

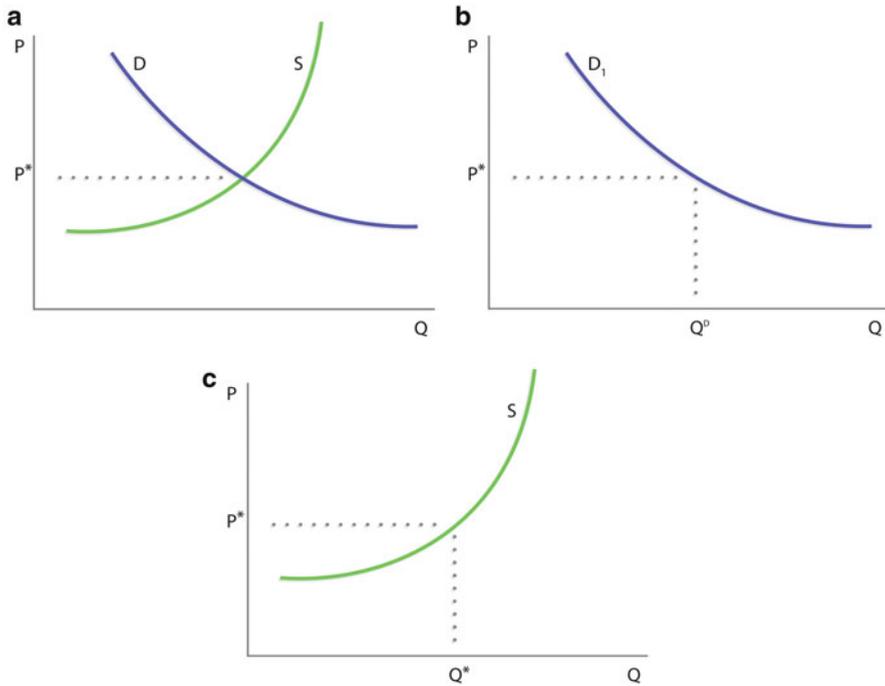
Up to now, the dimension of power has been missing from our analysis. We have imagined an economic world in which individuals and organizations compete for their advantage, but their choices have all been about themselves—how to produce more efficiently, what to purchase, and so on. Now we take the next step and consider situations in which competitors act strategically to dominate or exploit others. We will do this using two models, one portraying the power to control prices in order to gain higher profits, the other the power that results from having a superior bargaining position. The first will be taken up in this chapter, and bargaining will be examined in Chap. 14. Taken together, they provide the beginning of an explanation of how a system based on free choice in the marketplace can result in concentrations of wealth and power.

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## 13.1 Perfect Competition: A World Without Power

In the previous chapter we painted a picture of perfect competition in the market for any good or service. In the short run no seller or buyer has any control over the market price; there are simply too many of them for any individual to make a difference. Prices are set by the intersection of supply and demand over the entire range of the market, and each participant adapts as best they can. The story is told in Fig. 13.1a–c:

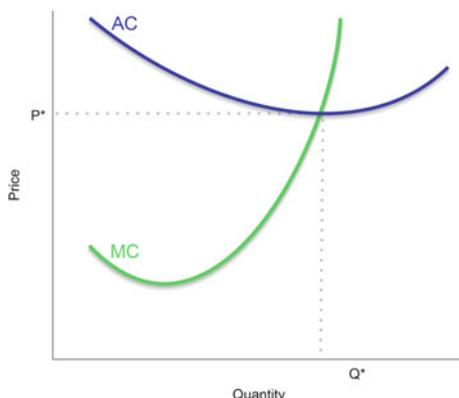
No individual buyer or seller can have any influence over the price at which goods exchange. All they can hope to do is make the best of this situation by choosing the right amounts to purchase or produce. Note that sellers will try to hold down their own costs, but they are buyers in other markets for the goods and services they need to produce. If these markets are perfectly competitive as well, their cost-reduction strategies cannot include lowering the price they have to pay for labor, materials or other inputs. The logic of perfect competition applies to any market with these characteristics, whether the goods being exchanged are in finished form, like consumer items, or whether they are the things businesses purchase in order to make things to sell to consumers.



**Fig. 13.1** Buyers and sellers are price-takers under perfect competition. (a) The equilibrium price  $P^*$  is set by the equilibrium between market supply  $S$  and market demand  $D$ . (b) The individual buyer takes  $P^*$  as given and chooses to buy  $Q^D$  based on the individual demand curve  $D_1$ . (c) The individual seller takes  $P^*$  as given and chooses to offer  $Q^S$  based on the individual supply curve  $S_1$ .

The second feature of perfect competition arises in the long run: there are no economic profits to be made by any producers. Firms can cover their costs, including the cost of capital, but they cannot make more than this. The zero-economic-profit condition is enforced by freedom of entry and exit, a crucial aspect of perfect competition. If extra profits are temporarily available in such a market, new producers will enter or existing producers will expand production. This will shift the market supply curve to the right, lowering the equilibrium price. If prices are too low to cover the opportunity cost of capital, on the other hand, some production capacity will be withdrawn and redirected to other sectors of the economy. This will shift the market supply curve to the left, raising the equilibrium price. In either case, the process will come to a halt only when the rate of profit in this one market is equal to the average throughout the economy; in other words, when price conditions permit firms to recoup the opportunity cost of capital but no more. This is depicted in Fig. 13.2.

