



iStockphoto/Thinkstock

Monopolistic Competition and Oligopoly

Learning Objectives

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

- Describe the characteristics of monopolistic competition.
- Explain why interdependence is unique to oligopoly.
- Understand why government policy is often necessary to assure the success of a cartel.
- Use game theory to understand oligopolistic behavior.
- Describe how and why equilibrium price and output under monopolistic competition and oligopoly differ from that of perfect competition.

Introduction

Consider this. . . What's in a brand name? Do you have a favorite soap, aspirin, breakfast food, or cola? When you get right down to it, a bar of soap is pretty much a bar of soap. An aspirin is pretty much an aspirin and a cola is pretty much a cola. Maybe including colas is taking it too far—to some people one cola is not the same as any other cola. A few decades ago Coke introduced a new cola, and some of its customers revolted; some of them even hoarded cases of the original version of the cola. Coke eventually gave up and brought back the old favorite as *Coca-Cola Classic*. To these consumers, one cola was definitely not the same as any other.

To the owner of a brand name, the important question is how much different is the product that has the brand identification. Is it a quarter different? Would you pay 25 cents more for a bar of Dove soap? Would you pay a dollar more per bar? How much would you be willing to pay to buy Tylenol over the generic acetaminophen? Perhaps two dollars more? Clearly the value of the brand disappears at some price. Even a product with a brand name is still subject to the forces of supply and demand in a competitive market.

We have just seen in Chapters 9 and 10 that there are no perfect real-world examples of either perfect competition or monopoly. For many years, however, all real-world industries were analyzed in terms of these two models. In the 1930s, theories were developed that filled out the spectrum between monopoly and perfect competition. Market structures between the two theoretical extremes are called imperfect competition. Economists divide imperfect competition into monopolistic competition and oligopoly. We will study these two market structures in this chapter.

11.1 What Is an Industry?

We have, up to this point, been using the term industry without carefully defining it. In general, an **industry** is a group of firms producing the same, or at least similar, products. The difficulty with this definition is that it does not specify how dissimilar products must be before they are thought of as being produced in different industries. Consider containers. Are firms producing glass bottles and aluminum cans similar enough to be included in the container industry? How about firms making paper cups or even pewter mugs? Most consumers regard pewter mugs and paper cups as quite different. If you are willing to pay substantially more for a pewter mug than for a paper cup, you regard them as being distinct products. What about a plastic Ronald McDonald glass? Is it closer to a paper cup or a pewter mug? These questions demonstrate that whatever scope is assigned to an industry will be arbitrary to some extent. Some people, even some economists, may disagree with a classification of two products as belonging to the same industry or to different industries.

Cross elasticity of demand, a concept we discussed earlier, can be useful in determining whether products belong to the same industry. If the cross elasticity of demand between two products is positive, the goods are substitutes. Goods that are close substitutes have

a positive and very high cross elasticity of demand. If economists could agree on a value of this cross elasticity that would define goods as belonging to the same industry—again an arbitrary decision—they could use that number to draw the boundaries between industries.

The problem of assigning firms to industries is made even more difficult by the fact that some multiproduct firms produce a variety of goods that might be included in different industries. In which industry is a firm that produces coffee in addition to soap and cake mixes? General Electric produces goods as unrelated as jet engines and toasters. Informed judgments and somewhat arbitrary definitions are necessary in order to move from the world of theory into the real world of industry studies.

11.2 Industry Structure

Once an industry has been defined, it is possible to determine its market structure, or where it lies on the spectrum from perfect competition to monopoly. The structure will depend on several characteristics of the industry. The degree of concentration and conditions of entry are especially important characteristics. Entry affects concentration because high barriers to entry result in a more concentrated industry.

Economics in Action: What's in Between?

There is a drastic difference between monopolies (one seller) and perfect competition (many sellers). Are there opportunities for any markets that fall in between these two? The Khan Academy explains the various markets at <http://www.khanacademy.org/finance-economics/microeconomics/v/oligopolies-and-monopolistic-competition>.

Concentration Ratios

Concentration refers to the extent to which a certain number of firms dominate sales in a given market. Measures of concentration have, for many years, been a major tool of industry studies. A **concentration ratio** is used by economists to provide a measure of the distribution of economic power among firms in an oligopolistic market. To calculate a concentration ratio, the economist lists all the firms in a particular industry in order of decreasing size. The next step is to calculate the percentage of that industry's total sales accounted for by a certain number of the largest firms. For example, a four-firm concentration ratio measures the percentage of sales accounted for by the four largest firms in an industry. Other commonly used concentration ratios are for the largest firm, the three largest firms, the eight largest firms, and so on. Most industry studies employ four-firm ratios. Table 11.1 gives four-firm concentration ratios for a few industries.

Table 11.1: Four-firm concentration ratios for selected industries	
Product	Concentration ratio
Automobiles	94%
Chewing gum	93
Window glass	89
Sewing machines	82
Detergent (household)	80
Tires	71
Canned beer	66

Federal Trade Commission. (1990). Selected statistical series. Washington, DC: U.S. Government Printing Office.

It could be argued that the percentage of sales accounted for by the largest firms is not the best measure of concentration in an industry. Concentration ratios might instead be calculated using percentage of assets, percentage of employees, or value of shipments. The various measures of concentration are all closely related, however, so the choice of a ratio isn't crucial.

The more concentrated an industry, the more likely it is that there will be a recognized interdependence and joint action of either a collusive or noncollusive nature. When the four-firm concentration ratio exceeds 50%, the degree of interdependence in the industry is likely to be very high.

Barriers to Entry

Entry conditions are the second characteristic affecting market structure. If barriers to entry are high and the industry is highly concentrated, it is more likely that joint action can be undertaken to create monopoly profits. You saw earlier that cartels are very unstable and that economic profits will strongly attract new firms into the industry. If concentration is high and entry is blocked, the existing firms will be in a better position to restrict output, raise prices, and maintain persistent profits.

The rapid internationalization of world markets makes the maintenance of entry barriers very difficult. It may be possible to limit entry in a domestic economy, but if free trade is allowed or if movements to increase trade exist, these barriers will fall. Almost all arguments against more liberal trade policies, such as the North American Free Trade Agreement (NAFTA), come from those firms and labor unions in those firms that enjoy some economic rents from the barriers to more open trade. One of the most effective antimonopoly policies is a policy of more open international trade.

The Herfindahl Index

The U.S. Justice Department has been using the **Herfindahl Index**, a summed index of concentration, to replace the more traditional concentration ratios. The Herfindahl Index, which was developed in 1950 by Orris Herfindahl in his Ph.D. dissertation at Columbia University, takes into account the market shares of all of the firms in an industry, not just

the market share of the few largest firms. Later in this chapter, we will look at how the Herfindahl Index was used by the Justice Department in the 1980s.

The Herfindahl Index is the sum of the squares of market shares in an industry. The formula for this sum is

$$H = (S_1)^2 + (S_2)^2 + \dots + (S_n)^2,$$

where H is the Herfindahl Index and S_1 through S_n are the market shares of individual firms 1 through n . These market shares total 100%. An industry that had 10 equal-sized firms each having 10% of the market would have a Herfindahl Index of 1,000.

Table 11.2 shows how the Herfindahl Index is calculated for two industries and compares each index to a four-firm concentration ratio. Note that both industries have four-firm concentration ratios of 96%, but industry A has a much higher Herfindahl Index (8,116) than industry B (2,308). These Herfindahl Index values imply that industry A is 3.5 times more concentrated than is industry B. The table demonstrates that the Herfindahl Index has a much higher value for industries that have a firm or group of firms that are relatively large. This higher value is the result of squaring the individual market shares to construct the index.

