

Demand

DEMAND for a product is the quantity bought over a given time period. For example, demand for cars in the UK in 2006 was 2.4 million vehicles. The quantity bought of a product is affected by a number of factors. These include:

- price – the lower the price, the higher tends to be the quantity demanded; the higher the price, the less tends to be bought;
- the income of customers – for most goods, the higher the income of customers, the more will be bought and vice versa. However, there are some goods, called **inferior goods**, where customers buy less of the good as their incomes rise;
- the price of other goods – for example, if one chocolate bar goes up in price by 10 per cent, demand for other chocolate bars is likely to increase if their price remains constant;
- advertising – successful advertising can increase demand for a product;
- seasonal factors – many goods, from ice creams and beer to toys and foreign holidays are affected by the time of year and the weather. For example, hot summer weather increases demand for ice creams and beer. The run up to Christmas is the peak selling time for toys and clothing.

Price and demand

Businesses operate in markets where they produce and sell, or **supply**, products that consumers want and are able to buy, or **demand**. The interaction of supply and demand can determine the price of a product. This unit considers the factors affecting the demand for an individual business's products and the way in which these factors can influence the price that the business might charge.

The demand curve of a business

Businesses need to understand how the demand for a product can affect the price that they can charge for it. This relationship can be shown by a demand schedule and a demand curve. For most products the relationship between demand and price is inverse. As the price goes up, the quantity demanded goes down. As the price goes down, the quantity demanded goes up. So, for product A shown in Figure 1, a rise in price from OP to OP₁ (£20 to £40) will lead to a fall in the quantity demanded from OQ to OQ₁ (£5,000 to £3,000).

Some products have a demand curve which looks different to that shown in Figure 1. 'Prestige' perfumes are designed to appeal to wealthy consumers. A low price might put off consumers of such a product, given the association made between a higher price and high quality. This means that the quantity demanded

over lower price ranges may increase as price rises for such a product. This would create an entirely different demand curve. Figure 2 shows the demand curve for such a product. An increase in price from OP to OP₁ causes the quantity demanded for this perfume to increase from OQ to OQ₂. However, an increase in price from OP₁ to OP₂ causes the quantity demanded to fall from OQ₂ to OQ₁. In this part of the curve a more normal relationship between demand and price exists. An increase in price leads to a fall in the quantity demanded. Speculative goods are also said to have upward sloping demand curves. As prices rise people buy more of them, hoping to sell them for a profit at a later date.

Other factors influencing the demand for a business's products

Other than price there is a range of factors affecting the demand for an individual business's products. A change in any of these factors can cause a shift in the whole demand curve (as opposed to a change in price which causes a movement along the

