

*Edexcel*  
*AS Level*  
*Econ*  
*(Code: WEC13 01)*  
*Unit 01*  
*Supply*



## Chapter 10 – Supply and price elasticity of supply

### SUPPLY

In any market there are buyers and sellers. Buyers demand goods while sellers supply goods. Supply in economics is defined as the quantity of goods that sellers are prepared to sell at any given price over a period of time.

### SUPPLY AND PRICE

If the price of a good increases, how will producers react? Assuming that no other factors have changed, they are likely to expand production to take advantage of the higher prices and the higher profits that they can now make.

The supply curve shows that quantity supplied will increase if the price of a good also rises, assuming other variables remain constant. For example, if wheat is priced at £110 per tonne, farmers already growing wheat might increase their land use for production, while non-wheat farmers might start growing wheat, as it allows for profit on production even with higher costs.

### CONDITIONS OF SUPPLY

Changes in price will lead to a change in quantity supplied. These changes are shown by movements along the supply curve. However, there are many other factors apart from price that can cause supply of a product to change. These other factors are, as a group, called the **conditions of supply**.

### COSTS OF PRODUCTION

The supply curve is drawn on the assumption that the general costs of production in the economy remain constant (part of the *ceteris paribus* condition).

If other things change, then the supply curve will shift. If the costs of production increase at any given level of output, firms will attempt to pass on these increases in the form of higher prices.

Figure 2 shows that a rise in production costs leads to higher prices at output levels, causing the supply curve to shift upwards and to the left. This results in a fall in supply, as firms charge higher prices at output levels of OA, while a fall in production costs leads to an increase in supply.

### TECHNOLOGY

The supply curve assumes that technology remains unchanged, but new technology can lead to reduced production costs and increased efficiency. This shift in the supply curve can occur during times of conflict or natural disasters, where firms may need to use less efficient production methods, reducing supply at any given price.

FIGURE 1

#### The supply curve

The supply curve is upward sloping, showing that firms increase production of a good as its price increases. This is because a higher price enables firms to make profit on the increased output whereas at the lower price they would have made a loss on it. Here, an increase in the price of wheat from £110 to £140 per tonne increases quantity supplied from 110 million tonnes to 150 million tonnes per year.

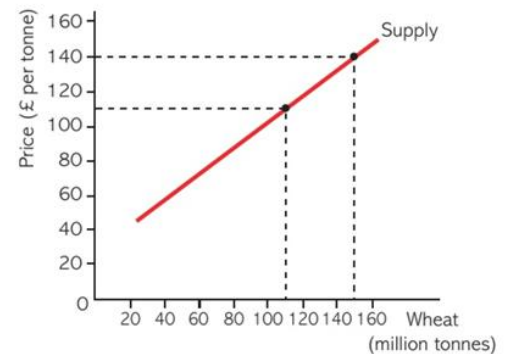
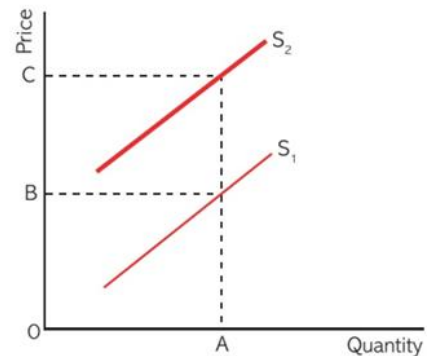


FIGURE 2

#### A rise in the costs of production

A rise in the costs of production for a firm will push its supply curve upwards and to the left, from  $S_1$  to  $S_2$ . For any given quantity supplied, firms will now want a higher price to compensate them for the increase in their costs.



## THE PRICES OF OTHER GOODS

Changes in the prices of some goods can affect the supply of a particular good. For instance, if the price of wood increases substantially there will be an increase in the quantity of wood supplied. More trees will be planted and grown. As a result there will be an increase in the supply of wood (saw) dust used for animal bedding. At the same price, the quantity of wood dust supplied to the market will increase.