Table 11.2: Sample calculations of the Herfindahl index					
Industry A			Industry B		
Firm	Market share (%)	Square of market share	Firm	Market share (%)	Square of market share
1	90	8,100	1	24	576
2	2	4	2	24	576
3	2	4	3	24	576
4	2	4	4	24	576
5	1	1	5	1	1
6	1	1	6	1	1
7	1	1	7	1	1
8	1	1	8	1	1
Four-firm concentration ratio = 96%. Herfindahl Index = 8,116.			Four-firm concentration ratio = 96%. Herfindahl Index = 2,308.		

The Number Equivalent

M. A. Adelman has developed another way to interpret the Herfindahl Index. The **number equivalent** is the reciprocal of the Herfindahl Index (1 divided by the value of the Herfindahl Index times 10,000). It shows the theoretical number of equal-sized firms that should be found in an industry. Industry A in Table 11.2 should have 1.2 equal-sized firms, and industry B should have 4.3. Adelman would conclude that, ceteris paribus, industry B would be more competitive than industry A because A has a higher likelihood of **collusion**, or agreements between firms in an industry to set a certain price or share a market.

11.3 Monopolistic Competition

The model of **monopolistic competition** describes an industry composed of a large number of sellers. Each of these sellers offers a **differentiated product**, which is a good or service that has real or imagined characteristics that are different from those of other goods or services. This differentiation can take many forms. The salespeople may be nicer, the packaging prettier, the credit terms better, or the service faster. It could even be that a famous person is associated with the product, like Bill Cosby and Jell-O or Michael Jordan and Nike. It is important to note that a product is differentiated if consumers perceive it as different. For example, chemists tell us that aspirin is aspirin, and there is no real difference among the various brands. Yet many consumers view the brands as different, showing a preference for a brand such as Bayer, so aspirin is a differentiated product.

In monopolistic competition, the industry consists of a large number of firms, each producing a differentiated product. A very important assumption is that entry into this industry is relatively easy. New firms can enter the industry and start selling products that are similar to those already being produced. In Edward Chamberlin's original description of monopolistic competition, a market for a set of goods that were differentiated but had a large number of close substitutes was called a **product group**. Chamberlin characterized monopolistic competition as the large-group case where there was rivalry between many firms in a product group.

You may have recognized monopolistic competition as a familiar market structure, since retail firms often fit this model. Monopolistic competition is generally what comes to mind when people think of competition. Perfect competition, with its homogeneous products, simply does not fit the popular idea of competition in which firms are scrambling to make their products different.



Doug Pensinger/Getty Images

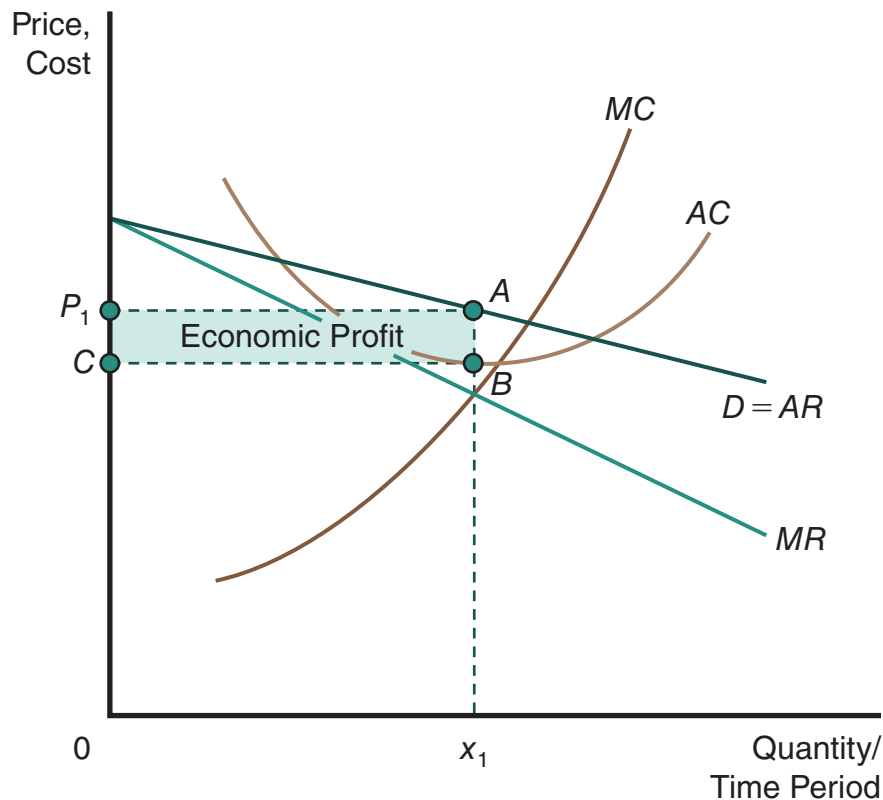
Sellers in a single industry attempt to differentiate their products. Nike, for example, is associated with basketball star Michael Jordan.

Short-Run Equilibrium

Short-run equilibrium of the monopolistically competitive firm is very similar to that of the monopolistic firm. Figure 11.1 shows the demand curve for a representative firm in monopolistic competition. When we depicted perfect competition, we started with the market and derived the representative firm's demand curve. In analyzing monopolistic competition, we begin with a representative firm, rather than with the market. With product differentiation, each firm faces a unique demand curve. The firm's demand curve in

Figure 11.1 is negatively sloped, unlike the perfectly elastic demand curve faced by the perfectly competitive firm. The negative slope is a result of the differentiated nature of the firm's product. If the product's price is raised, the firm will not lose all its customers because some will continue to prefer this product to substitutes that are close but not perfect. Likewise, if the price is reduced, the firm will gain customers, but some customers will remain loyal to the products produced by other firms.

Figure 11.1: Short-run profits in monopolistic competition



In the short run, an economic profit can exist for firms in monopolistic competition. Such profits will cause new firms to enter the industry.

The relative elasticity of the demand curves is a measure of the degree of differentiation within the industry. If the products are only slightly differentiated, then they are close substitutes and each firm's demand curve will be very elastic. If the products are highly differentiated, the demand curve will be less elastic, indicating that the firm can more easily raise the price without losing many customers. Its customers don't change products because they don't view them as substitutes. Think again of aspirin, for example. Some people are willing to pay more for Bayer than for Brand X because they think it is different. The makers of Bayer are able to charge a higher price without losing a large number of customers. Bayer will be limited in price flexibility by the amount of differentiation it is able to create. As price goes higher and higher, fewer people will be willing to pay for the differentiation. Some people may be willing to pay 10 cents more for Bayer than for a

different brand, but if the price of Bayer is increased further, more and more people will shift to the other brands.

