OCR GCSE (9–1)

ECONOMICS

Second Edition

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Topic 2.3
Supply

Learning outcomes

After studying this topic you should be able to:

- explain what is meant by supply
- draw and explain a supply curve using data, including individual and market supply
- draw shifts of, and movements along, the supply curve
- analyse the causes and consequences for consumers and producers of shifts of, and movements along, the supply curve
- explain price elasticity of supply
- draw supply curves of different elasticity
- evaluate the importance of price elasticity of supply for consumers and producers

What is meant by supply?

Supply is not just the quantity produced, but the ability and willingness of firms to provide goods and services at each price level in a given time period. The time period is very important for supply because in some cases it is easy to increase supply, such as tins of Heinz baked beans, whereas in other situations, such as cinema seats, the supply cannot easily be changed (see later in this topic for more detail).

For most goods and services the quantity supplied varies directly with the price, i.e. as the price rises, the quantity increases, or as the price falls, the quantity also falls. This is called the **law of supply** and comes about because:

- Higher profits are likely to be earned by existing firms if they supply more.
- Production costs are likely to rise as output expands, so a higher price is needed to cover these extra costs.
- New firms may be attracted to the market because the higher prices mean they can cover their higher production costs.

In this topic we are concerned with the supply of goods and services.

Key terms

Supply The ability and willingness of firms to provide goods and services at each price in a given time period.

Law of supply For most products the quantity supplied varies directly with its price.

Drawing and explaining a supply curve

The supply curve for most goods and services slopes upwards because of the direct relationship between its quantity and its price. This means that if the price rises, so does the quantity, while if the price falls, so does the quantity. This is shown in Figure 2.3.1.

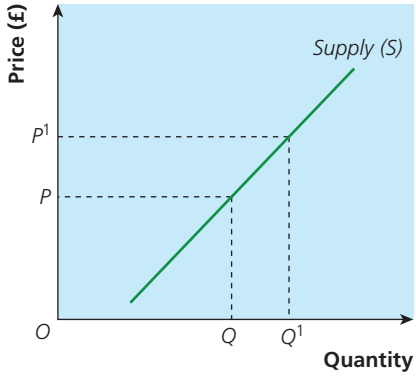

Figure 2.3.1 The supply curve

Study tip

Remember to label diagrams fully. But there is no need to write words in full, so price = *P*, quantity = *Q*, supply = *S* and demand = *D* are sufficient.

Key term

Individual supply The supply of a good or service by an individual producer.

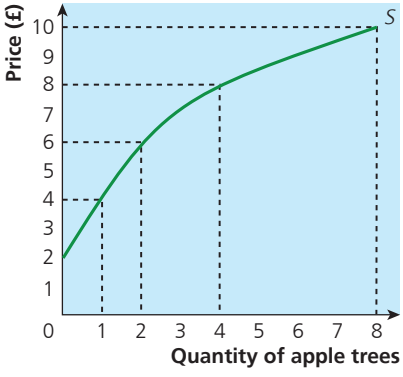

Figure 2.3.2 Claude's supply curve of apple trees

Study tip

Supply can also refer to the supply of labour (see Topic 2.7) and the supply of money (see Topics 2.8 and 3.6).

Key term

Market supply The total supply of a good or service as a result of adding together all individual producers' supplies.

What is meant by individual supply?

Individual supply is the supply of a good by an individual producer. Each individual producer will have their own supply curve for a good or service. In the example given in Table 2.3.1, we are considering the supply of apple trees at different prices. Table 2.3.1 shows the schedule of Claude's supply (this just means a table with prices and the related quantity). It shows us how many apple trees Claude is prepared to sell at different prices. It does not tell us the actual amount the producer will supply because we do not know the prices at which consumers will demand (see Topics 2.2 and 2.4). (See also Figure 2.3.2.)

Table 2.3.1 Claude's supply schedule

Price of apple trees (£)	Quantity of apple trees supplied
2	0
4	1
6	2
8	4
10	8

Activity

Table 2.3.2 The supply schedule for ice cream tubs

Price (£)	Borys' supply of ice cream tubs	Mariana's supply of ice cream tubs	Parvez's supply of ice cream tubs
5	4	10	16
4	3	8	8
3	2	6	4
2	1	4	2
1	0	2	1

1 Using the information in Table 2.3.2, and graph paper if available, draw three supply curves, one each for Borys, Mariana and Parvez. Make sure that you keep these diagrams safe because they will be required for the next activity.

