

CHAPTER 12. MONOPOLY

INTRODUCTION TO A MONOPOLY



Figure 1. Political Power from a Cotton Monopoly. In the mid-nineteenth century, the United States, specifically the Southern states, had a near monopoly in the cotton supplied to Great Britain. These states attempted to leverage this economic power into political power—trying to sway Great Britain to formally recognize the Confederate States of America. (Credit: modification of work by “ashleylovespizza”/Flickr Creative Commons)

THE REST IS HISTORY

Many of the opening case studies have focused on current events. This one steps into the past to observe how monopoly, or near monopolies, have helped shape history. In the spring of 1773, the East India Company, a firm that, in its time, was designated ‘too big to fail,’ was continuing to experience financial difficulties. To help shore up the failing firm, the British Parliament authorized the Tea Act. The act continued the tax on teas and made the East India Company the sole legal supplier of tea to the American colonies. By November, the citizens of Boston had had enough. They refused to permit the tea to be unloaded, citing their main complaint: “No taxation without representation.” Arriving tea-bearing ships were warned via several newspapers, including *The Massachusetts Gazette*, “We are prepared, and shall not fail to pay them an unwelcome visit; by The Mohawks.”

Step forward in time to 1860—the eve of the American Civil War—to another near monopoly supplier of historical significance: the U.S. cotton industry. At that time, the Southern states provided the majority of the cotton Britain imported. The South, wanting to secede from the Union, hoped to leverage Britain's high dependency on its cotton into formal diplomatic recognition of the Confederate States of America.

This leads us to the topic of this chapter: a firm that controls all (or nearly all) of the supply of a good or service—a monopoly. How do monopoly firms behave in the marketplace? Do they have “power?” Does this power potentially have unintended consequences? We’ll return to this case at the end of the chapter to see how the tea and cotton monopolies influenced U.S. history.

CHAPTER OBJECTIVES

Introduction to a Monopoly

In this chapter, you will learn about:

- How Monopolies form: Barriers to Entry
- How a Profit-Maximizing Monopoly Chooses Output and Price

There is a widespread belief 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 are? 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 complete 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. While a monopoly, by definition, refers to a single firm, in practice the term is often used 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.

12.1 HOW MONOPOLIES FORM: BARRIERS TO ENTRY

LEARNING OBJECTIVES

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

- Distinguish between a natural monopoly and a legal monopoly.
- Explain how economies of scale and the control of natural resources led to the necessary formation of legal monopolies
- Analyze the importance of trademarks and patents in promoting innovation
- Identify examples of predatory pricing

Because of the lack of competition, monopolies tend to earn significant economic profits. These profits should attract vigorous competition as 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 the rights to all of them have been purchased, 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* 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 two types of monopoly, based on the types of barriers to entry they exploit. One is **natural monopoly**, where the barriers to entry are something other than legal prohibition. The other is **legal monopoly**, where laws prohibit (or severely limit) competition.

NATURAL MONOPOLY

Economies of scale can combine with the size of the market to limit competition. (This theme was introduced in Cost and Industry Structure). Figure 1 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 6,000 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 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.