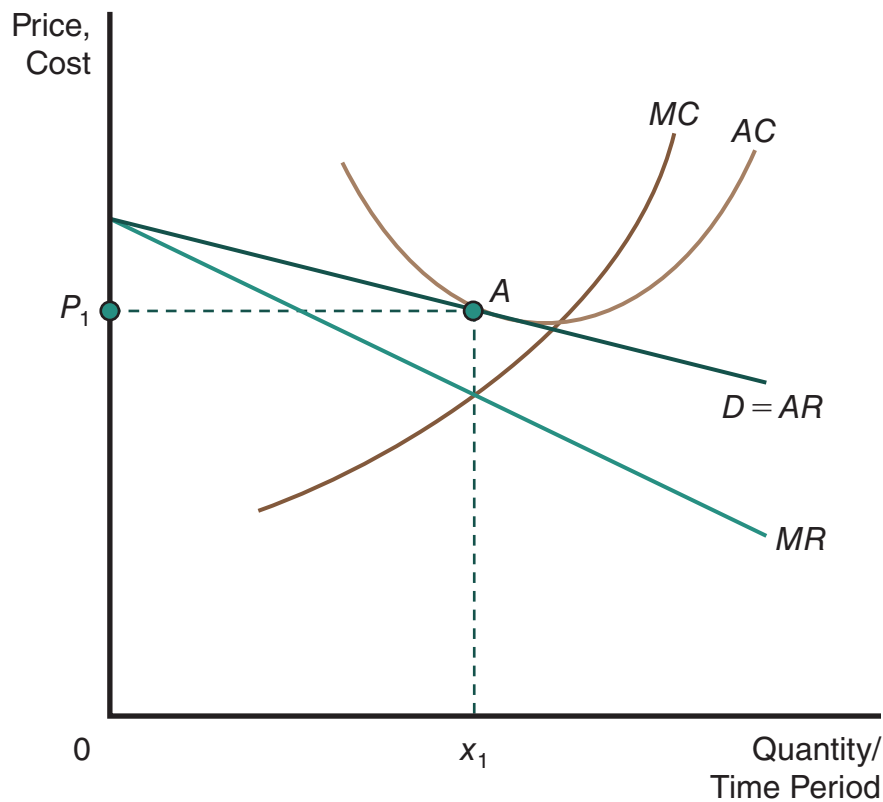
The demand curve in Figure 11.1 has a negative slope, indicating product differentiation. However, demand is very elastic, indicating that there are many good substitutes. Since the demand (average revenue) curve is negatively sloped, the marginal revenue curve will lie below it, for the same reasons it does in the case of monopoly. The firm will, of course, maximize profits at price P_1 and output x_1 , where marginal revenue is equal to marginal cost. The firm in Figure 11.1 is earning an economic profit because average revenue, P_1 , exceeds average cost, C . Total revenue is represented by rectangle OP_1Ax_1 , and total cost is represented by rectangle $OCBx_1$. Economic profit is thus the area of the shaded rectangle CP_1AB .

This analysis is very similar to the one developed in the preceding chapter for monopoly in the short run. The most important difference is that the demand curve here is very flat. The key to whether it is more like a perfectly competitive firm or more like a monopoly depends on what happens in the long run in response to the economic profit.

Long-Run Equilibrium

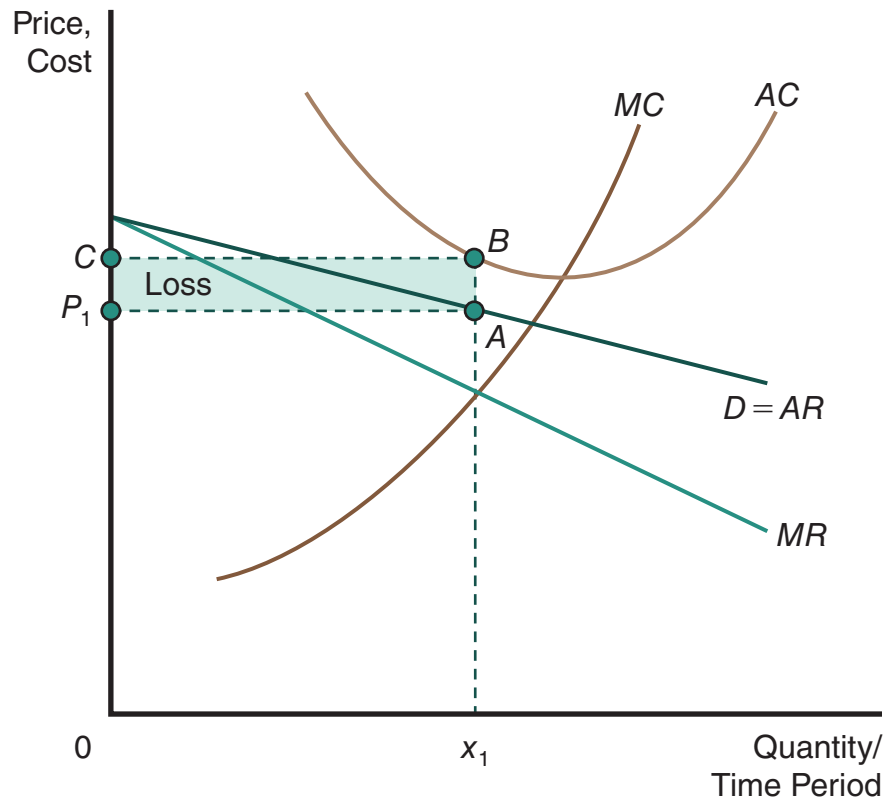
What about long-run equilibrium in a monopolistically competitive industry? Figure 11.1 shows that a short-run equilibrium results in an economic profit.

Suppose, instead, that new firms can respond to these economic profits. Entry into monopolistically competitive industries is assumed to be relatively easy. Thus, new firms will enter the industry in response to the economic profits. As firms enter the industry, the demand curve faced by any representative firm will shift to the left because the new firms will be attracting customers away from firms already in the industry. This shift of buyers is what happens, for example, when a new grocery store opens in an area. It draws some customers away from the existing stores. The existing firms' demand curves will continue to shift down and to the left as new firms enter, and new firms will enter as long as economic profits are to be made. Long-run equilibrium will occur when firms are earning zero economic profit (or normal profit). Such an equilibrium is depicted in Figure 11.2. Price is P_1 and output is x_1 . Total revenue and total cost are represented by rectangle OP_1Ax_1 . There are no economic profits being earned, and no additional firms will attempt to enter this industry.

Figure 11.2: Long-run equilibrium in monopolistic competition

Since entry into a monopolistically competitive industry is relatively easy, there can be no long-run economic profits. Firms will enter until all firms are earning only a normal profit.

Of course, too many firms might enter an industry due to a mistaken anticipation of economic profits. If this happens, firms will experience losses, and some firms will leave the industry as the long-run adjustment proceeds. Figure 11.3 shows a monopolistically competitive firm suffering a loss equal to rectangle P_1CBA . Firms would respond to such losses by leaving the industry. The demand curves faced by the remaining firms would shift up and to the right until the equilibrium shown in Figure 11.2 was restored. The long-run adjustment process under monopolistic competition produces an equilibrium with zero economic profits.

Figure 11.3: Short-run losses in monopolistic competition

Short-run losses, indicated by the shaded area, will cause some firms to exit the industry. Firms will exit until the remaining firms are earning a normal profit, as in Figure 11.2.