2 Discuss in pairs why the three supply curves are all different. (Later in this topic we will give you some economic tools to answer this, but don't worry about it at this stage.)

What is meant by market supply?

The market supply is the total supply of a good or service. It is found by adding together all the individual producers' supply. This can be seen in Figure 2.3.3, where the third diagram (market supply (S^{ms}), is a result of adding together the two previous diagrams, Firm A (S^{a}) and Firm B (S^{b}).

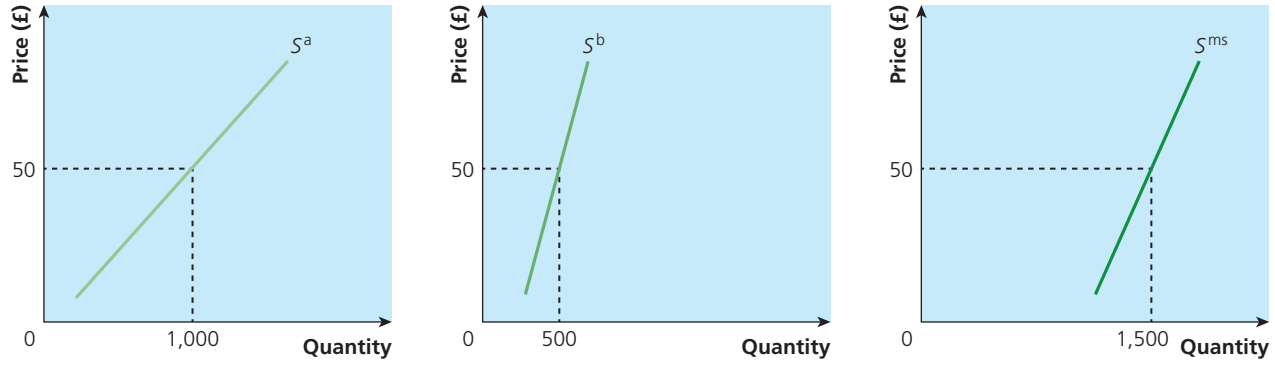

Figure 2.3.3 The market supply curve

Firm A can supply 1,000 units at £50, while Firm B can supply 500 units at the same price. By adding the two together the market supply is given: 1,500 units at £50.

Activity

Using the three diagrams for Borys, Mariana and Parvez, and assuming they are the only three producers, draw a market supply curve. How does it differ from the three individual ones?

Now test yourself

1 Complete the following sentences using either *supply*, *individual supply* or *market supply*:

a The supply of a good by one firm is called ..... .

b The ability and willingness to provide goods over a specified time period is called ..... .

c The total provision of a good is called ..... .

d The addition of the quantity offered by each firm is called ..... .

How to draw shifts of, and movements along, the supply curve

It is very important to distinguish clearly between a **shift of the supply curve** and a **movement along the supply** curve. A shift of the supply curve means that the quantity supplied at each price changes. This is caused by non-price factors. A movement along the supply curve is caused by a change in price and by no other factor.

How to show a shift of the supply curve

A shift of the supply curve is shown in Figure 2.3.4 by moving the supply curve to the right, S to S^1. This shows an increase in supply at every price of Q to Q^1. Equally, a shift of the supply curve can be shown by moving the supply curve to the left (S^1 to S). This shows a decrease in supply at every price of Q^1 to Q.

How to show a movement along the supply curve

In Figure 2.3.5 a movement either up or down the supply curve leads either to an increase in both the price and the quantity, P/Q to P^1/Q^1, which is called an expansion of supply, or to a fall in both, P/Q to P^2/Q^2, which is called a contraction of supply.

Key terms

Shift of the supply curve The complete movement of the existing supply curve either outward (to the right) or inward (to the left).

Movement along the supply curve When the price changes, leading to a movement up (expansion) or down (contraction) on the existing supply curve.

