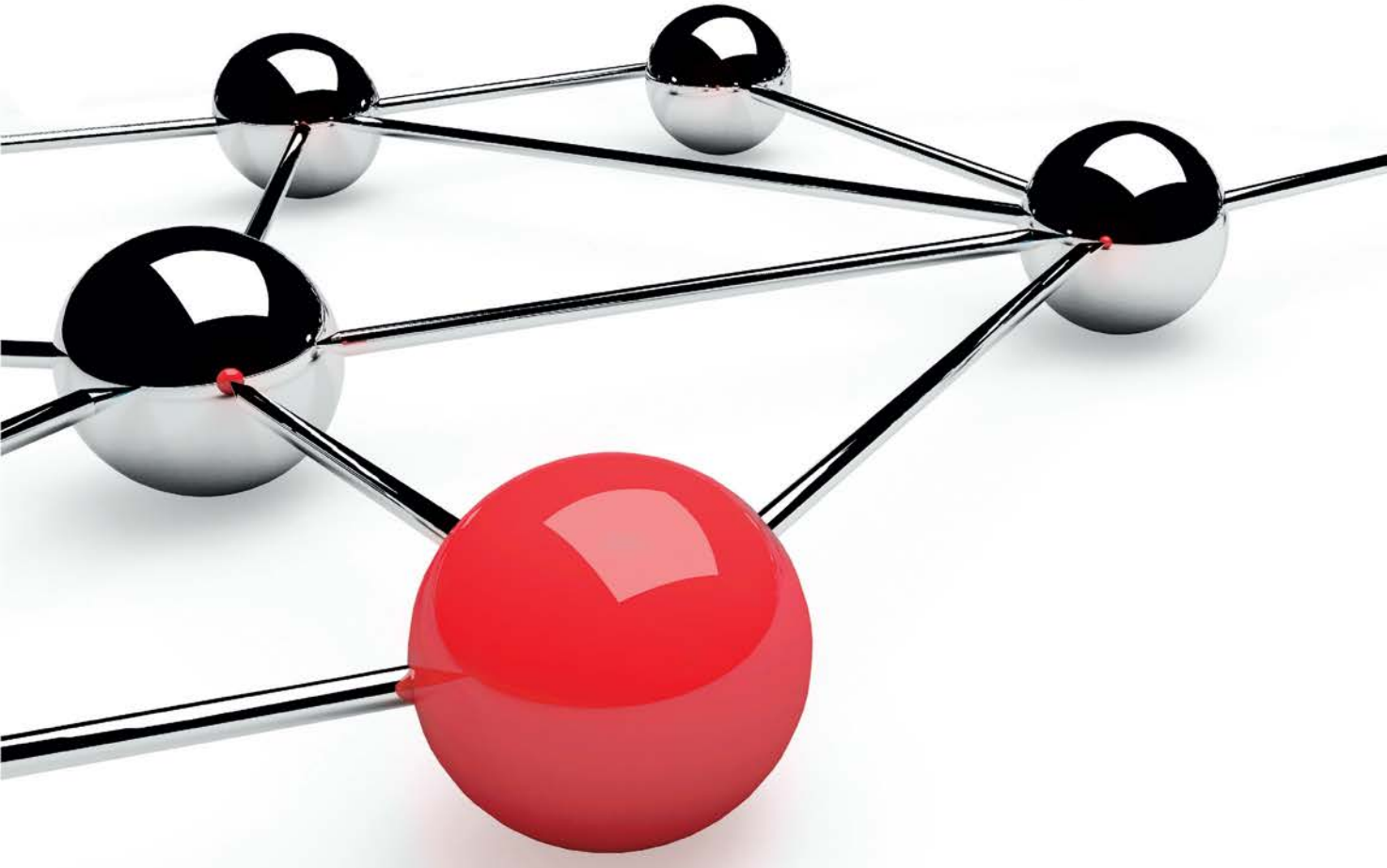


NINTH EDITION

ESSENTIALS OF ECONOMICS

JOHN SLOMAN
DEAN GARRATT

Pearson

ESSENTIALS OF ECONOMICS

adoption in 1994 of a relatively high OPEC production ceiling of 24½ million barrels per day, meant that supply more than kept pace with demand.

