Chapter Summary

This chapter is about market entry, monopolistic competition, and oligopoly. In a monopolistically competitive market, firms differentiate their products, and entry continues until each firm in the market makes zero economic profit. In an oligopoly, a few firms serve a market, and firms have an incentive to act strategically: They may cooperate to fix prices and may price their products strategically to keep other firms out of the market. In markets with a small number of firms, the role of public policy is to regulate monopolists and promote competition. Here are the main points of the chapter:

- The entry of a firm into a market decreases the market price, decreases output per firm, and increases the average cost of production.
- In long-run equilibrium with monopolistic competition, marginal revenue equals marginal cost, price equals average cost, and economic profit is zero.
- A firm can use celebrity endorsements and other costly advertisements to signal its belief that a product will be appealing.
- Each firm in an oligopoly has an incentive to underprice the other firms, so price fixing will be unsuccessful unless firms have some way of enforcing a price-fixing agreement.
- To prevent a second firm from entering a market, an insecure monopolist may commit itself to producing a relatively large quantity and accepting a relatively low price.
- Under an average-cost pricing policy, the regulated price for a natural monopoly is equal to the average cost of production.
- The government uses antitrust policy to break up some dominant firms, prevent some corporate mergers, and regulate business practices that reduce competition.

Learning Objectives

1. Describe and explain the effects of market entry.
2. List the conditions for equilibrium in monopolistic competition.
3. Contrast monopolistic competition and perfect competition.
4. Explain the role of advertising in monopolistic competition.
5. Explain why a price-fixing cartel is difficult to maintain.
6. Explain the effects of a low-price guarantee on the price.
7. Explain the behavior of an insecure monopolist.
8. Define a natural monopoly and explain the average-cost pricing policy.
9. List three features of antitrust policy.
Monopolistic competition refers to a market served by many firms that sell slightly different products. This type of market has two key features:

- Each firm produces a good that is slightly different than the other firms. This means that each firm is a monopoly provider of their product.
- Products sold by different firms in the market are close substitutes for each other.

For example, you can only buy a Big Mac at McDonald’s. However, Wendy’s, Burger King, and Hardee’s all offer similar burgers that are good substitutes for the Big Mac, even though they are slightly different.

8.1 The Effects of Market Entry

Firms in a monopolistically competitive market will use the marginal principle to determine how much output to produce.

The Marginal Principle
Increase the level of an activity as long as its marginal benefit exceeds its marginal cost. Choose the level at which the marginal benefit equals the marginal cost.

When economic profits exist in a market, new entrants will be attracted to that market. In Figure 8.1 of the text, in panel A we see a single firm earning economic profits. These profits will attract a new entrant selling a similar, but distinct, product. Those consumers who prefer the new variety of the product will now purchase the new product. Three things will happen to the first firm as a result of entry:

- The price will fall. As the firm-specific demand curve shifts to the left due to entry, a price-making firm will charge a lower price. In the figure, the price falls from $2 to $1.80.
- The quantity sold by the original firm will fall. As the firm-specific demand curve shifts left, the quantity sold by firm one falls from 300 toothbrushes to 200.
- The average cost increases. Because firm one is producing fewer toothbrushes and is on a downward-sloping portion of average cost, reducing output increases the average cost.

The result is that profits fall from $330 to $160. Since positive profits still exist, entry will continue to occur until economic profits are zero for all firms.

Let’s review an Application that answers a key question:

1. How does market entry affect prices?

APPLICATION 1: SATELLITE VERSUS CABLE
This Application illustrates possible responses by a cable company to the entry of a satellite TV provider. In many cases the cable firm improves the quality of its service. It may lower price as well, or possibly increase price (in concert with the higher service). Consumers typically win in either case because their consumer surplus (the difference between what they are willing to pay for a service and what they actually pay) increases by an average of 32 percent.
8.2 Monopolistic Competition

The monopolistic competition market structure can be described by the following three features:

- Many firms. Because economies of scale exist at low output levels, both small and large firms can coexist in this market.
- Differentiated product. **Product differentiation** is the process used by firms to distinguish their products from the products of competing firms. Products can be differentiated by style, options offered, flavor, location, or many other characteristics.
- No barriers to entry. There is nothing to prevent entry from occurring in the market.

Each firm is like a monopoly in that it is the only seller of its version of the market product. The market is like competition in that goods are substitutes for each other and that there is free entry into the market.

Free entry in a market will always cause economic profits to fall to zero. Entry will continue to occur until no economic profits exist. In Figure 8.1, the impact of entry is that the firm-specific demand curve continues to shift to the left until we reach the outcome shown in Figure 8.2 of the text. Here you see that the firm chooses its profit-maximizing quantity of 80 toothbrushes and sells them for $1.40 each. At an output level of 80 toothbrushes, average cost is also $1.40. The firm is earning zero economic profits.

### Remember

Economic profits attract entry into a market. With no barriers to entry, entry will occur until economic profits are zero.

Product differentiation can take many forms. One important consideration is location. Think about your own purchasing decisions. Do you always buy gasoline from the same station? If so, is it because they always have the lowest price or because they are the most convenient?