Study tip

When drawing diagrams in your answers, make sure that you: use a ruler, draw them large enough to be easily seen and understood, and overall make them tidy. It is essential that you use black ink and not pencil or other colours so that your diagram can be clearly understood.

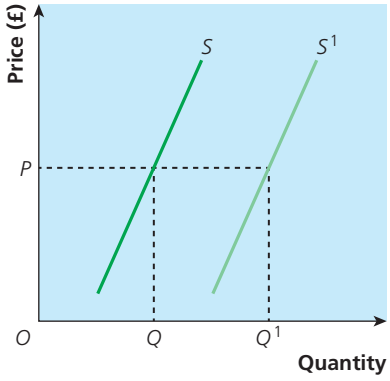

Figure 2.3.4 A shift of the supply curve

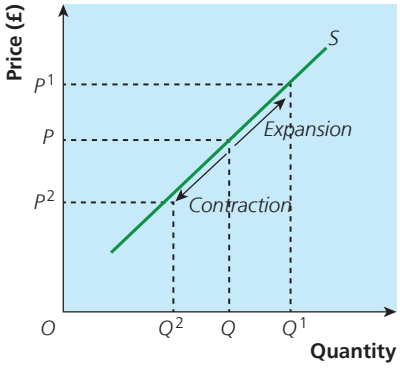

Figure 2.3.5 A movement along the supply curve

Case study

Confusion and the supply curve

Collette was in conversation with Ranjit. She believed that if she supplied more of her eggs to local shops, she would get a lower price, but more revenue. Instead, she found that she was getting a higher price and more revenue. Ranjit explained that this was because there had been an expansion of supply rather than a shift in supply. At this, Collette looked confused and said, 'I don't understand!'

Follow-up questions

1. Using a diagram, explain to Collette what is meant by an expansion of supply.
2. Using a diagram, explain to Collette why she could be correct in saying that if she supplied more, she would get a lower price, but greater revenue.
3. Assuming that it costs Collette the same to supply any quantity of eggs, analyse why an expansion of supply might be better for her than a shift in supply.

Analysing the causes and consequences of shifts of, and movements along, the supply curve

The basic difference between shifts of, and movements along, the supply curve is that movements along the supply curve are a result of a change in price, while a shift of the supply curve is caused by non-price factors. The causes of both and their consequences are explained in more detail below.

What causes shifts of the supply curve?

A shift of the supply curve is seen by the supply curve moving to the right or to the left. This is an increase, or decrease, in supply. All the causes of these shifts in supply are non-price ones, i.e. they are not to do with the actual price of the good or service. A shift in a supply curve occurs when a good's quantity supplied changes even though the price remains the same.

Below are some of the main factors that could cause the supply curve to shift. In order to keep this as simple as possible, only either an increase or a decrease in supply is considered, but the other one would just be the exact opposite: for example, a fall in production costs would lead to the opposite effects to a rise in production costs.

Costs of production

An increase in the costs of production means that a firm would supply less at every price. This could be caused by an increase in the price of raw materials, such as oil, or a rise in wages.

Taxes and subsidies

An increase in an indirect tax such as VAT (see Topic 3.5) would lead to a rise in costs and thus a fall in quantity supplied at each price. Similarly, a government subsidy to a firm would allow the firm to supply more at every price, leading to a shift in supply to the right.

Technology

The introduction of new or improved technology can reduce the costs of production and/or increase the amount that can be produced. The mechanisation of farming has meant that farmers can now grow more of a crop. Equally, the use of computers in many industries has greatly reduced costs by increasing the speed at which work can be carried out.

Activity

Table 2.3.3 The supply schedule of electric car production

Price of cars (£)	10,000	11,000	12,000	13,000	14,000	15,000
Number of cars produced per week	100	120	140	160	180	200

1 Using the figures in Table 2.3.3, draw the supply curve for electric cars.

2 Due to improved technology, the supply now increases by 10% at each price. Calculate the new supply schedule and then plot this on the graph.

Climate

This is a very important factor in agriculture. Changes in the weather can lead to significant differences in how much farmers can supply each year. The weather can affect all work that takes place outside, such as construction.

