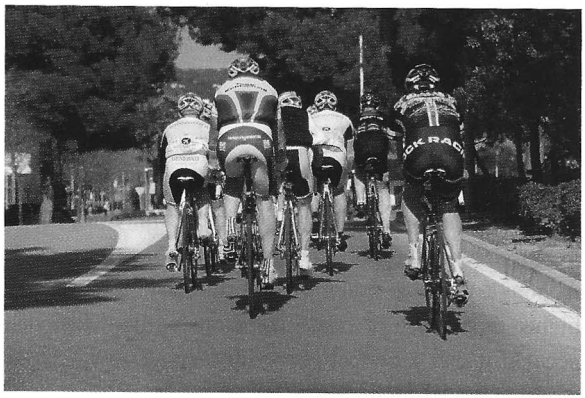
Monopolistic competition and oligopoly

09

Suppose you are a keen cyclist who patronises a local bike shop called Wheeler-dealer. Wheeler-dealer does not fit either of the two extreme models studied in the previous two chapters. Instead, Wheeler-dealer's characteristics are a blend of monopoly and perfect competition. For starters, similar to a monopolist, Wheeler-dealer's demand curve is downward-sloping. This means Wheeler-dealer is a *price maker* because it can consider charging a higher price, which means that, although it would lose some customers, many loyal customers would keep returning. The reason is that Wheeler-dealer's services and products are different from those of its competitors. It makes its products and services different by using advertising, by providing first-rate service, and by being situated in a convenient location. In short, like a monopolist, Wheeler-dealer has a degree of *market power*. But like a perfectly competitive firm, Wheeler-dealer is not the only place where you can buy a bike or have it serviced. It must share the market with many other bike shops.

Even though Wheeler-dealer may not seem to have much in common with a gigantic firm such as Honda, you will see in this chapter that, in spite of the size difference, they are similar in many ways. These two firms compete in different market structures, both of which fall between perfect competition and monopoly.



Source: Photolibrary/Alamy/Alvey & Towers Picture Library

One of these market structures is *monopolistic competition* and the other is *oligopoly*. Wheeler-dealer operates in the former, while Honda belongs to the latter.

Unlike monopolies, firms in these two market structures share the market with competing firms. But like monopolies, their profit-maximising behaviour results in a situation where industry output is restricted to below the level that would occur if the industry was perfectly competitive. The theories of perfect competition and monopoly presented in the previous two chapters will help you understand the impact of these new market structures on price and output decisions.

In this chapter, you will examine these economics questions:

- Why will a bike shop like Wheeler-dealer make zero economic profit in the long run?
- Does advertising increase or decrease prices and profits?
- Why do cartels, such as OPEC, tend to break down?
- Could the game of 'chicken' played by children provide insights into the behaviour of airlines?

The monopolistic competition market structure

In the previous two chapters we have looked at the market structures at each end of the continuum presented in Exhibit 7.1. In this chapter we look at the two remaining structures. Later in the chapter we will look at the structure called oligopoly, which is closest to monopoly at one end of the continuum. However, before we do that, we shall investigate the structure known as monopolistic competition which is the structure closest to perfect competition at the other end of the continuum.

Monopolistic competition
A market structure characterised by (1) many small sellers, (2) a differentiated product and (3) easy market entry and exit.

Economists define **monopolistic competition** as follows: monopolistic competition is a market structure characterised by (1) many small sellers, (2) a differentiated product and (3) easy market entry and exit. Monopolistic competition fits numerous real-world industries. In fact, most of the businesses you deal with on a day-to-day basis – the corner shop, your favourite restaurant, the dry-cleaner and the hot-bread shop – are all monopolistic competitors. Monopolistic competition is the market structure in which we find more firms than in any other structure. Let's look at each of the characteristics of monopolistic competition in turn.

Many small sellers

Under monopolistic competition, as under perfect competition, the existence of a large number of firms means that no single firm can influence the market outcome. Wheeler-dealer, described in the chapter introduction, is an example of a monopolistic competitor. Although Wheeler-dealer cannot influence the market outcome, it can set prices slightly higher than those of rival bike shops without fear of losing all its customers, as would occur if it was a perfect competitor. As you will see, it is able to do this because it sells a differentiated product.

IN SUMMARY The many-sellers condition is met when each firm is so small relative to the total market that each firm's pricing decisions have no effect on the market outcome.

Differentiated product

The key feature of monopolistic competition is **product differentiation**. Product differentiation is the process of creating real or apparent differences between goods and services. A differentiated product means there are close, but not perfect, substitutes for the firm's product. While the products of each firm are very similar, the consumer views them as somewhat different or distinct. There may be 50 bike shops in a given city, but they are not all the same. They differ in location, products sold, atmosphere, style and quality of service and so on.

Product differentiation
The process of creating real or apparent differences between goods and services.

Product differentiation can be real or imagined, but it does not matter if it is only imagined so long as consumers believe such differences exist. For example, many customers think Wheeler-dealer provides the best quality servicing of bikes in town even though other bike shops actually offer a similar service. The importance of this consumer viewpoint is that Wheeler-dealer can increase prices if it wishes because many of its customers will be willing to pay a slightly higher price to have their bike serviced at Wheeler-dealer. The greater the perceived difference between Wheeler-dealer's product and services and those of its rivals, the greater will be the capacity for Wheeler-dealer to raise its prices without significant loss of customers. This gives Wheeler-dealer the incentive to try to differentiate its products and services further by, for example, undertaking expenditure on appearances at local fun rides and by developing a marketing campaign using shots of the owner of Wheeler-dealer cycling past a well-known city landmark.