Let’s review an Application which answers a key question:

2. What does it take to enter a market with a franchise?

**APPLICATION 2: OPENING A DUNKIN’ DONUTS SHOP**

This Application provides an overview of entering a market by opening a franchise shop. If you wanted to sell donuts, you could either open your own independent store or open an outlet of a franchise store. The franchise gives you brand recognition, advertising, and training. In return you pay a fixed fee plus a percentage of your sales to the franchise holder. Can you expect to make money? If other firms can enter the market, you can expect to cover your economic costs and earn zero economic profits.

8.3 Trade-Offs with Entry and Monopolistic Competition

While entry leads to lower prices and a larger total quantity in the market, it lowers output by firm and leads to higher average costs of production. This is the key trade-off of entry and monopolistic competition. We gain a lower market price, higher output, and more product variety, but it comes at the cost of higher costs of production.
Remember

In a perfectly competitive market in long-run equilibrium, each firm is producing output at minimum average cost. Because firms in a monopolistically competitive market face a downward-sloping demand curve, in long-run equilibrium, each firm will produce at higher than minimum average cost.

Figure 8.4 of the text shows the efficiency cost of monopolistic competition. If each firm sold an identical product we would have a perfectly competitive industry as shown in Panel A. Notice that for a firm in this market, marginal revenue is equal to price and the profit-maximizing output of the firm occurs at point $a$. This is also the point of minimum average cost.

In Panel B, we have the firm diagram for a monopolistically competitive firm. Here the firm faces a downward-sloping, firm-specific demand curve, and thus marginal revenue is less than price. The firm chooses price/output at point $c$, which occurs on the downward-sloping portion of average cost. As a result, production costs are higher than they would be without product variety.

Let’s review an Application that answers a key question:

3. How does monopolistic competition compare to perfect competition?

APPLICATION 3: HAPPY HOUR PRICING
This Application illustrates how bars and restaurants respond to increased demand elasticity for its product as individual demands increase. As a result, they respond by lowering their prices in the face of more elastic demand. The result is happy hour.

Remember

Product differentiation increases the average cost of production but introduces new varieties of products that consumers value. Many economists believe the value consumers place on product variety outweighs the social cost of producing above minimum average cost.

8.4 Advertising for Product Differentiation

Advertising can play a key role in markets with product differentiation. A famous study found that advertising price competition lowered eyeglass prices by about 20 percent. Advertising can also focus on different features of the product. Finally, advertising can be used to promote a brand image without conveying any real information about the product.

Advertising can also be a signal to consumers. If you are willing to pay a large sum of money to an endorser, you are signaling to the market that you believe you have a good product. Your goal with the endorser is to get people to try the product for the first time and, hopefully, to continue to purchase the product. If you don’t think people will like the product enough to purchase it again, you are unlikely to spend a great deal of money advertising the product.
Let’s review an Application that answers a key question:

4. How does advertising affect consumer choice?

APPLICATION 4: PICTURE OF MAN VERSUS PICTURE OF WOMAN
This Application illustrates that the demand for consumer loans is not only responsive to the interest rate offered, as we would expect, but for men, it is also responsive to whether the ad contained a male or female. Replacing a male with a female in the advertisement had the same effect as lowering the interest rate by 25 percent. The response by females was the same regardless of whether a male or female model was used in the ad.

8.5 Oligopoly and Pricing

An **oligopoly** is defined as a market served by a few firms. In particular, firms in an oligopoly market
- may sell similar or differentiated products.
- are concerned about how other firms in the market will react to their choices.
- act strategically, taking into consideration how its rivals will respond to their actions.

In an oligopoly, a few firms have market power, that is, the ability to control prices. In an oligopoly market, much of the market power is concentrated in a few firms. A **concentration ratio** measures the percentage of the market output produced by the largest firms.

Most typical is the **four-firm concentration ratio**. This is simply the sum of the market shares of the four largest firms in the market.

Suppose a market consists of ten firms. The largest firm has 25 percent of the market. The next three firms each have 15 percent of the market. Each of the other six firms have market share of 5 percent. The four-firm concentration ratio is:

\[ 25\% + 15\% + 15\% + 15\% = 70\% \]

Table 8.3 in the text also contains the **eight-firm concentration ratio**. This is simply the sum of the market shares of the eight largest firms in the market.

Using the numbers from our previous example, the eight-firm concentration ratio would be:

\[ 25\% + 15\% + 15\% + 15\% + 5\% + 5\% + 5\% + 5\% = 90\% \]

An alternative measure of market power is the Herfindahl-Hirschman index (HHI). To compute the HHI, we add up the squared market shares of all the firms in the industry. A monopoly will have an HHI of 10,000. This is 100^2 since the only firm in the market will have 100 percent market share. An industry with 100 small firms, each with 1 percent of the market, would have an HHI of 100.

The Justice Department classifies industries in the following ways:
- Unconcentrated: HHI less than 1,000.
- Highly concentrated: HHI greater than 1,800.
Using the numbers from our first example, we have:

\[
HHI = 25^2 + 15^2 + 15^2 + 15^2 + 5^2 + 5^2 + 5^2 + 5^2 + 5^2 + 5^2
\]

\[
= 625 + 225 + 225 + 225 + 25 + 25 + 25 + 25 + 25 + 25
\]

\[
= 1,550
\]

There are three primary reasons why an oligopoly occurs:

1. Government barriers to entry.
2. Economies of scale in production.
3. Advertising campaigns.

**Cartel Pricing and the Duopolists’ Dilemma**

A duopoly is a market with two firms. We can use the duopoly model to understand the behavior of firms in an oligopoly market. The text considers a duopoly in air travel between two cities.

