

Chapter 15: Monopoly

Chapter Objectives

Little Picture: learning about the characteristics of monopolies, including how much of a good or service they produce and at what level they price their products.

Big Picture: analyzing monopoly behavior to obtain a better understanding of microeconomics, i.e., what forces determine the price (and market quantity) of a good or service.

Monopoly is always an interesting topic. Monopoly seldom unfolds in the way students expect, as they're conditioned by popular media to view monopolies as a feature of markets or even worse, an inevitability of them. Yet the overarching monopoly in any nation is its national government. Monopoly power is certainly alluded to in one definition of government: the sovereign exercise of force for the maintenance of civil order over a certain geographic area. While it's seen as (and indeed is) beneficial to have many competitors in industries in the private sector, does the government encourage competitors to itself? No, to put it lightly. In fact there are a number of words with highly negative connotations that applied to any one or group who seeks to be or form competition to a government: insurrection, subversion, rebellion, treason, secession (see the U.S. "Civil War"--actually an attempted secession rather than a literal civil war). [John Walker Lindh](#) is viewed as the most recent prominent traitor in U.S. history, but he was, at least in some sense, challenging a monopoly (albeit in an unfavorable way from the typical American perspective).

Governments since at least the middle-age monarchies have been the source of many different grants of monopoly. The U.S. Treasury's [Bureau of Printing and Engraving](#) has a monopoly on the creation of official U.S. paper money and the [U.S. Federal Reserve System](#) has a monopoly of control of the quantity of U.S. money in circulation. (Interestingly, the Web address of the Bureau of Printing and Engraving is [moneyfactory.com](#), despite it not being a private firm!)

While most laypersons assume that these two monopolies are either necessary or mandated by the U.S. Constitution, U.S. economic history suggests otherwise. Indeed, most money supplies began with commodity money (e.g., coins and bars of precious metals, furs, whiskey, etc.) and then private bank notes. Personal checks and debit cards make up a significant amount of today's money supply and function as a form of private money. Hong Kong had a completely private money supply of commercial bank notes during its 99-year history (1898-1997) of independence from mainland China.

A fascinating case study is the intertwined histories of the Federal Reserve system and

Federal Deposit Insurance Corporation (FDIC). While the U.S. Federal Reserve ("Fed") has unquestionably become one of the most powerful monopolies in the world, the newest economic research, particularly from the Monetarist and Austrian schools of macroeconomics (you'll learn more about these schools in macroeconomics), suggests that the Fed's assumption of control of the money supply in 1914 was not a move toward greater economic stability.

The Fed was created in 1913 by Congress to smooth the business cycle and make severe recessions/depressions and inflation/deflation (ideally) obsolete. However, the Fed played a crucial (albeit unwitting) role in causing the Great Depression by allowing the money supply to catastrophically fall by 30% from 1929-1933 and then again from 1937-1942. Regardless of ultimate cause, the Great Depression was, no doubt, far worse than any of the banking panics and recessions that preceded the Fed's creation. The [Federal Deposit Insurance Corporation](#) (FDIC) was created in 1933 to clean up the banking wreckage of the Depression that the Fed failed to prevent, however, the Fed was never subsequently abolished for its blatant failure. Recently, many economists have pointed to what they see as former Fed chairman Alan Greenspan's role in helping bring about not only the recent 2000-2003 recession, but also the housing boom and bust of 2002-2010.

This is all very surprising to many laypersons. While they can be convinced that the Fed and FDIC monopolies were creations of Congress, they're certain that the U.S. Postal system is a monopoly blessed by America's Founding Fathers. Again, while it's certainly true that Article I, Section 8 of the U.S. Constitution gave Congress the power to establish post offices and roads, it nowhere grants a monopoly.

The larger point is that *long-term* monopolies descend from some form of government control. Patents, exclusive rights, and other controls are examples.