P3

How do Pepsi and Coca-Cola use their websites to differentiate their products? See **www.pepsi.com** and **www.cocacola.com**.

Search me!
▸ product differentiation

When a product is differentiated, buyers are not indifferent as to which seller's product they buy.

IN SUMMARY

The example of the Wheeler-dealer bike shop makes it clear that, under monopolistic competition, rivalry centres not only on price competition but also on **non-price competition**. Non-price competition is the situation in which a firm competes using advertising, packaging, product development, quality and service, rather than lower prices. Non-price competition leads to important differences between monopolistic competition, perfect competition and monopoly. Under perfect competition, there is no non-price competition because the product or service is identical for all firms. Likewise, the monopolist may have little incentive to engage in non-price competition because it sells a unique product.

Non-price competition
The situation in which a firm competes using differences in advertising, packaging, product development, quality and service, rather than lower prices.

Search me!
▸ non-price competition

Easy entry and exit

Unlike a monopoly, firms in a monopolistically competitive market confront low barriers to entry. Someone who wants to enter the bike shop business can get a loan, lease a building and start selling and servicing bikes without too much trouble. Monopolistically competitive markets are thus markets that remain very easy to enter. Just consider how anyone with a small amount of capital, the willingness to work hard and a modicum of common sense can start up a business such as a courier service, a lawn care service, a plant shop or a home maintenance service.

The monopolistically competitive firm as a price maker

Whereas the perfectly competitive firm is a price taker, the monopolistic competitor is a *price maker*. The primary reason is that its product is differentiated. This gives the monopolistically competitive firm, like the monopolist, limited control over its price. If it decides to raise its price it finds that, rather than losing all its customers as would be the case under perfect competition, a degree of loyalty to its product or service means that some customers will remain steadfast. On the other hand, a decision by a monopolistic competitor to lower its price will result in an increase in sales. This contrasts with the perfectly competitive case where the firm can sell as much as it likes at the market price, and thus has no incentive to reduce price. This control over price means that, as for a monopolist, the demand curve and the corresponding marginal revenue curve for a monopolistically competitive firm are downward-sloping. However, the existence of close substitutes causes the demand curve for the monopolistically competitive firm to be more elastic than the demand curve for a monopolist. When Wheeler-dealer raises its prices by 10 per cent, the quantity of its bikes and services demanded declines, say, 30 per cent. Instead, if Wheeler-dealer has a monopoly, no close substitutes exist and consumers are less sensitive to price changes. As a monopolist, Wheeler-dealer might lose only 15 per cent of its quantity of products and services demanded from the same 10 per cent price increase.

IN SUMMARY

The demand curve for a monopolistically competitive firm is less elastic (steeper) than for a perfectly competitive firm and more elastic (flatter) than for a monopolist.

Advertising pros and cons

Before presenting the complete graphical models for monopolistic competition, let's pause to examine further the topic of advertising. As explained at the beginning of this chapter, a distinguishing feature of a monopolistically competitive firm is that it engages in non-price competition, which may involve the use of advertising to differentiate its product. The desirability of this advertising is a subject that has exercised the minds of economists for more than half a century.

Critics of advertising argue that its main purpose is to persuade or mislead consumers into buying something they do not need. From society's viewpoint, the resources used in advertising could be used for schools, hospitals, food, clothing or other useful products and services. On the other hand, proponents of advertising cite its many benefits. Those on this side of the debate see ads as infusing the product with its characteristics (luxury cars for sophisticated people, off-road vehicles for adventurous types) and providing worthwhile information. Advertising informs consumers of the target market for the product and the availability of different products, as well as their advantages. So while advertising means that the product may cost a little more, this information saves consumers money and time. Ads may also increase price competition among sellers. Finally, protagonists of advertising argue that consumers are rational and cannot be fooled by advertising. If a product is undesirable, customers will not buy it.

Does non-price competition, which is a hallmark of monopolistic competition, lead to lower prices, greater output and better-informed consumers? Or does this market

structure simply raise prices and annoy customers with useless and often misleading information? As long as there is advertising there will be continuing debate about its value to society. Nevertheless, a measure of the concern that society has about the ill-effects of misleading advertising can be found in the regularity with which the Australian Competition and Consumer Commission (ACCC) imposes severe penalties on firms that contravene the *Competition and Consumer Act 2010* (formerly known as the *Trade Practices Act*) by engaging in false or misleading advertising. Later in this chapter you will learn that advertising to differentiate a product is also a key characteristic of many firms in the oligopoly market structure.

Price and output decisions for a monopolistically competitive firm

Now we are prepared to develop the short-run and long-run graphical models for monopolistic competition. In the short run, you will see that monopolistic competition resembles monopoly. In the long run, however, entry by new firms leads to a more competitive market structure. This section presents a graphical analysis that shows why a monopolistically competitive firm has some of the characteristics of perfect competition and some of the characteristics of monopoly.