Monopoly and Competition

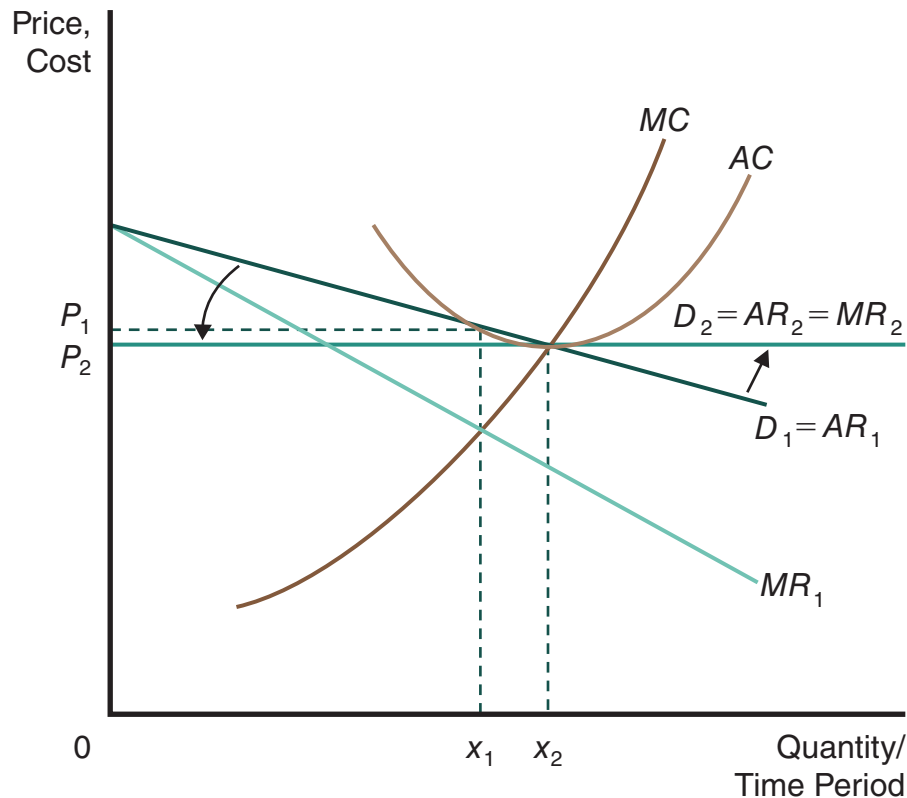
As you can see, the model of monopolistic competition borrows from the model of monopoly and the model of perfect competition. In the short run, the monopolistically competitive firm is producing the profit-maximizing output and searching for the best price that can be charged for this output. In the long run, the economic profits disappear as new firms enter the industry. The demand curve of each firm then shifts to the left because market demand is shared by more firms. This result is similar to the long-run outcome in perfect competition. The market structure of monopolistic competition has some characteristics of monopoly and some of pure competition, which explains its name.

Excess Capacity

In long-run equilibrium, the monopolistically competitive firm chooses an output that does not fully utilize existing plant size. The unutilized part of the production facilities, called **excess capacity**, is depicted in Figure 11.4. The profit-maximizing output is x_1 , where $MR = MC$. This level of output is not, however, the output that would have resulted under perfect competition. Under perfect competition, the firm would use the

least-cost combination of inputs, where average cost is at a minimum. That output would be socially optimal because represents maximum attainable allocative efficiency because $MC = P$. That output is represented by x_2 in Figure 11.4. In other words, in long-run equilibrium, the monopolistically competitive firm produces less than the quantity that would efficiently use its full productive capacity.

Figure 11.4: Excess capacity



Excess capacity results from the negative slope of the demand curve. As the demand curve becomes more elastic, the excess capacity diminished. It disappears when the curve becomes perfectly elastic.

Is excess capacity a bad thing? To answer this question, it is necessary to consider what causes excess capacity. The firm is producing less than the socially ideal output because it maximizes profits by producing a lower output. This lower output results from the fact that the demand curve for the monopolistically competitive firm slopes downward. You can see this result by examining Figure 11.4. Begin with demand curve D_1 . The monopolistically competitive firm is producing quantity x_1 at price P_1 . Now make the demand curve more elastic by rotating it counterclockwise. As the demand curve becomes more and more elastic and finally perfectly elastic, at D_2 in Figure 11.4, the output will increase toward the socially efficient output x_2 . Excess capacity is a result of the negative slope in the demand curve. This negative slope, you recall, is a result of the product differentiation. The excess capacity, therefore, results from product differentiation.

It can be argued that excess capacity is not necessarily a bad thing. Consumers may be willing to incur the extra cost in return for the perceived benefits of product differentiation. It would indeed be a very boring world without product differentiation. We might all be wearing khaki-colored shirts, for example.

The major problem with this argument lies in separating desired from undesired product differentiation. A consumer who is faced with a wide range of product choices but little price competition is not able to choose whether or not to pay extra to get the differentiated product. This problem isn't likely to be too important, however, when there are many firms, as in monopolistic competition. Consider aspirin. If the only products in the industry were Anacin, Bayer, Bufferin, and Excedrin, the consumer would probably not have a low-price choice, since these brands compete almost exclusively by advertising rather than by cutting prices. But the consumer actually does have a choice of lower-priced generic brands of aspirin. So in choosing Anacin over Brand X, the consumer voluntarily chooses product differentiation. In this case, product differentiation seems to be a good thing because the consumer making the choice is maximizing individual utility. If, on the other hand, there are no lower-priced products and the consumer must choose among products that compete only through advertising, then the consumer does not really have a choice about bearing the cost of the differentiation (unless, of course, he or she simply does without the product altogether).

Product Differentiation and Advertising

The firm in monopolistic competition will try to differentiate its product in order to shift its demand curve to the right and to make demand relatively more inelastic by developing consumer loyalty. The firm will advertise as well as make changes in color, style, quality, and so on. Advertising can inform consumers about higher quality or develop brand loyalty. Either of these results creates product differentiation. Competing with rival firms through advertising, style changes, color changes, and techniques other than lowering price is referred to as nonprice competition.

If effective use of nonprice competition differentiates a firm's product enough that other firms' products do not seem to be good substitutes, the firm can earn an economic profit in the long run. Nonprice competition will often be gradual, so the firm can avoid a price war in which all firms will lose. A firm that is successful in such nonprice competition has in essence turned its share of the monopolistically competitive market into production with long-run economic profit. The profit of such a firm could exist in the long run and not be driven to zero by new entrants.

Fast-food preparation is usually a monopolistically competitive industry. In a small town, fast food could be a monopoly or an oligopoly. However, in metropolitan areas, there are large numbers of firms, and entry is relatively easy. If a firm is able to successfully differentiate its product so that consumers don't consider the products of other firms close substitutes, the firm will be able to earn a long-run economic profit because it can keep would-be competitors out of its segment of the market. For example, McDonald's can't keep firms out of the hamburger market, but it can keep firms out of the Big Mac market. If enough people believe there's nothing like a Big Mac, this persistent brand loyalty might allow McDonald's to maintain an economic profit in the long run.



Exactostock/SuperStock

Fast food is a monopolistically competitive market. For example, McDonald's can't keep other firms out of the hamburger market, but it can keep firms out of the Big Mac market.

.....
It doesn't matter what causes the differentiation. The economic impact is that McDonald's may be able to earn an economic profit in the long run.

It is easy to determine how successful a firm is at product differentiation by examining the difference between its prices and its competitors' prices. The consumer may go to McDonald's if a Big Mac costs \$0.15 more than the competition, but what if it cost \$0.55 more or \$1.15 more? There is some price at which the other products will become good substitutes. That price is a measure of the success of product differentiation. It may be that a Big Mac is worth more to the consumer because of higher quality or because McDonald's has a very successful advertising and public relations program. The point is that

Check Point: Characteristics of Monopolistic Competition

- There are many sellers of similar but differentiated products.
- Economic profits can exist in the short run.
- Price is equal to average cost in the long run.
- Excess capacity exists in the long run (price is greater than marginal cost).
- Nonprice competition increases product differentiation.

