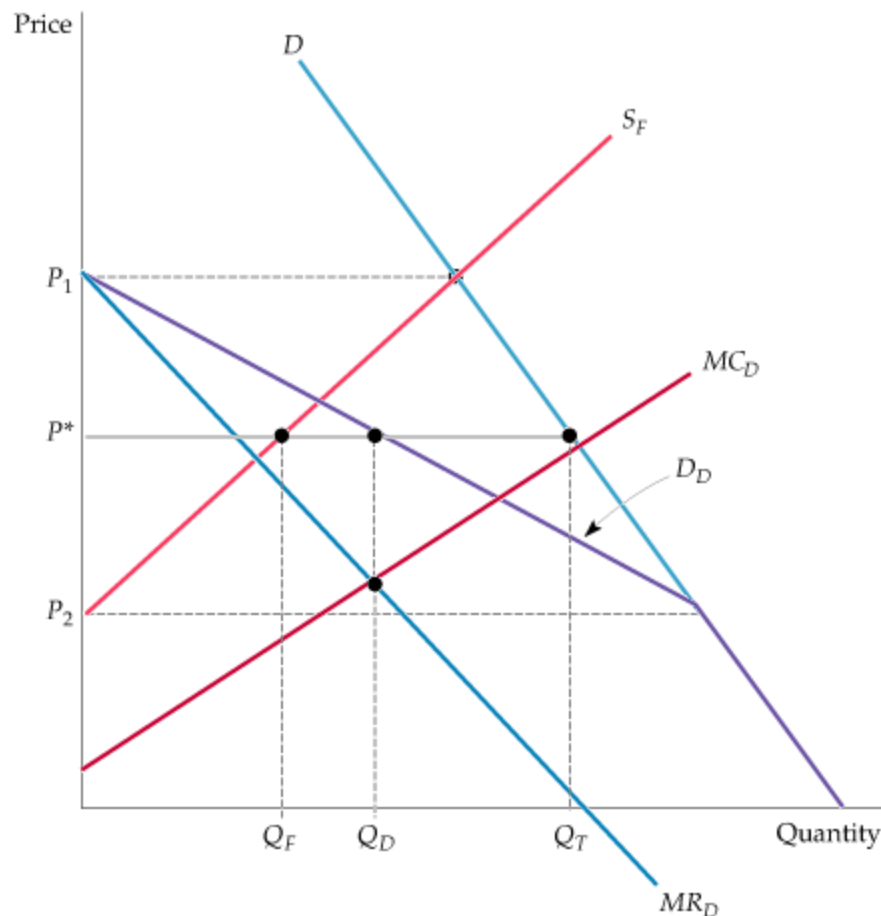
12.6 Cartels

Producers in a *cartel* explicitly agree to cooperate in setting prices and output levels.

If enough producers adhere to the cartel's agreements, and if market demand is sufficiently inelastic, the cartel may drive prices well above competitive levels.

Cartels are often international. While U.S. antitrust laws prohibit American companies from colluding, those of other countries are much weaker and are sometimes poorly enforced. Furthermore, nothing prevents countries, or companies owned or controlled by foreign governments, from forming cartels. For example, the OPEC cartel is an international agreement among oil-producing countries which has succeeded in raising world oil prices above competitive levels.

CONDITIONS FOR CARTEL SUCCESS
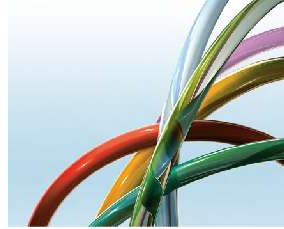
First, a stable cartel organization must be formed whose members agree on price and production levels and then adhere to that agreement.

The second condition, and may be the most important, is the potential for monopoly power. Even if a cartel can solve its organizational problems, there will be little room to raise price if it faces a highly elastic demand curve.

Analysis of Cartel Pricing

Cartel pricing can be analyzed by using the dominant firm model discussed earlier. We will apply this model to two cartels, the OPEC oil cartel and the CIPEC copper cartel. This will help us understand why OPEC was successful in raising price while CIPEC was not.

