

Product Differentiation and Entry in the Market for Smart Phones

Apple Sues Rival HTC as Phone Competition Rises

<http://seattletimes.nwsourc.com>

March 2, 2010

As Apple Inc.'s iPhone faces stiffer competition in the lucrative market for smart phones, the company is going after one of its main rivals with patent lawsuits claiming theft of touch screen technology and other features.

The complaints, which Apple filed Tuesday, cover a slew of models made by Taiwanese phone maker HTC Corp., including the Nexus One, G1, and myTouch 3G—all using the free, rival Android mobile operating software from Google Inc. Non-Android phones include HTC's Touch series.

But consumers shouldn't worry about buying or using any of those phones. Patent cases can take months or years to resolve—sometimes longer than the life of these phones—and agreements over licensing and royalty payments often emerge.

Still, it shows Apple's get-tough strategy as significant competitors emerge.

"We can sit by and watch competitors steal our patented inventions, or we can do something about it," Apple CEO Steve Jobs said in a statement. "We've decided to do something about it." ...

Since the iPhone's debut, Apple has had a lock on much of the smart phone market, alongside Research In Motion Ltd., which makes the popular BlackBerry devices.

However, over the last year or so, more competition has emerged from such phone makers as HTC and Motorola Inc., which are rolling out smart phones that use Google's Android software. Not only do these phones appeal to consumers, but they also work on numerous wireless networks, unlike the iPhone, which is still limited in the United States to AT&T Inc. ...

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ESSENCE OF THE STORY

- The iPhone faces stiff competition in the market for smart phones.
- Apple is bringing patent lawsuits against HTC Corp., one of its main rivals, claiming theft of touch screen technology.
- The smart phones produced by HTC Corp. include the Nexus One, G1, and myTouch 3G.
- Resolving patent cases can take longer than the life of the product.
- Apple and Research In Motion Ltd., which makes the BlackBerry, have the largest share of the smart phone market.
- More competition is coming from phone makers HTC, Motorola Inc., and others.

ECONOMIC ANALYSIS

- Apple sold its first iPhone in 2007 and brought the more powerful 3G version to market in 2008.
- By creating a substantially differentiated product, Apple was able to generate a great deal of interest in smart phones throughout the world.
- In the first weekend, Apple sold 1 million of the 3G iPhone.
- But within a month of the launch of the 3G iPhone, many competing but differentiated devices were on the market.
- The monopolistic competition model explains what is happening in the smart phone market.
- Figure 1 shows the market for Apple's iPhone in its first month. (The numbers are assumptions.)
- Because Apple's iPhone differs from its competitors and has features that users value, the demand curve, D , and marginal revenue curve, MR , provide a large short-run profit opportunity.
- The marginal cost curve is MC and the average total cost curve is ATC . Apple maximizes its economic profit by producing the quantity at which marginal revenue equals marginal cost, which in this example is 3 million iPhones a month.
- This quantity of iPhones can be sold for \$200 each.
- The blue rectangle shows Apple's economic profit.
- Because this market is profitable, entry takes place. HTC, Motorola, and others (such as Research in Motion, LG, Nokia, and Samsung) enter the smart phone market.
- Figure 2 shows the consequences of entry.
- The demand for the iPhone decreases as the market is shared with the other phones.
- Apple's profit-maximizing price for the iPhone falls, and in the long run, economic profit is eliminated.
- With zero economic profit, Apple has an incentive to develop an even better differentiated phone and start the cycle described here again, making an economic profit in a new phone in the short run.
- The iPhone 4, announced in June 2010, was Apple's response to the entry described in the news article.