Firms in an oligopoly would like to act as a cartel. A cartel is a group of firms that act in unison, coordinating their price and quantity decisions. Ideally a cartel would like to charge the monopoly price for the industry product. This is shown as point \( b \) in Figure 8.5 of your text. This could be done if the firms agree together to fix prices. **Price fixing** is an arrangement in which firms conspire to fix prices. Both cartels and price-fixing are illegal in the United States. It is also difficult for firms to enter a price fixing agreement unless the firms have some way to punish those who violate the agreement.

Figure 8.6 in your text shows a more usual duopoly outcome in which firms are unable to fix prices. Each firm will sell at point \( b \) on their firm-specific demand curve. This translates into point \( d \) on the market demand curve. Notice that when firms are unable to fix prices, we have higher output and lower prices than under the cartel result (which you remember is the same as the monopoly result).

Recall the following key principle:

**Key Principle: Marginal Principle**

Increase the level of an activity as long as its marginal benefit exceeds its marginal costs. Choose the level at which the marginal benefit equals the marginal costs.

We can use game theory to understand the choices facing the two firms. Figure 8.7 in your text illustrates a game tree, a graphical representation of the consequences of different actions in a strategic setting. A game tree has three components:

- Decision nodes: These are the squares in the diagram and show a point at which one of the players makes a decision. In the game tree in Figure 8.7, Jill makes the first decision, choosing a high or low price, and then Jack makes the second decision. There are two decision nodes for Jack as he faces two possible decision scenarios, one in which Jill has chosen a high price and one in which Jill has chosen a low price.
- Arrows: These show the possible paths of the game across the game tree. The game moves from left to right. The highlighted arrow shows the outcome of the game.
- Rectangles: These show the payoffs from a particular set of choices. Notice that the payoffs depend on the actions of both players. So the payoff to Jill from choosing a high price depends on whether Jack also chooses a high price.
To solve the game tree, we move from right to left. If Jill picks a high price, Jack has the choice between profits of $12,000 (with a low price) and $9,000 (with a high price). We would expect that Jack would choose the low price in this situation. If Jill picks a low price, Jack has the choice between profits of $3,000 (with a high price) and $8,000 (with a low price). Again we would expect Jack to pick the low price.

For Jack, a low price is a dominant strategy. A dominant strategy is an action that is the best choice for a player, no matter what the other player does.

Since Jill knows that Jack will always pick the low price, her choice is between profits of $3,000 (with a high price) or $8,000 (with a low price). She would prefer the low price. The equilibrium of the game is illustrated by the bold arrow in Figure 8.7. In this case Jill earns profits of $8,000, and Jack earns profits of $8,000.

If both Jack and Jill had chosen the high price, they would have each earned higher profits. This is the duopolists’ dilemma, a situation in which both firms in a market would be better off if both chose the high price, but each chooses the low price.

The solution with both choosing the low price is the Nash equilibrium outcome for this game tree. A Nash equilibrium is an outcome of a game in which each player is doing the best he or she can, given the action of the other players.

✉️ Study Tip
A Nash equilibrium means that no player in a game would want to change their chosen strategy once they know what the other player has chosen.

Let’s review an Application that answers a key question:

5. Why do cartels sometimes fail to keep prices high?

APPLICATION 5: FAILURE OF THE SALT CARTEL
This Application shows the formation and collapse of nineteenth century salt cartels. These were groups established to ensure high salt prices as reductions in transportation costs introduced more competition into the salt markets. Like many cartel agreements, the salt cartels broke down as firms cheated on agreements and high prices attracted new firms to the market.

8.6 Overcoming the Duopolists’ Dilemma

The duopolists’ dilemma arises because each firm has an incentive to underprice the other to gain market share. If this incentive can be eliminated, duopolists can keep prices high.

One strategy is to ensure that there is no gain from underpricing. A low-price guarantee, a promise to match a lower price of a competitor, is one way to do this. Figure 8.8 in the text illustrates that Jill’s low-price guarantee eliminates Jack’s ability to earn higher profits by offering a low price when Jill charges a high price. Jill does this by committing to offering a low price if Jack offers a low price. The low price guarantee essentially adds a decision node to the game tree. If Jack chooses a low price after Jill has chosen
a high price, Jill automatically offers a refund to provide the same outcome as if both had chosen a low price. Jack now has the choice between earning $9,000 with a high price or $8,000 with a low price in response to Jill’s high price. Jill’s action has taken away the incentive for Jack to offer a low price.