Monopolistic competition in the short run

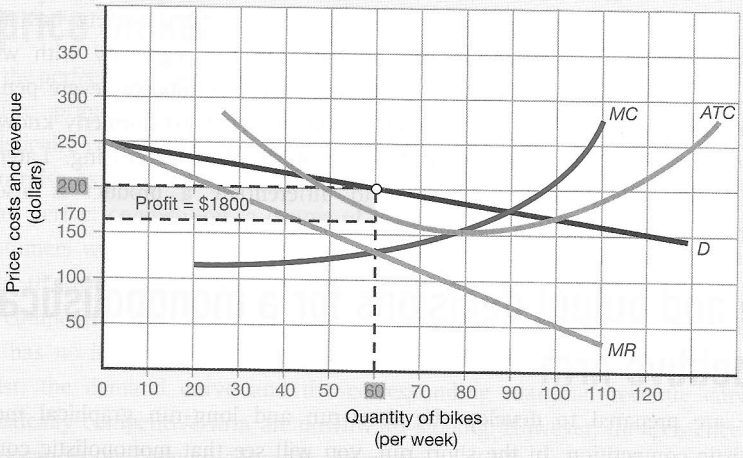
Exhibit 9.1 (page 214) shows the short-run equilibrium position for the Wheeler-dealer bike shop, a typical firm under monopolistic competition. As explained earlier, the demand curve faced by the firm slopes downward because customers perceive that Wheeler-dealer's products and services are different from its competitors' products and services. Wheeler-dealer's customers are attracted by its friendly atmosphere, its convenient location and the quality of service provided. These non-price factors differentiate Wheeler-dealer's products and services and allow this bike shop to set its own price rather than 'take' the price that would be determined in the market if it were perfectly competitive. In the simple analysis that follows, we assume that Wheeler-dealer sells only one product – bikes. You can see in Exhibit 9.1 that Wheeler-dealer's marginal revenue curve lies below the demand curve, as is the case for a monopolist.

Like firms in any market structure, the monopolistically competitive firm maximises short-run profit by following the $MR = MC$ rule. In this case, the marginal cost and the marginal revenue curves intersect at an output of 60 bikes sold per week. The profit-maximising price per bike of $200 is given by the point on the demand curve corresponding to this level of output. This price exceeds the *ATC* of $170 per bike, giving an economic profit of $30 per bike. Wheeler-dealer thus earns a short-run weekly economic profit of $1800.

You can see that this short-run outcome, where price is in excess of marginal cost, looks just like that of the monopolist.

As is also the case under monopoly and perfect competition, if the price equals *ATC*, the firm earns a short-run normal profit; if the price is below the *ATC* curve, the firm suffers a short-run loss; and if the price is below the *AVC* curve, the firm shuts down. In the next section we will turn to the long run, which is just like perfect competition where ease of entry into the market ensures that short-run economic profits are competed away.

Exhibit 9.1 A monopolistically competitive firm in the short run



Wheeler-dealer is a monopolistically competitive firm that maximises short-run profit by producing the output where marginal revenue equals marginal cost. At a profit-maximising output of 60 bikes sold per week, the price of $200 per bike is determined by its demand curve. Given the firm's costs, output and prices, Wheeler-dealer will earn a weekly short-run profit of $1800.

Monopolistic competition in the long run

Unlike a monopolist, the monopolistically competitive firm will not earn an economic profit in the long run. Rather, like a perfectly competitive firm, the monopolistically competitive firm earns only a normal profit (that is, zero economic profit) in the long run. The reason is that short-run profits and easy entry attract new firms into the industry. When Wheeler-dealer earns a short-run profit, the entry of new firms will affect Wheeler-dealer's demand curve, which will shift downward as some of each bike shop's market share is taken away by new firms seeking profit. Wheeler-dealer, as well as other bike shops, may try to recapture market share by advertising, improving the atmosphere of the shop, and using other forms of non-price competition. If this does happen, these firms may succeed in moderating the decrease in demand for their product; but the flip side is that they will see their average costs increase. In the analysis that follows, we ignore the possibility of firms engaging in increased non-price competition in these circumstances so that we can concentrate on the effects of increased competition on the demand curve alone. These effects are explained in Exhibit 9.2.

Exhibit 9.2 shows the result of the leftward shift in the firm's demand curve, which continues in the long run until the firm earns zero economic, or normal, profit. The result shown in Exhibit 9.2 is the long-run equilibrium condition. At a price of $170 per bike, the demand curve is tangent to the *LRAC* curve at the *MR* = *MC* output of 50 bikes per week. Once long-run equilibrium is achieved in a monopolistically competitive industry, there is no incentive for new firms to enter or leave. You can see that this outcome (zero economic profit) is similar to the long-run outcome for a firm in a perfectly competitive market. Note that because we are in the long run, existing firms may change the size of their plant to ensure that they are producing at the lowest average cost possible. Given that demand for the firm's output has decreased as a result of the entry of new firms, this could mean that existing firms would use smaller-sized plants than they had previously. In Wheeler-dealer's case, the shop's floor area, number of bike racks and storage area may be reduced.

under monopolistic competition compared with perfect competition. If there are many bike shops offering differentiated products, this gives consumers much more choice than if the bike shops were all the same. Each bike shop may sell and service bikes in a variety of ways in premises that have a different atmosphere and a different location. If you do not like Wheeler-dealer's location, its range of bikes or the quality of its services, you may be able to find better at another bike shop. Then again, other bike riders may find that the products and services supplied by Wheeler-dealer's competitors are more to their liking. Most of us appreciate being able to exercise choice in this way.

All things considered, we can be pretty sure that, in the case of most goods and services, consumers would prefer the variety that comes with product differentiation in monopolistically competitive markets rather than be faced with no choice in a perfectly competitive market in which all firms sell identical products. Although product differentiation means lower output and higher prices, it would seem that the benefits of variety usually far outweigh the benefit from lower prices that would result from production of identical goods and services in a perfectly competitive market. It seems that governments see it this way too. Can you imagine a competition policy that proposed penalties for small firms that attempted to use product differentiation and advertising to make their products or services more attractive to consumers?

