

## 2 Price determination in a competitive market — answers

### Test yourself

#### Test yourself 2.1

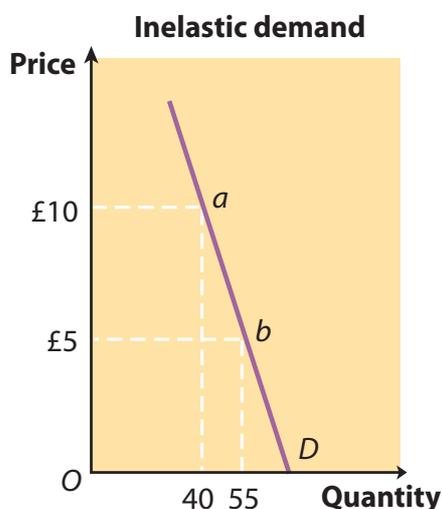
The data in the question tell us that the demand for small cars in the UK is price elastic. Following a price fall of approximately 33%, consumers respond by increasing their demand by 100%. Plugging this information into the formula for price elasticity of demand (see Chapter 2, page 25), we get:

$$\text{price elasticity of demand} = \frac{+100\%}{-33\%}, \text{ which is an elasticity of } -3 \text{ (approx.)}$$

Note that downward-sloping demand curves always have negative price elasticities of demand, but with price elasticities it is conventional to ignore the minus sign. In this example, the data are telling us that demand for small cars is quite highly responsive to price changes.

#### Test yourself 2.2

The demand curve in the diagram below is similar to the curve in panel (d) in Figure 2.4 in Chapter 2, page 26, except that we have added two prices, £5 and £10, and the corresponding quantities demanded, 55 and 40, to the diagram. When the price of the good is £10, 40 units of the good are demanded. This means that total sales revenue is £400 (£10 × 40, shown by the rectangle bounded by the points *O*, £10, *a* and 40). However, when the price falls by 50% to £5, demand only increases to 55 units — a percentage increase of 37.5%. When demand is inelastic, as is the case in this diagram, a fall in price induces a smaller percentage increase in demand. At the price of £5, total consumer expenditure is £275, shown by the rectangle bounded by the points *O*, £5, *b* and 55.



### Test yourself 2.3

When interpreting income elasticity of demand statistics, you must look first at the plus or minus sign, and then at the absolute size of the elasticity statistic. In this case, the plus sign tells us that foreign holidays are a normal good — an increase in income leads to more demand for foreign holidays. The statistic 1.6 then tells us that the demand for foreign holidays is income elastic, for example a 10% increase in income induces a 16% increase in demand for foreign holidays.

### Test yourself 2.4

As is the case with income elasticity of demand, with cross elasticity of demand, you must look first at the plus or minus sign, and then at the absolute size of the elasticity statistic. In this case, you can infer from the information in the questions that gaming consoles and games cartridges are complementary goods, or goods in joint demand. When the prices of gaming consoles rise, demand for them falls, which induces a fall in demand for games cartridges. The cross elasticity of demand for games cartridges with respect to a change in the prices of games consoles is negative. The absolute size of the cross elasticity statistic ( $-0.33$ ) indicates that the demand relationship is inelastic: the 30% increase in the prices of games consoles induces a 10% fall in demand for games cartridges.

### Test yourself 2.5

If we assume that the bakeries have over-priced the loaves of bread they are trying to sell (and that the increased price has not resulted from a sudden very large increase in production costs), the bakeries will reduce their prices in order to get rid of the excess supply which emerged at the £3 price. By contrast, if production costs have risen, the supply curve of loaves will in fact have immediately shifted to the left, meaning that the bakeries have reduced the quantity of loaves they bring to the market.

### Test yourself 2.6

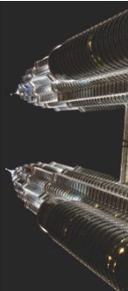
The correct answer is **B**. The elasticity statistic of  $+2.5$  tells us that when the good's price increases by 10% the planned quantity supplied increases by 25%. Although the plus sign is not included in the elasticity statistic, we treat the elasticity as positive because we know that supply curves generally slope upward and have a positive slope.

### Test yourself 2.7

The Lawn Tennis Association has set the price of the tickets at £100, which is well below the market-clearing (or equilibrium) price of £5,000. This decision creates a significant amount of excess demand, which triggers the emergence of a 'black' market or secondary market in which those 'lucky' ticket holders who would be willing to sell at prices above £100 resell to 'unlucky' customers who are willing to pay more than £100 to get hold of tickets. Much of the 'black' market takes place via the intermediary of ticket touts or spivs, more respectfully known as 'middle men'. However, those who buy on the 'black' market may be taking a risk. This could be because the tickets are 'fake', or it may be because the Lawn Tennis Association refuses to admit anyone who was not a genuine first-time buyer of a ticket — provided that the LTA finds out that this is the case.