If Jack and Jill make pricing decisions repeatedly, it becomes easier for them to fix prices. If Jack and Jill agree to sell at the cartel price, the outcome will be at point c in Panel B of Figure 8.6. The text lists three pricing strategies:

1. A duopoly pricing strategy: If Jack violates the cartel arrangement, Jill accepts the lower profits of a low price strategy, and the duopoly outcome is at point d and forever abandons the idea of cartel pricing.
2. A grim-trigger strategy: If Jack underprices Jill, she drops her price so low that economic profits fall to zero for both firms.
3. A tit-for-tat strategy: Jill decides that her pricing decision next month will be the same as Jack’s pricing decision this month. This is illustrated in Figure 8.9 in your book. Notice that Jill’s choice (indicated by a square) is always the choice Jack made (indicated by a circle) in the previous period.

All three of these strategies promote cartel pricing by penalizing the firm that underprices the other firm. As with most decisions, there are benefits and costs to be considered when deciding whether to underprice:

- Benefit: If Jill chooses a high price and Jack chooses a low price, he earns $12,000 this period instead of $9,000.
- Cost: If Jill responds by charging a low price next period and in the future, Jack will earn $8,000 per period instead of $9,000.

If Jack is interested in making profits for a long period of time, he would rather sacrifice the $3,000 additional dollars this period for the $1,000 additional dollars in many future periods. If Jack is unconcerned about the future, he would rather have the $3,000 now.

Explicit price fixing is illegal in the United States. The Sherman Antitrust Act of 1890 was the first of several pieces of legislation that outlawed price-fixing and cartel behavior in the United States.

At times firms sometimes rely on implicit price fixing, often through price leadership, a system under which one firm in an oligopoly takes the lead in setting prices. In this system, the lead firm sets the price and the other firms follow the leader.

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**Remember**

Repeated interaction between oligopolists makes cooperation and cartel-like behavior more likely.
Let’s review an Application that answers a key question:

6. Do low-price guarantees generate higher or lower prices?

**APPLICATION 6: LOW-PRICE GUARANTEE INCREASES TIRE PRICES**
This Application illustrates that low-price guarantees often serve as a way for firms to charge higher prices than they would in the absence of the low-price guarantee.

8.7 The Insecure Monopolist and Entry Deterrence

This section examines the choices of a monopolist in the face of potential entry. Figure 8.10 in the text shows the outcomes of behavior in the face of entry.

When there is no threat of entry, a monopolist will choose point c. At this point, she will earn profits of $18,000. How will the monopolist act in the face of potential entry?

The monopolist could be passive, allowing the entry and then producing at the duopoly output level, which is shown as point d in Figure 8.10. Your text shows the profit from this activity as $8,000.

Another action that Mona can take is to serve so much of the market that another firm cannot reasonably enter. In Figure 8.10, a firm will only enter if it can serve 20 passengers. The zero-profit point comes when a firm serves 120 passengers. Mona could choose point e on the demand curve. At this point she is serving 100 passengers, leaving only 20 for a potential entrant. The entry-deterring quantity is calculated as:

Key Equation

entry-deterring quantity = zero-profit quantity – minimum entry quantity

Notice that, for Mona, choosing point e leads to profits of $10,000. Since the profits from this strategy are greater than the profits from the duopoly outcome, we would expect Mona to price in such a way to deter potential entry. This practice is known as limit pricing, the strategy of reducing the price to deter entry.

Figure 8.11 shows the game tree for this situation. Doug will choose whether or not to enter based on Mona’s output. If Mona chooses a small quantity, Doug can profitably enter. If Mona chooses a large quantity, Doug can’t profitably enter. If Mona chooses a small quantity and Doug enters, Mona will earn $8,000. If Mona chooses the large quantity, Doug will stay out and Mona will earn $10,000. As a result, Mona will produce the large quantity.

Your text shows that if the minimum entry quantity were only 10 passengers, Mona would not fight entry. In this case she would have to serve 110 passengers, point f in Figure 8.10, but at this point, profits are smaller than at the duopoly outcome. As a result, Mona would allow entry with the smaller minimum entry quantity.

A contestable market is one with low entry and exit costs. In this situation, the threat of entry will lead a monopoly firm to choose lower prices and higher output levels, thus earning lower profits and keeping potential entrants out.
Remember

How a monopoly responds to potential entrants will depend upon which strategy leads to the highest profit for the monopolist. A monopolist will fight entry if profits from limit pricing are higher than profits with entry. If profits from fighting entry are lower than profits from allowing entry, the monopolist will take a passive approach.

Let’s review an Application that answers a key question:

7. How does a monopolist respond to the threat of entry?

APPLICATION 7: MICROSOFT AS AN INSECURE MONOPOLIST
This Application illustrates how Microsoft engages in limit pricing with its Windows operating system and Office suite. Microsoft leaves roughly $38 billion in profit on the table with its pricing decision but still earns $5 billion more than they would if it allowed a second firm to enter the market.

8.8 Natural Monopoly

Natural monopolies occur when the scale of production is so large that only one firm can survive in the market. Many public utilities are natural monopolies.

Think about a municipal water system. Even if you could secure a low-cost source of water, there would be a tremendous monetary cost involved in digging up streets and laying water pipe, not to mention the inconvenience to residents. In a situation like this, either the city will provide the utility service or will allow a natural monopoly provider in the market.

If left to its own devices, a natural monopoly would choose output where marginal revenue is equal to marginal cost and set the price from the demand curve. This is illustrated at point b in Figure 8.12 of your text.