In the late 1990s, the recession in the Far East reduced demand by some 2 million barrels per day, causing prices to fall once more. OPEC's members intervened by cutting production by 4.3 million barrels per day in an attempt to push the price back up to around $18–20 per barrel.

In late 2001, five of the major oil producers outside of the cartel, including Russia, formed an alliance with OPEC members, whereby they all agreed to cut output, aiming to push up and stabilise prices at around $25 per barrel. This type of alliance was the first of its kind in the oil industry and it gave control of oil back to OPEC. However, the Iraq War in 2003 created supply problems and although OPEC tried to relax its quotas, rising demand from India and China meant that OPEC could not adjust supply sufficiently quickly to make any real difference to the price.

The 2008 financial crisis and a new competitor

The financial crisis pushed oil prices down dramatically: falling from a high of $147 per barrel in July 2008 to a low of $34 in December 2008. The lower prices, while good for consumers, were potentially damaging for investment in both oil exploration/development and alternative energy supplies.

OPEC responded to the falling price by announcing cuts in production, totalling some 14 per cent between August 2008 and January 2009. But with OPEC now producing less than a third of global oil output, this represented less than 5 per cent of global production and consequently had little effect on the price.

Prices recovered and remained stable between mid-2011 and mid-2014 at around $100 to $120 per barrel. But then OPEC faced a new competitor in the form of US shale oil production. With a new source of supply, oil prices fell – from $112 per barrel in June 2014 to just $30 per barrel in February 2016.

OPEC responded, not by cutting price, but by announcing that it would retain output at existing levels. What it was relying on was the fact that production from shale oil wells, although often involving low marginal costs, often lasts only two or three years. Investment in new shale oil wells, by contrast, tends to be relatively expensive. By OPEC maintaining production, it was hoping to use its remaining market power to reduce supply of competitors over the medium to long term.

However, with revenues from oil falling so dramatically, OPEC plus 10 non-OPEC producers, including Russia, Mexico and Azerbaijan (known as the OPEC+ Alliance), reached an agreement in December 2016 to cut production. The oil price immediately started to increase again. However, the higher oil prices made US shale production profitable once again. A number of rigs that had temporarily shut down became operational again and production increased to over 9.1 million barrels a day in early 2020, around 9 per cent of total global output. The OPEC+ Alliance, responded by extending its quota agreements and agreeing to future production cuts.

COVID-19 and Russia's invasion of Ukraine

As countries entered lockdowns in 2020, global demand fell by over 30 per cent. Although Saudi Arabia wanted the OPEC+ Alliance to cut production significantly to keep prices up, Russia opposed the cuts because it would help keep US shale producers in business, and so no agreement was reached.

A price war began with production increasing and, together with the continued fall in demand due to COVID-19, there was a dramatic fall in prices from over $50 per barrel on 5 March to under $32 per barrel on 9 March 2020. Eventually the OPEC+ Alliance agreed to production cuts, but the downward trend in prices continued until lockdowns eased.

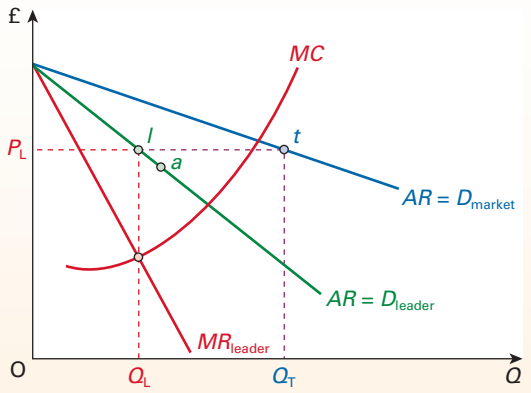
Throughout 2021 and in early 2022 prices rebounded, despite the development of new variants of COVID, as demand continued to rise and the global economy began to recover. This contributed to record petrol and diesel prices and inflationary pressures, which caused significant problems for many households.