Mankiw (p. 312) states that a firm is a monopoly if

1. it is the sole seller of a product
2. the product does not have close substitutes

The fundamental cause of monopoly is barriers to entry. These barriers in turn have three possible causes:

1. a crucial resource is owned by one firm
2. costs make a single producer more efficient than two or more producers for a particular industry
3. the government grants to one firm an exclusive right to produce a good or service

As mentioned above, the latest thinking tends to emphasize 3.

The controversies surrounding 1. and 2. are:

1. For this cause--a key resource--Mankiw gives the example of a single water well in a town. He concedes that "in practice monopolies rarely arise for this reason" (p. 313). Almost certainly more than one functioning well is possible in even the smallest towns. The Case Study on DeBeers (p. 313) concerns the so-called diamond monopoly. Mankiw mentions "emeralds, rubies, and sapphires" as possible substitutes, but this is seen as a bit of a weak case that doesn't mention much closer diamond substitutes. Cubic zirconia, moissanite, colorless zircon, enhanced diamonds, white sapphire, topaz, colorless quartz, and other more or less close diamond substitutes have in many cases given even some "experts" problems in distinguishing them from true diamonds. Cause 1 is thus (at least nowadays by many microeconomists) seen as weak.

2. The second cause listed above is known as the theory of **natural monopoly**. Natural monopoly is a hypothetical industry in which only a single firm can supply a good or service at the lowest cost to consumers. According to adherents of this theory, competition would be "ruinous" to certain markets because more firms would only raise the cost of the good or service, and in turn the price of the good or service being produced would be driven up. Compelling examples have been few in number--Mankiw offers water distribution, which seems like a convincing example for today's technology.

However, what may be impossible today may be possible tomorrow through technology. Telephone service in the early 1900s seemed like an open-and-shut case for natural monopoly. Today, not only can you purchase land line telephone service from traditional providers such as AT&T, but from cable TV providers such as Knology, Cox, and Time Warner. There's also Vonage and other voice-over-Internet-protocol (VoIP) providers which operate phone service through the Internet. Then there are still other consumers who have abandoned land lines altogether in favor of cell phones with service from Verizon or Sprint. While DISH and DIRECTV compete with traditional land cable TV providers via digital satellite dishes, it is expected that telephone and even utility companies are not too far from moving onto the same turf in the future. The big problem is the old guard traditional companies lobbying to put legal and regulatory roadblocks into the way of new competitors from outside their industries.

So while it might be difficult today envisioning technology enabling consumers to choose from more than one water provider, it certainly could be possible through some means (unimaginable today) at some point in the future, even for some smaller

towns. Even wireless electricity (see the company [WiTricity](#)), while in its infancy today, could blossom into a mass industry in the future.

Again, what is viewed as the persistent danger (from the perspective of regulatory economists) is the granting of exclusive rights to certain firms, technology developing to the point of enabling greater competition, yet the old-guard firms successfully lobbying local governments for protection from new competitors. This has been the story of why utilities and phone companies have been hindered in providing television to local markets in competition with old-guard cable monopolies. Besides local water distribution, Mankiw's bridge example would currently be viewed as a little weak as well. Again, the likely problem here would be long term: a town giving a contractor--especially one cozy with local politicians and regulators--exclusive rights to collect tolls on the single bridge and forbidding all potential competitors from building new, safer, and needed competing bridges.

3. This cause of monopoly (government grant or regulation) is slowly becoming more and more a consensus. Since we've already visited the reasoning behind this cause, let's look at a few more examples:

- a. The U.S. Postal Service - monopoly on all first- and third-class mail, but not parcel post (where it competes with UPS, FedEx, Airborne, DHL).
- b. The National Association of Securities Dealers (NASD) - monopoly on the administration of Series 7 and 63 stock-broker licensing examinations.
- c. Tennessee Valley Authority (TVA) - sole generator of electricity in many areas of Tennessee and Alabama.
- d. Federal Deposit Insurance Corporation (FDIC) - sole federal insurer of bank deposits in the U.S.
- e. American Medical Association (AMA) - sole accrediting agency for M.D. medical education programs in the U.S.

