

## Chapter 9

# Monopoly

### Introduction to a Monopoly

Many believe that top executives at firms are the strongest supporters of market competition, but this belief is far from the truth. Think about it this way: If you very much wanted to win an Olympic gold medal, would you rather be far better than everyone else, or locked in competition with many athletes just as good as you? Similarly, if you would like to attain a very high level of profits, would you rather manage a business with little or no competition, or struggle against many tough competitors who are trying to sell to your customers? By now, you might have read the chapter on [Perfect Competition](#). In this chapter, we explore the opposite extreme: monopoly.

If perfect competition is a market where firms have no market power and they simply respond to the market price, monopoly is a market with no competition at all, and firms have a great deal of market power. In the case of **monopoly**, one firm produces all of the output in a market. Since a monopoly faces no significant competition, it can charge any price it wishes, subject to the demand curve. While a monopoly, by definition, refers to a single firm, in practice people often use the term to describe a market in which one firm merely has a very high market share. This tends to be the definition that the U.S. Department of Justice uses.

Even though there are very few true monopolies in existence, we do deal with some of those few every day, often without realizing it: The U.S. Postal Service, your electric, and garbage collection companies are a few examples. Some new drugs are produced by only one pharmaceutical firm—and no close substitutes for that drug may exist.

From the mid-1990s until 2004, the U.S. Department of Justice prosecuted the Microsoft Corporation for including Internet Explorer as the default web browser with its operating system. The Justice Department's argument was that, since Microsoft possessed an extremely high market share in the industry for operating systems, the inclusion of a free web browser constituted unfair competition to other browsers, such as Netscape Navigator. Since nearly everyone was using Windows, including Internet Explorer eliminated the incentive for consumers to explore other browsers and made it impossible for competitors to gain a foothold in the market. In 2013, the Windows system ran on more than 90% of the most commonly sold personal computers. In 2015, a U.S. federal court tossed out antitrust charges that Google had an agreement with mobile device makers to set Google as the default search engine.

This chapter begins by describing how monopolies are protected from competition, including laws that prohibit competition, technological advantages, and certain configurations of demand and supply. It then discusses how a monopoly will choose its profit-maximizing quantity to produce and what price to charge. While a monopoly must be concerned about whether consumers will purchase its products or spend their money on something altogether different, the monopolist need not worry about the actions of other competing firms producing its

products. As a result, a monopoly is not a price taker like a perfectly competitive firm, but instead exercises some power to choose its market price.

### 9.1 How Monopolies Form: Barriers to Entry

Because of the lack of competition, monopolies tend to earn significant economic profits. These profits should attract vigorous competition as we described in Perfect Competition, and yet, because of one particular characteristic of monopoly, they do not. **Barriers to entry** are the legal, technological, or market forces that discourage or prevent potential competitors from entering a market. Barriers to entry can range from the simple and easily surmountable, such as the cost of renting retail space, to the extremely restrictive. For example, there are a finite number of radio frequencies available for broadcasting. Once an entrepreneur or firm has purchased the rights to all of them, no new competitors can enter the market.

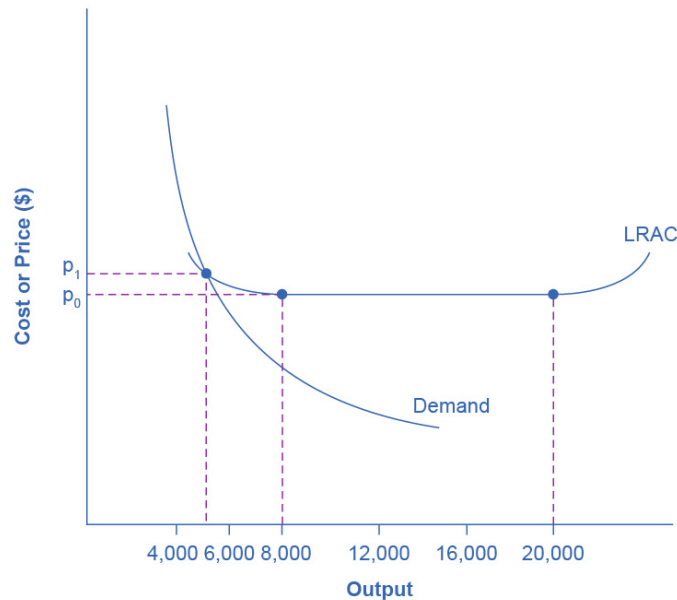
In some cases, barriers to entry may lead to monopoly. In other cases, they may limit competition to a few firms. Barriers may block entry even if the firm or firms currently in the market are earning profits. Thus, in markets with significant barriers to entry, it is *not* necessarily true that abnormally high profits will attract new firms, and that this entry of new firms will eventually cause the price to decline so that surviving firms earn only a normal level of profit in the long run.