Consider for a moment the meaning of a world in which there are no extra profits to be had, in which each producer is equally well off producing for this market or another one, or not at all for that matter. (They could sell off all their equipment and



**Fig. 13.2** There are no economic profits in the long run under perfect competition. When the long run equilibrium is reached, each producer finds that, when they maximize profits by producing where  $p = MC$  (at  $Q^*$ ), the price is just sufficient to cover the average cost of production, including the opportunity cost of capital. There is now no incentive for new firms to enter or existing firms to leave the market

materials and get the same return on their investment by buying government bonds.) What would relationships between such firms look like? They would no doubt compete furiously, since there is no margin of safety separating them from suffering economic losses. (If their average cost curve rises just a hair they are no longer covering their costs at  $P^*$ .) At the same time, however, they would never be in a position to make any threats against one another, since there is no cost to leaving this market and setting up shop somewhere else. If one company tried to drive a harder bargain with another, the second can always say goodbye with no regrets. Since everyone knows this, no one will ever try, *and therefore relations of power and exploitation will never arise.*

The same analysis can be used for any kind of market in such an economy. If labor markets, for instance, are perfectly competitive, both workers and employers will find themselves in the same situation as zero-economic-profit firms. (We will explore labor markets in greater detail in Chap. 16.) Wages would be just high enough to cover workers' opportunity (and perhaps disutility) costs—no more. If an employer made any attempt to pressure such a worker, such as making her work harder or threatening her with being fired, she would just quit and switch to another job or some other activity whose value is just as great; this is what is meant by saying that wages exactly equal opportunity costs. Similarly, suppose that the benefit employers get is exactly equal to the wages they pay for their workers—how could workers apply any pressure to the companies they work for? If they demanded a raise, employers would just replace them with other, equally profitable applicants.

The general point is this: in a world of perfect competition, no one has the ability to alter the prices or wages they face, and no one has any leverage over anyone else, since no one can be threatened with the loss of some advantage not available in

other jobs or markets. This is a world without power in any meaningful sense. To say this, however, is to realize that perfect competition must be a rare exception in the world we actually live in, since power relationships are commonplace. There are powerful companies, powerful economic interests, and sometimes powerful employees, and so there must be advantageous opportunities to be fought over—advantages that are not simply washed away by the tides of competition.

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## 13.2 Barriers to Competition

What prevents competition from being the universal, equalizing force it seemed to be in the previous chapter? Elsewhere we will consider limits to competition in labor markets; here we focus on competition between businesses. Our topic is **barriers to competition**, features of the economy or its legal environment that make it difficult for new businesses to break into markets with above-average profits. Here is a partial list:

1. Legal restrictions. Sometimes the government prevents competition by decree. This was the case in the chartered monopolies of Adam Smith's day. The crown would specify that only a particular corporation would have the right to enter a line of business, such as the East India Company, a private, for-profit enterprise that was actually given the right to rule—and exploit—India after its conquest by England. Putting a company in charge of an entire country would be considered excessive today, but it is still commonplace for competition to be denied in such fields as water, electricity, railroads and other utilities.  
Sometime legal restrictions are indirect: instead of specifying that only one company has the right to do business in a particular market, governments may create conditions that have this effect. The most important example, which we will return to later in this chapter, is patent and copyright law. These permit businesses to gain exclusive control over techniques or commercial identities that may be indispensable to effective competition. A drug patent, for instance, gives a single company the right to produce that drug; any competitor must try to buy the right to copy it, and they can be turned down for any reason or no reason. From the world of copyright, consider the “Mickey Mouse Law”. Mickey's copyright was set to expire in 2003, meaning that after that date anyone, and not just his Disney creators, would be able to make a movie or a comic book featuring the legendary rodent. The Disney Corporation lobbied Congress, and the result was a new law that extended control over Mickey's character for an additional 20 years. This means that only Disney will be able to use Mickey in its entertainments, a barrier to competition, given his enduring popularity.
2. Intimidation. In some cases businesses will use illegal methods to suppress competition, including the threat or use of force. This is particularly common in markets that are illegal to begin with, such as those for drugs, gambling and prostitution, but organized crime has sometimes muscled out competition even in such “legit” activities as trash hauling.

3. Economies of scale. As we will see later in this chapter, large economies of scale relative to the size of the market can make competition all but impossible. Even more moderate economies of this sort, however, can make competition difficult. As a practical matter, the size compulsion applies to marketing and finance as much as, or even more than, manufacturing. Big companies can spread advertising costs over a greater volume of sales, and they are often able to diversify risk (Chap. 18) more effectively. When successful participation in the market requires a vast scale of operations, drawing on large investments of money and time, potential competitors may be discouraged. The result is that companies already operating on the necessary scale will have a relatively free hand.
4. Product differentiation. Competition between companies is effective only if buyers believe that their goods are more or less substitutable for one another. To the extent that a producer can convince the public that their product is distinctive, it is released from competitive pressure. Once a restaurant, for instance, establishes a reputation of serving higher quality meals than any of its competitors, it is in a position to raise its prices and take in economic profits. It may not help at all for other establishments to cut their prices in retaliation; on the contrary, consumers might take this as further evidence that they are unable to compete on quality. New entrants into the restaurant market must somehow establish an aura of high quality if they are to take on the dominant players, and this may be difficult to do.

A particularly important form of product differentiation is **branding**. This is a strategy in which companies try to get consumers to form a positive image of the company name or logo, which is then used to sell an entire line of products. Typically it begins with consumer acceptance of one or more items the company already markets. Perhaps these were truly superior, or perhaps they benefitted from clever marketing in the past; it doesn't matter for brand development. The goal is to have consumers transfer these positive feelings to the overall company identity, so that any additional products it introduces can enjoy a marketing edge. If the strategy is successful, the company insulates itself from a degree of competition, since no one else offers quite the same brand. The most powerful evidence for the ability of brand identity to capture economic profits is the value successful brands capture in the marketplace when established firms (and their brands) are bought out through mergers or acquisitions. (We will look at this process in more detail in Chap. 18.)

5. Scarcity of key inputs. Sometimes the biggest barrier to new competition is simply the inability to acquire the skills or materials needed to market a competitive product. This is especially evident in two sectors of the economy, natural resources and professional services. In the first, it is nature that limits the potential supply; in the second it is the variability of human talent and effort.
  - A vivid example of scarce natural resources is given by premium wine grapes. Many regions have the combination of soils and climate to grow grapes, but few can produce the highest quality varieties that go into the best wine. One such area in the US is the Napa Valley in California, where land prices have gone into the stratosphere: an acre of prime vineyard land now goes for as

much as \$300,000. As you might expect, this is an enormous barrier to competition; few investors can afford the risk involved in entering Napa's wine industry, particularly since the ability to convert this land into cases of highly sought-after wine is far from a sure thing. What if you paid all that money but couldn't quite master the obscure art of winemaking?