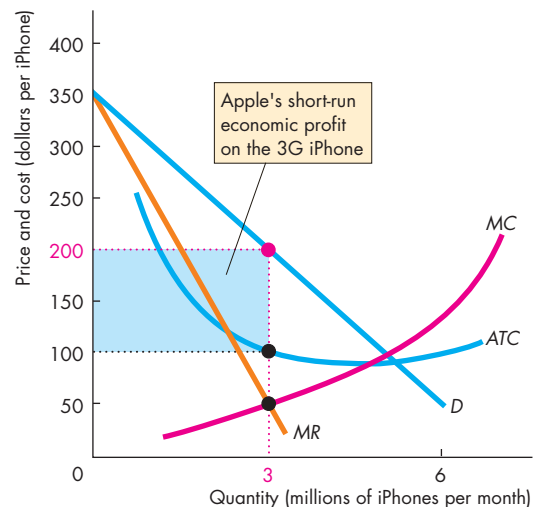


Figure 1 Economic profit in the short run

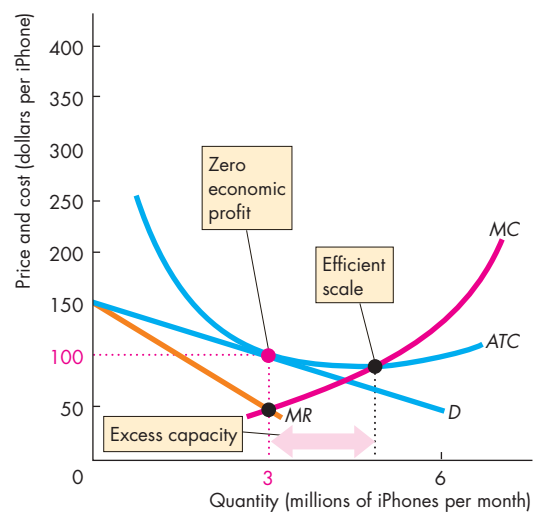


Figure 2 Zero economic profit in the long run



SUMMARY

Key Points

What Is Monopolistic Competition? (pp. 324–325)

- Monopolistic competition occurs when a large number of firms compete with each other on product quality, price, and marketing.

Working Problems 1 and 2 will give you a better understanding of what monopolistic competition is.

Price and Output in Monopolistic Competition

(pp. 326–329)

- Each firm in monopolistic competition faces a downward-sloping demand curve and produces the profit-maximizing quantity.
- Entry and exit result in zero economic profit and excess capacity in long-run equilibrium.

Working Problems 3 to 12 will give you a better understanding of price and output in monopolistic competition.

Product Development and Marketing (pp. 330–333)

- Firms in monopolistic competition innovate and develop new products.
- Advertising expenditures increase total cost, but average total cost might fall if the quantity sold increases by enough.
- Advertising expenditures might increase demand, but demand might decrease if competition increases.
- Whether monopolistic competition is inefficient depends on the value we place on product variety.

Working Problems 13 to 18 will give you a better understanding of product development and marketing.

Key Terms

Efficient scale, 328

Excess capacity, 328

Markup, 329

Monopolistic competition, 324

Product differentiation, 324

Signal, 332



STUDY PLAN PROBLEMS AND APPLICATIONS

You can work Problems 1 to 19 in MyEconLab Chapter 14 Study Plan and get instant feedback.

What Is Monopolistic Competition? (Study Plan 14.1)

- Which of the following items are sold by firms in monopolistic competition? Explain your selections.
 - Cable television service
 - Wheat
 - Athletic shoes
 - Soda
 - Toothbrushes
 - Ready-mix concrete
- The four-firm concentration ratio for audio equipment makers is 30 and for electric lamp makers it is 89. The HHI for audio equipment makers is 415 and for electric lamp makers it is 2,850. Which of these markets is an example of monopolistic competition?

Price and Output in Monopolistic Competition

(Study Plan 14.2)

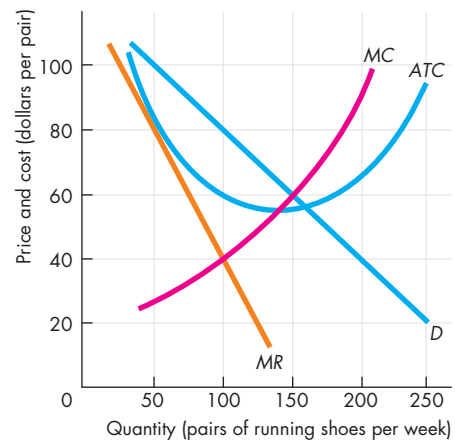
Use the following information to work Problems 3 and 4.

Sara is a dot.com entrepreneur who has established a Web site at which people can design and buy sweatshirts. Sara pays \$1,000 a week for her Web server and Internet connection. The sweatshirts that her customers design are made to order by another firm, and Sara pays this firm \$20 a sweatshirt. Sara has no other costs. The table sets out the demand schedule for Sara's sweatshirts.