Number of producers or size of existing firms

If the number of producers in an industry increases, supply will shift to the right. Equally, if existing firms increase their size by opening new factories or devoting more land to the growing of a crop, supply will also shift to the right.

Government regulation

Governments can intervene in the market by, for example, health and safety regulations, consumer protection or the minimum wage. These will all increase the costs of firms and could lead to the supply curve shifting to the left.

What are the consequences of shifts of the supply curve?

As already stated, the main consequence of a shift in the supply curve is that price and quantity move in opposite directions. The assumption

Study tip

Make sure you understand the difference between a shift of a supply curve (a shift in supply) and a movement along the supply curve (a change in the quantity supplied).

here is that the supply curve shifts to the right. Examples include:

- Economies of scale (see Topic 2.6): the ability of a firm to produce more at every price should lead to a fall in average costs and the gaining of greater economies of scale. This could lead to greater profits or lower prices for consumers or both.
- Efficiency: being able to produce more with the same resources leads to greater efficiency, which may include greater productivity (see Topic 2.6).
- Sales: being able to supply more at a lower price may lead to higher sales.
- Exports (see Topic 4.1): all the above would make a firm more competitive (see Topic 2.5) and increase its ability to export successfully.
- Monopoly (see Topic 2.5): if a firm becomes more competitive than its rivals then it may be able to drive them out of the market, leading to the establishment of a monopoly.

Now test yourself

2 Which of the following are causes, and which are consequences, of a shift in the supply curve?

a New technology
b Greater economies of scale
c Monopolies
d More government regulation
e A fall in the costs of production
f More efficient production

What causes movements along the supply curve?

Movements along the supply curve are caused solely by changes in the price, which in turn are caused by shifts of the demand curve (see Topics 2.2 and 2.4). If the price rises, then a supplier will want to put more of its product on the market as it will gain greater revenue. If total costs rise by less than total revenue, this results in more profit. If the price falls, the reverse will be true.

What are the consequences of movements along the supply curve?

The first consequence of any movement along a supply curve is that the quantity supplied will move in the same direction as the price. If this is an expansion, it is likely to lead to greater profits. It may, however, lead to more firms entering the market, resulting in a shift of the supply curve to the right, which will in turn lead to a fall in price.

This is particularly noticeable in the agricultural industry. Farmers with a choice of what to produce will opt for the product that will give them the greatest profit. This will then shift the supply curve to the right, leading to a surplus of supply and a fall in price. If the price falls, the opposite may happen (see the final section of this topic).

In addition, a fall in price is likely to reduce profits and less efficient firms may be pushed out of the market, while efficient firms may have to reduce their production.

Summary of differences

Table 2.3.4 is a summary of the differences between a shift of, and a movement along, a supply curve.

Table 2.3.4 Summary of the changes in supply and their effects

Change in supply	Effect
Increase in supply due to a rightward shift of the supply curve	The price falls and the quantity supplied of the product increases
Decrease in supply due to a leftward shift of the supply curve	The price rises and the quantity supplied of the product decreases
Decrease in quantity supplied due to a fall in price, leading to a movement down the supply curve	Both the price and the quantity supplied of the product fall (contraction of supply)
Increase in quantity supplied due to a rise in price, leading to a movement up the supply curve	Both the price and the quantity supplied of the product increase (expansion of supply)

What is meant by price elasticity of supply?

Earlier in this topic you met the law of supply, which explained why most supply curves slope upwards: as the price rises, the producer provides more. It does not tell us by how much quantity supplied will change with the change in price.

Price elasticity of supply (*PES*) measures the responsiveness of quantity supplied to a change in the price of the product. If a price change leads to a smaller change in quantity, as in the case of oil, then the supply is **price inelastic**. This means it has a value between 0 and 1.

If a price rise leads to a larger change in quantity, as in the case of a box of cornflakes, then the supply is **price elastic**. This means it has a value between 1 and infinity.

If a product has a value of 1 then the supply is **unitary elastic**.

What do the *PES* values mean?

The supply curve slopes upwards, so the price and quantity change in the same direction (except for the three exceptions shown below). Therefore the calculation is always positive, i.e. it obeys the law of supply. Also, *PES* has no units, so the answer to a *PES* calculation is just a number.