- The limited availability of skilled labor is primarily important in services. If there are only three chefs with a background in Italian food in a given city, there can be at most only three (good!) Italian restaurants. The same logic holds for accountants, hydrologists and neurologists. At the international level, there are just a few premier leagues in the major sports (basketball, football/soccer, tennis) because there is a limited number of professional athletes the public is willing to pay to see.
6. Network effects. In recent years economists have begun paying attention to the role played by connections between users in markets for information and communication. Computer users, for instance, often need to exchange files with one another, and this is easier to do if the files were created with the same software. The more users there are of any one software program, then, the more advantageous it is for others to switch over to it as well. The same argument goes for a format in which movies or music can be encoded, although here the edge comes from the interest that content providers (film and music companies) have in making their wares available in the most popular formats. If the formats are proprietary—if they are owned by a single company rather than being in the public domain—this advantage can lead to a virtual monopoly. The same result arises in computer software and is responsible for the near-monopoly position of Microsoft in certain categories.

These, then, are the primary barriers to competition that can result in a few firms having power over the market. When you look at the entire list it becomes obvious that less-than-complete competition is not the exception, but the rule, in modern economies.

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### 13.3 Pure Monopoly

A useful way to approach the problem of incomplete competition is to look at the most extreme case, in which a single firm's sales account for the entire output of the market. Formally, such a firm is called a **pure monopoly**; it is the single seller to which all buyers must come. Though it is extreme, pure monopoly is not uncommon. Such firms can be found in many parts of the economy, sometimes for natural reasons, but often because they are protected by laws and regulations.

Where do we see them? Sometimes at the local level, because the market isn't large enough to support more than one seller of a particular good. This is especially a problem in small towns and rural areas. Wal-Mart, a company we will return to in the next chapter, got its start setting up its large retail outlets in exactly these types of locations. They were the only source within an hour's travel for a wide array of goods, and this gave them an initial advantage. Similarly, sometimes there is only

one restaurant open after 9 p.m. or on Sunday morning in a particular region, and diners have no choice if they want to eat out.

Often monopolies are protected by the rules established by government. A **patent monopoly** is an example of this, as we saw above; only one company, the one that holds the patent, has the right to produce and market the product. Governments often assign monopoly rights to utilities, such as power and cable companies, in return for a fee. Public schools increasingly lease food services to private providers, giving them a monopoly over a particular group of students for part of the day.

So with these examples in mind, let's consider the case of a market with just one seller. Our starting point will be the geometry of production costs explored in the previous chapter. Here will take advantage of the simplification suggested in Box 12.1 and assume that, for all relevant levels of output and sales, average and marginal costs are constant and equal to one another. Leaving aside quantities below (declining ATC) and above (increasing ATC) this range, the result is a picture like Fig. 13.3 on the following page.

In Chap. 12 we brought in the demand side (the firm's sales) by assuming that a price was set in the market that no individual producer is able to change. A firm can decide to produce and sell more or less, but it must accept the going price as the one it must charge. This was represented by a demand curve in the form of a horizontal line across the diagram. (This was also the reason that we didn't use the constant-cost simplification above: our parallel lines would never meet.)

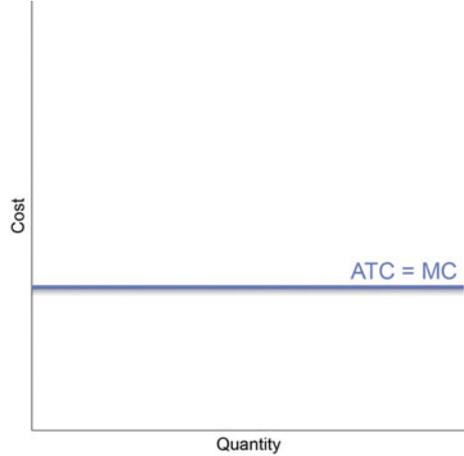
How would we portray the demand conditions facing a monopolist—a firm that *is* the market? The simplest answer is this: the demand for their products is the market demand curve itself, which, as we saw in Chap. 11, will generally be downward-sloping. But this in turn means that the price can change—or more precisely, that the price can *be* changed by the profit-hungry monopolist. It is possible to charge more and not fear that a competitor will steal away all the sales. And that, of course, is exactly what most monopolists will do most of the time.

But how much more does it make sense to charge? Let's assume that the monopolist has only one interest, making as much profit as possible, and is unconcerned by any future consequences from consumers, government or potential competitors. To help think this through, we will create a simple numerical example. Suppose that the demand curve is represented by Table 13.1. The units may be measured in the millions (copies of software) or they may actually be ten or under (custom-built furniture). We don't have to worry too much about realism at this point, because the important thing is to understand the logic.

Let's further suppose that the marginal and average cost are constant at \$8. (Recall from the previous chapter why these must be equal when average cost is constant.) It is obvious that the firm could afford to maximize its sales by charging \$8 per unit, but this would result in no profits at all. If profit is truly the goal, the price should be higher.

Raising the price to \$15 is one possibility. It appeals to a certain narrow-minded greed, but it is not very smart, because it leads to such a sharp drop in sales.

**Fig. 13.3** Constant costs of production in the short run. It simplifies the analysis to assume that average and marginal costs are constant at some fixed level. This is unlikely to be true at very low and high levels of  $Q$ , but it is often true at intermediate levels relevant to real-world production choices



**Table 13.1** Hypothetical demand schedule facing a monopolist

Price	Quantity demanded
15	3
14	4
13	5
12	6
11	7
10	8
9	9
8	10

The profit per unit, \$7, is handsome, but only three units are sold, resulting in a total profit of \$21. As we will see, it is possible to do better.

Try setting the price at \$14 instead: now the profit margin is down to \$6, but sales are 4; so total profit is \$24. If the price is set at \$13, total profit is slightly higher yet at \$25. And this turns out to be the best choice, as any lower price will not quite match the profits raked in at \$13. (Check to see if this is right.)