As with monopoly, the monopolistically competitive firm can, because it faces a downward-sloping demand curve, try to practise price discrimination. In order to do this it must, like the monopolist, fulfil the three conditions for price discrimination that were discussed in Chapter 8. Examples of price discrimination by monopolistic competitors include restaurants that charge lower prices for seniors and travel agencies that give discounts to students.

The oligopoly market structure

Now we turn to oligopoly, a market structure in which a few large firms dominate the market. Many industries, such as steel, aluminium, motor vehicle manufacturing, airlines, banking, insurance, pharmaceuticals and tobacco, are best described as oligopolistic. This is the 'big business' market structure, in which firms often aggressively compete by using forms of non-price competition such as costly marketing campaigns and image-building exercises.

Economists define an **oligopoly** as follows: oligopoly is a market structure characterised by (1) few sellers, (2) either a homogeneous or a differentiated product and (3) barriers to market entry. Although the number of oligopolistic firms in the economy is relatively small, between them they have a large share of total output produced in the economy. Let's examine each of the characteristics of oligopoly in turn.

Oligopoly
A market structure characterised by (1) few sellers, (2) either a homogeneous or a differentiated product and (3) barriers to market entry.

Few sellers

Search me!
▸ concentration ratio

Oligopoly is competition 'among the few'. Here we cover industries that have too few firms to be classed as monopolistically competitive. We use the terms 'Big Three' or 'Big Four' to mean that three or four firms dominate an industry. But what does 'few' firms really mean? Does this mean at least two, but fewer than 10? As with other market structures, the answer is not that a specific number of firms must dominate an industry if it is to be described as oligopolistic. Economists measure the extent to which the largest firms in an industry dominate the market by using a measure called a

Concentration ratio
A measure that indicates the percentage of total sales in the industry generated by its largest firms.

concentration ratio. This measure indicates the percentage of total sales in the industry that are generated by its largest firms. For example, it might be determined that the four largest firms in industry A have 90 per cent of the market, while in industry B they have only 50 per cent of the market. The important point to understand is that in oligopoly a small number of firms *dominate* the market regardless of the total number of firms that operate in that market. Because a small number of firms dominate the market, this means that a decision by a single large firm to alter the amount of output it sells in the market will affect overall market supply and thus the market price. It follows from this that, like the monopolist and the monopolistic competitor, the oligopolist is a *price maker* facing a downward-sloping demand curve. If it wishes to sell more it must lower its price; if it sells less it can raise its price.

IN SUMMARY

The few-sellers condition is met when these few firms are so large relative to the total market that they can affect the market price.

Because they face a downward-sloping demand curve, oligopolists can, like monopolists and monopolistically competitive firms, endeavour to engage in price discrimination. Some examples of price discrimination practised by oligopolists would include banks having lower fee structures for students and pensioners, and supermarket chains charging different prices for the same product in different stores where there is no difference in costs between stores.

Mutual interdependence
A condition in which an action by one firm may cause a reaction on the part of other firms.

An important feature of firms in an oligopoly market structure is that they tend to be mutually interdependent. **Mutual interdependence** is a condition in which an action by one firm may cause a reaction on the part of other firms. When the ANZ Bank considers raising its fees or offering new financial products, it must predict how the Commonwealth Bank, the National Australia Bank and Westpac will change their fees or products in response. Therefore, the decisions under oligopoly are more complex than under perfect competition, monopoly or monopolistic competition.

An extreme case of mutual interdependence occurs when oligopolistic firms collude – usually with the intention of raising profits. For example, they may carve up the market to give each player exclusive (monopoly) rights to a defined territory, or they may agree to restrict output and raise prices across the market as a whole. Collusion is, of course, facilitated by the fact that only a small number of players must 'join the party'. The large number of firms under perfect competition or monopolistic competition rule out mutual interdependence and collusion in these market structures.

To read about the world aluminium oligopoly search for *global aluminium oligopoly* using a search engine such as Google at www.google.com.

Homogeneous or differentiated product

Under oligopoly, firms can produce either a homogeneous or a differentiated product or service. The aluminium ingots produced by Alcan are virtually identical to the ingots manufactured by Alcoa. The oil sold by Saudi Arabia is very similar to the oil from Iran. Similarly, raw zinc, copper and steel are standardised products. But cars produced by the three Australian manufacturers are differentiated products. Domestic air travel, soft drinks, tobacco products and insurance are also differentiated services or products sold by firms in oligopoly market structures.

IN SUMMARY

Buyers in an oligopolistic market may or may not be indifferent as to which seller's product they buy.

Barriers to entry

Similar to monopoly, formidable barriers to entry in an oligopoly market protect firms from new entrants. These barriers include very large financial requirements to enter the market, control of an essential resource by existing firms, patent rights held by existing firms, and other legal barriers such as licences required by operators of banks and hotels. But the most significant barrier to entry in an oligopoly market structure is *economies of scale*. For example, larger car manufacturers achieve lower average total costs than those incurred by smaller firms. Consequently, the world motor car manufacturing industry has moved from having hundreds of firms prior to the Second World War to having no more than 20 significant players today.

Which model fits the soft-drink market?

Source: iStockphoto/Ekely

When you walk into the local store or supermarket you will probably see lots of different soft drinks for sale in the fridge or on the shelves. For example, you may see Fanta, Solo, Sprite, Coca-Cola, Pepsi and Passiona, to name only a few. There are many different brands of the same product – soft drinks – on the shelves. Each brand is clearly differentiated from the others. Is the soft-drink industry's market structure monopolistic competition or oligopoly?