Microsoft?

What almost always arises in discussions about monopoly is the issue of Microsoft. Is the company a monopoly? Although lawyers for Microsoft's competitors and some U.S. federal judges were convinced it was in the late 1990s, far from all microeconomists are convinced. The company was asserted by many in the legal profession to be a monopoly because of the relatively high market shares of two of its products: its computer operating system software (Windows) and its Internet browser software (Internet Explorer). According to some trial attorneys, a company is a monopoly not based on the number of competitors it has but whether it commands a large share of the market. (What this precisely means is anyone's guess, usually whatever a court determines at a certain place and time.)

For most economists, the issue is not so much one of market share but whether competitors to Windows and Internet Explorer are close enough substitutes. At the time of the legal proceedings against the company in 1998, Linux, Unix, and Apple's OS 9 were operating-system alternatives to Windows. Netscape was an alternative to Internet Explorer.

Austrian economist Jeffrey Tucker emphasizes what he views as the waste of the anti-Microsoft campaign by reviewing what has happened to the market since the Microsoft case. He first notes that IBM was the Microsoft of the 1960s and 1970s. The government's antitrust actions against IBM went on so long that the product IBM supposedly monopolized, mainframe computers, had become obsolete. Mainframes yielded to the personal computer (PC) in the early 1980s.

Further, Tucker argues that Microsoft has recently lost market share in browsers and office suites to (at least in some features) superior alternatives such as Mozilla's free [Firefox](#) browser and Apache's free [OpenOffice](#) office suite. This is in addition to the Linux operating system (versions of which can be acquired free). Combined, these free operating systems, browsers, and office suites eliminate--according to Tucker--not only the irritating licensing and registration obstacle courses Microsoft makes consumers navigate, they have also made some of the highest-quality computing tools accessible to low-income households.

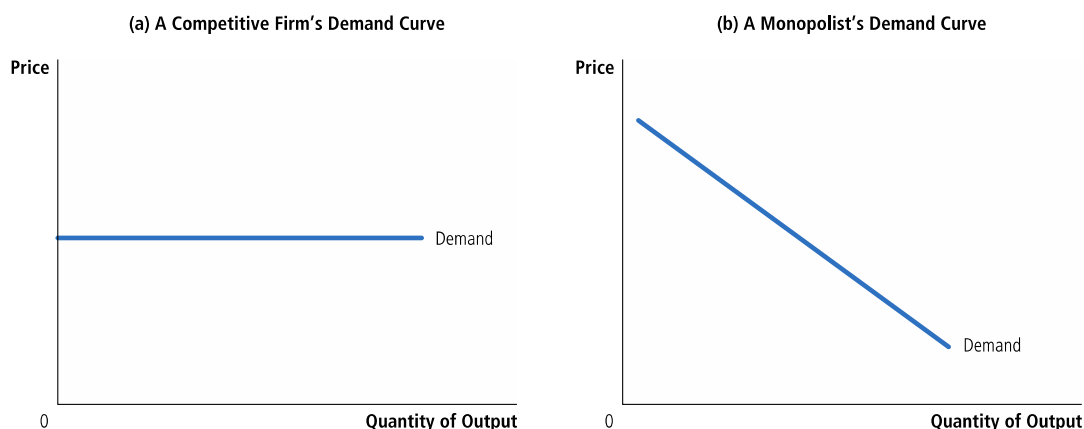
Monopoly vs. Competition

A key portion of this chapter is dedicated to showing the inefficiency of monopoly compared to competition. It begins with a comparison between the demand curves of the competitive firm on the one hand, and a monopoly on the other.

FIGURE 2

Demand Curves for Competitive and Monopoly Firms

Because competitive firms are price takers, they face horizontal demand curves, as in panel (a). Because a monopoly firm is the sole producer in its market, it faces the downward-sloping market demand curve, as in panel (b). As a result, the monopoly has to accept a lower price if it wants to sell more output.