We can get to the logic of this process by looking at it algebraically. Consider any two adjacent prices,  $P_1$  and  $P_2$ , and the associated levels of demand,  $Q_1$  and  $Q_2$ . Total revenue is therefore either  $P_1 * Q_1$  or  $P_2 * Q_2$ . Total cost is either  $C * Q_1$  or  $C * Q_2$ , since average cost  $C$  is the same at both quantities. The firm’s choice, then is between two levels of profit ( $Pr$ ):

$$Pr_1 = P_1 * Q_1 - C * Q_1 \text{ or}$$

$$Pr_2 = P_2 * Q_2 - C * Q_2$$

The comparison is

$$Pr_1 - Pr_2 = (P_1 * Q_1 - C * Q_1) - (P_2 * Q_2 - C * Q_2)$$

In each parenthesis on the right-hand side is a revenue term (with P) and a cost term (with C). Grouping them together, we get

$$Pr_1 - Pr_2 = (P_1 * Q_1 - P_2 * Q_2) - (C * Q_1 - C * Q_2)$$

Algebraically, this just says that the first price yields a higher profit than the second if there is an increase in total revenue that exceeds the increase in total costs. But recall that we have shorthand expressions for these two things, **marginal revenue** and **marginal cost**. Marginal revenue is the change in total revenue between one output level and a slightly different one; marginal cost is the corresponding change in total cost. (If  $Q_1$  and  $Q_2$  are exactly one unit apart, marginal cost is simply C.) We can then simply say that

$Pr_1 > Pr_2$  if  $MR > MC$ , where MR and MC are calculated going from  $Q_1$  to  $Q_2$ .

This is the rule our profit-seeking monopolist is looking for. Always increase price if the marginal revenue from doing so exceeds the marginal cost of production. Adding MR to Table 13.1 gives us Table 13.2 on the next page.

Since marginal cost is \$8, it is profitable to raise the price until somewhere between \$12 and \$13, where marginal revenue is also \$8. Graphically, the procedure is illustrated by Fig. 13.4.

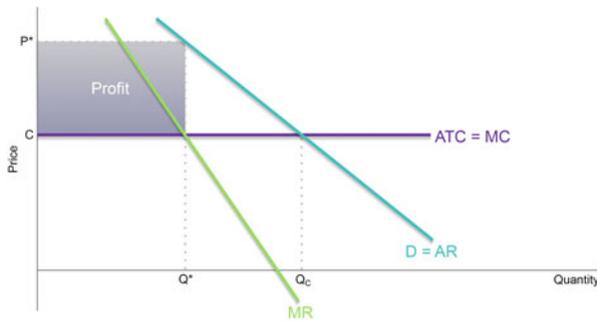
There is a lot going on in this diagram, so let's examine it one element at a time:

- For simplicity, we are assuming that average cost ATC is constant. (The analysis would work just as well if ATC were U-shaped, as in the previous chapter.)
- The demand curve D is the average revenue curve faced by the firm. It displays the amount of output that can be sold at any chosen price level. Since the price will be the same for every unit sold, it is also the average revenue—total revenue divided by the quantity sold.
- Since AR is downward-sloping, MR is below it. This follows the same logic regarding the relationship between an average and a marginal curve as we uncovered in the previous chapter's discussion of average and marginal cost. If an average result is going down, the marginal result is below, "pulling" it down. This relationship is illustrated in Table 13.2.
- Profits will be greatest if the firm produces at the quantity  $Q^*$  where  $MR = MC$ . If it produces less than this amount, the additional revenue it could get will be greater than the additional cost it would take on by expanding production. If it produces more, the additional cost exceeds the additional revenue.
- By producing at  $Q^*$ , the monopolist is able to raise the price to  $P^*$  and still sell all its output. This is worth spending an extra moment to consider. The firm could, if it were in a generous mood, charge only C, its cost of production. This would mean that profits would be zero, since there would be no surplus of price over cost. Since we are assuming that the monopolist wants to maximize its profits,

**Table 13.2** Calculating marginal revenue for the monopolist’s hypothetical demand schedule

Price	Quantity demanded	Marginal revenue
15	3	
14	4	11
13	5	9
12	6	7
11	7	5
10	8	3
9	9	2
8	10	-1

Marginal revenue is calculated in this table by going from a higher price to the one just below it. Thus MR is 11 as the monopolist goes from  $P = \$15$  to  $P = \$14$ .



**Fig. 13.4** Profit maximization for a hypothetical monopolist. The monopolist achieves the greatest profit by producing a quantity  $Q$  at the level where marginal revenue equals marginal cost. At this quantity a price of  $P^*$  can be charged, yielding a profit per unit of  $P^* - C$  and total profit (unit profit times quantity) equal to the shaded area

however, it makes sense to raise the price to the highest level possible at which  $Q^*$  units will be purchased. In our numerical example this was \$13.

- The profit per unit is  $(P^* - C)$ , the price minus the cost. This is commonly referred to as the firm’s **profit margin** on sales. It is represented by the vertical distance between  $P^*$  and  $C$  on the horizontal axis.
- Total profit is calculated by multiplying the profit margin times the number of units sold. This is seen in the shaded area, since the height of the rectangle is  $(P^* - C)$  and its length is  $Q^*$ .

Thinking back to the Market Welfare Model, it is clear that monopoly production and pricing, as depicted in Fig. 13.4, poses several problems. First and most important, the price is not equal to the marginal cost. There are people who would purchase the product we are considering if its price were lower than  $P^*$  but above  $C$ . These people put more value on the product than it would cost to produce it, yet nothing is produced for them. This is economically inefficient. A different way to frame this would be to notice that the quantity produced by the monopolist,  $Q^*$ , is less than the amount that would be produced in a competitive market, where the

demand curve  $D$  intersects the supply curve—which would then be the marginal cost curve. This higher quantity is labeled  $Q_C$  in the diagram.

Second, we can no longer say that the supply curve equals the marginal cost curve because. . .with a monopoly there is no supply curve! What does this mean? We defined the supply curve in Chap. 5 as the amount suppliers wish to produce and make available to the market at various potential prices. It was based entirely on their costs and was unaffected by shifts in the demand curve. This is the logical basis for the main use to which we put supply and demand analysis: looking at what would happen if one curve shifted while the other remained fixed. But in the current example of a monopoly, there is no supply curve to remain fixed as demand changes; price and production decisions of the monopolist will depend in a complicated way on both the position (to the left or right) and slope (flatness or steepness) of the demand curve. In other words, there is no such thing as supply and demand analysis if the supplier has a monopoly.