On 24 February 2022, Russia invaded Ukraine. Severe sanctions were imposed on Russia by the USA, the EU and many other countries. With Russia being the world's second largest oil producer (behind the USA and just ahead of Saudi Arabia) and a key oil exporter, it was unsurprising that oil prices rose rapidly and passed $100 per barrel – the highest level in over seven years. It may be that already high oil prices are going to continue to rise, but much of this will depend on the duration of the conflict and the speed that other oil producers increase production to replace Russian oil. As the chart shows, however, oil prices began to fall from mid-2022 as the world economy slowed down and, with it, the demand for oil.

1. *What conditions facilitate the formation of a cartel? Which of these conditions were to be found in the oil market in (a) the early 1970s; (b) the mid-1980s; (c) the mid 2000s; (d) the mid-to-late 2010s?*
2. *Could OPEC have done anything to prevent the long-term decline in real oil prices seen from 1981 to 2002?*
3. *Do the increased demand from China and India and the sanctions against Russia imply that the era of cheap energy is over? What impact could technology have in the long run on (a) demand; (b) supply?*

Download monthly price data on commodity markets from the World Bank. Create a chart showing the annual rate of oil price inflation from the early 1970s. Write a short commentary summarising the patterns observed in oil price inflation.

Figure 6.10 A price leader aiming to maximise profits for a given market share



follow that price. Total market demand is Q_T, with followers supplying that portion of the market not supplied by the leader: namely, $Q_T - Q_L$.

There is one problem with this model: that is the assumption that the followers will want to maintain a constant market share. It is possible that if the leader raises its price, the followers may want to supply more at this new price. On the other hand, the followers may decide merely to maintain their market share for fear of invoking retaliation from the leader, in the form of price cuts or an aggressive advertising campaign.

Barometric firm price leadership. A similar exercise can be conducted by a barometric firm. Although the firm is not dominating the industry, its price will be followed by the others. It merely tries to estimate its demand and *MR* curves – assuming, again, a constant market share – and then produces where $MR = MC$ and sets price accordingly.

In practice, which firm is taken as the barometer may frequently change. Whether we are talking about oil companies, car producers or banks, any firm may take the initiative in raising prices. If the other firms are merely waiting for someone to take the lead – say, because costs have risen – they will all quickly follow suit. For example, if one of the bigger building societies or banks raises its mortgage rates by 1 per cent, this is likely to stimulate the others to follow suit.

Other forms of tacit collusion. An alternative to having an established leader is for there to be an established set of simple 'rules of thumb' that everyone follows.

One such example is *average cost pricing* (see also Section 5.5). Instead of equating *MC* and *MR*, producers simply add a certain percentage for profit on top of average costs. Thus, if average costs rise by 10 per cent, prices will automatically be raised by 10 per cent. This is a particularly useful rule of thumb in times of inflation, when all firms will be experiencing similar cost increases.

Pause for thought

If a firm has a typically shaped average cost curve and sets prices 10 per cent above average cost, what will its supply curve look like?

Another rule of thumb is to have certain **price benchmarks**. Thus clothes may sell for £24.99, £49.95 or £99.95 (but not, say, for £23.31 or £102.42). If costs rise, then firms simply raise their price to the next benchmark, knowing that other firms will do the same.

Rules of thumb can also be applied to advertising (e.g. you do not criticise other firms' products, only praise your own); or to the design of the product (e.g. lighting manufacturers tacitly agreeing not to bring out an everlasting light bulb).

Factors favouring collusion

Collusion between firms, whether formal or tacit, is more likely when firms can clearly identify with each other or some leader and when they trust each other not to break agreements. It is easier for firms to collude if the following conditions apply:

- There are only very few firms, all well known to each other.
- They are open with each other about costs and production methods.
- They have similar production methods and average costs, and are thus likely to want to change prices at the same time and by the same percentage.
- They produce similar products and can thus more easily reach agreements on price.
- There is a dominant firm.
- There are significant barriers to entry and thus there is little fear of disruption by new firms.
- The market is stable. If industry demand or production costs fluctuate wildly, it will be difficult to make agreements, partly due to difficulties in predicting and partly because agreements may frequently have to be amended. There is a particular problem in a declining

Definition

Price benchmark A price that is typically used. Firms, when raising a price, will usually raise it from one benchmark to another.

market where firms may be tempted to undercut each other's price in order to maintain their sales.
- There are no government measures to curb collusion.

