

# Chapter 4

## The supply of goods and services

### 1 What is the relationship between a firm's supply and market supply?

A **firm's supply curve** shows how much of a good or service a particular firm within the market wishes to supply at different prices. By contrast, the **market supply curve** shows how much of the good or service all the firms in the market desire to supply at different prices. The market supply curve is the *sum* of the supply curves of all the firms within the market. For example, if there are a thousand firms in a competitive market, the market supply curve is the sum of the lot.

### 2 Why does a market supply curve slope upward?

Developing the last point made in the answer to Question 1, if (on average) the supply curves of all the firms in the market slope upward to the right, the market supply curve also slopes upward to the right. We must therefore ask the question: why should a particular firm respond to a higher price by being willing to supply more of the good or service? The short answer lies in the word profit.

Generally, when a firm increases its level of output, the cost incurred by the firm for each extra good increases. (At A2, this is called increasing marginal cost.) If this is the case, the profit made on any further units of output decreases and may become a loss, unless the price of the good or service rises to offset the effect of the increased cost of producing the extra output. Firms are only prepared to increase supply if it is profitable to do so; with rising costs of production a higher price is needed to create the incentive to increase production.

### 3 What are the conditions of supply?

The **conditions of supply** are the factors that influence and determine supply, other than the good's own price. The main conditions of supply are: the prices of goods in joint supply, the costs of production such as wage costs and raw material costs, the state of technical progress, the taxes that firms have to pay to the government such as VAT and the business rate, and subsidies given by the government to firms.

As the next answer explains, a change in any of the conditions of supply causes the supply curve to shift to a new position, either to the left (if a tax or costs of production rise), or to the right (if technical progress occurs or firms benefit from a subsidy).

### 4 Why may a supply curve shift?

The explanation for a shift of a supply curve is similar to the explanation for a shift of a demand curve provided for the answer to Question 3 in Chapter 3. To understand this, we must distinguish between the **single explanatory variable** and the **multi-explanatory variable** supply functions. The single explanatory variable supply function (written below) shows planned quantity supplied when the good's own price changes, assuming that the conditions of supply do not change:

$$Q_s = f(P), \text{ ceteris paribus}$$

By contrast, the multi-explanatory variable supply function is:

$$Q_s = f(P, P_{JS}, C, TP, T_F, Sub_F, \dots)$$

Once again, the symbol 'P' is the good's own price, but the other symbols represent the conditions of supply:  $P_{JS}$  is the symbol used for the prices of goods in joint supply,  $C$  represents costs of production such as wage costs and raw material costs, TP stands for technical progress, while  $T_F$  and  $Sub_F$  are symbols representing respectively taxes imposed on firms and subsidies granted to firms.

If any of the conditions of supply change (including any that have not been listed explicitly inside the brackets), the supply curve shifts to a new position. For example, the shift to the right of the supply curve shown in Figure 4.1 might have been caused by a fall in costs of production.

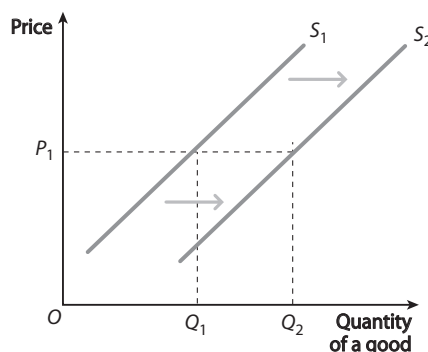


Figure 4.1 A shift of a supply curve to the right

### 5 Distinguish between joint supply and competing supply.

Consider a foodstuff such as beef. Whenever a farmer arranges for one of his cows to be slaughtered in order to provide meat, the animal's hide is available for conversion into leather. There is a fixed relationship or coefficient between the supply of beef from the animal and the supply of leather, namely 1 to 1. The decision to slaughter the cow increases the supply of the by-product by one hide, and it is impossible to supply the hide without first killing the cow. The two products are in **joint supply**.

**Competing supply** can also involve the joint supply of two products, but in this case the supply of one product can also be increased by reducing the supply of the other. A good example stems from the supply of crude oil. When crude oil is refined, a number of different goods can be produced, for example aviation fuel, petrol, diesel fuel, and petrochemicals that are used to produce plastics. With crude oil refining, and unlike the supply of beef and cow hides, more petrol can be produced from a barrel of oil by reducing production of one or more of the other by-products. In this case, there is a variable coefficient in the relationship between petrol and other oil products.

Competing supply has a certain resemblance to composite demand, which is defined in the answer to Question 5 in Chapter 3. In that answer, I explained how the increasing demand for biofuel has led to corn or maize being sold for fuel rather than for food. However, with composite demand, only one agricultural product is produced, namely corn, but it can be switched between competing uses. With competing supply, by contrast, production or supply of one good can be increased, but only (providing the total supply of the raw material or source of energy is fixed) at the expense of reducing the supply of another good produced from the same raw material or energy source.

### 6 Compare the effect of the imposition of an *ad valorem* tax on supply with that of a unit tax.

From a firm's point of view, the imposition of a tax by the government on a good, which the firm has to pay, is equivalent to a rise in the costs of production faced by the firm. This means that the good's supply curve shifts to the left or upward, the quantity supplied falls, and the good's price rises.