Price and output decisions for an oligopolist

Mutual interdependence among firms in an oligopoly makes this market structure more difficult to analyse than perfect competition, monopoly or monopolistic competition. Nevertheless, we can be sure that the market power that oligopolists derive from significant barriers to entry means that, like the monopolist, they can earn economic profits in the long run. However, the price–output decision of an oligopolist is not simply a matter of charging the price where $MR = MC$. Making price and output decisions in an oligopoly is like playing a game of chess, or like a sporting game in which one player's move depends on the anticipated reactions of the opposing player. Indeed, the behaviour of oligopolists is so like that of players of a game that this market structure is often analysed by a specialised subdiscipline called *game theory*. As you will see shortly, this theory has evolved to help analyse and explain situations where mutual dependency of players determines the strategy they employ. Just as in a game, there are many different possible reactions that one firm in an oligopoly can make to the price, non-price and output changes of another firm. Consequently, there are different oligopoly models because no single model can cover all cases. The following is a discussion of four well-known oligopoly models: (1) non-price competition, (2) the kinked demand curve, (3) price leadership and (4) the cartel.

Non-price competition

When we observe major oligopolies, they often compete using advertising and product differentiation. Instead of 'slugging it out' with price cuts, oligopolies can try to take

business away from their rivals with better advertising campaigns and improved products. This model of behaviour explains why advertising expenditures are often large in the cigarette, soft drink, athletic shoe and motor vehicle industries. It also explains why the R&D function is so important to oligopolies. For example, much effort is put into developing new products and improving existing products.

Why might oligopolies compete through non-price competition rather than price competition? The answer is that each oligopolist perceives that its rival will easily and quickly match any firm's price reduction. On the other hand, it is much more difficult to combat a clever advertising campaign or an important product improvement.

The kinked demand curve

Kinked demand curve
A demand curve faced by an oligopolist who assumes that rivals will match a price decrease but ignore a price increase.

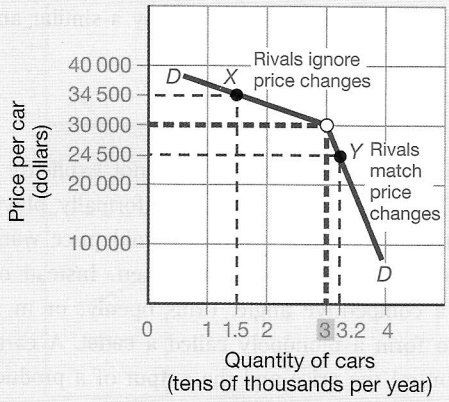
Unlike other market structures, different assumptions define different models for any given oligopolistic industry. In relation to some oligopolistic industries it is argued, for example, that the behaviour of firms can be explained by the **kinked demand curve.** (No, this is not the *kinky* demand curve one hard-of-hearing student reported it to be after the lecture!) The strange shape of this curve explains why prices in an oligopolistic market for motor cars, for example, would change far less often than prices in a perfectly competitive market selling tomatoes.

The kinked demand curve is a demand curve faced by an oligopolist who assumes that rivals will match a price decrease but ignore a price increase. Assuming there is no collusion, the kinked demand curve exists because management tacitly believes that the competition will match its price cuts to ensure that it will not be 'undersold'. On the other hand, a price hike by one firm allows its competitors to increase their share of the market by leaving their prices unchanged. As you have seen, oligopolistic firms must make pricing decisions and, therefore, they are *price makers* rather than price takers. But as we will demonstrate in the kinked demand curve model, the high degree of interdependence among oligopolists restricts their pricing discretion.

In Exhibit 9.4, a kinked demand curve is drawn for Aussica, which we assume competes with Holden, Ford and Toyota in the market for six-cylinder family cars in Australia. The current price per car is $30 000 and the quantity demanded at this price is 30 000 Aussica cars per year. Aussica's management assumes that, if it raises its price even slightly above $30 000, the other car makers *will not follow* with higher prices. This price gap between the Aussica and other cars would drive many of Aussica's customers over to its rivals. The segment of the demand curve above $30 000 is therefore relatively flat. Stated differently, above the 'kink' in the demand curve, demand is relatively elastic.

If Aussica raises the price to, say, $34 500 at point *X*, this price hike cuts Aussica's quantity demanded to 15 000 cars per year. Since raising its price is ill advised, management can consider a price reduction strategy. Suppose Aussica cuts the price of its cars to $24 500 at point *Y*. The model shows that Aussica gains few customers and the quantity demanded rises slightly to only 32 000 cars per year. The reason for such a small sales boost is that Holden, Ford and Toyota also cut their prices so that each firm might keep its initial market share. (However, the lower price does attract some new buyers who would not buy a car at all at the higher price.) The segment of the demand curve below the kink is therefore relatively steep. Here demand is less elastic, meaning the quantity demanded is less responsive to a price drop.

Exhibit 9.4 The kinked demand curve



An oligopolist's demand curve may be kinked. In this graph, a car manufacturer believes it faces two demand curves. A price increase from $30 000 to $34 500 per car causes a sizeable reduction in the quantity demanded from 30 000 to 15 000 cars (point *X*). Demand above the kink is relatively elastic, because rivals ignore the firm when it raises the price. Below the kink, the demand curve is less elastic. A price reduction from $30 000 to $24 500 attracts very few new customers, and the quantity demanded increases only from 30 000 to 32 000 cars per year (point *Y*). Under the kinked demand curve theory, prices will be sticky.

Given the kinked demand curve facing the oligopolist, management fears the worst and is afraid to raise or lower the price of its product. Under this model of oligopoly, the price established at the kink changes very infrequently. Price rigidity is eliminated only after large cost increases or decreases force a change in the position of the kink.