Pause for thought

In which of the following industries is collusion likely to occur: bricks, beer, margarine, cement, crisps, washing powder, USB flash drives, carpets?

Non-collusive oligopoly: the breakdown of collusion

In some oligopolies, there may be only a few (if any) factors favouring collusion. In such cases, the likelihood of price competition is greater.

Even if there is collusion, there will always be the temptation for individual oligopolists to 'cheat', by cutting prices or by selling more than their allotted quota. The danger, of course, is that this would invite retaliation from the other members of the cartel, with a resulting price war. Price would then fall and the cartel could well break up in disarray.

When considering whether to break a collusive agreement, even if only a tacit one, a firm will ask: (1) 'How much can we get away with without inviting retaliation?' and (2) 'If a price war does result, will we be the winners? Will we succeed in driving some or all of our rivals out of business and yet survive ourselves, and thereby gain greater market power?'

The position of rival firms, therefore, is rather like that of generals of opposing armies or the players in a game. It is a question of choosing the appropriate *strategy*: the strategy that will best succeed in outwitting your opponents. The strategy a firm adopts will, of course, be concerned not just with price but also with advertising and product development.

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Non-collusive oligopoly: assumptions about rivals' behaviour

Even though oligopolists might not collude, they will still need to take account of rivals' likely behaviour when deciding their own strategy. In doing so they will probably look at rivals' past behaviour and make assumptions based on it. There are three well-known models, each based on a different set of assumptions.

Assumption that rivals produce a given quantity: the Cournot model

One assumption is that rivals will produce a particular *quantity*. This is most likely when the market is stable and the rivals have been producing a relatively constant quantity for some time. The task, then, for the individual oligopolist is to decide its own price and quantity given the presumed output of its competitors.

The earliest model based on this assumption was developed by the French economist Augustin Cournot in 1838. The **Cournot model** (which is developed in Web Appendix 6.2) takes the simple case of just two firms (a **duopoly**) producing an identical product: for example, two electricity generating companies supplying the whole country.

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This is illustrated in Figure 6.11 which shows the profit-maximising price and output for Firm A. The total market demand curve is shown as D_M. Assume that Firm A believes that its rival, Firm B, will produce Q_{B1} units. Thus Firm A perceives its own demand curve (D_{A1}) to be Q_{B1} units less than total market demand. In other words, the horizontal gap between D_M and D_{A1} is Q_{B1} units. Given its perceived demand curve of D_{A1}, its marginal revenue curve will be MR_{A1} and the profit-maximising output will be Q_{A1}, where $MR_{A1} = MC_A$. The profit-maximising price will be P_{A1}.

If Firm A believed that Firm B would produce *more* than Q_{B1}, its perceived demand and *MR* curves would be further to the left and the profit-maximising quantity and price would both be lower.

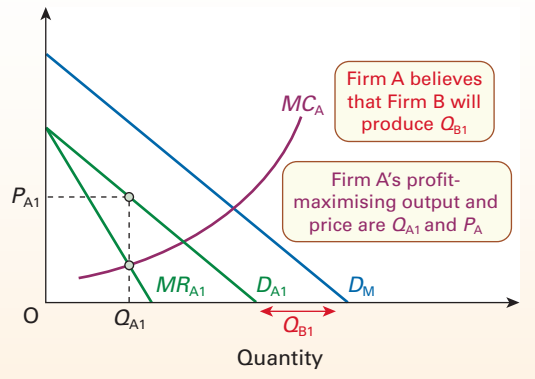
At the same time as Firm A makes an assumption about Firm B's output, Firm B will also be making an assumption about how much it thinks Firm A will produce. This is therefore a 'simultaneous game',

Definitions

Cournot model A model of duopoly where each firm makes its price and output decisions on the assumption that its rival will produce a particular quantity.

Duopoly An oligopoly where there are just two firms in the market.