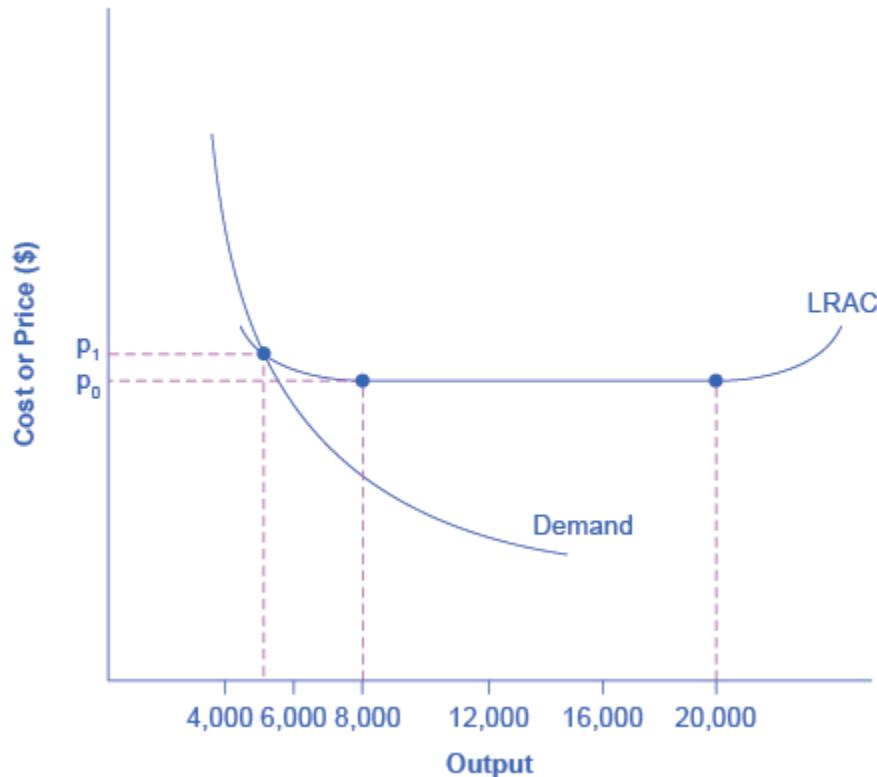


Figure 1. Economies of Scale and Natural Monopoly. In this market, the demand curve intersects the long-run average cost (LRAC) curve at its downward-sloping part. A natural monopoly occurs when the quantity demanded is less than the minimum quantity it takes to be at the bottom of the long-run average cost curve.

This situation, when economies of scale are large relative to the quantity demanded in the market, is called 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. Once the main water pipes are laid through a neighborhood, the marginal cost of providing water service to another home is fairly low. Once electricity lines are installed through a neighborhood, the marginal cost of providing additional electrical service to one more home is very low. 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 natural 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. Though 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 considered utilities—products necessary for everyday life—that are socially beneficial to have. As a consequence, the government allows producers to become regulated monopolies, to insure that an appropriate amount of these products is provided to consumers. 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. Roughly 1.9 million trademarks are registered with the U.S. government. A firm can renew a trademark over and over again, 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 permission of the author. 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. But 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, this combination of patents, trademarks, copyrights, and trade secret law is called **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 patents and copyrights in one country will be respected in other countries.

Government limitations on competition used to be even 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 what trucking firms could charge customers.

What products are considered utilities depends, in part, on the available technology. Fifty years ago, local and long distance telephone service was provided over wires. It did not make much sense to have multiple companies building multiple systems of wiring across towns and across the 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 could be charged, and the quantities that could be produced in many industries, 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.

Visit this website for examples of some pretty bizarre patents.



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 this pattern is repeated 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 who 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 1 lists the barriers to entry that have been discussed here. 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
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 1. Barriers to Entry

KEY CONCEPTS AND SUMMARY

Barriers to entry prevent or discourage competitors from entering the market. These barriers include: economies of scale that lead to natural monopoly; control of a physical resource; legal restrictions on competition; patent, trademark and copyright protection; and practices to intimidate the competition like predatory pricing. Intellectual property refers to legally guaranteed ownership of an idea, rather than a physical item. The laws that protect intellectual property include patents, copyrights, trademarks, and trade secrets. A natural monopoly arises when economies of scale persist over a large enough range of output that if one firm supplies the entire market, no other firm can enter without facing a cost disadvantage.

SELF-CHECK QUESTIONS

1. Classify the following as a government-enforced barrier to entry, a barrier to entry that is not government-enforced, or a situation that does not involve a barrier to entry.
 - a. A patented invention
 - b. A popular but easily copied restaurant recipe
 - c. An industry where economies of scale are very small compared to the size of demand in the market
 - d. A well-established reputation for slashing prices in response to new entry
 - e. A well-respected brand name that has been carefully built up over many years
2. Classify the following as a government-enforced barrier to entry, a barrier to entry that is not government-enforced, or a situation that does not involve a barrier to entry.
 - a. A city passes a law on how many licenses it will issue for taxicabs
 - b. A city passes a law that all taxicab drivers must pass a driving safety test and have insurance
 - c. A well-known trademark
 - d. Owning a spring that offers very pure water
 - e. An industry where economies of scale are very large compared to the size of demand in the market
3. Suppose the local electrical utility, a legal monopoly based on economies of scale, was split into four firms of

equal size, with the idea that eliminating the monopoly would promote competitive pricing of electricity.