There are five types of monopoly, based on the types of barriers to entry they exploit.

#### Natural Monopoly

Economies of scale can combine with the size of the market to limit competition. (We introduced this theme in Production, Cost and Industry Structure). Figure 9.2 presents a long-run average cost curve for the airplane manufacturing industry. It shows economies of scale up to an output of 8,000 planes per year and a price of  $P_0$ , then constant returns to scale from 8,000 to 20,000 planes per year, and diseconomies of scale at a quantity of production greater than 20,000 planes per year.

Now consider the market demand curve in the diagram, which intersects the long-run average cost (LRAC) curve at an output level of 5,000 planes per year and at a price  $P_1$ , which is higher than  $P_0$ . In this situation, the market has room for only one producer. If a second firm attempts to enter the market at a smaller size, say by producing a quantity of 4,000 planes, then its average costs will be higher than those of the existing firm, and it will be unable to compete. If the second firm attempts to enter the market at a larger size, like 8,000 planes per year, then it could produce at a lower average cost—but it could not sell all 8,000 planes that it produced because of insufficient demand in the market.



**Figure 9.2 Economies of Scale and Natural Monopoly** In this market, the demand curve intersects the long-run average cost (LRAC) curve at its downward-sloping part. A natural monopoly occurs when the quantity demanded is less than the minimum quantity it takes to be at the bottom of the long-run average cost curve.

Economists call this situation, when economies of scale are large relative to the quantity demanded in the market, a natural monopoly. Natural monopolies often arise in industries where the marginal cost of adding an additional customer is very low, once the fixed costs of the overall system are in place. This results in situations where there are substantial economies of scale. For example, once a water company lays the main water pipes through a neighborhood, the marginal cost of providing water service to another home is fairly low. Once the electric company installs lines in a new subdivision, the marginal cost of providing additional electrical service to one more home is minimal. It would be costly and duplicative for a second water company to enter the market and invest in a whole second set of main water pipes, or for a second electricity company to enter the market and invest in a whole new set of electrical wires. These industries offer an example where, because of economies of scale, one producer can serve the entire market more efficiently than a number of smaller producers that would need to make duplicate physical capital investments.

A natural monopoly can also arise in smaller local markets for products that are difficult to transport. For example, cement production exhibits economies of scale, and the quantity of cement demanded in a local area may not be much larger than what a single plant can produce. Moreover, the costs of transporting cement over land are high, and so a cement plant in an area without access to water transportation may be a natural monopoly.

### Control of a Physical Resource

Another type of monopoly occurs when a company has control of a scarce physical resource. In the U.S. economy, one historical example of this pattern occurred when ALCOA—the Aluminum

Company of America—controlled most of the supply of bauxite, a key mineral used in making aluminum. Back in the 1930s, when ALCOA controlled most of the bauxite, other firms were simply unable to produce enough aluminum to compete.

As another example, the majority of global diamond production is controlled by DeBeers, a multi-national company that has mining and production operations in South Africa, Botswana, Namibia, and Canada. It also has exploration activities on four continents, while directing a worldwide distribution network of rough cut diamonds. Although in recent years they have experienced growing competition, their impact on the rough diamond market is still considerable.