### Test yourself 2.8

The market contains a large number of consumers and also a large number of producers or firms. This probably means that the market is highly competitive.



## Test yourself 2.9

The American website 'About Money' describes eBay auctions in the following way:

Auction items have a 'Place Bid' button next to a box for entering bids and show a 'current bid' price. Auction items are open to bids for a predetermined amount of time. When time is up, the item is declared 'sold'. eBay auctions accept bids only for a specific amount of time. In a traditional non-eBay auction, bidders frantically place competing bids. When bidding slows to nothing, the auctioneer pounds the gavel and the item is sold. On eBay, auctions are open to bids for exactly 1, 3, 5, 7, or 10 days. When time is up, the high bidder wins, even if people are still frantically bidding. You must place a bid that is higher than the current bid.

## Test yourself 2.10

Total revenue is price multiplied by quantity sold. In this example it is  $\text{£}20 \times 100$ , which is  $\text{£}2,000$ . But unless costs of production are zero, which is very rarely the case, positive costs of production must mean that profit is less than total sales revenue. Remember, total profit = total revenue – total costs. In this case, if the cost of producing the 100 sheep were to be  $\text{£}1,900$ , the farmer's profit would only be  $\text{£}100$ .

## Test yourself 2.11

When parents are required to pay a price for their children to be vaccinated against measles, they may decide to free-ride, in the sense of gaining the benefits resulting from other children being vaccinated against the disease. However, if too many parents decide to free ride, under-vaccination occurs, leading to the possible result of measles spreading through the child population. Under-consumption of a product is a form of market failure and certainly in this case would be regarded as undesirable.

## Case studies

### Case study 2.1

- 1 Price elasticities of demand between 0 and  $-1$  mean that demand is price inelastic. When this is the case, a rise in the price of tobacco increases total consumer expenditure on tobacco. If the price rise is caused by an increase in tobacco tax imposed by the government, the total tax revenue collected by the government will also rise. However, the inelastic demand for tobacco means that an increase in the tobacco tax is not very effective in discouraging people from smoking.
- 2 In the first place, because they have been smoking for more years, adults are likely to be addicted to nicotine. In the second place, because they have less disposable income, teenagers are likely to be more sensitive to price changes.

### Case study 2.2

- 1 Reasons include (i) much more land is available for house building in the USA; (ii) different methods of construction, for example houses built in wood rather than in bricks, mean that with a price elasticity of supply of  $+10$ , US houses can be built in a shorter space of time, and (iii) there are fewer planning controls in the USA than in the UK.
- 2 The reason for this lies in the fact that year-by-year the market demand curve for housing is shifting rapidly to the right. To keep house prices more or less at their initial level, a price elasticity of supply of  $+10$  is needed. However, in real life the supply of new houses is highly price inelastic, which means that a rightward shift of the demand curve leads to a rapid rise in house prices.



## Case study 2.3

- 1 Advantages to buying and selling on eBay:
  - eBay's built-in buyers make for less marketing.
  - eBay's auctions are the best place to sell rare items or items for which the seller is not sure of the value.
  - When buying something on eBay, the purchaser is not really buying it from eBay. However, many buyers don't think of it in this way, believing instead that eBay has brand recognition and built-in trust.
  - There is seller and buyer protection. This goes both ways. Protection for the seller and mediation through eBay is a big plus for you as it offers some safety in the event of a problem buyer, but it's also a selling point on the other end. Buyers are more likely to purchase if there is less of a risk of their being cheated, scammed or otherwise left without money or the item.

Disadvantages of buying and selling on eBay:

- From the seller's point of view it is expensive since fees are high.
  - eBay policies dictate and require you to take only certain kinds of payment, limit what keywords you use, and put only certain text in your listings.
  - Restrictions on what can be sold.
  - Potential customers may suffer from built-in prejudices against eBay. Listing an item only on eBay can push away some buyers who would bid or buy if the item were listed somewhere else.
  - It's harder to sell items that aren't keyword driven or already of interest because in these cases it will be hard to attract buyers on eBay. It's a keyword-driven marketplace.
- 2 Using the internet can reduce shopping costs in a number of ways. Prospective shoppers can search the internet for the lowest prices charged for particular goods and services. Price comparison websites can be used, such as [gocompare.com](http://gocompare.com), though perhaps the best price comparisons are provided online for subscribers to *Which?* magazine, published by the Consumers' Association. Once a purchase has been decided on, it is generally possible for goods to be delivered to the purchaser's place of residence without their being charged for delivery. Alternatively, a free 'click and collect' service may be available. For services such as holiday bookings, the Tripadvisor website provides comparisons of the prices charged for air flights and hotels by Booking.com, Expedia and many other online booking agencies. Online auction sites such as eBay can also be used when purchasing goods.