The Marginal Principle
Increase the level of an activity as long as its marginal benefit exceeds its marginal cost. Choose the level at which the marginal benefit equals the marginal cost.

Study Tip
Regardless of the market structure, a firm will always choose to produce output to the point where marginal revenue is equal to marginal cost.

Entry is not going to occur in this market, even with economic profits, because of the high fixed costs of entering the market. As Figure 8.13 of the text shows, if two firms tried to split the market, each firm’s firm-specific demand curve would lie below the average cost curve, and both firms would lose money. As a result, there will be no entry.
In the case of natural monopoly, government typically sets a maximum price that the monopoly can charge consumers. A typical approach is *average-cost pricing* in which the price is set at the intersection of the average-cost curve and the demand curve. This is illustrated by point *e* in Figure 8.14 in your text. At this point, the regulated monopolist will earn zero economic profits.

Let’s review an Application which answers a key question:

8. What is the rationale for regulating a natural monopoly?

**APPLICATION 8: PUBLIC VERSUS PRIVATE WATERWORKS**

Nineteenth century England saw a movement toward private water provision in many urban areas. This Application highlights the negative impacts of this for water customers and the move back toward public provision of water. The Application shows that in some cases a regulated monopoly provider is the best solution.

8.9 Antitrust Policy

A *trust* is an arrangement under which the owners of several companies transfer their decision-making powers to a small group of trustees. The practical effect is to limit competition among the firms and allow the firms to act more like a monopolist. Antitrust policy exists to promote competition among firms. Both the Antitrust Division of the Department of Justice and the Federal Trade Commission are tasked with enforcing U.S. antitrust laws.

There are three basic types of antitrust policy:

- Breaking up monopolies.
- Blocking mergers.
- Regulating business practices.

Many of today’s largest tobacco companies were at one time all part of the American Tobacco Company. By 1907, the American Tobacco Company controlled 95 percent of the U.S. cigarette market. The Supreme Court found that the American Tobacco Company used its monopoly position to eliminate rivals and in 1911 ordered that the company be broken into several smaller tobacco companies.

A *merger* is a process in which two or more firms combine their operations. There are two basic types of mergers:

- Horizontal merger: the joining together of firms producing a similar product.
- Vertical merger: the joining together of firms at different stages of the production process.

Mergers that are expected to have little impact on the market are allowed. Mergers that will reduce competition, typically defined as giving firms more ability to raise prices, are challenged and may be prevented or allowed only with certain restrictions on the firms.

The Wonder Bread case provides a nice example of a restriction on a merger. Before the merger would be allowed, Interstate Bakeries had to sell off some of its brands and bakeries so that adequate competition would continue to exist in the market after the merger of Interstate and Continental bakeries.

Certain business practices may also reduce competition in the market. A *tie-in sale* is a business practice under which a business requires a consumer of one product to purchase another product. *Predatory pricing* occurs when a firm sells a product at a price below its production cost to drive a rival out of business and then increases the price.
Let’s review an Application which answers a key question:

9. How does a merger affect prices?

APPLICATION 9: MERGER OF PENNZOIL AND QUAKER STATE
This Application illustrates that the merger of Pennzoil and Quaker State resulted in the price of Quaker State oil increasing by 5 percent, with no change in the price of Pennzoil. Additionally, Pennzoil’s market share increased, while that of Quaker State fell. In general, prices tend to increase by relatively small amounts following mergers. We tend not to see large increases by firms trying to exploit market power nor price decreases as firms become more efficient.

The following table summarizes key antitrust legislation:

<table>
<thead>
<tr>
<th>Law</th>
<th>Date Enacted</th>
<th>Regulation Enacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sherman Act</td>
<td>1890</td>
<td>Made it illegal to monopolize a market or to engage in practices that result in a restraint of trade.</td>
</tr>
<tr>
<td>Clayton Act</td>
<td>1914</td>
<td>Outlawed specific practices that discourage competition, including tie-in sales contracts, price discrimination for the purpose of reducing competition, and stock-purchase mergers that would substantially reduce competition.</td>
</tr>
<tr>
<td>Federal Trade Commission Act</td>
<td>1914</td>
<td>Created a mechanism to enforce antitrust laws.</td>
</tr>
<tr>
<td>Robinson-Patman Act</td>
<td>1936</td>
<td>Prohibited selling products at “unreasonably low prices” with the intent of reducing competition.</td>
</tr>
<tr>
<td>Celler-Kefauver Act</td>
<td>1950</td>
<td>Outlawed asset-purchase mergers that would substantially reduce competition.</td>
</tr>
<tr>
<td>Hart-Scott-Rodino Act</td>
<td>1980</td>
<td>Extended antitrust legislation to proprietorships and partnerships.</td>
</tr>
</tbody>
</table>

Activity

Think of the product commercials you have recently seen on television. Answer the following questions:
- a. What product was being advertised?
- b. How did the advertisement attempt to differentiate its product from others?
- c. Did the product use a celebrity endorser?
- d. Did the advertisement attempt to create an image for the good or convey information about the product?

Key Terms

**Cartel:** A group of firms that act in unison, coordinating their price and quantity decisions.

**Concentration ratio:** The percentage of the market output produced by the largest firms.

**Contestable market:** A market with low entry and exit costs.
Dominant strategy: An action that is the best choice for a player, no matter what the other player does.