### Legal Monopoly

For some products, the government erects barriers to entry by prohibiting or limiting competition. Under U.S. law, no organization but the U.S. Postal Service is legally allowed to deliver first-class mail. Many states or cities have laws or regulations that allow households a choice of only one electric company, one water company, and one company to pick up the garbage. Most legal monopolies are utilities—products necessary for everyday life—that are socially beneficial. As a consequence, the government allows producers to become regulated monopolies, to ensure that customers have access to an appropriate amount of these products or services. Additionally, legal monopolies are often subject to economies of scale, so it makes sense to allow only one provider.

### Promoting Innovation

Innovation takes time and resources to achieve. Suppose a company invests in research and development and finds the cure for the common cold. In this world of near ubiquitous information, other companies could take the formula, produce the drug, and because they did not incur the costs of research and development (R&D), undercut the price of the company that discovered the drug. Given this possibility, many firms would choose not to invest in research and development, and as a result, the world would have less innovation. To prevent this from happening, the Constitution of the United States specifies in Article I, Section 8: “The Congress shall have Power . . . to Promote the Progress of Science and Useful Arts, by securing for limited Times to Authors and Inventors the Exclusive Right to their Writings and Discoveries.” Congress used this power to create the U.S. Patent and Trademark Office, as well as the U.S. Copyright Office. A **patent** gives the inventor the exclusive legal right to make, use, or sell the invention for a limited time. In the United States, exclusive patent rights last for 20 years. The idea is to provide limited monopoly power so that innovative firms can recoup their investment in R&D, but then to allow other firms to produce the product more cheaply once the patent expires.

A **trademark** is an identifying symbol or name for a particular good, like Chiquita bananas, Chevrolet cars, or the Nike “swoosh” that appears on shoes and athletic gear. Between 2003 and 2019, roughly 6.8 million trademarks were registered with the U.S. government. A firm can renew a trademark repeatedly, as long as it remains in active use.

A **copyright**, according to the U.S. Copyright Office, “is a form of protection provided by the laws of the United States for ‘original works of authorship’ including literary, dramatic, musical, architectural, cartographic, choreographic, pantomimic, pictorial, graphic, sculptural, and audiovisual creations.” No one can reproduce, display, or perform a copyrighted work without the author's permission. Copyright protection ordinarily lasts for the life of the author plus 70 years.

Roughly speaking, patent law covers inventions and copyright protects books, songs, and art. However, in certain areas, like the invention of new software, it has been unclear whether patent or copyright protection should apply. There is also a body of law known as **trade secrets**. Even if a company does not have a patent on an invention, competing firms are not allowed to steal their secrets. One famous trade secret is the formula for Coca-Cola, which is not protected under copyright or patent law, but is simply kept secret by the company.

Taken together, we call this combination of patents, trademarks, copyrights, and trade secret law **intellectual property**, because it implies ownership over an idea, concept, or image, not a physical piece of property like a house or a car. Countries around the world have enacted laws to protect intellectual property, although the time periods and exact provisions of such laws vary across countries. There are ongoing negotiations, both through the World Intellectual Property Organization (WIPO) and through international treaties, to bring greater harmony to the intellectual property laws of different countries to determine the extent to which those in other countries will respect patents and copyrights of those in other countries.

Government limitations on competition used to be more common in the United States. For most of the twentieth century, only one phone company—AT&T—was legally allowed to provide local and long distance service. From the 1930s to the 1970s, one set of federal regulations limited which destinations airlines could choose to fly to and what fares they could charge. Another set of regulations limited the interest rates that banks could pay to depositors; yet another specified how much trucking firms could charge customers.

What products we consider utilities depends, in part, on the available technology. Fifty years ago, telephone companies provided local and long distance service over wires. It did not make much sense to have many companies building multiple wiring systems across towns and the entire country. AT&T lost its monopoly on long distance service when the technology for providing phone service changed from wires to microwave and satellite transmission, so that multiple firms could use the same transmission mechanism. The same thing happened to local service, especially in recent years, with the growth in cellular phone systems.

The combination of improvements in production technologies and a general sense that the markets could provide services adequately led to a wave of **deregulation**, starting in the late 1970s and continuing into the 1990s. This wave eliminated or reduced government restrictions on the firms that could enter, the prices that they could charge, and the quantities that many industries could produce, including telecommunications, airlines, trucking, banking, and electricity.