Online purchasers also benefit from not incurring 'shoe leather costs', which are the costs incurred when traipsing from shop to shop, for example in shopping centres. However, higher costs can also be incurred through unwise use of the internet when shopping. Fraud can occur when goods which have been paid for are not delivered or when credit card information is stolen. A good way to avoid these costs is to buy from reputable sites such as Amazon and to use PayPal rather than a credit card when paying for goods bought online.

## Case study 2.4

- 1 Diverting crop production to meet the demand for biofuel is affecting world poverty through the opportunity cost involved. When crops such as wheat are used for biofuel production, the supply of wheat for food is reduced. The price of wheat then rises in response to excess demand for the crop and poor people who spend a significant proportion of their low incomes on wheat then suffer.
- 2 One cause is unexpected supply-side 'shocks' stemming from climate hazards, e.g. droughts and floods. A second cause is speculative activity in commodity markets, with speculators buying large quantities of crops in the hope of making a speculative gain when selling after the crop's price has risen.

## Case study 2.5

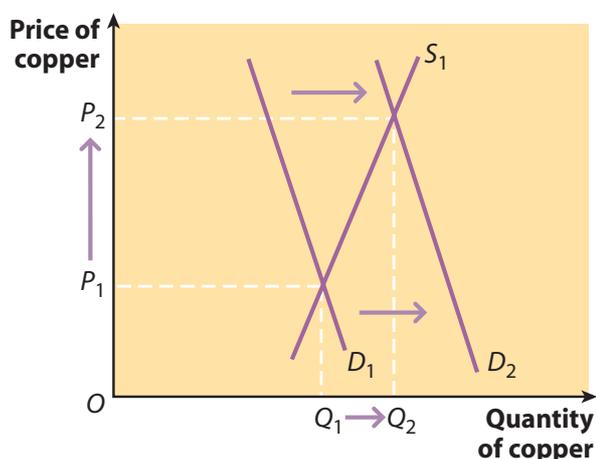
- 1 When a new method is developed of providing recorded music to customers, the price of recorded music in the new format falls, sometimes very quickly. The price fall encourages consumers to switch away from the older forms of music consumption to the newly developed form. For example, the cost of supplying recorded music via the internet is extremely low — the marginal cost of supply is virtually zero. This creates an incentive for suppliers such as iTunes to provide the music at a very low price, possibly to deter pirate downloading of the same music. By contrast, the provision of recorded music on CD and DVD discs involves considerable production and distribution costs. Disc prices have to be considerably greater than zero in order for the music suppliers to cover these costs and then make a profit. As a result CDs and DVDs cannot compete with downloaded music.

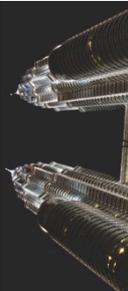
Secondly, just as vinyl discs could carry more music than the older shellac discs, so CDs and then DVDs can hold even more music. Allied to this is the fact that the quality of the music does not deteriorate the more the music is played. MP3 players by contrast hold less music than a DVD, but this is offset by the portability of the MP3 player.

- 2 CDs and MP3 files are substitutes for each other (or in competing demand) with a positive cross-elasticity of demand. If the price of MP3 files falls, the demand for CDs — the substitute good — also falls.