Price (dollars per sweatshirt)	Quantity demanded (sweatshirts per week)
0	100
20	80
40	60
60	40
80	20
100	0

- Calculate Sara's profit-maximizing output, price, and economic profit.
- Do you expect other firms to enter the Web sweatshirt business and compete with Sara?
 - What happens to the demand for Sara's sweatshirts in the long run? What happens to Sara's economic profit in the long run?

Use the following figure, which shows the situation facing a producer of running shoes, to work Problems 5 to 10.



- What quantity does the firm produce, what price does it charge, and what is its economic profit or economic loss?
- In the long run, how does the number of firms producing running shoes change?
- In the long run, how does the price of running shoes and the quantity the firm produces change? What happens to the market output?
- Does the firm have excess capacity in the long run? If the firm has excess capacity in the long run, why doesn't it decrease its capacity?
- In the long run, compare the price of a pair of running shoes and the marginal cost of producing the pair.
- Is the market for running shoes efficient or inefficient in the long run? Explain your answer.
- Wake Up and Smell the Coffee**
Every change that Starbucks made over the past few years—automated espresso machines, pre-ground coffee, drive-throughs, fewer soft chairs and less carpeting—was made for a reason: to smooth operations or boost sales. Those may have been the right choices at the time, but together they ultimately diluted the coffee-centric experience. By 2008, Starbucks experienced a drop in traffic as customers complained that in pursuing rapid growth, the company has strayed too far from its roots. Starbucks will once again grind beans in its stores for drip coffee, give free

drip refills, and provide two hours of wi-fi. The company will roll out its new sleek, low-rise espresso machine that makes baristas more visible.

Source: *Time*, April 7, 2008

- a. Explain how Starbucks' past attempts to maximize profits ended up eroding product differentiation.
- b. Explain how Starbucks' new plan intends to increase economic profit.

12. The Shoe That Won't Quit

I finally decided to take the plunge and buy a pair of Uggs, but when I got around to shopping for my Uggs, the style that I wanted was sold out. The scarcity factor was not a glitch in the supply chain, but rather a carefully calibrated strategy by Ugg's parent Deckers Outdoor that is one of the big reasons behind the brand's success. Deckers tightly controls distribution to ensure that supply does not outstrip demand. If Deckers ever opened up the supply of Uggs to meet demand, sales would shoot up like a rocket, but they'd come back down just as fast.

Source: *Fortune*, June 5, 2008

- a. Explain why Deckers intentionally restricts the quantity of Uggs that the firm sells.
- b. Draw a graph to illustrate how Deckers maximizes the economic profit from Uggs.

Product Development and Marketing (Study Plan 14.3)

Use the following information to work Problems 13 to 16.

Suppose that Tommy Hilfiger's marginal cost of a jacket is a constant \$100 and the total fixed cost at one of its stores is \$2,000 a day. This store sells 20 jackets a day, which is its profit-maximizing number of jackets. Then the stores nearby start to advertise their jackets. The Tommy Hilfiger store now spends \$2,000 a day advertising its jackets, and its profit-maximizing number of jackets sold jumps to 50 a day.

13.
 - a. What is this store's average total cost of a jacket sold before the advertising begins?
 - b. What is this store's average total cost of a jacket sold after the advertising begins?
14.
 - a. Can you say what happens to the price of a Tommy Hilfiger jacket? Why or why not?
 - b. Can you say what happens to Tommy's markup? Why or why not?
 - c. Can you say what happens to Tommy's economic profit? Why or why not?

15. How might Tommy Hilfiger use advertising as a signal? How is a signal sent and how does it work?

16. How does having a brand name help Tommy Hilfiger to increase its economic profit?

Use the following news clip to work Problems 17 and 18.

Food's Next Billion-Dollar Brand?

While it's not the biggest brand in margarine, Smart Balance has an edge on its rivals in that it's made with a patented blend of vegetable and fruit oils that has been shown to help improve consumers' cholesterol levels. Smart Balance sales have skyrocketed while overall sales for margarine have stagnated. It remains to be seen if Smart Balance's healthy message and high price will resound with consumers.

Source: *Fortune*, June 4, 2008

17. How do you expect advertising and the Smart Balance brand name will affect Smart Balance's ability to make a positive economic profit?
18. Are long-run economic profits a possibility for Smart Balance? In long-run equilibrium, will Smart Balance have excess capacity or a markup?