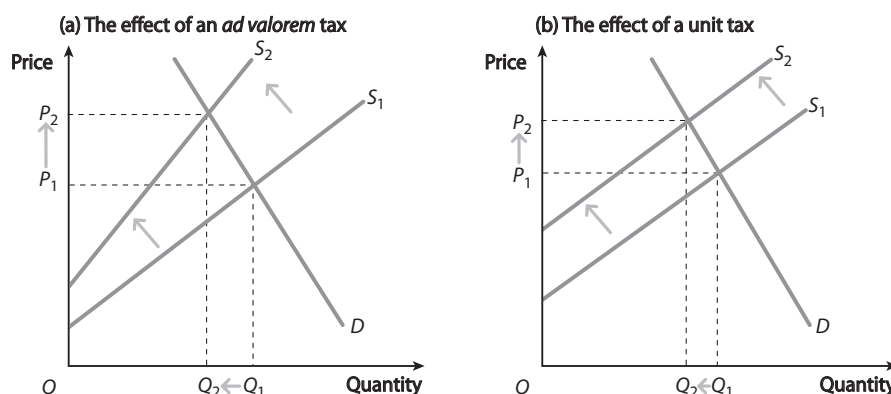


Figure 4.2 The imposition of ad valorem and unit taxes

However, the effect will differ to some extent depending on whether the tax is an **ad valorem tax** or a **unit tax**. In the UK **value added tax (VAT)** is an **ad valorem tax** or **percentage tax**. For most goods, VAT is levied at a rate of 17.5% of the price of the good before the tax is imposed. For example, if the good's price is exactly £1, the government collects 17.5 pence for each unit of the good sold. But if the price (without the tax) increases to £2, the government collects 35 pence per unit sold. This means that in panel (a) of Figure 4.2, the supply curve that includes the tax ( $S_2$ ) diverges away as the price rises from the supply curve that does not include the tax ( $S_1$ ).

In the case of a unit tax (or a **specific tax**), the size of the tax per unit of the good remains the same at all prices. In the UK, the **excise duties** imposed on petrol and diesel fuel, and on tobacco and alcohol, are unit taxes (though these goods are actually taxed twice as VAT is also levied). If we ignore the impact of VAT, the tax imposed on these goods shifts the supply curve upward by the size of the tax per unit, but the new supply curve ( $S_2$ ) remains parallel to  $S_1$ . This is shown in panel (b) of Figure 4.2.

## 7 How does a subsidy given by the government to farmers affect the supply of an agricultural good?

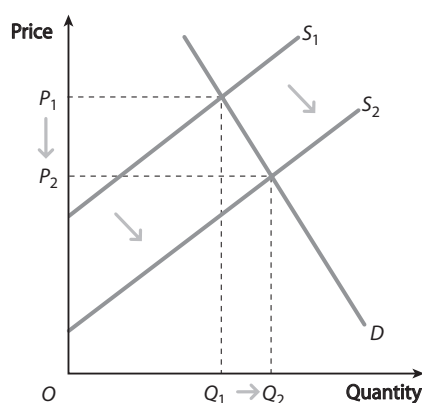


Figure 4.3 The effect of a subsidy given to producers of a good

A subsidy is the opposite of a tax, i.e. it is money given by the government to people or firms rather than money taken away from them. When the government imposes income tax on people, this shifts to the left the demand curves for goods that people buy (provided of course that the goods are normal goods). In a symmetrical way, a subsidy paid directly to households, for example, a subsidised bus fare claimable by presenting a bus pass to the bus driver, shifts the demand curve for the good to the right.

Normally, however, AS exam questions focus on subsidies given to producers or sellers of goods rather than to the people demanding the good or service. The most common subsidies are those given to farmers. If we assume that a subsidy paid directly to a farmer is a **unit subsidy** (i.e. the same subsidy per unit irrespective of the price paid for the agricultural crop or animals that the farmer is selling), the subsidy shifts the supply curve to the right. The extent to which the good's price falls and the quantity bought increases depends not only on the size of the subsidy, but also on the price elasticity of demand for the good.

In the case of a 100% subsidy (which is not the case with agricultural subsidies), the good ends up being 'free' for the consumer. Merit goods, such as state education and most of the services provided by the NHS, are completely subsidised in this way. And even when private education and healthcare are provided at market prices through markets, some of the consumers, usually those from poor families, may be partially subsidised by the state.

# Chapter 5

## Bringing demand and supply together in a competitive market

### 1 Distinguish between goods markets and factor markets in an economy.

Economists divide the markets in an economy into two groups. These are the economy's **goods markets** (or **product markets**) and the **markets for factors of production** (land, labour, capital and enterprise). Goods markets are markets for *outputs*, while factor markets are markets for *inputs* into the production process.

### 2 Explain why the market for tomatoes is competitive whereas the market for tap water is uncompetitive.

A competitive market is a market in which there are large numbers of both buyers and sellers, all of whom possess fairly accurate information about what is going on in the market. Competitive markets are associated with two main types of competition: **price competition**, in which firms try to attract customers away from other firms by reducing prices and offering bargains; and **quality competition** where factors such as technical quality, style and design are the main competitive factors. The latter are sometimes called forms of **non-price competition**. Arguably, however, factors such as these which create brand loyalty and differentiate otherwise relatively similar products from each other, can increase the monopoly power of firms within the market.

Tap water is provided under monopoly conditions. Water provision is an example, first of a **utility industry**, and second of a **natural monopoly**. Utility industries, such as water, telephones, gas and electricity produce a service that is delivered through a distribution network of pipes and cables into millions of separate market outlets. Competition would lead to a duplication of fixed capacity, which in turn would increase distribution costs. Because of the development of **technology-driven competition** (e.g. mobile phones competing with traditional landline telephones), industries such as electricity, gas and of course telephones have ceased to be natural monopolies. This is not the case though with the provision of piped tap water, which continues to be a natural monopoly. Consumers