Table 1: The demand schedule for Product A

Price (£)	Quantity demanded
10	6,000
20	5,000
30	4,000
40	3,000
50	2,000

Figure 1: The demand curve for Product A

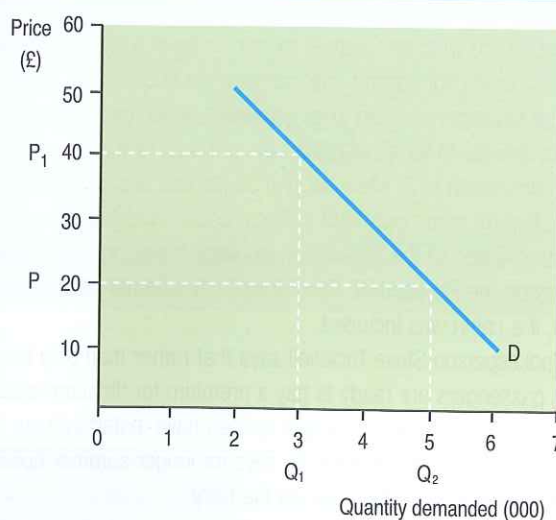


Figure 2: The demand curve for a prestige perfume

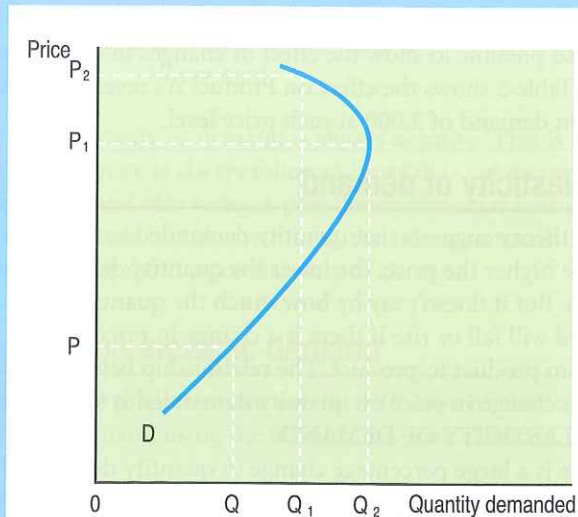
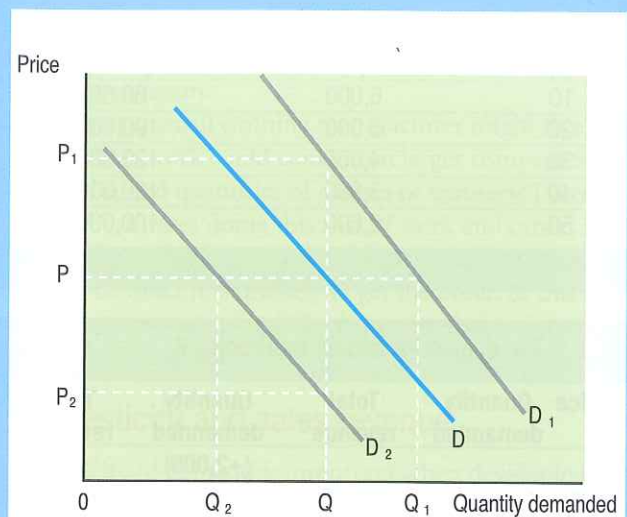


Figure 3: An increase and a decrease in demand



demand curve). Figure 3 shows an increase in the demand for a product by the demand curve moving outwards from D to D_1 . A decrease in the demand for the product is shown by the demand curve shifting inwards, from D to D_2 . What factors might lead to a change in demand and how will this affect a particular business?

- The consumers at which the product is aimed may experience an increase in income. The business may be able to sell more of the product at a given price ($OQ - OQ_1$) or charge a higher price ($OP - OP_1$). If incomes fall, the demand curve shifts inwards and the quantity demanded may fall ($OQ - OQ_2$) or the price may fall ($OP - OP_2$). An example may be increased demand for Bosch dishwashers as incomes increase.
- The price of a rival's goods may change. If a rival's price goes up, customers may be more willing to buy more of this product. If a rival's prices fall customers may reduce demand for this product. An example may be a fall in demand for one newspaper as another cuts its price.
- The price of a complementary product may fall. For example, if the price of DVD players falls, people may buy more of these and so the demand for DVDs themselves could increase. A rise in the price of a complementary product may lead to a fall in demand for the related product.
- Changes in tastes and fashion. There has been a change in the type of food products that have become popular in recent years. Examples include organic foods bought from supermarkets, flavoured and specialist coffees from shops such as Starbucks, and cholesterol reducing spreads such as Flora Proactive and Benecol.
- Marketing campaigns. Asda, for example, has pursued a low pricing marketing campaign and is often found to have the lowest supermarket prices in studies. It has

supported this with the 'Asda price' adverts on television showing people saving money.

- Changes in population. A large shopping mall such as the Trafford Centre in Manchester is likely to find an increase in demand if offices and housing are drawn close to its location.
- Government legislation and regulation can affect demand. Local pubs and breweries, for example, may find a fall in demand as a result of a reduction in the legal alcohol limit for drinking and driving.

How businesses use demand curves

Demand curves are useful tools to businesses in terms of analysing and planning their marketing activities. In particular they enable businesses to:

- calculate revenue to be earned for any given price change;
- predict the likely reaction of consumers to price changes;
- predict the likely impact upon revenue of price changes.

Calculating revenue

One of the reasons why businesses are interested in their demand curve is because it enables them to calculate revenue that may be earned for a particular price that is charged. Revenue can be calculated using using a simple formula:

$$\text{Price} \times \text{quantity demanded} = \text{total revenue}$$

Table 2 reproduces Table 1 showing the revenue that a business will earn for product A at different prices, given its demand schedule.