Around the world, from Europe to Latin America to Africa and Asia, many governments continue to control and limit competition in what those governments perceive to be key industries, including airlines, banks, steel companies, oil companies, and telephone companies.

### Intimidating Potential Competition

Businesses have developed a number of schemes for creating barriers to entry by deterring potential competitors from entering the market. One method is known as **predatory pricing**, in which a firm uses the threat of sharp price cuts to discourage competition. Predatory pricing is a violation of U.S. antitrust law, but it is difficult to prove.

Consider a large airline that provides most of the flights between two particular cities. A new, small start-up airline decides to offer service between these two cities. The large airline immediately slashes prices on this route to the bone, so that the new entrant cannot make any money. After the new entrant has gone out of business, the incumbent firm can raise prices again.

After the company repeats this pattern once or twice, potential new entrants may decide that it is not wise to try to compete. Small airlines often accuse larger airlines of predatory pricing: in the early 2000s, for example, ValuJet accused Delta of predatory pricing, Frontier accused United, and Reno Air accused Northwest. In 2015, the Justice Department ruled against American Express and Mastercard for imposing restrictions on retailers that encouraged customers to use lower swipe fees on credit transactions.

In some cases, large advertising budgets can also act as a way of discouraging the competition. If the only way to launch a successful new national cola drink is to spend more than the promotional budgets of Coca-Cola and Pepsi Cola, not too many companies will try. A firmly established brand name can be difficult to dislodge.

### Summing Up Barriers to Entry

Table 9.1 lists the barriers to entry that we have discussed. This list is not exhaustive, since firms have proved to be highly creative in inventing business practices that discourage competition. When barriers to entry exist, perfect competition is no longer a reasonable description of how an industry works. When barriers to entry are high enough, monopoly can result.

Barrier to Entry	Government Role?	Example
Natural monopoly	Government often responds with regulation (or ownership)	Water and electric companies
Control of a physical resource	No	DeBeers for diamonds

Barrier to Entry	Government Role?	Example
Legal monopoly	Yes	Post office, past regulation of airlines and trucking
Patent, trademark, and copyright	Yes, through protection of intellectual property	New drugs or software
Intimidating potential competitors	Somewhat	Predatory pricing; well-known brand names

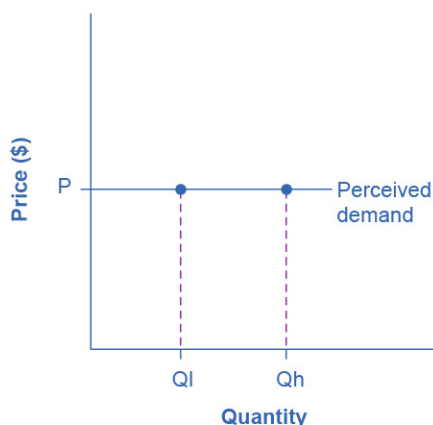
**Table 9.1** Barriers to Entry

## 9.2 How a Profit-Maximizing Monopoly Chooses Output and Price

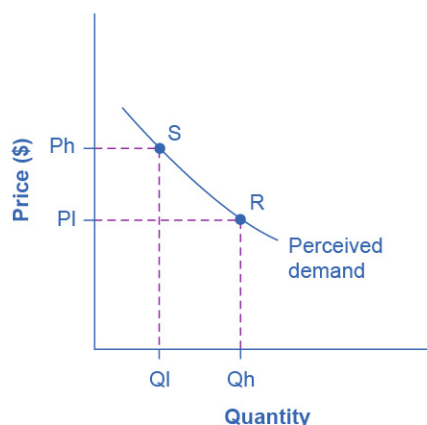
Consider a monopoly firm, comfortably surrounded by barriers to entry so that it need not fear competition from other producers. How will this monopoly choose its profit-maximizing quantity of output, and what price will it charge? Profits for the monopolist, like any firm, will be equal to total revenues minus total costs. We can analyze the pattern of costs for the monopoly within the same framework as the costs of a perfectly competitive firm—that is, by using total cost, fixed cost, variable cost, marginal cost, average cost, and average variable cost. However, because a monopoly faces no competition, its situation and its decision process will differ from that of a perfectly competitive firm. (The Clear It Up feature discusses how hard it is sometimes to define “market” in a monopoly situation.)