Economics in the News (Study Plan 14.N)

19. Computer Makers Prepare to Stake Bigger Claim in Phones

Emboldened by Apple's success with its iPhone, many PC makers and chip companies are charging into the mobile-phone business, promising new devices that can pack the horsepower of standard computers into palm-size packages—devices that handle the full glory of the Internet, power two-way video conferences, and stream high-definition movies to your TV. It is a development that spells serious competition for established cell-phone makers and phone companies.

Source: *The New York Times*, March 15, 2009

- a. Draw a graph of the cost curves and revenue curves of a cell-phone company that makes a positive economic profit in the short run.
- b. If cell-phone companies start to include the popular features introduced by PC makers, explain how this decision will affect their profit in the short run.
- c. What do you expect to happen to the cell-phone company's economic profit in the long run, given the information in the news clip?
- d. Draw a graph to illustrate your answer to part (c).

ADDITIONAL PROBLEMS AND APPLICATIONS



You can work these problems in MyEconLab if assigned by your instructor.

What Is Monopolistic Competition?

20. Which of the following items are sold by firms in monopolistic competition? Explain your selection.
- Orange juice
 - Canned soup
 - PCs
 - Chewing gum
 - Breakfast cereals
 - Corn
21. The HHI for automobiles is 2,350, for sporting goods it is 161, for batteries it is 2,883, and for jewelry it is 81. Which of these markets is an example of monopolistic competition?

Price and Output in Monopolistic Competition

Use the following information to work Problems 22 and 23.

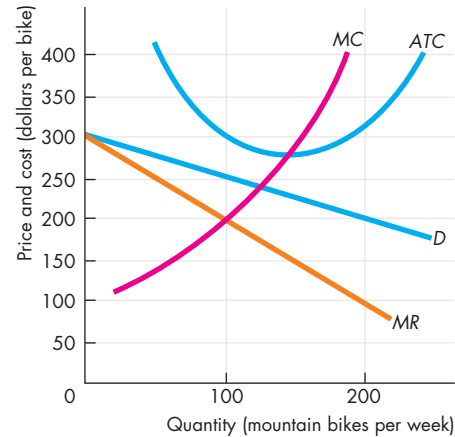
Lorie teaches singing. Her fixed costs are \$1,000 a month, and it costs her \$50 of labor to give one class. The table shows the demand schedule for Lorie's singing lessons.

Price (dollars per lesson)	Quantity demanded (lessons per month)
0	250
50	200
100	150
150	100
200	50
250	0

22. Calculate Lorie's profit-maximizing output, price, and economic profit.
23. a. Do you expect other firms to enter the singing lesson business and compete with Lorie?
b. What happens to the demand for Lorie's lessons in the long run? What happens to Lorie's economic profit in the long run?

Use the following figure, which shows the situation facing Mike's Bikes, a producer of mountain bikes, to work Problems 24 to 28. The demand and costs of other mountain bike producers are similar to those of Mike's Bikes.

24. What quantity does the firm produce and what is its price? Calculate the firm's economic profit or economic loss.



25. What will happen to the number of firms producing mountain bikes in the long run?
26. a. How will the price of a mountain bike and the number of bikes produced by Mike's Bikes change in the long run?
b. How will the quantity of mountain bikes produced by all firms change in the long run?
27. Is there any way for Mike's Bikes to avoid having excess capacity in the long run?
28. Is the market for mountain bikes efficient or inefficient in the long run? Explain your answer.

Use the following news clip to work Problems 29 and 30.

Groceries for the Gourmet Palate

No food, it seems, is safe from being repackaged to look like an upscale product. Samuel Adams' \$120 Utopias, in a ridiculous copper-covered 24-oz. bottle meant to resemble an old-fashioned brew kettle, is barely beer. It's not carbonated like a Bud, but aged in oak barrels like scotch. It has a vintage year, like a Bordeaux, is light, complex, and free of any alcohol sting, despite having six times as much alcohol content as a regular can of brew.