So, for example, the revenue of the business at a price of £30 would be $\text{£}30 \times 4,000 = \text{£}120,000$. If the price were to change to £20 the revenue would be $\text{£}20 \times 5,000 = \text{£}100,000$. Thus we can

Table 2: The demand schedule for Product A

Price (£)	Quantity demanded (Q)	Total revenue (P x Q)
10	6,000	60,000
20	5,000	100,000
30	4,000	120,000
40	3,000	120,000
50	2,000	100,000

Table 3: The demand schedule for Product A

Price (£)	Quantity demanded (Q)	Total revenue (P x Q)	Quantity demanded (+2,000) (Q)	Total revenue (P x Q)
10	6,000	60,000	8,000	80,000
20	5,000	100,000	7,000	140,000
30	4,000	120,000	6,000	180,000
40	3,000	120,000	5,000	200,000
50	2,000	100,000	4,000	200,000

see that a change in price from £30 to £20 has led to a fall in revenue from £120,000 to £100,000, a fall of £20,000.

This process can help a business to identify the point on the demand curve and the price at which revenue is maximised.

This can be seen from Table 2. At prices below £30 the business

Question 1.

A stationery shop selling fibre tipped pens has estimated the following demand schedule for its products.

Table 4: Demand for fibre tipped pens

Price (£)	Quantity demanded
2	800
3	600
4	500
5	400
6	350
7	300
8	260
9	225
10	200

(a) Calculate the change in total revenue for fibre tipped pens of:

- an increase in price from £2 to £3;
- an increase in price from £7 to £10;
- a decrease in price from £5 to £3.

(b) Explain why the business might be reluctant to raise prices above £7 per pen.

actually increases the revenue by raising its price. At prices above £40 revenue falls as prices are increased. The business earns most revenue between £30 and £40.

It is also possible to show the effect of changes in demand on revenue. Table 3 shows the effect on Product A's revenue of an increase in demand of 2,000 at each price level.

Price elasticity of demand

Demand theory suggests that quantity demanded varies with price. The higher the price, the lower the quantity demanded and vice versa. But it doesn't say by **how much** the quantity demanded will fall or rise if there is a change in price. This varies from product to product. The relationship between the effect of a change in price on quantity demanded is known as PRICE ELASTICITY OF DEMAND.

If there is a **large** percentage change in quantity demanded when price changes by a small percentage, there is said to be ELASTIC DEMAND. The word 'elastic' is used to give an idea that there would be a large response. Think of an elastic band. When you pull it, can you easily double its length? Then it is 'elastic'. But if it is thick, it may be difficult to change its length. It is 'inelastic'. This is also the case with price elasticity. If a large percentage change in price brings about only a **small** percentage change in quantity demanded, there is said to be INELASTIC DEMAND.

Take the example of a Mars Bar made by Mars Corporation. If it puts up the price by 10 per cent, and there is a fall in quantity demanded of 30 per cent, then the demand for Mars Bars is elastic. The percentage change in quantity demanded of Mars Bars is much bigger than the percentage change in price which caused it. But if quantity demanded fell only 5 per cent when prices went up by 10 per cent, then there would be inelastic demand. The percentage change in quantity demanded is smaller than the percentage change in price.

It is important to realise that price elasticity compares **percentage** changes in quantity and price. Percentages allow the relative changes to be measured and compared.

The formula for price elasticity of demand

The exact value of price elasticity of demand can be calculated by using the formula:

$$\text{Price elasticity of demand} = \frac{\% \text{ change in quantity demanded}}{\% \text{ change in price}}$$

For example, say that the price of Mars Bars increases by 10 per cent.

- If the quantity demanded falls by 20 per cent as a result of the 10 per cent price rise, then price elasticity of demand is:

$$\frac{-20 \text{ per cent}}{+10 \text{ per cent}} = -2$$

- If the quantity demanded rises by 5 per cent as a result of

Price - the influence of demand

the 10 per cent price fall, then price elasticity of demand is:

$$\frac{+5 \text{ per cent}}{-10 \text{ per cent}} = -0.5$$

Price elasticity of demand is always negative. This is because a rise (+) in price is always followed by a fall (-) in quantity demanded and vice versa. A plus divided into a minus is a minus. Because it is always minus, the sign is normally left out when talking about price elasticity of demand.