Figure 6.11 The Cournot model of duopoly: Firm A's profit-maximising position



as both firms are making their decisions at the same time and, crucially, cannot observe the action of the other firm. We discuss this in Section 6.6.

Profits in the Cournot model. Industry profits will be *less* than under a monopoly or a cartel. The reason is that price will be lower than the monopoly price. This can be seen from Figure 6.11. If this were a monopoly, then to find the profit-maximising output, we would need to construct an *MR* curve corresponding to the market demand curve (D_M). This would intersect with the *MC* curve at a higher output than Q_{A1} and a *higher* price (given by D_M).

Nevertheless, profits in the Cournot model will be higher than under perfect competition, since price is still above marginal cost.

Assumption that rivals set a particular price: the Bertrand model

An alternative assumption is that rival firms set a particular price and stick to it. This scenario is more realistic when firms do not want to upset customers by frequent price changes or want to produce catalogues which specify prices. The task, then, for a given oligopolist is to choose its own price and quantity in the light of the prices set by rivals.

The most famous model based on this assumption was developed by another French economist, Joseph Bertrand in 1883. Bertrand again took the simple case of a duopoly, but its conclusions apply equally to oligopolies with three or more firms.

The outcome is one of price cutting until all supernormal profits are competed away. The reason is simple. If Firm A assumes that its rival, Firm B, will hold price constant, then Firm A should undercut this price by a small amount and as a result gain a large share of the market. At this point, Firm B will be forced to respond by cutting its price. What we end up with is a price war until price is forced down to the level of average cost, with only normal profits remaining.

Definitions

Nash equilibrium The position resulting from everyone making their optimal decision based on their assumptions about their rivals' decisions. Without collusion, there is no incentive for any firm to move from this position.

Takeover bid Where one firm attempts to purchase another by offering to buy the shares of that company from its shareholders.

Kinked demand theory The theory that oligopolists face a demand curve that is kinked at the current price, demand being significantly more elastic above the current price than below. The effect of this is to create a situation of price stability.

As with the Cournot model above, this is also a simultaneous-move game, except here the variable of interest is price. The supermarket industry is a good example of a market where price wars are a constant feature.

Nash equilibrium. The equilibrium outcome in either the Cournot or Bertrand models is not in the *joint* interests of the firms. In each case, total profits are less than under a monopoly or cartel. But, in the absence of collusion, the outcome is the result of each firm doing the best it can, given its assumptions about what its rivals are doing. The resulting equilibrium is known as a **Nash equilibrium** after John Nash, a US mathematician (and subject of the film *A Beautiful Mind*) who introduced the concept in 1951. We will return to this concept in Section 6.6.

In practice, when competition is intense, as in the Bertrand model, the firms may seek to collude long before profits have been reduced to a normal level. Alternatively firms may put in a **takeover bid** for their rival(s).

The kinked demand-curve assumption

In 1939 a theory of non-collusive oligopoly was developed simultaneously on both sides of the Atlantic: in the USA by Paul Sweezy and in Britain by R.L. Hall and C.J. Hitch. This **kinked demand theory** has since become perhaps the most famous of all theories of oligopoly. The model seeks to explain how it is that, even when there is no collusion at all between oligopolists, prices can nevertheless remain stable.

The theory is based on two asymmetrical assumptions.

TC 5 p 17

- If an oligopolist cuts its price, its rivals will feel forced to follow suit and cut theirs, to prevent losing customers to the first firm.
- If an oligopolist raises its price, however, its rivals will *not* follow suit since, by keeping their prices the same, they will thereby gain customers from the first firm.

On these assumptions, each oligopolist will face a demand curve that is *kinked* at the current price and output (see Figure 6.12). A rise in price will lead to a large fall in sales as customers switch to the now relatively lower-priced rivals. The firm will thus be reluctant to raise its price. Demand is relatively elastic above the kink. On the other hand, a fall in price will bring only a modest increase in sales, since rivals lower their prices too and therefore customers do not switch. The firm will thus also be reluctant to lower its price. Demand is relatively inelastic below the kink. Thus oligopolists will be reluctant to change prices at all.

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This price stability can be shown formally by drawing in the firm's marginal revenue curve, as in Figure 6.13.