## Case study 2.6

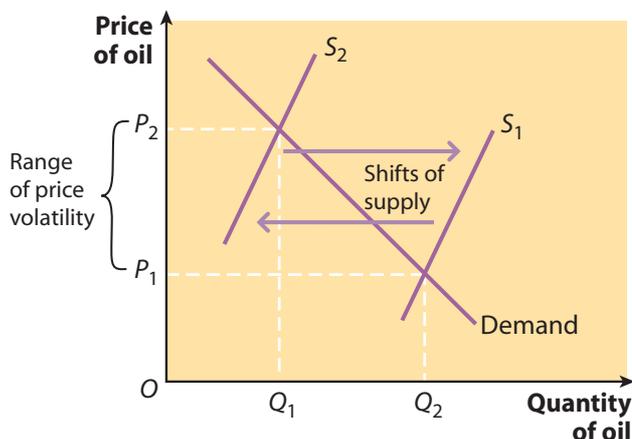
- 1 Speculation involves buying a good at its current low price in the hope that its price will rise so that the speculator can then make a capital gain, or speculative gain, by selling at the higher price. Speculation can also involve selling at the current high price in the hope that the good's price will fall so that the speculator can make a gain by repurchasing the good at the eventual low price. Speculation on rising markets is often called 'bull' speculation, whereas speculation on falling markets is often called 'bear' speculation.
- 2 The supply and demand diagram drawn below illustrates 'bull' speculation in the market for copper. Initially the copper price is  $P_1$ , but speculators believe that a rightward movement of the demand curve, brought about for example by increased industrial demand for copper, will shift the demand curve to position  $D_2$  and raise the price of copper. The speculators start buying copper at the current price of  $P_1$ , which of course provides a further reason for the demand curve to shift to the right. Once price  $P_2$  is reached, the speculators might start selling copper, so as to realise a speculative gain. In this example, speculators are making guesses about the future demand for copper, but in other examples, such as those relating to agricultural markets, they may speculate against changing supply conditions, caused perhaps by possible future crop shortages.





## Case study 2.7

- 1 The supply and demand diagram drawn below shows volatility in the price of oil caused by sudden changes in the position of the supply curve for oil (apart from those caused by the intervention in the market of an organisation such as OPEC). In recent years, the entry into the oil market of American shale-oil producers using the oil extraction process known as fracking has caused the price of crude oil to fall. Changing demand conditions (not shown on the diagram) resulting from the ‘boom’ and ‘bust’ phases of the economic cycle also cause price volatility in the market for oil and other raw materials and commodities.



- 2 OPEC cannot completely control the price of crude oil, first, because it cannot control the demand for oil, second, because it cannot prevent new suppliers from entering the oil market and shifting the world supply curve to the right, and third, because it cannot prevent its own member states from reneging on any agreement to control prices or the amount of oil sold.

## Case study 2.8

- 1 Cars are a normal good, which means that demand increases as real incomes increase. Recovery from recession began late in 2009, with the rate of recovery increasing from 2013 onward. This meant that for many UK residents, real incomes rose, and with them their demand for new cars. However, not all benefited from rising real incomes. Poorer households, who may not have been able to afford new cars anyway, suffered falls in their real incomes.
- 2 Though new cars in general are normal goods, luxury cars are also superior goods with an income elasticity of demand which exceeds +1. At the other end of the spectrum, when sold second hand, an old mass-produced car is likely to be an inferior good. As people’s incomes rise, the demand for these cars falls as their owners switch to buying new cars.

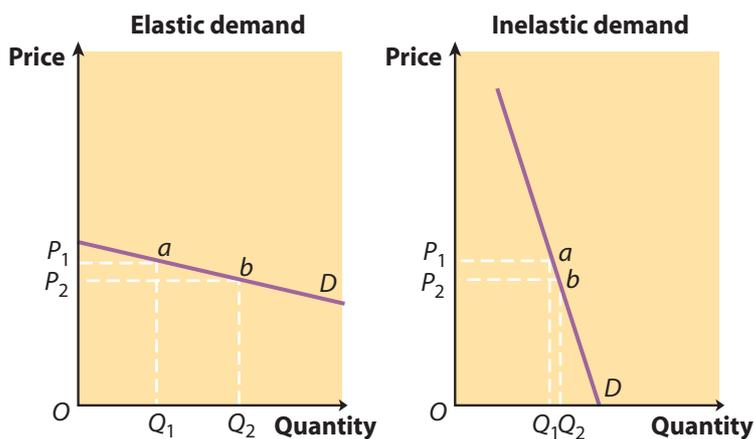
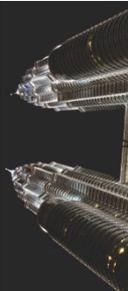
## Case study 2.9

- 1 The UK housing sector divides into owner-occupied housing; private rented housing; and social housing provided in the form of council houses owned and rented by local authorities, and rented accommodation owned by housing associations. Homelessness is caused in part by house prices and rents being too high across all three of these sectors. Too little affordable housing is available in all three sectors. Homelessness is also caused by incomes being too low at the bottom end of the income pyramid. Unemployment and the effects of cuts in welfare benefits are a further cause of homelessness. Underlying all three of these causes is the fact that too few houses have been built to meet the demand for housing, which has grown due to factors such as the growth of population and also of the number of households in the UK.