If the value of *PES* is 0 or less than 1, for example 0.5, then it is price inelastic. Quantity supplied is relatively unresponsive to a price change (see Figure 2.3.6). For example, if *PES* is 0.5 then a 10% rise in price would lead to a 5% rise in quantity.

If the value of *PES* is more than 1, for example 2, then it is price elastic. Quantity supplied is responsive to a change in price (see Figure 2.3.7). For example, if *PES* is 2 then a 10% rise in price would see a 20% rise in quantity.

There are three special *PES* exceptions:

- *PES* = 0. This is called perfectly price inelastic (see Figure 2.3.8).
- *PES* = ∞ (infinity). This is called perfectly price elastic (see Figure 2.3.9).
- *PES* = 1. This is called unitary price elastic (see Figure 2.3.10).

The next section explains in more detail how supply curves of different elasticity are drawn.

Study tip

Make sure that you learn the definition of *PES* very carefully. Too many answers are vague.

Key terms

Price elasticity of supply (*PES*) The responsiveness of quantity supplied to a change in the price of the product.

Inelastic supply When the percentage change in quantity supplied is less than the percentage change in price.

Elastic supply When the percentage change in quantity supplied is greater than the percentage change in price.

Unitary supply When the percentage change in quantity is the same as the percentage change in price.

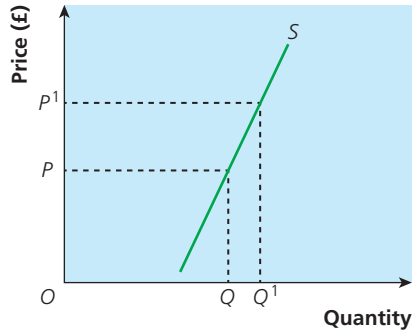

Figure 2.3.6 Price elastic supply curve

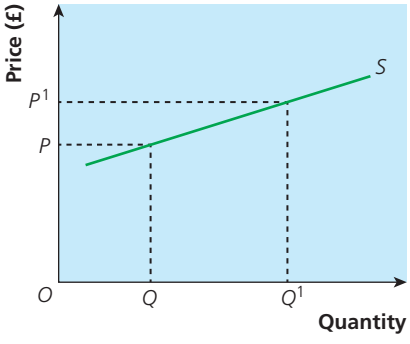

Figure 2.3.7 Price inelastic supply curve

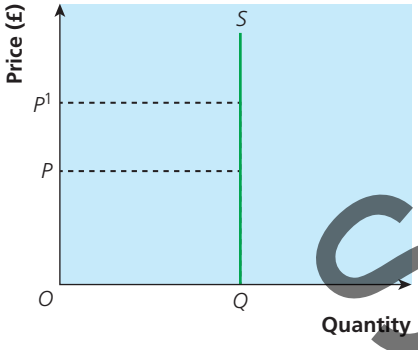

Figure 2.3.8 Perfectly price inelastic supply curve

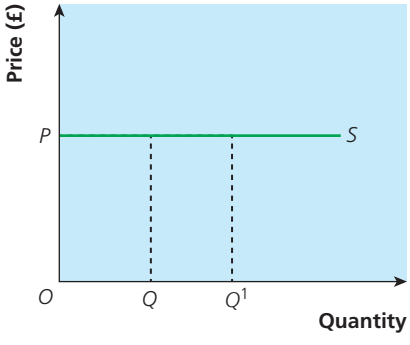

Figure 2.3.9 Perfectly price elastic supply curve

How to draw supply curves of different elasticity

In Figure 2.3.6, an increase in price from P to P^1 leads to a smaller increase in quantity from Q to Q^1. This shows that quantity is relatively unresponsive to a change in price. This could be because it is difficult to store the product, such as milk, so only a limited extra quantity can be supplied if the price rises.

In Figure 2.3.7, an increase in price from P to P^1 leads to a larger increase in quantity from Q to Q^1. This shows that quantity is responsive to a change in price. If resources are easily available, it will be possible to respond quickly to price changes.