Resource Allocation in Monopolistic Competition

The model of monopolistic competition has several implications for the allocation of resources. The resulting allocation will be different from the societal ideal achieved with perfect competition. First, even at the long-run equilibrium with zero economic profit, there will be excess capacity with monopolistic competition. This means that price will be greater than minimum average cost. Consumers are paying only the average cost of production, but this cost is higher than it would be with more competition.

Second, if costs are the same under perfect competition and monopolistic competition, prices will be higher with monopolistic competition because price is greater than marginal cost (or marginal revenue). Third, firms in monopolistic competition will provide a wider variety of styles, colors, qualities, and brands. These choices are, unfortunately, related to the product differentiation and excess capacity that cause average cost to be higher.

Fourth, in monopolistic competition, there will be advertising and other forms of nonprice competition. This outcome is not necessarily bad. To the extent that advertising adds to customer satisfaction and the product is voluntarily purchased, it can be a good thing. Some social critics consider any advertising that does more than convey information to be a bad thing. Economists would argue that one must compare the marginal benefits of advertising to the marginal costs of advertising to judge its worth.

11.4 Oligopoly

The last of the four market structures is oligopoly. In 1934, German economist Heinrich von Stackelberg published a book entitled *Market Structure and Equilibrium*. It discussed the idea of firms' interdependence and formed the basis of the model of oligopoly. Oligopoly is the market structure in which a few firms compete imperfectly. The scarcity of sellers is the key to firms' behavior in oligopoly. In oligopoly, firms realize that their small number produces mutual interdependence. As a result, each firm will forecast or expect a certain response from its rivals to any price or output decision that it might make. **Oligopoly** is the market structure in which there are only a few firms or a few firms dominate the market. Oligopoly is important because there are so many real-world examples of it. For example, there are four primary breakfast cereal manufacturers: Kellogg, General Mills, Post, and Quaker. There are two major producers in the beer industry: Anheuser-Busch and MillerCoors. Four music companies control 80% of the market: Universal Music Group, Sony Music Entertainment, Warner Music Group, and EMI group. The market for jetliners is dominated by Boeing and Airbus, and so on. Since there are few firms, the actions of the firms are interdependent.

In some people's minds, oligopoly and monopoly are essentially the same. This view was expressed by John Kenneth Galbraith. Galbraith argued, "So long as there are only a few massive firms in an industry, each must act with a view of the welfare of all." (Galbraith, 1956, p.83) This view, which is not widely held among economists, regards oligopoly as shared monopoly. **Shared monopoly** is the model of oligopoly that says that oligopolists coordinate decisions and share markets to act as a monopoly.

Most economists view oligopoly as more complex and more difficult to analyze than monopoly. There is no single model of oligopoly, as there is for the other three market structures. The difficulty stems from the interdependence that characterizes oligopoly. Because of the complexity of oligopoly, economic analysis of it often includes heavy doses of descriptive economics rather than formal models with graphs. We will follow this tradition and describe several types of oligopoly and forms of oligopolistic behavior.

Oligopolies are sometimes categorized by the type of product they produce: homogeneous or differentiated. An oligopolistic industry that produces a homogeneous product is referred to as a **pure oligopoly** or a standardized oligopoly. The distinction is important because in pure oligopolies a single price is charged for the output of all the firms. An example of a pure oligopoly is the aluminum industry. As a manufacturer making aluminum furniture, you would be indifferent about which firm produced the bar of aluminum you purchase as an input.

In contrast, a **differentiated oligopoly** produces products that are different. The auto industry is a good example. In differentiated oligopolies, there are **price clusters**, which

are groupings of prices for similar, but not homogeneous, products. The range of prices within a cluster will depend on the amount of product differentiation. The more differentiated the products, the greater the price divergence. Tight price clusters indicate very little product differentiation.

Global Outlook: Commodity Cartels in the Real World

Cartels are groups of independent firms that, instead of competing, agree to act in concert to determine prices and dictate output. The United States uses anti-trust laws to discourage cartel behavior, but many governments around the world actively encourage the formation of cartels. This is particularly the case with commodity cartels.

Commodity cartels have a long history of failure. In the 1950s, commodity agreements, which are essentially cartels for agricultural products and raw materials, existed for tin, coffee, sugar, and wheat. The countries forming these cartels were less developed countries of South America and Africa. The success of the Arab countries with OPEC in 1973 reenergized some of these cartels as many commodity-exporting countries tried to emulate OPEC. The result was a flurry of activity that produced the following official organizations:

- International Bauxite Association (IBA)
- International Coffee Organization (ICO)
- Intergovernmental Council of Copper-Exporting Countries (CIPEC)
- International Sugar Association (ISA)
- International Tin Council (ITC)
- Organization of Banana Exporting Countries (OBEC)

In addition, there were attempts in the late 1970s and early 1980s to organize cartels in iron ore, nickel, rubber, tungsten, molybdenum, cobalt, columbium, and tantalum. Very few of these cartels, however, enjoyed the success that OPEC had in the 1970s.

Several lessons can be learned from the experience of these commodity cartels and the success of OPEC. To be successful, a commodity cartel must:

1. have few members,
2. produce a product with few substitutes (have inelastic demand),
3. have buoyant world demand (have high income elasticity),
4. pursue a moderate pricing policy,
5. have at least tacit approval of consuming nations, and
6. have effective sanctions against chiselers, or sellers that cheat on a cartel agreement, by lowering prices in an attempt to capture more of the market.

Most cartels have great difficulty with the last three requirements and, as a result, break down rather quickly.

The effects of commodity cartels are often mixed up with economic development and world politics. Members tend to be less developed countries, and the consuming nations tend to be developed countries. The formation of a cartel is often justified in terms of a “fair” price that will redistribute wealth from rich to poor countries.

Cartels are anti-consumer. Although some of those consumers live in high-income countries, many are poor people in poor countries. The OPEC oil price hikes in the 1970s caused greater hardship in poor countries than it did in rich countries.

11.5 Collusion and Oligopolies

The history of cartels is not impressive. Most have held together for only short periods of time, and have then fallen apart because of cheating. In the few cases where cartels have had long-term success, there has usually been direct government support. Once a government is involved, it becomes more difficult to cheat because the government can police and penalize this behavior.

Cartels in the Real World

Organized, collusive activity in private industry in the United States has usually been invalidated by the courts. However, General Electric and Westinghouse engaged in a conspiracy in the late 1950s to act as a cartel. They decided on a scheme that allowed them to submit low bids alternately on government contracts. The scheme depended on the phases of the moon. At either full or new moon (every two weeks), the firm designated to be the low bidder would gain the contract because the other firm would submit an uncompetitively high bid. This plan worked well because there were only two firms dealing with one buyer, the federal government. Each firm would know if the other was cheating because the bids were later made public. In this case, the government was inadvertently helping the cartel overcome the cheating problem.

Another example, involving a large number of firms, was an attempt to form a cartel known as the National Farm Organization (NFO). The industry for milk and beef production is composed of large numbers of firms (farms), and the NFO cartel only included about 10% of them. In 1967 and 1968, the NFO attempted two separate actions: one to raise milk prices and the other to raise beef prices. The cartel tried to organize farmers to keep production from the market. In order to raise prices, cartel members were to destroy milk and keep cattle away from the market. If the NFO members had been successful in raising prices, the nonmembers who continued to produce and sell would have benefited. They would have reacted to the higher prices by expanding output. Also, as prices began to rise, there would have been tremendous pressure on cartel members to cheat on the withholding action. In fact, the cheaters would have benefited much more than the members who refused to cheat. The attempt to organize the cartel resulted in violence. Cattle scales were blown up. NFO farmers sat in the roads to keep others from taking their products to market. Some farmers even resorted to taking cattle to market in house trailers to avoid detection. The lesson is clear: A cartel with many members will find it very difficult to succeed.