Third, there has been a large transfer of wealth from consumers to the monopolist. Recall that we have defined the cost of production  $C$  to include the opportunity cost of capital, the rate of return available on alternative investment opportunities. This means that the profit margin represents “super profits” beyond those normally earned. These extra earnings come directly out of consumers, who pay the higher price  $P^*$  instead of the competitive price  $C$ . This transfer contributes to overall economic inequality to the extent that the owners of the monopoly are, as is usually the case, wealthier than its consumers. Whether it is a further source of economic inefficiency is a question we will put off until later in the discussion.

These three problems can be found wherever there is monopoly, but their severity depends on how captive consumers are in the market that has been monopolized. Consider the two possibilities depicted in Fig. 13.5 on the next page.

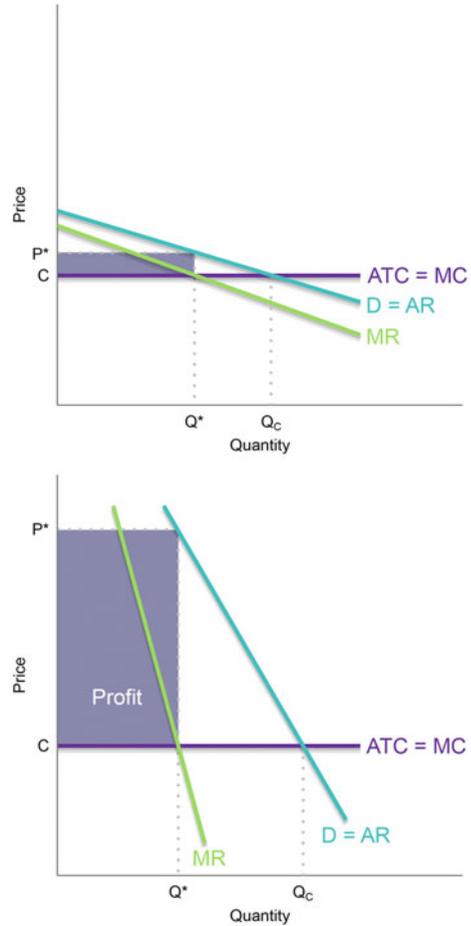
This demonstrates vividly the crucial role played by the price elasticity of demand, the percent change in quantity demand corresponding to a percent change in the price. In Fig. 13.5a, demand is highly elastic:  $MR$  is only slightly below the demand curve, and  $P^*$  is just a shade above  $MC$ .<sup>1</sup> Monopoly has a limited effect. In Fig. 13.5b, on the other hand, demand is inelastic, and the difference between competitive and monopoly outcomes is striking: a big drop in output, a big increase in price, and a wide gap between price and marginal cost.

Now we can see one more reason for developing the elasticity apparatus in Chap. 5. Recall the argument presented there for the underpinnings of elasticity: it depends on the possibilities open to consumers for substitution. Where substitutes are plentiful, demand is elastic and consumers are free to seek alternatives to higher monopoly prices. Where they are scarce, consumers must dance to the monopolist’s tune.

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<sup>1</sup> To see for yourself the relationship between the slope of the demand curve and the slope of  $MR$ , substitute different quantity figures in Table 13.2 and see how they affect your calculation of  $MR$ . For instance, instead of letting the quantity sold rise by 1 unit with each \$1 reduction in price, let it rise by 2 units, then calculate total revenue and the change in total revenue from one price to the next. Graph the old and new pair of  $AR$  and  $MR$  curves.

**Fig. 13.5** The effect of price elasticity of demand on the extent of monopoly distortion. (a) demand is price elastic, which minimizes the difference between competitive and monopoly production ( $Q_C - Q^*$ ) and the amount of extra profits in the shaded area. (b) demand is price inelastic; so the reduction in output and the transfer of income from consumer to monopolist is greater



Consider two examples. First, should consumers fear a monopoly in red onions? Probably not. If the supplier raises prices by a significant amount, buyers can switch to onions of a different color—yellow or white. The diagram representing this situation would look like Fig. 13.5a, where monopoly is a modest inconvenience. But now consider the problem posed by a monopoly in water supplies. The privatization of water utilities, selling public water systems to private companies, is highly controversial, above all because many consumers use water primarily for essential purposes like drinking and hygiene. If a private supplier gains a monopoly, there may be little alternative to paying whatever price is charged. (Such systems are usually regulated, but regulation may not be enough protection.) Thus, where water plays a subsistence role demand may well take the form of Fig. 13.5b, and monopoly is a serious concern. (The situation may be different where water is used in a discretionary manner, such as landscaping. There the alternative to high prices may be switching to more drought-tolerant plant species.)

## 13.4 Between Pure Monopoly and Perfect Competition

Few real-world markets are either completely competitive or completely monopolistic. Usually there is some rivalry between producers seeking the consumer's loyalty, but not to the extent that producers have no leeway at all over prices. Thus we are in an intermediate situation, with some of the characteristics of competition and some of monopoly. How far markets veer in one direction or another depends on many factors, which will look at in a moment. First, however, we should try to clarify what we might mean by "in between monopoly and competition".

Up to this point we have sketched the competitive and monopolistic worlds as extreme cases. In competition firms have no control at all over the price they charge; it is dictated to them by the market. The market supply curve, which is the sum of all the individual supply curves, represents the marginal cost at each level of production, and prices equal this cost in equilibrium. Firms tend to receive an average rate of profit, just covering their opportunity cost of capital. Those that are less profitable eventually shut down; those that are more profitable attract new competition. In either case, prices in the long run will adjust to guarantee that profits revert to the average. In such a world the consumer is king; firms knock themselves out to meet demand in the most cost-efficient way.

Monopoly is a reverse-image of this situation. The monopolist can raise the price to whatever level promises the greatest profit; supply is determined by calculating how much consumers can be squeezed. Price is above marginal cost, often by a large margin. There are severe barriers to competition, so even in the long run consumers get no relief. Here the supplier is king, dictating terms to buyers and reaping the rewards.

What would it mean to speak of an intermediate situation between these two extremes? Economists have developed a variety of models to answer this question. If you continue to more advanced courses you will have a chance to study them; here it is enough just to say that the key results can be placed along a spectrum that stretches from very competitive to very monopolistic. In more competitive situations there is less monopoly distortion in most respects; in more monopolistic situations the distortion approaches the form it takes in pure monopoly. In this sense the "degree of monopoly" functions somewhat like the price elasticity of demand in Fig. 13.5: it determines how significant the departure from competitive pricing and production is likely to be. Two practical ways to measure this departure using real-world information are the average spread between price and marginal cost and extent of above-average rates of profit.