### Demand Curves Perceived by a Perfectly Competitive Firm and by a Monopoly

A perfectly competitive firm acts as a price taker, so we calculate total revenue taking the given market price and multiplying it by the quantity of output that the firm chooses. The demand curve *as it is perceived by a perfectly competitive firm* appears in [Figure 9.3](#) (a). The flat perceived demand curve means that, from the viewpoint of the perfectly competitive firm, it could sell either a relatively low quantity like  $Q_L$  or a relatively high quantity like  $Q_H$  at the market price  $P$ .



(a) Perceived demand for a perfect competitor



(b) Perceived demand for a monopolist

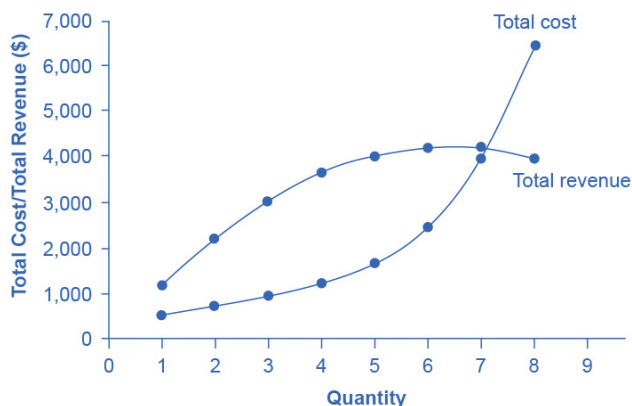
**Figure 9.3 The Perceived Demand Curve for a Perfect Competitor and a Monopolist** (a) A perfectly competitive firm perceives the demand curve that it faces to be flat. The flat shape means that the firm can sell either a low quantity ( $Q_l$ ) or a high quantity ( $Q_h$ ) at exactly the same price ( $P$ ). (b) A monopolist perceives the demand curve that it faces to be the same as the market demand curve, which for most goods is downward-sloping. Thus, if the monopolist chooses a high level of output ( $Q_h$ ), it can charge only a relatively low price ( $P_l$ ). Conversely, if the monopolist chooses a low level of output ( $Q_l$ ), it can then charge a higher price ( $P_h$ ). The challenge for the monopolist is to choose the combination of price and quantity that maximizes profits.

While a monopolist can charge *any* price for its product, nonetheless the demand for the firm's product constrains the price. No monopolist, even one that is thoroughly protected by high barriers to entry, can require consumers to purchase its product. Because the monopolist is the only firm in the market, its demand curve is the same as the market demand curve, which is, unlike that for a perfectly competitive firm, downward-sloping.

[Figure 9.3](#) illustrates this situation. The monopolist can either choose a point like R with a low price ( $P_l$ ) and high quantity ( $Q_h$ ), or a point like S with a high price ( $P_h$ ) and a low quantity ( $Q_l$ ), or some intermediate point. Setting the price too high will result in a low quantity sold, and will not bring in much revenue. Conversely, setting the price too low may result in a high quantity sold, but because of the low price, it will not bring in much revenue either. The challenge for the monopolist is to strike a profit-maximizing balance between the price it charges and the quantity that it sells. However, why isn't the perfectly competitive firm's demand curve also the market demand curve? See the following Clear It Up feature for the answer to this question.

### Total Cost and Total Revenue for a Monopolist

We can illustrate profits for a monopolist with a graph of total revenues and total costs, with the example of the hypothetical HealthPill firm in Figure 9.4. The total cost curve has its typical shape that we learned about in Production, Costs and Industry Structure, and that we used in Perfect Competition; that is, total costs rise and the curve grows steeper as output increases, as the final column of Table 9.2 shows.