Cartels are much more common in Europe than they are in the United States. In Europe, cartels are permitted and often encouraged by governments. Before the 1950s, all major German industries operated as cartels. Currently in Western Europe, the Common Market Commission is actively promoting cartels in steel, textiles, and shipbuilding. In contrast, cartels are—with one exception—illegal in the United States. The one exception, based on the Webb–Pomerene Act of 1921, allows the formation of cartels when they are necessary to participate in foreign trade. These Webb–Pomerene cartels have not been successful in raising prices, primarily because of the large number of firms participating.

OPEC: A Decade of Success

The best-known cartel of recent years is the Organization of Petroleum Exporting Countries, known as OPEC. In the 1950s, international oil companies controlled a major portion of the world's oil supply. These companies frequently engaged in price competition. In an attempt to stop price cutting, some Arab governments and a few non-Arab governments formed OPEC in 1960. At first, OPEC enjoyed little success. But this changed in 1973, as the Arab-Israeli war heated up and the Arab countries banded together. On January 1, 1973, the price of oil was \$2.12 per barrel. Of this \$2.12, \$1.52 went to the OPEC governments. By January 1, 1974, the price was \$7.61 with \$7.01 going to the governments. By January 1975, the price was about \$10.50. By 1982, the price had risen to \$35.00.

How did this cartel, which had been in existence since 1960, come to flex its muscles in 1973? At that time, importing governments helped by posting prices and dealing with OPEC in open forums, so individual members were less likely to cheat. More importantly, however, Saudi Arabia was willing to cut back its production of oil to allow other members to sell all they wanted to produce at the high prices set by the cartel.

In 1984, after production had to be cut back by 5 million barrels a day to prevent the cartel from collapsing, Saudi Arabia's willingness to bear this cost began to weaken. The price of oil began to fall. The January 1984 price was \$29 per barrel, down from the 1982 high of \$35. The slide continued. In January 1987, the price was \$13 per barrel. In January 1990, it was under \$12 per barrel. As prices fell, cheating became more common. The predictions made by economists in the 1970s that the cartel would eventually weaken started to come true. Some of the Persian Gulf countries, notably Kuwait, the United Arab Emirates, and Qatar, were experiencing cash flow problems. These countries started grandiose development schemes when their oil revenues were in excess of \$300 billion per year. Their revenues fell significantly because of the decreased price, but the development projects still had to be paid for. Kuwait began shipping more oil than allowed by OPEC agreements—one of the factors underlying the Gulf War. In 1986, Nobel Prize winner Milton Friedman wrote an editorial entitled, "Right at Last, an Expert's Dream," reminding readers that he had predicted in 1974 that OPEC would not last very long (Friedman, 1986, p.8).

As we pointed out earlier, all cartels face two problems. The first is **cheating**, or secret price cutting. OPEC faced this problem in the presence of oil surpluses. The second problem a cartel faces is new entry. Large amounts of oil have been coming into the market from non-OPEC sources, such as the North Sea, Alaska, and the Alberta oil



Exactostock/SuperStock

The Organization of Petroleum Exporting Countries (OPEC) is one of the best-known cartels in recent years. The organization was formed to stop price cutting in the oil market.

.....

sands. In addition, other sources of energy, such as solar and nuclear energy, which were uneconomical when oil was \$2 per barrel, became profitable at the much higher prices. The new entry has been slow to develop, but the future should prove even more difficult for OPEC as new firms producing oil and other competing products enter the market and challenge the cartel's cohesiveness.

The impact of new oil supplies is evident in the statistics. In 1973, OPEC's share of world oil production was 56%. In 1975, its share was 51%. In 1980, it was 45% and by 1986, OPEC's share had fallen to 28%. This declining share of production signaled the weakening of the cartel better than any other piece of data. If a cartel is going to set prices, it must control a large share of total production. After a rebound in the 1990s and 2000s, OPEC now produces roughly 40% of the world's oil (Nguyen, 2012).

In addition to the new oil supplies, the high oil prices have also had an effect on quantity demanded. OPEC's dominance resulted in adjustments in consumer demand. Perhaps the most evident of these adjustments is the increased fuel efficiency of automobiles.

Informal Market Coordination

Informally coordinated oligopolies engage in unorganized and unstated attempts to practice joint actions. Such **tacit collusion** is much weaker than the collusion among members of a cartel. It is weaker because all the incentives to cheat are still present, but organized vigilance against cheating is not. Tacit collusion is found in U.S. industries because cartels are illegal under federal antitrust laws. Informal cooperation among oligopolistic firms can be viewed as an attempt to form cartels while avoiding antitrust laws. Such collusion usually takes the form of informal agreements to behave in certain ways. Often these agreements arise naturally, without any need for formal organization.

Check Point: Characteristics of Oligopoly

- There are only a few sellers of homogenous or differentiated products.
- Interdependence leads to attempts at communication, coordination, and collusion.
- Cartels may be formed to determine industry pricing and output.
- Nonprice competition increases product differentiation.

No Market Coordination

Unorganized, uncollusive oligopolies are characterized by independent action. Firms in these oligopolies practice profit maximization independently but are affected by the actions and responses of their rivals. Each firm tries to anticipate the response of its rivals and then takes that prediction into account when making decisions. Economists tried to develop a model for this behavior in the early 19th century. In 1838, A. Augustin Cournot (1801–1877) published a theory of duopoly (a market with only two firms). His theory and those that followed (up to the post-World War II period) were unsatisfactory because they assumed that the rival firm would not react to the action of the firm

being analyzed. The post-World War II developments in oligopoly theory rest heavily on **game theory**. Game theory is a field of mathematics that can provide insights into oligopolistic behavior.

Policy Focus: Oligopoly and Tit-for-Tat

In the real world of cartel behavior, oligopoly firms may develop a strategy to help support a collusive market in one form or another. One such example is called the Tit-for-Tat strategy, which is a form of tacit collusion. In Tit-for-Tat, firms begin by behaving cooperatively in time t . If the other firm cheats in time $t = 1$, then you engage in cheating in the next period, $t = 2$. Cheating results in a decrease in prices that serves one primary purpose: to reduce any profits the other firm would stand to earn from cheating on your arrangement.

However, sometimes cheating after the other player has cheated is not enough to enforce cooperation. Instead, a firm can create a punishment stage of the game, where you go beyond simply cheating and engage in extreme behavior. Although this punishment stage is harmful to the other firm, it is usually also quite harmful to the punisher. The goal is to send a signal to the other firm that there is a cost of not cooperating.

Sometimes a Tit-for-Tat strategy results in an all-out price war. In July 2012, Southwest Airlines sparked a price war in airline fares by cutting some fares to as low as \$50 each way depending on the cities. Other airlines started offering their own “fall specials” immediately after the announcement was made by Southwest. Because airlines typically update fares three times per day, they are quickly able to respond to other airlines’ price changes, speeding up the downward spiral of a price war (Cokely, 2012).

OPEC is the most well-known example of an organization engaging in a fairly successful Tit-for-Tat strategy. When the organization suspects that one of the countries may be cheating, the reaction is to punish cheating by matching the overproduction. Although this strategy harms the cheating country, it also increases oil price volatility, which has repercussions of its own. However, if the Tit-for-Tat strategy helps enable the oil cartel to deter cheating and maintain high prices in the market, the countries can achieve the joint profit maximizing outcome for an oligopoly.