Duopolists’ dilemma: A situation in which both firms in a market would be better off if both chose the high price, but each chooses the low price.

Duopoly: A market with two firms.

Game tree: A graphical representation of the consequences of different actions in a strategic setting.

Grim-trigger strategy: A strategy where a firm responds to underpricing by choosing a price so low that each firm makes zero economic profits.

Limit price: The price that is just low enough to deter entry.

Limit pricing: The strategy of reducing the price to deter entry.

Low-price guarantee: A promise to match a lower price of a competitor.

Merger: A process in which two or more firms combine their operations.

Monopolistic competition: A market served by many firms that sell slightly different products.

Nash equilibrium: An outcome of a game in which each player is doing the best he or she can, given the action of the other players.

Oligopoly: A market served by a few firms.

Predatory pricing: A firm sells a product at a price below its production cost to drive a rival out of business, and then increases the price.

Price fixing: An arrangement in which firms conspire to fix prices.

Price leadership: A system under which one firm in an oligopoly takes the lead in setting prices.

Product differentiation: The process used by firms to distinguish their products from the products of competing firms.

Tie-in sales: A business practice under which a business requires a consumer of one product to purchase another product.

Tit-for-tat strategy: A strategy where one firm chooses whatever price the other firm chose in the preceding period.

Trust: An arrangement under which the owners of several companies transfer their decision-making powers to a small group of trustees.
Practice Quiz

(Answers are provided at the end of the Practice Quiz.)

1. Which of the key principles of economics does the monopolistically competitive firm use to make its output decisions?
   a. the marginal principle
   b. the principle of diminishing returns
   c. the principle of opportunity cost
   d. the real-nominal principle

2. What are the characteristics of monopolistic competition?
   a. many firms, homogeneous product, and artificial barriers to entry
   b. many firms, differentiated product, and artificial barriers to entry
   c. many firms, differentiated product, and no artificial barriers to entry
   d. few firms, differentiated product, and no artificial barriers to entry

3. Monopolistic competition is similar to a perfectly competitive industry in the fact that
   a. marginal revenue is less than price in both industries.
   b. there are no significant barriers to entry in either industry.
   c. the firm’s demand is downward sloping in both cases.
   d. there is a unique product sold in each industry.

4. Monopolistically competitive firms have some control over price because
   a. there are no barriers to entry.
   b. there are only a few firms in the market.
   c. the products they produce are differentiated.
   d. economic profits are possible.

5. Refer to the table below. What level of output should be produced in order to maximize profit?

<table>
<thead>
<tr>
<th>Coffee Cups Sold per Week (Q)</th>
<th>Price (P)</th>
<th>Total Revenue (TR)</th>
<th>Marginal Revenue (MR)</th>
<th>Total Cost (TC)</th>
<th>Marginal Cost (MC)</th>
<th>Average Total Cost (ATC)</th>
<th>Profit</th>
</tr>
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a. 1 unit of output.  b. 5 units of output  c. 6 units of output  d. 10 units of output.
6. Suppose that there are currently three video rental stores in your town. Each store rents movies for $4 and has an average cost of $2 per movie. What do you expect to happen in this market in the future?
   a. More firms will enter, and the price of video rentals will rise.
   b. More firms will enter, and the price of video rentals will fall.
   c. Firms will exit the market, and the price of video rentals will rise.
   d. Firms will exit the market, and the price of video rentals will fall.

7. In a monopolistically competitive market, what will cause the entry of new firms to stop?
   a. an increase in the costs of producing output
   b. a decrease in market price
   c. a decrease in revenues
   d. the eventual disappearance of economic profit

8. This question tests your understanding of Application 2 in this chapter: Opening a Dunkin’ Donuts shop: What does it take to enter a market with a franchise?
   How much money are you likely to make in your donut shop? You will compete for donut consumers with other donut shops, bakeries, grocery stores, and coffee shops. Given the small barriers to entering the donut business, you should expect keen competition for consumers. Although your brand-name donuts will give you an edge over your competitors, remember that you must pay the franchise fee and royalties. In the monopolistically competitive donut market, you should expect to make zero economic profit, with total revenue equal to total cost.

   If monopolistically competitive firms can expect to earn zero economic profit in the long run, which of the following will occur?
   a. Zero economic profit does not cover the opportunity cost of being in the business, so firms will exit the market.
   b. New firms will enter the market.
   c. Zero economic profit means that firms earn normal profit, so they stay in the market, but there is no incentive for firms to enter.
   d. For entrepreneurs, the opportunity cost of being in the industry is zero.

9. When differentiating a product by location in a market with no barriers to entry, a firm can expect to earn
   a. positive economic profit.
   b. zero economic profit.
   c. below normal profit.
   d. losses in the short run but profits in the long run.

10. As described in the textbook, by paying millions of dollars for celebrity endorsements, a firm’s primary purpose is to
    a. comply with government regulations.
    b. provide information about the product’s characteristics and price.
    c. send a signal to consumers that the advertised product is appealing and likely to be popular.
    d. try to sell less appealing products.
11. Compare and contrast the price/output decisions of profit-maximizing firms in a perfectly competitive market versus those of a monopolistically competitive market.