**Figure 9.4 Total Revenue and Total Cost for the HealthPill Monopoly** Total revenue for the



monopoly firm called HealthPill first rises, then falls. Low levels of output bring in relatively little total revenue, because the quantity is low. High levels of output bring in relatively less revenue, because the high quantity pushes down the market price. The total cost curve is upward-sloping. Profits will be highest at the quantity of output where total revenue is most above total cost. The profit-maximizing level of output is not the same as the revenue-maximizing level of output, which should make sense, because profits take costs into account and revenues do not.

Quantity Q	Price P	Total Revenue TR	Total Cost TC
1	1,200	1,200	500
2	1,100	2,200	750
3	1,000	3,000	1,000
4	900	3,600	1,250
5	800	4,000	1,650
6	700	4,200	2,500
7	600	4,200	4,000
8	500	4,000	6,400

**Table 9.2** Total Costs and Total Revenues of HealthPill

Total revenue, though, is different. Since a monopolist faces a downward sloping demand curve, the only way it can sell more output is by reducing its price. Selling more output raises revenue, but lowering price reduces it. Thus, the shape of total revenue isn't clear. Let's explore this using the data in Table 9.2, which shows quantities along the demand curve and the price at each quantity demanded, and then calculates total revenue by multiplying price times quantity at each level of output. (In this example, we give the output as 1, 2, 3, 4, and so on, for the sake of simplicity. If you prefer a dash of greater realism, you can imagine that the pharmaceutical company measures these output levels and the corresponding prices per 1,000 or 10,000 pills.) As the figure illustrates, total revenue for a monopolist has the shape of a hill, first rising, next flattening out, and then falling. In this example, total revenue is highest at a quantity of 6 or 7.

However, the monopolist is not seeking to maximize revenue, but instead to earn the highest possible profit. In the HealthPill example in Figure 9.4, the highest profit will occur at the quantity where total revenue is the farthest above total cost. This looks to be somewhere in the

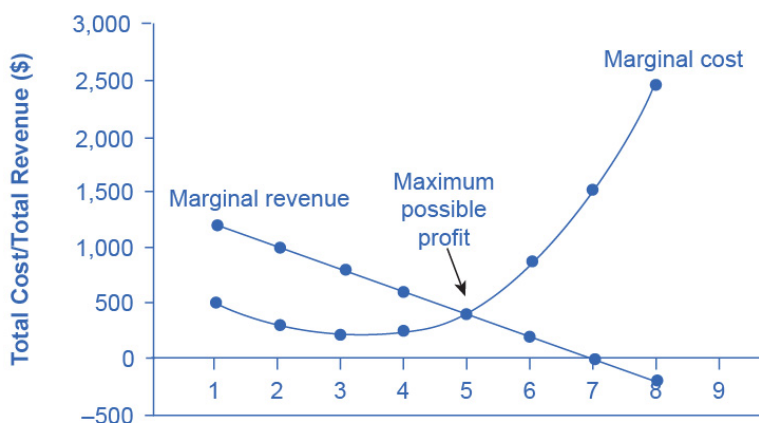
middle of the graph, but where exactly? It is easier to see the profit maximizing level of output by using the marginal approach, to which we turn next.

### Marginal Revenue and Marginal Cost for a Monopolist

In the real world, a monopolist often does not have enough information to analyze its entire total revenues or total costs curves. After all, the firm does not know exactly what would happen if it were to alter production dramatically. However, a monopolist often has fairly reliable information about how changing output by small or moderate amounts will affect its marginal revenues and marginal costs, because it has had experience with such changes over time and because modest changes are easier to extrapolate from current experience. A monopolist can use information on marginal revenue and marginal cost to seek out the profit-maximizing combination of quantity and price.

Table 9.3 expands Table 9.2 using the figures on total costs and total revenues from the HealthPill example to calculate marginal revenue and marginal cost. This monopoly faces typical upward-sloping marginal cost and downward-sloping marginal revenue curves, as Figure 9.5 shows.