Economists continue to debate the importance of the kinked demand model. Critics challenge the theory on theoretical and empirical grounds. On a theoretical level, there is no explanation for how the original price at the kink was determined. On empirical grounds, studies of certain oligopolistic industries fail to find price stickiness. On the other hand, widespread use of price lists in catalogues that remain fixed for a long time is consistent with kinked demand theory. In any case, the kinked demand theory is not intended to provide a complete explanation of price and output decisions.

Is price leadership illegal?

The *Competition and Consumer Act 2010*, which is administered by the ACCC, prohibits contracts, arrangements or understandings that have the purpose or effect of fixing, controlling or maintaining prices. Do you think that this provision of the *Competition and Consumer Act 2010* means that the ACCC would consider taking action against a firm like a bank if it were to make a public announcement foreshadowing the revised interest rate it will charge on home loans in the future?

Price leadership

Without formal agreement, firms can play a game of follow-the-leader that economists call **price leadership**. Price leadership is a pricing strategy in which a dominant firm sets the price for an industry and the other firms follow. Following this tactic, firms in an industry simply match the price of perhaps, but not necessarily, the biggest firm. For

Price leadership
A pricing strategy in which a dominant firm sets the price for an industry and the other firms follow.

example, suppose GMH initiates a price increase for its popular six-cylinder family car. Reacting to this price hike, other Australian car manufacturers quickly follow the leader's example and boost the price of their cars by a similar amount. Price leadership is not uncommon.

Search me!
▸ price leadership

The cartel

The price leadership model assumes that firms do not explicitly collude to avoid price competition. Instead, firms avoid price wars by informally playing by the established follow-the-leader pricing rules. Another way to avoid price wars is for oligopolists to formally, but often covertly, agree to act in concert. Instead of approaching mutual interdependence from a competitive angle, firms openly, or in secret, agree with one another to cooperate to form a monopoly called a **cartel**. A cartel is a group of firms formally agreeing to control the price and the output of a product. The goal of a cartel is to reap monopoly profits by raising prices and restricting output. Cartels are illegal in Australia and in most other developed countries. However, they are common in some developing countries and also across international boundaries where there is no legal authority to regulate them. The best-known cartel is the Organization of Petroleum Exporting Countries (OPEC). The members of OPEC divide crude oil output among themselves according to quotas openly agreed upon at meetings of the OPEC oil ministries. Saudi Arabia is the largest producer and has the largest quota. Let's see how these cartels work.

Cartel
A group of firms formally agreeing to control the price and the output of a product.

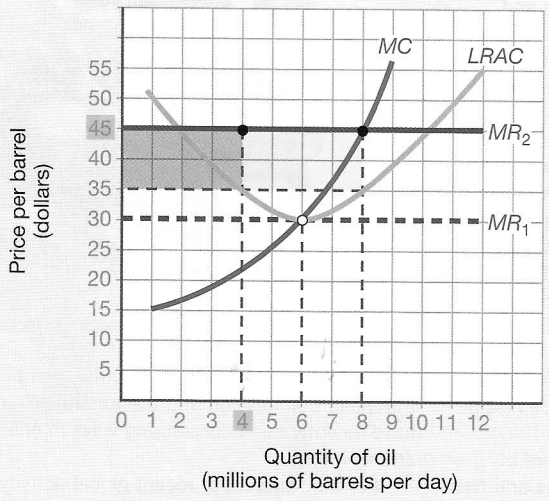
Search me!
▸ cartel

OPEC is one of the most successful cartels in history. Visit its site at **www.opec.org**.

Using Exhibit 9.5, we can demonstrate how a cartel works and why keeping members from cheating is a problem. Our analysis begins before oil-producing firms have formed a cartel. For simplicity, we will assume that the oil industry is initially perfectly competitive rather than oligopolistic. Keep in mind, however, that because there are so many firms in a competitive market, it is usually not possible to achieve consensus on forming a cartel. It is easier, but still difficult, to form a cartel in an oligopolistic industry where only a small number of firms must come to the party. Assume each firm has the same cost curve as shown in Exhibit 9.5. Competition has driven each firm to charge $30 a barrel, which is equal to the minimum point on its *LRAC* curve. Because oil is a fairly homogeneous product, each firm fears that raising its price will result in the loss of many, if not all, of its customers. Thus, the typical firm can be described as being in long-run competitive equilibrium at a price of $30 per barrel ($MR_1$), producing 6 million barrels per day. In this condition, economic profits are zero. There is thus a strong incentive for the firms to attempt to increase profitability by organising a meeting of all oil producers to establish a cartel.

Now assume the cartel is formed. After examining the price/output combinations dictated by the market demand curve for oil, it is decided that each firm should charge $45 per barrel and reduce its output to 4 million barrels per day. At the cartel price, each firm earns an economic profit of $40 million, rather than a normal profit. The cartel is behaving in the same way as would a monopolist that owned all the world's oil reserves. But what if one firm decides to cheat on the cartel agreement by stepping up its output and other firms stick to their quotas? The marginal revenue curve for the cheater is represented by the horizontal curve MR_2. Output corresponding to the point at which $MR_2 = MC$ is 8 million barrels per day. If a cheating firm expands output to this level, it can increase its profit by earning an extra $40 million. There is thus a strong incentive for cartel members to cheat. However, if all firms cheat and the cartel breaks up, the price

Exhibit 9.5 **Why a cartel member has an incentive to cheat**



A representative oil producer operating in a perfectly competitive industry would be in long-run equilibrium at a price of $30 per barrel, producing 6 million barrels per day and making zero economic profit. A cartel can agree to raise the price of oil from $30 to $45 per barrel by restricting the firm to 4 million barrels per day. As a result of this quota, the cartel price is above $35 on the *LRAC* curve and the firm earns a daily profit of $40 million. However, if the firm cheats on the cartel agreement, it will set the cartel price equal to the *MC* curve and earn a total profit of $80 million by adding an additional $40 million. If all firms cheated, the original long-run equilibrium would be re-established.

and output of each firm return to the initial levels and economic profit again falls to zero. Of course, if we had assumed that the firms were oligopolists earning economic profits before the cartel was formed, the increase in profitability would not have been as great as was shown here. Nevertheless, oligopolists would generally find it worthwhile to form a cartel if cheating could be eliminated and if a country's competition policy did not prohibit it.