In Figure 2.3.8, an increase in price from P to P^1 leads to no change in quantity; it remains at Q. This shows that quantity is totally unresponsive to a change in price. There are products whose supply cannot, at least in the short run, be increased, or can be increased only by running down limited stocks. This applies to many food products. Damsons, a type of plum, are only grown in limited parts of the UK. They are picked in September. This means that, except for those that are cooked and frozen, it is another year before more become available.

Activity

In pairs, try to think of at least five other different, i.e. non-fruit, products that would also be difficult to get more of very quickly. Then share your ideas with others in the class.

Seasonal fruits, such as cherries, are usually only available for part of the year

In Figure 2.3.9, although there is no change in price (it stays at P), there is still an increase in quantity from Q to Q^1. This shows that quantity is infinite in its response to a change in price, i.e. any quantity will be supplied at that, but only that, price.

In Figure 2.3.10, an increase in price from P to P^1 leads to the same percentage increase in supply from Q to Q^1. This shows that quantity is unitary in its response to a change in price, i.e. any percentage change in price will bring about the same percentage change in quantity. Any straight supply line that goes through the origin will have a value of 1.

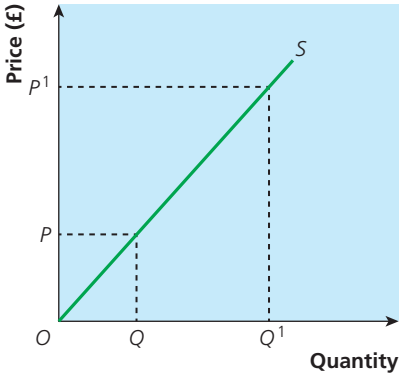

Figure 2.3.10 Unitary price elastic supply curve

Activity

1. In groups, compile a list of products you think would have inelastic supply and another list of those that would have elastic supply. Then as a class exchange your ideas and compile a class list.
2. Discuss as a class which goods might have a perfectly inelastic supply, or very near to perfect. Do you think there are any products that might be completely perfectly elastic or unitary?

Evaluating the importance of price elasticity of supply for consumers and producers

Although knowledge of movements of, and along, the supply curve are useful for both consumers and producers, this knowledge does not enable either group to predict (other than vaguely) what the effect of a change in price would be on the quantity supplied. To do so it is necessary to know the value of *PES*.

Study tip

Supply curves are unlikely to be linear in real life. This means they will have a different *PES* as one moves along the curve. Supply will be more elastic at lower prices and more inelastic at higher prices.

What are the effects on consumers?

While most consumers do not have the means to calculate *PES*, this does not mean that it has no effect on them. If *PES* is inelastic then it may prove more difficult for a consumer to get more of the product without paying a much higher price. In some cases, such as seats in a sports stadium or at a concert, even an ability to pay more may not provide a seat, as the numbers are restricted to how many seats there are. Consumers will find that although through their demand they can affect the price, there is little they can do to access more supply except by paying much higher prices. On the other hand, if *PES* is elastic, it is relatively easy to obtain more of the product, but there may be less flexibility in negotiating the price the consumer wants.

What are the effects on producers?

In most cases it is better for firms to have an elastic *PES*, as they can respond more easily to price changes. Firms can increase their elasticity by:

- adopting, or upgrading to, the latest technology
- creating spare capacity
- improving storage methods to prolong the life of a product
- keeping large amounts of stock
- training employees so that they can perform a range of jobs as required

Activity

In small groups, discuss how these five points could make *PES* more elastic. Are there any other ways in which this could be achieved? Share your ideas with the other groups.

Now test yourself

3 Define elasticity of supply. Make sure your definition is accurate.

4 If the value of *PES* is 0.8 then supply is said to be price ..... .

5 If *PES* is said to be elastic, what happens to the change in price and quantity as there is a movement up the supply curve?

6 If *PES* is inelastic, how might this affect the consumer?

7 Give four ways in which a producer can try to increase its elasticity of supply.

Evaluate this

Using the information in this topic and your own knowledge, evaluate the view that producers should always try to increase the value of the price elasticity of supply of their products.

Check that you fully understand what is meant by *evaluate* before answering this question – see p. ix for advice on this technique.