Notice that marginal revenue is zero at a quantity of 7, and turns negative at quantities higher than 7. It may seem counterintuitive that marginal revenue could ever be zero or negative: after all, doesn't an increase in quantity sold not always mean more revenue? For a perfect competitor, each additional unit sold brought a positive marginal revenue, because marginal revenue was equal to the given market price. However, a monopolist can sell a larger quantity and see a decline in total revenue. When a monopolist increases sales by one unit, it gains some marginal revenue from selling that extra unit, but also loses some marginal revenue because it must now sell every other unit at a lower price. As the quantity sold becomes higher, at some point the drop in price is proportionally more than the increase in greater quantity of sales, causing a situation where more sales bring in less revenue. In other words, marginal revenue is negative.



**Figure 9.5 Marginal Revenue and Marginal Cost for the HealthPill Monopoly** For a monopoly like HealthPill, marginal revenue decreases as it sells additional units of output. The marginal cost curve is upward-sloping. The profit-maximizing choice for the monopoly will be to produce

at the quantity where marginal revenue is equal to marginal cost: that is,  $MR = MC$ . If the monopoly produces a lower quantity, then  $MR > MC$  at those levels of output, and the firm can make higher profits by expanding output. If the firm produces at a greater quantity, then  $MC > MR$ , and the firm can make higher profits by reducing its quantity of output.

Quantity Q	Total Revenue TR	Marginal Revenue MR	Total Cost TC	Marginal Cost MC
1	1,200	1,200	500	500
2	2,200	1,000	775	275
3	3,000	800	1,000	225
4	3,600	600	1,250	250
5	4,000	400	1,650	400
6	4,200	200	2,500	850
7	4,200	0	4,000	1,500
8	4,000	-200	6,400	2,400

**Table 9.3** Costs and Revenues of HealthPill

A monopolist can determine its profit-maximizing price and quantity by analyzing the marginal revenue and marginal costs of producing an extra unit. If the marginal revenue exceeds the marginal cost, then the firm should produce the extra unit.

For example, at an output of 4 in [Figure 9.5](#), marginal revenue is 600 and marginal cost is 250, so producing this unit will clearly add to overall profits. At an output of 5, marginal revenue is 400 and marginal cost is 400, so producing this unit still means overall profits are unchanged. However, expanding output from 5 to 6 would involve a marginal revenue of 200 and a marginal cost of 850, so that sixth unit would actually reduce profits. Thus, the monopoly can tell from the marginal revenue and marginal cost that of the choices in the table, the profit-maximizing level of output is 5.

The monopoly could seek out the profit-maximizing level of output by increasing quantity by a small amount, calculating marginal revenue and marginal cost, and then either increasing output as long as marginal revenue exceeds marginal cost or reducing output if marginal cost exceeds marginal revenue. This process works without any need to calculate total revenue and

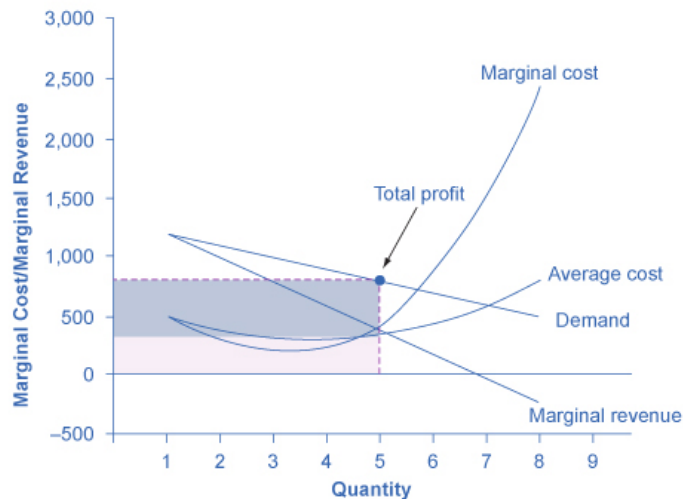
total cost. Thus, a profit-maximizing monopoly should follow the rule of producing up to the quantity where marginal revenue is equal to marginal cost—that is,  $MR = MC$ . This quantity is easy to identify graphically, where MR and MC intersect.

### Illustrating Monopoly Profits

It is straightforward to calculate profits of given numbers for total revenue and total cost. However, the size of monopoly profits can also be illustrated graphically with [Figure 9.6](#), which takes the marginal cost and marginal revenue curves from the previous exhibit and adds an average cost curve and the monopolist's perceived demand curve. [Table 9.5](#) shows the data for these curves.