## OTHER FACTORS

Several other factors affect supply. These include:

- the goals of sellers - if for some reason there is a change in the profit levels that a seller expects to receive as a reward for production, then there will be a change in supply;
- government legislation - anti-pollution controls that raise the costs of production, the removal of legal barriers to setting up business in an industry, or tax changes, are some examples of how government can change the level of supply in an industry
- expectations of future events - if firms expect future prices to be much higher, they may restrict supplies and stockpile goods; if they expect disruptions to their future production because of a strike they may stockpile raw materials, paying for them with borrowed money, thus increasing their costs and reducing supply
- the weather in agricultural markets, the weather plays a crucial role in determining supply, bad weather reducing supply, good weather producing bumper yields
- producer cartels - in some markets, producing firms or producing countries band together, usually to restrict supply; this allows them to raise prices and increase their profits or revenues; the best-known cartel today is OPEC, which restricts the supply of oil onto world markets.

## PRODUCER SUPPLY

**Producer surplus** is the difference between the market price received by a firm and the price at which it is prepared to supply. In Figure 4, firms supply 10 million units at US\$0.10, receiving US\$0.20 more than their prepared price. This surplus is the sum of producer surplus earned at each output level.

## PRICE ELASTICITY OF SUPPLY

Price elasticity of demand measures the responsiveness of changes in quantity demanded to change in price. Equally, the responsiveness of quantity supplied to changes in price can also be measured - this is called **price elasticity of supply**. The formula for measuring the price elasticity of supply is:

$$\frac{\text{percentage change in quantity supplied}}{\text{percentage change in price}}$$

This is equivalent to:  $\frac{\Delta Q_s}{Q_s} \div \frac{\Delta P}{P}$

or  $\frac{P}{Q_s} \times \frac{\Delta Q_s}{\Delta P}$

**FIGURE 4**

### Producer surplus

The supply curve shows how much will be supplied at any given price. Except on the last unit supplied, the supplier receives more for the good than the lowest price at which it is prepared to supply. This difference between the market price and lowest price at which a firm is prepared to supply is producer surplus. Total producer surplus is shown by the shaded area above the supply curve.



As with price elasticity of demand, different ranges of elasticity are given different names. Price elasticity of supply is:

- Perfectly inelastic (0) if there is no response in quantity supplied to a change in price
- Inelastic (between 0 and 1) if there is a less than proportionate response in quantity supplied to a change in price
- Unitary (1) if the percentage change in quantity supplied equals the percentage change in price elastic (between 1 and infinity) if there is a more than proportionate response in quantity supplied to a change in price
- Perfectly elastic (infinite) if producers are prepared to supply any amount at a given price.

### DETERMINANTS OF ELASTICITY OF SUPPLY

As with price elasticity of demand, there are four factors that determine supply elasticity across a wide range of products.

**Availability of substitutes** - Substitutes here are not consumer substitutes but producer substitutes. These are goods that a producer can easily produce as alternatives. For instance, one model of a car is a good producer substitute for another model in the same range because the car manufacturer can easily switch resources on its production line. In contrast, carrots are not substitutes for cars. The farmer cannot easily switch from the production of carrots to the production of cars.

**Time** The shorter the time period, the more difficult producers find it to switch from making one product to another. So in the short term, supply is likely to be more price inelastic than in the long term. There is a number of reasons why this is the case.

- Some items take a long time to make.
- If there is no spare capacity to make more of a product, it will be difficult to increase supply very much even if prices rise sharply. The sparer capacity, the less constraint this places on increasing supply in response to price rises.
- With some products, it is easy and relatively cheap to hold stocks to supply the market when they are demanded. With others, it is impossible to hold stocks.
- Price elasticity of supply will be higher the easier it is for a firm to switch production from one product to another or for firms to enter the market to make the product.