Game Theory: Strategy and Rivalry in Oligopoly

Life for the entrepreneur is simple in pure monopoly and pure competition. But most firms in the real world must make strategic decisions, based on how rival firms are likely to react to their own action. The just-completed review of oligopoly and monopolistic competition demonstrated the interdependence in these market structures. A review of some elements of game theory will show how firms might make moves that could gain a competitive edge in the market place. Game theory applied to economic reasoning asks how management of a firm should act if it believes that the rival firm is rational and out to maximize its profits.

Game theory, a theory of rational decision making under conditions of uncertainty, was first developed by John von Neumann (1903–1957) and Oskar Morgenstern (1902–1977) in a book entitled *The Theory of Games and Economic Behavior*. Game theory says that players

try to reach an optimal position through strategic behavior that takes into account the anticipated moves of other players. Game theory attempts to explain how a decision maker will make decisions based on the assumption that the competitors are rational and profit-maximizing. This model describes very accurately how oligopolists behave.

Standard microeconomic decision-making theory is based on the assumption that the outcomes of various decisions are known with certainty. Game theory suggests rational solutions when the outcomes are uncertain. Games are usually described as being either zero-sum or non-zero-sum. Zero-sum games are those in which one player's gain is another player's loss. Non-zero-sum games open the door to collusion or cooperative action because all players may gain (or all may lose) from a certain course of action. This aspect of game theory has proved very useful in the study of oligopolies in which each firm must take into account the reactions of its competitors.

Cooperative and Noncooperative Games

Games can be cooperative or noncooperative. A cooperative game is a game in which a contract is possible. You may, for example, enter into an agreement with a rival to share risk or bring complementary technologies together to solve a customer's problem. In both of these cases, it is possible for the parties to draw up a contract that divides the profits or losses. In a noncooperative game such a contract is not possible. An example of a noncooperative game would be an airline deciding to cut prices on some flights expecting that its rivals will match the cut. Most games of interest in examining business strategic behavior are noncooperative.

One of the most famous economic games is called the Prisoners' Dilemma. Two prisoners are interrogated separately. Each one knows that if neither confesses, both will go free. However, if one confesses and implicates the other, the one who confesses will receive a light sentence and the other will get a long prison term. The interrogator separately offers each prisoner the opportunity to confess and "get a better deal." The rational course of action for the self-interested prisoner is to confess and implicate the other. Since both face the same incentive and the same uncertainty about the other's action, both will confess. The outcome of the two rational decisions will make both of the prisoners worse off. They would both be better off if they could engage in collusion because if neither confesses, both will go free. This same lesson holds for oligopolistic firms. Oligopolistic firms may decide to compete aggressively, attempting to take their competitors' market, or try to cooperate and settle for the market share they have. Like the prisoners, each firm has an incentive to undercut the other and each knows the other has the same incentive.

Does the prisoners' dilemma mean that firms will be doomed to low profits and financial problems because they will always undercut one another? Experience in the airline industry in the past decade might lead to this conclusion. Boeing and Airbus could have tried to cooperate by reducing output and increasing prices, but instead the two companies have been fiercely competitive for more over 20 years. But, as we saw earlier, some oligopolies exist side by side over time and a form of price leadership or other cooperative behavior emerges. The U.S. breakfast cereal market is a perfect example. Prior to the 1990s, this industry was incredibly profitable and the price leader in the market was Kellogg. Every year, Kellogg could increase cereal prices and the other three companies in the market would follow suit. This tacit noncompetition allowed these firms to generate massive



David Young-Wolff/Stone/Getty Images

Over time, some oligopolies exist side by side and form a price leadership. The breakfast cereal market is an example of this scenario.

.....

revenues from selling a relatively pleasant product. Decreased demand, increased competition by discount producers, and an unwillingness by some firms to follow Kellogg's lead eventually eroded profits. However, an attempt to move away from price competition has been seen in the market since 2001. A major difference between the prisoners' dilemma of theory and that faced by oligopolists is that the offer to the prisoners is made only once by the interrogator. In the real world of cartel behavior, the firm faces the prisoners' dilemma daily. Over time the firms can learn how their rival will react—most of the time!

Nonprice Competition

All oligopolists compete in dimensions other than just the price dimension. In formulating models, economists tend to treat goods as homogeneous and view competition as occurring mostly through price adjustments. In the real world, however, competition can take other forms. Firms can change the quality, color, texture, design, size, advertising, and a host of other attributes of a product. Sometimes quality or quantity changes substitute for price changes. The size of a candy bar could be decreased while the price remains the same. This change is in effect a price increase, albeit a disguised price increase. Even an apparently homogeneous product can be differentiated by the quality of customer service.

Casual observation leads to the conclusion that a great deal of the advertising on television is done by firms in oligopolistic markets. Most informational advertising is done on radio or in the print media. Most of the major ads on television appear to be aimed at a goal other than informing consumers. There may be several economic goals of this advertising. **Name brand capital** is the value that consumers place on a product because of experience, reputation, or image. This name brand capital can be very important in terms of maintaining market share in the face of price (or quality) competition from new rivals that don't have it. In the extreme, name brand capital is a barrier to entry that may allow the firm to behave in a monopolistic fashion.

Robert Wills and Willard Mueller have examined the effect of brand advertising on pricing in oligopolistic markets (Wills & Mueller, 1989). They were motivated in part by the fact that in some markets consumers show a preference for high-priced brands even though competing brands are physically identical. Brands of lemon juice concentrate, evaporated milk, and household bleach, for example, are exactly the same in every respect except packaging. In addition, blind taste tests of some products, such as beer and cookies, show

that consumers often cannot distinguish their preferred brand from competing brands. The research by Wills and Mueller showed that monopoly power in such markets produces price premiums and higher profits. This monopoly power was created by advertising. They conclude that large firms will tend to advertise more heavily, have higher prices, and have higher profits than their smaller competitors.

An oligopolistic firm may resort to nonprice competition in an attempt to increase its market share. We can apply the model of oligopoly to these other types of competition. For example, a firm contemplating a new advertising program has to consider whether the program will increase its market share or prompt a rival to undertake a similar program. In the first case, the program may be worthwhile. In the second, it would probably only increase costs without creating a larger market share. Thus, even with respect to advertising, firms in an oligopoly are interdependent and need to consider the reactions of rivals.

Factors Determining Market Coordination by Oligopolies

As you have seen, there are benefits to be gained by oligopolists who can coordinate output and pricing, whether such coordination is formal or informal. There are strong forces pulling in opposite directions. It is worthwhile to review some variables that facilitate or limit such market coordination.

The Number of Firms

The number of firms in an oligopoly has the most obvious impact on the likelihood of formal or informal market coordination. As the number of firms increases, the incentive and ability to coordinate diminish. In addition, as the number of firms increases, the cost of coordinating and policing the agreement increases. It is obvious that as the size of the group increases, the probability that it will include a maverick also increases. As the number of firms increases, the likelihood of effective coordination diminishes rapidly.

Barriers to Entry

Barriers to entry play a key role in determining market coordination because they are related to the number of firms. An oligopoly will not be able to practice effective coordination if it can't limit entry. New firms will destroy market coordination and erode any economic profit created by it. The lesson is a simple one. If strong barriers to entry (including barriers created by government) exist, the possibility of coordination exists. If barriers to entry are weak, coordination is highly unlikely.

The Size of Firms

If the oligopolistic industry is dominated by one firm, or if several of the firms are large relative to the others, the possibility of market coordination is enhanced. In such a case, coordination would only require agreement by the dominant firm or firms.

