

Therefore, with elastic demand, producers have the higher tax incidence. With elastic supply, consumers have the higher tax incidence. If schedules are inelastic, the opposite holds, so that more of the tax burden falls on the same side. With inelastic demand, most of the tax burden is on consumers; with inelastic supply, most of the tax burden is on producers. Examining Figures 4.6 and 4.7 will enable you to confirm that these results hold.

In general, the tax burden falls proportionately more on the group whose activities are less responsive to price changes: on consumers whose purchases are not very responsive to price increases (inelastic demand), and on producers whose sales are not very responsive to price increases (inelastic supply). The low responsiveness (low price elasticities) means that as price increases due to the imposition of the tax, consumers or producers do not change their buying and selling activities substantially, and so as a result must bear a relatively larger portion of the tax burden.

Test your understanding 4.3

- 1 What determines whether the incidence of an indirect tax falls mainly on consumers or mainly on producers?
- 2 Using diagrams, show how the incidence of an *ad valorem* tax will be shared between consumers and producers in the case of (a) elastic demand, and (b) inelastic demand. What conclusions can you draw about relative tax burdens and price elasticities of demand?
- 3 Using diagrams, show how the incidence of an *ad valorem* tax will be shared between consumers and producers in the case of (a) elastic supply, and (b) inelastic supply. What conclusions can you draw about relative tax burdens and price elasticities of supply?

4.3 Subsidies

Introduction to subsidies

The meaning of subsidies

A *subsidy*, in a general sense, refers to assistance by the government to individuals or groups of individuals, such as firms, consumers, industries or sectors of an economy. Subsidies may take the form of direct cash payments or other forms of assistance

such as low-interest or interest-free loans (for example, to students, to low-income consumers for the purchase of goods and services such as housing, or to firms needing assistance), the provision of goods and services by the government at below-market prices; tax relief (i.e. paying lower or no taxes); and others.

In this section, we will consider only subsidies consisting of cash payments by the government to firms. Such payments are usually a fixed amount per unit of output, and are therefore *specific subsidies*.

Subsidies and the allocation of resources

Subsidies, like taxes, have the effect of changing the allocation of resources because they affect relative prices, thus changing the signals and incentives prices convey. A subsidy granted to a firm (or group of firms) has the effect of increasing the price received by producers, causing them to produce more, and lowering the price paid by consumers, causing them to buy more. Therefore, the allocation of resources changes and results in greater production and consumption than in the free market.

As with indirect taxes, we are interested in seeing whether the granting of a subsidy improves or worsens the allocation of resources. Here, too, the answer depends on the degree of allocative efficiency in the market before the subsidy. In an economy where resources are allocated efficiently, a subsidy introduces allocative inefficiency and welfare losses. This will be the topic of this section. But if the economy begins with allocative inefficiency (due to market imperfections), then a subsidy can work to improve the allocation of resources if it is designed to correct the source of the inefficiency. This will be examined in Chapter 5.

Why governments grant subsidies

- ◆ Explain why governments provide subsidies, and describe examples of subsidies.

There are several reasons why governments grant subsidies to firms:

- **Subsidies can be used to increase revenues (and hence incomes) of producers.** Subsidies have the effect of increasing the revenues of producers. Therefore, governments often grant subsidies to particular producers whose revenues (and therefore incomes) they would like to support. This is most commonly done for producers of agricultural products.

- **Subsidies can be used to make certain goods (necessities) affordable to low-income consumers.** Subsidies have the effect of lowering the price of the good that is paid by consumers, thus making the good more affordable. For example, a government may wish to make a food staple (such as bread or rice) more affordable to low-income earners, and can do so by granting a subsidy to producers of the good.
- **Subsidies can be used to encourage production and consumption of particular goods and services that are believed to be desirable for consumers.** A subsidy has the effect of increasing the quantity of a good produced and consumed. If a government wishes to encourage consumption of a good because it is considered to be desirable (for example, education, vaccinations), it can use a subsidy to achieve this.
- **Subsidies can be used to support the growth of particular industries in an economy.** Since subsidies have the effect of increasing the quantity of output produced, if granted to firms in a particular industry, they support the growth of that industry. For example, subsidies to the solar industry are intended to promote the growth of solar power, subsidies to ethanol production are intended to promote the production of biofuels. Other examples include chemicals, textiles, steel, fossil fuels and many more.
- **Subsidies can be used to encourage exports of particular goods.** Since subsidies lower the price paid by consumers, they are sometimes granted on goods that are exported (sold to other countries), since lower export prices increase the quantity of exports.
- **Subsidies are a method to improve the allocation of resources (reduce allocative inefficiencies) by correcting positive externalities.** It was noted above that market imperfections prevent the achievement of allocative efficiency; in some cases (such as when there are positive externalities), it may be possible to use subsidies to improve allocative efficiency (see Chapter 5).
Subsidies are a controversial topic in economics because they are very extensive and are often designed to achieve certain objectives that may not be consistent with other important objectives. For example, many countries grant subsidies to fossil fuels, which run contrary to objectives of sustainable development (see page 128), and which also contradict the objectives of other subsidies intended to support

the growth of alternative energy. Fossil-fuel subsidies are known as 'perverse subsidies'. Subsidies for agriculture and exports are also highly controversial (see Chapters 13 and 17).