As we saw in Chapter 14, a competitive firm is one among many in its industry. Its actions have no effect on market price, thus it can produce a wide range of outputs [panel (a) above] and price won't move. The monopolist is the opposite. It has market power (a downward-sloping demand curve), which means that it has some ability to set both its price and the quantity demanded for its product. While it obviously won't set its product price to zero, it certainly can't charge infinity or even prohibitively high prices since at some point (regardless of product) all buyers disappear.

As with competition, the demand in the monopolist's market is given. For the monopolist, long-term market power is due to some long-term barrier to entry set up on its behalf. At a certain price, a certain number of units are demanded of the monopolist's product. From here, total revenue, average revenue, and marginal revenue can be determined.

(1) Quantity of Water (Q)	(2) Price (P)	(3) Total Revenue ($TR = P \times Q$)	(4) Average Revenue ($AR = TR / Q$)	(5) Marginal Revenue ($MR = \Delta TR / \Delta Q$)
0 gallons	\$11	\$ 0	—	
1	10	10	\$10	\$10
2	9	18	9	8
3	8	24	8	6
4	7	28	7	4
5	6	30	6	2
6	5	30	5	0
7	4	28	4	-2
8	3	24	3	-4

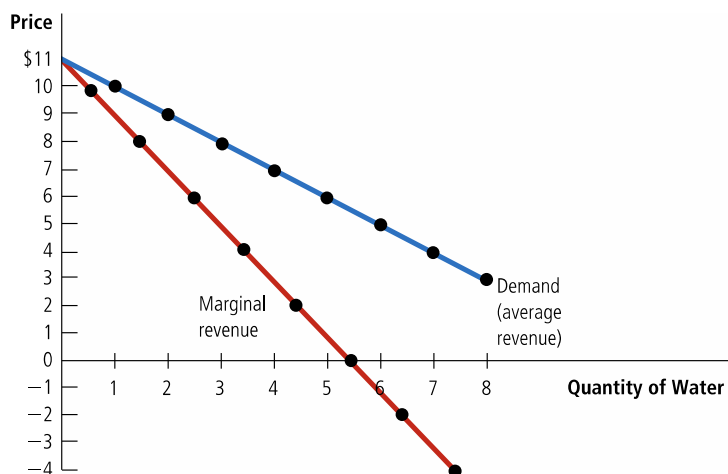
TABLE 1

A Monopoly's Total, Average, and Marginal Revenue

It should come as no surprise that because a monopolist's demand curve is downward sloping, its marginal revenue (MR) curve is as well.

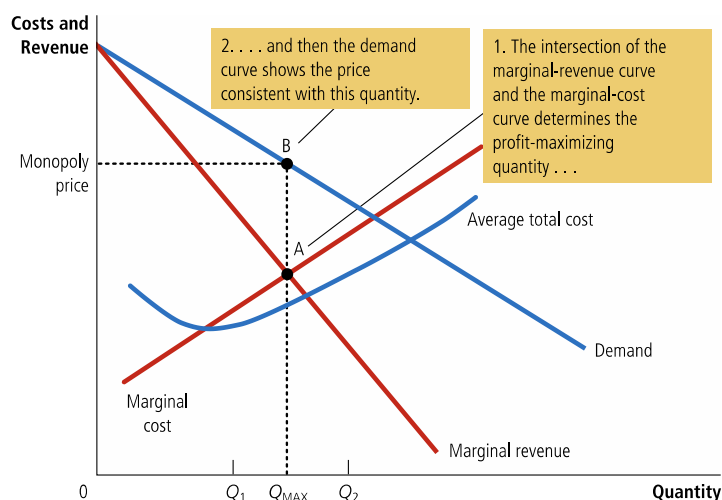
FIGURE 3**Demand and Marginal-Revenue Curves for a Monopoly**

The demand curve shows how the quantity sold affects the price of the good. The marginal-revenue curve shows how the firm's revenue changes when the quantity increases by 1 unit. Because the price on *all* units sold must fall if the monopoly increases production, marginal revenue is less than the price.