ANALYZING OPEC

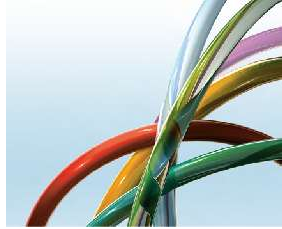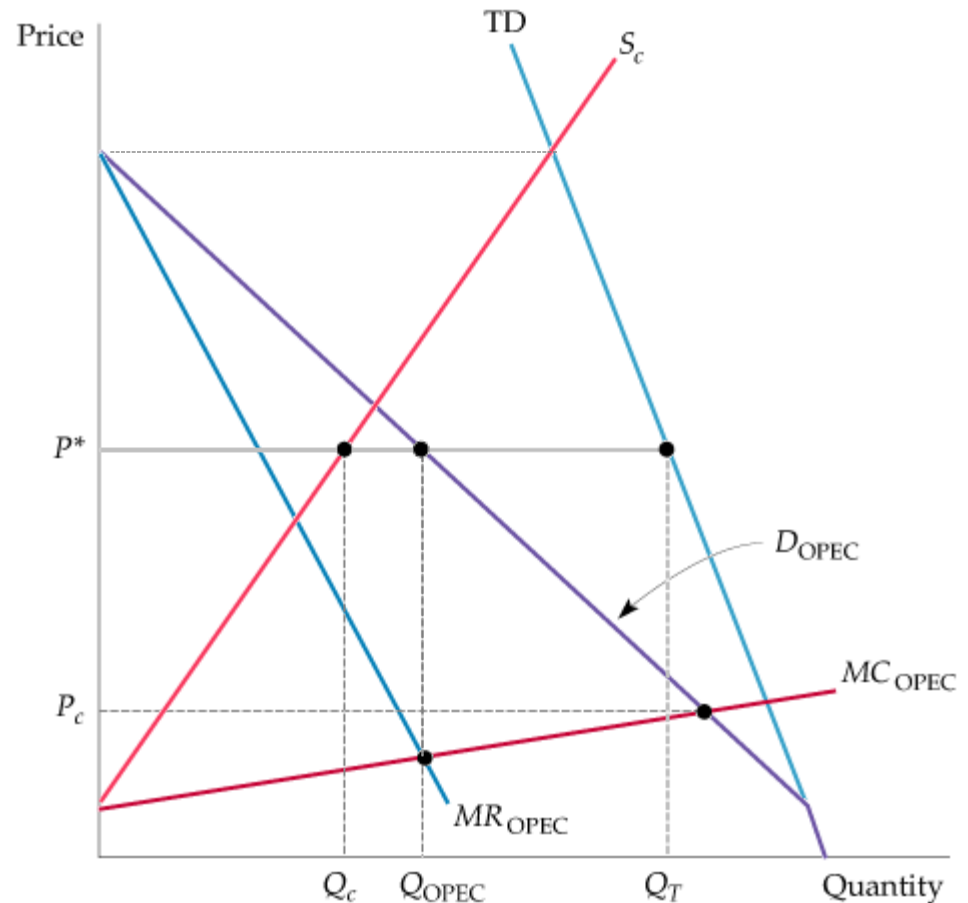### FIGURE 12.10

THE OPEC OIL CARTEL

TD is the total world demand curve for oil, and S_C is the competitive (non-OPEC) supply curve.

OPEC's demand DOPEC is the difference between the two.

Because both total demand and competitive supply are inelastic, OPEC's demand is inelastic.

OPEC's profit-maximizing quantity Q_{OPEC} is found at the intersection of its marginal revenue and marginal cost curves; at this quantity, OPEC charges price P^*.

If OPEC producers had not cartelized, price would be P_c, where OPEC's demand and marginal cost curves intersect.

FIGURE 12.11

**THE CIPEC COPPER CARTEL**

TD is the total demand for copper and S_c is the competitive (non-CIPEC) supply.

CIPEC's demand D_{CIPEC} is the difference between the two.

Both total demand and competitive supply are relatively elastic, so CIPEC's demand curve is elastic, and CIPEC has very little monopoly power.

Note that CIPEC's optimal price P^* is close to the competitive price P_c.
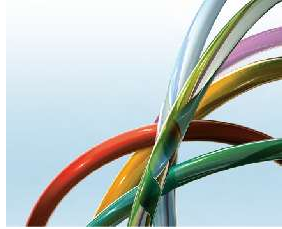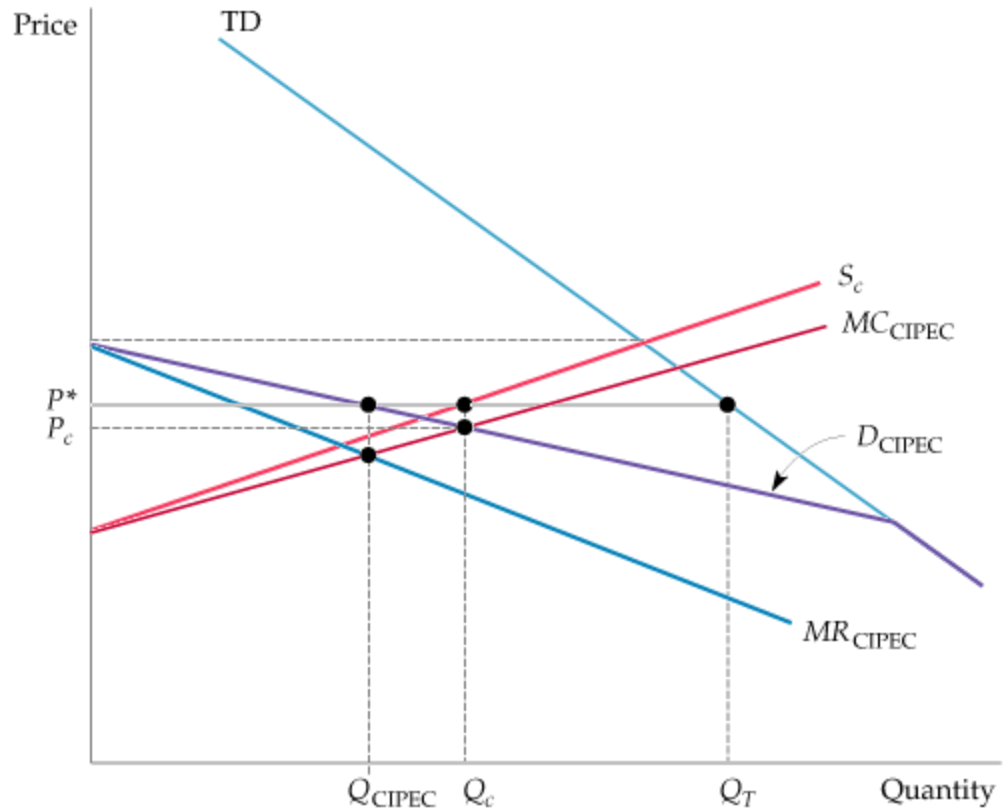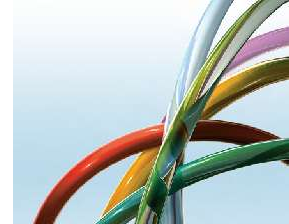
As the examples of OPEC and CIPEC illustrate, successful cartelization requires two things:

First, the total demand for the good must not be very price elastic.

Second, either the cartel must control nearly all the world's supply or, if it does not, the supply of noncartel producers must not be price elastic.

Most international commodity cartels have failed because few world markets meet both conditions.

EXAMPLE 12.6 **THE CARTELIZATION OF INTERCOLLEGIATE ATHLETICS**

Intercollegiate athletics is a big—and an extremely profitable—industry. Like any industry, intercollegiate athletics has firms and consumers. The "firms" are the universities that support and finance teams. The inputs to production are the coaches, student athletes, and capital in the form of stadiums and playing fields. The consumers are the fans and the TV and radio networks.

There are many firms and consumers, which suggests that the industry is competitive. But the persistently high level of profits in this industry is inconsistent with competition. This profitability is the result of monopoly power, obtained via cartelization.

The cartel organization is the National Collegiate Athletic Association (NCAA). The NCAA restricts competition in a number of important ways. To reduce bargaining power by student athletes, the NCAA creates and enforces rules regarding eligibility and terms of compensation. To reduce competition by universities, it limits the number of games that can be played each season and the number of teams that can participate in each division. And to limit price competition, the NCAA positioned itself as the sole negotiator of all football television contracts.

EXAMPLE 12.6 THE CARTELIZATION OF INTERCOLLEGIATE ATHLETICS

In 1984, however, the Supreme Court ruled that the NCAA's monopolization of football television contracts was illegal, allowing individual universities to negotiate their own contracts. The ensuing competition led to an increase in the amount of college football shown on television, but a drop in the contract fees paid to schools.

The NCAA still negotiates fees for other televised collegiate sports; in 2010, CBS and Turner Broadcasting signed a $10.8 billion deal with the NCAA to cover the Division I Men's Basketball Championship for 14 years.

The NCAA's anticompetitive practices have come under numerous attacks.

In 2005, the National Invitation Tournament (NIT), a college basketball tournament operated by the Metropolitan Intercollegiate Basketball Committee, challenged the NCAA's rule that effectively forced schools invited to its tournament to boycott the NIT.

In 2007, the NCAA was sued by 11,500 Division I football and basketball players claiming that it illegally fixed the price of an athletic scholarship below the cost of a college education. According to the players, the NCAA shortchanged them, on average, $2,500 a year because of its arbitrary limit on scholarships.

EXAMPLE 12.7 THE MILK CARTEL

The U.S. government has supported the price of milk since the Great Depression and continues to do so today. The government, however, scaled back price supports during the 1990s, and as a result, wholesale prices of milk have fluctuated more widely. Not surprisingly, farmers have been complaining.

In response to these complaints, in 1996 the federal government allowed milk producers in the six New England states to cartelize. The cartel—called the Northeast Interstate Dairy Compact—set minimum wholesale prices for milk, and was exempt from the antitrust laws. The result was that consumers in New England paid more for a gallon of milk than consumers elsewhere in the nation.

Studies have suggested that the cartel in the New England states has caused retail prices of milk to rise by only a few cents a gallon. Why so little? The reason is that the New England cartel is surrounded by a fringe of noncartel producers.

Congress ended the Northeast Interstate Dairy Compact in October 2001. Although proponents of the Compact attempted to revive the cartel, opposition in Congress has been strong. Nonetheless, milk production continues to benefit from federal price supports