Source: *Time*, April 14, 2008

29. a. Explain how Samuel Adams has differentiated its Utopias to compete with other beer brands in terms of quality, price, and marketing.
b. Predict whether Samuel Adams produces at, above, or below the efficient scale in the short run.
30. a. Predict whether the \$120 price tag on the Utopias is at, above, or below marginal cost:

- (i) In the short run.
 - (ii) In the long run.
- b. Do you think that Samuel Adams Utopias makes the market for beer inefficient?

Use the following news clip to work Problems 31 and 32.

Swinging for Female Golfers

One of the hottest areas of innovation is in clubs for women, who now make up nearly a quarter of the 24 million golfers in the United States. Callaway and Nike, two of the leading golf-equipment manufacturers, recently released new clubs designed specifically for women.

Source: *Time*, April 21, 2008

31. a. How are Callaway and Nike attempting to maintain economic profit?
 - b. Draw a graph to illustrate the cost curves and revenue curves of Callaway or Nike in the market for golf clubs for women.
 - c. Show on your graph in part (b) the short-run economic profit.
32. a. Explain why the economic profit that Callaway and Nike make on golf clubs for women is likely to be temporary.
 - b. Draw a graph to illustrate the cost curves and revenue curves of Callaway or Nike in the market for golf clubs for women in the long run. Mark the firm's excess capacity.

Product Development and Marketing

Use the following information to work Problems 33 to 35.

Bianca bakes delicious cookies. Her total fixed cost is \$40 a day, and her average variable cost is \$1 a bag. Few people know about Bianca's Cookies, and she is maximizing her profit by selling 10 bags a day for \$5 a bag. Bianca thinks that if she spends \$50 a day on advertising, she can increase her market share and sell 25 bags a day for \$5 a bag.

33. If Bianca's advertising works as she expects, can she increase her economic profit by advertising?
34. If Bianca advertises, will her average total cost increase or decrease at the quantity produced?
35. If Bianca advertises, will she continue to sell her cookies for \$5 a bag or will she change her price?

Use the following news clip to work Problems 36 and 37.

A Thirst for More Champagne

Champagne exports have tripled in the past 20 years. That poses a problem for northern France, where the bubbly hails from—not enough grapes. So French

authorities have unveiled a plan to extend the official Champagne grape-growing zone to cover 40 new villages. This revision has provoked debate. The change will take several years to become effective. In the meantime the vineyard owners whose land values will jump markedly if the changes are finalized certainly have reason to raise a glass.