Figure 6.12 Kinked demand curve for a firm under oligopoly

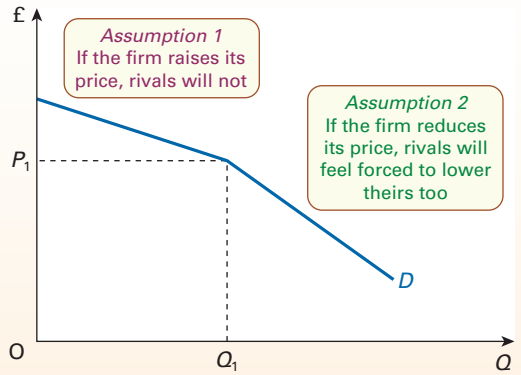
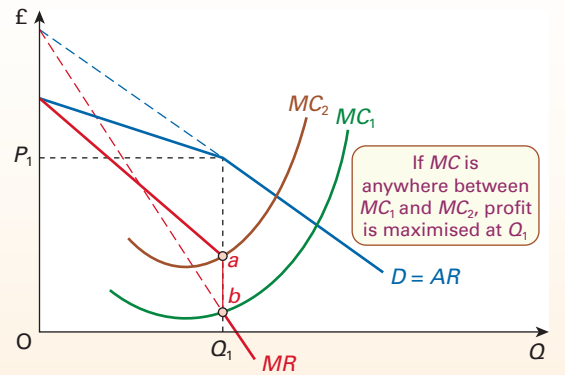


Figure 6.13 Stable price under conditions of a kinked demand curve



To see how this is done, imagine dividing the diagram into two parts either side of Q_1. At quantities less than Q_1 (the left-hand part of the diagram), the *MR* curve will correspond to the shallow part of the *AR* curve. At quantities greater than Q_1 (the right-hand part), the *MR* curve will correspond to the steep part of the *AR* curve. To see how this part of the *MR* curve is constructed, imagine extending the steep part of the *AR* curve back to the vertical axis. This and the corresponding *MR* curve are shown by the dotted lines in Figure 6.13.

As you can see, there will be a gap between points *a* and *b*. In other words, there is a vertical section of the *MR* curve between these two points. Profits are maximised where $MC = MR$. Thus, if the *MC* curve lies anywhere between MC_1 and MC_2 (i.e. between points *a* and *b*), the profit-maximising price and output will be P_1 and Q_1. Thus prices will remain stable *even with a considerable change in costs*.

Oligopoly and the consumer

If oligopolists act collusively and jointly maximise industry profits, they will in effect be acting together as a monopoly. In such cases, prices may be very high. This is clearly not in the best interests of consumers.

KI 19 p 122

Furthermore, in two respects, oligopoly may be more disadvantageous than monopoly.

- Depending on the size of the individual oligopolists, there may be less scope for economies of scale to mitigate the effects of market power.
- Oligopolists are likely to engage in much more extensive advertising than a monopolist. This will raise costs. Consumers could thus end up paying higher prices, though it may lead to product development and better information about the product's characteristics.

These problems will be less severe, however, if oligopolists do not collude, if there is some degree of price competition and if barriers to entry are weak. For example, in the Bertrand model, prices end up being set at the perfectly competitive level.

Moreover, the power of oligopolists in certain markets may to some extent be offset if they sell their product to other powerful firms. Thus oligopolistic producers of baked beans or soap powder sell a large proportion of their output to giant supermarket chains, which can use their market power to keep down the price at which they purchase these products. This phenomenon is known as **countervailing power**.

Pause for thought

Which of the following are examples of effective countervailing power?
(a) Tour operators purchasing seats on charter flights; (b) A large office hiring a photocopier from Xerox; (c) Marks & Spencer buying clothes from a garment manufacturer; and (d) A small village store (but the only one for miles around) buying food from a wholesaler.

In some respects, oligopoly has *advantages* to society over other market structures.

Definition

Countervailing power Where the power of a monopolistic/oligopolistic seller is offset by powerful buyers which can prevent the price from being pushed up.