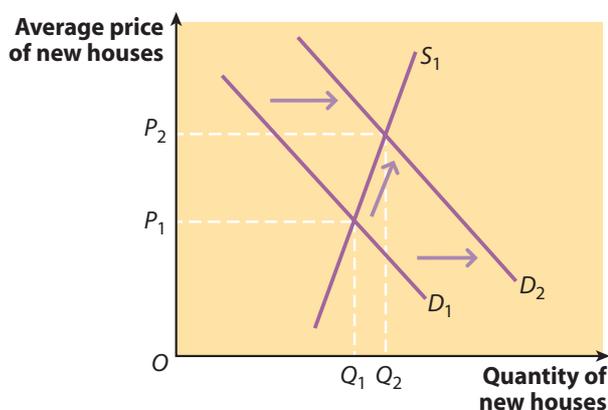
- 2 As stated in the previous answer, homelessness could be reduced by building more affordable houses. Various factors have prevented this from happening. These include the fact that house-builders cannot make sufficient profit from building affordable housing, preferring instead to build properties aimed at richer potential clients. The government could tighten and enforce rules that require house-builders to build cheap houses as well as more expensive properties. However, this might lead to the unintended consequence of fewer houses being built, with construction companies switching to the building of commercial properties rather than housing. A second policy would be to ease or abolish planning regulations so as to encourage more house building. This should reduce the rate at which house prices rise, but the policy would take several years to have an effect. Also on the down side, it might lead to the destruction of green belts and to further urban sprawl. A third policy would be to promote better use of the existing housing stock by encouraging small households to move out of larger properties, containing bedrooms they don't need, and into smaller properties. This policy has been introduced in the social housing sector through the use of the so-called 'bedroom tax'. However it hits, perhaps unfairly, low-income families renting council houses and has no effect on higher-income small households in the owner-occupied sector. The policy is thus inequitable.

## Questions

- 1 When drawing a demand curve or a supply curve, *ceteris paribus* means holding unchanged all other factors except price, which influence demand (or supply). This is a key part of *partial equilibrium* analysis, through which a small part of the economy is analysed and explained when assuming that all other parts of the economy are held unchanged. It is especially important in microeconomic theory, but less significant in macroeconomic theory which focuses on the economy as a whole. In microeconomic demand and supply analysis, relaxing the *ceteris paribus* assumption, for example by assuming that income changes, leads to the demand curve for a good shifting either rightward or leftward. This disturbs the initial equilibrium and leads to the good's price rising (or falling) until a new equilibrium is established. The *ceteris paribus* assumption is significant because it allows a small part of the economy to be rigorously analysed by separating it from the 'background noise' of events occurring in the economy as a whole.
- 2 Evidence shows that this statement is not true. It is true for *most* goods, but not for *all* goods. The word 'inevitably' in the question is too dogmatic. An example of a good which has an upward-sloping demand curve, showing that less of the good is demanded as the good's price falls, is a Veblen good, for which price is an indicator of status or exclusivity. The lower the Veblen good's price, the lower its exclusivity, and hence the lower the demand for the good.
- 3 When the good's price is  $P_1$ , total consumer spending is shown by the rectangle which is bounded by the four points  $OP_1 aQ_1$ . When the good's price falls to  $P_2$ , total consumer spending is shown by the rectangle bounded by the four points  $OP_2 bQ_2$ . The diagrams below show that when demand is price elastic (the left-hand panel), total consumer spending increases when the price falls, but when demand is price inelastic (the right-hand panel), total consumer spending becomes smaller as the price falls.



- The position of a market supply curve is largely determined by firms' costs of production. If costs of production fall, it becomes cheaper for firms to produce the good in question and the supply curve shifts rightward (or downward), showing that firms are prepared to supply more at all prices. A fall in wage costs, raw material costs or energy costs can produce this result. A fall in government taxes imposed on firms or an increase in government subsidies granted to firms has the same effect. This is because firms view a tax they have to pay as a business cost, and a subsidy as a reduction in business costs.
- The diagram below illustrates how the inelastic supply of new housing has affected UK house prices in recent decades. Because of factors such as population growth, higher real incomes and an increase in the number of households, the demand curve for new houses has shifted to the right. The demand curve 'slides' up the inelastic supply curve of new housing, causing the average price to rise from  $P_1$  to  $P_2$ .



- As the diagram below shows, a government subsidy granted to producers shifts the good's supply curve to the right. The equilibrium price falls from  $P_1$  to  $P_2$  and the equilibrium quantity increases from  $Q_1$  to  $Q_2$ . The extent to which equilibrium price and quantity change depends on the size of the subsidy and on the price elasticity of demand.