What do you anticipate would happen to prices?

4. If Congress reduced the period of patent protection from 20 years to 10 years, what would likely happen to the amount of private research and development?

REVIEW QUESTIONS

1. How is monopoly different from perfect competition?
2. What is a barrier to entry? Give some examples.
3. What is a natural monopoly?
4. What is a legal monopoly?
5. What is predatory pricing?
6. How is intellectual property different from other property?
7. By what legal mechanisms is intellectual property protected?
8. In what sense is a natural monopoly “natural”?

CRITICAL THINKING QUESTIONS

1. ALCOA does not have the monopoly power it once had. How do you suppose their barriers to entry were weakened?
2. Why are generic pharmaceuticals significantly cheaper than name brand ones?
3. For many years, the Justice Department has tried to break up large firms like IBM, Microsoft, and most recently Google, on the grounds that their large market share made them essentially monopolies. In a global market, where U.S. firms compete with firms from other countries, would this policy make the same sense as it might in a purely domestic context?
4. Intellectual property laws are intended to promote innovation, but some economists, such as Milton Friedman, have argued that such laws are not desirable. In the United States, there is no intellectual property protection for food recipes or for fashion designs. Considering the state of these two industries, and bearing in mind the discussion of the inefficiency of monopolies, can you think of any reasons why intellectual property laws might hinder innovation in some cases?

PROBLEMS

Return to Figure 1. Suppose P_0 is \$10 and P_1 is \$11. Suppose a new firm with the same LRAC curve as the incumbent tries to break into the market by selling 4,000 units of output. Estimate from the graph what the new firm's average cost of producing output would be. If the incumbent continues to produce 6,000 units, how much output would be supplied to the market by the two firms? Estimate what would happen to the market price as a result of the supply of both the incumbent firm and the new entrant. Approximately how much profit would each firm earn?

GLOSSARY

barriers to entry the legal, technological, or market forces that may discourage or prevent potential competitors from entering a market

copyright a form of legal protection to prevent copying, for commercial purposes, original works of authorship, including books and music

deregulation removing government controls over setting prices and quantities in certain industries

intellectual property the body of law including patents, trademarks, copyrights, and trade secret law that protect the right of inventors to produce and sell their inventions

legal monopoly legal prohibitions against competition, such as regulated monopolies and intellectual property protection

monopoly a situation in which one firm produces all of the output in a market

natural monopoly economic conditions in the industry, for example, economies of scale or control of a critical resource, that limit effective competition

patent a government rule that gives the inventor the exclusive legal right to make, use, or sell the invention for a limited time

predatory pricing when an existing firm uses sharp but temporary price cuts to discourage new competition

trade secrets methods of production kept secret by the producing firm

trademark an identifying symbol or name for a particular good and can only be used by the firm that registered that trademark

SOLUTIONS

Answers to Self-Check Questions

1.
 - a. A patent is a government-enforced barrier to entry.
 - b. This is not a barrier to entry.
 - c. This is not a barrier to entry.
 - d. This is a barrier to entry, but it is not government-enforced.
 - e. This is a barrier to entry, but it is not directly government enforced.
2.
 - a. This is a government-enforced barrier to entry.
 - b. This is an example of a government law, but perhaps it is not much of a barrier to entry if most people can pass the safety test and get insurance.
 - c. Trademarks are enforced by government, and therefore are a barrier to entry.
 - d. This is probably not a barrier to entry, since there are a number of different ways of getting pure water.
 - e. This is a barrier to entry, but it is not government-enforced.
3. Because of economies of scale, each firm would produce at a higher average cost than before. (They would each have to build their own power lines.) As a result, they would each have to raise prices to cover their higher costs. The policy would fail.
4. Shorter patent protection would make innovation less lucrative, so the amount of research and development would likely decline.