Source: *Fortune*, May 12, 2008

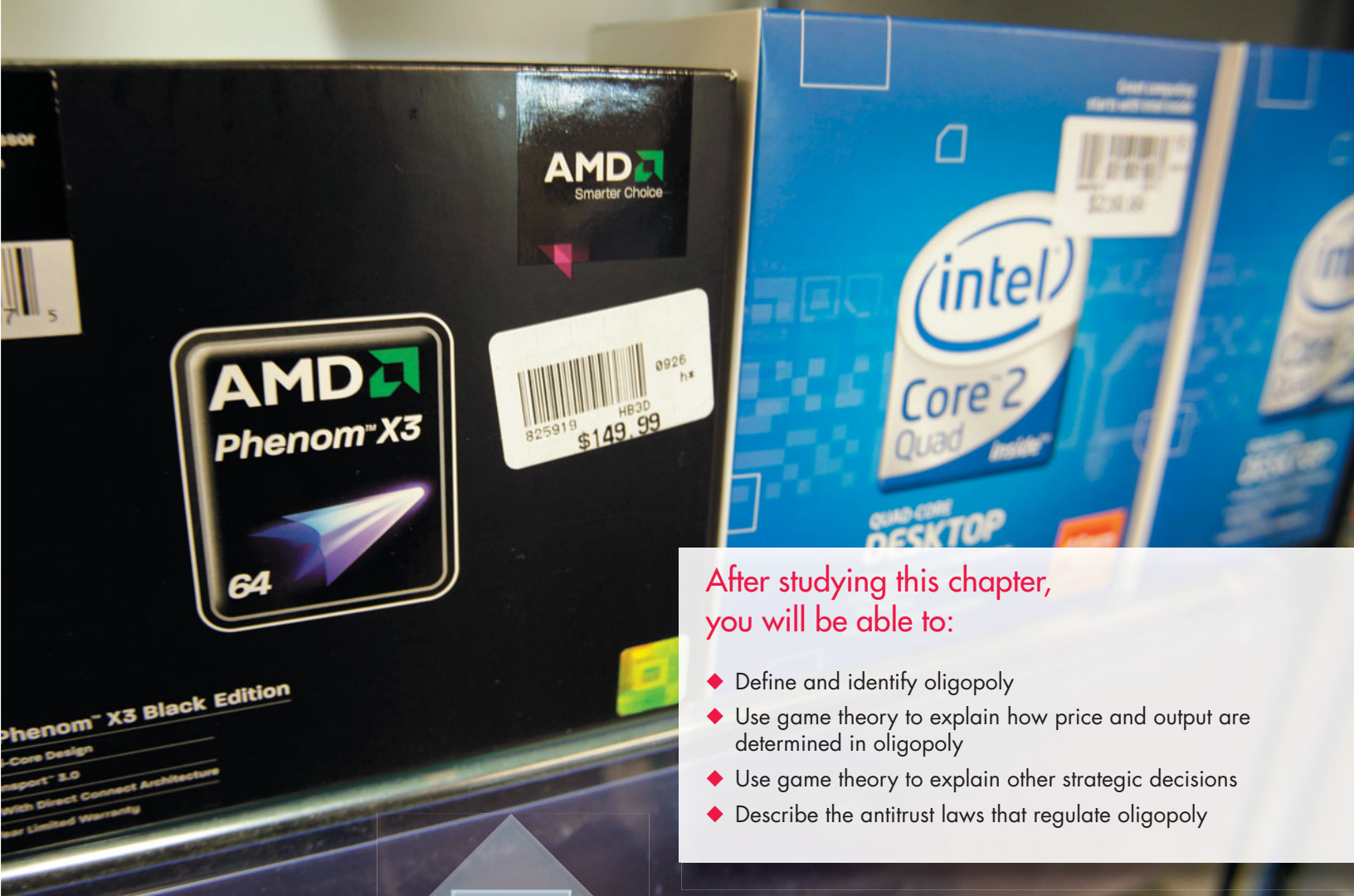
36. a. Why is France so strict about designating the vineyards that can use the Champagne label?
 - b. Explain who most likely opposes this plan.
37. Assuming that vineyards in these 40 villages are producing the same quality of grapes with or without this plan, why will their land values “jump markedly” if this plan is approved?
38. **Under Armour's Big Step Up**
Under Armour, the red-hot athletic-apparel brand, has joined Nike, Adidas, and New Balance as a major player in the market for athletic footwear. Under Armour plans to revive the long-dead cross-training category. But will young athletes really spend \$100 for a cross training shoe to lift weights in?

Source: *Time*, May 26, 2008

What factors influence Under Armour's ability to make an economic profit in the cross-training shoe market?

Economics in the News

39. After you have studied *Reading Between the Lines* on pp. 334–335 answer the following questions.
 - a. Describe the cost curves (*MC* and *ATC*) and the marginal revenue and demand curves for the iPhone when Apple first introduced it.
 - b. How do you think the creation of the iPhone influenced the demand for older generation cell phones?
 - c. Explain the effects of the introduction of the 3G iPhone on HTC and other firms in the market for smart phones.
 - d. Draw a graph to illustrate your answer to part (c).
 - e. Explain the effect on Apple of the decisions by BlackBerry and HTC to bring their own smart phones to market.
 - f. Draw a graph to illustrate your answer to part (e).
 - g. Do you think the smart phone market is efficient? Explain your answer.
 - h. Do you predict that producers of smart phones have excess capacity? Explain your answer.



After studying this chapter, you will be able to:

- ◆ Define and identify oligopoly
- ◆ Use game theory to explain how price and output are determined in oligopoly
- ◆ Use game theory to explain other strategic decisions
- ◆ Describe the antitrust laws that regulate oligopoly

15

OLIGOPOLY

The chip in your laptop was made by either Intel or Advanced Micro Devices; the battery in your TV remote is most likely a Duracell or Energizer; if you use a high-tech razor, it is either a Gillette or a Schick; and if you take a long-distance trip by air, you will fly in an airplane made by either Boeing or the European firm Airbus. In the markets for computer chips, batteries, high-tech razors, and big airplanes, two producers compete for market share in the pursuit of maximum profit. Many other markets have only a small number of firms. Among them are the markets for light bulbs, breakfast cereals, and major appliances.