Quantity Q	Demand P	Marginal Revenue MR	Marginal Cost MC	Average Cost AC
1	1,200	1,200	500	500
2	1,100	1,000	275	388
3	1,000	800	225	333
4	900	600	250	313
5	800	400	400	330
6	700	200	850	417
7	600	0	1,500	571
8	500	−200	2,400	800

**Table 9.5**



**Figure 9.6 Illustrating Profits at the HealthPill Monopoly** This figure begins with the same marginal revenue and marginal cost curves from the HealthPill monopoly from Figure 9.5. It then adds an average cost curve and the demand curve that the monopolist faces. The HealthPill firm first chooses the quantity where  $MR = MC$ . In this example, the quantity is 5. The monopolist then decides what price to charge by looking at the demand curve it faces. The large box, with quantity on the horizontal axis and demand (which shows the price) on the vertical axis, shows total revenue for the firm. The lighter-shaded box, which is quantity on the horizontal axis and average cost of production on the vertical axis shows the firm's total costs. The large total revenue box minus the smaller total cost box leaves the darkly shaded box that shows total profits. Since the price charged is above average cost, the firm is earning positive profits.

Figure 9.7 illustrates the three-step process where a monopolist: selects the profit-maximizing quantity to produce; decides what price to charge; determines total revenue, total cost, and profit.

### The Inefficiency of Monopoly

Most people criticize monopolies because they charge too high a price, but what economists object to is that monopolies do not supply enough output to be allocatively efficient. To understand why a monopoly is inefficient, it is useful to compare it with the benchmark model of perfect competition.

**Allocative efficiency** is an economic concept regarding efficiency at the social or societal level. It refers to producing the optimal quantity of some output, the quantity where the marginal benefit to society of one more unit just equals the marginal cost. The rule of profit maximization in a world of perfect competition was for each firm to produce the quantity of output where  $P = MC$ , where the price ( $P$ ) is a measure of how much buyers value the good and the marginal cost ( $MC$ ) is a measure of what marginal units cost society to produce. Following this rule assures allocative efficiency. If  $P > MC$ , then the marginal benefit to society (as measured by  $P$ ) is greater than the marginal cost to society of producing additional units, and a

greater quantity should be produced. However, in the case of monopoly, price is always greater than marginal cost at the profit-maximizing level of output, as you can see by looking back at Figure 9.6. Thus, consumers do not benefit from a monopoly because it will sell a lower quantity in the market, at a higher price, than would have been the case in a perfectly competitive market.

The problem of inefficiency for monopolies often runs even deeper than these issues, and also involves incentives for efficiency over longer periods of time. There are counterbalancing incentives here. On one side, firms may strive for new inventions and new intellectual property because they want to become monopolies and earn high profits—at least for a few years until the competition catches up. In this way, monopolies may come to exist because of competitive pressures on firms. However, once a barrier to entry is in place, a monopoly that does not need to fear competition can just produce the same old products in the same old way—while still ringing up a healthy rate of profit. John Hicks, who won the Nobel Prize for economics in 1972, wrote in 1935: “The best of all monopoly profits is a quiet life.” He did not mean the comment in a complimentary way. He meant that monopolies may bank their profits and slack off on trying to please their customers.

When AT&T provided all of the local and long-distance phone service in the United States, along with manufacturing most of the phone equipment, the payment plans and types of phones did not change much. The old joke was that you could have any color phone you wanted, as long as it was black. However, in 1982, government litigation split up AT&T into a number of local phone companies, a long-distance phone company, and a phone equipment manufacturer. An explosion of innovation followed. Services like call waiting, caller ID, three-way calling, voice mail through the phone company, mobile phones, and wireless connections to the internet all became available. Companies offered a wide range of payment plans, as well. It was no longer true that all phones were black. Instead, phones came in a wide variety of shapes and colors. The end of the telephone monopoly brought lower prices, a greater quantity of services, and also a wave of innovation aimed at attracting and pleasing customers.