12. Compare and contrast the long-run equilibrium conditions that hold in a perfectly competitive market, a monopolistically competitive market, and a monopoly. Be specific by referring to the relationship between common measures such as price, marginal revenue, marginal cost, average cost, and profit.

13. Fill in the blanks: A four-firm concentration ratio is the percentage of the ____________ by the four largest firms.
   a. total industry revenue shared
   b. market output produced
   c. total geographic coverage of the market
   d. market inputs purchased

14. When firms agree to act as a monopoly and set prices,
   a. they are called a cartel.
   b. they are likely to make higher profits.
   c. they have incentives to cheat on the agreement.
   d. all of the above occur.

15. Refer to the figure below. Which of the following trajectories describes the best strategy for Jack when Jill charges the high price?

   ![Diagram](image)

   a. XY1
   b. XY2
   c. XZ3
   d. XZ4

16. Which of the following is true about guaranteed price matching?
   a. Price matching is one of those situations that leads to the duopolists’ dilemma.
   b. Price matching eliminates the possibility of cartel profits.
   c. Price matching is a strategy that results in a duopoly price.
   d. None of the above is true.
17. In which of the following retaliation strategies does the firm drop its price to the level that will result in zero economic profit?
   a. a duopoly pricing strategy
   b. a grim trigger strategy
   c. a tit-for-tat strategy
   d. none of the above

18. Refer to the figure below. Which portion of this demand curve is the elastic portion?

![Demand Curve Diagram]

a. the portion above $6
b. the portion below $6
c. The entire demand curve is relatively elastic.
d. Neither portion. The entire demand curve is relatively inelastic.

19. Refer to the figure below. Knowing Jill’s dominant strategy, Jack’s best response is to

![Game Tree Diagram]

a. follow the trajectory X, Y, 1.
b. follow either X, Y, 1, or X, Z, 4.
c. follow either X, Y, 1, or X, Z, 3.
d. follow either X, Y, 2, or X, Z, 4.

20. If a market is a natural monopoly,
   a. the government can and often does intervene by regulating the price charged by the monopolist.
   b. the government can but does not intervene in the market.
   c. the government is prevented by law from intervening in the market.
   d. the price charged by the monopolist is close or equal to the competitive price.

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21. Refer to the figure below. When the monopolist maximizes profit, how much is the profit per subscriber?

![Graph showing long-run average and marginal cost curves with market demand and marginal revenue lines.

a. $27
b. $21
c. $6
d. $420,000

22. What happens under an average-cost pricing policy?
   a. The government chooses the price at which the demand curve intersects the long-run average cost curve.
   b. The government chooses the price at which the demand curve intersects the long-run marginal cost curve.
   c. The government chooses the price at which marginal revenue equals long-run marginal cost.
   d. The government chooses the price that minimizes the long-run average cost of production.

23. A process in which two or more firms combine their operations is called
   a. a merger.
   b. a monopoly.
   c. a cartel.
   d. a duopoly.

24. Which of the following terms refers to the practice in which a business forces the buyer of one product to purchase another product?
   a. a merger
   b. predatory pricing
   c. tie-in sales
   d. a natural monopoly

25. Which of the following is a type of antitrust policy?
   a. blocking mergers
   b. preventing trusts
   c. regulating business practices
   d. all of the above

26. Which of the following pieces of legislation made it illegal to monopolize a market or to engage in practices that result in a restraint of trade?
   a. the Sherman Act
   b. the Robinson-Patman Act
27. Which piece of antitrust legislation prohibited selling products at “unreasonably low prices” with the intent of reducing competition?
   a. the Federal Trade Commission Act
   b. the Clayton Act
   c. the Sherman Act
   d. the Robinson-Patman Act

28. Briefly, explain the duopolists’ dilemma and compare it to a cartel agreement.

29. Briefly explain the prisoners’ dilemma.

30. Explain the concept of guaranteed price matching, and explain whether it results in lower or higher prices.
Answers to the Practice Quiz

1. a. As long as the marginal benefit is greater than the marginal cost of production, the monopolistically competitive firm will continue to produce.

2. c. Many firms, product differentiation, and no artificial barriers to entry are characteristics of monopolistic competition.

3. b. Monopolistically competitive industries have many firms, differentiated products, and no barriers to entry. Perfectly competitive industries have many firms, identical products, and no barriers to entry. Differentiated products means that firm demand is downward sloping in monopolistically competitive industries, and thus marginal revenue is less than price.

4. c. Monopolistically competitive firms have some control over price because products are differentiated. Since products are not identical, demand for each firm’s goods are elastic but not perfectly elastic.

5. b. At this level of output, marginal revenue of $1.50 equals marginal cost.

6. b. Since firms are earning positive economic profit, eventually more firms will enter the market. As firms enter, demand for each firm decreases, and the price falls.

7. d. Entry will stop once the economic profit of existing firms reaches zero and revenue is just enough to cover all costs, including the opportunity cost of all inputs.

8. c. Revenue is sufficient to cover your total cost, which includes the franchise fee and royalties, as well as the opportunity cost of your time and the opportunity cost of any funds you invest in the business, but not enough to make it worthwhile for other firms to enter.