Case study

The producer and price elasticity of supply

The operations director of TCR Sports Ltd was worried that if the firm could not respond quickly enough, it would lose orders to foreign firms that were more flexible. The operations director asked Mila if she could advise him on how to increase the price elasticity of supply of the firm's products.

One suggestion Mila made was that TCR Sports Ltd should try to ensure that its stocks of goods were easily available.

Follow-up questions

1 What is meant by price elasticity of supply?

2 Other than the suggestion in the case study, how else could TCR Sports Ltd increase the *PES* of its products?

Extension material

Table 2.3.5 Supply schedule

Price (£)	2	4	6	8	10	12	14
Quantity	4	6	8	10	12	14	16

1 Using the data in Table 2.3.5, calculate the *PES* for each change in price, e.g. £2 to £4.

2 In the section 'What causes shifts of the supply curve?', you were given some of the possible causes. In pairs, write down two more possible causes. You could then share your ideas with the rest of the class. Make a class list of those that the class accepts and add them to your notes.

3 Contact a local firm and ask it how it tries to make its supply more elastic (more responsive to changes in price). If several of you do this, you could share your research with the rest of the class.

Evaluate this

Using the information in this topic and your own knowledge, evaluate the importance of price elasticity of supply to consumers.

Check that you fully understand what is meant by *evaluate* before answering this question – see p. ix for advice on this technique.

Progress check

Now you have finished this topic, you should be able to:

- explain what is meant by supply
- draw and explain, using data, individual supply curves
- draw and explain, using data, market supply curves
- analyse the causes and consequences for consumers and producers of shifts in the supply curve
- analyse the causes and consequences for consumers and producers of movements along the supply curve
- draw shifts in the supply curve
- draw movements along the supply curve
- explain price elasticity of supply
- draw supply curves of different elasticity
- evaluate the importance of price elasticity of supply for consumers and producers

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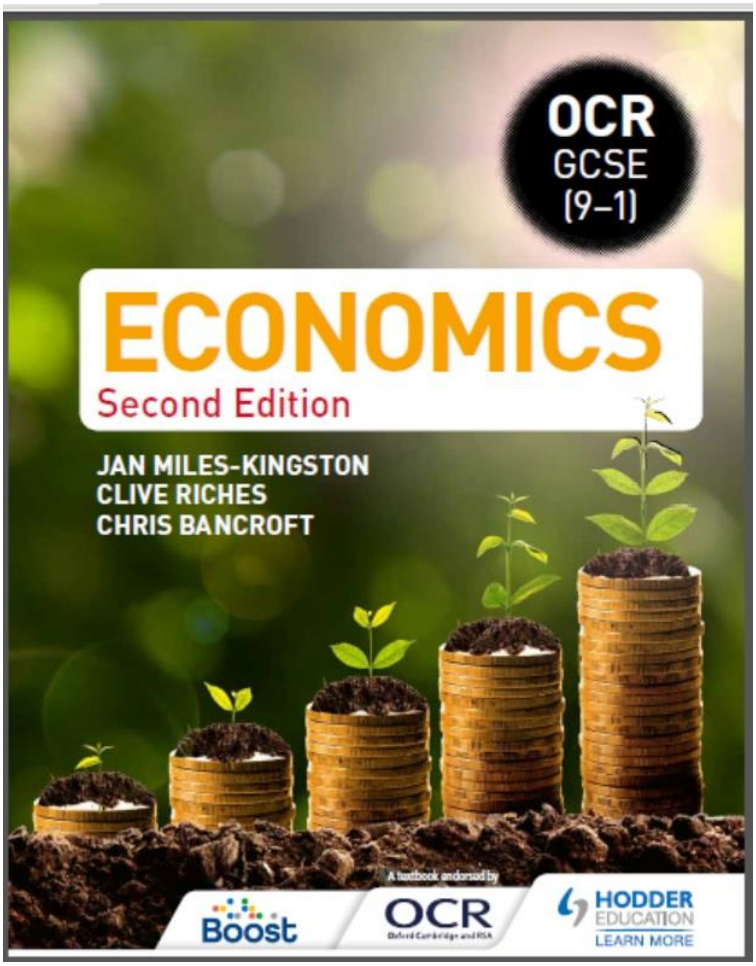

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