### THE SHORT RUN AND THE LONG RUN

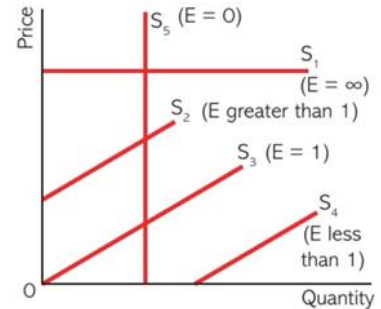
The phrases 'short term' and 'long term' have no precise meaning in economics.

However, **short run** and **long run** have precise meanings in microeconomics. The long run is when all factors of production involved in making a good are variable. This means they can all be changed. The short run is defined as being a period of time when at least one factor of production is fixed. This means it cannot be changed.

FIGURE 5

#### Elasticity of supply

The elasticity of supply of a straight line supply curve varies depending upon the gradient of the line and whether it passes through the origin.



#### SUBJECT VOCABULARY

**conditions of supply** factors other than price, such as income or the price of other goods, that lead to changes in supply and are associated with shifts in the supply curve.

**long run** the period of time in which all factor inputs can be varied but the state of technology remains constant.

**price elasticity of supply** a measure of the responsiveness of quantity supplied to a change in price. It is measured by dividing the percentage change in quantity supplied by the percentage change in price.

**producer surplus** the difference between the market price that firms receive and the price at which they are prepared to supply.

**short run** the period of time when at least one factor input to the production process can be varied.

**supply** the quantity of goods that suppliers are willing to sell at any given price over a period of time.

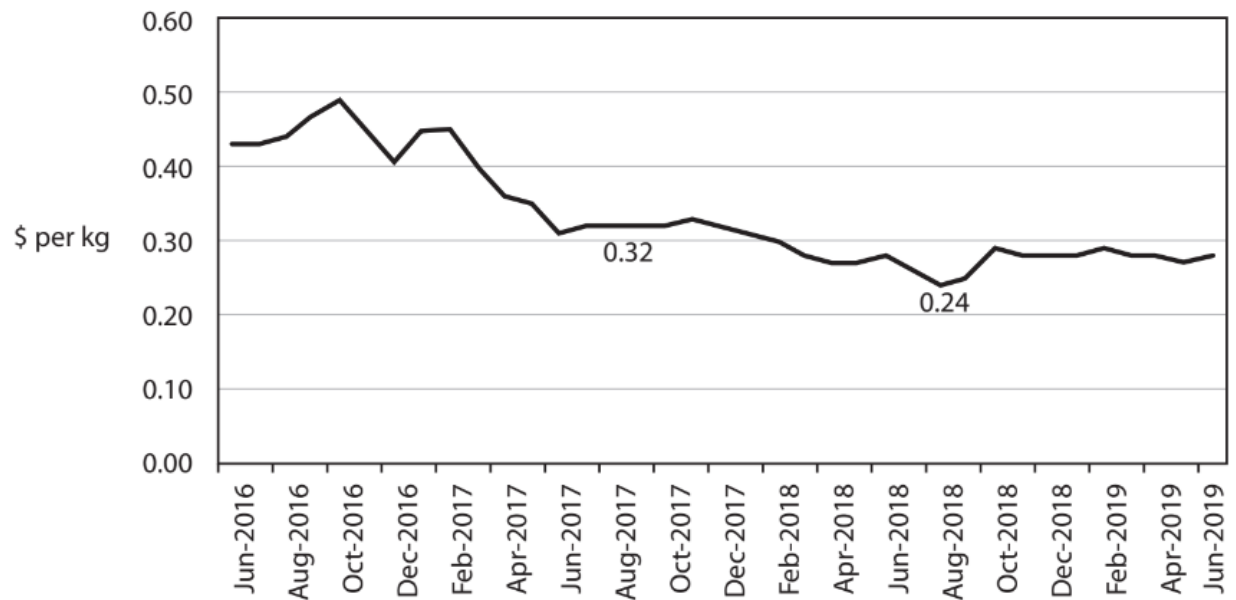
## Revision questions

### 1. 2021 May/June question number 12 (d) P1 (marks 8)

With reference to Extract B, examine two possible effects of information gaps on the consumption of sugar.