How does a market work when only a handful of firms compete? Is the market efficient like perfect competition with the firms operating in the social interest? Or is the market inefficient like monopoly with the firms restricting output to increase profit?

To answer these questions, we need to understand the models of oligopoly. These models use game theory, which the chapter explains.

At the end of the chapter, in *Reading Between the Lines*, we'll look at the market for high-tech razors and see the game that Gillette and Schick are playing in their battle for market shares and maximum profit.

What Is Oligopoly?

Oligopoly, like monopolistic competition, lies between perfect competition and monopoly. The firms in oligopoly might produce an identical product and compete only on price, or they might produce a differentiated product and compete on price, product quality, and marketing. **Oligopoly** is a market structure in which

- Natural or legal barriers prevent the entry of new firms.
- A small number of firms compete.

Barriers to Entry

Natural or legal barriers to entry can create oligopoly. You saw in Chapter 13 how economies of scale and demand form a natural barrier to entry that can create a *natural monopoly*. These same factors can create a *natural oligopoly*.

Figure 15.1 illustrates two natural oligopolies. The demand curve, D (in both parts of the figure), shows the demand for taxi rides in a town. If the average

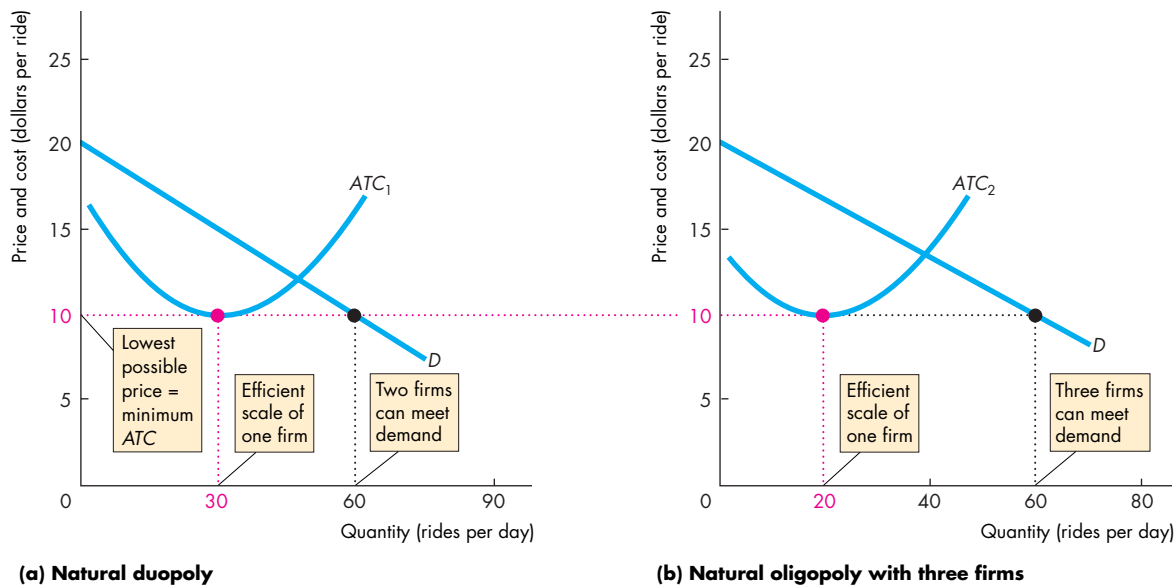
total cost curve of a taxi company is ATC_1 in part (a), the market is a natural **duopoly**—an oligopoly market with two firms. You can probably see some examples of duopoly where you live. Some cities have only two taxi companies, two car rental firms, two copy centers, or two college bookstores.

The lowest price at which the firm would remain in business is \$10 a ride. At that price, the quantity of rides demanded is 60 a day, the quantity that can be provided by just two firms. There is no room in this market for three firms. But if there were only one firm, it would make an economic profit and a second firm would enter to take some of the business and economic profit.

If the average total cost curve of a taxi company is ATC_2 in part (b), the efficient scale of one firm is 20 rides a day. This market is large enough for three firms.

A legal oligopoly arises when a legal barrier to entry protects the small number of firms in a market. A city might license two taxi firms or two bus companies, for example, even though the combination of demand and economies of scale leaves room for more than two firms.