MR falls at a greater rate than demand because as price declines for all goods produced, additional revenue steadily declines even though quantity increases. (Notice however that this isn't true for the first unit, where $P = MR$.) This is quite a contrast with competition where $P = MR$. In the very first illustration above where the competitive and monopoly demand curves are compared, in panel (a), the competitive demand curve is illustrated. The way to think of the competitive marginal revenue curve in panel (a) is to think of it as being stacked below the demand curve. That's why it can't be seen in the illustration. Now let's say that the market structure of such an industry goes from being competitive to a monopoly overnight. Then we would see the stacked curves physically separate with marginal revenue pivoting downward from under the demand curve like the second (unseen) blade of a pair of scissors. The end result would be as illustrated in the diagram immediately above.

All that must be done now is add in costs (marginal and average total costs, which are both derived from total costs) which gives us...

**FIGURE 4****Profit Maximization for a Monopoly**

A monopoly maximizes profit by choosing the quantity at which marginal revenue equals marginal cost (point A). It then uses the demand curve to find the price that will induce consumers to buy that quantity (point B).

the profit maximization solution for monopoly. We already know where this will be--as it is for all market structures--where marginal cost (MC) equals marginal revenue (MR), or point A in the diagram above. Once the monopolist finds the profit-maximizing point A, then price and quantity are set for the monopolist. Q_{MAX} , the quantity below point A, is the quantity that will be produced. Point B, the point on the demand curve above point A, represents the level of price that will be charged. Now for the next diagram:

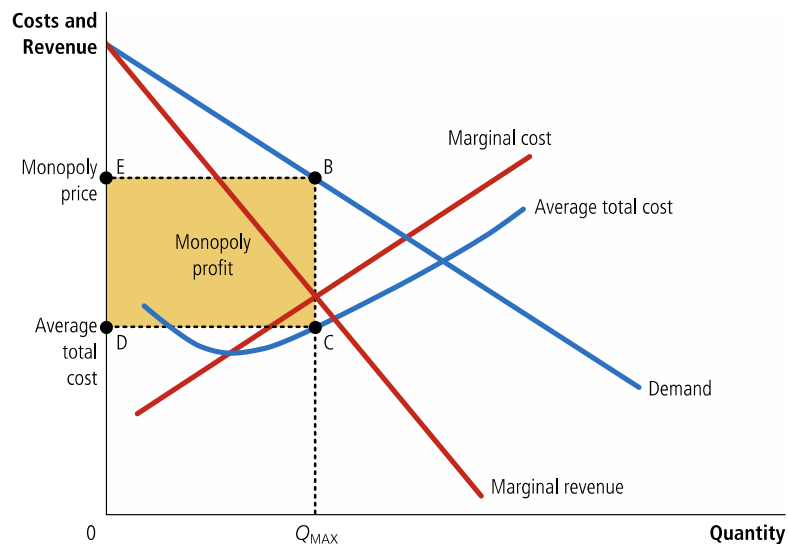


FIGURE 5

The Monopolist's Profit

The area of the box BCDE equals the profit of the monopoly firm. The height of the box (BC) is price minus average total cost, which equals profit per unit sold. The width of the box (DC) is the number of units sold.

Monopoly profit can now be calculated. It begins with the difference between monopoly price and average total cost (line segment BC in the diagram immediately above--notice that point C does not lie at the intersection of $MR = MC$ as a fast glance at the diagram might lead some to mistakenly believe). Extending a straight line from point B to point E on the vertical axis and point C to point D in the same manner gives us the top and bottom sides of the monopoly profit box (tan rectangle in the diagram above). To calculate the dollar value of the monopoly's per-unit profit, find the width (height) of the monopoly-profit box. To calculate the total dollar value of the monopoly's profit, multiply the length times the width of the box (in other words, find the profit box's area).