Major cartels in global markets

INTERNATIONAL FOCUS

Applicable concept: cartel

Cartels, which try to exploit consumers by raising prices and reducing output, have been outlawed in most English-speaking countries for a century or more. However, they flourished in Germany and other European countries in the first half of the 20th century. Many were international in membership. Although European countries passed laws against such restrictive trade practices after the Second World War, it is difficult for truly international cartels to be outlawed. Nonetheless, in recent times governments around the world have become increasingly active in their endeavours to break them up. Here are brief details of some of these international cartels.

- *Organization of Petroleum Exporting Countries (OPEC).* OPEC was created by Iran, Iraq, Kuwait, Saudi Arabia and Venezuela in Baghdad in 1960. Today, OPEC's membership consists of 11 countries that control around 70 per cent of the world's oil reserves. OPEC's objective is to set oil production quotas for members and, in turn, raise global prices of oil and petroleum products. Since the oil crises of the 1970s, when threefold increases in the world oil price demonstrated just how powerful this cartel could be, the developed countries have greatly reduced their reliance on oil with the result that the cartel is less powerful than previously.

- *International Airline Cartel (IATA).* Most of the world's international airlines belong to the IATA. This cartel controls access to airports, fixes airline rates and promotes mutual objectives for its members. The market power of the IATA may decline as more nations follow the example of the United States by reducing protection and regulation of airlines.
- *Bulk Vitamins Cartel.* This little known cartel which lasted for almost a decade in the 1990s saw over a dozen large pharmaceutical companies controlling the price of most bulk vitamins. This resulted in average price increases of up to 20 per cent. Interestingly, the group was unable to continue to cartelise vitamin C when the entry of China into the market occurred. Following China's entry, the price of bulk vitamin C fell dramatically. Prosecution of members in the late 1990s led to large fines being imposed by the United States and the European Union, and the eventual demise of the cartel.

Another little-known group of cartels that are of particular importance to countries like Australia and New Zealand, which rely heavily on ships for transport of exports and imports, are the international container lines cartels. Although immunity from international competition laws has allowed these cartels to flourish in the past, the European Commission and the Australian Government have recently been considering ways to end these arrangements.

Source: Shutterstock/Chezlov

For a discussion of recent global activity by governments against cartels see www.cliffordchance.com/publicationviews/publications/2009/01/global_cartels_round-up2008.html.

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▸ game theory

Game theory

Each of the oligopoly models above involves strategic analysis of the responses that firms make, or are likely to make, to the actions of their rivals. Thus, *non-price competition* may be preferred to price competition because it is more difficult for rivals to match non-price strategies; the *kinked demand curve* is the outcome of asymmetrical responses of rivals to price increases as compared to price decreases; *price leadership* assumes that rivals will follow the leader; and the *cartel* will work only if rivals cooperate unreservedly. As foreshadowed earlier, much of this interdependent behaviour can be analysed by a subdiscipline called game theory. **Game theory** analyses the strategic decisions of players when the outcome for each is dependent on the behaviour of others. These strategic decisions can be competitive or cooperative.

Game theory
Analyses the strategic decisions of players when the outcome for each is dependent on the behaviour of others.

Every game – even one as simple as noughts and crosses – must be played by a set of rules, and must have a clear-cut goal or objective for those trying to win the game. Every game will also be characterised by a number of possible strategies and their corresponding outcomes or pay-offs, which may be positive or negative. In the case of games applied in the context of the oligopoly market structure, the rules might involve conformity to the laws of the land – including those enshrined in competition policy; and the strategies could include following the leader or going it alone.

There are many different games that can be applied to the interdependent behaviour of firms in oligopolistic markets. In the 'Analyse the Issue' section below we look at just one of them – the competitive game of *chicken*. In looking at this game we are going to assume that there are only two firms in the market – a special case of oligopoly called **duopoly**. The game of chicken is derived from the real-world situation where each of two individuals has the choice of continuing with an action which will seriously harm both parties, or discontinuing the action. Discontinuation of the action will minimise harm to both parties, although only one party must discontinue for this outcome to occur. If discontinuation does occur, the party which initiated the discontinuation is described

Duopoly
An oligopoly market structure characterised by there being just two sellers.

derogatively as being 'chicken'. Children and teenagers play many variations of this game, including riding or driving towards each other until they crash or until one of them (the 'chicken') swerves away.

Search me!
▸ duopoly

Airlines play chicken

Source: Shutterstock/Peter Kirillov

The winter sun warms the scantily clad bodies on the pearl-white beach, palm trees sway in the gentle breeze and the nightlife in the bar is really something. It's a great place to be; but this holiday destination has no regular passenger flights – holiday makers must drive here or take the train.