FIGURE 15.1 Natural Oligopoly



The lowest possible price is \$10 a ride, which is the minimum average total cost. When a firm produces 30 rides a day, the efficient scale, two firms can satisfy the market demand. This natural oligopoly has two firms—a natural duopoly.

When the efficient scale of one firm is 20 rides per day, three firms can satisfy the market demand at the lowest possible price. This natural oligopoly has three firms.

Small Number of Firms

Because barriers to entry exist, oligopoly consists of a small number of firms, each of which has a large share of the market. Such firms are interdependent, and they face a temptation to cooperate to increase their joint economic profit.

Interdependence With a small number of firms in a market, each firm’s actions influence the profits of all the other firms. When Penny Stafford opened her coffee shop in Bellevue, Washington, a nearby Starbucks coffee shop took a hit. Within days, Starbucks began to attract Penny’s customers with enticing offers and lower prices. Starbucks survived but Penny eventually went out of business. Penny Stafford and Starbucks were interdependent.

Temptation to Cooperate When a small number of firms share a market, they can increase their profits by forming a cartel and acting like a monopoly. A **cartel** is a group of firms acting together—colluding—to limit output, raise price, and increase economic profit. Cartels are illegal, but they do operate in some markets. But for reasons that you’ll discover in this chapter, cartels tend to break down.

Examples of Oligopoly

The box below shows some examples of oligopoly. The dividing line between oligopoly and monopolistic competition is hard to pin down. As a practical matter, we identify oligopoly by looking at concentration ratios, the Herfindahl-Hirschman Index, and information about the geographical scope of the market and barriers to entry. The HHI that divides oligopoly from monopolistic competition is generally taken to be 1,000. An HHI below 1,000 is usually an example of monopolistic competition, and a market in which the HHI exceeds 1,000 is usually an example of oligopoly.

REVIEW QUIZ

- 1 What are the two distinguishing characteristics of oligopoly?
- 2 Why are firms in oligopoly interdependent?
- 3 Why do firms in oligopoly face a temptation to collude?
- 4 Can you think of some examples of oligopolies that you buy from?

You can work these questions in Study Plan 15.1 and get instant feedback.



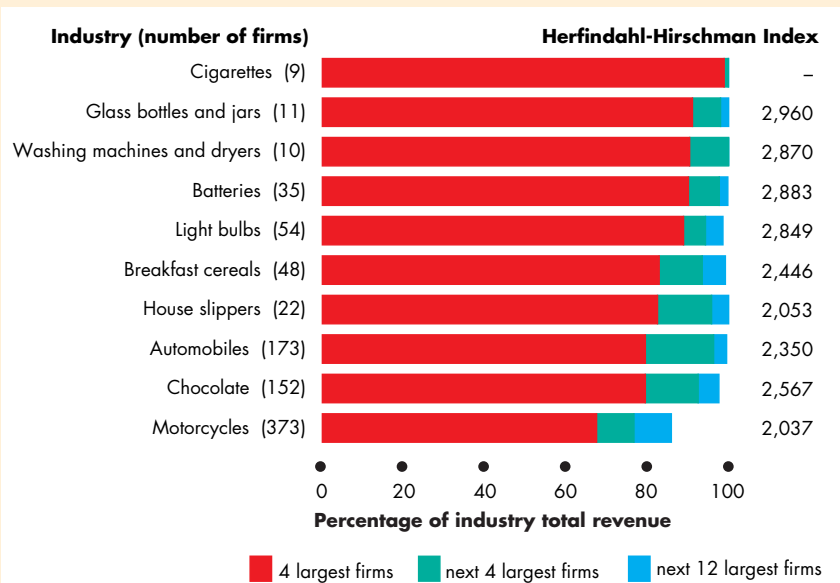
Economics in Action

Oligopoly Today

These markets are oligopolies. Although in some of them, the number of firms (in parentheses) is large, the share of the market held by the 4 largest firms (the red bars) is close to 100 percent.

The most concentrated markets—cigarettes, glass bottles and jars, washing machines and dryers, and batteries, are dominated by just one or two firms.

If you want to buy a battery for your TV remote or toothbrush, you’ll find it hard to avoid buying a Duracell or an Energizer.



Measures of Concentration

Source of data: U.S. Census Bureau.