#### The market for sugar

**Figure 1 World price of sugar, US\$ per kg, June 2016 – June 2019**



#### Extract B Overconsumption of sugar

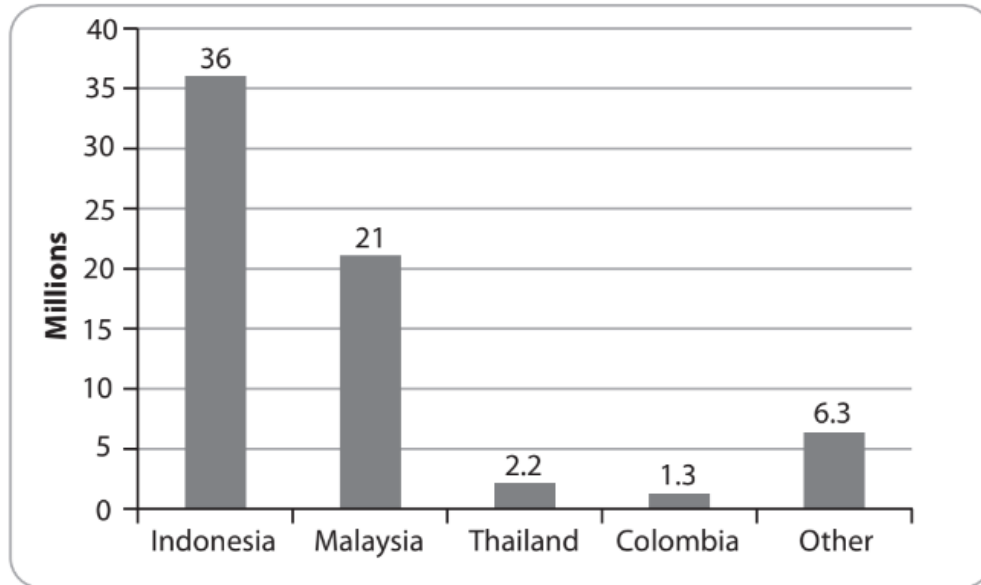
In the USA the recommended maximum amount of sugar consumption is 50 grams per day. In the USA average consumption is 73 grams per day. The human body can comfortably process 25 grams a day. However, any sugar consumption in excess of 25 grams per day will normally be processed into body fat. This is contributing to obesity.

One study found that a high sugar diet increased the risk of heart disease by 38%. Another study found that excess sugar consumption caused an increased risk of many types of cancer. A further study found that men who consumed 67 grams or more of sugar per day were 23% more likely to experience depression than men who consumed less than 40 grams per day.

**2. 2020 May/June question number 12 (d) P1 (marks 8)**

(d) With reference to Figure 2 and Extract A, examine the likely price elasticity of supply for palm oil.

**Figure 2 Global palm oil production in 2017 (million tonnes)**

**Extract A Palm oil price falls**

The equilibrium price of palm oil decreased in 2018. The price of competing vegetable oils, including rapeseed, soybean and sunflower also fell in 2018. Palm oil is used in the production of biodiesel, a substitute for crude oil. Lower crude oil prices during 2018 caused a fall in the demand for biodiesel.

More palm oil was produced in 2018 than was consumed. This abundant supply led to a stockpile of three million tonnes. When first planted, palm trees can take up to 30 months to produce fruit. The fruit can then be harvested twice a year and converted into palm oil.

**3. 2019 May/June question number 13 P1 (marks 20)**

'The HPV vaccine is recommended for all adults in the USA because it reduces the risk of cancer by 88%. If the HPV vaccine was given to all adults 925 000 cases of cancer would be prevented. However only 18.3% of adults were vaccinated between 2011 and 2014 preventing 170 000 cases of cancer.'

Evaluate why only 18.3% of adults were vaccinated.