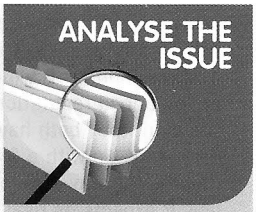
To see how the problem of limited travel modes to this growing tourist destination could be relevant to the duopoly model, imagine a situation where two established airlines are each preparing to introduce a regular service to this destination. They are doing this because there is already an airstrip used to freight tropical fruit near the beach and they have calculated there will be sufficient traffic on this route to enable each of them to service it profitably. They also believe that if one of them does not enter this route it will be left behind and have great difficulty establishing itself on this route in the future. Now imagine that both airlines, which are at the same stage in their well-publicised process of planning and developing their new service, receive information which suggests to each of them that entry into this market may be a much riskier proposition than previously thought. For example, the adverse effects on international tourism of a strong Aussie dollar and the aftermath of the global financial and economic crisis (GFEC) might indicate much lower passenger numbers than expected. Given this situation, each airline may consider pulling out and sticking with its established routes. Given this background, let us assume that the following outcomes are possible:

a) Both airlines continue with their plans and both suffer huge losses because there is insufficient demand for both of them.
b) Both airlines discontinue their plans to introduce the new service and stick with existing routes. As a result both suffer a blow to their reputation because they are seen to have pulled out of their well-publicised plan to introduce the new service. Both must embark on a public relations campaign to restore their credibility.
c) One airline discontinues its development of the new service while the other continues with the plan. The airline which discontinues avoids the loss it would have incurred if both airlines had continued with their plans; but because it has 'chickened out' of its well-publicised plan it suffers a blow to its reputation and must incur the cost of a public relations campaign to restore its image. The other airline continues with its plan. Because it is the only provider of services on this new route it is able to earn handsome profits. In addition, its reputation and public standing are greatly enhanced because it has successfully implemented its well-publicised plan to offer this new service.

In short, if both airlines continue with the plan they both lose big-time (no one chickens out and the crash occurs); if they both pull out, they both survive but each suffers a blow to its reputation (they have both chickened out); if one pulls out, they both survive, but the one that pulls out suffers a significant blow to its reputation while the other earns good profits and enhances its reputation (one pays the cost of being chicken while the other benefits from not chickening out). (You can see how these outcomes mirror the real-world game of chicken played by children and teenagers.)

It is clear that there is a high degree of interdependency in this game. While the outcome for each airline depends on what it does, it also depends on what its rival does.

Exhibit 9.6, which is known as a pay-off matrix, shows the combined effect of each possible outcome. The possible actions for Airline A are shown in the first column and those for Airline B are shown in the first row.



Applicable concepts: game theory; duopoly; interdependence

The outcome for each possible combined action is shown in each of the boxes. Thus, if both airlines pull out, the outcome, shown in the north-west box, is a loss of $1 million each spent on restoring their reputation; if A pulls out while B continues with the plan, the outcome, shown in the north-east box, is a loss of $1 million for A (which must restore its reputation) and a gain valued at $5 million for B which earns extra profits and has an enhanced reputation; if both airlines continue with the plan, they both have insufficient passengers and each ends up with a $4 million loss (south-east box). Clearly, the way each airline behaves will depend on how it expects its rival to behave. If both continue with their plans to service the new route, hoping that their respective rivals will chicken out but this does not happen, they will both be much worse off – $4 million each. And there is a real possibility that this would occur. This is because the best possible outcome for both airlines is that its rival chickens out while it continues with the introduction of the new route – in this event it gains $5 million while the rival loses $1 million.

Exhibit 9.6 Pay-off matrix for airlines playing chicken

		Airline B	
		Chickens Out	Continues
Airline A	Chickens Out	–$1 mil, –$1 mil	–$1 mil, +$5 mil
	Continues	+$5 mil, –$1 mil	–$4 mil, –$1 mil

As you can see, this is a simple example with many abstractions from the real world. Nonetheless, you can appreciate that in oligopolistic situations each firm must not only consider its own reaction to a changing situation but must also consider the reaction of its rivals.

Using the information provided, answer the following questions:

1 Consider the outcomes shown in the south-west box of the pay-off matrix. Can you explain what these outcomes are and the reasons for them?

2 Is there an incentive for the two airlines to collude? Why? What might prevent such collusion?

An evaluation of oligopoly

Oligopoly is much more difficult to evaluate than other market structures. None of the models presented above gives a definite answer to the question of efficiency under oligopoly. Depending on the assumptions made, an oligopolist can behave much like a perfectly competitive firm or more like a monopoly. Nevertheless, let's look at a comparison of outcomes under perfect competition compared with an oligopoly selling a differentiated product.

First, the price charged for the product will be higher than under perfect competition. The smaller the number of firms there are in the oligopoly and the more difficult it is to enter the industry, the greater the oligopoly price will be in comparison to the perfectly competitive price.

Second, an oligopoly is likely to spend money on advertising, product differentiation and other forms of non-price competition. These expenditures can shift the demand curve to the right. As a result, both price *and* output may be higher under oligopoly than under perfect competition.

Third, in the long run, a perfectly competitive firm earns zero economic profit. The oligopolist, however, can charge higher prices and earn economic profits because it is more difficult for competitors to enter the industry.

Overall, we can conclude that, as is the case with monopoly, the market power wielded by oligopolists results in a misallocation of resources.

Mathematician John Nash, who won the Nobel Prize in Economics in 1994, developed a game-theory-based concept of equilibrium that can be applied to oligopolists. Nash was the subject of a Hollywood movie called *A Beautiful Mind*, starring Russell Crowe. Read about Nash by entering *movie a beautiful mind* into a Web browser such as Google (**www.google.com**).