Limitations to monopoly can be either actual or potential. The most important actual limitation, of course, is the presence of other firms. As soon as the monopolist has less than 100 % of the market we have to take into account the role that other firms may play in introducing a competitive dynamic. A market with more than one producer but less than many is called an **oligopoly**; here a few firms, and not just one, sell to consumers. A market with even just two firms could be intensely competitive if each one fought for as much market share as possible by cutting prices down to marginal costs. By the same token, a group of firms can suppress

competition by forming a **cartel**, an arrangement to jointly control prices and quantities. Cartels are illegal in many instances, but this doesn't prevent them from emerging. If a market is fully controlled by a cartel, it functions exactly as if it were purely monopolistic.

There are many factors that affect how competitively an oligopolistic market will tend to function. Some of the most important are:

- The degree of concentration. The greater the percentage of sales in a market that is concentrated in just a few producers, the more concentrated it is. One common measure is the four-firm concentration ratio, the percentage of the market that is accounted for by the four largest sellers. Generally speaking, the less concentrated a market is, the more competitive it is.
- The presence of a dominant firm. If one firm towers above the rest in a particular market, it is often in a position to maneuver the others into a less competitive orientation. The smaller sellers may fear the dominant player, or they may look up to it for leadership in setting prices.
- Conditions favoring collusion. Whether oligopolistic firms will choose to compete with one another or collude to control the market depends on the incentives they face and the conditions that make it easier or harder to act in concert. Inelastic consumer demand makes collusion more attractive, but aggressive surveillance by public regulators can be a strong disincentive. Barriers to entry and networks connecting the owners or managers of the firms can facilitate collusion. Adam Smith feared such relationships, saying, "People of the same trade seldom meet together, even for merriment and diversion, but the conversation ends in a conspiracy against the public, or in some contrivance to raise prices." (*The Wealth of Nations*)

Even pure monopolists, however, face limits to their ability to raise prices, even in the absence of competitors nipping at their market share; there is always the specter of *potential* competition. A firm that tries to take full advantage of inelastic demand, as in Fig. 13.5b, runs the risk that its riches will attract new competitors who will dissipate the advantages of monopoly. In practice, firms with overwhelming dominance usually choose to raise their prices less than immediate profit maximization would require.

#### **Box 13.1: A Cruising Altitude for Airline Prices**

Most collusion occurs behind closed doors, and we get only the most general account of it, if any. But one attempt at fixing prices was caught on tape, when Howard Putnam of Braniff Airlines secretly recorded a phone call he received from American Airlines CEO Robert Crandall on February 21, 1982. The transcript, cleaned up to meet refined textbook standards, went like this:

Crandall: I think it's dumb as hell for Christ's sake, all right, to sit here and pound the <bleep> out of each other and neither one of use making a <bleep>ing dime.

(continued)

**Box 13.1** (continued)

Putnam: Well. . .

Crandall: I mean, you know, goddam, what the hell is the point of it?

Putnam: But if you're going to overlay every route of American's on top of every route that Braniff has—I just can't sit here and allow you to bury us without giving our best effort. (Pause.) Do you have a suggestion for me?

Crandall: Yes, I have a suggestion for you. Raise your goddam fares 20 %. I'll raise mine the next morning.

Putnam: Robert, we. . .

Crandall: You'll make more money and I will, too.

Putnam: We can't talk about pricing!

Crandall: Oh <bleep>, Howard. We can talk about any goddam thing we want to talk about.

Although Crandall's own words appeared to convict him of the federal crime of attempted price-fixing, he was able to get off because secretly taping a phone call is also illegal! The evidence could not be introduced into a court of law.

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## 13.5 Is Concentration a Problem?

It depends! First of all, it depends on *why* concentration has come about. Adam Smith, as we saw, feared collusion; he thought that business owners might try to band together to limit competition. Karl Marx, writing 80 years later, expected big firms to swallow up their smaller competitors until there were just a few behemoths left in the marketplace. Neither prospect is particularly appealing, since in either case it would be the potential for monopoly pricing power that would guide business decisions.

A different perspective was suggested by Joseph Schumpeter, the Austrian economist we encountered earlier. He felt that monopoly, as a temporary state of affairs, was normal—the product of all-out business competition. A firm that successfully innovated—that discovered a new way to make or market its products—would destroy its competitors. This would give it the opportunity to enjoy monopoly profits, at least until the next round of innovation reshuffled the deck. Such profits were the *reward* for risk-taking and creativity, and it would be a mistake to try to limit them. As long as the game remained open for new players, so that monopoly was not protected by law or other means unrelated to meeting consumer demand, high profits perform a useful social role.

So how would we know who is right, critics of monopoly (like Smith and Marx) or its defenders (like Schumpeter)? When is monopoly a temporary prize earned for achievements in efficiency and innovation, and when is it a form of exploitation visited by the powerful against the weak or vulnerable?

In practice, economists have developed a number of tests to determine whether monopoly (or high levels of concentration) are against the public interest. The first is simply the history of the market itself: the sequence of events by which concentration came about. In particular, did monopolistic firms acquire their large market share through **anti-competitive behavior**? Did they owe their success not to their own higher level of performance, but to actions that interfered with the performance of competitors? An example would be exclusionary contracts, deals with suppliers or distributors that rule out business with other firms. The software giant Microsoft, for instance, was accused by the government of forcing computer manufacturers that wanted to install its Windows operating system to agree to not install any software by competitors. The point was that such a requirement enhances Microsoft's monopoly not because it has become a more effective producer of software, but because it has limited the business opportunities of competing producers.

Sometimes, however, it is clear that large market share is simply the result of consumer preferences. Coca-Cola, for instance, built its empire on the basis of a soft drink it created in the early twentieth century. It has kept its formula secret, and many consumers seem to prefer its flavor to that of the competition. Thus there is no reason to assume that, at least in the case of its flagship product, the Coca-Cola company has acted anti-competitively. This logic does not automatically extend, of course, to other products (such as bottled water) in which this company might also have a high market share.