Secrecy

Coordination requires the elimination of secrecy so that uncooperative behavior can be punished. Monitoring cheating is easier in an environment in which secret deals don't stay secret long. Government has often aided in market coordination by requiring the full disclosure of contract details.

Unstable or Fluctuating Demand

If demand fluctuates or is otherwise unstable, a firm in an oligopoly will have difficulty determining if changes in its demand are the result of market forces or, alternatively, the competitive behavior of a rival. As a result, unstable or fluctuating demand will make market coordination more difficult.

Product Differentiation

The more homogeneous a product is, the easier it will be to coordinate the sale of that product. As product differences increase, firms will be unable to determine whether the price concessions of rivals are attempts to cheat or are due to actual differences in product characteristics.

Industry Social Structure

As you have already seen, the maturity of an industry can affect market coordination. The social structure of an industry is also important. Do the leaders know and trust each other? Do they get together at meetings? Do they play golf or engage in other recreational pursuits? If they do, coordination might be easier. Note, however, that socializing does not mean that entrepreneurs are not competitive. What appears to be cooperation may be a subterfuge for future cheating on a coordinated effort. Remember, if an oligopolist can get all the others in the market to agree and then can cheat on the agreement, it can be very profitable.

Antitrust Activity

The U.S. antitrust laws make collusion illegal. If these laws are vigorously enforced, it will make coordination more costly. The antitrust laws will serve to limit attempts at coordination.

11.6 Market Structures in Review

This section concludes the discussion of the four theoretical market structures. Table 11.3 summarizes some of the important characteristics that differentiate these market structures. The key to understanding the theory of the firm is a solid understanding of monopoly and perfect competition. Oligopoly and monopolistic competition expand the models of monopoly and perfect competition and bring those models closer to real-world situations.

Table 11.3: Summary of market structures

Type	Number of firms	Product differentiation	Control over price	Type of nonprice competition	Examples
Perfect competition	Many	Homogenous product	None	None	Agriculture
Monopolistic competition	Many	Slightly differentiated products	Some	Advertising and product differentiation	Retail trade and service industry
Oligopoly	Few	Homogenous or differentiated products	Some to considerable (it depends)	Advertising and product differentiation	Auto and steel industries
Monopoly	One	Unique product (no close substitutes)	Considerable	Public relations or advertising can increase demand	Some utilities and aluminum industry before 1945

Summary

Consider again. . . Now, what is the value of a brand name? The answer, of course, like all answers in economics, is, "it depends." Product differentiation and brand loyalty give the owners of that brand name monopoly power in a certain range. That range is determined by how much more consumers are willing to pay for the brand. According to the 2012 Brand Keys Loyalty Leaders List, the number one company in customer brand loyalty was Apple. Apple's tablets held the number one position, Apple's smartphone came in at number three, and Apple computers were number five. That's pretty impressive—to have three products in the top five, out of 598 brands in 83 categories ("16th annual," 2012). As a result, Apple is able to sell its products at higher-than-average prices.

Key Points

1. Monopolistic competition is a market structure characterized by many firms selling differentiated products. Key assumptions in the model of monopolistic competition are a large number of producers, product differentiation, and relative ease of entry. Economic profits can exist in the short run in this market structure, but entry of new firms will ensure a long-run equilibrium with zero economic profit.
2. Oligopoly is the market structure in which there are only a few firms competing imperfectly. Because there are so few firms in an oligopoly, they are interdependent. They take this interdependence into account in their economic decision making.
3. Cartels are threatened by cheating behavior on the part of individual members and by new entry. The larger the number of firms in a cartel, the more difficult it is for the cartel to hold together. Barriers to entry are thus important in oligopoly,

- just as they are in monopoly. Successful cartels have often been supported by governments, which police cheating behavior.
4. Game theory is a theory of rational decision making under uncertainty. It can give valuable insights into behavior in oligopoly.
 5. Economic forces that work to limit coordination in oligopoly or to facilitate it pull in opposite directions. Because of product differentiation, monopolistically competitive firms produce a smaller output at a higher price than firms (with the same costs) engaged in perfect competition. In long-run equilibrium in monopolistic competition, marginal cost is not equal to average cost.

Key Terms

cartel A group of independent firms that agree not to compete, but rather to determine prices and output jointly.

cheating Violating a cartel agreement by lowering prices in an attempt to capture more of the market.

collusion Agreements between firms in an industry to set a certain price or to share a market in certain ways.

concentration ratio A measure of the distribution of economic power among firms in an oligopolistic market.

differentiated oligopoly An oligopoly that produces heterogeneous products that are very close substitutes.

differentiated product A good or service that has real or imagined characteristics that are different from those of other goods or services.

excess capacity The unutilized part of existing production facilities by a monopolistically competitive firm.

game theory A mathematical theory about rational decision making under conditions of uncertainty that can provide insight into oligopolistic behavior.

Herfindahl Index A summed index of concentration that takes into account all the firms in an industry.

monopolistic competition The market structure in which a large number of firms sell differentiated products.

name brand capital The value that consumers place on a product because of experience, reputation, or image.

number equivalent A measure of the theoretical number of equal-sized firms that should be found in an industry (the reciprocal of the Herfindahl Index).

oligopoly The market structure in which a few firms compete imperfectly and recognize their interdependence.

price clusters Groupings of prices for similar, but not homogeneous, products.

product group A market for a set of goods that are differentiated but have a large number of close substitutes.

pure oligopoly An oligopolistic industry that produces a homogeneous product.

shared monopoly The model of oligopoly that says that oligopolists coordinate and share markets to act as a monopoly.

tacit collusion Unorganized and unstated attempts by informally coordinated oligopolies to practice joint actions.

Critical Thinking and Discussion Questions

1. Compare a perfectly competitive market and a market with monopolistic competition. Which assumptions are different?
2. In what sense is monopolistic competition like monopoly? In which key areas do they differ?
3. How might the expectation of entry limit cartel formation? What other factors might influence the likelihood of a successful cartel?
4. What does it mean for firms to be interdependent? How does this change the way a firm chooses to set prices?
5. What is a concentration measure and how are they used to differentiate markets?
6. Give four examples of differentiated products. Are these differences real, imagined, or created? Why is it important that a firm be able to convince consumers that their product is different?
7. How does a firm in monopolistic competition maximize profit? How does this differ from the way a monopolist maximizes profit?
8. Suppose that advertising in an oligopolistic market does not increase the total volume of sales but only the distribution of sales among the oligopoly firms. How does this fit with the Prisoner's Dilemma game?
9. The following data are for a fictional soft drink industry. What is the four-firm concentration ratio for this industry?

Firm	Annual sales
1	\$400,000,000
2	\$300,000,000
3	\$200,000,000
4	\$50,000,000
5	\$20,000,000

10. Calculate the Herfindahl Index for the industry in Question 9. What does this number tell you about the level of competitiveness in the market? How would these answers change if the market consisted of only the first two firms?
11. Would the National Collegiate Athletic Association (NCAA) be considered a cartel? Why or why not?
12. How do changes in technology affect oligopoly? How is this seen in the United States domestic auto industry?
13. Assume that a merger between two firms in a market would change the market composition from a low concentration ratio to a much larger concentration ratio. Should this merger be approved by the Department of Justice? Why or why not?
14. Given what has happened in the airline industry since its deregulation, should it be re-regulated? Why or why not? If so, how should the regulations be set?
15. The National Football League (NFL) has an exclusive deal with Reebok so that players may only wear Reebok attire. How does this deal create a barrier to entry? What does it say about the structure of individual teams within the NFL?