- Oligopolists, like monopolists, can use part of their supernormal profit for research and development. Unlike monopolists, however, oligopolists will have a considerable *incentive* to do so. If the product design is improved, this may allow the firm to capture a larger share of the market, and it may be some time before rivals can respond with a similarly improved product. If, in addition, costs are reduced by technological improvement, the resulting higher profits will improve the firm's capacity to withstand a price war.

TC 6 p 24

- Non-price competition through product differentiation may result in greater choice for the consumer. Take the case of tablets or mobile phones. Non-price competition has led to a huge range of different products of many different specifications, each meeting the specific requirements of different consumers.

It is difficult to draw any general conclusions, since firms within oligopolies differ so much in their performance.

BOX 6.4 **BUYING POWER** CASE STUDIES & APPLICATIONS

What's being served up by the UK grocery sector?

Over the past few years there has been increasing concern about the power of large supermarket chains in the UK. This has resulted in a number of investigations by the country's competition authorities. Many of these investigations have focused on anti-competitive practices, such as rival chains agreeing not to set up in the same town and price collusion on some staple products.

However, more recently, focus has turned to the supermarkets' power not as sellers, but as buyers. If a wholesale manufacturer of ready-meals, or a supplier of sausages, wants to reach a wide customer base, it will need to deal with one or more of the eight largest supermarket chains, which control some 93 per cent of the grocery market. A market like this, where there are a few large purchasers of goods and services, is known as an ***oligopsony***. (A single large buyer of goods, services or factors of production is known as a *monopsony* and we look at this in Chapter 7, pages 168–9.)

Buying power

Over the years, a number of unfair practices by the supermarkets towards their suppliers have been identified. These include retrospectively changing contracts, delaying payments, forcing suppliers to fund special offers such as 'buy one, get one free' and asking for very substantial payments in order to be included on 'preferred supplier' lists.

Following a lengthy investigation, the Competition Commission (a predecessor to the Competition and Markets Authority) found that the supermarkets were passing on excessive risks and unexpected costs to their suppliers. As a consequence, a stronger Grocery Supplies Code of Practice (GSCP) was introduced in 2009. This recognised the power that large grocery retailers wield over their smaller suppliers and outlawed the practices detailed above.

A Groceries Code Adjudicator

In 2013, the government appointed a 'Groceries Code Adjudicator' (GCA), Christine Tacon, to ensure that supermarkets were complying with the GSCP. In 2016, the GCA concluded that Tesco had not complied with the code and had 'knowingly delayed paying money to suppliers . . . to improve its own financial position'. Morrisons also broke the code by requiring suppliers to make lump-sum payments even though the supply contracts didn't require this.

Tacon's approach was about collaboration and nudging the supermarkets to get in line, albeit with penalties imposed where necessary. Some concessions were made during COVID-19 to help supermarkets provide supplies to households, but Tacon was forced to intervene to stop supermarkets from having aspects of the GSCP waived. In April 2020 she noted that the code requires suppliers to be given 'reasonable notice' regarding de-listing and variation of supply agreements but that the code had sufficient flexibility to determine what is 'reasonable' on a case-by-case basis, and that it could also take the effects of the pandemic into account.

In 2020, a new Adjudicator was appointed. Suppliers may hope he takes a stronger approach, while supermarkets may fear a move away from collaboration and self-regulation.

Conclusions

Despite the supermarkets' power both as buyers and sellers, it is too simplistic to assume that the industry outcomes are all bad. Suppliers have been exploited, but the degree of competition between the largest supermarkets has kept food prices down and new products and offers have provided more convenience for many people, particularly those working full-time.

The grocery market is therefore a good example of a sector where growth and market power can be identified as both beneficial and harmful to other economic agents.

1. *Explain why manufacturers of food products continue to supply supermarkets, despite concerns that they are not always treated fairly.*
2. *Is the supermarket sector an oligopoly or monopolistically competitive? Justify your answer.*

Visit the website of the Competition and Markets Authority. Under CMA cases, search for cases/investigations involving the grocery sector. Choose a particular case and summarise the economic ideas and principles relevant to the case.

Definition

Oligopsony A market with just a few buyers (or employers in the case of labour markets).