Related to the question of possible anti-competitive activity is the scope for consumer choice. Do consumers have a wide array of alternatives available to them, or are they held captive by monopoly restrictions on choice? Variety is a good thing in itself (usually), and one of the potential drawbacks of monopoly is the possibility that consumers will be forced to settle for what is offered rather than what they want. The value of choice in itself was an important issue in the European and American court cases involving Microsoft and later Google.

Finally, does a high degree of concentration lead to less innovation or more? Do firms with a large market share become conservative, more concerned with protecting their existing assets than creating new ones? Or do they tend to spend more on investment and take more risks, drawing on the extra freedom of action that money and market share provide? The answer depends on the firm, its market and the strategy it adopts, and the study of these factors is of great interest to economists.

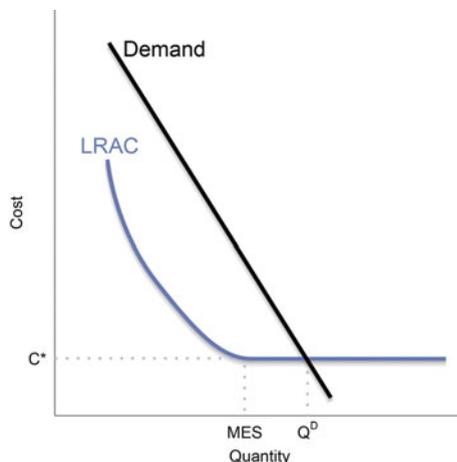
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## 13.6 Natural Monopoly

One particular barrier to competition is so important that it deserves a discussion of its own, **natural monopoly**. This arises whenever economies of scale are so great compared to the size of the market that there is room for only one low-cost producer. Recall from the previous chapter the portrayal of average costs in the long run: it generally takes the form of a curve that initially slopes downward and

**Fig. 13.6** Natural monopoly.

If the size of the market, the quantity demanded at the lowest feasible price ( $Q^D$ ) is less than twice the minimum efficient scale (where the average cost of production equals  $C^*$ ), there isn't enough room for two producers to compete at an efficient level of production



then levels off after **minimum efficient scale** (MES) has been reached. The downward-sloping part reflects **economies of scale**, but after MES there are no more such economies to be had, and average cost is unaffected by further increases in the level of output.

Figure 13.6 reproduces such a long run average cost curve, and adds to it an expected demand curve which predicts how much will be purchased at various potential prices. The lowest possible average cost is  $C^*$ . The intersection between the long run average cost curve and the demand curve is given by  $Q^*$ , which is the size of the market if a price equal to the minimum possible average cost is charged. (Recall once more that this cost includes the opportunity cost of capital.) The other critical quantity level is given by  $Q_{MES}$ , the level of output needed to achieve the lowest average cost. Natural monopoly is said to arise if  $Q_{MES} > \frac{1}{2} Q^*$ .

What does this mean exactly? To compete on equal terms, a firm must have an average cost of production no greater than  $C^*$ . This means it must produce at least  $Q_{MES}$ . For there to be more than one such firm able to sell all it produces,  $Q^*$  must be at least twice  $Q_{MES}$ . Under a condition of natural monopoly, however, this is not the case; the market is big enough to accommodate only one lowest-cost producer.

Now we can see why such a monopoly is considered “natural”: it is the result of technological and consumer demand factors and not the actions of government or the strategies of the firms themselves. If costs are to be kept low and consumers satisfied, there is no avoiding it.

The advantage of this analysis is that it gives us specific questions to ask if we want to know whether it makes sense to try to prevent a particular market from being monopolized. It comes down to the relationship between technology (economies of scale) and consumer demand (size of the market). These may be difficult to measure precisely, but it is not difficult to classify most cases one way or the other. For instance, the theory of natural monopoly was originally developed in the context of electrical utilities. (One private producer of electricity in particular helped subsidize the research on which the theory was based.) At that time, in the

early twentieth century, it is quite possible that there was space for only one efficient electricity provider in most markets. (With only local transmission networks, these markets were small, and economies of scale were substantial.) On the other hand, one study has found that economies of scale in the retail grocery industry requires no more than four stores, so (if this is true) any region with enough demand to support at least eight has the potential for competition.

Reflecting on the underlying factors behind Fig. 13.6 makes it clear that natural monopoly should be a diminishing aspect of the world economy. We have already seen in the previous chapter that there are technological reasons, especially computerization, for suspecting that economies of scale are capable of being realized at lower levels of production. At the same time, globalization is increasingly fashioning the world into a single integrated marketplace. Thus, for most products, the size of the market is expanding while MES is drifting downward. For this reason, more than any other, most economists believe that the force of competition is greater now than in the past, and that this trend will continue into the future.

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### 13.7 Competition Policy

Because monopolistic practices can sometimes have a harmful effect on an economy, governments have developed policies for monitoring market conditions and sometimes intervening to prevent the exercise of pricing power. Collectively these measures are known as **competition policy**; they constitute one of the most important roles played by governments in a market economy.

The first element of any such policy is surveillance: there must be a regular flow of information to alert authorities to the possibility that competition is endangered. For this reason, most developed countries have reporting requirements: firms must file documents indicating what markets they operate in, the value of their purchases and sales, etc. In particular, when companies consider merging with or acquiring their competitors they must submit a detailed proposal with enough information for regulators to evaluate the potential effect on competition.

Logically, a second element is the right of authorities to deny permission for mergers and acquisitions. Here regulators must balance the potential positive aspects of consolidation, such as economies of scale, against the negative potential for undesirable pricing power. Since the scope of such companies is often international, permission may be required from multiple regulatory agencies; most often, this means the United States and the European Union.

The third element is legal action to limit monopoly power after it has been established. All modern nations (and the multinational entity that is the EU) have laws prohibiting anti-competitive behavior. If a company is found to have violated such a law, either by unfairly inhibiting competitors or by engaging in practices harmful to consumers or other sectors of the economy, remedies can be sought. The most dramatic is breaking up the monopolist into smaller competing firms, as happened in the landmark case brought against John D. Rockefeller's Standard Oil monopoly in the United States. The dispute went to the Supreme Court, which

ruled in 1911 that the company had to divest itself of some of its holdings and then split into 34 separate entities, each with an independent board of directors. A lower court order in 2000 similarly required Microsoft to separate into two competing companies (one for operating systems like Windows, the other for other types of software), but that ruling was overturned on appeal.