Subsidies: impacts on market outcomes and consequences for stakeholders

- ♦ Draw a diagram to show a subsidy, and analyse the impacts of a subsidy on market outcomes.

Impacts of subsidies on market outcomes

In Figure 4.8, the initial, pre-subsidy equilibrium is determined by the intersection of the demand curve D and the supply curve S_1 , giving rise to equilibrium price P^* paid by consumers and received by producers, and equilibrium quantity Q^* . Now the government grants a subsidy consisting of a payment to the firm of a fixed amount for each unit of output sold. This means that for each unit of output the firm is willing and able to produce, it receives a lower price than the original by the amount of the subsidy; this produces a downward, parallel shift of the supply curve by the amount of the subsidy, to the new curve $S_2 (= S_1 - \text{subsidy})$. (This is equivalent to a rightward shift of the supply curve, meaning that for each price, the firm is now willing to supply more output; see 'Quantitative techniques' chapter on the CD-ROM, page 13 for an explanation.) The demand curve remains constant at D since demand is not affected. The demand curve and new supply curve S_2 determine a new equilibrium, where price is P_c (the price paid by consumers) and the quantity produced and sold increases to Q_{sb} . Since the vertical difference between the two supply curves represents the subsidy per unit of output, the firm receives price P_p , which is equal to

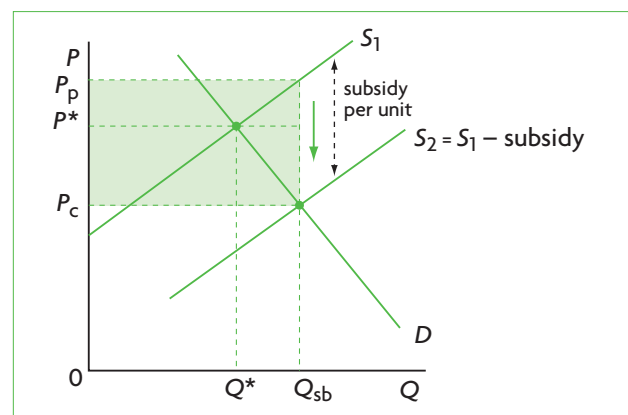


Figure 4.8 Impacts of subsidies on market outcomes

the price paid by the consumer, P_c , plus the subsidy per unit of output.

The market outcomes due to the subsidy are the following:

- equilibrium quantity produced and consumed increases from Q^* to Q_{sb}
- the equilibrium price falls from P^* to P_c ; this is the price paid by consumers
- the price received by producers increases from P^* to P_p
- the amount of the subsidy is given by $(P_p - P_c) \times Q_{sb}$, or the amount of subsidy per unit multiplied by the number of units sold; this is the entire shaded area, and represents government spending to provide the subsidy
- there is an overallocation of resources to the production of the good: Q_{sb} is greater than the free market quantity, Q^* .

Consequences of subsidies for various stakeholders

- ◆ Discuss the consequences of providing a subsidy on the stakeholders in a market, including consumers, producers and the government.

Consumers

Consumers are affected by the fall in price of the good from P^* to P_c (Figure 4.8) and the increase in quantity purchased (from Q^* to Q_{sb}). Both these changes make them better off.

Producers

Producers are also better off, because they receive a higher price ($P_p > P^*$) and produce a larger quantity ($Q_{sb} > Q^*$), seen in Figure 4.8. The price and quantity effects translate into an increase in revenues. Before the granting of the subsidy, firms had revenues of $P^* \times Q^*$. Following the subsidy, firm revenues increase to $P_p \times Q_{sb}$.

The government

The government pays the subsidy, which is a burden on its budget. To obtain the revenues for the subsidy, the government may have to reduce expenditures elsewhere in the economy, or it may have to raise taxes, or it may have to run a budget deficit (government expenditures greater than tax revenues).

Whatever the case, the impact on the government's budget is negative.

Workers

As output expands from Q^* to Q_{sb} , firms are likely to hire more workers to produce the extra output, therefore workers who find new jobs are better off.

Society as a whole

Society as a whole is worse off because there is an overallocation of resources to the production of the good; $Q_{sb} > Q^*$.

Foreign producers

If the subsidy is granted on exports (goods sold to other countries), it lowers price and increases the quantity of exports. While this is positive for domestic producers, it is negative for the producers of other countries who may be unable to compete with the lower price of the subsidised goods. (This topic will be discussed in Chapter 17.)

Test your understanding 4.4

- 1 Explain the meaning of subsidies.
- 2 Explain some reasons why governments grant subsidies, and provide examples.
- 3 Using diagrams, show how the supply curve shifts when a subsidy is granted to firms producing a particular product.
- 4 The government is considering granting a €0.50 subsidy per kilogram of cheese. **(a)** Draw a diagram for the cheese market before the granting of the subsidy, showing the price paid by consumers, the price received by producers and the quantity of cheese that is bought/sold. **(b)** Draw a diagram for the cheese market after the granting of the subsidy, showing the price paid by consumers, the price received by producers, and the quantity of cheese bought/sold. **(c)** Explain how your diagram for question (a) differs from your diagram for question (b).
- 5 Considering question 4 above, **(a)** analyse the impacts on the market of the subsidy for cheese producers, and **(b)** discuss the consequences for stakeholders.