9. b. As shown in the textbook example, new video stores will enter the market until each store makes zero economic profit. Each firm’s revenue is high enough to cover all its costs—including the opportunity cost of all its inputs—but not enough to cause additional firms to enter the market.

10. c. An advertisement that doesn’t provide any product information may actually help consumers make decisions. By paying millions of dollars to run an advertisement, a firm sends a signal to consumers that the advertised product is appealing and likely to be popular. This is called the signaling effect of advertisement.

11. In order to maximize profit, both perfectly competitive firms and monopolistically competitive firms set output where marginal revenue equals marginal cost. In the perfectly competitive case, price equals marginal revenue; therefore, price equals marginal cost. This is one indicator that firms are efficient. In the case of monopolistic competition, the firm’s demand curve is downward sloping, which means that marginal revenue is less than price. When profit is maximized, price is greater than marginal cost. This means that the amount of output produced is insufficient. Monopolistically competitive firms charge a higher price and produce less output than perfectly competitive firms.

12. In perfect competition, price equals marginal revenue, which equals marginal cost, which equals minimum average total cost. Economic profit equals zero, that is, the amount of profit is only normal profit. In monopolistic competition, marginal cost equals marginal revenue, and price is greater than marginal revenue and marginal cost. Average cost is above the minimum average cost and equal to...
price; therefore, economic profit equals zero. Firms earn only normal profit. In monopoly, marginal cost equals marginal revenue, price is greater than marginal revenue and marginal cost, and average cost is above the minimum average cost. Price is greater than average cost, so the firm may earn positive economic profit equals zero. Only in a perfectly competitive market are resources allocated efficiently. Since price equals marginal cost, firms produce exactly what consumers want, and since average cost is minimized, firms make optimal use of their plant sizes.

13. b. A four-firm concentration ratio is the percentage of the market output produced by the four largest firms.

14. d. A cartel, illegal under U.S. law, consists of firms acting together to set prices and thus increase profit. However, cartels tend to fall apart due to the incentive to cheat.

15. b. Jack earns higher profits when he charges the lower price once Jill decides to charge the high price—$8,500 instead of $7,500.

16. d. Guaranteed price matching is a strategy where a firm guarantees it will match a lower price by a competitor; prices are likely to end up at the monopolist level so that the firms make cartel profits.

17. b. In a duopoly pricing strategy, the firm also lowers price; abandons the idea of cartel profits, and settles for duopoly profits, which are better than the profits when she is underpriced by the other firm. In a grim-trigger strategy, the firm drops the price to the level that will result in zero economic profit. In a tit-for-tat strategy, the firm chooses whatever price the other firm chose the preceding period.

18. a. The demand curve above $6 is elastic (use the TR test to check—\( TR \) moves with \( Q \) above $6 and with \( P \) below $6 so it is elastic above and inelastic below).

19. a. Jill’s dominant strategy is to advertise, thus Jack’s best action is to advertise, giving us trajectory X, Y, 1.

20. a. The government usually does intervene by regulating the price charged by the natural monopolist.

21. c. Profit per subscriber equals revenue per subscriber, or price, of $27 minus cost per subscriber, or average cost, of $21. \( 27 - 21 = 6 \).

22. a. Under an average-cost pricing policy, the government chooses the price at which the demand curve intersects the long-run, average-cost curve.

23. a. A merger is a process in which two or more firms combine their operations.

24. c. Tie-in sales occur when a business forces the buyer of one product to purchase another product.

25. d. The choices above summarize all of the types of antitrust regulation available today.

26. a. The Sherman Act of 1890 made it illegal to monopolize a market or to engage in practices that result in a restraint of trade.

27. d. The Robinson-Patman Act of 1936 prohibited selling products at “unreasonably low prices” with the intent of reducing competition.

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28. The duopolists’ dilemma is a situation in which both firms in a market would be better off if they chose the high price but each chooses the low price. This occurs when firms act interdependently, or when the actions of one firm affect the actions of the other. In the duopoly situation, both firms act on their own, without price agreements. In effect, both firms behave competitively. This results in a lower price and higher output produced by the firms in the duopoly than by firms in a cartel. A cartel is an agreement whereby firms agree to coordinate price and output decisions, in effect acting as a monopoly. The outcome of a cartel agreement is the same as the outcome of a monopoly. The cartel restricts output and charges higher prices.

29. The prisoners’ dilemma is the duopolists’ dilemma. When two prisoners are placed in separate cells, and each prisoner is unaware of the other’s decision to confess or not to confess, they end up implicating each other. Although both criminals would be better off if they both kept quiet, they implicate each other because the police reward them for doing so.

30. Guaranteed price matching is a scheme under which a firm guarantees that it will match a lower price by a competitor; also known as meet-the-competition policy. If one producer chooses the high price, the other will match the high price in which case both producers will earn maximum (cartel) profits. If one producer chooses the low price, the other will match the low price, and both firms will earn minimum (duopoly) profits. Therefore, firms have no reason to choose the low price. Guaranteed price matching will result in higher prices. Price matching eliminates the duopolists’ dilemma and makes cartel profits and pricing possible, even without a formal cartel. Guaranteed price matching ensures that consumers pay the higher price!