Short of breaking up the monopolist, regulators can demand that specific policies be implemented to reduce the threat to competition. In the case of Microsoft, for instance, the company was made to agree that it would discontinue the practice under which it charged computer manufacturers a lump-sum price no matter how many copies of Windows were installed on their machines. Instead, Windows would be made available on a per-copy basis. This made it possible for producers of alternative operating systems to compete, since the cost of an additional copy (the marginal cost) of Windows was no longer zero. By taking actions such as this, regulators are reconciling themselves to the dominant market position of a single firm, but trying to limit the potential negative impact.

Related to this is action against collusion by oligopolists seeking combined monopoly power. (We saw a case of attempted collusion in the Braniff–United Airline conversation above.) Setting up a cartel, for instance by setting quotas limiting how much each company can sell or by agreeing not to charge less than a certain price, is price-fixing, and it is against the law everywhere. Violators, if convicted, can be fined up to and beyond the extent of their illicit earnings, and other measures can be taken to prevent them from colluding again in the future.

Sometimes governments intervene proactively to set up a regulatory framework intended to maintain the advantages of monopoly while limiting its disadvantages. This is particularly common in the context of natural monopoly, as seen in such services as telecommunications and energy transmission. Thus, a monopoly will be granted to a private company, but its pricing, investment and other activities will be monitored by a special board empowered to overrule practices that take excessive advantage of this situation. For instance, an electrical company may have to petition for every rate increase, where it has the burden of demonstrating that the higher price is justified by higher costs. This type of arrangement is known as a **regulated monopoly**.

Finally, the government may decide that, if monopoly is unavoidable, it should be the one to occupy that position. Thus, many services thought to have characteristics of a natural monopoly, like local water and power systems, are owned by units of government. The expectation is that, operating without private investors, managers of public enterprises will be less tempted to raise prices or restrict output. Of course, a substitute must then be found for the positive effect of the profit motive—the incentive to cut costs or provide more highly valued services.

Competition policy is a fine art. No matter how carefully the laws are crafted, implementing them requires plenty of analysis and judgment. Is the monopoly of the natural variety, and therefore unavoidable? Was it the result of anti-competitive behavior or just competitive success? Do its potential advantages for the public outweigh the disadvantages? In the end each case must be decided on its own merits. Unfortunately, large sums of money are often at stake on all sides, and the

risk of policy being determined by private rather than public interests is ever-present.

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### The Main Points

1. In a perfectly competitive market neither buyers nor sellers can individually alter the equilibrium price, and no economic profits are earned either. Thus, no one has the ability to alter the prices or wages they face, and no one has any leverage over anyone else, since no one can be threatened with the loss of some advantage not available in other jobs or markets. This is a world without power in any meaningful sense. To say this, however, is to realize that perfect competition must be a rare exception in the world we actually live in, since power relationships are commonplace.
2. Monopolistic conditions are the result of barriers to competition. These can take many forms, such as legal restrictions, intimidation, economies of scale, product differentiation, the scarcity of key inputs and network effects.
3. The impact of barriers to competition can be seen most clearly in the analysis of pure monopoly, where a single seller commands the entire market. The profit-maximizing monopolist will withhold supply to the level at which the marginal cost of production is equal to the marginal revenue from sales, taking into account the higher prices that can be extracted from consumers as supply is reduced. The monopolist will charge the highest price at which this quantity can be sold. This is advantageous for the firm in a position to do this, but it has several negative effects: it restricts output below the efficient level, it forces consumers to pay a higher price than they would otherwise, it reduces consumer surplus and correspondingly increases profits, and it interferes with the role that prices should play in conveying information about production costs.
4. The extent of monopoly output restriction and price increase depends on the consumers' price elasticity of demand: the distortion is greater the more inelastic this demand. The elasticity of demand depends on the opportunities for substitution available to consumers: how easily can they switch to different products when a monopolist raises the price of one particular product?
5. Most markets lie between the extremes of perfect competition and pure monopoly. They will have some characteristics of each. Factors which lead them to resemble monopoly include high levels of concentration, the presence of a dominant firm, the likelihood of collusion, and the height of entry barriers. In practice, economists look at the extent of anti-competitive behavior on the part of firms and the degree to which prices depart from marginal costs to assess the damage caused by monopolistic conditions.
6. Sometimes we face a natural monopoly; this occurs when the most of efficient scale of production is more than half the size of the market. This means that there isn't room for more than one efficient (low-cost) firm. Such monopolies may need to be regulated rather than prevented.
7. All modern economies engage in competition policy—government interventions to limit the costs monopolistic conditions and behavior impose on society.

They may try to limit the size of firms, control their anti-competitive practices, reduce entry barriers, or create public enterprises to compete with or supplant private monopolies.

► Terms to Define

Anti-competitive behavior

Barriers to competition

Branding

Cartel

Competition policy

Natural monopoly

Oligopoly

Patent monopoly

Profit margin

Pure monopoly

Regulated monopoly

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**Questions to Consider**

1. Can you think of any portions of the economy in which competition is near-complete and power does not exist? Are all the participants able to go somewhere else and get the same economic return? Does anyone have leverage over anyone else?
2. What barriers to competition exist in the film industry? In what ways does it perform more like a monopoly? More like a competitive industry?
3. Pick an industry you are familiar with and discuss which barriers to competition, if any, apply. What are the consequences for where the industry stands on the monopoly–competition spectrum?
4. In general, do you think that the elasticity of demand is the same for most movies shown by a local movie theater? Why or why not? If not, why do theaters charge the same prices for all movies at a given time? Does your answer support or contradict the theory of monopoly (or monopolistic) pricing presented in this chapter?
5. One of the most celebrated anti-monopoly cases in recent years has involved Microsoft, which had to defend itself in US, European and other courts. Microsoft's computer operating system Windows still commands a near-monopoly share of the global market for personal computers. Based on the theory in this chapter, how serious a problem does this pose for the public? On what arguments do you base your conclusion?
6. Can you think of an example of a natural monopoly? Is it regulated? Is it a problem?