Elastic and inelastic demand

It is possible to give a more precise definition of elastic and inelastic demand using the formula for price elasticity.

Price elastic demand Demand is **price elastic** when it is **greater than 1**. This means that the percentage change in quantity demanded (on the top of the formula) is greater than the percentage change in price (on the bottom of the formula). A 12 per cent rise in quantity demanded resulting from a 10 per cent fall in price would give a price elasticity of $+12 \text{ per cent} \div -10 \text{ per cent}$ or -1.2 . This would be an example of elastic demand.

Price inelastic demand Demand is **price inelastic** when it is **less than 1**. This means that the percentage change in quantity demanded (on the top of the formula) is less than the percentage change in price (on the bottom of the formula). An 8 per cent fall in quantity demanded resulting from a 10 per cent rise in price would give a price elasticity of $-8 \text{ per cent} \div +10 \text{ per cent}$ or -0.8 . This would be an example of inelastic demand.

Estimating price elasticity

There is no easy way to find out the exact price elasticity of demand for a particular product. The business environment is constantly changing. So when the price of a product changes, it is likely that other factors will change too. For example, competing businesses may all change their prices at roughly the same time.

One way of estimating the price elasticity of demand is to assume that all these other factors remain the same. Then a business could consider the impact of its price changes on demand in recent years. If it has changed price four times in four years, it could estimate the impact this has had on quantity demanded each time and calculate a price elasticity figure for each price change. These four figures might be averaged to provide an approximate price elasticity.

Alternatively, a business could use market research. It could ask customers how much they would buy of a product at different prices. Price elasticity of demand for the sample could then be calculated. A problem is that what respondents actually do can be different from what they say they will do in a survey.

A business could consider the behaviour of its customers. For example, the price elasticity of demand for the gas that British

Gas sells to households might be inelastic. A 10 per cent rise in price is likely to have little effect on quantity demanded. This is because households tend not to turn off their central heating when the price of gas rises. Most customers, also, won't switch to another gas company.

In contrast, a small clothing manufacturer might face elastic demand. All its work could come from larger companies that only want limited quantities of dresses or trousers. There are many UK businesses doing this sort of work and others in countries like India or China. So if it quotes a slightly higher price for a contract it is unlikely to get the order. In this industry, businesses find it difficult to raise their prices without losing many customers.

Price elasticity and sales revenue

Price elasticity of demand is important when developing a **pricing strategy**. This is because the price of a product affects **sales revenue**. Sales revenue is the amount a business receives from the sale of its products. It is calculated by multiplying the price of the product by the quantity sold. For example, a business selling 1 million products at £10 each would have sales revenue of £10 million (£1 million \times £10).

Sales revenue is affected by the price at which a product is sold and price elasticity of demand. Assume that the product sold at £10 has a price elasticity of 2.

- This means that a 10 per cent increase in price would lead to a fall in quantity demanded (and therefore sales) of 20 per cent. Sales revenue would then fall from £10 million (1 million \times £10) to £8.8 million (800 000 \times £11).
- If, on the other hand, price was lowered by 10 per cent, quantity demanded (and therefore sales) would rise by 20 per cent. Sales revenue would then rise from £10 million (1 million \times £10) to £10.8 million (1.2 million \times £9).

This is an example of a more general rule. If demand is price elastic, then putting up price will lead to a fall in sales revenue. The increase in price will be more than offset by a decrease in sales. Conversely, lowering price when demand is price elastic will lead to a rise in sales revenue. The fall in price will be more than offset by an increase in sales.

Equally, the opposite relationship applies if price is inelastic. A rise in price will lead to a rise in sales revenue whilst a fall in price will lead to a fall in sales revenue. For example, if price elasticity of demand is 0.7, then a 10 per cent rise in price leads to a 7 per cent fall in sales. This leads to an approximate 3 per cent rise in sales revenue. This relationship between price elasticity and sales revenue is shown in Table 5.

Changing the price can therefore affect sales revenue. But the exact effect, and whether it leads to an increase or decrease,

Table 5: Effect on sales revenue of a change in price

	Elastic demand	Inelastic demand
Price increase	Revenue down	Revenue up
Price decrease	Revenue up	Revenue down