Example Problem

point B = product price = \$20

point C = average total cost = \$10

quantity Q_{MAX} = profit-maximizing monopoly output [where $MR = MC$] = 1,000 units

Find:

1. monopoly profits per unit
2. total monopoly profits

Solutions:

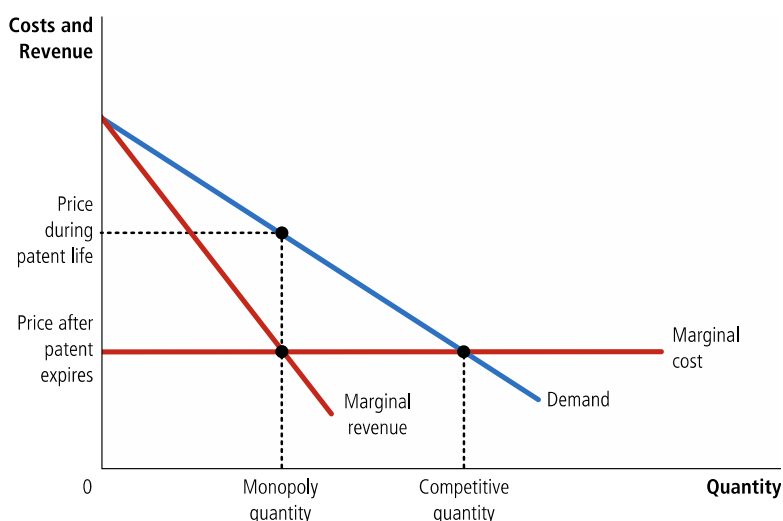
1. monopoly profits per unit = width of monopoly profit box (W) = $B - C = \$20 - \$10 = \$10$.
2. total monopoly profits = area (length times width) of monopoly profit box ($L \cdot W$) = $1,000 \cdot (B - C) = 1,000 \cdot \$10 = \$10,000$

The important point to remember is that, unlike competition, these profits can persist for a monopoly even into the long run because of the barriers to entry set up to protect the firm from competitors. For competition, even if profits are positive in the short run, they will always fall to zero by the time the long run arrives because of the free entry and exit conditions of competitive industries.

FIGURE 6

The Market for Drugs

When a patent gives a firm a monopoly over the sale of a drug, the firm charges the monopoly price, which is well above the marginal cost of making the drug. When the patent on a drug runs out, new firms enter the market, making it more competitive. As a result, the price falls from the monopoly price to marginal cost.



The diagram above is a comparison between competition and monopoly. Under competition, output is greater than it is under monopoly and of course the competitive price is lower than the monopoly price. Examine the graph carefully to be sure you see this.

The rest of the chapter, including the important sections on the social costs of monopoly, antitrust laws, and price discrimination is very straightforward and comprised of mostly good treatments by Mankiw, hence there's little need to clarify or elaborate on them here.

Discussion Topics (topics requiring examples are marked with an asterisk *)

Please copy these topics exactly as written--shortening them can cause you to omit follow-up questions and thus lose points.

1. price maker*
2. Complete and explain: *The fundamental cause of monopoly is ____.*

3. Complete and explain: *A monopolist's _____ is less than the _____ of its good.*
4. price effect (provide a quantitative example)*
5. Complete and explain: *...the monopolist's profit-maximizing quantity of output is determined by the intersection of the _____ curve and the _____ curve.*
6. Why does a monopoly not have a supply curve?
7. What should happen to the price of a drug when the patent runs out? Does the expiration of a patent cause the monopolist to lose all its market power?
8. Complete and explain: *The monopolist produces less than _____.*
9. How does a monopoly effectively place a tax "wedge" on markets? (See Figure 8 and subsequent discussion.)
10. arbitrage (provide a quantitative example)*
11. imperfect price discrimination*
12. synergies*
13. Why are firms with substantial monopoly power so rare? (see "15-6 Conclusion: The Prevalence of Monopolies")